Fertility in the Philippines

Further Analysis of the Republic of the Philippines Fertility Survey 1978

Editors
Luisa T. Engracia
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COUNTRY STUDIES PHILIPPINES

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In collaboration with
National Census and Statistics Office
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Preface

This volume brings together the results of detailed analysis of the data from the Republic of the Philippines Fertility Survey (RPFS) 1978 which was carried out as part of the World Fertility Survey Programme. A First Country Report of the RPFS was published towards late 1979 which presented a description of the survey operation and the major findings based on a large set of detailed and fairly standardized tabulations which were produced according to the WFS guidelines. The level and amount of analysis in the Report are understandably limited and from the very beginning the need to carry out further analysis using more sophisticated methods in a multivariate context has been recognized both by WFS and by the country. The need for such analysis was also emphasized at the National Seminar on the RPFS held in December 1979. In his opening address at the Seminar, Dr Conrado Ll. Lorenzo, Jr, President and Executive Director of the Population Center Foundation, stated: 'At the same time, we are fully aware that drawing these policy and program implications involves far more than reading the First Country Report and speculating on its implications. We recognize that re-analysis of the data will be necessary, that some problem areas may even demand intensive re-analysis of the RPFS data in conjunction with other data sets already available'.

Following the recommendations at the Seminar in the light of the national needs, the National Census and Statistics Office (NCSO), in collaboration with the University of the Philippines Population Institute (UPPI), proposed a comprehensive programme for analysis. The WFS has been pleased to support the programme by providing the assistance needed by the country.

This volume consists of reports on analysis of most of the major topics for which information was gathered in the RPFS: nuptiality, fertility levels and trends, fertility determinants, fertility preferences, family planning behaviour and infant and child mortality. Analysis has also been undertaken with WFS support in certain other areas – factors other than contraception affecting marital fertility, community factors and their effect on child mortality, fertility preferences and contraceptive orientation – and the findings are published elsewhere. It should be noted here that all such further analysis work on RPFS data was preceded by a detailed evaluation of the quality of the demographic data, the results of which appear as *WFS Scientific Reports* no 19. Most of these studies were carried out in the Philippines by researchers from the national organizations and this indicates the high level of local commitment to make good use of the data collected in the RPFS. I take this opportunity to congratulate the contributors for the quality and depth of their work. It is hoped that this volume, along with the other reports, will make a contribution to the understanding of the population dynamics of the Philippines.

We very much appreciate and gratefully acknowledge the leadership given to this project from the very beginning by Dr Tito Mijares, Project Director, and Dr Mercedes Concepción, Co-Project Director of the RPFS. Dr John Casterline of the WFS Central Staff co-ordinated the RPFS analysis activities with his customary high efficiency and also edited the papers in this volume with Dr Luisa Engracia and Dr Corazon Raymundo-Mejia from the Philippines. They all are to be congratulated for their high quality work. Finally, I also wish to record my appreciation of the valuable work of technical editing by Kathryn Swift.

V. C. CHIDAMBARAM
Deputy Project Director

Introduction

This is the second of two volumes that presents facts and conjectures about the reproductive behaviour of Filipino women which were taken principally from the Republic of the Philippines Fertility Survey 1978 (RPFS). The first volume presented basic tables and provided a descriptive and situational account of the levels, trends, and differentials in fertility and contraceptive practices in the Philippines. The present volume discusses the findings of analytical studies about the 'how' and the 'why' of the reproductive process.

The RPFS 1978 was undertaken as part of the World Fertility Surveys (WFS) which is an international research programme whose purpose is to assess the current state of human fertility throughout the world through promoting and supporting nationally representative, internationally comparable and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.

The RPFS, in itself, was a survey of a nationally representative sample of households and ever-married women selected on the basis of a multi-stage probability sampling design. After leaving out cases of non-response, the final RPFS data set includes responses from 12 742 households and 9268 ever-married women in the childbearing ages located in 716 sample barangays.

Three types of survey instruments were utilized: an individual questionnaire, a household schedule and a community level questionnaire. Basic fertility questions were included in the individual level questionnaire, the respondents for which were the ever-married women in childbearing ages. The individual level questionnaire was essentially an adaptation of WFS's core questionnaire and covered eight sections: respondents' background, pregnancy history, marriage history, factors affecting fertility other than contraception, contraceptive knowledge, use and availability of supplies, fertility planning, work history and current husband's background.

The household and the community questionnaires, on the other hand, collected relevant information about the households and the communities where the respondents resided. Membership within the household, socio-economic characteristics of the members, and availability of certain types of housing facilities were among the items of information ascertained in the household schedule. Accessibility of transportation and communication services as well as to important government facilities such as those for health, family planning and others were likewise determined through the community level questionnaire. Incidentally, the latter was administered only in the rural areas but despite such limitation, the research value of the data has been aptly recognized.

The first national report of the RPFS was published and made available 18 months after the completion of the main fieldwork. This report was presented in a national seminar held in December 1979. The seminar highlighted some of the major findings of the RPFS: the previously observed trend towards increasing age at marriage had continued well into the 1970s; overall fertility slowed down, although marital fertility had hardly changed; there was widespread preference for small families and an almost universal awareness of methods of family limitations which, sadly, was not matched by a similar level of contraceptive use. These generalizations characterize the overall demographic scenario of the country, but considerable variation was observed across socio-cultural subgroups of the population.

Despite the numerous and revealing findings that the first RPFS report presented, it has in fact raised more questions than it has provided answers. It has left some important issues still grounded on dubious arguments and has, all the more, intrigued

social scientists and policy-makers alike as to the exact nature of the demographic path of the country. For example, while the data did indicate that age at marriage continued to increase, it was not clear whether or not nuptiality had remained a significant determinant of current fertility. And questions such as — why is there such a large gap in contraceptive knowledge and use among Filipino women? What determines the effective use of family planning methods? Has increased child survivorship affected family size norms? To what extent have development variables such as female non-familial role participation affected fertility? — are still puzzling many students of population in this country.

Thus a project was conceived for the second stage analysis of the 1978 RPFS data. This project included proposals for the analysis of the data covering a very comprehensive, albeit not exhaustive, range of topics possible with the RPFS data set solely or in conjunction with other demographic data available in the country. The proposals dealt with such topics as patterns and correlates of childbearing, family formation, contraception and family planning impact, infant and child mortality, and female work participation. The studies were undertaken by researchers from different national agencies: researchers from the National Census and Statistics Office (NSCO), the University of the Philippines Population Institute (UPPI) and School and Economics (UPSE) and the Commission of Population (POPCOM). Generous financial as well as technical assistance were provided by the World Fertility Survey.

Before the papers came into final form, two seminars were conducted in Manila during which the preliminary drafts of the papers were presented for critical evaluation. Members of various research institutions and concerned national agencies, who were present during these seminars, offered valuable comments and suggestions toward the improvement of the drafts of the papers. The research papers, in the form that they are now presented in this volume, reflect the valuable contributions of those seminar participants.

The task of putting these disparate studies together into one cohesive and comprehensive report has been done by the Editorial Committee consisting of Dr John B. Casterline (WFS), Dr Corazon M. Raymundo (UPPI) and Dr Luisa T. Engracia (NCSO). Further editorial work was undertaken by Kathryn Swift of WFS in London.

With the successful completion of this volume, acknowledgements and expressions of gratitude are only fitting for this would not have been possible without the contributions of other individuals and agencies. All those involved in the Second Stage Analysis of the RPFS project are greatly appreciative of the contributions of the World Fertility Survey and its donor agencies, particularly the US AID. True to its commitment to further research on fertility, WFS has supported this project from its inception until the publication of the final results. Special thanks and recognition go to Dr John B. Casterline, the Philippine Country Co-ordinator from WFS whose efforts and dedication spelled out the success of this project. John was a critic, adviser and facilitator; but above all, he was a friend. Dr Mercedes B. Concepción, with her able leadership in the field of demographic research not only in this country but also in the international scene, is greatly responsible for the successful completion of this entire endeavour known as the Republic of the Philippines Fertility Survey. Her contributions extend from the planning and negotiations for the main survey (she was Co-Project Director of the first phase of the RPFS) up to the completion of this second report. Many thanks, indeed, are due her. To countless others, who in one way or the other have made this volume possible, their valuable contributions are here acknowledged with gratitude.

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Part I

Nuptiality

Introduction

The postponement of first marriage as modernization proceeds in many developing countries has wide-ranging implications for the existing programmes and policies of these countries. For the majority of these populations, marriage, whether formal or consensual, still signifies the socially-sanctioned initiation of a woman to sexual activity. Fertility is thus found to be closely and positively associated with marital duration. In the Philippines, there is little difference in the average interval between marriage and first birth for early and late marriers (RPFS, *First Report*). Unfavourable socio-economic, marital and health consequences of early fertility are therefore implied by early marriage.

It is not surprising, therefore, that interest has increased with regard to research and policy in nuptiality during the last two decades. Past efforts in the Philippines suggest that postponement of marriages has contributed to the attainment of fertility reduction (Smith 1975; Concepción 1980). Although Filipino women marry late by many standards, a trend towards further delay in age at marriage was seen as early as 1939 and this has accelerated during the 1970s. RPFS data recorded a singulate mean age at marriage of 24.4 years among Filipino women in 1978.

The paper of Smith, de Guzman and Alcantara in this Part heightens our confidence that the rise in age at marriage is a real phenomenon. Taking advantage of the availability of a series of national surveys and censuses, and the ability to reconstruct past marital status distributions from several single surveys, the authors test the consistency of reported ages at marriage across data sources and conclude that the rise is real.

The trend having been established 'beyond dispute', the authors then answer the next logical question: 'Is the trend likely to continue in the future?' Incomplete cohort marriage experiences are extrapolated into the future through use of Coale's nuptiality model. The results suggest that there might even be an acceleration of the upward trend in marriage timing among the younger cohorts and that 'the cohorts currently entering marriage will post an aggregate record of marriage delay which is unprecedented for the Philippines and, indeed, for any major population of South-east Asia'.

Modernization factors such as degree of urbanization, educational attainment and work participation of women were used earlier by Smith (1980) to explain variations in age at entry into marriage on an aggregate level. De Guzman updates this effort in chapter 2 by employing further background characteristics of the women and carrying out analyses not only on the national level but across and within regional subdivisions as well. His analysis lends support to an earlier suggestion that those in more traditional social positions and those less exposed to modernizing influences marry earlier. Utilizing an hierarchical entry of variables into regression equations, the net and added influences of a variable of interest are highlighted. The author concludes that there are important and considerable differences in age at entry into marriage among socio-economic groups of women within the country and within the regions and also across the regions. A continued upward course of age at marriage as suggested by chapter 1 is expected to be a result of heightened development efforts in the regions providing both men and women with more opportunities for employment and better education in the more formal sector of the economy.

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1 An Assessment of Philippine Cohort Nuptiality Trends

Peter C. Smith, Adelamar Alcantara and Eliseo A. de Guzman

1.1 INTRODUCTION

Evidence of a significant trend in the timing of marriage among Filipino women is readily available in the time series of eight national censuses, complemented by the recent sequence of three National Demographic Survey (NDS) and Republic of the Philippines Fertility Survey (RPFS) survey rounds. Examination of the marital status data in the censuses (Smith 1975; 1978; Reyes 1981) indicates substantial declines between censuses in the percentage ever married in each age group. It is more difficult to establish trends using the retrospective survey responses on age at marriage (Smith 1975), mainly because of the problems of event truncation and age-censoring that are inherent in all cross-sectional surveys (Ryder 1975). However, the surveys have been quite useful in identifying cross-sectional socio-economic differentials in marriage timing (Smith 1975; de Guzman, chapter 2).

Existing research on Philippine nuptiality establishes past trends and recent differentials quite adequately on the whole, but does not indicate whether further marriage delay can be expected in the future and, if so, how much additional delay should be anticipated. In this chapter we explore this question by examining the past and anticipated future nuptiality of recent cohorts of Filipino women. We accomplish this by applying a well-known age model of the cohort first marriage process (Coale 1971) to the experience of actual cohorts measured as recently as 1978. The result is an assessment of the nuptiality experience of these cohorts which includes their likely future experience in the years after the surveys.

The second major focus of this chapter is methodological. The data base on marriage in the Philippines has now expanded to the point where it can be fruitful to juxtapose estimates from several sources in order to establish the degree of consistency among them and thus heighten confidence in the conclusions drawn from them. Much of this chapter is devoted to a discussion of inconsistencies among the 1968, 1973 and 1978 surveys and to our interpretation of why these inconsistencies occur. Our comparisons among the three surveys will be of methodological interest to researchers in other countries where time series of household surveys have begun to accumulate.

1.2 A SUMMARY OF NUPTIALITY TRENDS

The following assessment of long-term nuptiality trends draws on the national censuses from 1903 to 1975, including the years 1939, 1948, 1960 and 1970. In table 1.1 we present the cross-sectional marital structures for these dates, supplemented by similar data from the NDS rounds of 1968 and 1973 and the RPFS of 1978.

A significant long-term trend in the timing of marriage is indicated by the declines in the percentage ever married at each age. The decline at age 15–19 is from one in four ever married in 1903 to only one in fifteen ever married in 1978. At ages 20–24 the decline is from two out of three in 1903 to only two out of five in 1978. Even the age group 25–29 shows a decline of more than ten percentage points. The historical timing of these changes is interesting. Considerable change had occurred by the time of the Second World War, and the percentages ever married in the youngest age groups had reached very low levels by 1960. Still, in the recent past we have seen a continuation of the long-term trend.

The statistical record for the last two decades is made up of a combination of census and survey estimates of marital status composition. It will be noted in table 1.1 that the survey estimates of current marital status composition seem somewhat low relative to those from the censuses. In

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Table 1.1 Percentages ever married according to the censuses of 1903, 1939, 1948, 1960, 1970 and 1975, the 1968 NDS, the 1973 NDS and the 1978 RPFS

Year	Age group							
	15–19	20–24	25–29		30–34	35–39		40–44
1903[a]	26.4	66.7	—	84.4	—	—	90.6	—
1939[a]	19.7	63.6	—	84.3	—	—	92.6	—
1948[a]	14.9	59.3	81.2		87.4	90.5		91.3
1960[a]	12.7	55.7	80.5		78.5	91.9		92.4
1968[b]	10.6	47.7	78.7		87.3	92.8		95.3
1970[a]	10.8	49.7	88.4		88.3	92.0		92.7
1973[c]	8.5	44.1	75.2		86.3	92.7		94.1
1975[d]	12.4	48.8	75.7		87.9	91.8		93.2
1978[d]	6.8	40.4	70.6		86.1	91.3		95.1

[a]Obtained from table 113, Smith, P.C. (1978). Trends and Differentials in Nuptiality. In *Population of the Philippines. ESCAP Country Monograph Series* no 5: 139. Bangkok, Thailand: United Nations.
[b]Obtained from table 4.2, Flieger, W. (1975). Fertility Levels and Fertility Trends. In W. Flieger and P.C. Smith, eds *A Demographic Path to Modernity*. Quezon City: University of the Philippines Press.
[c]Obtained from University of the Philippines Population Institute, Weighted marginals, 1973 National Demographic Survey.
[d]Computed from table 4.4 in National Census and Statistics Office, University of the Philippines Population Institute, Commission on Population, and National Economic and Development Authority (1979). *World Fertility Survey: Republic of the Philippines Fertility Survey 1978. First Report*. Manila.

the next section we make a different kind of comparison between the censuses and the surveys and arrive at a very different conclusion.

Comparisons between each census and the surveys

A different and more subtle comparison of the census and survey sources is made possible by utilizing the survey retrospective information on age at marriage to reconstruct cross-sectional marital status composition at various census dates before each of the three surveys.

Since the RPFS individual questionnaire recorded ages at first marriage for ever-married women, and the RPFS household questionnaire provided proportions of women by their current ages who were ever married by the survey dates, it is possible to combine this information and thereby reconstruct for each cohort (age group) in each of the surveys the proportions ever married by any date before the survey (Flórez and Goldman 1980: 13–16; Reyes 1981; Trussell 1980: 25–30). And, because the information is available for single years of age at the time of each survey, it is straightforward to select age groups (cohorts) on current age which place those cohorts in standard age groups on the dates of censuses in the past. The results reported here are based on all three surveys, thus allowing a variety of comparisons. A similar exercise with only the 1978 RPFS is reported by Reyes (1981); her figures differ slightly from ours.

Several comparisons are of particular interest. First, we can compare the census estimates for each age group with survey reconstructions for the same age groups at those census dates. Doing so, we find that the survey responses generally yield estimates of the proportion ever married which are higher, especially for age groups below age 25 (table 1.2). These discrepancies are greatest in the reconstructions back to 1960. All three surveys indicate substantially higher estimates of the proportions ever married among women in the younger cohorts in 1960 than were reported in that census. All three surveys are consistent in implying that the proportions ever married in the 15–19 cohort are about twice as high as the 0.127 level reported in the census. The survey estimates for the 20–24 age group are also substantially higher than that of the census. The 1968 and 1973 NDSs are higher by about the same magnitude (4.8 and 4.7 percentage points, respectively), while the 1978 RPFS-estimated proportion ever married for this age group is higher by 10.3 percentage points. Differences between the 1960 census and the survey estimates are also evident among the older women but these are smaller in magnitude.

Table 1.2 Estimates of percentages ever married for census years as implied by the 1968 NDS, 1973 NDS and 1978 RPFS, with comparative census estimates

Age group	1960 estimates based on				1970 estimates based on			1975 estimates based on	
	1960 census	1968 NDS	1973 NDS	1978 RPFS	1970 census	1973 NDS	1978 RPFS	1975 census	1978 RPFS
15–19	12.7	21.8	20.7	21.8	10.8	11.2	16.4	12.4	12.2
20–24	55.7	60.5	60.6	66.0	49.7	51.0	56.2	48.8	49.5
25–29	80.5	81.0	80.0	84.7	78.5	81.4	81.6	75.6	77.8
30–34	88.4	85.8	90.3	*	88.2	88.4	90.9	87.8	89.1
35–39	91.9	89.7	*	*	92.0	91.4	93.9	91.7	93.0
40–44	*	*	*	*	92.7	93.0	*	93.1	94.7

*Not estimated.

The second panel of table 1.2 summarizes the reconstructions back to 1970. Again, the 1978 RPFS proportions ever married for the younger cohorts are proportionally higher than those reported in the 1970 census. In contrast, the 1973 NDS approximates the 1970 census proportions ever married fairly well. Also, the 1975 reconstruction based on the 1978 RPFS (panel 3 of table 1.2) shows results fairly consistent with the 1975 census, but of course only three years separate the data sources in these last two comparisons.

Comparisons among the surveys

The three surveys also can be compared with one another on the basis of similar reconstructions (table 1.3). These comparisons highlight the fact that each survey generates a higher proportion ever married than the one preceding, particularly for the youngest age groups. Both the 1973 NDS and the 1978 RPFS, and the latter in particular, indicate substantially higher incidences of marriage at these youngest ages. As in the reconstructions for census dates, estimates for the oldest age groups show greater convergence.

These observations suggest that Filipino women understate their ages at marriage when they married early, and that they understate the ages at events that occurred in the more distant past. This pattern of error was anticipated by Coale (1971) when he noted that the random error attached to reports of age at marriage increases as the true age at marriage decreases. For a given current age, this observation stems from increased memory error for events with the earliest dates. Thus, at the ages at which the number of marriages is increasing most rapidly, random error transfers roughly equal numbers of marriages in downward and upward directions, but the errors result in greater proportions married at ages below the mode.

We can examine this observation further on the basis of the comparisons in tables 1.4 to 1.6,

Table 1.3 Estimates of percentages ever married for survey years as implied by the 1968 NDS, 1973 NDS and 1978 RPFS

Age group	1968 estimates based on			1973 estimates based on	
	1968 NDS	1973 NDS	1978 RPFS	1973 NDS	1978 RPFS
15–19	10.6	13.8	16.2	8.5	15.0
20–24	47.7	54.1	57.7	44.1	49.5
25–29	78.7	78.8	81.5	75.2	77.8
30–34	87.3	90.9	91.7	86.3	89.1
35–39	92.8	92.6	93.5	92.7	93.0
40–44	95.3	91.7	*	94.1	94.2

*Not estimated.

Table 1.4 Ratio of the proportion ever married in 1960 based on the 1968 NDS to the proportion ever married in the 1960 census, by the ages of cohorts in 1960

Age in 1960	Age in 1968 NDS				
	23–27	28–32	33–37	38–42	43–47
15–19	1.717				
20–24		1.086			
25–29			1.006		
30–34				0.971	
35–39					0.976 → 1960 census

Table 1.5 Ratio of the proportions ever married at various census dates based on the 1973 NDS to the proportions ever married in the 1960 and 1970 censuses, by the ages of cohorts in the censuses

Age at census	Age in 1973 NDS					
	18–22	23–27	28–32	33–37	38–42	43–47
15–19	1.111		1.630			
20–24		1.026		1.088		
25–29			1.036		0.994	
30–34				1.002		1.021 → 1960 census
35–39					0.993	
40–44						1.003 → 1970 census

Table 1.6 Ratio of the proportions ever married at various census dates based on the 1978 RPFS to the proportions ever married in the 1960, 1970 and 1975 censuses, by the ages of cohorts in the censuses

Age at census	Age in 1978 RPFS					
	18–22	23–27	28–32	33–37	38–42	43–47
15–19	0.984	1.519		1.717		
20–24		1.000	1.131		1.185	
25–29			1.000	1.039		1.052 → 1960 census
30–34				1.000	1.031	
35–39					1.000	1.021 → 1970 census
40–44						1.005 → 1975 census

Table 1.7 Ratio of the proportions ever married in 1968 based on the 1978 RPFS and the 1973 NDS to the proportions ever married in the 1968 NDS, by the ages of cohorts in 1968

Age in 1968 NDS	Age in 1978 RPFS/1973 NDS					
	20–24	25–29	30–34	35–39	40–44	45–49
15–19	1.302	1.528				
20–24		1.134	1.210			
25–29			1.001	1.036		
30–34				1.041	1.050	
35–39					0.998	1.008 → 1978 RPFS
40–44						0.962 → 1973 NDS

Table 1.8 Ratio of the proportion ever married in 1973 based on the 1978 RPFS to the proportion ever married in the 1973 NDS, by the ages of cohorts in 1973

Age in 1973 NDS	Age in 1978 RPFS					
	20–24	25–29	30–34	35–39	40–44	45–49
15–19	1.760					
20–24		1.122				
25–29			1.035			
30–34				1.032		
35–39					1.003	
40–44						1.001 → 1978 RPFS

where we present ratios of survey estimates to census estimates for cohorts represented in both data sets. Similar comparisons have been made among the surveys, and these results are presented in tables 1.7 and 1.8. It is clear in all these comparisons that the ratios of estimated proportions ever married for any cohort and age group increase as time into the past increases, especially for the youngest age groups. Hence, estimates of the mean age at marriage based on the more recent surveys are probably biased downwards among the oldest cohorts represented in each of them.

Interview questions on marriage timing

All the censuses and surveys incorporated the same *de facto* definition of marriage, meant to include both formal unions, solemnized through civil or church ceremony, and consensual unions. Nevertheless, important differences in the form and intensity of questioning between the censuses and the surveys and among the surveys may be responsible for some of the differences by data source just noted.

Each of the censuses included only a straightforward question on marital status. In 1960, for

example, the question was 'Are you married, separated, widowed or single?' In the 1970 and 1975 censuses, the question was 'What is his/her marital status?' In each of the surveys, however, the procedure was much more elaborate. Marital statuses were established early in the interviews, during the listing of households. Women thus identified as 'ever married' were asked a series of marriage questions later in the interview. In the 1968 survey, an ever-married woman was first asked 'What was the date of your present marriage?' and 'Is this your first marriage?' If she had been married more than once she was asked 'How many times have you been married?' 'When was your first marriage?' and 'How old were you at the time?'

In the 1973 survey, these questions were expanded in the form of a marriage history. Ever-married female respondents were asked when they got married for the first time and where their marriages took place. Then they were asked 'Is this date (the date of first union) when you were married in the church? Before a Justice of the Peace?' and 'Were you living together before this date?' Also, 'When did you first begin living together?' If the response to this last question was an earlier date, that date was taken to be the age at first marriage. This series of probing questions about regular sexual exposure before the age at marriage that was initially obtained probably accounts for the earlier mean age at marriage estimated in the 1973 NDS.

The 1978 RPFS incorporated a similar attempt to probe for early sexual exposure, but the effort was more elaborate. After an initial response on date of marriage was taken, the following question was asked: 'Some couples begin living together before or after they are formally married. How was it in your case? Did you start living with your husband before, after, or at the time you were formally married?' If this question elicited an earlier age, the respondent was asked 'How long (before, after) the date of your formal marriage did you begin living together?'

We suggest that differences in the estimates of mean ages at marriage among the surveys reflect the progressively greater effort taken in each survey to ascertain early sexual exposure through probing questions. Similarly, the much lower census proportions ever married in the youngest age groups probably reflect the limitations on follow-up questions and on the linking of marital status and childbearing information that are inherent in the typical census interview.

In this section we have highlighted two sources of difficulty in pinpointing precisely the trend in the mean age at marriage. One problem stems from apparent progressive understatement of age at marriage in the surveys as time into the past increases. The other is changing interview formats which have produced earlier age at marriage estimates in the surveys than in the censuses and in each more recent survey. These problems have different effects on our estimates of levels and trends and, complicating matters further, they are probably at least partially countervailing. Still, the existence of a substantial upward movement in the age at marriage and of a relatively late age at marriage in recent decades is beyond dispute.

1.3 THE COMPLETED NUPTIALITY EXPERIENCE OF COHORTS

We address the question of future nuptiality patterns by estimating the remaining experience of the cohorts who were part of the way through their nuptiality experience at the time of each of the three surveys. The most recent usable experience in these surveys is for the group aged 20–24 in the 1978 RPFS. We have insufficient information on those aged 15–19 in 1978, and none on the cohorts below that age that had not yet begun to marry by 1978. Lacking information on cohorts under age 20 in 1978 – the population groups that will be major contributors to cross-sectional marriage patterns over the next 10–15 years – we confine our analysis to the average completed marriage timing of the cohorts aged 20 and older in the surveys and to the percentages ultimately marrying in these cohorts. As we have shown elsewhere (Smith, Shahidullah and Alcantara 1982), estimates of the former are highly sensitive to assumptions regarding the latter.

Method of analysis

The method of analysis employed is maximum likelihood estimation of the parameters of the Coale model nuptiality schedule, based on the distributions of ages at marriage reported in the surveys. The Coale age-model of the nuptiality process is described in detail elsewhere (Coale 1971), as is maximum likelihood estimation of the model's three parameters (Rodríguez and Trussell

1980). The latter report also describes the computer software we have employed, software which was developed for application to World Fertility Survey standard recode tapes. Only a brief discussion of the Coale model and the details of estimation need be given here.

The model expresses a very pronounced regularity in the age pattern of entry into first marriage, a pattern which Coale observed across a wide range of societies and apparently different marriage patterns. Trial and error curve fitting led Coale to a complex double exponential curve involving three parameters: a_0, k and c (Coale 1971). The a_0 term is the age at which the curve first departs 'consequentially' from universal non-marriage; k indicates the tempo of the transition of a cohort from the never-married state to its ultimate proportion ever marrying, which is indexed by c. Alternatively, Coale's a_0 and k parameters can be re-expressed as the mean (μ) and the standard deviation (σ) of the age at marriage distribution (Rodríguez and Trussell 1980: 11–12).

One of the most important and useful implications of the observed age regularity is that when, in a survey, a cohort is observed only part of the way through its completed marriage experience, the completed experience can be extrapolated rather well on the basis of the partial experience that is available. This is a critical advantage with cross-sectional data such as those from the NDSs and the RPFS, where only the oldest (and in some respects the least interesting) cohorts can report complete or near-complete experience.

The model has been shown to provide useful estimates of the nuptiality parameters for cohorts with as few as half their marriages having already occurred. When less than half the completed experience is available, the model works less well; most often in these instances the model fails to produce reasonable estimates of the proportion ultimately marrying (c). In these cases it is convenient to re-estimate the μ and σ values with c constrained at some reasonable level.

Rodríguez and Trussell outline alternative approaches to fitting the age-model to WFS data. Briefly, the individual data for ever-married women can be used to estimate μ and σ, which would then describe the distribution of first marriages among the ever-married (and those ever to marry) in a population. Or, as in the application here, the individual and household data can be combined to obtain estimates μ, σ and c describing the entire cohort of women.

The level and trend in cohort marriage timing

The principal difficulty in interpreting results for each of the surveys is that a range of estimated means is available depending upon whether the c parameter is fixed or estimated. Earlier analysis of the RPFS as well as the nine other national surveys spanning Asia and the Pacific (Smith, Shahidullah and Alcantara 1982) has shown that the fixed c estimates are by far the most plausible ones for most countries. Both fixed and estimated c results are presented here, but we focus our analysis on the results obtained when c is constrained to its recent level of 0.939.

Considering tables 1.9 to 1.11, we find that in each of the surveys the expected upward trend in the mean over time is found for all but the oldest cohorts. The shift in marriage timing indicated from one age group to the next is quite substantial. Comparing the cohorts aged 30–34 and 20–24, for example, the decadal shift is 4.5 years in the 1968 data, 1.9 years in the 1973 data, and 2.6 years in the 1978 data. These shifts are far greater in magnitude than the trends evident in the census data, and since they describe the recent past they suggest an acceleration of the long-term trend in the mean age at marriage.

The oldest cohorts (generally, the pre-Second World War birth cohorts) show some decline in the mean age at marriage, so the overall pattern in our data is U-shaped. We cannot ascertain whether this downward trend among older cohorts is genuine. This pattern is not found in the other Asian and Pacific countries covered by the World Fertility Survey (Smith, Shahidullah and Alcantara 1982: figure 3).

What can be said about the absolute level of the mean age at marriage based on these data? A very precise comparison can be made across these surveys, because they provide multiple estimates of the mean age at marriage for the same cohorts of women. For example, the 1939–43 birth cohort was sampled at ages 25–29 in 1968, 30–34 in 1973 and 35–39 in 1978. In general, we find that the more recent the survey, the lower the estimated mean age at marriage for a particular cohort. This is shown in table 1.12. For example, in the 1939–43 cohort the estimated mean is 22.8, 22.3 or 21.4 depending on the survey consulted. The same pattern is found for every other cohort with but one minor exception (the 1973 estimate for the 1929–33 cohort).

Our earlier discussion of differences among the

survey questionnaires gives us reason to believe that the observed pattern reflects, at least in part, genuine differentials across the surveys and not merely the age group encountered at the time of interview. This claim is reinforced by comparing the estimates from each survey for the same age group (see the diagonals). Thus, the estimates for age group 35–39 declined from 21.6 in 1968 to 21.4 in 1978. Other age groups reflect even greater differentials. (The only notable exception to this pattern is the estimates for women aged 20–24 and 25–29 in 1978, for whom the estimated means are relatively high.)

This application of the Coale age-model of the first marriage process does not establish cohort levels on marriage timing very well because of the differences among the surveys. Nevertheless, there is very clear evidence that the cohorts currently entering marriage will post an aggregate record of marriage delay which is unprecedented for the Philippines and, indeed, for any major population of south-east Asia.

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2 Determinants of Nuptiality in the Philippines: Some New Findings

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2.1 INTRODUCTION

The quantum, the timing, and the tempo of marriage are increasingly viewed as important variables affecting fertility levels and trends. Cho and Retherford (1973) have demonstrated in a study covering Asian countries that the fertility declines observed were due, wholly or to a significant measure, to changes in marriage patterns. Even in populations in which marital fertility is subject to voluntary control, nuptiality patterns still play a significant role in influencing fertility levels. It has been shown that most developing countries could not achieve a replacement level of fertility, even if family planning practice is increased to possible limits, without a rise in the age at marriage or in celibacy (Lesthaeghe 1974).

Raising the age at marriage is thus seen as an important policy alternative to initiate or accelerate a decline in population growth on a major scale. To be plausible, policy change, however, requires a comprehensive understanding of the factors which influence the age at which women enter the married state. Sklar (1971) contends that attempts to postpone marriage must entail changing certain social and economic conditions which permit and even motivate early marriage.

Socio-economic factors affecting nuptiality patterns have become a focal point of interest (Yaukey 1973). Dixon (1971) has revealed in a cross-national study that the distinction made by Hajnal (1965) between the traditional marriage pattern (characterized by early and universal marriage) and the European marriage pattern (characterized by later marriage and a high level of celibacy) still holds, especially for female populations. Some evidence nevertheless shows that there has been a trend towards convergence of marriage patterns in European and non-European countries, with most Western countries veering toward earlier and more universal marriage and many parts of the Middle East and Asia towards later marriage (Dixon 1971; Smith 1976).

Substantial evidence indicates that the age at marriage in the Philippines is rising (see, for example, Smith 1973, 1974a, 1974b; de Guzman and de la Paz 1976; *RPFS 1978: First Report* 1979), although marriage among Filipinos remains almost universal. The age at marriage also varies among population subgroups and has been found to differ markedly by socio-economic characteristics (Smith 1975, 1978; de Guzman 1980).

The objective of this chapter is to provide further illumination on the relationship between age at first marriage and some socio-economic factors beyond what is achieved by the *RPFS 1978: First Report* (1979) and an earlier paper by the same author (de Guzman 1980). This chapter will try to demonstrate the relationships more statistically and quantitatively.

2.2 DETERMINANTS OF AGE AT MARRIAGE: NATIONAL LEVEL ANALYSIS

Results from multiple linear regressions of the criterion variable 'age at first marriage' (AGEM) on the national level are presented first. Continuous predictors are introduced in the conventional manner, while non-metric variables with more than two categories are introduced in the regression by means of a set of dichotomous dummy or indicator variables. To illustrate, a work status variable with four categories, namely, worked in non-family enterprise, self-employed, worked in family enterprise, and never worked, is represented by three dummy variables namely, *non-family*, *self-employed*, and *family*, assuming the value of 1

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 16–25. Voorburg, Netherlands: International Statistical Institute.

if a respondent belonged to the first, second, or third category and 0 if otherwise. The level which is not identified by any dummy variable, in this example 'never worked', is the reference category. The reference category may be chosen arbitrarily, although in certain instances a specific choice is natural. The regression coefficients of these dummy variables are interpreted in the usual way, ie they indicate the effect on the criterion variables when the independent variable is increased by one unit while controlling for the other variables. The common approach of including all relevant variables in a single regression and then assessing the effect of individual variables by their coefficients in the regression has deliberately been avoided because the procedure can yield misleading results when the regressor variables are highly correlated (see, for example, Gordon 1968). The procedure adopted in this section was to calculate for every predictor a set of regressions with other variables added in a hierarchical fashion, a flexible way of ordering controls using a stepwise regression program. The aim was to monitor the effects of a regressor at each step and hence determine the impact of correlated factors and covariates.

The subsample

The data from the 1978 Republic of the Philippines Fertility Survey (RPFS) suffer some effects of censoring, because the nuptiality experience of many of the cohorts is incomplete. To avoid potential bias, the subsample has been restricted to women who married before age 25 and who were 25 years and over at the time of the survey, a total of 6621 ever-married women. This investigation is thus an extension of the analysis made in the *RPFS 1978: First Report* where the same subsample was treated.

The variables

The socio-economic variables included in this analysis were selected from the wife's and husband's characteristics available in the RPFS. Selection was based on their relevance to the woman's experience before marriage. After some initial regressions, further variables were eliminated, leaving one demographic predictor, current age of the respondent, and eight socio-economic predictors. Religion and childhood place of residence were also eliminated in the process because they were discovered to be very weak predictors.

The age at marriage of the woman appears to be affected by the socio-economic characteristics of the husband (de Guzman 1980; de Guzman, forthcoming). This observation derives its theoretical base from Dixon's (1971) classification of the determinants of the age at marriage as those affecting availability of mates, desirability of marriage, and feasibility of marriage. Thus, I have included the husband's education and his occupation in the models. The predictors examined in the analysis, and their ordering in the hierarchy, are as follows.

Group 1 *Current age of respondent* (AGE). Single continuous variable in years.

Group 2 *Region of residence* (REGION). Thirteen categories and represented by 12 dummy variables with Metro Manila as the reference category.

Group 3 *Type of place of residence* (RES). Urban = 1 for urban respondents and urban = 0 for rural respondents.

Group 4 *Ethnicity* (ETHNIC). Six dummy variables, the 'others' category taken as the reference category.

Group 5 *Woman's education* (EDUC). Represented by four indicator variables which take the value of 1 for no schooling, primary, intermediate or high school level and 0 if otherwise, with college level as the reference category.

Group 6 *Occupation before marriage* (OCC). Four dummy variables, for non-manual, service, manual, and farm categories; the 'never worked' category served as the reference category.

Group 7 *Work status before marriage* (WORK STAT). Three dummy variables: worked in non-family enterprise, self-employed, and worked in family enterprise. The 'never worked' category taken as the reference category.

Group 8 *Husband's education* (HEDUC). Same categories as in respondent's education.

Group 9 *Husband's occupation* (HOCC). Four dummy variables, for non-manual, service, manual, and farmers (self-employed). Farmers (non-self-employed) taken as the reference category.

In the hierarchical regressions, the categorical variables are represented by their complete set of

indicator variables, introduced into the regression as a block. The variables are forced into the equation in a predetermined hierarchical order. Thus the set of predictors is controlled at every step. The choice of the order in which the predictors are introduced has an important bearing on the interpretation of the results. Often in studies such as this one, the choice is not clear cut and is quite arbitrary. It is often hard to justify even an approximate causal ordering between the variables. An alternative approach may be resorted to wherein the effects of a variable are calculated with a variety of controls, a strategy which may generate a great amount of data. I have followed a compromise strategy which relies to some extent on a causal ordering but calculates a range of effects for each variable and which was also adopted in earlier studies by Cleland, Little and Pitaktepsombati (1979) and Little and Perera (1980). An ordering is decided on causal and substantive grounds. For each predictor, the unadjusted effect is calculated first, then the other predictors are added one at a time, following the selected ordering.

For the first regression, each of the groups of predictors defined earlier was forced into the equation in the following sequence: AGE, REGION, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC. It can be observed that the variables have been entered according to an approximate temporal or causal order. Age is truly an exogenous variable while region is basically determined prior to the socio-economic variables. The positioning of husband's education and husband's occupation is unclear but this decision has been made on the basis of one of the objectives of the analysis, which is to determine how much these variables add to the explanation of differences in age at marriage after the characteristics of the woman have been controlled.

Analysis of variance from the hierarchical regression

The analysis of variance table for each of the steps of the regression giving the regression and residual sum of squares, together with associated degrees of freedom, mean squares, and F statistics, is given in table 2.1. The last column contains the multiple R^2, representing the proportion of the variance of age at marriage explained by all the explanatory variables included. Thus age, region, residence, ethnicity, and education altogether account for 12 per cent of the variation in age at marriage. When all the explanatory variables are included, the R^2 value reaches only 16 per cent. This low value of the R^2 should not be cause for concern, for, as Cleland, Little, and Pitaktepsombati (1979) have stated, 'values of R^2 of more than 20 per cent are not common in sociological research'. The F values indicate that statistically significant ($p \leqslant .01$) differentials in the age at marriage by the socio-economic characteristics are evident in the data.

From table 2.1, a single analysis of variance table has been derived. The effect of each group of predictors has been separated out, net of variables entered at previous steps, by subtracting the regression degrees of freedom and sums of squares of adjacent steps. The results are displayed in table 2.2. The increments in the proportion of total variance explained at each step is given by the partial R^2 in the last column while the penultimate column contains the F values which can serve as the basis for assessing the statistical significance of the net effects. The large differentials in education, occupation before marriage, and residence are reflected in the large F statistics for these three independent variables. The woman's education and occupation together explain 11 per cent of the variation in AGEM. The R^2 values for husband's education and husband's occupation are low and altogether explain less than 1 per cent, but nevertheless the differentials are statistically significant.

We shall now turn to the other hierarchical regressions to analyse the direction and substantive significance of the above effects.

Regional differences in age at marriage

For the examination of regional differences, the order in which the variables are introduced has been modified so that REGION is entered first in the regression. Thus the first step comprises a regression of AGEM on region. Then the other predictors are introduced in the following order: AGE, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC. Following the method described by Little (1980: 52–3), the regression coefficients at each step were converted into regional means shown in table 2.3. The last column gives partial R values, which are equivalent to the *beta* in multiple classification analysis (MCA), a measure which indicates the relative strength of the variable in affecting the criterion variable. It is the square root of the added R^2 (see Little 1980: 58).

It can be gleaned from the table that the

Table 2.1 Analysis of variance from the hierarchical regression

Step	Variables in regression	Analysis of variance					R^2
		Source	Degrees of freedom	Sum of squares	Mean square	F[a]	
1	AGE	Regression	1	87.3	87.3	10.7	.002
		Residual	6 619	54 110.7	8.2		
2	AGE, REGION	Regression	13	1 515.8	116.6	14.6	.028
		Residual	6 607	52 682.2	8.0		
3	AGE, REGION, RES	Regression	14	2 081.1	148.6	18.8	.038
		Residual	6 606	52 116.9	7.9		
4	AGE, REGION, RES, ETHNIC	Regression	20	2 519.3	128.0	16.1	.046
		Residual	6 600	51 678.7	7.8		
5	AGE, REGION, RES, ETHNIC, EDUC	Regression	24	6 477.6	269.9	37.3	.120
		Residual	6 596	47 720.4	7.2		
6	AGE, REGION, RES, ETHNIC, EDUC, OCC	Regression	28	8 170.4	291.8	42.0	.151
		Residual	6 592	46 027.6	7.0		
7	AGE, REGION, RES, ETHNIC, EDUC, OCC, WORK STAT	Regression	31	8 308.9	268.0	38.5	.153
		Residual	6 589	45 889.1	7.0		
8	AGE, REGION, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC	Regression	35	8 444.7	241.3	34.7	.156
		Residual	6 585	45 753.3	6.9		
9	AGE, REGION, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC	Regression	39	8 528.4	218.7	31.5	.158
		Residual	6 581	45 669.7	6.9		

[a]All are statistically significant at $p \leqslant .01$.

Table 2.2 Hierarchical analysis of variance from regressions of age at first marriage

Step	Variable entered at step	Sum of squares at step	Degrees of freedom added at step	Mean square	F[a]	Partial R^2
1	AGE	87.3	1	87.3	12.7	.002
2	REGION	1 428.5	12	119.0	17.2	.026
3	RES	565.3	1	565.3	81.9	.010
4	ETHNIC	438.2	6	73.0	10.6	.008
5	EDUC	3 958.3	4	989.6	143.4	.074
6	OCC	1 692.8	4	423.2	61.3	.031
7	WORK STAT	138.5	3	46.2	6.7	.002
8	HEDUC	135.8	4	34.0	4.9	.003
9	HOCC	83.7	4	20.9	3.0[b]	.002
	RESIDUAL	45 669.7	6 581	6.9		

[a]All are statistically significant at $p = .01$, except where noted otherwise.
[b]Statistically significant at $p = .05$.

Table 2.3 Age at first marriage of women aged 25 years and over who married before age 25 by region, adjusted for selected variables by linear regression

Model	Controls	Region of residence						
		Ilocos	Cagayan Valley	Central Luzon	Southern Luzon	Bicol	Western Visayas	Central Visayas
1	–	19.1	17.9	19.3	18.5	18.5	19.1	19.0
2	AGE, RES, ETHNIC	19.2	18.1	19.3	18.4	18.3	19.2	19.1
3	AGE, RES, ETHNIC, EDUC	19.3	18.2	19.3	18.6	18.4	19.2	19.2
4	AGE, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC	19.1	18.3	19.3	18.7	18.4	19.2	19.1

Model	Controls	Region of residence							
		Eastern Visayas	Western Mindanao	Northern Mindanao	Southern Mindanao	Central Mindanao	Metro Manila	Mean	Partial R
1	–	18.5	18.6	18.8	18.8	18.7	19.7	18.9	.164
2	AGE, RES, ETHNIC	18.9	18.9	19.0	19.0	19.1	19.1	18.9	.114
3	AGE, RES, ETHNIC, EDUC	19.0	18.8	18.7	18.9	19.0	19.0	18.9	.100
4	AGE, RES, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC	19.1	19.0	18.8	18.8	19.0	18.9	18.9	.095

greatest deviations from the overall mean are exhibited by Metro Manila and Cagayan Valley; the other regional means do not deviate very much from the overall mean. Controlling for the other independent variables tended to reduce the mean age at marriage in Metro Manila by at most 0.8 years and Eastern Visayas by 0.6 years. For most of the regions the changes are not of substantive interest. Nevertheless, the partial R indicates that the effects of region diminished from 0.164 to 0.094 with the inclusion of the other controls, a decrease of more than 40 per cent. This leads to the conclusion that a larger proportion of the regional differentials in age at marriage is due to other factors not accounted for by the socio-economic variables included in the analysis.

Urban–rural differentials

The analysis of the residence differentials in the age at marriage entails introducing the variables in the following order: RES, AGE, REGION, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, and HOCC. Table 2.4 has been constructed in the same manner as table 2.3. As shown in table 2.4, age at marriage in the urban sector is 0.9 years higher than the rural sector. This differential is slightly affected by AGE, REGION and ETHNIC, but falls to 0.2 years when EDUC is controlled. Further control for the husband's characteristics equalizes the means. It can be said that a great part of the urban–rural differential in age at marriage arises from the higher levels of education attained by the urban population. The inclusion of the other socio-economic variables greatly diminishes the residence effects on age at marriage. This implies that the residence differentials arise from urban–rural differences in the selected socio-economic variables. Apart from being better

Table 2.4 Age at first marriage by women aged 25 years and over who married before age 25 by type of residence, adjusted for selected variables by linear regression

Model	Controls	Type of residence		Mean	Partial R
		Urban	Rural		
1	–	19.5	18.6	18.9	.155
2	AGE, REGION, ETHNIC	19.4	18.7	18.9	.100
3	AGE, REGION, ETHNIC, EDUC	19.0	18.8	18.9	.027
4	AGE, REGION, ETHNIC, EDUC, OCC, WORK STAT, HEDUC, HOCC	18.9	18.9	18.9	.016

Table 2.5 Age at first marriage of women aged 25 years and over who married before age 25 by education, adjusted for selected variables by linear regression

Model	Controls	Education					Mean	Partial R
		No schooling	Primary	Inter-mediate	High School	College		
1	–	17.4	18.1	18.8	19.6	21.0	18.9	.319
2	AGE, REGION, RES, ETHNIC	17.6	18.2	18.8	19.5	21.0	18.9	.270
3	AGE, REGION, RES, ETHNIC, OCC, WORK STAT	17.7	18.2	18.8	19.5	20.7	18.9	.230
4	AGE, REGION, RES, ETHNIC, OCC, WORK STAT, HEDUC	17.9	18.3	18.8	19.4	20.6	18.9	.169
5	AGE, REGION, RES, ETHNIC, OCC, WORK STAT, HEDUC, HOCC	17.9	18.3	18.8	19.4	20.6	18.9	.167

educated, the urban respondents tended to be more highly placed on the occupational ladder, to participate in the labour force and to work in non-family enterprises or to be self-employed.

Education differentials

The effects of controls on differences by education are given in table 2.5. The results here were derived from a stepwise regression in which EDUC was introduced ahead of the other predictors. There exists a very strong positive relationship between age at marriage and education, with the means ranging from 17.4 years for the unschooled women to 21.0 years for the college educated. As other variables were introduced, the adjusted means tended to converge slightly towards the overall mean of 18.9 years, indicating the effect of the composition of the other variables on the educational differences. Another noteworthy point is the effect of controlling for husband's education on age at marriage. This variable further eroded the existing differential by education of woman after controlling for the other variables, excluding husband's occupation, with the differences between the extreme categories reduced to only 2.7 years. Controlling for AGE, REGION, RES, OCC, and WORK STAT reduced the effect of woman's education by 20 per cent but the inclusion of HEDUC decreased this further to almost 50 per cent.

Differentials in age at marriage by occupation before marriage

The important effect of controlling for the various socio-economic variables is to reduce the mean age at marriage among the non-manual workers and to increase that among the farm workers (table 2.6). These adjusted means, however, are of little substantive interest unless taken in relation to the adjusted means of the other occupational groups. Adjusting for education obliterated the existing differential between the non-manual and service workers as well as between the farm workers and those who never worked. Controlling for the husband's characteristics did not introduce any alterations in the adjusted means and partial R values. As shown by the partial R, almost three-quarters of the occupational differences in age at marriage are due to differentials in the woman's characteristics and the other background variables.

Differentials by husband's education

Table 2.7 demonstrates the same pattern of relationship as that shown by table 2.5, although the respondent's education appears to be a somewhat stronger predictor of age at marriage than the husband's education. The differences between the highest and lowest levels in table 2.5 is 3.6 years while the differences for the same levels in table 2.7 is 2.9 years, almost a fifth lower.

The differentials by husband's education are not affected by controls for age, region, residence, and ethnicity. When the respondent's education was controlled, the adjusted means converged towards the overall mean, reducing the differential between the extreme categories to 1.3 years. The addition of the other variables thereafter was inconsequential. The large reduction in the differences in adjusted means as well as in the value of partial R again underscores the close association between the wife's education and her husband's education.

Table 2.6 Age at first marriage of women aged 25 years and over who married before age 25 by occupation before first marriage, adjusted for selected variables by linear regression

Model	Controls	Occupation before first marriage					Mean	Partial R
		Non-manual	Service	Manual	Farm	Never worked		
1	–	20.8	19.8	20.0	18.0	18.6	18.9	.263
2	AGE, REGION, RES, ETHNIC	20.8	19.9	20.1	18.5	18.8	18.9	.221
3	AGE, REGION, RES, ETHNIC, EDUC	19.9	19.9	20.0	18.7	18.6	18.9	.177
4	AGE, REGION, RES, ETHNIC, EDUC, WORK STAT, HEDUC, HOCC	20.1	20.0	20.2	19.0	18.6	18.9	.073

Table 2.7 Age at first marriage of women aged 25 years and over who married before age 25 by husband's education, adjusted for selected variables by linear regression

Model	Controls	Husband's education					Mean	Partial R
		No schooling	Primary	Inter-mediate	High school	College		
1	—	17.5	18.2	18.8	19.3	20.4	18.9	.260
2	AGE, REGION, RES, ETHNIC	17.8	18.3	18.8	19.3	20.2	18.9	.208
3	AGE, REGION, RES, ETHNIC, EDUC	18.3	18.6	18.9	19.0	19.1	18.9	.060
4	AGE, REGION, RES, ETHNIC, EDUC, OCC, WORK STAT, HOCC	18.4	18.7	19.0	19.0	19.1	18.9	.051

2.3 DETERMINANTS OF AGE AT MARRIAGE: WITHIN REGION ANALYSIS

In this section the results of single hierarchical regression for each region will be presented. Although this level of analysis may be limited by the sample size within each region, there are however two advantages gained. First, the analysis provides evidence on how age at marriage behaves across various selected socio-economic variables within each region. The second advantage is the incorporation of the study of interactions in the regression framework (Cleland, Little and Pitaktepsombati 1979).

Table 2.8 gives the overall effects of the variables which have been introduced into the hierarchical regression in the following order: AGE, RES, EDUC, OCC, WORK STAT, HEDUC, HOCC. It provides the partial R^2 which is equal to the effect of the sum of squares expressed as a proportion of the total sum of squares.

The percentage of total variance in age at marriage explained by the variables within each region ranges from a high of 27 per cent in Bicol to a low of 11 per cent in the Ilocos. In seven regions, residence explains a small part of the variance in age at marriage, from 1 per cent in Bicol to 5 per cent in the Cagayan Valley, but the differentials are statistically significant. Woman's education takes a greater share of the variance explained in all regions except in Central Luzon (where occupation before marriage dominates), the R^2 ranging from 14 per cent to 5 per cent, and as expected there are very large and highly significant differentials by education. Taken together, wife's education and her occupation before marriage explained as much as 17 per cent of the variance in the criterion variable. In contrast, only as high as 6 per cent can be attributed to the husband's characteristics and, except in one region (Bicol), there are no significant differentials in age at marriage. Of course, there are certain difficulties in dealing with the husband's education and his occupation. The husband's education as shown earlier is highly correlated with the respondent's education and the husband's occupation may be later than the occurrence of marriage.

The preceding paragraphs demonstrate that in addition to the observed differentials in the levels of age at marriage between regions, there also exist considerable socio-economic differentials within regions.

2.4 SUMMARY

Analysis of data from the Republic of the Philippines Fertility Survey points to increasing proportions who never marry and a trend of rising age at marriage. This delay in entry into the marital state further curtails the amount of time spent by the average Filipino in reproductive life within the marital bond. Such changes naturally are expected to affect fertility, and, with the efforts exerted to bring down marital fertility, augur well for the achievement of fertility targets.

Marriage patterns vary among different population subgroups. The analysis demonstrates no important ethno-linguistic and religious differentials. Childhood place of residence did not exert

Table 2.8 Effects of background variables on age at first marriage by region: partial R-squareds (100 × sum of squares of effect divided by total sum of squares)

Variable entered	Region						
	Ilocos	Cagayan Valley	Central Luzon	Southern Luzon	Bicol	Western Visayas	Central Visayas
1 Age	.1	.8	.6	.2	1.3	.0	.0
2 Residence	.0	5.1	.0	2.8	1.0	1.4	4.5
3 Education	4.6	10.5	5.2	10.9	10.4	11.3	6.5
4 Occupation before first marriage	2.1	.2	7.2	2.6	7.8	4.2	5.3
5 Work status before first marriage	2.9	.1	.9	.3	.5	.7	.1
6 Husband's education	.4	.5	.3	1.1	3.5	.2	.1
7 Husband's occupation	.5	2.2	.7	.1	2.5	.4	.5
Sum 3–4	6.7	10.7	12.4	13.5	18.2	15.5	11.8
Sum 6–7	.9	2.7	1.0	1.2	6.0	.9	.6
N	493	357	671	848	515	656	538

Variable entered	Region					
	Eastern Visayas	Western Mindanao	Northern Mindanao	Southern Mindanao	Central Mindanao	Metro Manila
1 Age	.4	1.0	.1	.1	1.3	.2
2 Residence	.4	.5	2.4	2.7	.4	—
3 Education	6.6	9.7	12.6	13.9	10.7	5.5
4 Occupation before first marriage	1.8	1.0	3.8	.7	2.8	6.0
5 Work status before first marriage	.3	1.1	.5	.2	1.6	.9
6 Husband's education	1.2	1.4	1.7	.6	.6	.4
7 Husband's occupation	1.2	1.4	1.7	.6	.6	.4
Sum 3–4	8.4	10.7	16.4	14.6	13.5	11.5
Sum 6–7	1.4	3.5	3.0	1.3	1.3	.5
N	410	248	385	430	293	778

any significant effect on the age at marriage. Differences by urban–rural residence have been found to be widening and by educational subgroups to be very sharp.

Regressions for the national level reveal that the important socio-economic variables account for only 16 per cent of the total variance in the age at marriage. However, the differentials by various socio-economic variables are statistically significant even with controls. Two predictors stand out – regional residence and education of the respondent – in the sense that large differentials remain even when the other explanatory variables are controlled. Wife's education and her occupation are more closely associated with age at first marriage than husband's education and his occupation. To illustrate this, after adjusting for current age and the other socio-economic variables, the mean age at marriage among the women who were college educated is almost three years higher than that for the unschooled women. On the other hand, after adjustment, the mean age at marriage of the women whose husbands were college educated is only 0.7 years higher than their counterparts with uneducated husbands. It is interesting to note that urban–rural differentials only exist because of the confounding effects of the other socio-economic variables.

Further regression analysis shows that large and significant differentials in age at marriage by socio-economic variables are also present within regions, but the same explanatory variables stand out as in the national level analysis.

Regional and urban–rural development, a major thrust of national development programmes, is expected to facilitate the rise in age of marriage, especially in areas where it is still comparatively low. This upward course is intended to provide a further boost, from increasing opportunities for education and for employment in the commercial and industrial sectors of the economy, for both males and females.

The low proportion of variance explained in age at marriage by the socio-economic variables implies that a great amount of variation in age at marriage is attributable to factors other than those we have examined. For example, there are other cultural and certain psychological and physical factors that impinge on the decision on when to marry or whether to marry at all. Dixon (1971) has listed some factors associated with the availability of mates, the feasibility of marriage, and the advisability of marriage which have an important bearing on marriage. Undoubtedly the incorporation of such factors in future analyses, together with associated socio-economic variables, will deepen our knowledge on the determinants of age at marriage in the Philippines.

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Part II

Fertility: Levels and Trends

Introduction

There has definitely been progress in the field of demographic estimation during the last two decades. In the 1960s the major preoccupation of local demographers was locating the appropriate sources of data and mustering available techniques for estimating, usually from incomplete data, baseline levels of demographic indicators. At that time, all indicators pointed to a high level of fertility in the country and its subdivisions, and as a consequence interest in instituting population programmes escalated. Crude measures of fertility, mostly derived from data on the age structure of the population, suggested a high and unchanging fertility level during the first half of the twentieth century. As advances have been made in the data collection, there is now more confidence in the estimates of fertility levels and in our ability to trace recent fertility trends.

The availability of various measures of fertility in the more recent censuses (1960, 1970 and 1975) and the national demographic surveys (1968 and 1973) enables us to arrive at the following fertility picture in the country. From a very high national crude birth rate of around 50 per thousand during the first half of the century, an indication of a slight decline was discerned in the early 1960s. The decline was more visible in the 1970s, with the average completed fertility declining by two children from 6.89 in 1960 to 4.5 in 1978. As the most recent of the national fertility surveys, the Republic of the Philippines Fertility Survey allows researchers the luxury of employing different techniques to obtain fertility indicators by which to assess recent trends, with the aim of validating or modifying the accepted picture.

Using age-specific marital fertility rates, Morada and Alegre compare the level and the trend of fertility implied by the Republic of the Philippines Fertility data with those reported during the 1968 and 1973 rounds of demographic surveys. The reconstructed fertility rates from the 1978 birth history record appeared to be generally of higher magnitude but with no difference in the age pattern and overall trend suggested by the 1968 and 1973 data. The trends by age suggest an increasing marital fertility among young women, which is compensated by a continuing decline among the older women, leaving the overall trend of decline undisturbed.

The role of older women in the later stages of the decline in fertility is substantiated through decomposition of the change in fertility rates between 1972 and 1975, as presented in the Raymundo chapter. Raymundo confirms that in the 1970s fertility decline has been mainly due to changes in marital fertility rates rather than changes in marital composition, a reversal of the situation existing in the 1960s. Pre-programme decline was mostly due to changes in age at first marriage and in the proportion of those eventually getting married. The 1970 decade saw both the institution of an active national population programme and growth in the importance of the contribution of the declining age-specific fertility rates. Despite the diminished role of younger women through marriage postponement, their contribution has not been reduced to insignificance. Delayed marriage, partly due to further improvement in women's educational status, is still assigned credit for a significant proportion of the fertility decline.

Digressing from single measures of the fertility experience of a woman, Cabigon undertakes a sequential analysis of childbearing experience. Differential experiences in each birth interval, as indexed by the proportion of women advancing from one interval to the next (parity progression) and the length of that interval, are examined. The exercise reveals two important milestones in

Philippine fertility transition:

(1) a declining trend starting in the early 1970s and
(2) a declining trend in the period immediately preceding the RPFS among women in their peak childbearing ages.

The first is only a confirmation of earlier contentions while the latter, if true, suggests a change from a pattern of limiting the number of children to fertility control for spacing purposes as well.

Thus the chapters in this part confirm earlier contentions about the start, pace and source of decline in Philippine fertility. However, expected demographic and socio-economic differentials in fertility remain. Changes in the various factors affecting fertility decline may have occurred, with women at their peak reproductive ages reporting lower fertility and a general recognition that a later age at first marriage will help sustain the decline.

3 Levels and Trends of Fertility in the Philippines

Hector B. Morada, Marietta P. Alegre and Florentina Reyes Salvail

3.1 INTRODUCTION

Fertility in the Philippines has been declining at a slow rate until very recently. Crude birth rates measured during the first half of the century were in the 50s or high 40s. It was only in the second half of the century that significant decreases were noted (de Guzman 1977; Gonzales *et al* 1979). Likewise, total marital fertility has remained extremely high (Concepción and Smith 1977). However, declines in age-specific fertility rates across all age groups may be observed since the 1950s.

Since marriage is almost universal to Filipino women, and most births occur within marriage, age-specific marital fertility rates (ASMFR) might be even more meaningful measures of fertility. In contrast to age-specific fertility rates, however, the marital fertility rates exhibit conflicting trends. While for younger women ASMFRs have been increasing, declines for older women have been noted. The observed decline in overall fertility may be attributed, in part, to postponement of marriage (Smith 1978). More and more women choose to marry later, so that although ASMFRs for younger women are high, fewer women are married at these ages.

Over the years, there have been significant changes and differentials in regional fertility. While fertility in the more urban areas has been lower and continuously declining, rural areas have been experiencing high, though likewise decreasing, fertility rates. Differentials in fertility might also be observed with regard to the educational attainment of women, with better educated women having lower fertility (Concepción and Smith 1977).

Differentials in marital fertility by subgroups as measured from age-specific marital fertility rates are affected by the differentials in the timing of marriage of women. The inverse relationship between age-specific fertility rates and marital duration implies fertility decline as marital duration lengthens. Hence, controlling for other variables affecting fertility, women marrying later exhibit higher ASMFRs; ie women aged 20–24 years belonging to a population where most women marry at ages 15–19 years would exhibit a lower ASMFR than the corresponding group of women belonging to a population where most women marry at ages 20–24 years.

Using the data from the Republic of the Philippines Fertility Survey 1978, this paper presents estimates of the levels, trends and differentials in marital fertility for the whole country and its broad subdivisions. More specifically, the objectives are:

1 to estimate the levels of natality in the country and its different subgroups classified according to demographic and socio-economic characteristics and cultural conditions; and
2 to estimate the trends and differentials for various education, occupation, ethnic and residence subgroups.

3.2 THE DATA

Several variables are considered in the analysis. The basic data on fertility come from the birth histories of respondents in the RPFS 1978. Classificatory variables are the age of mother at birth of each child, educational attainment, ethnicity, region, type of current residence and husband's occupation. Age at birth of child is a demographic variable, educational attainment and husband's occupation are socio-economic variables, while ethnicity is a cultural variable. Type of current residence may be viewed as both a socio-economic and a cultural variable, in as much as it can be used as an indicator of the conservativeness of an area, with the urban areas being the more

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 31–49. Voorburg, Netherlands: International Statistical Institute.

developed and less conservative and the rural areas the less developed and more conservative.

For the purposes of the analysis, educational attainment has been collapsed into three categories: primary or less, intermediate, and high school or over. Occupation of the husband has been classified into farm or non-farm. Ethnicity, as determined from the mother tongue or language generally spoken, has been categorized into five groups — Tagalas, Cebuanas, Ilocanas and Hilonggas and 'Others'. (The catch-all category, Others, includes Bicolanas and Muslims.) For the RPFS, the country was grouped into seven strata, namely: Metro Manila, urban and rural Luzon, urban and rural Visayas, and urban and rural Mindanao. Within this chapter, however, two larger areal categorizations are adopted. The urban–rural distribution is disregarded in the four-region classification: Metro Manila, Luzon, Visayas, and Mindanao. Type of current residence is a separate two-category variable.

As with other survey data, the RPFS data are subject to some limitations. Except for age at birth of each child all the other classificatory variables used refer to the survey date. These characteristics might have been different in periods before the survey. A college graduate at the time of the survey might have had a lower level of education a few years before or at the birth of her first child. Likewise, an urban dweller might have migrated from a rural area just a year or so before the survey date. In establishing trends, the fertility of women belonging to specific categories at the survey is traced back through time, but there is no way to ensure that these women belonged to the same category at each point in time.

Among the classificatory variables used, reported ethnicity is unlikely to have changed. Although no concrete study has been done on social mobility, it may be assumed that, except in the more urban areas where education facilities are located, a woman who marries has very limited opportunity to pursue further education. Similarly, the husband's occupation is likely to have been relatively stable since marriage. Place of residence may well have changed since marriage, however.

The strength of birth-history data is the opportunity they provide to estimate levels and patterns in the past and to examine how these have changed. However, for such purposes, the data are subject to biases typical of retrospective data:

1 The sample is not a random one of all individuals in a particular birth cohort of interest, as some members of this group may have died or emigrated before the date of survey, hence their pregnancy and childbearing experience will not be recorded. This problem is more serious for the older age groups.
2 The age range to which the data refer shrinks for dates further in the past.
3 Retrospective data are subject to recall error. Respondents may forget events that took place many years before the survey. They may also misplace the dates of recalled events (Potter 1977).

3.3 ANALYSIS OF THE RESULTS

Levels and trends for all women

Marital fertility estimates derived from the RPFS data generally support the patterns evident in recent studies. Table 3.1 presents the age-specific marital fertility rates for the country from 1970–5 as reconstructed from birth histories of ever-married women aged 15–49 years. It may be noted that after 1970, fertility of younger women (aged 15–19 and 20–24 years) at first declines slightly and then increases after 1973. On the other hand, women aged 25 years and over exhibit definite fertility decline over the same period.

Total marital fertility rates (TMFR) estimated using five-year moving averages centring on calendar years 1970–5 decrease from 10.0 children per ever-married woman in 1970 to 8.8 children in 1975. Exclusion of women aged 15–19 years from the estimates reduces the TMFR by about two children, and the pattern of decline over time is maintained.

Table 3.2 presents period estimates for 1958–68 and from 1968–72 based on the results of the 1968 and the 1973 National Demographic Surveys (NDS), respectively, and for the period 1973–77, from the RPFS 1978. Comparative figures for the two earlier periods have also been reconstructed and presented in the same table. Results of the three surveys confirm the trend observed above, ie high and unchanging rates for younger women and lower and declining rates for the older groups.

It is worth noting that estimates for the earlier period based on the RPFS data are generally higher. This could, however, be attributed to shortcomings of the data cited earlier.

Table 3.1 Age-specific marital fertility rates[a] in the Philippines 1970–5

	Year					
	1970	1971	1972	1973	1974	1975
TMFR						
15–49	10 045	9 780	9 385	9 000	8 890	8 815
TMFR						
20–49	7 900	7 675	7 310	6 950	6 830	6 705
TMFR						
25–49	5 675	5 485	5 140	4 825	4 670	4 555
ASMFR						
15–19	429	421	415	410	412	422
20–24	445	438	434	425	432	430
25–29	378	370	352	338	334	327
30–34	324	310	299	284	273	269
35–39	239	231	224	204	201	194
40–44	157	149	120	107	95	93
45–49	*	37[b]	33[b]	32[b]	31[b]	28

*The preceding available rate for the age group has been used to estimate TMFR.
[a] Rates are computed using five-year moving averages.
[b] Based on those ages for which data are available.

Table 3.2 Age-specific marital fertility rates in the Philippines, 1958–78

Age group	1958–68		1968–72		RPFS 1973–7
	NDS[a]	RPFS	NDS[b]	RPFS	
15–19	400	404	449	429	422
20–24	421	434	443	445	430
25–29	383	391	378	378	327
30–34	327	344	307	324	269
35–39	245	289[c]	217	239	194
40–44	115	166[c]	108	157	93
45–49	28	*	24	*	28
TMFR					
15–49	9 590	10 280[d]	9 640	10 000[d]	8 815
20–49	7 590	8 260[d]	7 385	7 855[d]	6 705

*No sample.
[a] 1968 NDS estimates from T. Pullum, Recent Philippine Fertility. In Wilhelm Flieger and Peter C. Smith, eds *A Demographic Path To Modernity*: 177.
[b] 1973 NDS estimates from E.A. de Guzman, *Trends in Differentials in Overall and Marital Fertility, 1968–1972*: 184. PREPF Final Project Report.
[c] Based on those ages for which data are available.
[d] A value of 28 has been used for women aged 45–49 years.

Table 3.3 Marital fertility rates by region of residence, 1973–7

Region	TMFR for age groups		ASMFR for age groups						
	15–49	20–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Philippines	8 815	6 705	422	430	327	269	194	93	28
Metro Manila	7 440	5 380	412	416	281	216	113	35	15[a]
Luzon	8 985	6 745	448	425	322	271	195	104	32[a]
Visayas	8 925	6 990	387	444	354	274	215	92	19
Mindanao	9 355	7 270	417	437	340	288	215	103	71

[a] Based on those ages for which data are available.

Fertility differentials among subgroups of the population

The general fertility pattern and trend observed for the entire country may also be observed for the different subgroups of the population. It is only in the levels that significant differentials may be noted. Table 3.3 and figure 3.1 present marital fertility estimates for 1975 by region of residence.

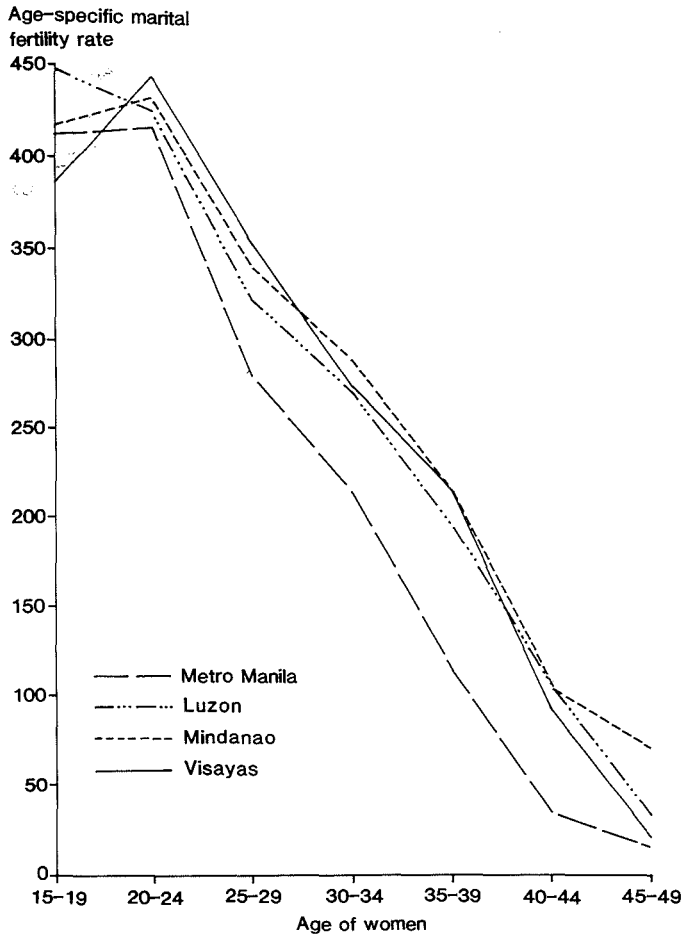

Figure 3.1 Marital fertility by region of residence 1973–7

With the national TMFR at 8.8 only Metro Manila shows an estimate significantly lower at 7.4, or 15.9 per cent lower. Although Visayas has the next lowest regional fertility estimates (8.9), this is 1.1 per cent higher than the national average. Luzon and Mindanao both show higher TMFRs, at 9.0 and 9.4, respectively.

Regional differentials in age-specific marital fertility rates vary by age. While Metro Manila has consistently lower levels than the country, Luzon has the closest levels to the national except for the youngest age group where the rate is about 6 per cent higher for Luzon. Visayas, on the other hand, has a lower rate for women aged 15—19 years but generally higher rates for all other age groups. A similar pattern may be observed in Mindanao, but the difference between the levels of fertility for women aged 15—19 years and 20—24 years is not as pronounced.

Women in Metro Manila exhibit the shortest childbearing period. The level of fertility peaks at early ages and drops drastically after 35—39 years. In Luzon, high rates may be observed for ages 15—29 years, declining moderately thereafter up to ages 40—44 years and dropping drastically only at the oldest age group. In the Visayas and Mindanao, marital fertility among women aged 15—19 years is relatively low but is higher at ages 20—24 years before maintaining a declining pattern. However, the ASMFR for Mindanao women aged 45—49 years is several folds higher than the rates observed in the other regions. Comparatively speaking, Mindanao women have the longest childbearing period with childbirths relatively more widely distributed.

Regional differentials also exist in the trends in the ASMFRs. In Metro Manila the ASMFR for women aged 15—19 years increases from 0.35 children per ever-married woman in 1960 to 0.41 in 1975. However, this observed pattern is not uniform for the period examined. Table A1, panel B shows that fertility increased from 1960—6, thereafter decreasing until 1972 before starting an upward trend again. Generally, fertility of women aged 20—24 years has been relatively constant despite the erratic pattern. For older women, the trend reverses so that the ASMFRs decrease by 26.2 per cent from 1960—75 for women aged 25—29 years, 27.7 per cent for women aged 30—34 years, 69.0 per cent for women aged 35—39 years.

The level and pattern of age-specific marital fertility of women in Luzon closely resemble the estimated national levels and trends. Between 1960 and the end of the decade, the ASMFR of women aged 25—29 years appears to be stable. The trend then reverses until 1973. During the last three years, however, relative stability may be observed (table A1, panel C).

Among older women in the Visayas, it is not until the 1970s that a definite decline in fertility may be detected. From table A1, panel D, relatively constant rates for women aged 25 years and over may be noted in the 1960s. In contrast to the other groups, women in the youngest age group exhibit a similar pattern as their fertility seems to decline in the very recent years. Only the group of women aged 20—24 years seem to exhibit increasing fertility.

Women in the Mindanao area show a similar marital fertility trend to those in the Visayas although the levels are generally higher (table A1, panel E).

Other studies have noted the disparity between the fertility levels in urban and in rural areas, with rural fertility characteristically higher. Fertility estimates from the RPFS data lead to the same conclusion. Table 3.4 and figure 3.2 give the marital fertility estimates for urban and for rural women. On the average, a rural woman bears 1.3 children more than her urban counterpart. Percentage differences in ASMFRs are, however, positively related to age: while among younger women the disparity is not wide, the gap broadens considerably for older women. Apparently, urban women prefer to bear children early and to cut short their childbearing period. Rural women, on the other hand, tend to bear more children and bear them over a longer period of time.

The classification scheme used for the occupation of the husband links this variable to the type of current place of residence. Most rural women are married to farm workers. Hence, the differentials observed between urban and rural women may also be observed between women whose husbands are non-farm workers and women whose husbands are farm workers, with the latter bearing on the average 1.1 more children (table 3.5 and figure 3.3). The difference increases with age, highlighting not only the lower fertility of women married to non-farm workers across all age groups but also their shorter childbearing period.

Fertility of women aged 15—19 years married to non-farm workers has undergone little change since the 1960s. Table A3, panel B shows the reconstructed age-specific marital fertility rates of these women. The fertility of women aged 20—24 years declined consistently from 1970 onward

Table 3.4 Marital fertility rates by place of current residence, 1973–7

Place of current residence	TMFR for age groups		ASMFR for age groups						
	15–49	20–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Urban	7 945	5 830	423	419	304	231	138	57	17
Rural	9 230	7 120	422	435	339	286	221	110	33
Total	8 815	6 705	422	430	327	269	194	93	28
% difference, rural minus urban	16.2	22.1	−0.2	3.8	11.5	23.8	60.1	93.0	94.1

after relative stability in the 1960s. On the other hand, a declining trend is discernible for older women throughout the 15-year period.

In urban areas, only women in the youngest age group exhibit fairly high and stable fertility. Women aged 20–24 years experience declining fertility over the whole period in review. The rural counterparts of these women, however, still exhibit high and fairly stable fertility.

The age-specific fertility patterns of women

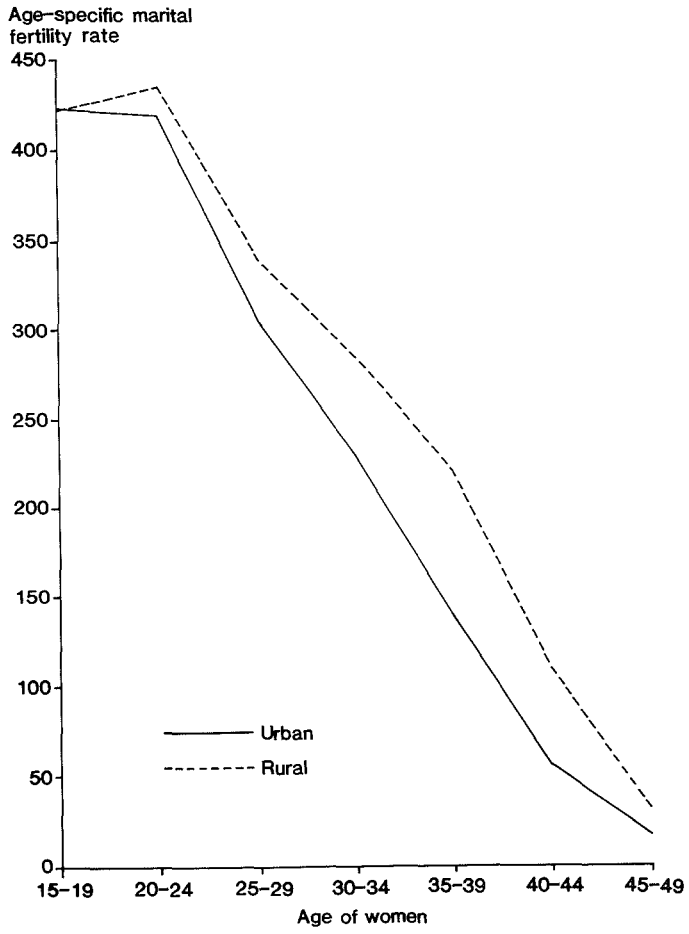

Figure 3.2 Marital fertility by place of current residence 1973–7

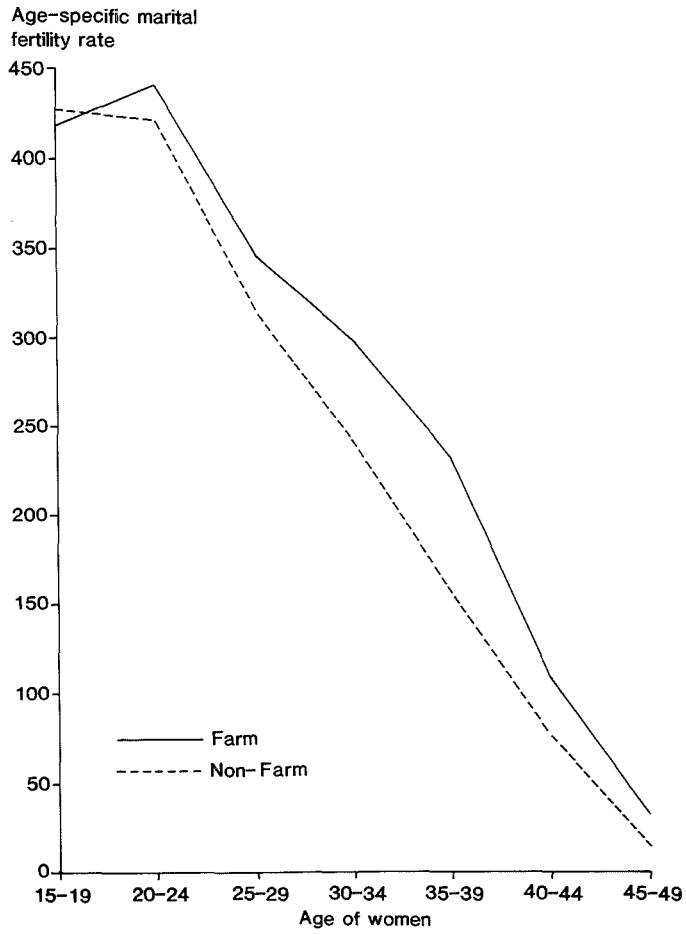

Figure 3.3 Marital fertility by occupation of husband 1973–7

married to farm workers closely resemble those of rural women, with the younger women exhibiting high and relatively stable fertility while a declining trend may be observed among older women (table A3, panel B).

It is a common observation that education has a suppressing effect on fertility. Table 3.6 and figure 3.4 present the marital fertility rates of women belonging to each of three education categories. Differentials in total marital fertility

Table 3.5 Marital fertility rates by occupation of the husband, 1973–7

Occupation of the husband	TMFR for age groups		ASMFR for age groups						
	15–49	20–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Farm	9 380	7 290	418	440	344	298	231	107	38
Non-farm	8 245	6 110	427	420	313	241	155	77	16
Total	8 815	6 705	422	430	327	269	194	93	28
% difference, farm minus non-farm	13.8	19.3	−2.1	4.8	9.9	23.7	49.0	39.0	137.5

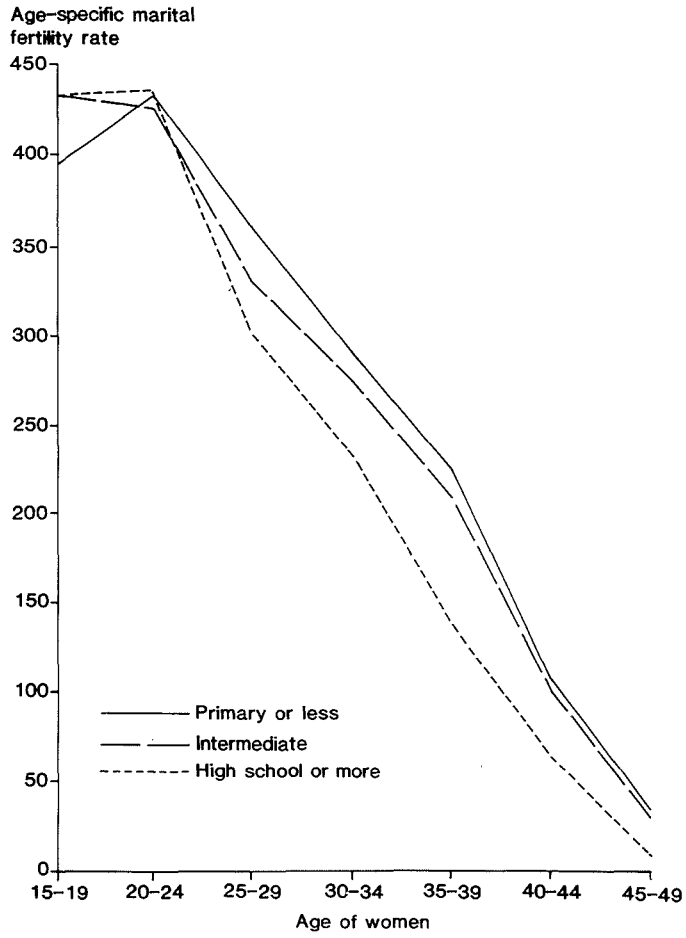

Figure 3.4 Marital fertility by educational attainment 1973–7

are quite evident, with women having very little education (primary or less) having the highest fertility. The TMFR for women with intermediate education is 0.2 child less than for women with less education and 1.0 child more than women with some high school education or further schooling. Total marital fertility rates measured over ages 20–49 years show a similar differential. Except for women aged 15–19 and 20–24 years, the ASMFRs likewise present the same differentials, with the better educated women having lower fertility at each age group. The absolute

Table 3.6 Marital fertility rates by education, 1973–7

Education	TMFR for age groups		ASMFR for age groups						
	15–49	20–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
Primary or less	9 225	7 245	396	428	361	292	225	107	36
Intermediate	9 030	6 870	432	425	331	277	209	101	31
High school or more	8 070	5 910	432	436	301	234	137	64	10[a]
Total	8 815	6 705	422	430	327	269	194	93	28

[a] Based on those ages for which data are available.

difference in ASMFRs between women with primary or less education and women with intermediate education increases with age, as does the difference between the ASMFRs for women with intermediate education and with at least high school education. For the younger group the reverse seems to be true – women with less education exhibit lower levels of fertility than those with higher education. This reflects the tendency for the better educated to bear children early and to cut short their childbearing period.

The trends in ASMFRs of ever-married women with primary or less education may be observed in table A4, panel A. Even in the 1960s, the fertility of less educated young women (15–19 years) was lower and appeared to be declining during the early 1960s, before increasing towards the end of the decade. A decline may again be observed in the 1970s. On the other hand, no such recent decline may be observed for women aged 20–24 years. Though a decline may be observed for older women, the rate of decline is slow.

Among women with intermediate education, indications of decline may also be observed for women aged 20–24 years. Older women exhibit more substantial fertility decline than their counterparts with less education. Only women in the youngest age group show a contrary trend, reversing a trend towards decline by the end of the 1960s and maintaining high fertility thereafter (table A4, panel B).

Women with high school or higher educational attainment exhibit a similar pattern but the levels are generally lower, as shown in table A4, panel C.

A cultural variable found to affect the level of fertility of married women is ethnicity. Studies show that not only do Ilocano women marry later but they also exhibit lower fertility levels (Smith 1978). Table 3.7 and figure 3.5 present marital fertility estimates for different ethnic groups. Tagalog women exhibit the lowest level, followed by the Ilocanas. Bicolanas and Muslims, who are known to exhibit higher levels of fertility, have been included in the 'Others' category which ranks third, followed by the Cebuanas. Surprisingly, Hilonggas are found to have the highest fertility level, with very high ASMFRs for ages 20–24, 25–29, 30–34 and 35–39 years. While rates for Tagalas and Ilocanas are higher than the rates for the other ethnic groups at the youngest age group, sharp declines may be observed at older ages which indicate the shorter childbearing period of these women. On the other hand, women in the 'Others' category exhibit the longest childbearing period.

Although fertility of younger women shows no sign of decline in the recent years and even seems to be increasing for some ethnic groups, a declining trend may be observed for the older women, differing only in levels and rates of decline. Among Tagalog women aged 15–19 years, a high and relatively constant fertility level is observed. The same pattern may be observed for women in the next age group except for a very recent but slow decline. On the other hand, older women show a general pattern of decline throughout the period in review (table A5, panel A).

Retrospective ASMFRs for Cebuano women are presented in table A5, panel B. It may be observed that while the fertility trend of younger women is erratic, around a rate of over 400 per thousand, the fertility of older women is on the decline. The rates are, however, higher than those of the Tagalas.

Ilocano women aged 15–19 years exhibit a unique fertility pattern. The 1960s showed a decline until the end of the decade when a slowly increasing trend is observed. However, from

Table 3.7 Marital fertility rates by ethnicity, 1973–7

Ethnicity	TMFR for age groups		ASMFR for age groups						
	15–49	20–49	15–19	20–24	25–29	30–34	35–39	40–44	45–49
All ethnic groups	8 815	6 705	422	430	327	269	194	93	28
Tagala	8 400	6 125	455	422	297	242	167	68	29[a]
Cebuana	9 155	7 015	428	440	336	265	206	98	58
Ilocana	8 665	6 275	478	420	324	240	176	67	28[a]
Hilongga	9 480	7 235	449	458	363	297	218	91	20[a]
Others	8 945	7 045	380	427	330	290	199	118	45[a]

[a] Based on incomplete data.

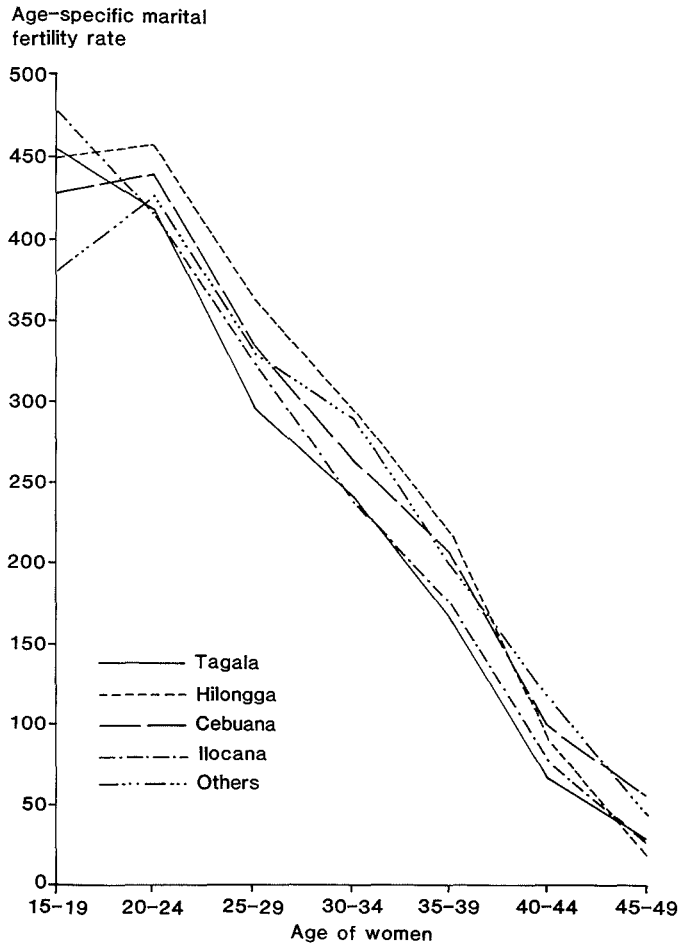

Figure 3.5 Marital fertility by ethnicity 1973–7

1974–5, a drastic increase of 14.0 per cent may be observed. As with the other groups of women, those in the older ages exhibit substantial declines in fertility (table A5, panel C).

During the more recent years the Hilonggas have the highest fertility levels for all ages except for the youngest age group. This is due to the increasing fertility observed for women aged 20–24 years and to the relatively slow decline in fertility of older women, as gleaned from table A5, panel D. Increases may be observed for the youngest group of women.

Women aged 15–19 years belonging to the category 'Others' exhibit a pattern of rising fertility beginning in the late 1960s, from a relatively constant level in the first half of the decade, with decline commencing again after 1972. Although fertility of women aged 20–24 years seems to decline in the 1960s, from 1970–5 a plateau seems to have been reached. Consistent with the observed pattern for older women in the other ethnic groups, declining trends may also be observed for older women in this group. However, in comparison to other women aged 40–44 years, these women still exhibit high fertility, reflecting a tendency for women in this ethnic category to bear children over a longer period of time (table A5, panel E).

3.4 SUMMARY AND CONCLUSION

Using the RPFS 1978 data, levels and trends of marital fertility are estimated through the reconstructed fertility histories. Although there are recognized weaknesses in using this method, its

merit lies in the ability to produce an estimated time series for the population.

In general, the total marital fertility rate is declining. Although the age-specific rates for the younger women show no sign of decline, decrease in the rates for older women results in a decline in the total rate. This finding must be interpreted in the light of the observed rising age at marriage, the lower fertility preferences of younger women and increasing contraceptive use. Hence, although women who marry at younger ages tend to bear children immediately after marriage, they tend to bear less children over their lifetimes and in a relatively shorter duration of time. It must also be noted that more and more women choose to marry at later ages where declines in marital fertility rates are observed.

General trends likewise conceal many interesting differences among subgroups. From the same data, differentials are observed in levels and trends among women grouped into broad geographic categories; Metro Manila, the rest of Luzon, Visayas and Mindanao. Similarly, differentials are also observed among the various educational and occupational groups, and important differentials are observed among ethnic groups.

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APPENDIX A DETAILED TABLES

Table A1 Age-specific marital fertility rates[a] for regions by calendar year

Year	Age group						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A The Philippines							
1975	422.1	430.1	327.1	268.7	193.9	92.9	28.2
1974	412.5	432.0	333.8	273.3	201.0	95.1	(30.9)
1973	410.2	424.6	338.1	283.5	204.4	106.7	(31.5)
1972	415.3	434.2	352.4	298.8	224.0	119.6	(33.3)
1971	420.5	438.3	369.7	310.4	231.1	148.6	(36.9)
1970	428.7	445.4	377.7	323.9	239.2	157.4	
1969	423.6	436.1	380.8	326.2	243.0	(171.2)	
1968	424.6	437.6	387.5	329.5	249.9	(183.0)	
1967	403.6	435.9	385.3	332.5	256.2	(196.0)	
1966	395.4	435.0	390.5	338.9	266.0	(166.2)	
1965	391.2	423.9	389.4	335.8	300.8		
1964	404.8	433.4	389.6	341.9	(314.5)		
1963	400.8	431.6	386.2	343.4	(334.6)		
1962	413.2	432.6	391.8	352.4	(349.6)		
1961	409.9	430.4	387.9	348.3	(406.8)		
1960	408.1	437.7	392.1	347.6			
B Metro Manila							
1975	412.4	416.0	281.2	215.6	112.6	34.7	(14.6)
1974	398.3	415.9	281.6	202.3	111.3	42.9	(22.4)
1973	392.3	384.1	291.0	217.4	116.3	47.5	
1972	380.4	403.3	309.5	219.0	130.7	61.6	
1971	397.7	421.0	339.9	223.1	153.0	72.6	
1970	415.6	419.8	349.6	229.2	162.8	84.9	
1969	428.6	418.3	347.5	255.8	180.4	(89.3)	
1968	421.8	430.7	360.7	265.8	187.4	(97.8)	
1967	434.0	410.2	356.4	278.3	191.1	(92.4)	
1966	434.9	406.8	359.0	279.0	192.3	(84.9)	
1965	423.1	414.9	366.0	296.2	231.3		
1964	398.2	425.1	371.6	305.2	(238.6)		
1963	388.0	429.2	365.1	307.4	(260.3)		
1962	378.6	453.7	380.1	316.9	(286.7)		
1961	361.1	451.0	371.4	335.9	(362.9)		
1960	353.7	449.9	381.0	298.2			
C Luzon							
1975	448.0	424.7	322.1	270.9	194.9	104.0	(32.5)
1974	408.0	439.7	324.5	278.9	201.4	104.8	(39.3)
1973	414.5	431.5	324.6	290.2	204.4	121.2	(38.6)
1972	420.8	441.1	345.4	303.4	226.3	125.4	(43.7)
1971	432.0	439.7	361.7	314.5	233.2	155.3	
1970	435.9	447.0	373.3	318.7	248.8	164.1	

Table A1 (*cont*)

Year	Age group						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
1969	422.2	434.2	381.1	320.2	252.0	(179.1)	
1968	421.0	443.7	391.7	327.7	259.5	(184.6)	
1967	390.8	447.6	386.8	327.3	278.3	(213.0)	
1966	388.9	448.8	397.2	338.9	290.2	(180.6)	
1965	378.6	434.7	386.4	344.3	319.6		
1964	405.2	446.9	392.2	348.0	(337.7)		
1963	396.5	436.9	394.2	353.4	(364.1)		
1962	419.9	436.7	394.1	367.6	(355.8)		
1961	420.6	430.1	386.3	354.2	(399.3)		
1960	420.1	441.2	393.9	407.1			
D Visayas							
1975	386.7	444.2	354.4	274.4	214.6	92.5	18.7
1974	372.3	441.5	367.0	275.6	233.5	92.9	(17.8)
1973	373.6	427.3	370.5	289.6	238.8	104.6	(20.4)
1972	390.5	429.7	375.1	308.0	262.3	125.8	(25.2)
1971	400.9	427.1	376.8	322.8	256.3	165.1	(30.0)
1970	409.0	438.4	385.3	356.1	251.3	168.2	
1969	420.6	424.3	377.8	350.0	241.1	(184.5)	
1968	424.2	409.0	378.7	338.7	248.3	(199.9)	
1967	400.2	423.7	381.4	349.7	239.5	(202.2)	
1966	366.7	412.5	386.8	353.1	254.3	(133.2)	
1965	377.0	405.6	384.3	335.3	306.5		
1964	390.4	409.6	387.9	339.6	(322.6)		
1963	393.7	427.8	379.8	341.7	(337.0)		
1962	395.4	420.6	385.6	351.9	(378.9)		
1961	404.2	421.0	384.4	359.9	(472.4)		
1960	411.9	418.4	387.0	333.9			
E Mindanao							
1975	416.9	437.3	339.6	287.5	215.4	102.9	71.1
1974	450.8	421.0	352.0	298.4	211.9	107.9	(81.0)
1973	433.3	433.8	361.9	299.3	212.5	113.0	(97.3)
1972	432.4	448.1	366.9	323.4	224.2	136.3	(115.1)
1971	416.7	457.4	395.9	336.6	239.3	164.4	(195.3)
1970	430.8	464.8	393.2	350.7	245.6	194.1	
1969	425.1	462.9	400.3	352.7	263.4	(212.4)	
1968	428.3	458.9	402.1	360.4	269.3	(244.0)	
1967	413.4	436.5	401.5	356.3	269.1	(258.7)	
1966	419.6	444.0	397.5	358.8	277.2	(302.9)	
1965	421.2	424.1	416.6	341.3	299.3		
1964	423.4	434.1	396.1	353.7	(303.9)		
1963	422.8	423.9	387.5	344.8	(317.1)		
1962	430.7	426.8	401.8	338.3	(347.1)		
1961	409.4	432.7	405.8	323.0	(364.1)		
1960	393.3	447.9	401.3	294.6			

[a]In computing the rates, five-year moving averages were used to smooth out the fluctuations.
NOTE: Values in parentheses are for incomplete age groups.

Table A2 Age-specific marital fertility rates[a] for urban and rural areas by calendar year

Year	Age group						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A Urban							
1975	422.7	419.3	303.7	231.2	137.6	57.2	17.4
1974	419.4	416.1	308.4	231.1	143.0	63.3	(19.1)
1973	409.9	407.8	310.1	241.1	148.8	71.8	(19.3)
1972	405.0	418.0	330.1	248.7	171.0	85.7	(25.3)
1971	425.5	427.2	347.2	257.6	188.4	92.1	(41.9)
1970	429.3	432.0	362.8	273.8	203.1	116.3	
1969	431.6	435.4	368.0	288.7	209.3	(121.8)	
1968	437.4	439.7	388.3	301.5	219.6	(131.6)	
1967	440.2	436.2	380.0	311.3	223.9	(137.0)	
1966	438.0	439.0	385.9	322.3	231.6	(176.8)	
1965	427.3	434.0	389.5	321.9	266.8		
1964	416.1	436.7	395.6	333.6	(282.6)		
1963	396.7	438.2	390.6	330.4	(304.7)		
1962	393.5	442.6	399.4	346.5	(328.5)		
1961	378.7	439.4	391.8	339.6	(400.3)		
1960	389.9	450.5	396.3	305.4			
B Rural							
1975	421.7	434.9	339.4	286.2	220.5	109.9	33.2
1974	410.1	439.0	346.7	292.6	228.6	110.2	(36.3)
1973	410.4	432.0	351.6	303.0	230.9	123.5	(37.0)
1972	417.9	441.1	362.8	321.8	249.3	135.7	(36.8)
1971	418.1	443.1	379.9	334.7	251.6	175.4	(33.9)
1970	427.5	450.9	384.3	347.1	256.4	176.7	
1969	419.5	436.4	386.3	343.8	259.2	(194.4)	
1968	419.0	436.8	387.1	342.5	264.7	(206.8)	
1967	390.8	436.1	387.5	342.7	271.8	(223.2)	
1966	381.1	433.7	392.4	347.0	282.6	(159.8)	
1965	378.8	420.2	389.1	342.5	317.4		
1964	400.3	432.3	386.7	345.9	(330.0)		
1963	400.5	429.2	383.8	349.6	(349.1)		
1962	417.9	428.9	388.4	355.2	(360.2)		
1961	418.0	427.0	386.0	352.5	(410.8)		
1960	412.6	432.9	390.2	372.6			

[a]In computing the rates, five-year moving averages were used to smooth out the fluctuations.
NOTE: Values in parentheses are for incomplete age groups.

Table A3 Age-specific marital fertility rates[a] of women married to farm and non-farm workers by calendar year

Year	Age group						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A Farm workers							
1975	418.2	440.1	344.2	297.8	231.2	106.7	37.9
1974	402.0	445.5	344.5	300.8	241.8	107.0	(42.4)
1973	405.2	435.0	350.0	308.1	240.9	115.8	(42.6)
1972	410.8	437.0	359.0	325.2	256.9	136.4	(47.3)
1971	416.2	442.8	375.1	339.6	252.3	164.0	(51.8)
1970	420.5	451.3	377.0	356.1	254.6	187.6	
1969	421.2	431.8	378.7	349.3	253.1	(208.5)	
1968	416.0	429.0	382.1	346.8	262.1	(230.9)	
1967	398.4	432.8	382.4	345.5	261.0	(244.3)	
1966	378.9	426.9	389.0	347.3	265.2	(262.0)	
1965	379.1	414.5	389.0	338.2	300.8		
1964	393.3	430.8	388.1	340.0	(312.1)		
1963	395.5	428.2	377.9	337.3	(324.1)		
1962	407.9	426.5	383.7	348.3	(339.9)		
1961	404.9	425.6	379.5	344.3	(414.4)		
1960	407.1	429.6	379.6	380.3			
B Non-farm workers							
1975	427.2	419.9	313.1	241.2	154.8	77.4	16.4
1974	427.0	418.3	324.5	246.0	158.0	81.5	(17.1)
1973	417.2	414.2	327.0	258.2	166.0	96.2	(17.9)
1972	422.4	431.4	345.6	270.8	189.1	100.4	(16.0)
1971	427.4	433.6	364.2	279.3	208.4	130.9	(17.3)
1970	440.2	438.9	378.4	289.7	222.3	119.6	
1969	426.4	440.8	383.5	301.8	231.5	(124.5)	
1968	436.4	447.2	393.2	311.2	235.8	(122.9)	
1967	410.5	440.1	388.5	318.7	250.6	(132.3)	
1966	420.2	445.2	392.1	330.0	266.8	(39.7)	
1965	410.5	435.8	389.6	333.1	300.5		
1964	424.1	436.6	390.9	344.6	(316.8)		
1963	410.4	436.1	395.4	350.8	(346.4)		
1962	422.8	440.6	400.9	357.6	(360.4)		
1961	418.9	436.6	397.3	353.4	(397.0)		
1960	409.9	448.0	407.0	305.8			

[a]In computing the rates, five-year moving averages were used to smooth out the fluctuations.
NOTE: Values in parentheses are for incomplete age groups.

Table A4 Age-specific marital fertility rates[a] of women by education by calendar year

Year	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A Primary or less							
1975	396.1	428.2	361.2	292.4	225.0	106.7	35.9
1974	400.4	441.4	349.0	293.1	236.3	107.5	(40.1)
1973	419.9	412.7	344.6	292.9	240.3	120.1	(37.8)
1972	419.2	421.1	352.6	317.0	256.4	128.1	(35.0)
1971	414.1	423.7	367.8	322.4	256.8	163.9	(31.4)
1970	423.4	433.5	375.0	348.9	260.0	142.3	
1969	432.8	406.1	376.2	352.8	260.8	(152.8)	
1968	414.8	417.3	385.6	350.4	258.9	(151.2)	
1967	381.1	407.2	378.4	348.7	266.9	(153.7)	
1966	354.9	410.9	387.6	357.2	271.9	(132.7)	
1965	356.2	396.7	380.5	345.0	306.2		
1964	375.0	415.7	379.1	347.0	(316.6)		
1963	371.0	411.7	367.1	352.8	(342.4)		
1962	404.6	415.1	380.9	355.6	(345.9)		
1961	388.3	420.7	372.9	365.2	(399.4)		
1960	403.0	424.3	382.7	356.2			
B Intermediate							
1975	432.1	425.4	331.3	277.1	209.3	100.7	30.8
1974	424.5	424.1	342.8	287.9	217.8	103.7	(32.6)
1973	418.6	433.6	351.5	302.4	218.6	121.8	(38.4)
1972	420.5	439.4	368.5	314.2	244.5	138.7	(49.2)
1971	426.7	441.5	382.4	336.9	236.2	163.5	(75.0)
1970	440.0	446.7	384.3	338.4	243.6	202.1	
1969	420.8	442.6	386.3	329.1	241.8	(223.4)	
1968	425.2	442.7	390.4	337.3	252.6	(242.3)	
1967	413.8	447.2	388.2	333.5	260.6	(261.9)	
1966	415.4	451.2	390.4	340.1	269.4	(335.5)	
1965	403.8	444.4	388.9	338.9	329.7		
1964	422.9	450.3	393.1	352.6	(348.8)		
1963	418.0	444.5	396.4	346.7	(377.1)		
1962	411.9	445.9	394.8	360.3	(390.0)		
1961	429.2	433.2	391.3	334.4	(560.9)		
1960	415.5	442.2	399.2	372.3			
C High school or more							
1975	431.9	436.4	301.2	234.0	136.6	63.6	(10.4)
1974	413.0	433.7	312.5	233.2	137.5	67.6	(11.1)
1973	391.8	421.9	316.7	246.5	142.4	69.8	(12.2)
1972	402.5	437.2	331.5	254.4	159.6	87.0	(16.9)
1971	414.3	447.2	354.4	259.1	186.7	104.2	
1970	413.5	455.8	371.2	271.5	203.3	141.1	
1969	413.3	454.9	378.6	287.3	216.2	(153.3)	
1968	436.7	452.0	385.3	293.9	233.1	(182.1)	
1967	417.2	453.6	391.0	307.8	232.0	(206.1)	
1966	423.3	438.6	394.6	315.6	256.2	(255.3)	
1965	434.4	424.5	401.9	317.1	257.9		

Table A4 (*cont*)

Year	15–19	20–24	25–29	30–34	35–39	40–44	45–49
1964	417.3	429.5	400.2	323.1	(270.8)		
1963	424.6	441.7	401.9	325.1	(269.8)		
1962	431.4	438.8	405.6	338.9	(306.1)		
1961	431.5	442.3	405.1	327.5	(225.3)		
1960	411.9	454.1	397.5	291.0			

[a]In computing the rates, five-year moving averages were used to smooth out the fluctuations.
NOTE: Values in parentheses are for incomplete age groups.

Table A5 appears on p48

Table A5 Age-specific marital fertility rates[a] for ethnic groups by calendar year

Year	Age groups						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
A Tagala							
1975	455.1	421.6	296.6	242.3	167.0	67.6	(28.7)
1974	422.1	423.3	301.9	252.2	154.7	74.0	(28.7)
1973	435.7	415.6	311.4	269.2	163.7	90.5	
1972	415.7	427.9	327.2	280.4	171.0	97.2	
1971	442.7	430.7	360.5	288.2	178.6	110.8	
1970	453.0	435.3	358.7	298.2	191.1	128.9	
1969	438.2	446.8	369.4	303.9	207.0	(139.1)	
1968	423.6	452.0	369.3	308.6	204.8	(143.8)	
1967	432.8	444.9	374.8	314.2	220.1	(167.4)	
1966	435.2	445.9	365.1	314.7	220.3	(186.4)	
1965	432.1	438.1	383.3	316.4	(217.2)		
1964	459.2	442.5	379.6	314.4	(221.1)		
1963	432.2	438.2	393.7	329.3	(238.9)		
1962	466.5	436.9	392.7	344.9	(191.3)		
1961	457.9	430.6	387.2	337.6			
1960	455.0	441.7	388.1	305.1			
B Cebuana							
1975	427.8	440.3	336.1	264.8	205.6	98.3	58.5
1974	428.1	427.7	354.5	279.5	217.0	103.8	(67.9)
1973	412.9	432.1	361.5	282.8	224.7	111.8	(83.3)
1972	417.0	442.1	354.5	301.4	240.6	136.7	(116.0)
1971	427.0	455.1	379.7	324.2	244.3	189.8	(209.5)
1970	434.3	454.1	383.9	353.2	248.1	212.2	
1969	430.9	447.9	383.3	345.9	256.6	(237.2)	
1968	448.8	440.2	383.2	347.3	258.8	(272.6)	
1967	440.0	433.8	395.3	357.1	255.4	(299.6)	
1966	404.3	427.8	390.1	353.6	261.1	(256.7)	
1965	411.4	417.4	398.3	336.6	281.0		
1964	413.1	423.7	390.6	348.5	(286.7)		
1963	403.4	428.6	386.3	341.9	(296.0)		
1962	405.8	431.0	393.9	352.8	(317.2)		
1961	414.4	426.3	396.6	367.5	(340.2)		
1960	418.4	434.2	404.4	330.4			
C Ilocana							
1975	478.1	420.0	323.6	240.1	176.1	67.0	(27.8)
1974	419.3	430.0	309.0	242.2	195.5	67.8	(34.8)
1973	385.7	413.8	304.0	258.3	178.4	82.1	
1972	393.5	431.7	333.1	254.5	194.9	99.6	
1971	384.0	440.8	330.1	274.5	213.8	107.6	
1970	394.6	444.5	346.5	283.4	243.5	121.9	
1969	380.6	421.4	349.3	299.0	228.9	(134.5)	
1968	379.4	451.2	363.4	315.6	262.4	(139.8)	
1967	357.7	441.7	349.0	316.5	287.5	(131.8)	
1966	356.7	422.2	380.7	313.2	278.2	(165.2)	

Table A5 (*cont*)

Year	Age groups						
	15–19	20–24	25–29	30–34	35–39	40–44	45–49
1965	371.4	419.5	377.0	321.2	(277.9)		
1964	412.8	425.0	393.5	329.9	(301.7)		
1963	425.2	404.4	380.9	335.2	(309.6)		
1962	410.3	402.7	387.1	365.1	(215.9)		
1961	414.0	416.8	381.5	376.9			
1960	383.1	402.6	378.6	408.1			
D Hilongga							
1975	449.3	458.5	363.1	297.2	217.7	91.4	(19.7)
1974	433.9	448.7	374.4	285.4	231.5	91.1	(24.9)
1973	415.2	446.4	371.1	296.7	231.1	94.5	(35.2)
1972	425.7	455.8	401.8	310.2	269.3	117.9	(45.5)
1971	394.5	447.0	400.3	320.8	269.7	150.7	
1970	391.8	459.3	410.6	342.3	269.9	146.2	
1969	402.9	457.2	403.3	351.6	263.6	(157.6)	
1968	425.1	434.3	415.8	338.4	283.8	(174.7)	
1967	380.4	422.5	397.6	346.3	276.8	(162.1)	
1966	387.1	429.1	406.4	359.4	321.6	(82.5)	
1965	381.4	405.0	408.6	339.7	391.8		
1964	373.4	417.6	396.4	358.4	(420.3)		
1963	391.1	429.6	385.1	357.7	(446.7)		
1962	420.2	442.0	403.1	365.4	(511.2)		
1961	394.7	426.1	402.0	366.1	(578.1)		
1960	398.6	443.3	384.2	334.3			
E Others							
1975	379.6	427.1	330.1	290.0	199.4	118.3	(45.3)
1974	387.0	423.7	334.3	290.8	206.9	116.9	(51.2)
1973	402.3	430.9	339.8	298.8	215.5	129.3	(56.7)
1972	421.2	428.3	358.1	322.7	240.8	130.2	(54.1)
1971	426.4	423.7	373.3	323.9	248.1	156.7	
1970	436.0	440.0	384.6	326.1	249.8	159.6	
1969	432.7	418.0	389.1	325.3	255.2	(170.0)	
1968	423.0	421.7	399.6	329.7	253.6	(172.3)	
1967	381.3	434.2	392.3	326.9	256.2	(191.8)	
1966	382.2	441.2	402.8	348.1	266.6	(154.9)	
1965	362.2	428.8	382.4	354.3	358.4		
1964	376.5	445.0	390.0	355.4	(380.8)		
1963	374.6	442.4	383.9	353.1	(426.1)		
1962	388.4	440.1	387.0	348.6	(489.6)		
1961	384.0	441.4	379.0	325.5	(665.5)		
1960	387.8	452.8	395.4	362.0			

[a] In computing the rates, five-year moving averages were used to smooth out the fluctuations.
NOTE: Values in parentheses are for incomplete age groups.

4 Nuptiality and Fertility in the Philippines

Corazon Mejia-Raymundo

4.1 INTRODUCTION

In 1978, the Special Committee to Review the Philippine Population Program advocated, as one of their major policy recommendations, that marriage should not occur before 25 years of age. This was a direct response to the research finding that change in marital structure is one of the more important sources of the decline in Philippine fertility (Cho and Retherford 1973; Smith 1975). Delayed marriage is found to be negatively correlated with fertility in many societies. However, despite wide age at marriage differentials in fertility, the nature and extent of its effect has received little attention, and age at marriage has been treated primarily as a variable to be controlled in the analysis of other factors.

An analysis of the fertility impact of age at marriage will assume more importance now that the more recent declines in fertility have been attributed less to changes in marriage patterns and more to declining marital fertility (Concepción 1980). Herrin (1981) has expressed pessimism about the possibility of marriage timing reducing fertility further and has concluded that the limits of nuptiality as a significant factor in future fertility decline have been reached. This has critical implications for the recommendations to delay marriage further, and these findings should be given attention before any final recommendation is made.

Historically, there was a well-defined sequential pattern with regard to delayed marriage *vis-à-vis* contraception in depressing fertility. Coale (1973) identified two closely related transitional subphases: one, 'a Malthusian transition in which later marriage and fairly common spinsterhood replace early and universal marriage' and a 'neo-Malthusian transition in which marital fertility fell due to deliberate use of contraception'. Matras (1965) described these stages as social strategies of populations as they adjust to the requirements of a modern age. According to his typology, countries are classified according to degree of demographic modernization into three stages: (1) early marriage–uncontrolled fertility, (2) late marriage–uncontrolled fertility, and (3) late marriage–controlled fertility. The Philippines conform to this sequential pattern of responses to population pressure (Mejia-Raymundo 1981) and can be placed in the early phase of the third stage.

In general, the results of late marriage are smaller family size and longer intervals before the next generation is born (Yaukey 1973). In populations with little fertility control, delayed marriage is an effective means of restricting fertility, as it reduces the length of exposure to the risk of conception (Coale and Tye 1961). This also applies to modern contracepting populations since control of fertility is not perfect and the chances of contraceptive ineffectiveness are in part a function of time (Busfield 1972). Safeguards against slipping back to an early marriage pattern are recommended, to prevent a reversal of demographic trends and the ill effects of early marriage, leading to greater exposure and a higher number of pregnancies. The experience of developed countries attests to the possibility of return to a younger age at marriage, after a prolonged period of very late age at marriage. Early age at marriage is not so remote to the Philippines as it has been in the developed countries.

Theoretically, a further increase in age at marriage can still contribute to a decline in population growth because of its impact on the length of each generation. The effect will also depend on what the age at marriage initially was and how long marriage is deferred, since fecundity varies strongly with age. Preventing child marriage has little impact on fertility levels. On the other

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 51–60. Voorburg, Netherlands: International Statistical Institute.

hand, postponing marriage from ages 20–24 to after age 24 can substantially affect fertility because the early 20s are ages with the shortest waiting time until conception (Jain 1969).

This chapter attempts to contribute to a better understanding of the nuptiality–fertility relationship in the Philippines by focusing on the impact of age at marriage on fertility. On the aggregate level, the contribution of changes in marital structure on fertility decline will be ascertained by demographic decomposition. In addition, speculative analyses based on the changing contributions of young women to the overall fertility level will be made. The individual-level analysis consists of a multivariate analysis of cumulative fertility, highlighting the influence of age at marriage.

4.2 TRENDS IN NUPTIALITY LEVEL

Smith, Alcantara and de Guzman, in chapter 1 of this volume, describe the trend of marriage in the country since the turn of the century. In brief, marriage has remained almost universal, with a strong trend towards postponement to a much later age. This change in timing has accelerated during the last decade, confirming the relevance of nuptiality change to the recent fertility decline, though declines in marital fertility rates are now of more interest.

Philippine fertility has been declining. From an almost constantly high crude birth rate of 50 births per thousand population up to the 1950s, the first indication of a decline was recorded for 1960 (CBR = 46 per thousand). Since then it has been decreasing modestly, reaching an estimated level of 32 per thousand in 1977. Thus, it may be deduced that the crude birth rate has fallen by as much as 40 per cent during the last 30 years (Concepción 1980). The same conclusion can be reached using more refined measures of fertility, such as the total fertility rate.

There have been strong suggestions that the same forces affected both the delay in marriage and the decline in fertility. Pinpointed is the general trend towards economic growth which sustains the structural transformation that has imposed changes on social processes like marriage and childbearing.

In the Philippines, marriage still represents the socially sanctioned initiation into sexual activity and therefore signals the beginning of childbearing for a majority of the women. The age of marriage/fertility relationship will result directly from differences in exposure to risk of conception among the non-contracepting segment of the population. As contraception becomes more widely practised, the straightforward relationship is complicated by other social factors, such as effective contraceptive use and selective marriage patterns. As Westoff (1975) claims, as other fertility differentials appear in a modern society, age at marriage becomes increasingly important to the sociology of fertility.

4.3 SOURCES OF THE RECENT FERTILITY DECLINE

Based on the contribution of changes in marital composition and fertility rates to fertility decline in developing countries, the fertility reduction already noted can be divided into two periods. The first period (before 1970) is characterized by a modest fall in the fertility level and occurred before the launching of the family planning programme, thereby suggesting a cause other than contraception. Decomposing the 4.4 per cent decline in the Philippine crude birth rate from 1960–8, Cho and Retherford (1973) attributed the significant proportion of the decline to a change in marital pattern. Similar conclusions were reached by Smith (1975) and Concepción (1980) in their analysis of independent data sets.

During the second period (after 1970), the decline in fertility accelerated. Total fertility rate (TFR) which was estimated at 5.7 in 1972 declined to 4.8 in 1975 (table 4.1). In her analysis of census data, Concepción (1980) suggested that the declining marital fertility rate was the more important explanation for the decline between 1970 and 1975. Using data from the Republic of the Philippines Fertility Survey 1978, we will decompose the change in TFR between 1972 and 1975 into two sets of contributions: (1) from changes in population composition (specifically marital status and education) and (2) from changes in age-specific fertility rates cross-classified by these same characteristics. The novelty here is the inclusion of education as a contributing factor. Education was chosen as the additional compositional variable since it is the single best predictor of nuptiality and fertility in many contexts and represents the underlying socio-economic changes in a society. Although levels of education have been improving in the country for several decades now and the educational development of women has benefited, table 4.2 shows

Table 4.1 Fertility rates by age and education of ever-married women and all women, 1972 and 1975

Age group	Education															
	No schooling/elementary				High school				College				Total			
	Ever-married women		All women		Ever-married women		All women		Ever-married women		All women		Ever-married women		All women	
	1972	1975	1972	1975	1972	1975	1972	1975	1972	1975	1972	1975	1972	1975	1972	1975
15–19	.449	.424	.093	.084	.231	.445	.024	.040	.352	.329	.018	.007	.380	.415	.053	.050
20–24	.441	.427	.295	.281	.406	.451	.190	.207	.326	.416	.084	.083	.418	.395	.208	.191
25–29	.375	.342	.320	.294	.408	.294	.318	.201	.298	.303	.177	.170	.370	.287	.292	.216
30–34	.318	.284	.286	.264	.304	.237	.249	.182	.218	.334	.167	.183	.302	.247	.262	.217
35–39	.244	.216	.228	.294	.098	.141	.088	.117	.208	.129	.182	.107	.214	.185	.200	.168
40–44	.137	.106	.128	.103	.086	.076	.075	.067	.058	.042	.051	.037	.122	.090	.112	.085
45–49	.021	.035	.019	.034	.000	.009	.000	.008	.000	.009	.000	.008	.017	.028	.016	.026
TFR			6.848	6.315			4.713	4.111			3.390	2.975			5.711	4.761

Source: 1972 rates are calculated using data from the NDS 1973. 1975 rates are from the RPFS 1978

Table 4.2 Proportionate distribution of women by age and marital status (k_{xm}) and by age, marital status and education (k_{xme}), 1973 and 1978

	15–19	20–24	25–29	30–34	35–39	40–44	45–49	Total
1973 k_{xm}								
Ever married	.0856	.4429	.7541	.8649	.9285	.9420	.9328	.5985
Never married	.9144	.5571	.2459	.1351	.0715	.0580	.0672	.4015
1978 k_{xm}								
Ever married	.0767	.4122	.7126	.8691	.9152	.7460	.9545	.5638
Never married	.9233	.5878	.2874	.1309	.0848	.2540	.0455	.4362
1973 k_{xme}								
Ever married								
No schooling/elementary	.6733	.6445	.6577	.7048	.7241	.7396	.8291	.7138
High school	.3032	.2397	.1872	.1753	.1746	.1603	.1135	.1795
College	.0235	.1158	.1551	.1199	.1013	.1001	.0574	.1067
Never married								
No schooling/elementary	.3234	.2794	.2244	.1829	.1582	.1474	.1097	.2385
High school	.3342	.3496	.3824	.3973	.4045	.4125	.4325	.3717
College	.3424	.3710	.3932	.4198	.4373	.4401	.4578	.3898
Total								
No schooling	.4429	.4710	.5869	.6713	.7173	.7252	.8663	.5897
High school	.4403	.2563	.2023	.1894	.1734	.1706	.1132	.2558
College	.1168	.2727	.2108	.1393	.1093	.1042	.0705	.1545
1978 k_{xme}								
Ever married								
No schooling/elementary	.6947	.6427	.5565	.6349	.7038	.6845	.6955	.6493
High school	.2823	.3444	.2524	.1952	.1735	.2204	.1693	.2260
College	.0230	.0129	.1911	.1699	.1227	.0951	.1352	.1247
Never married								
No schooling/elementary	.3240	.2947	.2638	.2103	.1707	.1697	.1667	.2625
High school	.3346	.3373	.3585	.3897	.4035	.3860	.4088	.3589
College	.3414	.3680	.3777	.4000	.4258	.4443	.4245	.3786
Total								
No schooling/elementary	.4254	.4103	.4897	.6045	.6896	.6783	.6838	.5227
High school	.4764	.3220	.2461	.1983	.1770	.2199	.1708	.3010
College	.0982	.2677	.2642	.1972	.1334	.1018	.1454	.1763

that there was still a positive shift in the educational distribution of women in the fertile age range between 1973 and 1978.

The method of decomposition applied here is the technique used by Retherford and Ogawa (1978) in their analysis of the Korean fertility decline for 1966–70. The technique is basically patterned after Kitagawa's (1955) method and involves decomposing a change in TFR into changes in an expanded number of compositional variables and changes in age-specific birth rates. In this paper TFR is considered to be a more appropriate measure of fertility than CBR since age composition over the five-year period under consideration did not change.

A direct application of the above method produces the following equation:

$$\Delta TFR = 5\sum_{x,m} \bar{F}_{xm}\Delta k_{xm} + 5\sum_{x,m,e} \bar{k}_{xm}\bar{F}_{xme}\Delta k_{xme} + 5\sum_{x,m,e} \bar{k}_{xm}\bar{k}_{xme}\Delta F_{xme} \quad (1)$$

where Δ denotes change from the beginning period to the end period

$\bar{F}$ = average value of fertility rate over the period obtained by adding the beginning and end values and dividing by two

$\bar{k}$ = average value of compositional proportion obtained in the same way as $\bar{F}$

k_{xm} = proportion of the x^{th} age group (x to x + 5) with marital status m

k_{xme} = proportion of the $x-m^{th}$ age-marital status group with education e

F_{xm} = age-marital status-specific fertility rate

F_{xme} = age-marital status-education-specific fertility rate.

Thus, the change in TFR is considered as the sum of the contributions of (1) changes in marital composition – the first principal term on the right side of the equation; (2) changes in educational distribution within marital status groups – the second term; and (3) changes in age-marital status-education specific birth rates. Marital status consists of two categories (married and never-married) and education of three (no schooling/elementary, high school and college).

Clearly, the order in which the variables are entered in equation (1) influences the results and the explanatory power of the variables. We will thus try an alternative ordering, with education entered first instead of marital status (as in equation (1)), to examine the degree of interaction between them.

The data used in this section are the National Demographic Survey 1973 and the RPFS 1978. Fertility rates were computed as of the year immediately preceding the survey years.[1] It is therefore necessary to assume that there are no significant educational and marital compositional changes between 1972 and 1973 and also between 1975 and 1978. All births have been assumed as occurring within marriage.

Between 1972 and 1975, TFR declined by almost one point or by 16.5 per cent (5.7–4.8). This is a remarkable change within a three-year period especially considering that pre-1970 declines had been very slow. Similarly, the proportion married among women in the fertile age range between 1973 and 1978 declined from 60 to 56 per cent, with the change occurring mostly among the 15–29 age group (table 4.2). It was also mentioned earlier that there was a positive shift in the educational distribution of these women during the same time period. It is therefore interesting to see how these changes affect fertility rates.

The 1st order decomposition in the first panel of table 4.3 includes only marital status as a compositional variable. Changes in marital composition contributed 25.4 per cent of the decrease in TFR, and changes in age-specific fertility within marital categories contributed 74.6 per cent. This confirms the reversal in the relative importance of the two main sources of fertility reduction during this period.

The 2nd order decomposition introduces education as a second compositional variable after marital status. The inclusion of education splits the 74.6 per cent fertility contribution in the 1st order decomposition into two parts, one due to changes in educational composition within marital categories (4.8 per cent), and a second due to changes in age-specific fertility within marital-education categories (69.8 per cent). Education, one of the strongest determinants of fertility, proves to be only a minor force in the marital

[1] The resulting 1977 rates from the RPFS 1978 data displayed an erratic pattern, thus the 1975 rates were used.

Table 4.3 Percentage decomposition of the change in TFR, 1972–5

A Method 1[a]

Order of decomposition	Marital status	Education	Fertility
1st order	25.4	–	74.6
2nd order	25.4	4.8	69.8

B Method 2[a]

Order of decomposition	Education	Marital status	Fertility
1st order	18.1	–	82.0
2nd order	18.1	10.1	72.0

[a]Method 1 introduces marital status before education, as in equation (1), while method 2 introduces education first.

fertility change, ie improvement in the educational distribution of women during the three-year period was responsible only for a small proportion of the total marital fertility change. Most of the change came from other factors, plausibly from adoption of new family planning behaviour by women whose educational characteristics hardly changed.

In the above decomposition (method 1), the order of entry of variables in the equation did not allow the nuptiality effect to be touched by the educational composition effect. Considering education and marital composition in a reverse sequential order (method 2) will enable us to examine the effect of controls on educational composition on the marital status effect in the decomposition. In panel 2 of table 4.3 the contributions are 18.1 per cent for education and 10.1 per cent for marital status. This result emphasizes the strong association between education and age at marriage and that a substantial portion (about half) of the marital status effect is explained away by changes in educational distribution among women. Net of education effects, marital composition still contributes 10 per cent to the countrywide fertility decline.

Another way of approximating the contribution of postponed marriages to the overall decline in fertility is to compare the contribution to the overall decline of the fertility rates of young women (aged less than 25) to the contribution of the changes in the fertility rates of older women. This is presuming that most of the decline among the young women is due to delayed marriages and most of the decline among the older women is due in turn to the use of contraception. We shall use change in the total fertility rate (TFR) as the measure of the overall fertility decline.

To show fertility changes over the last two decades, figure 4.1 presents fertility silhouettes for 1960, 1970 and 1975 highlighting the relative impact of the contributions of various age groups of women to the decline for the periods 1960–70 and 1970–5. There was a greater constriction of fertility among the younger women during the pre-programme years than after 1970. Nevertheless, they still showed discernible decline in birth rates during that period. On the other hand, the proportion of the decline among the older women seemed to have picked up after 1970.

To gauge the quantitative contributions of these groups of women, the percentages of decline in TFR attributable to various age groups for roughly the same time periods are given in table 4.4. The data show fewer early births during the 1965–75 period, whether due to marriage delay or to contraception, and these have had differing impacts on fertility trends. During the 1965–70 interval, half of the overall decline in fertility rates occurred among women aged 15–24. In the later period, 1970–5, 19 per cent of the decline was attributed to the same group of women and the larger proportion, 81 per cent, to the older women. However, in spite of the decrease in the percentage contribution of declines at the younger ages, their absolute contribution to the decline in TFR remained the same (0.2 TFR points in both periods). Thus the importance of delay in age at marriage only became less significant as a result of accelerated changes in the fertility behaviour of older women. The latter phenomenon is displayed by the remarkable proportion (62 per cent) of the decline in the period 1970–5 applicable to

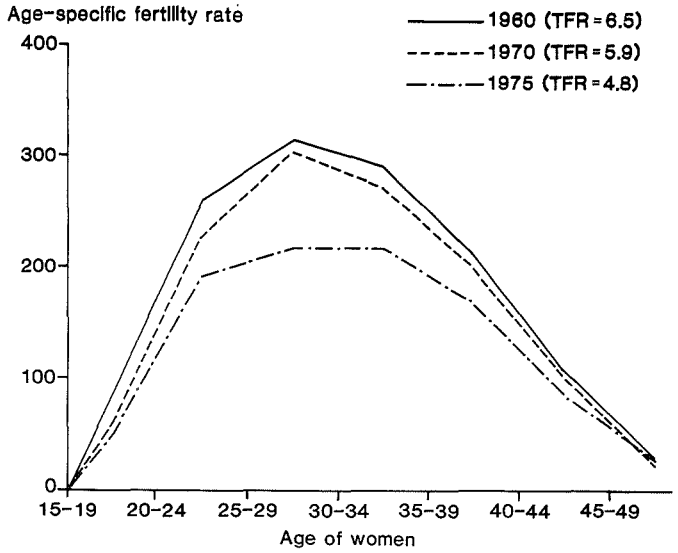

Figure 4.1 Age-specific fertility rates and total fertility rates, 1960, 1970 and 1975

women aged 25–34, despite the acceleration of the increase in age at marriage during the same time. This behaviour of the 25–34 age group is worth noting since their increasingly short marital durations and their ages can work against attainment of low fertility.

4.4 AGE AT MARRIAGE AND CUMULATIVE FERTILITY: A MULTIVARIATE ANALYSIS

This section focuses on the impact of age at marriage on cumulative fertility at the individual level.

The RPFS 1978 was the exclusive source of data for this section. Since we are relating age at marriage (a single occurrence variable) with cumulative fertility, the childbearing experience should be free from interruptions such as marital dissolutions. To control for this effect, we are limiting the analysis to continuously married women. Also, because the RPFS 1978 data are based on cross-sectional information, one cannot therefore make a complete analysis of age at marriage due to censoring problems. This is especially true among the young age groups for whom the date of marriage and the ultimate proportion marrying cannot be determined prospectively. We will thus concentrate on the women who married before 25 years of age and were at least 25 years old at the time of the survey.

Our choice of technique of multivariate analysis has been limited mainly by the nature of the data under consideration. The predictors of cumulative fertility considered are: age at marriage (under 15, 15–17, 18–19, 20–21, and 22–24); education (no schooling, elementary, high school and college); place of childhood residence (town and

Table 4.4 Contributions to declines in fertility of various age groups, 1965–75

Period	TFR	Decline in TFR	Percentage decline attributable to age groups of women				
			15–19	20–24	25–34	35–49	All ages
1965–70	6.3–5.9	0.4	22	33	25	20	100
1970–75	5.9–4.8	1.1	3	16	62	19	100
1965–75	6.3–4.8	1.5	8	20	53	19	100

Sources: For age-specific fertility rates: 1965 and 1970, Cabigon (1980); 1975, new calculations from RPFS 1978

Table 4.5 Mean number of children ever born for various groups of continuously-married women[a] (adjusted for the effects of other independent variables and current age) RPFS 1978

Predictors	Children ever born					
	Age groups					
	25–49		25–29		30–49	
Age at first marriage						
Under 15	7.08	(303)	4.83	(48)	7.83	(255)
15–17	6.51	(1567)	4.10	(402)	7.38	(1166)
18–19	5.72	(1551)	3.55	(406)	6.47	(1146)
20–21	5.06	(1277)	2.61	(348)	5.91	(929)
22–24	4.18	(1257)	1.75	(335)	5.02	(922)
Work since marriage						
No work	5.68	(4289)	3.27	(978)	6.53	(3312)
Traditional	5.57	(724)	3.02	(209)	6.44	(515)
Modern	5.32	(942)	3.01	(352)	6.11	(590)
Education						
No schooling	5.36	(366)	2.55	(39)	6.47	(327)
Elementary	5.76	(3820)	3.26	(883)	6.78	(2937)
High school	5.22	(1179)	3.04	(386)	6.20	(793)
College	4.95	(592)	2.88	(232)	5.85	(360)
Place of childhood residence						
Town	5.47	(1600)	3.11	(437)	6.29	(1164)
Rural	5.55	(4356)	3.14	(1102)	6.39	(3254)
Overall mean	5.53		3.13		6.37	
N		(5957)		(1539)		(4418)

[a] Figures inside parentheses are number of cases.

rural); and work since marriage (no work, worked in the traditional sector and worked in the modern sector). In the multiple classification analysis[2] performed, the effects of the above predictors have also been controlled for the influence of current age. In earlier analyses of the same data, these background variables have been found to exercise independent influences on fertility (*RPFS 1978. First Report* 1979; de Guzman 1981). In interpreting the influence of age at marriage on fertility we should therefore take account of these factors.

Table 4.5 confirms the strong negative influence of age at marriage on cumulative fertility. Those who married very young (under 15) have an average of 7.1 live births while those who married at ages 22–24 have only 4.2. There is thus a difference of three children by age at marriage even after statistically adjusting for the effect of other variables. This relationship holds for both the younger (25–29) and the older women (30 and over). Interestingly, education comes a poor second to age at marriage as predictor of cumulative fertility. There is less than one child difference between the elementary-educated and the college-educated women. In a separate analysis (not shown here), the unadjusted effect of education is comparable to that of age at marriage, both of which realized a differential of approximately three children between the lowest- and the highest-status groups. As the other background variables are introduced into the regression equation, the influence of education weakens considerably. Work status since marriage

[2] Multiple regression analysis with dummy variables.

has a fairly minimal impact on cumulative fertility. The place of orientation or a woman's childhood place of residence is a weak predictor of fertility, especially when other background variables are considered.

As noted above, to cope with the censoring problems created by the fact that many women under age 25 have not yet married, we limited the analysis to women aged 25 and over. But as marriage is unusually late in the Philippines, one might contend that 25 is not old enough. This portion of the analysis provides a simple test of this contention. Thus table 4.5 presents separate results for 25–49, 25–29 and 30–49 age groups. The fertility behaviour of the youngest age group, 25–29, does not differ significantly from the behaviour displayed by the rest of the women (at least with regard to the determinants considered in the present analysis). Therefore they do not seem to be a selective portion of the 25–49 cohort.

4.5 SUMMARY AND CONCLUSIONS

The role of nuptiality in influencing fertility variations both across time periods and within cohorts has been examined in this chapter. The decomposition analysis of fertility variations across periods confirms the increased role of the marital fertility effect in the early 1970s, independent of compositional changes in nuptiality and education. Nonetheless, the absolute contribution of nuptiality in the overall fertility change remains stable. It remains true, however, that in the cohort examined age at marriage is still a primary determinant of completed family size and is a basic variable discriminating between the fertility experience of different women. When pitted against education (often cited as the strongest determinant of fertility in the Philippines), its relative importance emerges all the more clearly.

The above findings, though preliminary, suggest that delaying marriage could still be an important component of fertility decline, in addition to more direct measures like contraception. Effecting a nuptiality change does not seem to have to rely solely on coercive regulations but can be an offshoot of positive changes like further improvement in education among women and providing meaningful alternatives for them. While the limitations put forward with regard to the potential of changes in nuptiality in further reducing fertility are valid, because overall women marry late, there are still a substantial number of women who marry at their reproductive peak. Family planning efforts have their limitations too; there may, for example, be fewer new acceptors when there are no further declines in desired family size, which seems to have stabilized at four children.

Finding effective ways to maintain and possibly accelerate the reduction in the fertility level remains a basic issue in the planning of social and economic development. In the past, focus has been mainly on increasing the acceptance of various forms of contraception. However, as the interrelationship of population growth and economic and social development has now become increasingly appreciated by policy-makers, the influences of various social, economic and demographic factors are now recognized. Within the confines of this paper we have demonstrated that nuptiality can be one of the 'other' factors that can contribute significantly to attaining the target fertility level at the turn of the next century.

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5 The Timing and Spacing of Births: The Philippines Case

Josefina Valera-Cabigon

5.1 INTRODUCTION

Any declining trend in fertility is the result of a reduction in ultimate family size and changes in the timing and spacing of births. Components of these latter changes include changes in the age at first marriage, the interval between marriage and first birth, and the subsequent birth intervals. Each of these represent stages in the family building or fertility process.

These sequences of events in the childbearing process offer venues for a more comprehensive understanding of the dynamics of fertility transitions. Viewing fertility as a sequence of events rather than a single outcome, such as children ever born, enables us to understand it more fully.

To date, there has been no attempt in studies of Philippine fertility to untangle the two interrelated components of the fertility process which are:

1 The proportion of women at each parity who eventually move to the next highest parity, or the parity progression ratio, which is related to the *quantity* or *quantum* of fertility; and
2 The time it takes to make the transition from one parity to the next for those women who continue reproduction, or the distribution of birth intervals, which is related to *timing* or *tempo* of fertility (Rodríguez and Hobcraft 1980; Ryder 1980).

Furthermore, there are indications that fertility in the country is on the decline, the major causes of which have been the increasing proportion remaining single and rising age at marriage in the late 1960s and decreasing marital fertility in the 1970s (Cabigon 1980a; Concepción 1980; Flieger 1975; NCSO, UPPI, POPCOM, NEDA 1979; Smith 1971). The declining marital fertility in the 1970s must be the result of changes in either or both the *quantum* and *tempo* of births.

With rich data available from the Republic of the Philippines Fertility Survey 1978 (RPFS) that enable one to analyse birth intervals in greater depth, this paper attempts to provide some insights on the above-mentioned issues. It primarily aims at attaining the following objectives:

1 To unravel the quantum and tempo of fertility;
2 To investigate the effect of age, cohort and calendar period on the quantum and tempo of fertility; and
3 To demonstrate the effect of quantity and timing of births on fertility levels.

5.2 LIFE-TABLE METHODOLOGY

In any analysis of birth spacing based on fertility surveys where most information pertains to incomplete fertility experience of women still engaged in reproduction at the time of interview, life-table techniques serve as very useful tools. Such methods have been primarily utilized in mortality analysis in which the major interest is survival probabilities. Correspondingly, in child-spacing analysis the main concern is the probability of women having their first birth after marriage, then, after having their first birth, their probability of having the next birth, and so on.

Rodríguez and Hobcraft (1980) have clearly illustrated the two major problems encountered in the analysis of the sequences of events in the fertility process which result from the incomplete nature of the data. One is *selectivity* which refers to the fact that the transition from parity i to i + 1 can only be studied for women who have reached parity i or more at survey date, who tend to be selected on a number of characteristics and are not representative of the total population. For instance, the transition from parity 2 to 3 can only be studied for women who have two or more

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 61–76. Voorburg, Netherlands: International Statistical Institute.

children at time of interview. The other is *censoring* which refers to the fact that some of the women who have reached parity i at the time of survey have not yet reached parity i + 1. Such women may either remain at parity i or proceed to i + 1. In other words, censoring is essentially curtailment of exposure to having the first birth, next birth, etc by the interview date, thus causing problems in estimating the parity progression ratio and the length of the birth interval.

However, as clearly stated by Rodríguez and Hobcraft (1980), these two problems can be appropriately handled. Censoring can be handled by using life-table techniques and selectivity by constructing separate life tables for women reaching each parity at various ages at time of interview, at ages at the start of the interval and at periods at the start of the interval.

Hence, in this paper the life-table approach utilized by Rodríguez and Hobcraft (1980) in their illustrative life-table analysis of birth intervals in Colombia was followed. Life tables were calculated using the procedure SURVIVAL of the SPSS software package which yields the life-table functions needed in the analysis (see Rodríguez and Hobcraft (1980) for a discussion of the series of steps in the calculation of the life table).

The following three life-table survival functions are calculated:

1 Cumulative survival rate (the proportion of all cases surviving to the end of each interval) or in life-table parlance 1_x;
2 The probability density function (the probability per unit time of dying within a given interval); and
3 The hazard function (the probability per unit time that an individual who has survived to the beginning of an interval will die in that interval).

For the present research, the most relevant function is 1_x calculated using duration in single months from 0 to 72. In birth interval data, this parameter means the probability of remaining childless or at the same parity, which is analogous to 'survival' in mortality analysis. But the main interest in the childspacing analysis is the probability of having given birth, which is simply the complement of 1_x. In formula form, it is

$$B_x = 1 - 1_x \qquad (1)$$

When durations in months are derived from the dates given in calendar month and year (or in century month form), the actual width of the first category of duration is $n - \frac{1}{2}$ rather than n months (Smith 1980; Rodríguez and Hobcraft 1980). To allow for this, B_x was adjusted by simple linear interpolation by the formula:

$$B_x^* = (B_x + B_{x+1})/2 \qquad (2)$$

since B_x values are in single months.

Life tables were produced for each birth interval from the first to the ninth (first interval, second interval, . . . ninth interval) without controls and controlling for period at the start of the interval (calendar period), age at time of survey (cohort) and age at the start of the interval (relative age). Such controls are useful in shedding some light as to the three objectives. For instance, life tables by birth interval and calendar period provide some trends in the quantum and tempo of fertility over time. Life tables by birth interval and cohort yield some insights as to which cohorts tend to have shorter birth intervals. That is, if the younger cohorts on the average show longer birth intervals than the older cohorts, then the decline of fertility in the recent past would be further confirmed. Life tables run separately by controlling for *relative age* are important in handling the selectivity problem caused by the incomplete nature of the cross-sectional data under consideration. For example, if we find that the younger the age at the beginning of the interval, the shorter the subsequent intervals and, furthermore, that this pattern increases with parity, then selectivity would be a serious source of bias in the analysis of cohort differences. Hence, relative age would be necessary as a control.

To convey the results of the life tables in bulk without losing their values, the summary measures utilized by Rodríguez and Hobcraft (1980) are adopted. From the B_x^* values the following summary indicators are calculated:

1 B_{60} — the *quintum* — an indicator of the quantum (Q) of fertility, or the proportion of women at each parity who eventually move to the next highest parity;
2 Trimean (T) as a summary of the tempo or timing of fertility, which is the distribution of birth intervals;
3 Spread (S) as a measure of dispersion; and
4 B_6 for the first interval life table as a measure of pre-marital conceptions.

B_{60} for each interval and B_6 for the first interval are simply the B_x^* values at 60 months and six months duration respectively. T and S required standardization of B_x^* to make $B_{60} = 1$, in order to obtain proportions of women having a subsequent birth by single months of duration among women who have another child within five years (Rodríguez and Hobcraft 1980). The following are the steps involved in their derivation:

1 Locate the position of the first, second, and third quartiles of B_{60} (the duration at which 25, 50 and 75 per cent of those women having a subsequent birth within five years have closed the interval);
2 Calculate the standardized quartiles, q_1, q_2 and q_3, by linear interpolation between the durations identified in Step 1;
3 $S = q_3 - q_1$; and
4 $T = (q_1 + 2q_2 + q_3)/4$, which is Tukey's (1977) trimean.

5.3 FINDINGS

To reduce the volume of figures to deal with here, birth functions in selected durations and the summary measures, B_{60} or Q, T and S are shown. (The complete results of the life-table analysis in single month durations are available on request.)

Figure 5.1 and table 5.1 present selected summary indicators for each of the birth intervals (first interval, second interval, . . . ninth interval) for the total sample. A close examination of the figure and table reveals that the proportion of women having a subsequent birth by each duration, particularly from duration of one to six years, decreased with parity. For instance, the quintum (Q), the proportion of women having a subsequent birth within five years, ranged from 95 per cent for first birth to just above 80 per cent for seventh and eighth births. The average birth interval measured by the trimean (T) increased with parity up to the fifth then stabilized

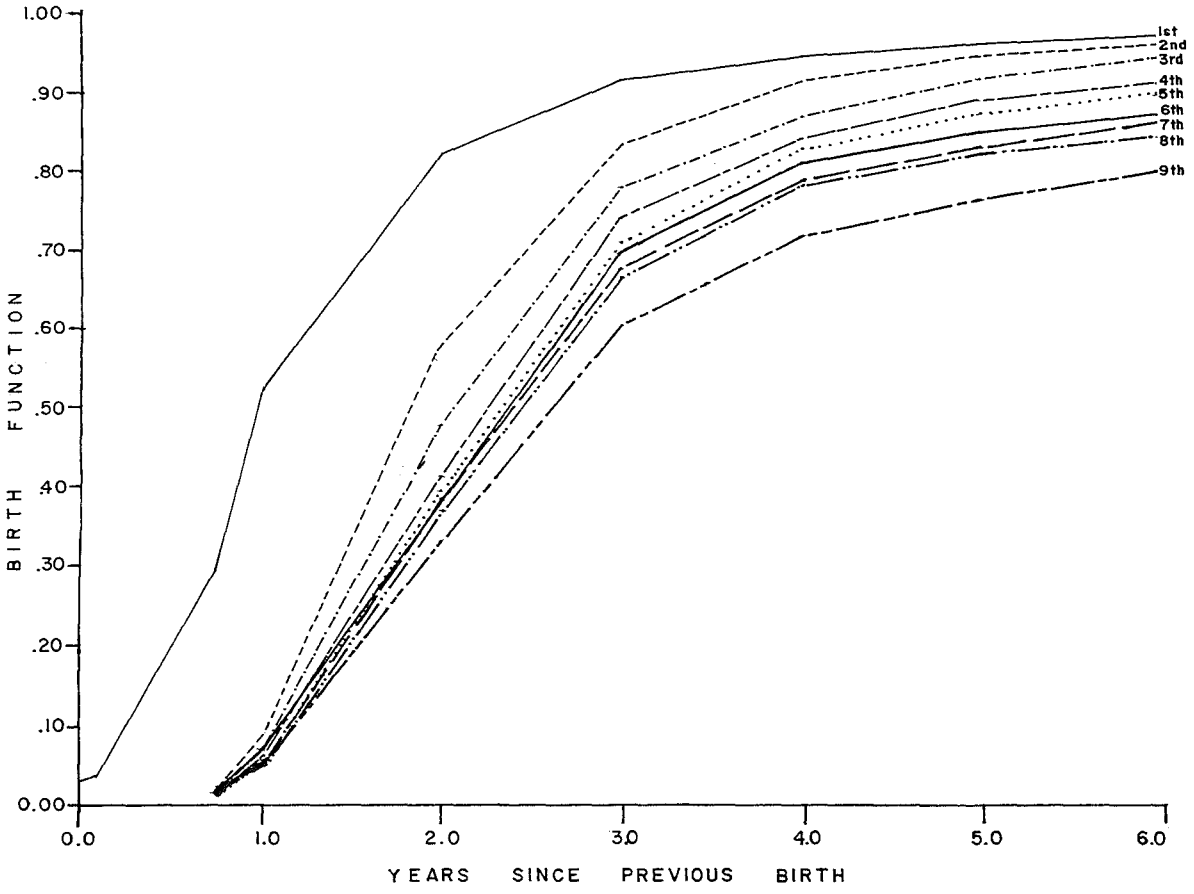


Figure 5.1 Life-table birth function by birth order

Table 5.1 Summary measures for birth intervals

Summary measure	Birth interval								
	1	2	3	4	5	6	7	8	9
B_7	.1075	.0074	.0076	.0075	.0071	.0072	.0060	.0044	.0024
B_9	.2973	.0203	.0190	.0170	.0144	.0211	.0150	.0142	.0129
B_{12}	.5245	.0910	.0695	.0604	.0554	.0658	.0599	.0543	.0581
B_{18}	.6989	.3249	.2245	.1975	.1756	.1867	.1905	.1826	.1634
B_{24}	.8200	.5859	.4760	.4140	.3952	.3801	.3839	.3716	.3316
B_{30}	.8792	.7471	.6714	.6192	.5944	.5673	.5676	.5554	.5219
B_{36}	.9117	.8353	.7767	.7381	.7067	.6923	.6734	.6698	.6070
B_{48}	.9408	.9121	.8682	.8380	.8248	.8063	.7838	.7763	.7110
B_{60} or quintum (Q)	.9553	.9411	.9117	.8830	.8693	.8446	.8288	.8182	.7590
B_{72}	.9636	.9547	.9340	.9077	.8910	.8649	.8540	.8369	.7943
Trimean (T)	12.43	21.67	23.94	24.85	25.51	25.48	25.21	25.36	25.84
Spread (S)	10.33	12.03	12.46	12.29	13.04	13.86	14.00	13.79	13.61
N of cases	9268	9035	8527	7903	7269	6703	6238	5819	5488

thereafter. It was slightly above one year for first births and more than two years for fourth order births and over. The spread was just under one year for first births and slightly over one year for higher order births.

The above features indicate that first birth intervals are shorter than other intervals. Parity substantially affects the probability of having a subsequent birth and, to a lesser extent, the timing of the next birth (among women who have another child within five years).

As can be seen from table 5.1 and from table 5.2 below, around 11 per cent of the total ever-married women had their first births seven months after marriage (B_7). The corresponding value nine months after marriage (B_9) dramatically increased to about 30 per cent. With this sudden increase of women having their first births nine months after marriage, it may not be correct to adopt B_9 as an indicator of the level of pre-marital conceptions for the Philippine setting as was done by Rodríguez and Hobcraft (1980) in their analysis of Colombian birth interval data. The dramatic rise in the proportion at nine months clearly indicates that most of these women conceived their first births within marriage, perhaps right after their honeymoon days. What then would be chosen as a plausible estimate of pre-marital conceptions in the Philippine case?

B_6 and B_7 are the most likely candidates. If we take B_7, then the level of pre-marital conceptions is estimated at 11 per cent. If a substantial proportion of women in the Philippines had premature births of seven months, then B_7 would not be a reasonable estimate, since such births could have been conceived within marriage. Some in the medical profession claim that a substantial number of Filipino women experience premature first births, especially at young ages. If such is the case, B_6 would be taken as an estimate of the level of pre-marital conception in the Philippines: the level of pre-marital conceptions for the nation as a whole was about 8 per cent.

It should be stressed that these estimates depend on very accurate retrospective dating of both marriage and first birth. If either are incorrectly dated by only a month or two on average, our estimate of the level of pre-marital conceptions will be seriously affected.

We now turn to an examination of selected birth intervals controlling for age (table 5.3). It must be reiterated that age in the present context refers to the age of the woman at the start of the interval. We categorize age by the quartiles of the distribution of age at the beginning of the interval for the whole sample (see table 5.3 for these quartiles). Looking more closely at this table, it appears that the quintum for the first interval was on the order of 95 per cent for all quartiles, suggesting that age at first marriage has no effect on the proportion of women who have their first child by the end of the fifth year following marriage. However, age at marriage substantially affects the timing of the first birth, as shown by the trimean decreasing from about 14 for those marrying under the age of 17 to 11 for those entering the married life after the 23rd birthday. In addition to affecting the length of the first interval, age at marriage is associated with the proportion of women conceiving their first birth before living together or formal marriage. This proportion ranged from around 5 per cent for early marriage entrants to about 10 per cent for late marriage entrants. Under such conditions, the date of first marriage or living together as an indicator of the start of exposure to the risk of child-bearing is somewhat weakened and its effect on the timing of the first birth can not be clearly stated.

For higher birth intervals such as those from third to fourth birth and from sixth to seventh birth, relative age seems to affect the quintum and this is shown by the declining proportion having a subsequent birth (94 per cent for women starting the fourth interval at early age to only 74 per cent for women who start the fourth interval after their 29th birthday). The corresponding proportions for the seventh interval are 92 and 60 per cent, respectively. The relatively increasing pattern of the trimean with age at the start of the interval for the fourth and seventh intervals suggests that

Table 5.2 Birth functions in various months, first interval

Durations in months (X)	B_x^*
1	.0353
2	.0397
3	.0448
4	.0526
5	.0630
6	.0777
7	.1075
8	.1859
9	.2973

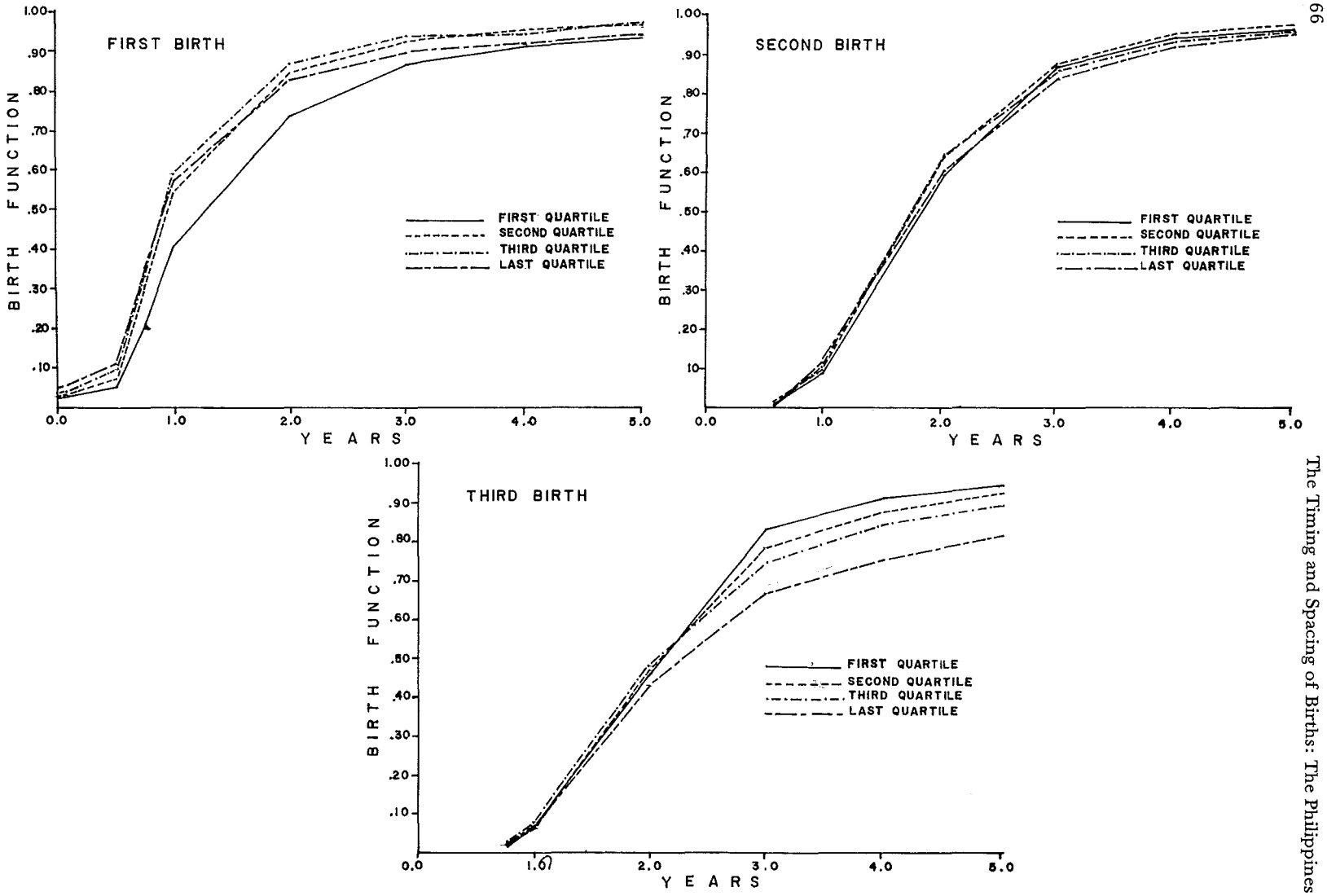
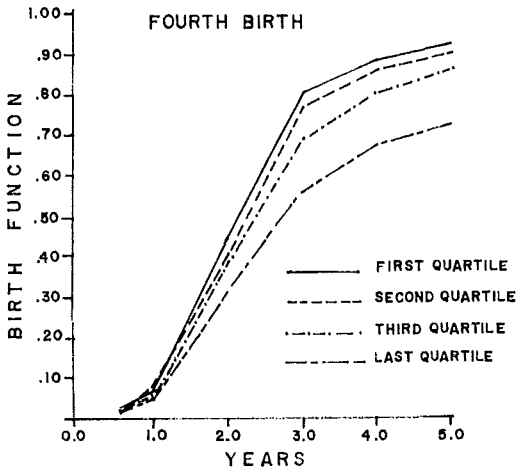
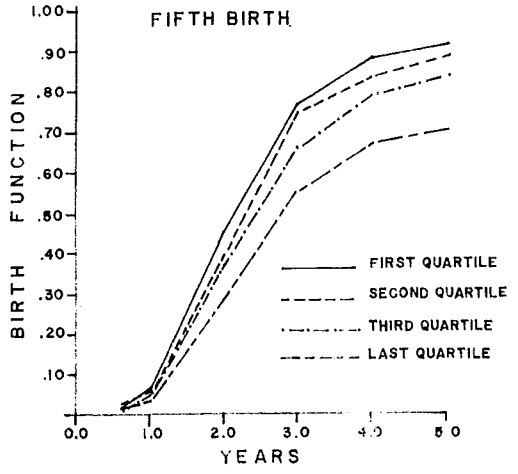
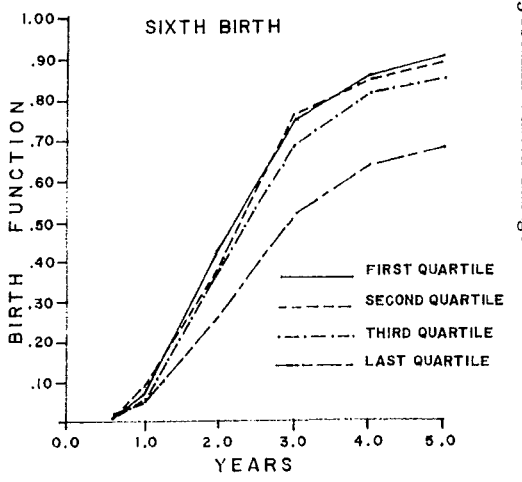
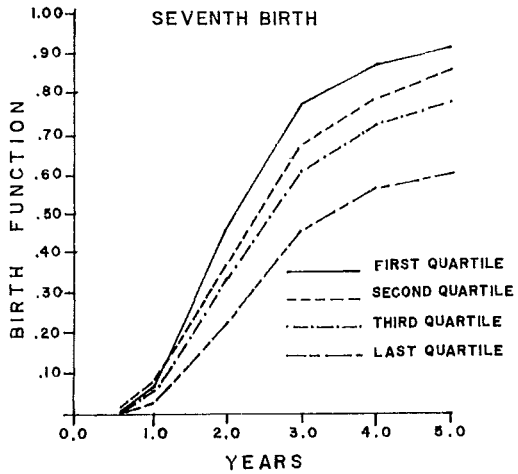


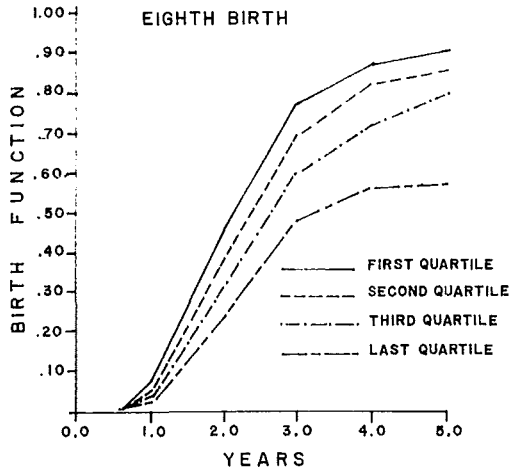
Figure 5.2 Life-tables by birth interval and age at start of interval











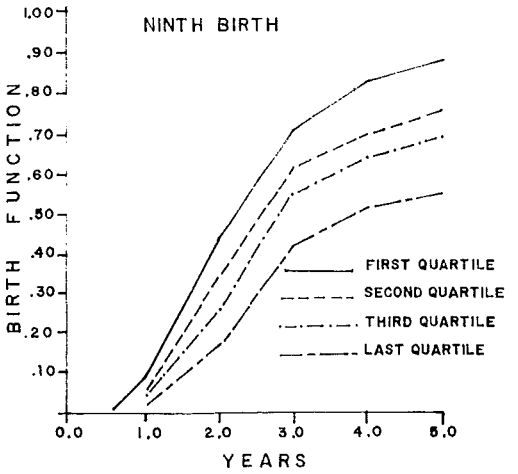


Figure 5.2 (*cont*)

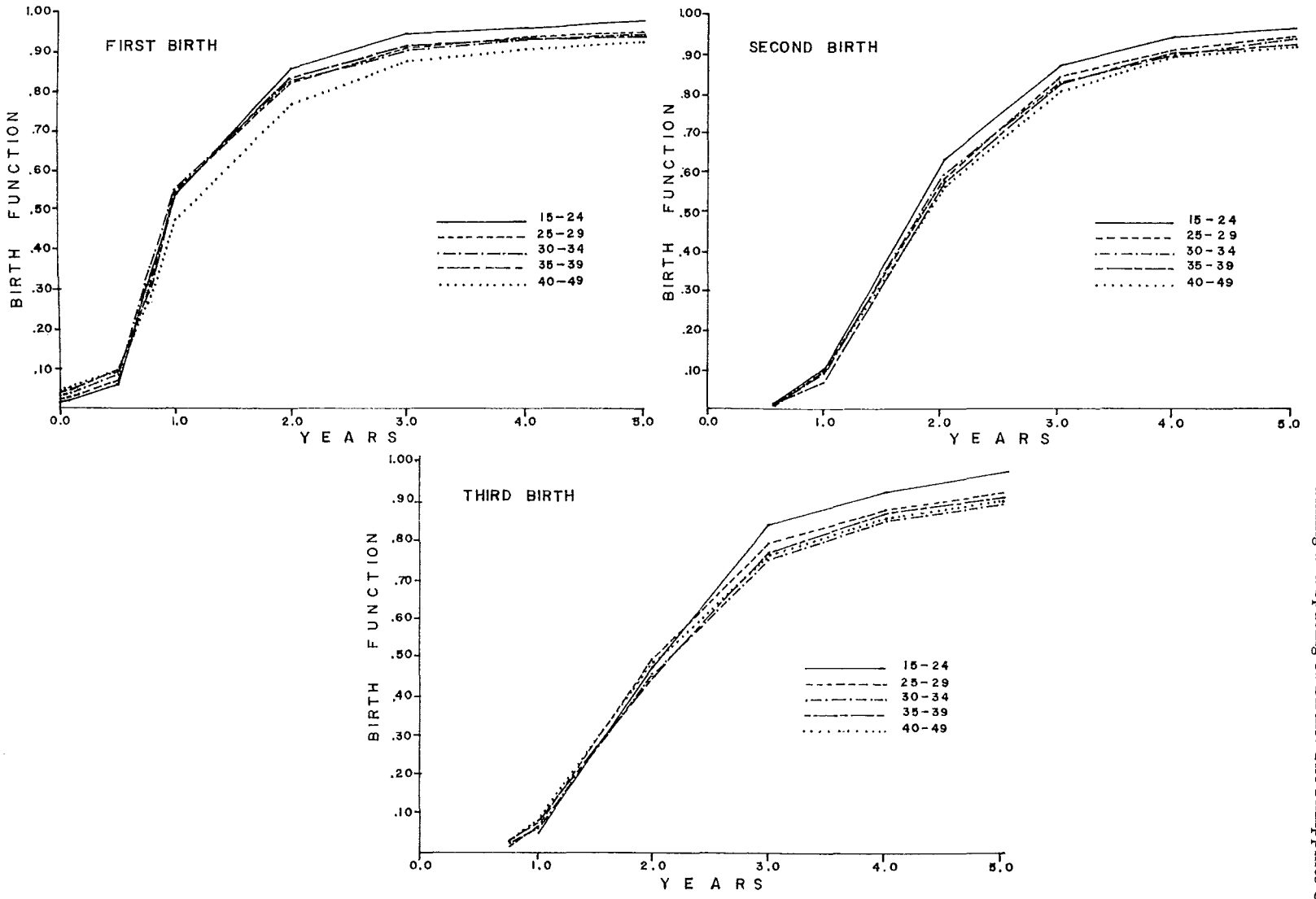
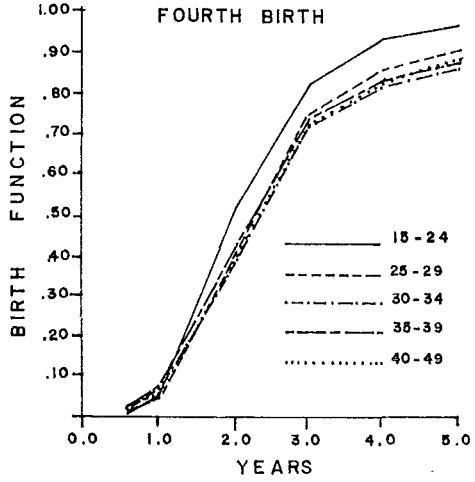
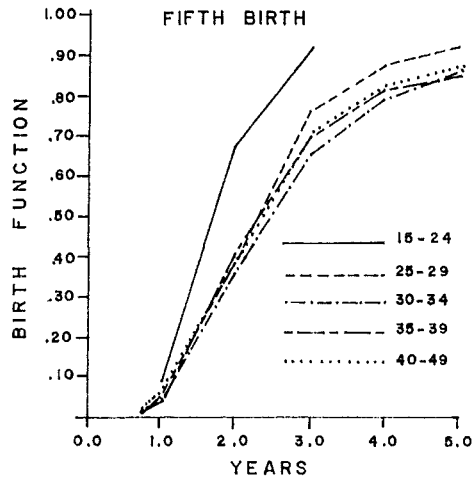
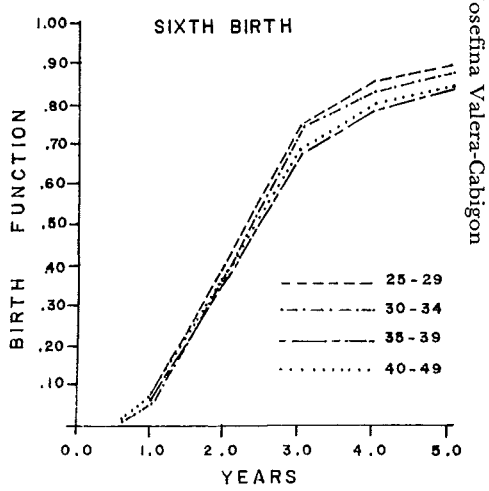
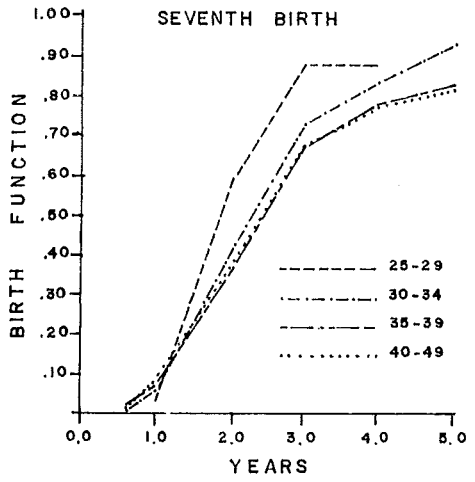


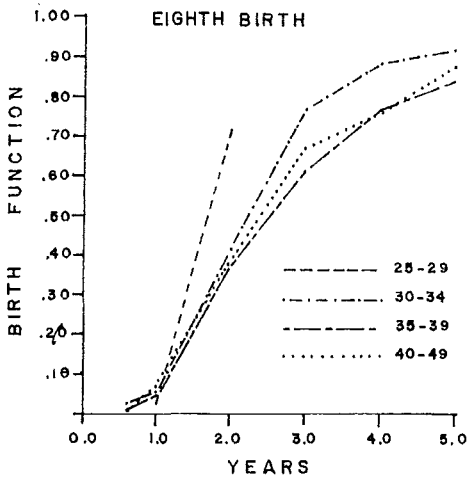
Figure 5.3 Life-tables by birth interval and cohort











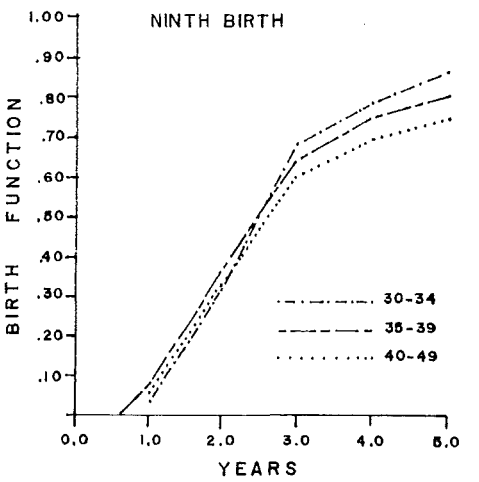


Figure 5.3 *(cont)*

Table 5.3 Summary measures for selected birth intervals by interval and age at start of interval

Birth interval	Summary measures	Age at start of interval			
		First quartile	Second quartile	Third quartile	Last quartile
First	Ages	10–17	18–19	20–22	23 +
	B_6	.0546	.0696	.0910	.1046
	Q	.9408	.9695	.9709	.9439
	T	14.43	12.40	11.37	11.35
Second	Ages	11–19	20–21	22–24	25 +
	Q	.9693	.9746	.9661	.9625
	T	21.98	21.28	20.77	20.96
Fourth	Ages	15–23	24–25	26–28	29 +
	Q	.9377	.9008	.8710	.7374
	T	24.49	24.88	25.22	26.34
Seventh	Ages	19–29	30–31	32–34	35 +
	Q	.9157	.8612	.7859	.6012
	T	24.04	25.73	26.19	26.60

relative age also has an effect on the timing of the next birth and this effect increases with parity. Such observations show that, as in Colombia (Rodríguez and Hobcraft 1980), relative age does not account for all the effect of parity on subsequent fertility; both variables need to be taken into account.

The above findings are substantiated when we examine the life-table results shown in figure 5.2. We find no clear trend of the effect of age at the start of the interval on the quantum and tempo of the first two intervals. But as we move to higher intervals, from the third to the ninth, evidence of substantial effects of relative age and parity on the quantum and tempo of fertility becomes very clear.

We consider now the effect of cohort or age at time of survey on both the quantum and tempo of fertility. Figure 5.3 presents life-table results for each of the nine intervals. Examining figure 5.3, it appears that no clear pattern of differentials exists among cohorts in the quintum, the proportion of women at each parity who eventually move to the next highest parity. Slight differences are observed at the higher intervals, eg the fourth, fifth, seventh and eighth, but such differences may not be significant. For the fourth interval, the youngest cohort appears to display a larger proportion progressing from the third to the fourth birth within five years (about 98 per cent) and a shorter interval than the other cohorts. This difference, however, is a spurious result of selectivity. The youngest cohort is selected for a relatively young age at third birth, and we have just seen that women who have their third birth relatively early (table 5.3) are more likely to have a fourth child and tend to have a shorter interval. If we disregard the youngest cohort, small differences are observed among the other cohorts. It does appear that women in their peak childbearing ages (25–29 years) who married at ages 15–23 and 24–25 years have a slightly smaller proportion (about 92 and 87 per cent, respectively) moving from the third to fourth birth within five years and a slightly longer interval (around 26 months) than the older cohorts. This may imply that a recent change in fertility among these peak childbearers has been initiated.

The effect of selectivity in attenuating differences across cohorts also appears for the seventh interval. The youngest cohort (aged 25–29 years) manifested the shortest interval (21) among those women having their seventh child at an early age.

Considering again the interval from marriage to first birth (table 5.4), we notice that among those marrying at the extreme ages – ages 10–17 and ages 23 and over – the oldest cohort showed

Table 5.4 Summary measures for selected birth intervals by interval, relative age and cohort

Birth interval/relative age/summary measures	Cohort				
	15–24	25–29	30–34	35–39	40–49
A First birth interval					
10–17					
B_6	.0434	.0417	.0537	.0568	.0750
Q	.9730	.9438	.9278	.9507	.9133
T	13.57	13.77	14.21	14.62	16.01
18–19					
B_6	.0621	.0744	.0636	.0897	.0632
Q	.9949	.9817	.9772	.9502	.9466
T	11.86	11.36	11.99	11.50	13.60
20–22					
B_6	.0980	.0765	.0866	.1106	.0907
Q	.9852	.9586	.9777	.9800	.9605
T	9.66	11.84	11.38	11.43	11.92
23 +					
B_6	.0797	.0681	.1197	.1059	.1137
Q	.9861	.9511	.9529	.9372	.9339
T	12.20	11.32	11.11	10.82	11.88
B Fourth birth interval					
15–23					
Q	.9745	.9182	.9381	.9318	.9505
T	23.14	25.57	24.13	24.19	24.74
24–25					
Q	–	.8719	.8658	.9135	.9269
T	–	25.67	24.26	24.10	25.02
26–28					
Q	–	.8067	.7611	.8828	.9125
T	–	23.28	26.55	24.30	25.91
29 +					
Q	–	–	.8071	.7239	.7327
T	–	–	28.74	24.93	26.57
C Seventh interval					
19–29					
Q	–	.8738	.9209	.8876	.9320
T	–	21.23	25.95	24.18	23.66
30–31					
Q	–	–	.9065	.7964	.8959
T	–	–	30.00	25.32	24.47
32–34					
Q	–	–	–	.7755	.7923
T	–	–	–	26.63	25.82
35 +					
Q	–	–	–	–	.6024
T	–	–	–	–	26.70

Table 5.5 Summary measures for selected birth intervals by interval and relative age and calendar period

Birth interval/relative age/summary measures	Calendar period				
	1957	1958–62	1963–7	1968–72	1973+
A First birth interval					
10–17					
B_6	.0707	.0506	.0353	.0431	.0540
Q	.9225	.9161	.9489	.9640	.9908
T	15.52	14.66	13.99	14.05	12.71
18–19					
B_6	.0757	.0680	.0677	.0741	.0591
Q	.9466	.9591	.9751	.9834	.9883
T	13.58	11.33	12.10	11.59	11.48
20–22					
B_6	.0869	.1006	.0958	.0667	.1092
Q	.9561	.9750	.9818	.9680	.9752
T	11.89	11.53	11.73	11.80	10.17
23+					
B_6	.1392	.1062	.0955	.1101	.0934
Q	.9561	.9474	.9531	.9275	.9442
T	11.76	12.19	11.18	10.92	11.18
B Fourth birth interval					
15–23					
Q	.9467	.9512	.9258	.9248	.9540
T	24.66	24.85	24.09	23.83	25.41
24–25					
Q	.9303	.9171	.9178	.8786	.8546
T	25.21	25.26	24.12	24.13	26.14
26–28					
Q	.9256	.9097	.9021	.8064	.8468
T	25.29	26.38	24.85	24.86	26.63
29+					
Q	–	.8467	.7613	.6896	.7013
T	–	27.61	24.39	25.08	28.19
C Seventh interval					
19–29					
Q	.9249	.9313	.9301	.8870	.9533
T	23.27	23.92	23.87	24.80	24.77
30–31					
Q	–	.8746	.9481	.8060	.8928
T	–	27.40	25.54	24.30	30.60
32–34					
Q	–	.8150	.8282	.7404	.7954
T	–	25.02	26.29	27.49	25.38
35+					
Q	–	–	.7945	.5706	.5509
T	–	–	25.53	25.30	28.45

higher proportions of pre-marital conceptions than the other cohorts. At other ages of entry into marriage, no consistent pattern of cohort differentials emerges.

In sum, we find slight cohort differences in the quantum and tempo of fertility once we control for relative age and the associated selectivity problems.

We now turn to trends over time using life tables calculated separately by birth interval and calendar period when the interval was initiated. Calendar periods were classified into five categories: before 1957, 1958–62, 1963–7, 1968–72 and 1973 to interview. Life-table results are portrayed in figure 5.4. We observe in figure 5.4 no trends over time in the first three intervals. A trend seems to emerge in the transition from third to fourth birth and becomes clearer at the higher intervals, a pattern indicative of fertility decline. Controlling for relative age does not substantially alter this pattern (table 5.5) contrary to the analysis of cohort effects.

The pattern of substantial effects of calendar period on the quantum and tempo of fertility is shown in the decline over time in the proportion of women who moved from parity 3 to 4 and from 6 to 7 within five years at any age at start of the interval. This pattern does not hold for the most recent period (1973+), but there is a consistent pattern of a sudden lengthening of the average birth intervals for this period. Such observations suggest that fertility in the Philippines had indeed started to decline in the 1970s.

Examining the trend over time of pre-marital conception (table 5.5, First birth interval panel) we discern no clear trend.

5.4 SUMMARY AND IMPLICATIONS

Using life-table techniques, the childbearing process has been analysed as a sequence of events starting from date of marriage to the higher order births. The birth function, which is defined as the cumulative proportion of women having a birth of a certain order by successive durations since the previous event (marriage or birth), has been utilized as the basic measure in the analysis. From this measure, two summary indicators of the quantum and tempo of fertility have been derived: the *quintum* or proportion having a subsequent birth within five years of the previous event, and the *trimean* or the average birth interval for women who have a subsequent birth within five years.

From the above analysis, the fertility decline in the Philippines in the 1970s has been identified. There is also an indication of a recent change in the fertility behaviour of Filipino women in peak childbearing ages. The challenge offered to those responsible for the national family planning and welfare programme is to concentrate on efforts that would hasten the decline and promote changes in fertility behaviour among such women.

The analysis also reveals that first birth intervals are shorter than all other intervals. We observe a significant effect of age at first marriage on the timing of the first birth but no effect on the proportion of women who have their first child by the end of the fifth year following marriage. Assessing the effect of age at first marriage on the timing of the first birth is confounded by the existence of pre-marital conceptions. For example, late marriage entrants appear to show shorter first birth intervals than early marriage entrants, but the tendency of those who pre-maritally conceive to marry as soon as possible to avoid having the births out of wedlock and the higher level of pre-marital conceptions among those who marry later complicate this effect of age at first marriage on the timing of the first birth. However, with the low level of pre-marital conceptions (around 8 per cent), the distortion does not seem to be serious, and the date of first marriage or cohabitation still seems a good overall indicator of the start of exposure to the risk of childbearing.

Age at the start of the interval and calendar period greatly affect both the proportion of women who have their next birth and the timing of the next birth at higher order births. The effect of relative age increases with parity. The effect of cohort on the quantum and tempo of fertility is confounded by the selectivity bias. Such findings indicate that age at the start of the interval, calendar period, parity and cohort are necessary demographic controls in any multivariate analysis of birthspacing.

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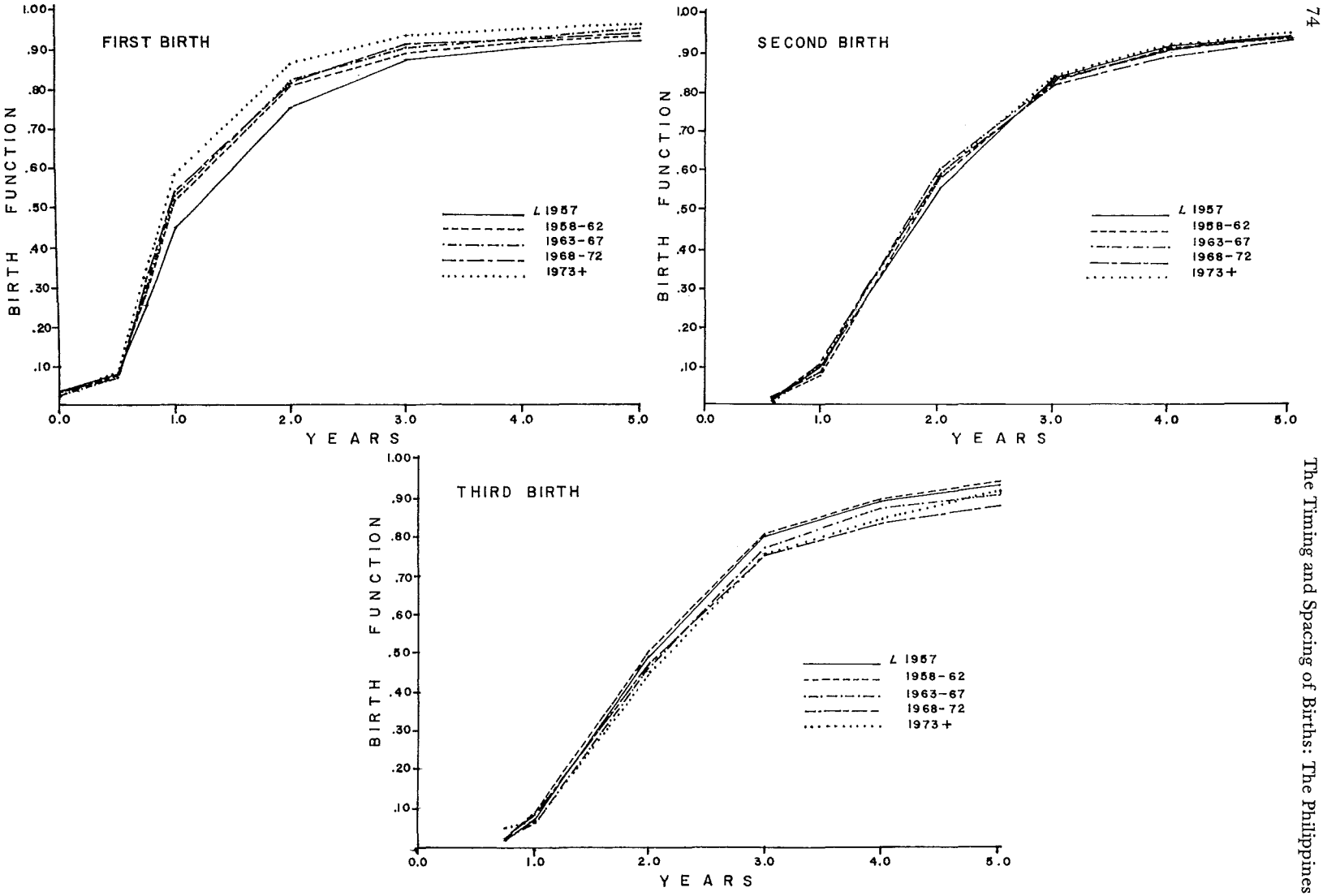
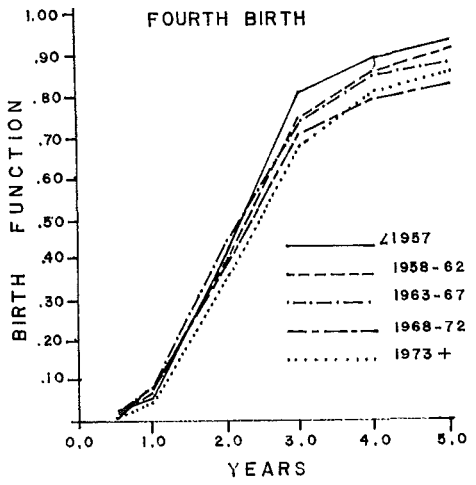
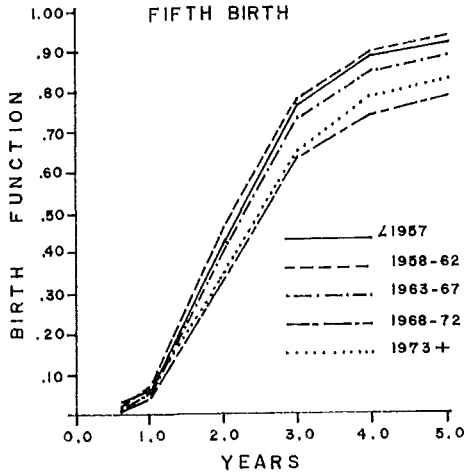
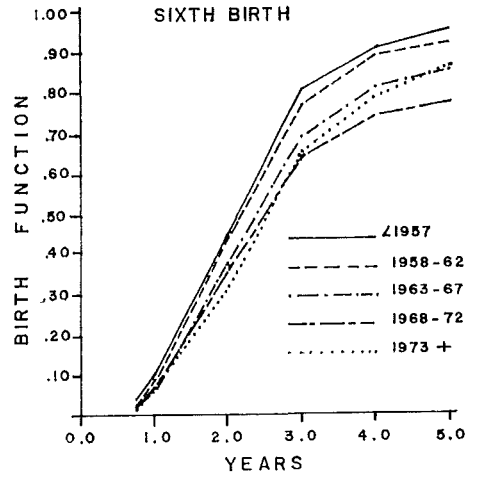
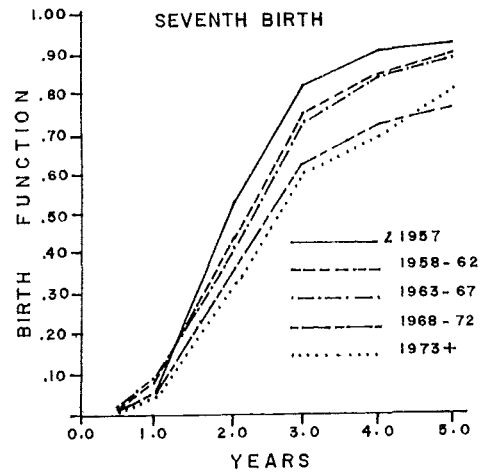


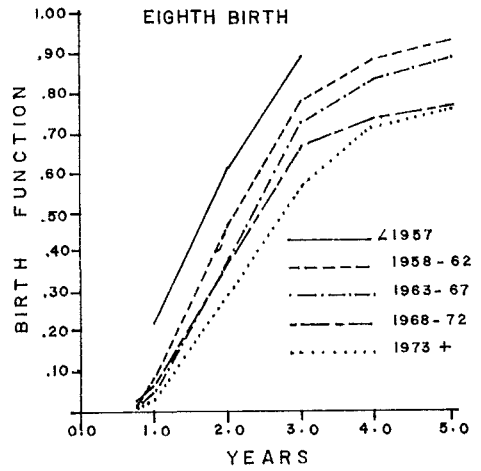
Figure 5.4 Life-tables by birth interval and calendar period











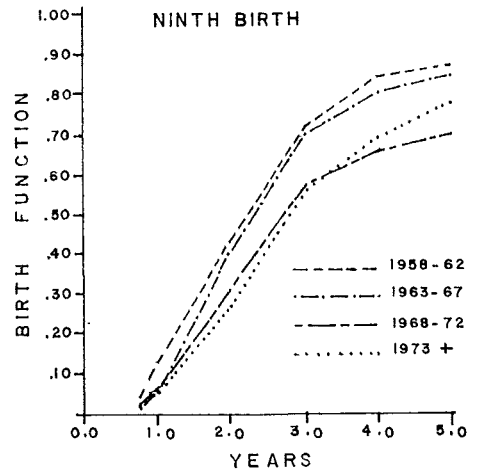


Figure 5.4 (*cont*)

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Part III

Fertility: Determinants

Introduction

The preceding chapters have been largely descriptive: setting current levels, outlining the trend of the much-awaited fertility transition in the country, and identifying differences in the behaviour of particular groups of women. Although some issues have been raised, no explanation has yet been put forward as to why fertility has been declining.

There have been previous attempts to explain the noteworthy features of Philippine fertility levels and trends. These have strongly suggested that the socio-economic and demographic milieu has become more receptive to smaller family sizes. Thus past literature suggested the important roles of changes in education, income, employment, place of residence, etc. It is not difficult to realize that there can be a limit to the role of adoption of contraception in meeting national population goals, especially if the desired number of children stabilizes at some number, say four, or if mortality continues to take a toll on the final number of children. These considerations provoke interest in special topics. The following chapters represent the second wave of analysis of determinants of Philippine fertility as it continues to decline. The analysis delves further into previously unsettled issues or newly emerging factors thought to impinge on fertility. Although the aim is to contribute to the knowledge of causes of fertility, methodological issues are also dealt with.

Morada and Alegre suggest in their article that the environment is not yet ripe for meaningful responses to fertility preference types of questions in surveys, because of the tendency of women to rationalize their actual fertility performance. They do show that many of the factors suggested as determinants of actual fertility explain preferences as well. In general, there are no differences in the set of correlates for the three aspects of child-bearing attitudes examined: (1) number of children desired, (2) number of additional children wanted, and (3) whether or not the last pregnancy was wanted.

Age at first marriage assumes an important role in the analysis of the determinants of the timing of women's first births in the chapter by Cabigon and Hufana. The major determinants of age at first birth, ie woman's education, work prior to marriage, residence of origin and husband's education, not surprisingly operate largely through age at entry into marriage. The conclusions arrived at necessarily include encouragement of measures to delay women's age at marriage if the same trend is desired for age at first birth.

De Guzman considers two important demographic determinants of fertility: infant mortality and the stability of marriages. In the context of the present development stage of the Philippines, the first seems to be more relevant since dissolution of marriages is a phenomenon not yet common in the Philippines. Working on a handful of either separated or widowed cases (8.5 per cent), the author demonstrates the anti-fertility effects of separation and widowhood, mostly due to loss of exposure after controlling for relevant variables such as age and age at marriage. While the findings have limited policy relevance, they could provide us with a better grasp of factors which are potentially relevant to changes in fertility behaviour.

Specifying the fertility and fertility-related response of a couple to an infant death is more attractive from a policy viewpoint. Infant mortality is still a major focus of health efforts, despite the great strides already made by the country in public health and sanitation and subsequently on mortality levels. Looking at the issue from the perspectives of child-replacement response and biological impact, de Guzman points to the attractive possibility of further reduction in fertility as infant mortality declines. With the

experience of less infant deaths, the motivation for replacing a lost child would be reduced. The diminished motivation for the next child was found to be manifested in longer birth intervals. Likewise a living child has a greater possibility of being breastfed, contributing to the further lengthening of the birth interval.

The recursive relationship between employment and fertility is addressed by Engracia and Herrin in terms of two time perspectives – cumulative and current experiences. Past studies concentrated on the effect of employment on fertility, to the neglect of the other direction of the relationship. Allowing for the simultaneity of effects between employment and fertility, the authors find a reverse pattern of relationships for the two time periods. Current fertility limits work participation, while the total number of children has a positive effect on a woman's employment. The presence of young children in the house seems to be the plausible explanation for the first effect. In the long run, a large family size compels the woman to work for additional income.

The labour force participation effect on fertility is also found to be situational. Current work increases recent fertility. On the other hand, work participation tends to limit cumulative fertility. The interplay between the income and substitution effects of women's employment is taken to be the explanation for the apparently different patterns of effects. For younger, low parity women the income effect of employment predominates, thus their higher recent fertility. In the long run, as work becomes a more permanent aspect of woman's life, substitution effects of employment on fertility seem to prevail.

6 Demographic, Socio-Economic and Cultural Correlates of Childbearing Attitudes in the Philippines

Hector B. Morada and Marietta P. Alegre

6.1 INTRODUCTION

'Family formation is undoubtedly a sequential process carried on within a complex of expectations and preferences about many aspects of life, of which preference for a certain number of children is but one' (Coombs 1979). Aside from this, there are many confounding factors associating desired to achieved fertility. The existence of preferences regarding the sex as well as the number of children are found in some cultures and societies.

Many natality researchers have closely examined the relationship between childbearing and a few carefully controlled social and psychological variables. However, these social-psychological characteristics of individuals or couples have consistently left unexplained much of the variation in natality. Studies on preferences for sex and number of children support the fact that they have a strong bearing on fertility (Coombs 1979; Shevasunt 1978).

This paper attempts to show how childbearing attitudes in the Philippines are affected by demographic, socio-economic and cultural conditions. 'Childbearing attitudes' refer to attitudinal variables included in the RPFS. The variables considered here are the desired number of children, the additional number of children wanted and the desire for the last pregnancy.

6.2 DATA AND METHODS

For the purposes of studying the relationship between the stated number of children desired and the actual number of living children, controlling for other demographic variables, women who did not answer the questions on the total number of living children desired were excluded, thereby cutting the sample to 9256 women. In the regression analyses, women included are only those who gave acceptable responses to the questions that have been considered in forming the regressands and the regressors. Ultimately, the sample is further pruned down to 6112 women.

The fertility history provides direct information on the total number of children ever born and children still living for each ever-married woman. The number of children desired is obtained from answers to the question 'If you could choose exactly the number of children to have in your whole life, how many would that be?' (RPFS question no 699).

The desire for more births is asked only of women who have had at least one pregnancy. The question to solicit this information varies according to the current marital and pregnancy status of the respondent. For currently married, pregnant women, the question is 'How many more children do you want to have, after the one you are expecting?' On the other hand, for women who are currently married, living with their husbands, fecund, not currently pregnant and wanting more births, the question used is 'How many more do you want to have?' Widowed, divorced or separated women are likewise asked the same question although the period specifically referred to is the one immediately after the birth of the last child. Women who desired no more children are then asked if their last pregnancy is unwanted. For pregnant women, desire for the current pregnancy is ascertained.

The first part of the analysis focuses on the behaviour of stated preferences as actual fertility experience changes, controlling for marital duration, age and educational attainment. Since number of additional children wanted and desire for the last pregnancy are closely tied up with the desired family size, only the latter is analysed here.

In the multivariate analyses, fertility preferences are treated as dependent variables and

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 81–91. Voorburg. Netherlands: International Statistical Institute.

regressed on selected socio-economic and demographic variables. The age-related variable used is the age at first marriage, while socio-economic variables used are type of current residence, educational attainment, work experience and ethnicity. Contraceptive use is introduced into the model as a control variable. Variables which have been found to be highly correlated with fertility preferences are those relating to the actual fertility experiences of the women. Hence, included also in the analyses are the number of living children, the number of births in the past five years and the number of child deaths. Sex balance (measured as the difference between the number of male children and the number of female children) and length of open interval have also been considered. Regression runs indicated that their effects on the dependent variable are negligible, hence their exclusion in the final analyses.

Number of living children, child deaths, births in the past five years and age at first marriage are treated as continuous variables while the other variables are categorical and entered into the regression as dummy variables with values 1 for presence and −1 for absence of each characteristic.

There are five categorical variables included in the models: type of current residence, contraceptive use, educational attainment, ethnicity and work experience. Dummy variables for these are generated as follows:

Type of current residence
URB = 1, if urban
−1, otherwise
Contraceptive use
CON = 1, if never used
−1, otherwise
Educational attainment
EDU = 1, if no schooling, primary or intermediate
−1, otherwise
Ethnicity
ETH 1 = 1, if Tagala or Ilocana
0, if Cebuana
−1, otherwise
ETH 2 = 1, if Cebuana
0, if Tagala or Ilocana
−1, otherwise
Work experience
WOE = 1, if ever-worked
−1, otherwise

Given the unbalanced nature of the data set, testing for the significance of each of the categorical variables presents some problems (Aitkin 1978; Hocking and Speed 1975; Speed, Hocking and Hackney 1978) since these variables are non-orthogonal to each other. To test then for the significance of a variable adjusted for other categorical variables and adjusting for the unbalancedness of the data, interaction terms among all categorical variables are generated and included in the model.

Moreover, because the data set is large, a 0.001 level of significance is adopted for the purpose of testing hypotheses (Chernoff and Moses 1959).

6.3 DESCRIPTIVE ANALYSIS OF NUMBER OF CHILDREN DESIRED

If fertility is a product of women's implementation of stable fertility preferences and no changes in fertility preferences across cohorts occurred, the number of children desired would be constant and the number of living children would be less than or equal to the desired number. On the other hand, suppose, in replying to fertility preference questions, women tend to report births as desired, whether or not this was actually so (this is termed 'rationalization'). At lower parities the number of children desired would then be greater than the actual number of children, but as the number of living children increases, the number of children desired would also increase. Figure 6.1 shows the relationship between the number of living children and children desired (a) if there is absolutely no rationalization and (b) if women fully rationalize the number of living children they have.

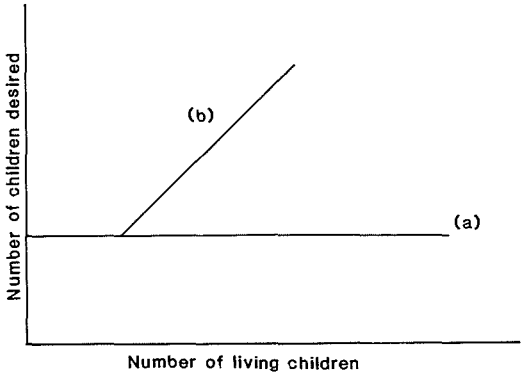

Figure 6.1 Number of children desired by number of living children under implementation and rationalization assumptions

Table 6.1 Mean number of children ever born and children desired by number of living children, 1978

Number of living children	Mean number of children			
	Ever born	Desired	Difference (Desired – CEB)	N
0	.1	2.8	– 2.7	(492)
1	1.2	2.9	– 1.7	(1121)
2	2.2	3.2	– 1.0	(1373)
3	3.3	3.7	– .4	(1355)
4	4.5	4.4	.1	(1263)
5	5.6	4.9	.7	(993)
6	6.6	5.5	1.1	(839)
7	7.7	5.8	1.9	(708)
8	8.5	6.0	2.5	(469)
9	9.0	6.6	2.4	(643)
Total	4.4	4.3	.1	(9256)

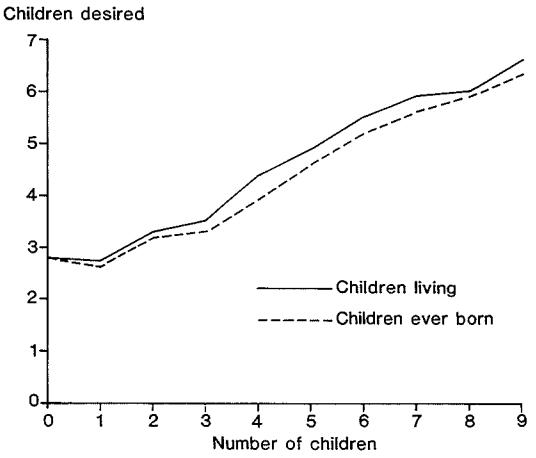

Figure 6.2 Number of children ever born and number of children living by number of children desired, 1978

Table 6.1 and figure 6.2 show the observed relationship between the number of children desired and the number of children ever born.

As may be observed, Filipino women seem to rationalize their actual fertility to some extent. As the number of living children increases from 0 to 4, the number of children desired follows an increasing trend and is higher than the number of living children and the number of children ever born. After four living children, however, the relationship reverses so that the number desired becomes lower than the number of living children, although both variables still follow an increasing trend. At the higher number of living children the degree of rationalization decreases, so that the difference between the actual and desired number of children increases.

Living children are the survivors of the children ever born (CEB), to a woman. As shown in table 6.1 and figure 6.2, a similar relationship may be observed between the mean CEB and mean number of children desired.

The fertility history of a woman is largely dependent on the length of exposure to the risk of childbearing. Hence, marital duration is one factor that is directly related to the number of living children, if women do not exercise full control over their fertility. One would expect women who have been married longer to have given birth to more children than women who have been married for shorter periods. When women rationalize their fertility, the number of children would likewise be directly related to marital duration.

Table 6.2 and figure 6.3 show the relationship between marital duration, fertility preferences, and the fertility experience of women. The data show that the number of living children and desired children become equal at about 15 years after marriage. Before 15 years, the actual number of children is less than the desired number, whereas beyond 15 years the actual is more than the desired. It appears that at the start of marriage, women desire approximately three children. However, as children are added to the family, they seem to reassess their preferences and increase the number of children desired. Nevertheless, when family size reaches around six, women show a preference to keep their family size at this level and the number desired becomes lower than the

Table 6.2 Mean number of children desired and children living by marital duration, 1978

Marital duration	Mean number of children			
	Living	Desired	Difference (Desired – Living)	N
0–4	1.2	3.0	−1.8	(1648)
5–9	2.7	3.6	−.9	(2012)
10–14	4.1	4.3	−.2	(1660)
15–19	5.1	5.0	.1	(1512)
20–24	6.1	5.4	.7	(1248)
25–29	6.5	5.4	1.1	(852)
30–34	6.6	5.8	.8	(307)
35+	6.7	6.1	.8	(15)
Total	4.0	4.3	−.3	(9256)

actual number thereafter, as they fail to implement substantially their fertility preferences.

Marital duration is directly related to the age of women. Thus, it may be claimed that the preference for a larger number of children among women in later marital durations is a cohort effect rather than rationalization. Empirical data show that younger women tend to prefer fewer children than older women. The RPFS data show, however, that although this observation is true, rationalization may be discerned in all age cohorts of women.

Table 6.3 presents the mean number of children desired by number of living children for each age cohort. Controlling for the number of living children, no definite pattern is observed in the number of children desired as age increases. However, for each age cohort, a direct relationship between number of children desired and number of children living may be observed. As has been noted earlier, children desired is less than living children when the latter is five or less. However, the relationship reverses when the number of living children is more than five. It seems that although women prefer less than six children, implementation of fertility preferences is weak so that number of living children continues to increase.

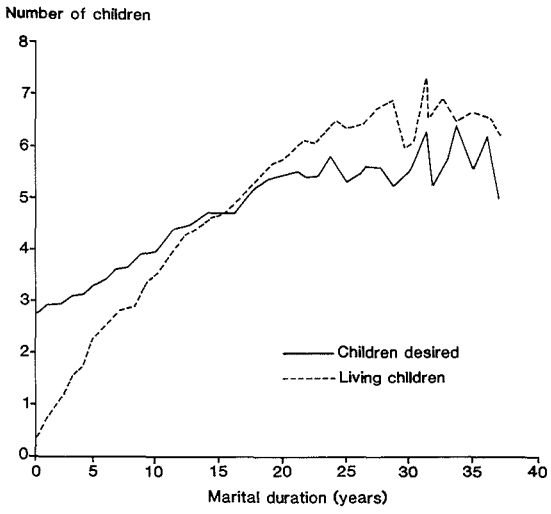

Figure 6.3 Number of children living and number of children desired by marital duration, 1978

The occurrence of deaths of their children could affect the stated fertility preferences. Women might tend to state higher figures so that, despite child deaths, they would be able to have the number of living children wanted especially if the number desired has not yet been attained. Table 6.4 presents the mean number of children desired by number of living children and by occurrence or non-occurrence of child deaths. At small numbers of living children, the mean number of children desired is larger for women who have had at least one child death. However, when the number of living children exceeds the number of children desired, the effect of child deaths weakens, so that at seven or more living children the difference between the preference of women who have experienced child deaths and the preference of those who have not decreases.

Fertility studies using Philippine data have pointed out the suppressing effect of education on fertility (Concepción 1975; Engracia 1979). The RPFS data show that women with primary education or less prefer a larger number of

Table 6.3 Mean number of children desired by number of living children and by age of women, 1978

Living children	Age of women							
	All ages	15–19	20–24	25–29	30–34	35–39	40–44	45–49
0	2.83	2.77	2.86	2.88	2.79	2.56	3.28	2.71
1	2.86	3.14	1.91	2.78	2.84	2.50	2.72	2.89
2	3.20	3.38	3.23	3.12	3.17	3.18	3.06	3.58
3	3.65	4.00	3.70	3.74	3.64	3.53	3.46	3.66
4	4.39	—	4.60	4.35	4.23	4.36	4.49	4.19
5	4.94	—	5.88	4.82	5.04	4.99	4.83	4.83
6	5.09	—	—	5.47	5.73	5.48	5.55	5.25
7	5.83	—	—	4.84	5.99	5.86	5.57	6.02
8	6.03	—	—	5.07	5.67	6.41	5.69	6.15
9+	6.64	—	—	—	5.93	7.26	6.50	6.39

Table 6.4 Mean number of children desired by number of living children and by occurrence of child death, 1978

Living children	Total	Occurrence/non-occurrence of child death		
		No child death	At least one child death	Difference (4) − (3)
(1)	(2)	(3)	(4)	(5)
0	2.83	2.83	3.12	.29
1	2.86	2.83	3.43	.60
2	3.20	3.16	3.64	.48
3	3.65	3.61	4.07	.46
4	4.39	4.31	4.89	.58
5	4.94	4.87	5.25	.38
6	5.51	5.41	5.94	.53
7	5.83	5.77	6.06	.29
8	6.03	6.11	5.75	(−.36)
9+	6.64	6.75	6.16	(−.59)

children, while women with at least intermediate education prefer a smaller number. The number of children preferred decreases further as educational attainment increases (table 6.5). It is surprising to note, however, that women with at least a college degree prefer to have more children than women with only some college education.

Although the data appear to support the findings of earlier studies on education and fertility, another factor that would contribute to this relationship is the differences in the age distributions among the levels of educational attainment. The mean age of women with no grade completed is highest, decreasing monotonically to women with some college education. However, women with college degrees have a higher mean age than women with intermediate or some college education. Since older women tend to state preferences for larger numbers of children, this may partly explain the higher preference for this group of women.

Another variable that may be observed in table 6.5 is the difference between the number of children desired and the number of living children. This difference increases with educational attainment, although the absolute numbers decrease. It is possible that rationalization of fertility is weaker among better educated women, ie they tend to state their actual preference despite their actual fertility levels.

Comparing the mean number of children desired and the mean number of living children by

Table 6.5 Mean number of children desired and living children and mean age of women by educational attainment, 1978

Educational attainment	Mean age	Mean number of children		Difference (Desired – Living)
		Desired	Living	
No grade completed	37.7	5.7	5.6	.1
Primary	35.9	5.1	5.4	(–.3)
Intermediate	32.9	4.4	4.5	(–.1)
High school	32.4	4.0	3.8	.2
Some college	31.2	3.6	2.9	.7
College graduate	34.9	3.8	3.0	.8
Total	33.7	4.4	4.3	.1

Table 6.6 Mean number of children desired by educational attainment and by marital duration, 1978

Marital duration	No grade completed or no schooling	Primary	Intermediate	High school	With some college	College with degree and higher
0–4	3.6	3.7	3.1	2.9	3.0	3.0
5–9	4.8	3.9	3.6	3.4	3.8	3.7
10–14	4.9	4.6	4.5	4.1	3.8	3.8
15–19	5.5	5.6	5.0	5.1	3.8	3.9
20–24	6.6	5.8	5.3	4.8	4.4	5.8
25–29	6.8	5.6	5.7	5.0	4.8	4.4
30–34	6.1	5.8	5.2	5.0	2.0	3.7

marital duration controlling for educational attainment, two distinct patterns emerge (table 6.6). Among women with no schooling, rationalization seems to be affecting fertility preferences irrespective of marital duration, while women with at least some college education exhibit not only lower fertility preferences but also a lower fertility level. In the intervening educational levels, a trend towards lower fertility preferences and levels as educational level increases is observed.

6.4 MULTIVARIATE ANALYSIS OF FERTILITY PREFERENCES

As mentioned before, three measures of fertility preferences are analysed in this study: number of children desired, number of additional children wanted and whether or not the last pregnancy is wanted. Several variables are used as predictors of these measures of fertility preferences: number of living children, age at first marriage, births in the past five years, number of child deaths (a measure of child mortality experience), use of contraceptive methods, type of current residence (urban or rural), educational attainment, ethnicity and work experience.

Since the predictors include categorical and continuous variables, an analysis of covariance is performed on the measures of fertility preference.

Number of children desired

Table 6.7 presents the results of the analysis of covariance performed on number of children desired using: (1) age at first marriage, (2) number of living children, (3) births in the past five years (or recent fertility experience), and (4) number of child deaths as covariates; and (1) contraceptive practice, (2) type of current residence, (3) educational attainment, (4) ethnicity, and (5) work experience as factors. In the analysis, no assumption of hierarchy among the factors and covariates is made.

Of the covariates considered in the model, only age at first marriage fails to obtain significance at the 0.001 level. This suggests a common preconceived ideal number of children women have at the start of marriage.

Table 6.7 Analysis of covariance of number of children desired, 1978

Source	df	MS	F-ratio	Coefficient
Model[a]	51	191.5	79.9[d]	
Constant				2.6
Covariates				
Age at first marriage	1	25.0	10.4[c]	−.02
Number of living children	1	6987.3	2915.4[d]	.5
Births in past five years	1	29.2	12.2[d]	.1
Child deaths	1	83.2	34.7[d]	.2
Factors				
Contraceptive use (CON)				
Never used	1	197.5	82.4[d]	.2
Type of current residence (URB)				
Urban	1	31.4	13.1[d]	−.1
Education (EDU)				
Intermediate/less	1	12.7	5.3[b]	.1
Ethnicity (ETH)	2	47.5	19.8[d]	
Tagala/Ilocana	1	10.1	4.2	−.1
Cebuana	1	28.6	11.9	−.1
Work experience (WOE)				
Ever worked	1	1.6	.6	*

*Less than 0.1.
[a]Interactions of factors have been examined but were found to be not significant.
[b]Significant at 0.05 level.
[c]Significant at 0.01 level.
[d] Significant at 0.001 level.

The coefficient of number of living children is positive (0.5) implying that as the number of living children increases, the number of children desired also increases – an additional living child increases the number of children desired by 0.5. Of course, it may be argued that the relationship runs in the reverse direction – that is, the number of children desired affecting the number of living children. However, as demonstrated earlier, women do not exhibit stable 'preferences' for children and strong indications of rationalization of actual fertility experience are evident.

Births occurring to a woman in the past five years are recent events that may affect her current fertility preferences. The regression analysis has confirmed this relationship. A highly significant positive coefficient is obtained for the variable births in the past five years. For every birth occurring in the past five years, 0.1 child is added to the stated number of children desired. It may be worth noting, however, that this variable is directly affected by the presence of rationalization of cumulative fertility.

The number of child deaths is also strongly related to the number of children desired. Results of the analysis show that 0.2 child is added to the number desired for each additional child death women have experienced. (The number of child deaths refers to the number of children born alive who died before reaching their sixth birthday.)

The factors included in this model present interesting results, some of which run counter to expectations based on some population theories. Studies on socio-economic variables and fertility have pointed out the inverse relationship between education and fertility. Education as a factor in the model, however, has been categorized into two broad categories – intermediate or less and high school or over. This categorization scheme may have reduced the differentials in levels of fertility between the groups. Hence, education has obtained a coefficient which is not statistically significant. Work experience of a woman may have been similarly affected by categorizing this variable into ever worked and never worked.

With the control for contraceptive use, factors which obtain statistically significant effects are type of current residence and ethnicity. As

expected women in urban areas have a lower stated number of children desired (0.1 below the mean) than their rural counterparts (0.1 above the mean).

Ethnicity appears to be a very strong predictor of the number of children desired. While Tagalas, Ilocanas and Cebuanas have stated number of children desired that is 0.1 below the mean, Hilonggas, Bicolanas, Muslims and women belonging to other minor ethnic groups exhibit higher preferences (0.2 above the mean).

Number of additional children wanted

The second measure of fertility preference analysed here is the number of additional children wanted. The same set of explanatory variables has been used in the analysis since this variable complements the number of children desired.

Table 6.8 presents the results of the analysis of covariance on the number of additional children wanted controlling for contraceptive use of women. In this model, the covariates age at first marriage, number of living children and births in the past five years obtain statistically significant coefficients, while the effect of child deaths is not significant at the 0.001 level. The latter is expected since the occurrence of births in the past five years is expected to offset the effect of child deaths.

Age at first marriage is observed to have a negative effect on the desire for additional children; ie for every year added to age at marriage, the dependent variable decreases by 0.01. A similar effect may be observed for the number of living children. For every child added to the number of living children additional children wanted decreases by 0.2. The covariate births in the past five years shows a surprising result: its effect on the dependent variable is positive, which means that for every birth occurring in the past five years, the number of additional children wanted increases by 0.06.

Of the factors considered, only ethnicity proves to have statistically significant effects on the number of additional children wanted. While Tagalas, Ilocanas and Cebuanas desire a number that is 0.1 lower than the mean, women belonging to other ethnic groups desire a number that is 0.2 higher than the mean.

Table 6.8 Analysis of covariance of additional number of children wanted, 1978

Source	df	MS	F-ratio	Coefficient
Model[a]	51	31.6	41.7[c]	
Constant				1.6
Covariates				
Age at first marriage	1	13.7	18.1[c]	−.01
Number of living children	1	1025.5	1352.4[c]	−.2
Births in past five years	1	20.1	26.5[c]	.6
Child deaths	1	6.3	8.3	−.04
Factors				
Contraceptive use (CON)				
Never used	1	159.9	210.7[c]	.2
Type of current residence (URB)				
Urban	1	7.2	9.5[b]	−.05
Education (EDU)				
Intermediate/less	1	6.7	8.8[b]	.04
Ethnicity (ETH)	2	24.9	32.8[c]	
Tagala/Ilocana	1	12.3	16.2	−.1
Cebuana	1	7.2	9.5	−.1
Work experience (WOE)				
Ever worked	1	0.2	0.3	*

*Less than 0.1.
[a]Interactions of factors have been considered. Only two two-way interactions, between CON and EDU and between CON and ETH, were significant, at the 0.05 and 0.01 levels, respectively.
[b]Significant at 0.01 level.
[c]Significant at 0.001 level.

Last pregnancy unwanted

Evidence that women rationalize their fertility experience has been pointed out earlier in the analysis. This means that some women refuse to admit that at least one of their children is unwanted. Hence, whether women would readily say that the last pregnancy was unwanted is debatable, but this is an issue which cannot be resolved here. The subsequent analysis, therefore, assumes that the responses solicited from women in the sample reflect the real sentiments of these women.

Although the model obtained a statistically significant F-ratio, only the number of living children and the number of child deaths, among the covariates, obtain statistically significant coefficients. Since the measure of whether the last pregnancy is unwanted is a dichotomous variable, taking the value '0' if wanted or undecided and '1' if unwanted, a positive coefficient implies an increasing probability that the last pregnancy is unwanted. Hence, for every unit increase in the number of living children, the probability that the last pregnancy is unwanted increases by 0.1. Surprisingly, child deaths likewise obtains a positive coefficient (0.03), which means that an additional occurrence of child death increases the probability of the last pregnancy being unwanted by 0.03. This could, however, be viewed in two ways: women are more likely to admit that their last pregnancy was unwanted if the baby died, or women experiencing more child deaths are more likely to have a negative attitude toward the last birth.

Except for contraceptive use, which is a control variable, not one of the factors considered in the model proves to have a statistically significant effect on the desire for the last pregnancy.

6.5 SUMMARY

Selecting three measures of fertility preference or childbearing attitudes, analyses of covariance on these three measures are performed using selected variables as factors and covariates. The three measures of fertility preference are (1) number of children desired, (2) number of additional children wanted, and (3) the desire for the last pregnancy.

Table 6.9 Analysis of covariance of the desire for the last pregnancy, 1978

Source	df	MS	F-ratio	Coefficient
Model[a]	51	5.5	35.6[c]	
Constant				.1
Covariates				
Age at first marriage	1	.5	3.3	*
Number of living children	1	211.5	1349.8[c]	.1
Births in past five years	1	1.2	7.6	−.01
Child deaths	1	3.5	22.8[c]	.03
Factors				
Contraceptive use (CON)				
Never used	1	8.5	54.5[c]	−.05
Type of current residence (URB)				
Urban	1	.7	4.5[b]	.01
Education (EDU)				
Intermediate/less	1	*	.1	*
Ethnicity (ETH)	2	.2	1.2	
Tagala/Ilocana	1	*	*	*
Cebuana	1	.3	1.6	*
Work experience (WOE)				
Ever worked	1	*	.1	*

*Less than 0.1.
[a]Interactions of factors have been examined. Only the two-way interactions between EDU and ETH and between ETH and WOE were found to be significant, at the 0.05 level.
[b]Significant at 0.05 level.
[c]Significant at 0.001 level.

These three are not measures of the same concept, but together reflect the same underlying concept of fertility preference or childbearing attitude.

Controlling for contraceptive use, factors examined as predictors of the childbearing attitude are (1) type of current residence, (2) educational attainment, (3) ethnicity, and (4) work experience. The covariates considered are (1) number of living children, (2) age at first marriage, (3) births in the past five years and (4) child deaths.

The results of the analyses of covariance performed on the three measures of fertility preference generally support each other. In all three models, number of living children appears to be the strongest explanatory variable, being positively related to the number of children desired and desire for last pregnancy and negatively related to the number of additional children desired. This implies that as the number of living children increases, the number of children desired likewise increases but the number of additional children wanted decreases. However, with respect to the desire for the last pregnancy, as the number of living children increases, the greater is the probability that the last pregnancy was not wanted.

Age at first marriage is found negatively to affect the number of additional children wanted but is not significantly related to the other two measures of fertility preferences. Apparently, as age at first marriage increases, the number of additional children wanted slightly decreases.

Births in the past five years is a strong predictor of the number of children desired and the number of additional children wanted, being positively related to both. However, it is a weak predictor of the desire for the last pregnancy.

The effect of child deaths on the number of additional children wanted may be affected by the occurrence of births in the past five years, so that the effect is weak. However, the number of child deaths is strongly related to the number of children desired and to the desire for last pregnancy, having positive effects on these two variables.

Not one of the factors is a strong predictor of the desire for the last pregnancy, indicating no significant differences in the attitudes of women belonging to different socio-economic groups after controlling for their prior fertility experience. However, type of current residence is found to have a strong effect on the number of children desired. As expected, women living in an urban area state a preference for smaller number of children than their rural counterparts. This variable, however, is a weak predictor of additional children wanted.

Differentials in fertility preferences exist among ethnic groups. While Tagalog, Ilocano and Cebuano women state preferences for smaller family sizes, the reverse is true for women belonging to the 'Others' category composed of Hilonggas, Bicolanas, Muslims and women in other ethnic groups.

Differentials in fertility preferences are not found among groups of women classified into educational categories and groups of women classified by type of work experience. This surprising finding could be due to the categorization scheme used for these two variables. Education has been categorized into intermediate or less and high school or over, while work experience has been divided into ever worked and never worked. Possibly whatever differentials in fertility preference exist among women with different educational attainments and work experience are obscured in this scheme. Unfortunately, the computing resources available at the National Census and Statistics Office do not allow more detailed categorization of variables. Furthermore, more detailed categorization would produce tabulation cells with no observations, which is methodologically unattractive under the present analytic approach.

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7 Determinants of Age at First Birth

Josefina Valera-Cabigon and Lourdes Jimenez-Hufana

7.1 INTRODUCTION

High levels of fertility have been mainly responsible for the rapid population growth in the Philippines that peaked in the 1960s. Correspondingly, demographic research has been devoted heavily to fertility in an effort to uncover its underlying determinants. However, in these studies emphasis has been on the cumulative outcome — children ever born as the dependent variable. One means of further understanding its determinants is to view fertility as a sequential process, a series of events in the life cycle of women starting from the occurrence of the first birth through to the end of childbearing.

The first step in the fertility process is the birth of the first child. The timing of this event has strong effects on both individual and aggregate levels of fertility, as well as broader implications for women's roles and social change in general (Hirschman and Rindfuss 1980).

In the related chapter on birth spacing (chapter 8), we focus on the determinants of the length of the interval between marriage and first birth. Childhood place of residence, wife's education, husband's education, husband's occupation, and work between marriage and first birth are the factors investigated in relation to the length of the first birth interval after controlling for the demographic factors, age at first marriage, calendar period and cohort.

In this chapter, we use age at first birth instead of length of first birth interval as our dependent variable. Because of the expected close association between age at first birth and age at first marriage, analysis of age at first birth cannot ignore age at first marriage. With such a close relationship, the determinants of age at first marriage are likewise the determinants of age at first birth. However, it is worthwhile to focus on age at first birth itself, especially in the context of a rapidly modernizing society. From the perspective of the women and from the perspective of the society, the transition to the mother role has important consequences that the transition to the wife role lacks (Rindfuss and Bumpass 1979). For instance, a wife active in the labour force may tend to postpone her first birth in order to continue employment. In contrast, labour force participation may not conflict with getting married. Furthermore, although postponing age at marriage usually implies postponing age at first birth as well, this may not always be the case and other factors also defer the first birth.

7.2 DATA AND VARIABLES

To control for the bias caused by the selective inclusion of women who marry and start childbearing at early age, the present analysis is restricted to women currently aged 25–44 who have had at least one birth. The total sample under consideration is 6360. To test whether or not relationships differ for the younger women, separate analyses using women aged 25–29 years and women aged 30–44 were performed.

The dependent variable is the start of childbearing measured by the age of a woman at the occurrence of her first live birth. It was derived by subtracting the year and month of birth of the woman respondent from the year and month of her first live birth.

The factors hypothesized to have some influence on the timing of the first birth are the following:

A Background variables
   1 Ethnicity
   2 Childhood place of residence
B Intervening variables
   1 Wife's educational attainment

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2 Wife's pre-marital occupation
3 Husband's educational attainment
4 Husband's occupation
5 Age at first marriage.

7.3 THEORETICAL FRAMEWORK

Inasmuch as the dependent variable under consideration is an event in the life cycle and the correlations among the independent variables are considered to be causal — for instance, wife's early work experience is likely to be the result of having a certain level of education — a hierarchical strategy was adopted. This basic model may be expressed as follows. The timing of the first birth is postulated to be a consequence of (1) background characteristics, (2) measured socio-economic characteristics, (3) age at first marriage and (4) a great variety of unmeasured characteristics called 'residuals'. The conventional F-test corresponding to the hierarchical method is used to indicate the significance of the incremental inclusion of a given variable to the explanation of variance. Under this hierarchical approach, when a variable which has a close association with a preceding variable as well as the dependent variable is entered into the equation, it mediates the effect of variable(s) prior to it.

According to the model, we expect direct effects of childhood place of residence and ethnicity on age at first birth and indirect effects through wife's education, early work experience and age at first marriage. The wife's education effect is expected to be indirect, through early work experience and through the path from early work experience to age at first marriage. We also posit a direct effect on age at first birth.

Husband's characteristics are investigated net of the background characteristics, wife's education and pre-marital work. Age at first marriage is the last variable in the hierarchy, enabling us to estimate regressions without and with it in order to test how it mediates the effects of the other predictors in the model.

7.4 FINDINGS

Table 7.1 presents the mean age at first marriage and age at first birth for the total sample of 6360 ever-married women aged 25–44 years for the total population and the four regions: Metro Manila, Luzon, Visayas and Mindanao. As expected, the correlation between age at first birth and age at marriage is very high. It is above 90 per cent regardless of region. Such a close association indicates that there has been little effort to delay the onset of fertility after marrying. It appears there are no differentials across regions.

Examining the differentials by the predictors hypothesized to influence age at first birth (table 7.2), we find that *regardless of region*:

1 Rural women had a lower age at first birth;
2 Tagala and Hilongga groups exhibited the highest mean age at first birth;
3 Education, be it the wife's or the husband's, is directly related to age at first birth; and
4 Women who did not work or who were engaged in agriculture tended to start childbearing earlier than those in the white collar occupations. A similar association appears for the husband's occupation.

Results of multiple regression estimates of the effects of the hypothesized predictors on age at first birth are presented in table 7.3. All the predictors (except age at first marriage) are introduced as sets of dummy variables and the regression coefficients are converted to deviations from the mean age at first birth. Age at first marriage is entered as a linear covariate, and the partial unstandardized metric regression coefficient is shown. Seven equations are estimated for each subsample in accordance with the basic model.

In the first equation, childhood place of residence significantly affects age at first birth. Women who are brought up in urban areas tend to have higher age at first birth than those reared in the rural areas. Its effect is not mediated by ethnicity. But when wife's education is entered in the third equation, its effect completely disappears indicating that its effect on age at first birth is indirect via education.

The next model includes ethnicity. This variable is statistically significant at the 0.05 level. Tagala, Hilongga/Bicolana, and Ilocana respondents show age at first birth higher than average and Cebuana, Muslim/others lower than average, with childhood place of residence held constant. But when wife's education is introduced, the effect of ethnicity is quite substantially reduced and the sign of the coefficient of the Ilocano category becomes negative, implying that most of the effect of ethnicity on age at first birth is indirect by way of education.

Wife's education is highly statistically significant

Table 7.1 Mean age at marriage and age at first birth for women aged 25–44

	Total		Metro Manila		Luzon		Visayas		Mindanao	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Age at first marriage	19.98	4.02	21.24	4.16	19.66	3.86	20.20	4.27	19.57	3.76
Age at first birth	21.82	4.00	23.13	4.19	21.52	3.86	22.03	4.21	21.36	3.71
Correlation	0.92		0.92		0.93		0.91		0.90	

Table 7.2 Mean age at first birth of ever-married women aged 25–44 by region of residence and selected socio-economic characteristics

Background variables	Total	Metro Manila	Luzon	Visayas	Mindanao
Childhood place of residence					
Urban	22.60	23.27	22.27	22.77	22.07
Rural	21.50	22.90	21.32	21.83	21.01
Ethnicity					
Tagala	22.19	23.28	21.67	*	*
Cebuana	21.51	23.41	20.87	21.74	21.27
Ilocana	21.85	22.98	21.64	*	22.28
Hilongga	22.40	23.41	21.92	22.44	21.98
Bicolana	21.62	22.87	21.37	*	*
Muslim	21.15	*	*	*	21.06
Others	21.61	22.84	21.31	21.92	21.14
Wife's years of schooling					
None	20.58	*	20.29	21.08	20.48
1–7 years	21.11	21.72	20.98	21.55	20.59
8–11 years	22.19	22.79	21.67	22.68	22.03
12–15 years	23.56	23.73	23.54	23.72	23.16
15+	25.61	25.89	25.99	25.54	24.68
Wife's pre-marital occupation					
Did not work	21.07	21.89	20.77	21.44	20.91
White collar	25.09	25.21	25.17	25.61	24.23
Agricultural	21.03	*	20.97	21.28	20.52
Services	23.04	24.52	22.79	23.21	22.07
Blue collar	23.08	23.81	23.19	22.55	21.94
Husband's years of schooling					
None	20.78	*	20.39	21.79	19.97
1–7 years	21.18	21.79	21.01	21.55	20.86
8–11 years	21.97	22.70	21.55	22.38	21.87
12–15 years	23.35	23.91	22.85	24.08	22.61
15+	24.59	24.71	25.29	24.98	23.87
Husband's occupation					
Did not work	23.42	*	*	*	*
White collar	23.27	23.75	23.06	23.88	22.51
Agricultural	21.09	*	20.89	21.56	20.84
Services	22.68	23.77	22.18	22.10	22.76
Blue collar	21.98	22.49	21.73	22.31	21.54
Total	21.8	23.1	21.5	22.0	21.4

*Less than 20 cases in the cell.

in delaying the first birth. College education adds three years to the average age at first birth (when women 25–44 are examined together), two years for the younger cohort and about four years for the older cohort. When occupation before marriage is added in equation 4, the effect of education is not drastically reduced, implying that the effect of education on deferring the first birth is direct and not by way of pre-marital occupation.

Work or occupation before marriage significantly delays the first birth. Holding all the preceding variables constant, being in white collar jobs postpones the first birth by slightly more than two years for women 25–44 years old and

Table 7.3 Deviations from the grand mean age at first birth, by age group

	25–44 (Grand mean = 21.8)								25–29 (Grand mean = 21.2)								30–44 (Grand mean = 22.0)							
	Model								Model								Model							
	1	2	3	4	5	6	7	(N)	1	2	3	4	5	6	7	(N)	1	2	3	4	5	6	7	(N)
Childhood place of residence																								
Urban	.76	.74	−.01	.01	−.02	−.04	−.00	1836	.57	.53	−.01	−.03	−.04	−.06	−.01	490	.83	.81	−.08	−.03	−.08	−.08	−.00	1346
Rural	−.31	−.30	.01	−.00	.01	.02	.00	4511	−.23	−.22	.01	.01	.02	.02	.00	1188	−.34	−.33	.03	.01	.03	.03	.00	3323
Ethnicity																								
Tagala		.23	.04	−.05	−.06	−.09	−.02	1270		.28	.11	.04	.01	−.00	−.03	349		.22	.02	−.07	−.11	−.11	−.02	921
Cebuana		−.28	−.15	−.12	−.11	−.10	−.13	1593		−.45	−.32	−.29	−.27	−.26	−.12	461		−.19	−.03	.00	.03	.03	−.12	1132
Ilocana		.11	−.04	−.01	−.02	−.01	.03	822		.19	.02	.07	.07	.10	.24	193		.05	−.12	−.11	−.13	−.13	−.05	629
Hilongga/Bicolana		.28	.31	.32	.33	.34	.01	1318		.38	.40	.41	.41	.40	−.02	299		.21	.23	.23	.25	.25	.02	1019
Muslim/others		−.22	−.14	−.12	−.12	−.12	.14	1344		−.11	−.04	−.04	−.04	−.05	.06	376		−.25	−.14	−.11	−.11	−.11	.17	968
Wife's education																								
No schooling/primary			−1.1	−.89	−.77	−.75	.07	1841			−1.1	−.99	−.93	−.90	.03	367			−1.16	−.96	−.81	−.81	.07	1474
Elementary			−.46	−.34	−.30	−.31	.05	2405			−.46	−.36	−.36	−.36	.01	627			−.47	−.33	−.31	−.31	−.07	1779
High school			.45	.43	.36	.34	.00	1277			.38	.30	.24	.23	−.03	416			.58	.62	.52	.52	.03	860
College and over			3.07	2.30	2.04	2.04	−.04	824			2.03	1.75	1.74	1.72	−.01	268			3.67	2.64	2.34	2.34	−.02	556
Wife's pre-marital occupation																								
Did not work				−.61	−.60	−.60	−.06	4320				−.55	−.55	−.55	−.08	1036				−.65	−.64	−.64	−.06	3283
Blue collar				.85	.85	.84	.07	1265				.58	.58	.58	.06	402				1.06	1.04	1.04	.10	864
White collar				2.06	2.02	2.02	.24	762				1.41	1.42	1.41	.23	240				2.35	2.30	2.30	.25	522
Husband's education																								
No schooling/primary					−.21	−.17	−.03	1881					−.15	−.11	.08	404					−.21	−.21	−.05	1477
Elementary					−.03	−.03	−.02	1973					−.02	−.01	−.00	535					−.00	−.00	−.01	1438
High school					.04	−.01	−.01	1528					.19	.17	−.10	467					−.04	−.04	−.00	1061
College and over					.40	.40	.11	965					−.06	−.09	.05	272					.52	.52	.14	693
Husband's occupation																								
Did not work/household and other services						.14	.09	418						.21	−.06	118						.11	.15	300
Agricultural						−.10	.02	3103						−.09	−.03	777						−.08	.04	2343
Blue collar[a]						.17	−.05	1731						.08	.07	495						.21	−.09	1236
White collar[b]						−.03	−.03	1095						.03	.00	288						−.12	−.04	807
Age at first marriage[c]							.91								.90								.91	
R^2	.015	.018	.108	.159	.160	.160	.846		.015	.026	.125	.183	.185	.185	.856		.015	.018	.117	.171	.172	.173	.84	

[a]Skilled and unskilled production and transport workers.
[b]Professional, technical, administrative, managerial, clerical and sales workers.
[c]Unstandardized (metric) regression coefficient.

women 30–44 years old and slightly more than one year for the younger women.

In equation 5, husband's education, net of all prior variables, is statistically significant (0.05 level) in delaying first births when all the women 25–44 are examined. But its direct effect on age at first birth is less substantial than wife's education. However, the effect of husband's education is insignificant for the two age subgroups.

Husband's occupation, controlling for all the preceding variables, does not have a significant effect on the timing of the first birth for any of the groups under consideration.

In the final equation, age at marriage, entered as a continuous covariate, plays the greatest role in affecting age at first birth. The unstandardized metric regression coefficient is 0.9, implying that a delay in marriage by one year delays the first birth by 0.9 year, and the proportion of variance explained increases from less than 20 per cent to about 85 per cent for any group of women under study. The close association between age at marriage and age at first birth causes the former to mediate significantly the effects of all the preceding variables that have had substantial influences on the first birth. As is evident in the estimated deviations, childhood place of residence now shows no residual effect on the delay of first births. Very modest direct effects of ethnicity, wife's education, wife's pre-marital occupation, and husband's education (only when all the women are examined together) remain. It is very clear that age at first marriage practically mediates all the effects of socio-economic-cultural background variables. The modest direct effect of wife's education becomes negative. Pre-marital occupation and husband's education maintain the expected positive associations.

7.5 CONCLUSIONS AND IMPLICATIONS

Results from the analysis indicate that the effects on age at first birth of childhood place of residence and ethnicity on the timing of first birth are largely mediated by wife's education, which itself strongly affects age at first birth. This implies that one strategy for postponing the first birth is to improve the level of education of the population under consideration. This conclusion is further supported by the fact that pre-marital occupation only slightly mediates the educational effect.

Pre-marital occupation is a strong factor in delaying first births. Women in white collar jobs tend to defer their first births by two years beyond the average. Husband's education has a modest effect on the postponement of first births, a much smaller effect than the education of the wife.

When age at first marriage, which is closely associated with age at first birth, is introduced into the regression equation, it practically mediates all the effects of the social, economic, cultural and background predictors. This suggests that to delay marriage is to delay the first birth; hence, relevant policies aiming at limiting family size should give more emphasis on the determinants of age at first marriage than on the determinants of age at first birth. As a matter of fact, wife's education and her pre-marital work experience, as the major determinants of age at first birth aside from age at first marriage, are also major determinants of age at first marriage. Development of policies which break the strong link between age at first marriage and age at first birth, especially for women who marry young, would also seem in order. Encouragement of continuing active employment for several years after marrying would be such a policy.

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8 Determinants of the Timing of Births in the Philippines

Josefina Valera-Cabigon

8.1 INTRODUCTION

Most studies on the determinants of Philippine fertility have placed a heavy emphasis on the outcome of the childbearing process, with cumulative fertility or children ever born as the dependent variable. An analysis of childspacing by Rindfuss and Bumpass (1979) and by Bumpass, Rindfuss, Palmore, Concepción and Choi (1982) has been carried out using the National Demographic Survey 1973 (NDS). The main focus of their study was the role of intermediate variables (infant mortality, foetal loss, contraception and breast-feeding) in mediating the effects of education on the timing or spacing of fertility.

Fertility is the result of a series of stages in the family building process which starts with the first birth and continues to the end of childbearing. In this paper, we extend the life-table analysis of this process presented in an earlier paper in this volume (chapter 5, The Timing and Spacing of Births: The Philippine Case) to a multivariate approach to improve our understanding of the determinants of the quantum and tempo of fertility. Our objective is, first, to examine the effects of social, economic and cultural variables on the timing of births and, secondly, to examine the role of intermediate variables in mediating these effects.

This paper is a complement to the paper, Determinants of Age at First Birth (chapter 7 of this volume); here we focus on the determinants of the length of the interval between marriage and first birth, and then continue on to consider higher birth intervals.

8.2 METHODOLOGY

To examine the determinants of birth spacing, we turn from life-table techniques to multivariate procedures. Conventional life-table analysis is bivariate and is not the ideal approach if our main concern is to measure the net effect of social, economic, cultural, demographic and intermediate variables upon the pace of fertility. However, it must be recognized that there are aspects of the fertility process which the life-table method is well suited to handle. Foremost is the untangling of the two interrelated components, the *quantum* and *tempo* of fertility. Hence, the life-table approach and the multivariate procedure we use here supplement each other in enabling the researcher to understand better the dynamics of fertility behaviour.

In the life-table analysis we focus our attention on both the quantum and the tempo of fertility simultaneously. Our main interest here is the latter. That is, we attempt to discover the factors that have direct and indirect effects on the *timing* or *lengthening* of a given interval. As in the life-table approach, we investigate the determinants of specific intervals one at a time (first interval, second interval, . . . , ninth interval), for all eligible women in the RPFS sample.

Two alternative means of measuring the dependent variable – length of interval – are discussed here. One is to use a continuous measure (length of the interval, with the sample restricted to those who have closed the interval). However, as discussed in chapter 5 and as empirically supported by Rodríguez and Hobcraft (1980), selectivity and censoring are two serious problems in interval analysis. Given the incomplete nature of birth interval data from a cross-sectional survey, the fact that the transition from parity i to i + 1 can only be studied for women who have reached parity i or more at survey date (who tend to be selected on a number of characteristics and are not representative of the total population) creates a serious selectivity problem for the present analysis. That is, limiting the analysis to those who have

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closed a given interval will always result in selectivity in the type of women to be included and excluded. Closely related is censoring, which is essentially curtailment of exposure to having the first birth, second birth, . . . , etc by the interview. Ignoring the fact that some of the intervals open at the survey date will eventually be closed leads to serious underestimation of the length of the interval.

Another approach is to use a dichotomous indicator fixed at certain durations of the interval (eg 18, 30, and 42 months) as the dependent variable. Respondents are scored as having closed or not having closed the interval by these durations. For the overall sample, these dichotomous indicators show the proportion closing the interval within durations chosen. As long as the overall proportion stays between 20 to 80 per cent, the indicators are statistically acceptable for use in ordinary least squares estimation. The chosen cut-off points, nevertheless, should be free from effects of the misreporting of dates. For instance, if there is a tendency for women to heap at months such as 12, 18, 24, and so on, then there would be a serious drawback in choosing these as cut-off points. However, this can be easily handled by first evaluating the data as to whether or not such heaping is present. Likewise, it is advisable to use more than one cut-off point, yielding more than one dependent variable, to ensure that the outcome of the analysis is not affected by the selected cut-off points. This strategy takes account of some of the selectivity and censoring problems, although there are still some women excluded.

In the present analysis, the second approach was adopted. It must be noted that during the exploratory stage of this project, the first strategy was tested. Because of the selectivity and censoring effects no meaningful patterns came out. Likewise, a further examination of the birth history data to discover heaping errors in months yielded no substantial presence of such a distortion. The evaluation substantiates Reyes' findings (1981) in her detailed evaluation of the RPFS 1978 birth history data.

The cut-off points adopted in the exploratory stage were 18, 30 and 42 months. That is, three regression equations per interval were explored with the dependent variables measured as follows:

1 First regression
  1 = interval $\geqslant$ 18 months
  0 = interval $<$ 18 months
2 Second regression
  1 = interval $\geqslant$ 30 months
  0 = interval $<$ 30 months
3 Third regression
  1 = interval $\geqslant$ 42 months
  0 = interval $<$ 42 months

Cases with intervals from the event to the date of interview less than the adopted cut-off points were excluded from the analysis. (Bumpass *et al* (1982), who use an approach similar to ours, only exclude one-half of the cases with intervals terminated by interview, by a random procedure.)

Results from such exploration indicated that for all intervals, 42 months as cut-off came out as a very poor measure, perhaps because it has a highly skewed distribution. Hence in this paper we present results using 18 months and 30 months as cut-off points. Likewise not all intervals showed meaningful associations between the relevant predictors and controls (to be explained below). For comparability with the findings from the life-table analysis of chapter 5, results of the multivariate analysis presented in this report are confined to the first, second, fourth and seventh intervals. (The results also hold true for the third and fifth intervals.)

Independent variables examined in the present analysis are the following:

A Social, economic and cultural variables
1 Childhood place of residence
2 Wife's education
3 Husband's education
4 Husband's occupation
5 Work within the interval

B Intermediate variables
1 Infant mortality within the interval
2 Foetal loss/spontaneous abortion within the interval
3 Contraceptive use within the interval
4 Breastfeeding within the interval

Work within the interval is available per interval from first to sixth intervals for all ever-married women. Infant mortality, foetal loss/spontaneous abortion *after* the birth which initiates the interval are available for all of the birth intervals for women with at least one live birth. Use of contraception and breastfeeding are measured only for the last two pregnancy intervals for each respondent. The nominal classification of the husband's occupation was transformed into a

quantitative classification utilizing the results of a previous study by the author, in which a socio-economic index for occupations in the Philippines was created using canonical correlation analysis (see Cabigon 1980b). The high correlation among the three predictors, wife's education, husband's education, and husband occupational socio-economic status score, needs to be mentioned. The zero-order correlation between wife's education and husband's education for the sample for most intervals was 0.7. For husband's occupational SES and his education the corresponding value was 0.6 and for wife's education and husband's occupational index, the correlation was 0.5. Such correlations are still far below the cut-off point, 0.8, at which, as a rule of thumb, two variables should not be considered as separate independent variables in multivariate analyses to avoid serious biases caused by multicollinearity. Thus, all three were considered as separate predictors. Nevertheless, with the three variables together so highly correlated the multicollinearity effect may be greatly distorting the estimated coefficients, and we take this into consideration in the interpretation of the effects.

Guided by the results of the life-table analyses wherein relative age, cohort and calendar period showed substantial effects on the quantum and tempo of fertility, these variables were regarded as controls in the multivariate analysis. In analysing contraceptive failure in the United States, Ryder (1973) and Vaughan, Trussell, Menken and Jones (1977) considered relative age as a control variable to take into account the effects of both parity and age. But Rodríguez and Hobcraft (1980) discovered that in the analysis of the timing of births, relative age did not account for all the effect of parity on subsequent fertility. Results from our life-table analysis of the RPFS shared the same finding and, thus, we include parity and age (entered as a continuous variable) as controls.

In analysing the relationship between breastfeeding and fertility using the same set of RPFS data, Zablan (1981: 145) found that after holding constant the socio-economic-demographic background variables, breastfeeding increased the last closed birth interval by at least the same length (3.0 months) as contraceptive use (3.1 months). On the basis of this we include breastfeeding in the present study, in the attempt to see the unique effect of the other predictors under consideration.

Since the correlations among some of the independent variables are considered to be causal — for instance, work within the interval is likely to be the result of having a certain level of education — a hierarchial, multiple regression strategy was adopted. This basic model may be summarized as follows. The timing of the next event (birth) is postulated to be a consequence of (1) demographic characteristics, (2) measured socio-economic characteristics, (3) intermediate variables, and (4) a great variety of unmeasured characteristics called 'residuals'. The demographic variables include relative age, cohort, calendar period and parity, and they are considered as controls in the model. Interest shall focus on the direct and indirect effects of the socio-economic and intermediate variables on the timing of the next event in the childbearing process. In this approach, a given variable or block of variables is added in single steps to the regression equation following the sequential order from numbers (1) to (3) as specified above. The increment in R^2 (or in the explained sum of squares) at each step is taken as the component of variation attributable to the particular variable or block of variables added on that step. Significance of each variable is tested by the F-ratio calculated in accordance with the hierarchial method. The test for the significance of a given predictor would reflect both its indirect influence through those predictors that succeed it in the hierarchial order and its direct influence on the dependent variable. In other words its total influence is reflected. For instance, since work within the interval follows the demographic controls and education-occupation characteristics in the hierarchy, it is tested without adjusting for the subsequent variables. The sum of squares attributable to it would include not only its direct influence on the length of interval but also that portion due to its indirect influence through the infant death → length of interval path, the foetal loss/spontaneous abortion → length of interval path, the breastfeeding → length of interval path, the family planning use → length of interval path and the breastfeeding → family planning use → length of interval path.

Information on each of the independent variables is not available for the total sample, and thus two sets of subsamples are analysed. Information on all predictors except breastfeeding and family planning (FP) use are available for 9257 ever-married women. (The sample was reduced from 9268 to 9257 because 11 cases had unclear ID numbers in the separate RPFS file from

which the work variable was obtained.) With this first sample, relative age, calendar period and cohort are entered into the regression equation as controls. Parity is not included in the regression equation. Rather, separate regression analyses are performed for women at parities 0–4 and at parities greater than four, as well as analyses of women at all parities. Because information on breastfeeding and FP use is only available for the last two pregnancy intervals for each woman, the sample for the analysis including these variables is restricted. For each interval, only those women for whom the birth initiating the interval is their last or next-to-last birth are eligible. Both sets of samples are, naturally, limited to those women who have attained the birth which initiates the interval, for example, women with three or more live births when we analyse the fourth interval. Because of this eligibility criterion, the sample for higher-order intervals is smaller.

We note, finally, that in the sets of regressions with these two samples, the education and occupation variables are treated differently. With the larger sample, they are entered as categorical variables; with the smaller samples when breastfeeding and FP use are incorporated, they are entered as continuous variables and a linear effect is assumed.

8.3 FINDINGS

The determinants of the first birth interval are analysed first. Because the 30 months cut-off point yielded a highly skewed distribution, only the 18 months cut-off point was analysed as the dependent variable. Table 8.1 presents the results of estimating three models in the hierarchical framework, not controlling and controlling for parity. Holding constant cohort, calendar period and age at first marriage, childhood place of residence is not statistically significant for the total sample, but it does significantly affect the length of the first interval for low parity women (four children and less) with urban women having a shorter interval. However, this effect is almost completely mediated by the education of both the wife and the husband and work within the interval, as evidenced by the sudden decrease of the deviations by almost a third. This indicates that the effect of social background on the length of first birth interval is very modest, although it remains significant.

Model 2 adds the three socio-economic variables. When all women are considered, all three are statistically and substantially significant. But, among low parity women, the husband's education is the only significant variable and, among the high parity women, it is the wife's education that stands out. Their effects are not substantially reduced when work experience is introduced. Such observations are further supported when we turn to the interpretation of the unstandardized (metric) regression coefficients as shown below:

Parity	Model 2	Model 3
All EMW		
Wife's education (WEDUC)	−.0047*	−.0052*
Husband's education (HEDUC)	−.0045*	−.0046*
Husband's occupation (HOCC)	−.0056*	−.0006*
EMW with parity < 4		
WEDUC	−.0016	−.0022
HEDUC	−.0099*	−.0102*
HOCC	.0004	−.0005
EMW with parity ⩾ 5		
WEDUC	−.0111*	−.0112*
HEDUC	.0017	.0017
HOCC	.0003	.0004

*Significant at 0.05 level.

It appears that the effects of education on the length of first birth interval are direct, and not by way of work experience patterns. Surprisingly, the pattern of association is contrary to the expectation of a positive relationship. Relevant to this surprising finding is the analysis of age at first birth in chapter 7 of this volume. There we estimate regressions without and with age at first marriage, and we find the following:

1 Wife's and husband's education significantly affect age at first birth in the expected positive direction when age at first marriage was not included in the model;
2 When age at first marriage was introduced in the regression equation, it practically mediated all the influence of all other socio-economic background variables on age at first birth; and
3 A very modest direct but significant effect of wife's education on age at first birth remained but the relationship was inverse.

The third finding is consistent with what is emerging in the present analysis. Such analysis indicates that the main factor delaying the first birth is marriage. However, in the life-table analysis, it turned out that the earlier the age at first marriage, the longer the first birth interval. However, this relationship could not be stated unequivocally due to the incidence of pre-marital conceptions which appeared to be increasing with

Table 8.1 Deviations from the grand mean of the probability (in per cent) of first birth interval greater than 17 months by parity

Variable and categories	All (grand mean = 33.2)				Parity ⩽ 4 (grand mean = 33.2)				Parity ⩾ 5 (grand mean = 33.3)			
	Model				Model				Model			
	1	2	3	(N)	1	2	3	(N)	1	2	3	(N)
Childhood place of residence												
Urban	− .8	.1	.2	2125	−2.9	−1.0	−1.0	1209	.6	1.6	1.8	916
Rural	.3	− .0	− .0	5438	1.3	.5	.5	2577	− .2	− .5	− .6	2860
Wife's education												
No schooling		12.0	11.6	415		12.5	12.2	116		11.6	11.4	299
Primary		2.1	2.1	1916		.4	.2	681		3.4	3.4	1234
Elementary		−2.4	−2.3	2807		−1.4	−1.2	1361		− 3.0	− 3.0	1446
High school		−1.0	− .7	1532		.6	1.0	948		− 4.8	− 4.5	584
Some college		−1.5	−1.6	330		1.6	1.6	257		−12.9	−12.7	73
College and over		.4	−1.6	563		−1.7	−3.1	423		2.8	2.0	140
Husband's education												
No schooling		8.4	8.0	386		8.4	8.5	116		6.6	6.0	270
Primary		.4	.6	1989		4.9	5.0	740		− 1.9	− 1.8	1249
Elementary		− .2	− .2	2318		− .1	− .1	1134		.2	.2	1184
High school		−1.9	−1.7	1817		−2.6	−2.4	1061		− 1.0	− .9	756
Some college		.6	− .7	493		−2.3	−2.4	326		3.4	3.4	167
College and over		.0	− .6	560		−2.3	−2.9	409		3.9	3.5	150
Husband's occupation												
Lowest		.3	.2	1966		− .6	− .7	876		1.5	1.5	1089
		− .7	.4	1892		1.7	1.3	777		− 1.8	− 2.2	1115
		.3	−1.2	1851		1.7	1.9	994		− 1.1	.9	856
Highest		.1	.6	1854		−2.2	2.0	1139		1.9	2.1	716
Worked within the interval?												
Yes			4.2	2177			4.4	1203			3.2	974
No			−1.7	5375			−2.1	2579			− 1.1	2796
R^2 with regression on demographic controls (%)	3.3				4.3				6.5			
R^2 with the variable(s) entered into the model + demographic controls (%)	3.3	4.2	4.5		4.5	5.5	5.9		6.5	8.0	8.2	

age at first marriage across older cohorts. It seems more likely then that the inverse relationship between education and length of first birth interval is partly due to pre-marital conceptions occurring among those with higher education and whose childhood place of residence is urban. It may be possible that among such women in order to have their first births within marriage, although pre-maritally conceived, they had to hurry getting formally settled. Another interpretation would be that it may be possible that the modest direct inverse effect of education on the length of interval may matter quite a bit but its effect is mostly indirect via age at first marriage. Placing age at marriage prior to these variables rather than after them in the model causes the sign to be negative as a result of the close association between age at first marriage and age at first birth.

Work within the interval is introduced in the final model. Net of all prior variables, this variable significantly lengthens the first interval by 4 per cent. The patterns for low and high parity women are similar.

We now examine the factors affecting the second interval. Deviations from the mean proportion with a second interval greater than 17 months, for the whole sample without and with parity used as control, are displayed in table 8.2. In table 8.3 are the corresponding estimates for women at parity 2 or at parity 1 and currently pregnant.

Childhood place of residence has a strong influence on the timing of the second birth regardless of whether women are at low or high parity at the time of interview. The resulting association is inverse, as also observed among the low parity women in relation to the first birth interval. But with the addition of all the other variables (models 2–4, table 8.2) its effect gradually decreases. This indicates that although it has a direct effect on shortening the second interval, most of its effect is indirect. In table 8.3, with the restricted sample, it is statistically insignificant.

Considering the three highly interrelated socio-economic characteristics in model 2, table 8.2, we see that they are highly significant regardless of whether the respondents are at low or high parity at time of survey. Even with the introduction of work, infant death and foetal loss/spontaneous abortion within the interval, the effects of these socio-economic characteristics are not substantially affected. This implies that their influence on the second birth interval is more direct than indirect. However, the effect of education is again negative, as seen by the negative signs on the deviations for higher education (table 8.2) and on the unstandardized metric regression coefficients (table 8.3). The most likely explanation would be that although the effect is direct on the length of the second interval, the sign was reversed due to the prior control for age at first birth, indicating again the high association between age at first birth and the timing of the second birth.

Working between the first and second birth significantly increases the proportion with the second interval greater than 17 months by 3 per cent. The effect is stronger for women at low parity. Adding infant mortality and foetal loss in the model (table 8.2) and together with breastfeeding and use of FP within the interval (table 8.3) does not alter this effect, signifying that its effect on the timing of the second birth is direct.

Experiencing the death of the first birth at infancy substantially and significantly shortens the second birth interval among all women at any given parity. This indicates a straightforward effect of shortening the interval for physiological reasons: breastfeeding is shortened. Unfortunately, the data do not allow further investigation of its direct and indirect effects via breastfeeding. The number of cases involved in testing such relationships (table 8.3) is very small. This holds true for the 30 months cut-off measure as well as for measures for the higher birth intervals.

Foetal loss/spontaneous abortion is statistically insignificant for all women taken together and for women of low parity. But it is statistically significant for women of high parity with 18 months as the cut-off measure of the dependent variable (table 8.2).

Due to the small number of cases involved when breastfeeding and FP use are added in the model (table 8.3), nothing can be said further about its influence on the timing of the second birth.

When breastfeeding is entered as a linear covariate in the model (table 8.3) its effect is highly significant and unchanged with the introduction of FP use in the final model, implying that it substantially delays the occurrence of the second birth. Similar conclusions can be postulated for FP use. That is, FP use within the interval significantly prolongs the second birth interval.

Turning now to the indicator of the length of the second birth interval based on the 30 months cut-off, (table 8.4) similar findings as for the

Table 8.2 Deviations from the grand mean of the probability (in per cent) of second birth interval greater than 17 months, by parity

Variable and categories	All (grand mean = 73.1)					Parity ⩽ 4 (grand mean = 74.6)					Parity ⩾ 5 (grand mean = 72.0)				
	Model					Model					Model				
	1	2	3	4	(N)	1	2	3	4	(N)	1	2	3	4	(N)
Childhood place of residence															
Urban	−3.3	−1.6	−1.0	− .9	1876	−3.0	− .4	− .3	− .2	919	−3.8	−1.8	−1.7	− 1.7	958
Rural	1.2	.6	.4	.3	4944	1.2	.2	.2	.1	1986	1.2	.6	.5	.5	2958
Wife's education															
No schooling		4.1	−4.3	− 4.6	411		−5.7	−5.6	− 4.8	93		−4.4	−4.3	− 4.9	319
Primary		.7	.4	.6	1235		3.9	3.8	3.7	587		− .9	− .9	− .6	1283
Elementary		2.0	2.0	2.0	2527		1.4	1.7	1.6	1038		2.0	2.9	2.8	1489
High school		−2.1	−1.8	− 1.5	1929		−1.8	−1.4	− 1.4	684		−2.2	−2.1	− 2.2	608
Some college		−2.4	−2.2	− 2.0	254		−1.8	−2.0	− 1.7	180		−5.6	−5.4	− 5.3	75
College and over		−2.9	−2.8	− 3.8	464		−5.1	−6.9	− 6.7	323		− .3	− .7	− 1.1	142
Husband's education															
No schooling		3.7	2.7	3.0	387		−6.2	−6.3	− 4.9	102		5.7	5.4	5.6	284
Primary		2.3	1.7	1.9	1860		3.2	3.1	3.4	570		1.5	1.6	1.5	1298
Elementary		.3	.4	.6	2086		1.2	1.2	1.5	864		− .0	− .1	− .1	1222
High school		−2.6	−2.0	− 2.0	1599		−2.4	−2.0	− 2.3	813		−2.1	−2.1	− 2.1	785
Some college		−1.8	−1.3	− 2.4	425		− .1	− .2	− 1.2	254		−3.5	−3.5	− 4.4	172
College		−3.0	−3.1	− 3.8	457		−1.0	−1.4	− 1.8	302		−8.0	−8.2	− 8.2	155
Husband's occupation															
Lowest		2.3	2.2	2.1	1786		4.6	4.4	4.2	667		1.5	1.4	1.4	1119
↓		1.1	.8	1.0	1761		2.0	1.5	1.5	596		.7	.6	1.0	1165
		−3.4	−3.2	− 3.3	1663		−3.3	−3.2	− 3.3	766		−3.3	−3.1	− 3.3	897
Highest		− .3	− .0	− .1	1610		−1.9	−1.6	− 1.3	876		.7	.8	.4	735
Worked within the interval?															
Yes			3.2	3.1	1964			4.8	4.5	883			1.3	1.4	1083
No			1.3	− 1.3	4844			−2.1	− 2.0	2018			− .4	− .5	2826
Infant death within the interval?															
Yes				−27.9	364				−27.2	116				−27.4	248
No				1.7	6445				1.1	2787				2.0	3659
Foetal loss/spontaneous abortion within the interval?															
Yes				− .8	367				2.6	182				− 4.1	185
No				.0	6453				− .2	2723				.2	3731
R^2 with regression on demographic controls (%)	1.0					2.4					1.9				
R^2 with the variable(s) entered into the model + demographic controls (%)	1.2	1.9	2.1	4.5		2.7	4.4	4.9	6.6		2.1	2.9	2.9	5.7	

Table 8.3 Deviations from the grand mean of the probability (in per cent) of second birth interval greater than 17 months, parity 2 or parity 1 and currently pregnant

Variable and categories	Grand mean = 82.7					
	Model					
	1	2	3	4	5	N
Childhood place of residence						
Urban	−1.4	.6	1.0	1.7	1.6	152
Rural	.2	− .3	− .5	− .9	− .8	302
Wife's education[a]		− .6	− .9	− .7	− .9	
Husband's education[a]		.6	.8	1.0[b]	.9	
Husband's occupational index[a]		− .2[b]	− .2[b]	− .2[b]	− .2[b]	
Worked within the interval?						
Yes			7.4	7.8	7.4	155
No			−3.9	−4.1	−3.9	298
Infant death within the interval?						
Yes				*	*	7
No				.0	.0	447
Foetal loss/spontaneous abortion within the interval?						
Yes				b	b	35
No				− .3	− .3	419
Duration of breastfeeding within the interval[a]				.7[c]	.7[c]	
Use of FP within the interval?						
Yes					4.4	171
No					−2.7	283
R^2 with regression on demographic controls (%)	5.2					
R^2 with variable(s) added to the model with demographic controls (%)	5.2	6.4	8.3	9.9	10.6	

*Less than 50 cases in this category.
[a]Unstandardized (metric) regression coefficient.
[b]Significant at 0.05 level.
[c]Significant at 0.001.

18 months cut-off hold true for childhood place of residence. That is, the negative direct influence of childhood place of residence on the timing of the second birth persists but to a smaller extent, as shown by the negligible deviations as a result of its mediation by other variables. In other words, the indirect influence of childhood place of residence on the length of the second interval is clearer with 30 months as a cut-off.

Among the three socio-economic characteristics (wife's education, husband's education and husband's occupation) only wife's education significantly affects the timing of the next birth without breastfeeding and FP use in the model (table 8.4). This holds true for low and high parity women. Even with the introduction of work, infant mortality and foetal loss, the negative association remains. It must be reiterated that

Table 8.4 Deviations from the grand mean of the probability (in per cent) of second birth interval greater than 29 months, by parity

Variable and categories	All (Grand mean = 24.6)					Parity ⩽ 4 (Grand mean = 29.6)					Parity ⩾ 5 (Grand mean = 21.3)				
	Model					Model					Model				
	1	2	3	4	(N)	1	2	3	4	(N)	1	2	3	4	(N)
Childhood place of residence															
Urban	−1.5	− .3	− .2	− .2	1775	−2.6	− .2	− .1	− .1	817	−2.1	− .4	− .3	− .3	958
Rural	.6	.1	.1	.1	4705	1.2	.1	.0	.0	1747	.6	.1	.1	.1	2958
Wife's education															
No schooling		4.2	4.3	4.2	403		8.0	7.9	8.5	84		−3.3	3.4	3.3	319
Primary		− .5	− .4	− .3	1804		4.0	3.8	3.7	523		−1.6	−1.6	− 1.5	1283
Elementary		.5	.7	.7	2413		− .8	− .5	− .7	923		2.2	2.2	2.1	1489
High school		−1.7	−1.1	− 1.2	1220		−2.9	−2.3	− 2.2	592		−1.3	−1.1	− 1.2	608
Some college		− .7	− .6	− .4	229		− .2	− .3	− .2	154		−5.8	−5.5	− 5.4	75
College and over		− .6	−2.7	− 2.7	430		− .8	−2.6	− 2.5	288		−7.4	−7.9	− 7.9	142
Husband's education															
No schooling		5.3	4.8	5.1	378		−3.5	−3.5	− 2.5	94		7.8	7.5	7.7	284
Primary		.5	.5	.6	4811		3.9	3.8	4.1	504		− .1	− .1	− .1	1298
Elementary		− .5	− .5	− .4	1974		−1.2	−1.2	− 1.1	752		.1	.1	.1	1222
High school		−1.2	−1.1	− 1.1	1504		−1.1	− .7	− .8	719		−2.1	−2.1	− 2.1	785
Some college		−2.2	−2.2	− 2.7	393		− .8	− .9	− 1.5	222		−5.3	−5.2	− 5.6	172
College and over		2.0	1.5	1.3	428		1.0	.2	− .3	273		2.3	2.1	2.0	155
Husband's occupation															
Lowest		.4	.2	.2	1685		2.7	2.5	2.4	566		− .2	− .2	− .3	1119
↓		1.8	1.3	1.4	1704		3.0	2.3	2.1	539		1.4	1.2	1.4	1165
↓		−2.6	−2.3	− 2.3	1571		−2.8	−2.6	− 2.5	675		−2.2	−2.1	− 2.2	897
Highest		.3	.7	.6	1520		−1.6	−1.1	− 1.1	784		.8	1.0	.8	735
Worked within the interval?															
Yes			3.8	3.8	1860			6.0	6.0	778			1.5	1.5	1083
No			−1.5	− 1.5	4609			−2.6	− 2.6	1782			− .5	− .5	2826
Infant death within the interval?															
Yes				−12.4	351				−11.3	103				−11.6	248
No				.8	6119				.5	2459				.8	3659
Foetal loss/spontaneous abortion within the interval?															
Yes				− 2.7	335				− 6.9	150				− .1	185
No				.1	6145				.4	2414				.0	3731
R^2 with regression on demographic controls (%)	.9					4.7					2.6				
R^2 with the variable added to the model with demographic controls (%)	.9	1.4	1.8	2.3		4.9	6.1	6.8	7.2		2.7	3.6	3.8	4.4	

because age at first birth is highly associated with age at second birth, the negative sign is due to placing age at first birth into the model as a control. Surprisingly, when breastfeeding and FP use are finally added to the model with the subsample of women at parity 2 or at parity 1 and currently pregnant (table 8.5) the effect of wife's education is positive and the effect of husband's education is positive and significant. In this case, the expected positive relation comes out because age at first birth does not have any significant effect on age at second birth. This is a further indication that when relative age is controlled and if it is significantly affecting the interval, it reverses the expected positive relation between education and length of interval.

The substantial and significant effect of work within the interval is maintained and remains unaltered with the introduction of infant mortality and foetal loss (table 8.4) plus breastfeeding and FP use (table 8.5). Even the intermediate variables maintain their significant direct effect on the timing of the second birth using the 30 months as cut-off.

Table 8.5 Deviations from the grand mean of the probability (in per cent) of second birth interval greater than 29 months, parity 2 or parity 1 and currently pregnant, RPFS 1978

Variable and categories	Grand mean = 45.7				
	Model				
	1	2	3	4	(N)
Childhood place of residence					
Urban	−7.2	−9.9	−9.5	−7.8	104
Rural	4.1	5.7	5.4	4.5	180
Wife's education[a]		1.0	1.0	1.3	
Husband's education[a]		1.3	1.3	2.1[b]	
Husband's occupation index[a]		− .1	− .1	− .2	
Worked within the interval?					
Yes			7.1	7.0	97
No			−3.7	−3.6	187
Had infant death within the interval?					
Yes				*	2
No				.2	282
Had foetal loss/spontaneous abortion within the interval?					
Yes				*	19
No				.3	265
Duration of breastfeeding within the interval[a]				1.7[c]	
Use of FP within the interval?					
Yes				4.0	108
No				−2.5	176
R^2 with regression on demographic controls (%)	6.0				
R^2 with variable(s) added to the model with demographic controls (%)	7.1	8.9	9.9	15.5	

*Less than 50 cases in this category.
[a]Unstandardized (metric) regression coefficient.
[b]Significant at 0.05 level.
[c]Significant at 0.001 level.

Table 8.6 Deviations from the grand mean of the probability (in per cent) of fourth birth interval greater than 29 months, by parity

Variable and categories	All (grand mean = 34.0)				Parity ⩽ 4 (grand mean = 48.7)				Parity ⩾ 5 (grand mean = 32.0)			
	Model				Model				Model			
	1	2	3	(N)	1	2	3	(N)	1	2	3	(N)
Wife's education												
No schooling	8.3	9.3	9.3	354	19.4	18.8	18.9	22	7.8	9.0	9.0	332
Primary	.8	.7	.7	1444	3.5	3.6	3.6	105	.9	.8	.8	1337
Elementary	−2.4	− 2.3	− 2.3	1725	−1.1	− .8	− .8	187	−2.3	− 2.3	− 2.3	1538
High school	1.4	1.2	1.2	776	.0	− .2	− .2	138	1.1	.9	.9	638
Some college	5.3	5.0	5.0	105	1.6	1.2	1.1	26	5.5	5.4	5.4	80
College and over	−7.3	− 7.9	− 7.9	215	−8.9	− 9.3	− 9.3	70	−9.3	− 9.9	− 9.6	146
Husband's education												
No schooling	2.8	2.5	2.5	326	−9.0	− 4.4	− 7.0	23	4.1	3.7	3.7	303
Primary	− .3	.1	.1	1419	.3	2.9	.5	81	.4	.7	.7	1339
Elementary	− .1	− .4	− .4	1435	−4.4	− 2.3	− 4.7	170	.2	− .1	− .1	1265
High school	− .0	− .4	− .4	980	1.1	3.4	1.1	161	−1.4	− 1.3	− 1.3	818
Some college	−3.9	− 4.0	− 4.0	227	−2.8	− 1.1	− 2.5	46	−4.7	− 4.8	− 4.8	181
College and over	4.3	3.9	3.9	232	13.2	15.0	12.8	67	.2	− .2	− .2	165
Husband's occupation												
Lowest	.7	.7	.7	1239	3.8	4.2	4.2	99	.7	.7	.7	1139
↓	2.5	2.5	2.5	1311	5.2	5.1	5.2	108	2.4	2.4	2.4	1203
	−1.5	− 1.6	− 1.6	1108	−1.1	− 1.2	− 1.2	148	−1.7	− 1.8	− 1.8	960
Highest	−2.6	− 2.5	− 2.5	961	−4.0	− 4.1	− 4.1	193	−2.6	− 2.6	− 2.6	769
Worked within the interval?												
Yes		.9	.9	1471		1.0	1.0	198		.7	.7	1273
No		− .4	− .4	3138		− .5	− .5	347		− .3	− .3	2790
Infant death within the interval?												
Yes		−17.0	−17.0	272		−18.5	−18.3	23		−16.6	−16.6	249
No		1.1	1.1	4341		.8	.8	525		1.1	1.1	3816
Foetal loss/spontaneous abortion within the interval?												
Yes			.1	202			1.6	31			− .1	172
No			− .0	4417			− .1	517			.0	3899
R^2 with regression on demographic controls (%)	.3				.0				.1			
R^2 with the variable(s) entered into the model + demographic controls (%)	1.1	2.1	2.1		1.9	2.6	2.6		1.3	2.2	2.2	

Table 8.7 Deviations from the grand mean of the probability (in per cent) of fourth birth interval greater than 29 months, parity 4 or parity 3 and currently pregnant

Variable and categories	Grand mean = 48.8				
	Model				
	1	2	3	4	(N)
Wife's education[a]	−1.8[b]	−1.9[b]	−1.6[b]	−1.9[b]	
Husband's education[a]	.4	.4	.8	.7	
Husband's occupational index[a]	.0	.0	.1	.1	
Worked within the interval?					
Yes		3.2	2.7	2.6	141
No		−1.6	−1.3	−1.3	259
Had infant death within the interval?					
Yes			*	*	7
No			.2	.2	394
Had foetal loss/spontaneous abortion within the interval?					
Yes			b	b	23
No			.1	.1	378
Duration of breastfeeding within the interval[a]			1.3[c]	1.3[c]	
Use of FP within the interval?					
Yes				8.1	140
No				−4.3	261
R^2 with regression on demographic controls (%)	.0				
R^2 with variable(s) added to the model + demographic controls (%)	1.6	1.9	4.8	6.1	

*Less than 50 cases in this category.
[a]Unstandardized (metric) regression coefficient.
[b]Significant at 0.05 level.
[c]Significant at 0.001 level.

We now consider the determinants of the fourth interval. Results are depicted in table 8.6 for all women and by parity and in table 8.7 for women at parity 4 or at parity 3 and currently pregnant. For this interval, for only the 30 months cut-off did the overall proportion fall within the 20 to 80 per cent range, and hence only the analysis of this is presented. Childhood place of residence was dropped because it had no bearing on the dependent variable in the preliminary analysis.

Among the three highly related variables, (wife's education, husband's education and husband's occupation) only wife's education statistically and significantly affected the timing of the fourth birth at any given parity. This effect was not altered even when all the succeeding variables were introduced (tables 8.6 and 8.7). However, since age at third birth significantly affects the length of the fourth interval, the negative association between education and length of the interval is observed.

Work within the interval is not a strong factor affecting the fourth interval. Its effect in the models in tables 8.6 and 8.7 is statistically unimportant. The same can be said for foetal loss/spontaneous abortion. However, it is worth noting that the effect of foetal loss/spontaneous abortion on the timing of the *fifth* birth (results not shown here) is significant.

Infant mortality within the interval (table 8.4), breastfeeding and FP use (table 8.7) substantially and significantly affect the timing of the fourth birth, each in the expected duration.

Let us now turn to the last interval under consideration, the seventh interval. Table 8.8 manifests the results of the five sub-models run for all women. For this interval only the 30 months

Table 8.8 Deviations from the grand mean of the probability (in per cent) of seventh birth interval greater than 29 months

Variable and categories	Grand mean = 34.8					
	Model					
	1	2	3	4	5	(N)
Childhood place of residence						
Urban	− .1	.5	.6	.7	.8	442
Rural	.0	− .2	− .2	− .2	− .2	1453
Wife's education						
No schooling		3.7	3.8	4.8	4.8	209
Primary		.5	.4	.4	.4	698
Elementary		.1	.1	− .0	− .1	676
High school		− 2.9	− 3.1	− 3.7	− 3.3	246
Some college		−13.5	−13.3	−12.1	−12.4	22
College and over		− 3.8	− 2.3	− 2.1	− 1.9	44
Husband's education						
No schooling		1.3	1.9	1.1	1.2	170
Primary		− 2.4	− 2.3	− 2.7	− 2.6	694
Elementary		− .0	− .0	.4	.4	556
High school		2.7	2.4	2.7	2.5	366
Some college		1.2	.6	1.2	1.1	61
College and over		8.5	8.4	8.6	8.4	48
Husband's occupation						
Lowest		.2	.4	.7	.5	568
↓		1.2	1.4	1.6	1.8	593
↓		− 2.7	− 3.0	− 3.3	− 3.3	415
Highest		.8	.5	− .0	.0	319
Worked within the interval?						
Yes			− 2.2	− 2.1	− 2.0	732
No			1.5	1.4	1.3	1141
Infant death within the interval?						
Yes				−16.1	−15.1	117
No				1.2	1.1	1770
Foetal loss/spontaneous abortion within the interval?						
Yes					11.5	94
No					− .1	1801
R^2 with regression on demographic controls (%)	2.0					
R^2 with the variable(s) entered into the model + demographic controls (%)	2.0	2.4	2.6	3.4	3.7	

Table 8.9 Deviations from the grand mean of the probability (in per cent) of seventh birth interval greater than 29 months, parity 7 or parity 6 and currently pregnant, RPFS 1978

Variable and categories	Grand mean = 58.5					
	Model					
	1	2	3	4	5	(N)
Childhood place of residence						
Urban	−4.5	−4.0	−4.7	−7.7	−7.8	74
Rural	2.0	1.8	2.1	3.5	3.5	162
Wife's education[a]		1.8[b]	1.8[b]	2.4[b]	2.4[b]	
Husband's education[a]		1.4	−1.3	−1.2	−1.2	
Husband's occupational index[a]		− .1	− .1	− .1	− .1	
Worked within the interval?						
Yes			−6.1	−7.5	−7.5	83
No			2.8	3.8	3.8	147
Infant death within the interval?						
Yes				*	*	2
No				.1	.1	234
Foetal loss/spontaneous abortion within the interval?						
Yes				*	*	16
No				−1.7	−1.7	220
Duration of breastfeeding within the interval?[a]				1.6[c]	1.5[c]	
Use of FP within the interval?						
Yes					1.2	66
No					− .4	170
R^2 with regression on demographic controls (%)	6.6					
R^2 with variable(s) added to the model + demographic controls (%)	7.0	8.4	9.5	17.1	17.1	

*Less than 50 cases in this category.
[a]Unstandardized (metric) regression coefficient.
[b]Significant at 0.05 level.
[c]Significant at 0.001 level.

cut-off measure has an overall distribution within the 20–80 per cent rule of thumb. All the predictors considered in table 8.8 except infant mortality and foetal loss do not pass the statistical test of significance.

However, if we examine table 8.9 where the estimation is limited to women at parity 7 or at parity 6 and currently pregnant, wife's education and work within the interval come out statistically significant.

Due to the small number of cases involved for infant mortality and foetal loss/spontaneous abortion within the interval, no meaningful conclusions can be reached.

Breastfeeding again strongly affects the length of the interval. Family planning use is not statistically significant. This is not surprising, for women at parity 6 and over are more likely to be never users of family planning.

8.4 CONCLUSIONS AND IMPLICATIONS

The findings from the analysis of the determinants of timing of births suggest that childhood place or residence has a moderate, yet significant, effect upon the timing *only* of the first and second births. However, its effect is greatly mediated by the socio-economic characteristics and intermediate variables. Among the three highly correlated socio-economic variables (wife's education, husband's education and husband's occupation) wife's education seems to emerge as the best predictor for some intervals and husband's education for other intervals. The educational effects on the length of the interval are stronger than the social origin effects. However, both education and social origin appear to be inversely related to the length of the interval. This unexpected association is the result of the close association between the socio-economic variables, age at the initiation of the interval and the length of the interval. It seems that when age at the start of the interval is highly associated with the length of the interval, it causes negative regression coefficients for the social origin and education variables when entered first in the regression equation as a control. In cases where age at start interval has no effect on the length of the interval, the expected positive relationship between the social origin and education variables and length of the interval becomes clear. Such findings suggest the importance of a model as a guide in the interpretation of results and the importance of estimating two models, *with* and *without* the age at the start of the interval, in instances where it greatly affects the dependent variable under consideration. Likewise, such patterns of association of the three interrelated variables imply that two of them particularly, wife's education and husband's education, have a clearer and stronger influence on the timing of the next birth. We suggest that policies directed to ameliorate living conditions should not disregard the importance of education.

Age at first marriage substantially and significantly affects the timing of the first birth. It practically mediates all the influence of social origin and socio-economic variables, except work within the first interval which makes a significant contribution to the postponement of first births. These findings indicate that initial fertility in the Philippines is deferred by delaying marriage and by working after marriage and before the occurrence of the first birth. They also imply that policies aimed at limiting family size and, specifically, delaying the first birth should put emphasis on the determinants of age at first marriage as well as on factors that create opportunities for newly-married women to participate actively in the labour force.

Work within higher intervals makes a significant contribution to the lengthening of some selected intervals only (in the present study, the second and the seventh). This pattern suggests the difficulty of unravelling the work/fertility relationship. It appears that sometimes work affects fertility but not always, thus making it difficult to suggest relevant policy implications.

Infant mortality of the birth initiating the interval substantially and significantly shortens the length of any given interval. Although it is very obvious that such a pattern of effect is the result of physiological reasons (the shortening of breastfeeding), it may be possible that the eagerness to replace such birth plays a significant role. It would be more illuminating if such a hypothesis could be satisfactorily tested with our models. But the small number of the cases involved prevented such an investigation in the present study. Nevertheless, with such a remarkable impact of infant mortality on the shortening of the interval, there may be some need to redirect existing health care and nutrition programmes so that they focus on the major responsibility a mother faces to give birth to a healthy baby and bringing more and more of the population to better access to health care. Likewise, special education on first aid may be helpful in areas where a majority of residents have only elementary schooling. Furthermore, incorporation of instruction in health care combined with a family planning seminar as a requirement for getting a marriage licence may be useful.

As happens with regard to work within the interval, foetal loss/spontaneous abortion influences only selected intervals. It tends to delay the timing of the second and fifth births. Such findings imply that the level of foetal loss/spontaneous abortion in the country is low, thus causing no effect on the intervals under consideration.

Breastfeeding and FP use within the interval play a significant role in delaying the occurrence of the next birth. Such findings indicate the need for stronger efforts to be exerted by the national family programme to motivate mothers to breastfeed and to practise family planning for the welfare of the family and the country.

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9 The Effect of Marital Dissolution on Fertility

Eliseo A. de Guzman

9.1 INTRODUCTION

The dissolution of marriage due to widowhood, separation or divorce has been listed as one of the intermediate variables affecting the risk of conception (Davis and Blake 1965). Unless remarriage occurs immediately, the disruption of marriage shortens the time of exposure to the risk of pregnancy. Several studies have been made in various settings in which marital instability has been identified as a determinant of lower fertility, and loss of exposure to the risk of pregnancy was emphasized as the important direct causal variable (eg Lauriat 1969; Palmore and Ariffin 1969). Lauriat's (1969) examination of the effect of marital dissolution on American fertility revealed lower fertility among the widows and divorcees than the women in intact first marriages, with age at first marriage as the most important background variable explaining the variations. Goldstein, Goldstein and Piampiti (1973) in their analysis of data from the 1960 census of Thailand found that the cumulative fertility of married women with spouses present far exceeded that of women whose marriages had been disrupted by divorce or temporary absence of spouse. Similar findings were reported by Knodel and Prachuabmoh (1973) from the Longitudinal Study of Social, Economic, and Demographic Change in Thailand and Chamratrithirong (1980) from the 1970 census of Thailand. Currently married women were found to have the highest cumulative fertility, followed by the widowed with intermediate fertility, and the separated or divorced women with the lowest.

There are various issues which are related to the analysis of marital dissolution *vis-à-vis* fertility. One relates to the possibility that causality operates in both directions (Cohen and Sweet 1974). For example, couples with several offspring may be less inclined to dissolve a union than couples with few or no children. Simultaneously, marital disagreements may result in couples intentionally or unintentionally restricting their fertility. Further, the timing of dissolution may selectively remove women from their exposure to the risk of pregnancy at their most fecund years. Another difficulty arises from the confounding and obscuring effects of various variables, socio-economic or otherwise, which may produce spurious fertility differentials between women in undissolved marriages and those who experienced marital dissolution. Fortunately, techniques which enable an analyst to overcome this problem are available. Finally, marital dissolution is a relatively rare phenomenon and as such investigation of its dimensions is usually handicapped by limited sample size. This is especially true in the Philippines where marriage is largely stable.

In spite of these difficulties, there is some merit in investigating some of the dimensions of marital dissolution. An examination of the effects of marital dissolution will greatly enrich studies of changing patterns of marriage and fertility particularly in the Philippines where there is a dearth of material on the subject.

For ever-married women, the RPFS provides information on their current marital status and the status of their first marriage, whether still intact or dissolved, and if dissolved, the cause of dissolution. Classified by marital status, 95.6 per cent were currently married, 2.6 per cent were widowed, and 1.8 per cent separated or divorced. Classification by status of first union shows that 91.5 per cent (8480) had their first marriages still intact at the time of the survey, 4.7 per cent (436) had their marriages disrupted by the death of the husband (with 2.2 per cent remarried and 2.5 per cent not remarried), and 3.8 per cent (352) disrupted by separation or divorce (2.3 per cent remarried and 1.5 per cent never remarried).

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 117–121. Voorburg, Netherlands: International Statistical Institute.

9.2 EVIDENCE OF FERTILITY DIFFERENTIALS BY MARITAL STATUS

Differences in cumulative fertility and current fertility by current marital status and status of first union, controlling for age and years since first marriage, will be examined first. The children ever born data in table 9.1 show marked differences by current marital status. The fertility of currently married women was higher than that of the widowed, separated or divorced. Among the women not currently married, the widowed tended to have more children ever born than the separated or divorced. The above observations are true for all age groups. The total means show higher fertility among widows than among the currently married. This arises from the fact that greater numbers of widows are found in the older ages. The mean ages are 33.6, 42.3, and 33.3 years for the currently married, widowed, and separated or divorced, respectively. The age-standardized means show that the currently married women had an average of 4.6 children, followed by the widowed with 4.0 children, and the separated or divorced, 3.5 children. By the time the women reached the end of their childbearing period, women with their spouses present had borne 7.0 children, whereas the widowed and the separated or divorced had 6.7 and 5.7 children, respectively. The difference between the last two groups of women is due to the generally later occurrence of widowhood than separation. With increasing life expectancy, the age of widowhood is pushed farther to the older ages. On the other hand, the disruption by separation or divorce can be spread across the age spectrum. Hence, the above differences can be due to varying lengths of marital duration. However, the same pattern emerges when control is made for years since first marriage (table 9.2). The women in stable first marriages manifested the most number of children ever born.

In table 9.3, an attempt is made to clarify certain aspects which are somewhat concealed in table 9.1. It must be noted that the women who reported themselves as currently married were comprised of a mixture of women whose first marriages were still intact and of women whose first marriages were dissolved but remarried. Controlling for remarriage reveals a few interesting points. Among the youngest marriage cohort, the women whose first marriages were disrupted by

Table 9.1 Mean children ever born by current marital status and current age of woman

Age of woman	Currently married	Widowed	Divorced/separated
15–19	.85	–	*
20–24	1.90	*	1.39
25–29	2.97	*	2.51
30–34	4.30	3.73	2.89
35–39	5.72	4.51	4.05
40–44	6.80	5.90	5.53
45–49	7.05	6.70	5.70
All	4.58	5.50	3.50
Age standardized	4.62	4.04	3.54

*Less than 15 cases.
– No cases.

Table 9.2 Mean children ever born by status of first union and years since first marriage

Years since first marriage	Status of first union		
	Intact	Widowed	Separated
Less than 10 years	2.19	2.08	1.96
10–19 years	5.17	4.59	3.63
20–29 years	7.58	6.60	5.68
All women	4.55	5.74	3.99
Age standardized	4.66	4.17	3.59

Table 9.3 Mean children ever born by marital status changes and years since first marriage

Years since first marriage	First marriage intact	First marriage dissolved			
		Remarried		Not remarried	
		Widowed	Separated	Widowed	Separated
Less than 10 years	2.19	2.44	2.41	1.86	1.67
10–19 years	5.17	5.00	3.79	4.36	3.35
20–29 years	7.58	6.62	5.90	6.58	5.14
All women	4.55	5.98	4.64	5.52	3.00
Age standardized	4.66	4.43	3.89	4.04	3.18

the death of the spouse or separation exhibited more children than their counterparts with intact first marriages. This is a case where differences in exposure to the risk of pregnancy do not influence fertility very much because remarriage has occurred quickly. In the new marriage, the spouses are highly motivated to have their own children soon, regardless of the number of children from the first union. It may also be possible that having more children forced earlier remarriage. The standardized means show women with intact marriages having the most number of children, but only slightly higher than the number of remarried widows. Understandably, the women who remarried had higher fertility than their counterparts who did not remarry.

Current fertility represented by children born in the past five years by current marital status and status of first union is displayed in table 9.4. Evidently, irrespective of the measure of fertility used, cumulative fertility or current fertility, the women who were currently married or whose first marriages were still intact exhibited higher fertility than women with broken marriages.

Table 9.4 Mean number of children born in most recent five years per 100 ever-married women, by current marital status and status of first union

	Mean	Age-standardized
A Current marital status		
Currently married	101.4	119.6
Widowed	78.3	80.3
Separated	87.1	70.9
B Status of first union		
Marriage intact	121.4	119.4
Widowed	68.5	108.3
Separated	90.8	94.1

The effect of lost exposure arising from the disruption of marriage is very evident from table 9.5 where children ever born is classified by years lost due to the dissolution of marriage. The difference in means between those whose marriages were broken for five years or more and the rest of the women is very substantial.

9.3 MEASUREMENT OF IMPACT: RESULTS FROM MULTIVARIATE ANALYSIS

The effects of marital dissolution on fertility controlling for other potentially confounding variables will be evaluated. Because of the number of confounding variables and the limited number of cases experiencing marital disruption, multiple regression techniques will be used. We follow here the lead of Cohen and Sweet (1974) but add other background variables. For this analysis, the subsample is restricted to women aged 25 years and over at the time of interview, numbering 7769. Cumulative fertility or children ever born is regressed on a set of dummy variables representing status of first marriage (ie whether undissolved first marriage, or if not, whether ended in widowhood or in separation/divorce) and selected demographic and non-demographic background variables. For this subsample, the mean number of children ever born in undissolved first marriages is 4.79, whereas women whose first union was terminated by widowhood and separation or divorce had 5.46 and 4.04, respectively. Thus the women whose first union ended in widowhood had 0.37 children more, and those whose first union ended in separation or divorce, 0.75 children less than women with intact first union.

The results of the regression runs are given to table 9.6. The figures are expressed in terms of the difference in cumulative fertility of widowed or

Table 9.5 Mean children ever born by years since first marriage and years lost due to marital dissolution

Years since first marriage	Years lost due to dissolution		
	0 years	1–5 years	5 + years
Less than 10 years	2.19	1.77	*
10–19 years	5.14	4.25	2.31
20–29 years	7.55	6.83	4.39
All women	4.59	4.69	3.94
Age standardized	4.57	4.00	2.89

*Less than 15 cases.

Table 9.6 Differentials[a] in children ever born by outcome of first marriage

Controls	Widowed	Separated/divorced
No controls	.67	− .75
Model 1 Age	− .43	− .90
Model 2 Age, ethnicity, age at first marriage	− .96	−1.42
Model 3 Same as 2, including background variables[b]	− .95	−1.40
Model 4 Same as 3, excluding residence	− .96	−1.43
Model 5 Same as 3, excluding education	− .93	−1.37
Model 6 Same as 3, excluding age at first marriage	− .61	−1.07
Excluding childless women		
Model 7 Same as 3	− .95	−1.35
Model 8 Same as 4, including exposure to risk	− .21	− .75

[a] Expressed as deviation from the mean for intact first marriages. Differentials are significant in all models.
[b] Residence, religion, education, occupation before first marriage, pattern of work.

separated/divorced women and that of women who were in intact marriages, after adjusting for compositional differences. If adjustment is made for age, the differentials become −.43 children for widowed and −.90 for separated/divorced women. Further adjustment for ethnicity does not alter the differentials. When control is made also for age at first marriage, the difference for the widowed and the separated/divorced women increased to −.96 and −1.42 (implying 4.79 children for those in intact marriages, 3.83 for widowed, and 3.37 for the separated/divorced). Women who married early have had more children, and also a higher risk of marital dissolution. The means represent a 20–30 per cent reduction in fertility for women in dissolved unions. Control for other background variables (model 3) did not change the deviations appreciably, demonstrating the negligible combined effects of these variables.

In the succeeding models (models 4–6) the individual effects of the variables have been segregated. Each of the models is the same as model 3, except that one explanatory variable is removed from the run. The coefficients in each model can then be compared with the coefficients in the complete model (model 3) to determine whether the exclusion of a particular variable affected the differences. This procedure was done for all the background variables, but the models yielding negligible differences have been omitted from this paper. It was observed that the most important variable affecting the differentials is age at first marriage. In model 7 an attempt is made to control for childlessness. Childlessness may well be a prime cause of dissolution; thus by eliminating childless women, we eliminate cases where the causation may operate in the opposite direction. With this control for childlessness, the differentials between women in separation or divorce and women in intact marriages narrow slightly.

Table 9.5 demonstrates the effects on fertility of time lost due to dissolution. To measure this

effect net of the influence of confounding variables, model 8 in table 9.6 includes exposure to the risk of pregnancy in the regression. Exposure is measured as the total number of months spent in the marital state. With all the controls, the lower fertility of the widowed and separated still remains. The differentials fall to −.21 for the widowed and −.75 for the separated/divorced. The coefficients suggest that among widows, lost exposure explained seven-ninths of the fertility difference between the widows and the women in undissolved marriages. Among the separated or divorced, loss of exposure accounted for four-ninths of lost fertility. The results suggest that low fertility may be a plausible cause of separation/divorce.

9.4 CONCLUSION

This analysis of the relationship between marital dissolution and fertility suffers from various shortcomings. First marriage in the Philippines as shown by the RPFS is largely stable: only 8.5 per cent of the ever-married women have experienced widowhood or separation or divorce. The effect on fertility is complex, subject to a variety of potentially confounding variables, but we can only include those available in the RPFS. There remain differentials not explained by the models. It is possible that somehow the selection of the variables has affected the results.

Within the limits of the data, marital stability appears to be strongly related to fertility. Cumulative fertility was highest among the currently married women and lowest among the separated or divorced. The widows' fertility lay between the two. Data on current fertility disclosed a similar pattern. These findings are all in line with the results of studies done elsewhere.

The multivariate analysis disclosed the following:

1 When age is controlled, the widowed women have 0.4 children and the separated or divorced women 0.9 children less than the women in intact first marriages.
2 Marital duration, however, varies among subgroups such that those with longer exposure to the risk of conception would necessarily manifest higher fertility. Control for age at marriage raised the fertility deficit to one child for widows and one and a half children for the separated/divorced.
3 Childlessness did not seem to have any effect on the relationship, except among the separated/divorced where the differential narrowed a bit when childlessness was controlled.
4 The fertility differentials by status of first union are reduced appreciably, to 0.21 and 0.75 children for the widowed and the separated/divorced, respectively, when the number of months of exposure or months spent in marital state is controlled, indicating the significant effects on fertility of lost exposure to risk arising from marital dissolution.

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10 The Effects of Infant Mortality on Fertility in the Philippines

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10.1 INTRODUCTION

Analyses of the interrelationships between mortality and fertility are of great significance because of their implications for population policy. The adverse effects of high fertility on health and mortality, for example, have been documented and subsequently taken into consideration in the implementation of family planning programmes (Wray 1971; Nortman 1974). The reverse relationship, the influence of mortality on fertility, is of substantive interest because of its 'seemingly greater demographic significance' (Preston 1975: 10). It has been argued under the 'child-survival hypothesis' that improved child survival will contribute to increased family planning motivation and consequently to fertility decline (Taylor and Hall 1967; Taylor, Newman and Kelly 1976). As long as the percentage of children that die in the early years of life remains enormous there exists a major psychological obstacle to be hurdled in promoting family size limitation. Thus a significant reduction in infant and child mortality may be an important means of encouraging an increased use of family planning in areas where both fertility and mortality are still high. An important gain from efforts directed towards the reduction of child loss and towards increasing the perceived probability of child survival would be a shortening of the demographically important lag between the decline of mortality and fertility rates (United Nations 1975).

Research on the subject has shown that child mortality experience may affect fertility in four ways (see Knodel 1978; Preston 1978), which can be labelled as: (1) physiological effect, which relates the average length of a birth interval to the fate of the infant born at the onset of the interval in situations where lactation is in practice; (2) child replacement effect, which implies that couples continue having children in order to replace those who die young, to achieve some number of surviving children considered to be sufficient; (3) insurance effect, which assumes that couples adjust their fertility in anticipation of possible future deaths based on an awareness of the level of child mortality in the community independent of their own experience; and (4) societal effect, which operates indirectly through social customs to insure that the fertility level of the community is brought into some sort of balance with the level of mortality in the community.

It is intended to seek evidence here on the tendency of couples to compensate for dead children by having more offspring or by having shorter intervals between births. Such tendency will be examined from the reproductive histories of each individual mother; the reproductive histories are those available from the Republic of the Philippines Fertility Survey 1978 (RPFS). Since the present interest is on micro-level analysis rather than a macro one, aspects of the insurance and societal effects will not be examined. An analysis of that scope would require relating the individual couple's behaviour to the community level of child mortality or at least their perception of it, data for which are not available from the RPFS. One important difficulty in making a macro study arises from an inability to isolate the effect of mortality on fertility. Correlations between these two variables on the community level could be due to the reverse effect (Chowdhury, Khan and Chen 1976).

10.2 THE DATA

Of the 9268 ever-married women interviewed, 95 per cent, or 8827 women, had at least one live birth at the time of the survey. These are the

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 123–130. Voorburg, Netherlands: International Statistical Institute.

women who have been exposed to the risk of child loss. These women provided information on their pregnancy histories, complete with the date of birth of all the live births and the date of death of the deceased children. The number of cases will vary from this original subsample depending on the type of analysis in the sections that follow. For example, in the analysis of the relationship between infant mortality and birth intervals only the women who had at least three children were included because interest was on the survivorship of a live birth or live births prior to a particular birth interval.

A common analytical method in the study of the mortality–fertility relationship to validate the child survival hypothesis is to cross-tabulate the number of children ever born by the number of infant deaths or child deaths controlling for some demographic (eg age of mother, marital duration) and non-demographic variables (eg education, occupation, residence). However, the method is deficient for two reasons: (1) the observed relationship could be due to high fertility causing a high incidence of infant or child mortality, and (2) while child loss may result in higher cumulative fertility, the cause may be physiological rather than behavioural. Some of the problems may be minimized by employing measures of fertility subsequent to child survival or loss instead of cumulative fertility. One such measure is the mean birth interval, the average time in months between successive live births. Basically, this paper will pursue the procedures suggested by Chowdhury *et al* (1976) and Balakrishnan (1978).

10.3 CHILD MORTALITY AND BIRTH INTERVALS

Table 10.1 shows the mean birth interval in months between parity i and i + 1 by number of surviving children at specific parities. With certain exceptions, women at the same parity level but who have fewer surviving children or have experienced higher child mortality exhibited shorter birth intervals than their counterparts with more survivors among their earlier births. Although most are in the expected direction, the differences are small and are not statistically significant. The larger differentials are found at the earlier parities (parities 2 and 3), where the need to replace deceased children is believed to be more urgent. To the extent that breastfeeding is practised, table 10.1 fails to reflect the genuine attempt of couples to replace earlier deaths. If the child at the onset of the interval dies during infancy, the duration of breastfeeding may be affected, curtailing its effects on post-partum amenorrhoea. An important question is whether there is any evidence from the data to indicate that infant death influences the length of birth intervals independent of this so-called physiological effect.

The physiological or biological effects can be segregated if computations are made separately for a surviving or dying first child in the interval. With particular reference to the interval between the second and the third children, a relationship between the fate of the first child and the interval

Table 10.1 Mean birth interval in months between parity i and i + 1 by number of surviving children at parity i among women with at least three births

Parity i + 1	Number of surviving children at parity i	Mean birth interval in months (i to i + 1)
2	0	27.2
	1	28.3
3	0	27.5
	1	29.4
	2	29.2
4	0–1	29.0
	2	29.1
	3	29.5
5	0–2	29.5
	3–4	29.4
6	0–3	28.5
	4–5	29.5

Table 10.2 Mean birth interval in months between parities i and i + 1 by number of living children at parity i and survivorship of parity i births during infancy

Parity i + 1	Number of living children at parity i	With infant death of parity i	No infant death of parity i
2	0	23.1	27.7
	1	24.3	28.6
3	0	*	27.1
	1	28.9	29.4
	2	23.9	29.5
4	0–1	29.1	29.0
	2	27.1	29.3
	3	24.8	29.7
5	0–2	25.6	30.0
	3	26.2	28.4
	4	25.7	30.7

*Less than 15 cases.

Table 10.3 Median birth interval between parity i and i + 1 classified by survivorship of parity i

Interval (parity i to i + 1)	Survivorship of parity i		Difference
	Child died	Child did not die	
1–2	20.2	23.2	3.0
2–3	23.1	26.0	2.9
3–4	23.4	27.5	4.1
4–5	26.9	28.2	1.3
5–6	27.7	28.7	1.0
6–7	26.7	28.9	1.2
7–8	27.3	28.8	1.5
8–9	30.0	34.5	4.5

between the second and third births, when the fate of the second child is held constant, would be an indication of the effect of infant mortality on the birth interval independent of any effects of breast-feeding. The results are reported in table 10.2 where intervals with infant deaths of parity i are displayed separately from intervals with no such deaths. When intervals with infant deaths (physiological effects) are excluded, little behavioural effect emerges. The largest effect is found at parity 3 between women who had no living children and those who had one surviving birth (2.3 months). While like those in table 10.1 the differentials in table 10.2 are not statistically significant, the consistency of the differentials suggests a tendency of couples to replace dead children.

The extent of physiological or biological effects on the birth interval is depicted by the data given in table 10.3. The median birth interval required to progress from parity i to i + 1 is shown separately for women whose parity i, the child at the onset of the interval, died before their conception of the next child and for those who had no child death. The median values were calculated using the life-table technique (Potter, Parker and Gordon 1965). Without exception, the median birth interval rises with parity, which is to be expected, because of the effects of age and parity on reproductive performance. At the same birth interval, the median is longer for women who did not experience any child mortality, and this is true for all intervals. The biological effects of infant death up to parity 9 approach five months as a maximum. The figures in table 10.3 do not vary very much from the means calculated by Alam (1973) in his attempt to separate the lactational and replacement effects using data from the Philippines.

10.4 CHILD MORTALITY AND SUBSEQUENT BIRTHS

In this section the number of subsequent births by attained parity will be examined in relation to experience of child mortality at that parity. The analysis will focus on experience of infant mortality up to the third parity.

Table 10.4 provides the mean number of subsequent births by number of infant loss at that parity. It is apparent from the means that when a woman experienced some child loss, her subsequent fertility is higher at all parity levels. The more infant deaths, the higher the subsequent number of live births and the greater the differential in the means. The t test revealed that all the differences are significant. However, it is dangerous to conclude from this table that the observed differences arise mainly from the desire to replace dead children. Women who experience child mortality can be a select group in several ways (Balakrishnan 1978). They may belong to socio-economic groups which are likely or more likely to experience high mortality and high fertility rates. It is also possible that other exogenous factors may be present and influence both infant mortality and fertility in the same direction. Additionally, there may be demographic factors which cause the higher subsequent fertility among mothers experiencing some child loss at a particular parity.

The means of demographic variables which are believed to affect the relationship have been calculated and indeed demonstrate that the mean age at attained parity is lower for women who experienced infant mortality. Specifically, the mean age of mothers at the birth of the second child whose first and second children died before the birth of the third child is 20.7 years compared to 22.7 years if both children survived. Elapsed duration, which is the period from the date of the live birth to the date of interview, increases monotonically with experience of infant loss. For women of first parity the period between the first birth and interview increased from 13.5 years, where the child survived, to 15.3 years, where the

Table 10.4 Mean number of births subsequent to parity i by experience of infant mortality at that parity and by residence

Parity i/ number of infant deaths	Total		Urban		Rural	
	Mean	N	Mean	N	Mean	N
First parity						
0	4.27	7434	3.68	2338	4.54	5096
1	5.08	368	4.48	95	5.37	273
Increase	.81		.80		.83	
Second parity						
0	3.87	5888	3.34	1776	4.10	4112
1	4.54	625	4.09	152	4.68	473
2	5.33	42	*	10	5.45	32
Increase 1	.67		.75		.58	
2	.79		*		.77	
Third parity						
0	3.57	4439	3.17	1267	3.73	3172
1	4.01	749	3.42	168	4.17	581
2	4.97	86	4.75	16	5.02	70
3	*	7	*	3	*	4
Increase 1	.44		.25		.44	
2	.96		1.33		.85	
3	*		*		*	

* Less than 15 cases.

infant died. This trend arises from two factors, namely, an earlier age at the birth of the children and higher age at time of interview. Thus the increase in the number of subsequent births among women may be due to longer duration of exposure, especially in the absence of widespread use of contraception. It is also possible that a selection process operates giving a semblance of child replacement even when parents do not attempt it (Knodel 1978). If fecundity is positively associated with child mortality, then even independent of the biological effect mothers experiencing child loss would reproduce more quickly than mothers not experiencing it, simply because they are more fecund.

Because of the possible effects of age and duration of exposure on the infant mortality and subsequent fertility relationship, these variables need to be controlled in this analysis by the use of multiple classification analysis (MCA). The MCA results in table 10.5 suggest that a large portion of the increase in additional births arises from the influence of age and elapsed duration. The differentials by successive levels of child loss diminished by more than 50 per cent in all but one out of the five comparisons made. Nevertheless, even with controls for these two factors, the estimates provide some support for the child survival hypothesis.

As mentioned earlier there are various socio-economic characteristics that may also influence the relationship between infant mortality and additional live births after a certain parity. Such important characteristics as residence, education, work status, and husband's education have also been controlled for and the adjusted means are given in the last column of table 10.5. It can be observed that the effects of the socio-economic variables are relatively unimportant. The salient feature of table 10.5 is that some replacement tendency is noticeable, though not very pronounced, even after controlling for important demographic and socio-economic variables.

10.5 SEX OF SURVIVING CHILDREN AND ADDITIONAL BIRTHS

Some studies in developing countries have demonstrated that where the last child was a son,

Table 10.5 Unadjusted and adjusted mean number of additional births by infant mortality experience at attained parity

Number of infant deaths	Unadjusted	Adjusted for age and elapsed duration	Adjusted for all factors[a]	N
First parity				
0	4.27	4.30	4.31	7429
1	5.14	4.66	4.60	369
Increase	.87	.36	.29	
Second parity				
0	3.87	3.92	3.93	5884
1	4.54	4.17	4.13	626
2	5.33	4.64	4.60	42
Increase 1	.67	.25	.20	
Increase 2	.79	.47	.47	
Third parity				
0	3.57	3.62	3.62	4436
1	4.01	3.79	3.76	750
2	4.97	4.11	4.04	87
Increase 1	.44	.17	.14	
Increase 2	.96	.32	.28	

[a] Adjusted for residence, education, work status, husband's occupation, age and elapsed duration.

there is a greater propensity to replace the child than if it was a girl (Repetto 1972; Rutstein 1974). This type of analysis has salience in the Philippines if there is a sex preference for children. Some studies in the local setting point to a slight preference for girls among Philippine mothers (*RPFS 1978. First Report* 1979; de la Paz 1975). The mean number of subsequent births for the first two attained parities is displayed in table 10.6. Although the mean subsequent number of live births at second parity is lower where a male survives than when a female survives, the small differences by sex suggest that the sex of the surviving children does not affect subsequent fertility.

Table 10.6 Mean number of subsequent births by sex of survivors at first and second parities

Parity and sex of survivors	Unadjusted mean	Adjusted mean[a]
First parity		
None	5.20	4.62
1 male	4.27	4.29
1 female	4.27	4.32
Second parity		
None	5.81	4.63
1 male	4.49	4.01
1 female	4.67	4.25
2 males	3.86	3.92
2 females	3.98	4.03
1 male and 1 female	3.76	3.87

[a]Adjusted for age and elapsed duration.

10.6 INFANT MORTALITY AND USE OF CONTRACEPTION

Studies of the relationship between child mortality and contraceptive use show that among couples experiencing child mortality the attitude toward family planning is less favourable, current use is low, and the timing of first use is delayed in contrast to couples without such experience.

Table 10.7 shows that women who have had some infant loss among the first three children postponed their first use of contraception until some time later than those who never had any experience. Among women who had no child loss, 43 per cent had begun using some method of family planning before having their third child compared to only 23 per cent among their less fortunate counterparts. Rutstein and Medica (1978) likewise discovered that experience with child mortality increased the parity at first use among Costa Rican women. As expected, current use of contraception was lower among women with child loss (table 10.8). A larger difference in the proportion of current users is noted among those who had less than five living children, where 6 out of 11 women with no child loss were contracepting against 3 out of 7 among those with mortality experience. Among current users, use of efficient methods of contraception is also more pervasive among women without child loss (table 10.9). However, caution must be exercised in the interpretation of these tables for lack of controls for important variables which are likely to affect contraceptive use.

10.7 CONCLUSION

This study principally used measures of subsequent fertility in the investigation of the child mortality and fertility relationship in an effort to overcome the limitations of traditional approaches. The results of the application of birth interval dynamics seem to indicate, although not very conclusively, some tendency among couples to replace deceased children. Although the differentials are small in most cases and are found to be

Table 10.7 Cumulative percentage of ever-married women by timing of first use of contraception, and infant mortality experience among the first three parities

	Timing of first use of contraception							
	Before first child	After 1	After 2	After 3	After 4	After 5	After 6	After 7
With infant deaths	1.1	10.6	22.6	38.8	51.3	63.4	71.0	100.0
No infant deaths	2.1	23.9	42.7	58.2	69.4	79.3	85.7	100.0

not statistically significant, the differentials exist for all categories of child survivorship for every attained parity and the pattern of differentials is quite consistent.

Further support to this observation is provided by the data on subsequent births. Women at any parity tend to manifest higher subsequent fertility when they experienced infant mortality. The attempt to replace deaths remains even with controls for age and exposure time. Such controls are necessary because of the possibility that women with child mortality had their early births at a younger age and were older at the time of the survey than women who did not experience any child loss.

The findings in relation to the timing of contraception, and use of efficient methods are congruent with the results of studies conducted elsewhere. Among women with child loss at earlier parities, first use of contraceptive is delayed, current use is low, and efficient methods are less used.

This study implies that improvements in child mortality can have an effect on fertility in various ways. A tentative implication is that where parents compensate for some child loss and end up having more children in the process, increased child survivorship would tend to reduce fertility. If family planning methods are available, couples who have favourable experience in relation to child mortality will be more prone to use contraception. Thus a reduction in child mortality should facilitate the decline in fertility. The evidence is quite strong that mortality control would reduce fertility through the biological mechanism. It has been shown that the birth interval is shorter if the child at the onset of the interval died. Where lactation is practised, better survivorship of infants would prolong the period of post-partum sterility and thus lengthen the entire birth interval.

The role played by child mortality in the decision whether to use contraception, when to use it, and what form to use is of special importance. It might be necessary to examine the magnitude of the effects of increased child survival on contraceptive use, if only as a factor in the case

Table 10.8 Percentage distribution of currently married women by current use of contraception, infant mortality experience among the first three parities, and by number of living children

Number of living children/ experience of infant mortality	Current use of contraception	
	Not using	Using
Less than five children		
With infant deaths	57.9	42.1
No infant deaths	46.8	43.2
Five and over		
With infant deaths	57.0	43.0
No infant deaths	49.1	50.9
All		
With infant deaths	57.5	42.5
No infant deaths	47.7	52.3

Table 10.9 Percentage distribution of married women currently using contraception by use of efficient methods by infant mortality experience and number of living children

Number of living children/ infant mortality experience	Use of efficient methods	
	Using inefficient methods	Using efficient methods
Less than five children		
With infant deaths	63.1	36.9
No infant deaths	44.3	55.7
Five and over		
With infant deaths	60.5	39.5
No infant deaths	56.0	44.0
All		
With infant deaths	61.8	38.2
No infant deaths	45.7	54.3

for an attack on infant and child mortality within the aims of the population programme.

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11 Female Work Participation and Fertility in the Philippines

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11.1 INTRODUCTION

Empirical studies on female work participation and fertility come to varying conclusions regarding the existence, direction and causal nature of the relationship. While evidence of a strong negative relationship has been found in industrialized countries, in developing countries the results have varied from negative to positive and even to no association between female work participation and fertility. Moreover, in these studies the causal nature of the relationship has not been clearly established. Consequently, the usefulness of special efforts to expand female employment as a means to hasten fertility reduction in less developed countries is still subject to debate.

Recent research, however, has suggested new methodological directions for a better understanding of the interaction between these two variables. First, the view that the causal relationship between female work participation and fertility is in itself a variable, that is, there may be not only one but a number of different causal links between these variables, suggests the need for analysis that allows the examination of all the possible causal links between these variables in a single framework. The four possible types of causal links are (1) fertility affects work participation; (2) work participation affects fertility; (3) work participation and fertility simultaneously affect each other; and (4) neither variable affects each other; their correlation is explained solely by their dependence on common determinants. Secondly, the view that both female work participation and fertility are multidimensional concepts, and that the magnitude and causal nature of their relationship may vary for each dimension, suggests the need to distinguish various aspects of these variables in determining their relationship (eg the distinction between paid and unpaid work, work inside or outside the home; and, correlatively, the distinction between cumulative and current fertility). Thirdly, the view that the fertility and female work relationship is likely to vary with different stages of the family life cycle suggests the need for analysis which allows for life-cycle effects.

This study examines the relationships between female work participation and fertility in the Philippines along the methodological lines suggested above using the RPFS data, which include data on fertility and female work, as well as other related variables.

This chapter is organized as follows. The next section describes the pattern of work participation of Filipino females in relation to basic demographic and socio-economic characteristics including fertility, as gleaned from the RPFS. Section 11.3 describes the framework and the variables used in the study; section 11.4 presents the results and limitations of the study; while the last section provides a summary.

11.2 THE PATTERN OF FEMALE WORK PARTICIPATION AND FERTILITY

Pattern of work

Definition of work

In the RPFS 1978, female work was defined in terms of activities which include paid employment, either in cash or in kind, unpaid work in own or family business, or unpaid work on the family farm, but excludes own housework. The pattern of work is divided into seven categories, namely:

1 Women who are currently working and had also worked before first marriage (before and now);

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2 Women who are currently working but did not do so before their first marriage (now not before);
3 Women who are not currently working but had done so before their first marriage and at some time after marriage (before and after);
4 Women who are currently not working but did some work after their first marriage (only after);
5 Women who are not currently working but did some work before their first marriage (only before); and
6 Women who had never worked and who are not currently working (never worked).

Given these categories, the following observations can be made with respect to the overall pattern of female work shown in table 11.1: (1) about 43 per cent of the ever-married women aged 15–49 were working at the time of the survey; (2) 32 per cent have worked at some time before first marriage, of which 20 per cent gave up work after they got married and had not rejoined the labour force since then; and (3) more than one-third (37 per cent) of the women have never worked at all outside of own housework.

Work pattern by age of women

Table 11.1 also shows the pattern of work participation by age of woman. Proportionately more ever-married women aged 35 and over are currently working compared with younger women aged 34 or less. Current work participation rates range from 25 per cent for women aged below 25 years to 52 per cent for ages 45 years and over. The lower participation rate of younger women, especially those below 25 years, may be associated with the preoccupation of these women in establishing their married life and in starting to build their families. In addition, the presence of small children in these early married years may discourage current work participation. In contrast, older women at the end of their reproductive careers may have children who are old enough to care for themselves or to take care of younger siblings; hence these women tend to be able to take more advantage of current work opportunities than younger women. Additionally, their already larger family size may induce these older women to work to supplement family income to support a larger family. Similar observations can be made when work is defined as ever work rather than current work.

Work pattern by education of women

The pattern of work participation of women by education of women is shown in table 11.2. The data reveal a U- or J-shaped work pattern whereby current work participation declines up to high school, then increases sharply thereafter. Perhaps because of the highly competitive labour market in the Philippines, particularly among females, a college graduate enjoys a decidedly greater chance of getting employed. The current participation rate of college graduates is about twice as high as that of undergraduates. Moreover, very few college graduates have never worked; the proportion is 1 out of 12; whereas among the less educated, at least 1 out of 3 has never worked.

Table 11.1 Percentage distribution of ever-married women by pattern of work and current age

Pattern of work	Current age				All women	Number of women
	Below 25	25–34	35–44	45 and above		
Before and now	12.8	20.0	18.2	18.4	18.0	1671
Now not before	12.2	23.9	33.0	33.5	26.3	2438
Before and after	10.7	9.4	4.8	4.6	7.5	694
Only after	2.8	4.4	5.4	5.3	4.6	424
Only before	12.3	8.0	3.7	3.4	6.7	620
Never worked	49.1	34.3	34.8	34.4	36.9	3420
Total	100.0	100.0	100.0	100.0	100.0	
Number of women	1498	3486	3083	1201		9268

Table 11.2 Percentage distribution of ever-married women by pattern of work and education

Pattern of work	Educational attainment					
	No schooling	Primary	Inter-mediate	High school	Some college	College graduate
Before and now	20.2	15.6	14.6	12.8	21.5	53.0
Now not before	27.1	31.0	26.2	21.7	21.3	27.3
Before and after	3.5	6.2	8.3	9.8	8.9	3.6
Only after	3.0	4.2	4.7	5.6	7.0	1.9
Only before	3.5	5.1	6.9	8.7	9.9	5.6
Never worked	42.7	37.9	39.3	41.4	31.4	3.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	537	2254	3396	1927	446	707

Table 11.3 Percentage distribution of ever-married women by pattern of work and husband's occupation

Pattern of work	Husband's occupation		
	White collar workers[a]	Agriculture[b]	Blue collar workers[c]
Before and now	28.3	16.3	15.4
Now not before	25.0	30.0	21.4
Before and after	7.2	5.6	10.5
Only after	4.5	3.2	6.7
Only before	7.3	5.1	8.7
Never worked	27.7	40.7	37.5
Total	100.0	100.0	100.0
Number of women	1549	4559	3031

[a]Includes professional, clerical and sales workers.
[b]Includes self- and not self-employed in agriculture.
[c]Includes service and unskilled and skilled manual workers.

Work pattern by occupation of husband

Table 11.3 reveals a pattern of current work participation that is highest among wives of white collar workers (53 per cent), and lowest among wives of blue collar workers (37 per cent). Wives of workers in agriculture had a current participation rate of 46 per cent. The high rates found among wives of white collar workers may be associated with their higher educational attainment, since women whose husbands are professionals are most likely to be college graduates. Similar observations can be made when work is defined as ever work rather than current work.

Work pattern by residence

Differences in the pattern of work by area of residence and by urban and rural residence are shown in table 11.4. Current work participation rates of urban and rural women are almost the same: 43 per cent for urban women and 45 per cent for rural women. The percentage of women who ever worked in the rural areas is a little bit higher than in the urban areas: 38 versus 34 per cent. The less rigid and less competitive work situation in rural areas, especially in the family business or family farm, apparently compensates for the relatively lower education of

Table 11.4 Percentage distribution of ever-married women by pattern of work and place of residence

Pattern of work	Place of residence					
	Metro Manila	Luzon	Visayas	Mindanao	Urban	Rural
Before and now	21.5	19.5	17.4	13.7	19.7	17.3
Now not before	21.9	28.6	25.0	25.8	23.6	27.6
Before and after	12.6	6.6	7.9	5.7	9.1	6.7
Only after	7.6	4.1	4.7	3.6	6.1	3.8
Only before	8.2	5.8	8.5	5.5	7.6	6.3
Never worked	28.2	35.4	36.5	45.7	33.9	38.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	1166	3953	2211	1938	2976	6292

Table 11.5 Mean number of children ever born to ever-married women (A) and mean number of children born in the past five years to women who have been continuously in married state for the past five years (B) by selected characteristics

Category of woman	A	B
All women		
Current age of woman		
<25	1.70 (1498)[a]	2.15 (459)
25–34	3.60 (3486)	1.62 (2836)
35–44	6.15 (3083)	.98 (2871)
45+	7.00 (1201)	.28 (1003)
Educational attainment		
No schooling	5.81 (537)	1.00 (455)
Primary	5.71 (2254)	1.26 (1953)
Intermediate	4.62 (3396)	1.32 (2655)
High school	3.83 (1927)	1.11 (1390)
Some college	2.76 (446)	1.05 (274)
College graduate	3.10 (707)	.81 (512)
Husband's occupation		
White collar	3.75 (1549)	.91 (1185)
Agriculture	5.11 (4559)	1.30 (3748)
Blue collar	4.37 (3031)	1.18 (2286)
Place of residence		
Metro Manila	3.58 (1166)	.89 (865)
Luzon	4.79 (3953)	1.20 (3142)
Visayas	4.71 (2211)	1.24 (1740)
Mindanao	4.61 (1938)	1.35 (1492)
Urban	3.99 (2976)	.99 (2248)
Rural	4.86 (6292)	1.30 (4990)

[a] Figures in parentheses are sample sizes.

rural wives, thus putting them on a par with their urban counterparts in terms of current work or ever work participation.

Area differentials by broad geographic divisions reveal a gradient of high to low current work participation as one moves from Luzon to Visayas to Mindanao. The current participation rate for Metro Manila is 43 per cent. In terms of ever work, however, the gradient of high to low is found as one moves from Metro Manila to Luzon to Visayas and then to Mindanao.

Fertility

Fertility is defined in terms of cumulative fertility, ie total number of children ever born, or in terms of current fertility, ie number of children born in the past five years before the survey. Table 11.5 presents data on these two fertility measures by current age of the woman, by educational attainment of the woman, by husband's occupation and by residence. The data reveal associations between fertility and these variables in the expected directions: eg cumulative fertility increases with age, declines with increasing education, is higher among agricultural households and lowest among white collar households, and is higher in rural than in urban areas.

Work pattern and fertility

Children ever born by work pattern

Table 11.6 shows the mean children ever born to women classified by work pattern and duration of marriage. Among women whose duration of marriage is less than ten years, work before marriage seems to be associated with a smaller family size. If post-marriage work experience affects fertility behaviour, it is not evident at least during the first ten years of marriage. In fact, it is only among those who have been married 20 years or more that we find a discernible fertility differential between those who worked after marriage and those who did not. On the whole, one notes that the smallest family size is associated with women who had worked most of their lives, ie those who worked before marriage up to the present or those who worked before and after marriage but not at present.

Current fertility by work pattern

The female work pattern by current fertility is also shown in table 11.6. It is interesting to note that for marital duration less than 20 years, fewer children have been born in the past five years to currently working women compared with their non-economically active counterparts. Among women married for at least 20 years, current fertility is in fact highest for those who are currently working. This seems inconsistent with their relatively fewer children ever born prior to the five-year reference period. A plausible explanation is that, if women attempt to achieve a desired family size, those who have stronger work commitments do so by spacing their children

Table 11.6 Mean number of children ever born to ever-married women (A) and mean number of children born in the past five years to women who have been continuously in married state for the past five years (B), by pattern of work and marital duration

Pattern of work	All women		Number of years married					
	A	B	<10		10–19		20+	
			A	B	A	B	A	B
Before and now	4.00	1.11	1.90	1.60	4.70	1.04	7.30	.66
Now not before	5.26	1.04	2.38	1.70	5.03	1.14	7.42	.61
Before and after	3.70	1.52	2.25	1.98	5.20	1.43	7.21	.55
Only after	5.31	1.08	2.40	1.68	5.12	1.26	7.57	.57
Only before	3.30	1.50	2.10	1.94	5.07	1.34	7.90	.48
Never worked	4.71	1.29	2.24	1.75	5.32	1.33	7.78	.52
Total	4.58	1.20	2.18	1.84	5.08	1.22	7.56	.62
Number of women	9268	7239	3663	1949	3176	3031	2429	2251

at longer intervals. Hence, they continue to bear children with greater frequency relative to other women in the later stage of their reproductive career.

The preceding bivariate analysis already suggests that the relationship between female work participation and fertility varies by the different temporal dimensions in which the two variables are taken, ie whether in current or cumulative terms, and whether in terms of shorter or longer marital experience. To further assess the relationships between these two variables under varying conditions, we apply multivariate analysis within the framework described below.

11.3 FRAMEWORK AND VARIABLES

Framework

We adopt a simple framework whereby both female work participation and fertility are allowed to influence each other directly and at the same time to be determined by a common set of determinants. The aim is to test the direction and significance of all the possible causal links between these two variables. Two dimensions of work participation and fertility will be considered, namely cumulative and current. For each dimension, we examine the following relationships:

(1) $F = f(S)$
(2) $W = g(S)$
(3) $F = H(S', \hat{W})$
(4) $W = j(S', \hat{F})$

where F = fertility, measured either as (a) cumulative fertility, or (b) current fertility
W = work participation, measured either as (a) work at any time since marriage or (b) current work
S = a set of common determinants
S' = a subset of S
$\hat{F}, \hat{W}$ = predicted values of F and W based on equations (1) and (2).

To examine the above relationships under different life cycle stages and under different labour market situations, we ran separate regressions, where applicable, by age of women, parity, residence, and occupation of the husband.

Variables

Table 11.7 presents the variables used in the regressions. Some variables proxy for theoretically relevant variables when the latter are not available from the RPFS 1978. The sample data were restricted to women who are once-married, currently living with husband, aged 15—49 years, fecund and married five years or more. This subsample totals 6284 women.

Endogenous variables

The two endogenous variables are fertility and work participation. Cumulative fertility is simply defined as the number of children ever born. Current fertility, on the other hand, is measured as the number of live births born to the woman during the last five years. Marital fertility has declined since the mid-1960s, with the decline accelerating in the 1970s. The latter fertility measure thus captures fertility during the more recent period when fertility has declined the most. This time frame also coincides with the period since the Philippine population programme was implemented. We wish to find out whether in this period of fertility decline work participation of women has had some impact independent of other variables.

Corresponding to cumulative fertility is cumulative work participation, which is simply measured as a dummy variable indicating whether the woman has ever worked since marriage. These 'ever worked' women include those currently working and those who worked after marriage but are no longer currently working. The shortcoming of this measure is readily apparent, ie it does not measure the intensity of work within marriage, say in terms of number of years worked.

Current work participation of the woman, on the other hand, is defined as a dummy variable indicating whether the woman is currently at work as of the interview date. Ideally, we want a measure of current work participation that parallels the fertility measure, ie whether the woman worked during the five years preceding the interview. This information, however, is not readily available from the RPFS 1978. Our current measure thus excludes women who may have worked anytime during the last five years but stopped in the most recent period prior to interview. These women who worked after marriage but not at the time of interview constitute 12 per cent of all women. The potential bias would tend to be larger for younger women, especially those younger than age 25.

Several theoretical perspectives in understanding the relationships between female work

Table 11.7 Variables selected for analysis of the relationship between female work participation and fertility

Variable		Definition/measurement and hypothesized relationships
A	Endogenous	
1	CEB	Cumulative fertility: number of children ever born. The larger the number, the greater the probability of female work participation to ensure minimum level of income.
2	CFERT	Current fertility: number of children born five years before the survey. Current fertility reduces the probability of current work participation due to time conflicts.
3	EWORK	Work experience within marriage (1 = woman has ever worked within marriage; 0 = woman has never worked). Women who have ever worked within marriage tend to have a small number of children ever born.
4	CWORK	Current work participation (1 = woman working at time of survey; 0 = woman not working at time of survey). Current work participation may reduce current fertility due to higher opportunity cost of additional children or may increase fertility because the extra income reduces the family's budget constraint.
B	Exogenous	
5	AGEW	Age of the woman in years. Older women tend to participate more in the labour force either currently or at some time during marriage; tend to have larger number of children ever born but fewer of these in the current period.
6	AFM	Age at first marriage in years. Late age at marriage will tend to be associated with smaller number of children ever born, but of these more would be born in the current period.
7	PPARITY	Previous parity, ie the number of living children before the five-year period preceding the survey. Fewer current births are expected to women with higher previous parity.
8	WBM	Work before marriage (1 = woman had worked before marriage; 0 = woman had not worked before marriage). Women who worked before marriage are most likely to work within marriage, including the current period. Measures previous work experience and knowledge of work opportunities.
9	{EDUC 0} EDUC 1 EDUC 2 EDUC 3	Educational level of woman. (1 = if in category K; 0 = otherwise, where K is coded as: 0 = no schooling 1 = elementary school graduate or some elementary schooling 2 = high school graduate or some high school 3 = at least some college schooling). Proxies for value of woman's time, potential wage rate, knowledge of work opportunities, knowledge of contraception, modern role orientations, etc. The higher the education of the woman, the lower is her fertility and the higher is her work participation.

Table 11.7 (*cont*)

Variable	Definition/measurement and hypothesized relationships
10 WCOCCH AGOCCH {MANUAL}	Occupational category of husband. (1 = if in category K; 0 = otherwise where K is coded as: WCOCCH = husband in professional, clerical or sales occupations AGOCCH = husband in agricultural occupations MANUAL= husband in service and manual occupations including unemployed.) Proxies for household socio-economic status, value of husband's time, husband's potential wage rate, as well as labour market structure. Women whose husbands are in the first occupational category tend to have lowest fertility and greatest probability of work participation.
11 METRO URBAN {RURAL}	Place of residence. (1 = if in category K; 0 = otherwise, where K is coded as: METRO = residence in Metro Manila URBAN = residence in other urban areas {RURAL}= residence in rural areas.) Proxies for labour market structure and fertility norms. The more urban the residence, the greater the probability of work participation and the lower the fertility.

participation and fertility have been suggested in the literature. These will not be reviewed here since excellent reviews are already available. (See eg Kupinsky 1977.) However, we shall indicate the more relevant ones with respect to our model. A significant positive effect of female work participation on fertility may suggest the effect of income, ie women who work will have additional income to support another child. In contrast, a significant negative effect of work participation on fertility may imply the usual negative substitution effect, ie the opportunity cost of children is higher for working women. It could also imply time incongruities, ie working women would not have time to have children and work at the same time.

Alternatively, a positive effect of fertility on work participation could suggest the income-inadequacy hypothesis, ie additional income is needed to support the additional births, hence women tend to work more; while a negative effect of fertility on work participation reflects more the effect of role conflict, both time and normative incongruities, ie current births restrict women from working to take care of infants and young children.

Exogenous variables

The exogenous variables included in the study are those known to be related to the endogenous variables, as revealed for example in the bivariate analysis presented earlier. Included are age of the woman, education of the woman, occupation of her husband, and type of place of residence.

Current work participation tends to increase with age, partly due to its association with greater work experience within marriage and higher parity. In contrast current fertility declines with age, due partly to biological factors as well as its association with larger numbers of children already born. To separate out some of these effects, previous parity and work before marriage are introduced into the model. Net of these, the age variable will reflect mainly the effect of longer work experience on work participation and declining fecundability on fertility.

Education has been found to be non-linearly related to work participation and fertility; hence this variable is measured in terms of categories of educational attainment rather than as a continuous variable. Education reflects several things for each of the endogenous variables. Higher education

means a higher potential female wage, greater knowledge of work opportunities, and a more favourable orientation towards work away from home, all of which tend to increase the probability of a woman working. Alternatively, higher education tends to reduce fertility due to the higher opportunity cost of the woman's time (higher potential wage rate), greater knowledge of contraception, greater participation in child bearing decisions, and wider options for alternative satisfactions other than childbearing.

Husband's occupation reflects the social and economic position of the household. High prestige occupations tend to be associated with high income, and hence would tend to reduce female employment (income-inadequacy hypothesis) and increase fertility (income effect). On the other hand, it may also reflect the labour market situation, ie a higher prestige occupation of the husband also implies the wife's potential access to such occupational categories. Hence, the higher prestige occupation of the husband may in fact be positively correlated with female work participation. Alternatively, higher prestige occupations may be negatively related to fertility due to its association with social status norms; ie persons of higher socio-economic status have smaller family size norms.

Residential categories reflect both differential labour market situations, as well as differential fertility norms, in metropolitan, other urban and rural areas. We would expect a gradient of high to low work participation in these respective areas, if work participation is purely in the structured paid employment labour market. In the Philippines, opportunities for work participation in the less structured labour market tend to be greater in the rural than in urban areas. In addition to structured labour markets, role conflicts (time incongruities) tend to be greater in urban than in rural areas. Hence, we may expect higher work participation in rural than in urban areas.

The other characteristics of the woman and her household included in our model are work experience before marriage, age at first marriage, and where relevant the number of surviving children prior to the period of reference. Those who worked before marriage or who married at a later age may have different orientations regarding work and fertility from other women. In addition, it is essential to control for the previous stock of children in determining the extent to which women have additional births during the current period, on the one hand, and on the need for supplementary income to support a large family, on the other.

11.4 RESULTS

Work-fertility relationships

The regression results for the all women sample are shown in tables 11.8 and 11.9. In view of the potentially simultaneous relationship between work participation and fertility, we employ the two-stage least squares approach to obtain unbiased estimates of the effect of these two on each other (Johnston 1972). Work participation and fertility were substituted by their corresponding predicted values with the predicted values in turn estimated from each of the corresponding reduced form equations, following the standard two-stage least squares estimation procedure.

The results reveal varying relationships between work participation and fertility, depending on whether one considers the cumulative or the current measures of these variables. In table 11.8, the coefficient of ever-work (EWÔRK) on children ever born (CEB) is negative and significant, while the coefficient of children ever born (CÊB) on work participation (EWORK) is positive and weakly significant. These results imply that (a) work participation within marriage significantly reduces total number of children ever born, a result consistent with the opportunity cost of children hypothesis; and (b) fertility significantly increases the probability of work participation, a result consistent with the income-inadequacy hypothesis. The negative effect of work on fertility is more clearly shown among older women, among rural women, and among women whose husbands are in the white collar occupations. (See table 11.10.) The positive effect of fertility on work participation is significant only among other urban women, and among women whose husbands' occupations are either agricultural or manual, both low income occupations.

The results for the current work–current fertility relationship shown in table 11.9, on the other hand, reveal that current work participation significantly increases the number of children born during the past five years, while current fertility significantly reduces the probability of participation in the current period. The former relationship is consistent with the positive effect of

Table 11.8 Regressions on cumulative fertility and work participation in marriage, all woman sample

Independent variables	Mean (standard deviation)	Reduced form[a]		Structural equation[a]	
		EWORK	CEB	EWORK	CEB
EWÔRK	.568	—	—	—	− 1.371[b]
	—				(− 7.297)
CÊB	5.018	—	—	.030[d]	—
	—			(1.939)	
AGEW	34.418	.008[b]	.207[b]	.002	.218[b]
	(6.764)	(8.748)	(51.723)	(.479)	(51.865)
AFM	20.407	− .001[d]	− .032[b]	—	− .034[b]
	(12.097)	(1.939)	(14.302)		(−14.899)
WBM	.297	.317[b]	− .434[b]	.330[b]	—
	(.457)	(24.182)	(7.297)	(21.991)	
EDUC 1	.365	.004	− .439[b]	.017	− .434[b]
	(.481)	(.268)	(6.312)	(1.053)	(− 6.231)
EDUC 2	.225	− .011	− .871[b]	.015	− .885[b]
	(.418)	(.576)	(10.516)	(.701)	(−10.685)
EDUC 3	.141	.139[b]	−1.656[b]	.189[b]	− 1.465[b]
	(.348)	(6.234)	(16.299)	(5.639)	(−13.579)
WCOCCH	.213	.056[b]	− .303[b]	.065[b]	− .226[b]
	(.410)	(3.282)	(3.900)	(3.566)	(− 2.878)
AGOCCH	.416	.028[d]	− .062	.030[d]	− .024
	(.493)	(1.790)	(.874)	(1.914)	(− .333)
METRO	.143	.028	− .827[b]	.053[c]	− .788[b]
	(.350)	(1.392)	(8.975)	(2.267)	(− 8.531)
URBAN	.346	− .026[d]	− .269[b]	− .018	− .305[b]
	(.476)	(1.768)	(3.962)	(−1.208)	(− 4.474)
Constant		.191	− .433	.203	− .171
$\bar{R}^2$		.119	.369	.119	.369
F		86.181	368.254	86.181	368.254
n		6284	6284	6284	6284
Mean		.568	5.018	.568	5.018
Standard deviation		(.495)	(2.654)	—	—

[a] t-values in parentheses.
[b] Significant at the 0.01 level.
[c] Significant at the 0.05 level.
[d] Significant at the 0.10 level.

additional income, which enables the woman to afford more children in the current period. The latter relationship is understandable in terms of time conflicts, where the presence of infants or pre-school children tends to restrict the woman's current work participation outside the home. The positive effect of work participation on fertility is significant only among younger, low parity and rural women. In contrast, the negative effect of fertility on work participation is significant in all categories of women except among younger women, among non-rural women and among women whose husband's occupation is manual.

The apparent inconsistency in the signs of the coefficients between the two dimensions of the work participation–fertility relationship is worth noting. Are the potential biases arising from the inherent shortcomings of the measures, specifically of work participation, responsible for the 'inconsistent' signs? Or can the inconsistency be actually explained by time-related differences in the situation of women implied by the two alternative measures of work participation and fertility?

First consider the effect of fertility on work participation. In the current case, the effect is

Table 11.9 Regression on current work participation and current fertility, all women sample

Independent variables	Mean (standard deviation)	Reduced form[a]		Structural equation[a]	
		CWORK	CFERT	CWORK	CFERT
CWÔRK	.440	–	–	–	.494[b]
	(.141)				(2.961)
CFÊRT	1.295	–	–	− .085[b]	–
	(.570)			(−3.429)	
AGEW	34.418	.011[b]	− .089[b]	.003)	− .094[b]
	(6.764)	(8.217)	(−36.249)	(1.445)	(−30.309)
AFM	20.407	− .002[b]	.022[b]	–	.023[b]
	(2.097)	(−3.429)	(21.448)		(8.307)
PPARITY	3.723	− .005	.051[b]	− .0001	.053[b]
	(2.729)	(−1.444)	(8.120)	(− .158)	(8.307)
WBM	.297	.153[b]	.075[b]	.159[b]	–
	(.457)	(11.308)	(2.961)	(11.657)	
EDUC 1	.365	− .016	− .070[c]	− .022	− .062[c]
	(.482)	(−1.013)	(− 2.361)	(−1.370)	(− 2.084)
EDUC 2	.225	− .035[d]	− .167[b]	.049[c]	− .150[b]
	(.418)	(−1.838)	(− 4.704)	(2.487)	(− 4.154)
EDUC 3	.141	.213[b]	− .209[b]	.195[b]	− .314[b]
	(.348)	(9.110)	(− 4.750)	(8.010)	(− 5.322)
WCOCCH	.213	.085[b]	− .130[b]	.074[b]	− .172[b]
	(.410)	(4.846)	(− 3.926)	(4.232)	(− 4.758)
AGOCCH	.416	.090[b]	.068[c]	.096[b]	.024
	(.493)	(5.612)	(2.248)	(5.989)	(.708)
METRO	.143	− .037[d]	− .244[b]	− .058[b]	− .226[b]
	(.350)	(−1.780)	(− 6.203)	(−2.607)	(− 5.676)
URBAN	.346	− .033[c]	− .074[c]	− .039[c]	− .058[d]
	(.476)	(−2.165)	(− 2.567)	(−2.534)	(− 1.951)
Constant		.028	3.845	.353	3.831
$\bar{R}^2$		.079	.286	.079	.286
F		50.077	230.060	50.078	230.060
n		6284	6284	6284	6284
Mean		.440	1.295	.440	1.295
Standard deviation		.496	1.063	.141	.570

[a] t-values in parentheses.
[b] Significant at the 0.01 level.
[c] Significant at the 0.05 level.
[d] Significant at the 0.10 level.

negative, suggesting the importance of role (time) conflicts. The presence of infants and pre-school children constrains work participation outside the home. In the cumulative case, however, the positive effect of fertility on work participation suggests the importance of income adequacy, that is, women with more children tend to work more to support the larger family size. Time conflict is less important in this latter case because the fertility measure includes children beyond pre-school age, ie those born before the five years preceding the interview. One could also speak of short-run and long-term effects of fertility on work participation. In the short run, the need to care for infants and pre-school children limits work participation. However, in the long run, the larger family sizes encourage women to participate in the work force to supplement family income.

Table 11.10 Direction and significance[a] of the relationship between female work participation and fertility by different categories of women

Categories of women	Sample size	Cumulative		Current	
		EWORK → CEB	CEB → EWORK	CWORK → CFERT	CFERT → CWORK
Age groups					
15–29	1679	− .265	.049	1.073[c]	− .251
		(1.341)	(.542)	(2.325)	(− .663)
30–39	3018	− 2.073[b]	.036	.269	− .088[c]
		(− 7.080)	(1.423)	(1.094)	(− 2.319)
40–49	1507	− 1.565[b]	.021	.190	− .084[c]
		(− 2.864)	(.954)	(.734)	(− 2.219)
Previous parity					
⩽3	3331	—	—	.769[b]	− 0.88[b]
				(2.862)	(− 3.615)
⩾4	2953	—	—	.140	− .768[b]
				(.708)	(− 2.759)
Husband's occupation					
WCOCCH	1340	− 2.101[b]	.043	.362	− .066[c]
		(− 4.372)	(1.091)	(1.012)	(− 2.151)
AGOCCH	2611	.028	.022[b]	.282	− .198[b]
		(.118)	(2.600)	(1.473)	(− 3.087)
MANUAL	2333	.028	.024[b]	.297	− .108
		(.105)	(2.433)	(.731)	(− 1.383)
Residence					
METRO	900	− .129	.023	.745	.063
		(− .279)	(1.194)	(.843)	(.640)
URBAN	2176	.252	.025[b]	− .220	− .077
		(.809)	(2.692)	(− .774)	(− .934)
RURAL	3280	− 1.230[b]	.036	.401[d]	− .094[b]
		(− 5.001)	(1.557)	(1.901)	(− 3.579)
All sample	6284	− 1.371[b]	.030[d]	.494[b]	− 0.85[b]
		(− 7.297)	(1.939)	(2.961)	(− 3.429)

[a] Coefficients and t-values from structural equations.
[b] Significant at the 0.01 level.
[c] Significant at the 0.05 level.
[d] Significant at the 0.10 level.

Next consider the opposite effects of work participation on fertility when viewed in the current and cumulative perspectives. It is possible that the contrasting signs reflect the fact that women who do work end up with less children ever born than non-working women but also tend to either: (a) delay childbearing and catch up later on, and thus are observed having more births in the more recent period, as in the case of rural women; or (b) attempt to complete their childbearing early during marriage so that they can continue working, as in the case of young and low previous parity women. Data, however, are not available to verify these possibilities. Hence, future studies may do well to examine the different birth sequences among working and non-working women.

Effect of other variables

The effect of the other variables on each dependent variable, whether measured in the current or cumulative dimensions, can be summarized as follows. Higher education is significantly associated with higher probability of work participation and lower fertility as expected. High prestige occupation of the husband, in general, is associated with lower fertility and greater work participation.

A gradient of low to high fertility is associated with residence in metropolitan, other urban and rural areas. The reverse, however, is found with respect to current work participation, suggesting that the more structured labour markets in the urban areas, especially in the large metropolitan region, tend to reduce current work participation.

In the work equation, work before marriage significantly increases the probability of work participation, as expected. In the current fertility equation, age of woman, age at first marriage and previous parity are all significant. The signs of the last two variables, however, are positive, contrary to what normally might be expected. A plausible explanation might be that women who married late are still catching up on their fertility up to the current period, hence show higher current fertility. In the cumulative fertility equation, however, the effect of delayed marriage is to significantly reduce children ever born as expected. However, the positive coefficient of previous parity on current fertility is much more difficult to explain. Higher previous parity may be associated with higher desired family size, and hence continued higher childbearing in the most recent period.

11.5 SUMMARY

This study examines the relationship between female work participation and fertility. To test the direction and significance of all the possible causal links between these two variables, a simple framework whereby both female work participation and fertility are allowed to influence directly each other and at the same time to be determined by a common set of determinants is used. Two temporal dimensions of work participation and fertility are distinguished, namely cumulative and current. The results reveal varying relationships between the two variables depending on which dimension is examined.

In the cumulative case, work participation reduces fertility, while fertility increases work participation. In contrast, in the current case, work participation increases fertility, while fertility reduces work participation. Although measurement problems are not entirely discounted, the apparent inconsistency in the direction of the relationships observed between the two dimensions may be due to time-related differences in the situation of women implied by these perspectives. Thus, for example, while current fertility tends to reduce current work participation due to role (time) conflicts, in the longer time perspective women with a larger family size will tend to work more to supplement the family income. In another vein, while current work participation tends to increase current fertility, either due to the positive income effect of female earnings or to the different timing of births by working women, in the longer time perspective women who work eventually end up with a smaller family size because of the higher opportunity cost of children.

In sum, we can tentatively conclude that over the woman's childbearing career, work participation reduces fertility and fertility simultaneously increases work participation. The first link is consistent with the findings in more advanced economies and is understandable in terms of the woman's value of time hypothesis. The second link is opposite to that usually found in more advanced economies where role (time and normative) conflicts are more important. In a low income country, like the Philippines, the income-inadequacy effect appears to be more important, so that women are encouraged to work more when their family size is large to ensure minimum levels of family welfare. This result is consistent with earlier empirical findings in the Philippines and is

understandable in terms of the threshold hypothesis described in Encarnación (1973) and Canlas and Encarnación (1977).

The above overall relationships, however, may differ during any given short-term period when other forces determining the links between the two variables may become more important. Thus role (time) conflict would tend to figure prominently in the short run, so that women with current births or with pre-school children will tend to participate less in the labour market in order to take care of the young children. Alternatively, the positive income effect of work participation on current fertility may dominate the negative substitution effect.

Moreover, as the results in the preceding section suggest, the significance of the links between female work participation and fertility vary by the characteristics of the woman, her family and the labour market.

Overall, the results of our investigation support Weller's (1977) view that there appears to be a number of different causal chains linking the two variables, and that the empirical importance of each link and of each factor producing that link should be viewed as situational, varying according to the circumstances of the woman, the family, and the employment market, each of which may be dependent upon a complex of other social, cultural and technological factors.

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Part IV

Family Planning

Introduction

The previous chapters have documented the levels and trends of fertility and nuptiality in the Philippines and the associations with a number of demographic and socio-economic variables. While these determinants do account for some of the observed differentials in fertility behaviour, an important issue is the role of contraceptive use in generating them and, further, the determinants of use and non-use of contraception. The use of contraception is an intermediate fertility variable which has assumed great importance in modern times in accounting for variations in marital fertility levels, a consequence of the availability of modern and effective techniques. Some other intermediate variables, such as involuntary infecundity and foetal mortality (voluntary and involuntary) no longer affect marital fertility in the same way as voluntary use of contraception, due to great improvements in health conditions. Who, why, or why not couples practise birth limitation has therefore become a major concern in demographic studies.

In the Philippines in the mid-1970s, knowledge of methods of family planning was already widespread, with close to 94 per cent of currently married women having heard of at least one method of family planning. Actual use of any method of contraceptive, however, seemed to lag behind considerably, with only slightly more than half (59 per cent) of the currently married women reported as having ever used a method and an even lower proportion currently using (36 per cent). Compared with the levels estimated in 1968 (before the adoption of an explicit policy of population control by the government) there has been a significant increase in use. The National Demographic Survey 1968 indicated that 63, 19 and 16 per cent of the currently married women, knew a method, had ever used a method and were currently using a method, respectively.

The family planning programme having been established during 1970, the first half of the 1970s witnessed a record increase in the number of acceptors. Service statistics derived from records of family planning clinics, both private and public, attest to the increasing number of acceptors between 1970 and 1975. Popularity of family planning, however, seemed to reach a peak sometime in the mid-1970s. For some reason the family planning programme has lost ground in creating a favourable climate, as far as control of fertility is concerned.

Even in recent years, the condition of high fertility in this country has continued to pose a major stumbling block in development efforts. Policy-makers are therefore concerned about strategies to maintain favourable acceptance of contraception as a means to regulate fertility. Chapter 12, Factors Affecting Use and Non-Use of Contraception, should therefore provide useful and informative material to policy-makers and those implementing the programme. This paper considers the individual characteristics of the users and non-users of contraception; it also investigates the reasons why some women stop using contraception after having used it for some time. The results of this analysis should give valuable insights into the conditions necessary to sustain high rates of contraceptive use.

It has been widely recognized that variations in levels and patterns of contraception cannot be adequately explained only by micro-level characteristics. The use of contraception by individuals is admittedly influenced as well by factors that go beyond individual psycho-social factors. Modernization and socio-economic development of societies are known to discourage childbearing and enhance the motivation to control childbirth through the use of contraceptive methods. And, of course, family planning programmes, to the extent that they disseminate information and deliver contraceptive supplies,

have also been credited with increases in the levels and patterns of contraceptive use.

Hence, the analysis of contraceptive use and fertility behaviour can be enhanced by considering societal-level factors such as community development and quality or strength of the family planning programme. Chapter 13 examines variations in contraceptive use and in fertility, according to indicators of socio-economic development and family planning programme effort. Specifically, an assessment is made of the impact of socio-economic development relative to that of family planning programme accessibility, with demographic and socio-economic characteristics controlled.

12 Factors Affecting Use and Non-Use of Contraception

Josefina Valera-Cabigon

12.1 INTRODUCTION

With the integration of family planning in Philippine development planning, there is a need to discover areas in which action may be taken by policy-makers and programme administrators to improve overall levels of contraceptive use. Specific areas of concern include factors that contribute to current use and non-use of contraception. Such factors may refer to demographic, socio-economic, as well as specific family planning programme aspects of the population under consideration.

The information obtained in the RPFS in the family planning module offers a basis for an intensive analysis of the above factors. Family planning data provided by the RPFS include: (1) knowledge, ever-use, current use, never use of contraceptive methods; (2) access, availability and satisfaction with family planning services in general; (3) availability of pills, condoms and tablets in the respondent's house; (4) duration of use for current or last method; (5) reasons for stopping or never using a contraceptive method; (6) perceived access, distance to a family planning outlet, and cost involved in acquiring pills, condom, IUD and sterilization; and (7) contraceptive use in relation to fertility regulation.

The *RPFS 1978: First Report* (1979) presents levels and differentials of ever-use and current use of contraception. A more detailed treatment of such differentials in relation to fertility was performed by Zablan (1981). In this chapter, we explore further the nature and extent to which the demographic and socio-economic variables influence the level of current contraceptive use, within a multivariate context, with the objective of arriving at clearer policy implications. Furthermore, an assessment of the strength of the family planning programme variables controlling for these background factors may provide insights to policy-makers and programme administrators.

A more specific topic needing thorough study is the characteristics of ever-users not currently using, as was suggested by Tabah (1979) in his evaluation of the *RPFS 1978: First Report*. Tabah argued that an important and overlooked research problem is how to interpret the behaviour of ever-using women who were not currently using (whom we term 'stoppers'). Possible interpretation for why ever-users are not currently contracepting are: (1) the stoppers could be dedicated family planners who are not currently married, currently pregnant, no longer fecund, or some similar reason; (2) they could be women who experimented once or twice with contraception and then abandoned it for some reason; or (3) they could be some combination of either of these two extremes. To discover which of these possible interpretations is correct, a thorough study of ever-users not currently using is called for.

Tabah also noted a sudden fall at the oldest age group in the proportions ever using and currently using any method (and efficient methods) and in the proportion intending future use. Tabah suggested that it is an important question whether the fall is due to the fact that these women are reluctant to accept the concept of family planning, or that they believe they are no longer capable of bearing children.

Important questions can also be raised about the entire group of never users. What factors explain why they have never used?

Finally, the data are rich with programme variables which provide insights on how the national family planning programme has been progressing. This chapter is addressed to the above issues.

12.2 VARIABLES AND METHODOLOGY

Two types of analysis are adopted here. The first is

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 149–173. Voorburg, Netherlands: International Statistical Institute.

descriptive, relying very much on cross-tabulations. It provides a background for the more complicated multivariate analysis, the second type of analysis. The descriptive analysis also yields useful highlights on certain factors that may have a bearing on contraceptive use but due to statistical and measurement constraints could not be considered in the multivariate analysis.

The dependent variables we examine fall into two general categories: current use of methods in general, and current use of specific methods (ie pill, IUD, condom, female sterilization, and rhythm).

In the analysis of the current use of methods in general, the following three measures were adopted as dependent variables:

1 Current use of any method, dichotomized as currently using equals one, otherwise zero;
2 Current use of an efficient method, also dichotomized as currently using equals one, otherwise zero; and
3 Continuation of use for a given period of time, structured in life-table perspective; for instance continuation after 12 months following acceptance equals one and continuation less than 12 months equals zero.

It is worth mentioning that three alternative measures were utilized to give several perspectives on the hypothesized relationships between contraceptive use and the predictors and controls. The third measure, as we will demonstrate, is upwardly biased; we assume it may be safely utilized for examining differentials, however. It must be conceded that the 'upward bias' in the estimated continuation rates might be more serious for some subgroups than for others.

In a related study made on the same set of data by Pullum, Immerwahr and Cabigon (1982) focusing on currently married, non-pregnant, fecund women who want no more children, it was discovered that cultural variables which identify aggregate and typically lifetime characteristics — religion, ethnicity, and region — significantly affected current use. Among the socio-economic characteristics (wife's education, husband's occupation and wife's work pattern) wife's education turned out to be the most important variable affecting use, as expected. Husband's occupation and wife's work pattern showed very little impact on current use. Effects of programme variables, such as cost of methods and time to outlet, were weak. Child mortality showed no direct effect on current use.

The present study focuses more on the programme variables, which the Pullum *et al* study did not touch in great detail. The same cultural variables — religion, ethnicity, and region — and the socio-economic characteristics (wife's education and her work pattern) are here regarded as controls, along with the demographic variables that are likely to affect contraceptive use. The independent variables investigated in great detail are: (1) husband's occupation; (2) most important source of family planning knowledge; (3) source of supplies, defined as supply point nearest respondent's home, and (4) access, defined as location of nearest supply point.

The independent variables considered as controls are: (a) age, (b) age at first marriage, (c) actual number of living children and current pregnancy, (d) open birth interval, (e) region, (f) residence, (g) ethnicity, (h) religion, (i) wife's education, (j) wife's pattern of work, and (k) total children desired. (In this study husband's occupation is transformed into a quantitative classification (see appendix A) using the socio-economic index for occupations in the Philippines created using canonical correlation analysis of the 1978 Area Fertility Survey (Cabigon 1980).)

Four dummy variable multiple regression equations following a hierarchical strategy are estimated. Equation 1 enters husband's occupation into the regression controlling only for age, age at first marriage, region, residence, ethnicity, and wife's education. Equation 2 adds source of FP knowledge, plus wife's pattern of work, actual number of living children and current pregnancy, open birth interval and total children desired as additional controls to the variables of equation 1. Equation 3 introduces source of supplies to the regression equation of equation 2. Equation 4 finally adds FP access or distance to the regression equation. Analysis of the influence of each predictor focuses on the regression coefficients expressed as deviations from the grand mean of the dependent variable. Such deviations are identical to the results yielded by multiple classification analysis (MCA). Furthermore, the increment in R^2 (or in the explained sum of squares) at each step is taken as the component of variation attributable to the particular variable added on that step. Significance of each variable is tested by the F ratio calculated in accordance with the hierarchical method.

The sample of currently married fecund and not pregnant women at survey date used with the first two dependent variables is 6670. (Fourteen

cases with no information on either years of schooling (wife or husband) or on husband's occupational index score are missing.) For the third measure (contraceptive continuation) truncated cases – those who accepted less than 12 months (1238) before the interview date, those with no information and those not applicable (2367) – are removed, thus reducing the sample to 3065.

For the second general category of the analysis, the method-specific analyses, there were two types of dependent variables. One was a dichotomy, with current use of a specific method scored one and current use of other methods scored zero. The other was a measure of continuation of a specific method, constructed as a dichotomy, with continuation of a specific method for 18 months scored one and discontinuation scored zero. This analysis, then, is restricted to ever users of the method under consideration.

It was possible to incorporate additional information from the family planning module data in this analysis. It should be noted, however, that more detailed information was collected only on selected variables related to a subset of methods. One variable is availability of a method in the house at time of interview; this information was collected for the pill, condom, and foam tablet. The question asked was 'Are there any (name of method) in your house now?' The other variables are related to source, distance and cost and were obtained for four specific methods: pill, IUD, condom, and female sterilization. The relevant questions are: (1) 'Where would you go to get (method)?'; (2) 'How long would it take you to get there?' and 'How much do you think (name of method) may cost there?'. From the questions, it is clear that distance and cost are measured in terms of the respondent's perceptions.

Given these limited data, the working framework adopted here is simply to examine the relationship of presence of supplies in the respondent's home and of the perceived source of supplies, access and cost with current use of the pill and condom (rather than other methods). The same variables, with the exception of presence of supplies in the home, are used in analysis of current use of female sterilization (rather than other methods). In addition to the above programme variables, region is considered as a predictor in line with the present regional thrust of the national family planning programme. Furthermore, since it is expected that source, access and cost of methods vary substantially between urban and rural respondents, separate method-specific analyses are run for urban and rural subsamples, for the pill and the condom. (Because of the skewed distributions of the dependent variables, it was not statistically appropriate to perform the analysis of other methods separately for urban and rural areas.) For female sterilization, analysis is confined to the rural subsample, because in the preliminary analysis no significant pattern of relationships emerged for the urban domain.

With the second measure of the dependent variable – the continuation rate – the IUD is analysed along with the pill and condom. Female sterilization is not applicable here because its continuation is assumed to be 100 per cent. Due to smallness of cases involved, separate analyses for rural and urban samples are not feasible, and the analysis is confined to the total sample. Furthermore, unlike in the analysis of current use of methods in general, where 12 months is the cut-off, in the method-specific analysis 18 months is adopted because in the exploratory analysis this cut-off yielded clearer patterns of association.

In our analysis of use of the pill, IUD, condom and female sterilization, interest will focus on programme variables, region and residence. Demographic and socio-economic variables are regarded as controls.

Finally, within our method-specific analysis, we devote special attention to rhythm. Along with withdrawal, rhythm is the method currently used by the highest proportion of exposed fecund currently married women (11 per cent and 12 per cent, respectively). We suspect its determinants will differ from the methods requiring supplies or modern health services. In the analysis of the continuation rate for rhythm, we consider the net effects of region, residence, husband's occupation, actual number of living children, total number of children desired, and regularity of menstrual period, after controlling for current age and age at first marriage.

As in the multiple regression analysis of current use of methods in general, the coefficients are transformed and presented as deviations from the grand mean of the dependent variable. The significance of each predictor is tested by the relevant F-ratio.

12.3 FINDINGS

Descriptive analysis

We first classify the 9268 ever-married women (EMW) according to exposure status and use/non-use of contraception as shown below:

Status	*Per cent*
Not currently married (CM)	4.4
CM, not fecund	10.5
CM, fecund, never user	32.0
CM, fecund, stopper	18.7
CM, fecund, current user	34.4
Total %	100.0
N	9268

It appears that about one EMW in three were CM and fecund and had never used family planning and one in three were CM and fecund and were currently using. A little less than one in five were CM and fecund and had stopped using any method. Only one in ten was currently married not fecund.

Looking more closely at the distribution of CM, fecund never users, stoppers and current users (table 12.1), we see that a majority of the never users were young (aged 20–29 years), had less than four children, had attained primary or intermediate schooling, resided in Luzon region, were rural residents, Roman Catholics, had never worked, and with husbands as farmers. Most stoppers were in the late twenties, with four or more children, and characterized by low education, residence in Luzon and in the rural areas, Roman Catholics, never worked and with husbands engaged in skilled manual jobs. Current users displayed the same distribution as the stoppers by background characteristics, excepting age where the majority were in the thirties.

The fall in the percentage using at the last age group noted by Tabah is evident in table 12.2. To find out whether it is the belief of respondents that they are no longer capable of bearing children or their reluctance to accept family planning which is the more likely explanation of this fall, let us examine the patterns more closely. A close look reveals that the percentage never using declines with age, as does the percentage of stoppers from ages 25–29 onward. But the percentage currently using peaks at ages 35–39 and only then falls off. The fact that the peak of current use falls on age group 35–39 and that a substantial proportion of those aged 40–44 (35 per cent) are still using suggests that reluctance to accept family planning as the explanation is unlikely. Furthermore, among the oldest women, one-half believed that they were no longer fecund. Such observations are further indications that the more likely explanation of the sudden fall is the belief of respondents that they are no longer capable of bearing children.

We now turn to the issue on the factors that are more likely to affect never use and stopping use. As a first step, further classifying the fecund never users and stoppers according to exposure status may be helpful. As seen from table 12.3, where these two groups are subdivided into exposure status and by age, it appears that 75 per cent of fecund never users were exposed to the risk of childbearing at time of survey. Most of these exposed fecund never users were in their peak childbearing age. Among those fecund never users who were currently pregnant, most were young. A closely related issue is how these fecund never users will behave in the future with regard to use of family planning. Of the 2969 fecund never users, 60 per cent stated no intention to use and their distribution by age is more or less equal, excepting the youngest:

Age							
15–19	20–24	25–29	30–34	35–39	40–44	45–49
4.8	15.6	16.2	17.8	18.6	16.4	10.6
Total	%	100.0				
	N	1792				

The fecund never users who do not intend to use in the future have to be reached and motivated if the goal of NRR = 1 is to be attained by the national family planning programme.

Returning to the stopper group, we note that 19 per cent were unexposed. Among those currently pregnant, most were in their peak childbearing period. Among the fecund stoppers who were not currently pregnant, a majority were also in high fecundity age groups. To discover the reasons why these women stopped using, let us examine table 12.4. Among the currently pregnant fecund stoppers, accidental pregnancy ranked first and husband's objection last (disregarding fears about method, with few cases) among the reasons given. Among the fecund stoppers exposed to the risk of childbearing, side effects emerged as the major reason, followed by the 'Others' category which includes those saying they wanted more children. This finding is consistent with the findings of other surveys in the country (1968 and 1973 National Demographic Surveys, 1978 and 1980 Community Outreach Surveys and 1977–80

Table 12.1 Percentage distribution of currently married fecund women according to use/non-use of contraception and various characteristics

Variable	Never user	Stopper	Current user
A Age			
15–19	6.7	1.6	1.4
20–24	19.2	15.7	10.9
25–29	19.3	26.7	21.1
30–34	17.6	22.7	22.6
35–39	16.3	18.4	22.8
40–44	13.4	10.9	15.2
45–49	7.5	3.8	6.0
Total %	100.0	100.0	100.0
Total N	2969	1736	3187
B Number of living children			
<4	51.2	48.6	43.8
4 and over	48.8	51.4	56.2
Total %	100.0	100.0	100.0
Total N	2970	1736	3187
C Level of education			
No schooling	9.1	(1.9)	(1.5)
Primary	31.7	19.1	16.1
Intermediate	38.3	39.9	37.2
High school	14.5	24.8	26.7
Some college	2.6	5.9	6.9
College with degree +	3.7	8.4	11.5
Total %	100.0	100.0	100.0
Total N	2969	1737	3186
D Region of residence			
Metro Manila	7.7	13.9	17.5
Luzon	42.3	44.2	40.7
Visayas	28.0	22.6	19.5
Mindanao	22.0	19.3	22.2
Total %	100.0	100.0	100.0
Total N	2972	1735	3185
E Type of place of residence			
Urban	21.2	34.8	42.1
Rural	78.8	65.2	57.9
Total %	100.0	100.0	100.0
Total N	2972	1734	3187

[*Table continues*]

Table 12.1 *(cont)*

Variable	Never user	Stopper	Current user
F Religion			
Roman Catholic	82.6	86.3	86.8
Protestant	2.9	3.3	4.0
Iglesia ni Kristo	(1.3)	(2.6)	2.5
Aglipayan	3.3	4.4	3.5
Islam	6.3	(.5)	(.6)
Others	3.4	(2.8)	2.5
None	(.2)	(.1)	(.1)
Total %	100.0	100.0	100.0
Total N	2971	1739	3184
G Pattern of work			
Before and now	15.1	17.6	19.7
Now not before	23.4	22.8	27.1
Before and after	7.0	9.2	8.2
Only after	3.2	6.1	4.7
Only before	7.7	7.8	6.6
Never worked	43.1	36.5	33.7
Total %	100.0	100.0	100.0
Total N	2971	1735	3185
H Husband's occupation			
Did not work	(.7)	(.5)	(.5)
Professional	3.9	6.6	8.9
Clerical	2.3	4.6	6.5
Sales	4.4	6.5	7.5
Self-employed agricultural	38.6	25.4	22.9
Not self-employed agricultural	25.9	18.7	14.3
Private household	(.2)	(.6)	(.3)
Other services	4.2	5.2	7.2
Skilled manual	16.7	26.8	26.8
Unskilled manual	3.1	5.1	4.5
Total %	100.0	100.0	100.0
Total N	2969	1736	3187

( ) Less than 50 cases.

Area Fertility Surveys). Note that the proportion citing husband's objection was about 18 per cent. It appears from these figures that the ever-users not currently contracepting were women who experimented once or twice with contraception and then abandoned it due to side effects, accidental pregnancy, husband's objection and other reasons. Furthermore, among all stoppers these exposed women are the vast majority (table 12.3). Only about 12 per cent of the stoppers reported themselves to be infecund.

Let us now turn to the percentage distribution

Table 12.2 Percentage distribution of ever-married women by age according to marital status, fecundity and use of contraception

Age	EMW		Not currently married	CMW—not fecund	CMW—FEC never user	CMW—FEC stopper	CMW—FEC current user
	N	%					
15—19	276	100.0	(1.09)	(.36)	72.46	(10.14)	(15.95)
20—24	1222	100.0	(2.37)	(.25)	46.56	22.34	28.48
25—29	1775	100.0	2.99	(.79)	32.11	26.14	37.97
30—34	1711	100.0	(2.80)	(1.52)	30.63	23.03	42.02
35—39	1673	100.0	4.36	4.07	28.93	19.13	43.51
40—44	1410	100.0	5.95	17.94	28.30	13.48	34.33
45—49	1201	100.0	9.57	50.46	18.57	5.58	15.82
Total	9268	100.0	4.37	10.48	32.03	18.73	34.39

( ) Less than 50 cases.

Table 12.3 Percentage distribution of ever-married women according to exposure, use status and age

Exposure status and age	Use status	
	Never user	Stopper
Not exposed	24.8	18.6
Widowed, divorced or separated	6.7	6.5
Currently married and reported infecund	18.1	12.1
Exposed	75.2	81.4
Not currently pregnant	60.2	52.2
>25	13.4	7.3
25—34	21.5	24.4
35—44	19.8	17.5
45+	5.5	3.0
Currently pregnant	15.0	29.2
>25	6.2	6.9
25—34	6.1	15.8
35—44	2.5	6.4
45+	.2	.1
Total		
%	100.0	100.0
N	3947	2135

of these EMW by various background characteristics, contraceptive use, and the most important source of family planning knowledge (table 12.5). It is apparent from this table that the most important source was a visit to a doctor, clinic or hospital for a majority of current users and stoppers in Metro Manila, Luzon, Visayas, in both urban and rural areas, for those who had at least an elementary education, and for all categories of religiosity. Friends, relatives and husbands were cited by a majority of never users in the corresponding groupings. It is also important to note

Table 12.4 Percentage distribution of fecund stoppers by exposure status, age and reasons for stopping last method

Exposure status	N	%	No need	Side effects	Fears about method	Husband's objection	Accidental pregnancy	Others
A Pregnant	623	100.0	–	18.9	(2.4)	15.3	39.8	23.6
<25	147	100.0	–	(19.0)	(2.0)	(18.4)	36.1	(24.5)
25–34	339	100.0	–	17.7	(2.6)	(13.6)	38.3	27.8
35–44	136	100.0	–	(22.0)	(2.2)	16.2	47.1	(12.5)
45+	1	100.0	–	–	–	(100.0)	–	–
B Not currently pregnant	1114	100.0	(6.8)	29.0	5.5	17.9	17.5	23.3
<25	154	100.0	(3.2)	(21.4)	(4.5)	(22.2)	(16.2)	32.5
25–35	521	100.0	(5.9)	28.2	(4.6)	18.0	19.3	24.0
35–44	373	100.0	(6.4)	34.0	(6.3)	17.1	16.4	19.8
45+	66	100.0	(25.8)	24.2	9.1	(12.1)	(10.6)	18.2

– No case.
( ) Less than 50 cases.

Table 12.5 Percentage distribution of ever-married women who have known or recognized a method by various characteristics, use of contraception and most important source of family planning knowledge

Characteristics/use of contraception	Sources						
	N	%	Visit to doctor, clinic, hospital	Home visit by nurse, midwife, teacher	Outreach worker, BSP[a]	Media, other form of communication	Friends, relatives, husbands, etc
A Region							
Metro Manila	1151	100.0	45.18	5.13	(.69)	21.02	27.98
Current user	560	100.0	53.93	(5.71)	(.36)	18.21	21.79
Stopper	312	100.0	46.79	(5.45)	(.96)	19.23	27.56
Never user	279	100.0	25.81	(3.58)	(1.07)	28.67	40.86
Luzon	3732	100.0	28.56	20.02	1.93	19.24	30.25
Current user	1297	100.0	38.01	20.66	(1.31)	16.65	23.36
Stopper	956	100.0	34.62	25.94	(2.51)	15.48	21.44
Never user	1479	100.0	16.36	15.62	(2.10)	23.93	41.99
Visayas	2099	100.0	30.68	16.20	6.67	19.01	27.44
Current user	624	100.0	40.54	15.70	(5.77)	18.43	19.55
Stopper	465	100.0	41.50	18.92	(7.96)	15.91	15.70
Never user	1010	100.0	19.60	15.25	6.63	20.79	37.72

Table 12.5 (*cont*)

Characteristics/use of contraception	Sources						
	N	%	Visit to doctor, clinic, hospital	Home visit by nurse, midwife, teacher	Outreach worker, BSP[a]	Media, other form of communi-cation	Friends, relatives, husbands, etc
Mindanao	1889	100.0	28.22	12.97	9.21	18.95	30.65
Current user	711	100.0	34.74	17.72	9.14	20.11	18.28
Stopper	533	100.0	29.46	10.69	(7.32)	14.07	38.46
Never user	645	100.0	20.00	9.61	10.85	21.70	37.83
B Residence							
Urban	2904	100.0	39.70	10.61	3.27	20.25	26.17
Current user	1345	100.0	46.69	10.33	(2.97)	19.03	20.97
Stopper	765	100.0	43.27	12.68	(4.31)	18.17	21.57
Never user	794	100.0	24.43	9.07	(2.77)	24.31	39.42
Rural	5826	100.0	27.62	18.61	5.11	19.34	29.32
Current user	1846	100.0	36.19	20.91	4.33	17.28	21.29
Stopper	1369	100.0	36.08	22.86	5.11	16.07	19.87
Never user	2611	100.0	17.12	14.74	5.67	22.52	39.95
C Education							
No schooling, primary	2409	100.0	22.29	16.44	5.44	16.27	39.56
Current user	563	100.0	30.91	18.83	(4.80)	13.50	31.97
Stopper	473	100.0	33.40	21.14	(6.55)	10.99	27.91
Never user	1373	100.0	14.93	13.84	5.32	19.23	46.69
Elementary	3353	100.0	30.12	21.56	4.74	15.81	27.77
Current user	1186	100.0	38.03	21.42	5.14	13.41	22.01
Stopper	902	100.0	35.81	31.15	(4.32)	10.86	17.85
Never user	1265	100.0	18.66	14.86	4.66	21.58	40.24
High school	1897	100.0	42.01	14.76	3.79	17.29	22.14
Current user	852	100.0	50.47	13.97	(1.99)	15.38	18.19
Stopper	527	100.0	44.59	18.03	(3.98)	14.42	18.97
Never user	518	100.0	25.48	12.74	(6.56)	23.36	31.85
College and over	1148	100.0	36.41	6.36	(2.61)	40.50	14.11
Current user	589	100.0	40.92	(7.81)	(2.55)	35.48	13.24
Stopper	311	100.0	35.37	(4.50)	(3.54)	42.76	(13.83)
Never user	248	100.0	27.02	(5.24)	(1.61)	49.60	(16.53)

[*Table continues*]

Table 12.5 (*cont*)

Characteristics/use of contraception	Sources						
	N	%	Visit to doctor, clinic, hospital	Home visit by nurse, midwife, teacher	Outreach worker, BSP[a]	Media, other form of communi-cation	Friends, relatives, husbands, etc
D Religiosity							
Everyday, several times or once a week	3326	100.0	36.77	13.35	4.30	22.61	22.97
Current user	1443	100.0	45.04	13.31	3.74	20.72	17.19
Stopper	817	100.0	41.00	16.03	(4.28)	19.09	19.58
Never user	1066	100.0	22.33	11.35	5.07	27.86	33.40
Once a month	2288	100.0	27.88	18.53	4.20	18.27	31.12
Current user	797	100.0	34.88	21.20	(3.64)	15.31	24.97
Stopper	597	100.0	36.52	22.11	(4.69)	16.75	19.93
Never user	894	100.0	15.88	13.76	(4.36)	21.92	44.08
Few times, once a year or never	1931	100.0	24.49	17.81	5.33	16.36	35.99
Current user	534	100.0	33.89	17.98	(4.12)	15.36	28.65
Stopper	435	100.0	34.48	23.91	(5.75)	11.03	24.83
Never user	962	100.0	14.76	14.97	5.82	19.33	45.11

( ) Less than 50 cases.
[a] BSP = barrio supply point.

that media and other forms of communication were cited by a substantial proportion, roughly 20 per cent of current users and never users in all regions except Luzon, in the urban and rural areas, and with a college education and who are very religious. The corresponding proportion of stoppers is at least 10 per cent. This indicates that the media have been playing an important role in selling the family planning and welfare programme.

The RPFS collected information on availability of pills, condom and foam tablets in homes of respondents at the time of interview. Table 12.6 displays the relevant information. A close examination of this table reveals that very few of those who have known or recognized pills, condom and foam tablets claimed availability of such methods in their homes at survey date regardless of background characteristics. Among those who had such methods (pills in particular), most came from Metro Manila, from other urban areas and were within the highly educated groups.

Respondents were asked their perception of time to a source of the pill, IUD, condom and sterilization. We grouped the times given into three categories – <15 minutes, 15–44 minutes, and 45 minutes and over, which we define as close, moderate, and far, respectively. The distribution of respondents over these categories by various background characteristics is presented in table 12.7. Most respondents perceived themselves as close to family planning outlets for pills, IUD, and condom, regardless of region, education and religion. Nevertheless, women in the rural areas thought that the nearest IUD source was at a distance requiring 15–44 minutes travel. Likewise, to get sterilized, a majority of the rural women

Table 12.6 Percentage distribution of ever-married women who have known or recognized a method by various characteristics and availability in the home of selected methods

Characteristics	Method											
	Pills				Condom				Foam tablets			
	N	%	No	Yes	N	%	No	Yes	N	%	No	Yes
A Region												
Metro Manila	1122	100.0	88.9	11.1	1079	100.0	90.2	9.8	542	100.0	97.0	(3.0)
Central Luzon	3532	100.0	92.1	7.9	3434	100.0	90.3	9.7	1434	100.0	97.5	(2.5)
Visayas	2008	100.0	93.4	6.6	1948	100.0	89.8	10.2	867	100.0	97.0	(3.0)
Mindanao	1701	100.0	91.3	8.7	1657	100.0	89.5	10.5	857	100.0	97.8	(2.2)
B Residence												
Urban	2852	100.0	89.6	10.4	2766	100.0	88.1	11.9	1447	100.0	96.3	3.7
Rural	5510	100.0	93.0	7.0	5352	100.0	91.0	9.0	2253	100.0	98.1	(1.9)
C Level of education												
No schooling	284	100.0	97.0	(3.0)	263	100.0	97.8	(2.2)	73	100.0	100.0	—
Primary	1903	100.0	95.8	4.2	1838	100.0	95.2	4.8	653	100.0	99.6	(.4)
Intermediate	3167	100.0	92.3	7.7	3047	100.0	90.5	9.5	1240	100.0	97.6	(2.4)
High school	1874	100.0	89.0	11.0	1832	100.0	87.3	12.7	925	100.0	97.2	(2.8)
Some college	434	100.0	85.3	14.7	439	100.0	84.5	15.5	287	100.0	96.9	(3.1)
College and over	701	100.0	88.5	11.5	699	100.0	81.8	18.2	522	100.0	94.4	(5.6)
D Religion												
Roman Catholic	7249	100.0	91.9	8.1	7049	100.0	90.0	10.0	3192	100.0	97.6	2.4
Protestant	276	100.0	92.6	(7.4)	263	100.0	90.0	(10.0)	144	100.0	94.9	(5.1)
Iglesia ni Kristo	178	100.0	87.1	(12.8)	79	100.0	87.2	(12.8)	79	100.0	99.0	(1.0)
Aglipayan	323	100.0	90.1	(9.9)	306	100.0	92.1	(7.9)	153	100.0	95.5	(4.5)
Islam	106	100.0	97.4	(2.6)	105	100.0	97.4	(2.6)	22	100.0	94.8	(5.2)
Others	227	100.0	93.3	(6.7)	214	100.0	86.8	13.2	109	100.0	96.3	(3.7)

( ) Less than 50 cases.
— Less than 20 cases.

Table 12.7 Percentage distribution of ever-married women who have known or recognized a method by various characteristics and accessibility[a] of family planning outlets

Characteristics	Total		Close	Moderate	Far
	N	%			
A Pills					
Region					
Metro Manila	1053	100.0	72.84	23.65	(3.51)
Luzon	2901	100.0	49.12	34.30	16.58
Visayas	1515	100.0	45.48	34.59	19.93
Mindanao	1374	100.0	50.00	30.71	19.29
Residence					
Urban	2582	100.0	74.79	22.46	2.75
Rural	4265	100.0	38.45	37.73	23.82
Level of education					
No schooling	144	100.0	(31.25)	(26.39)	42.36
Primary	1263	100.0	38.56	35.47	25.97
Intermediate	2621	100.0	46.51	35.02	18.47
High school	1720	100.0	62.21	29.65	(8.14)
Some college	405	100.0	65.43	29.38	5.19
College and over	683	100.0	69.84	22.84	7.32
Religion					
Roman Catholic	5952	100.0	53.13	32.02	14.85
Protestant	222	100.0	45.04	32.43	22.52
Iglesia ni Kristo	160	100.0	53.12	33.75	(13.13)
Aglipayan	249	100.0	46.55	34.54	(18.87)
Islam	86	100.0	(33.72)	(19.77)	(46.51)
Others	167	100.0	43.11	32.34	(24.55)
B IUD[b]					
Region					
Metro Manila	1003	100.0	52.34	39.48	8.18
Luzon	2646	100.0	42.40	37.26	20.34
Visayas	1412	100.0	37.68	35.98	26.34
Mindanao	1299	100.0	43.65	34.03	22.32
Residence					
Urban	2453	100.0	62.78	31.06	6.16
Rural	3846	100.0	31.31	40.87	27.82
Level of education					
No schooling	74	100.0	(29.73)	(28.38)	(41.89)
Primary	818	100.0	30.56	37.29	32.15
Intermediate	1884	100.0	38.06	39.65	22.29
High school	1241	100.0	48.67	37.63	13.70
Some college	310	100.0	57.10	34.52	(8.39)
College and over	510	100.0	59.22	30.00	10.78

Table 12.7 (*cont*)

Characteristics	Total		Close	Moderate	Far
	N	%			
Religion					
Roman Catholic	5518	100.0	44.07	36.88	19.05
Protestant	222	100.0	33.78	37.39	28.83
Iglesia ni Kristo	141	100.0	47.52	33.33	19.15
Aglipayan	230	100.0	39.57	36.52	23.91
Islam	79	100.0	(29.11)	(21.52)	(49.37)
Others	161	100.0	34.17	40.99	(24.84)
C Condom					
Region					
Metro Manila	1012	100.0	72.63	24.41	(2.96)
Luzon	2720	100.0	52.24	35.44	12.32
Visayas	1484	100.0	47.30	33.49	19.21
Mindanao	1347	100.0	50.78	31.40	17.82
Residence					
Urban	2509	100.0	74.81	22.88	2.31
Rural	4164	100.0	40.03	37.54	22.43
Level of education					
No schooling	140	100.0	(33.57)	(25.00)	41.43
Primary	1235	100.0	40.57	35.22	24.21
Intermediate	2548	100.0	47.77	35.28	16.95
High school	1675	100.0	61.97	29.49	8.54
Some college	412	100.0	67.48	27.67	(4.85)
College and over	681	100.0	70.63	22.47	(6.90)
Religion					
Roman Catholic	5837	100.0	53.74	32.26	14.00
Protestant	216	100.0	45.83	32.87	(21.30)
Iglesia ni Kristo	154	100.0	54.54	32.47	(12.99)
Aglipayan	235	100.0	48.51	34.47	(17.02)
Islam	861	100.0	(38.37)	(18.60)	(43.03)
Others	159	100.0	46.54	32.08	(21.38)
D Female sterilization					
Region					
Metro Manila	953	100.0	26.44	55.93	17.63
Luzon	2211	100.0	23.79	34.37	41.84
Visayas	1130	100.0	15.31	32.04	52.65
Mindanao	1086	100.0	20.16	29.56	50.28
Residence					
Urban	2251	100.0	33.01	44.11	22.88
Rural	3078	100.0	12.41	31.81	55.78

[*Table continues*]

Table 12.7 (*cont*)

Characteristics	Total		Close	Moderate	Far
	N	%			
Level of education					
No schooling	92	100.0	(16.30)	(25.00)	58.70
Primary	801	100.0	14.23	30.09	55.68
Intermediate	1962	100.0	14.58	37.77	47.65
High school	1455	100.0	24.95	40.62	34.43
Some college	362	100.0	31.77	39.78	28.45
College and over	654	100.0	35.32	35.63	29.05
Religion					
Roman Catholic	4554	100.0	22.09	38.32	39.59
Protestant	190	100.0	(18.95)	31.05	50.00
Iglesia ni Kristo	121	100.0	(17.35)	(35.54)	47.11
Aglipayan	190	100.0	(12.63)	33.68	53.69
Islam	481	100.0	(20.83)	(25.00)	(54.17)
Others	129	100.0	(17.83)	(37.98)	44.19

( ) Less than 50 cases.
[a] Travel time: close, < 15 minutes; moderate, 15–44 minutes; far, 45 + minutes.
[b] Cases for IUD refer to currently married fecund and exposed women.

perceived more than 45 minutes travel time required. This is expected as these methods are usually performed in the towns or cities where hospitals or clinics are located.

We now turn to a measure which is useful in assessing proximal effects of various inputs, that is the continuation rate. This is defined as the probability that an acceptor of a contraceptive will continue to use a given method for a specified period of time.

In the RPFS questionnaire, date of start of current use (for current users) and date of start and end of last method used (for stoppers) are available. Since detailed information required to calculate first segment and all methods continuation rates is not provided, we assume that the continuation rates calculated refer to single method continuation rates. That is, for simplicity, for deriving the continuation rates, it is assumed that the method currently used by current users or the last method used by stoppers was the first and only during the most recent episode of use.

The resulting continuation rates for all methods and for selected methods for ordinal months 6, 12 and 18 are displayed in table 12.8. Such rates appeared to be greatly biased upward regardless of specific methods when compared with rates from external sources. For instance, the 12 month continuation rate for all methods was 70 per cent from the 1978 RPFS but it was a little above 42 per cent from other sources, 1976 National Acceptor Survey (NAS) and the 1978 and 1980 Community Outreach Surveys (COS). The upward bias held true for all specific methods under question. It is obvious that the questions asked in the WFS family planning module to generate continuation rates appear to be seriously inadequate. We suspect that the main reason for this is the absence of any further questions to the respondent on whether or not, during any period between the date given as start of use and the interview (for current users) or end of use (for stoppers), use was terminated due to pregnancies or due to shifting to other methods.

Multivariate analysis: current use in general

We now turn to the results yielded by the four equations specified in section 12.2 for each of the three dependent variables measuring current use of any method (table 12.9). A close examination of the deviations (in per cent) from the grand mean percentage currently using any method (47.7 per cent) reveals that husband's occupation, net of demographic variables (age and age at first marriage), cultural variables (region, residence,

Table 12.8 Cumulative first-method[a] continuation rates by method, various surveys

Ordinal month/source	All methods	Method first accepted			
		Pills	IUD	Rhythm	Condom
6 months					
RPFS 1978	79.0	74.5	95.2	92.0	61.6
NAS 1976	59.0	61.4	78.5	58.9	35.6
12 months					
RPFS 1978	70.0	66.4	89.2	87.1	48.2
NAS 1976	45.9	47.8	67.5	41.5	23.3
COS 1978	42.8	47.0	69.0	48.0	16.0
COS 1980	46.2	42.0	70.0	51.0	10.0
18 months					
RPFS 1978	62.0	57.7	84.3	81.4	39.4

[a]In the RPFS 1978, it was assumed that the method currently used by current users or the last method used by stoppers was the first and only method used during the most recent episode of use.
Sources: RPFS 1978; Laing and Alcantara 1980; Final Report on the 1976 National Acceptor Survey; Laing 1981; Family Planning Outreach in the Philippines, Final Report on the Community Outreach Surveys

ethnicity and religion), and socio-economic variables (wife's education and husband's education), is not statistically significant in affecting current use. From the deviations, it seems that those in the two lowest categories in the occupational scale have 2–4 per cent lower use than the average and 7 per cent lower use than those in the next to highest category. However, these are not large relative to the standard errors associated with these coefficients for any of the three dependent variables. This indicates that measuring occupation on an interval scale does not disclose any significant pattern. As discovered by Pullum, Immerwahr and Cabigon (1982) husband's occupation has no effect on current use.

The most important source of family planning (FP) knowledge is added to the regression equation,[1] with additional demographic controls – actual number of living children and current pregnancy, total number of children desired and length of the open birth interval. The effect of this variable on current use is statistically and substantially significant with either current use of any method or current use of an efficient method as the dependent variable. Those who claimed visits to a doctor, clinic, hospital or home visit by a nurse, midwife, or teacher tend to have higher proportions currently using, while those who cited outreach worker, barrio supply point, media and all others as their most important sources of family planning knowledge show lower proportions currently using. These observations are open to different interpretations. They may represent real differences of such sources in influencing women to use a method. That is, doctors, clinics, hospitals and nurses, midwives and teachers making home visits may have a greater impact than the outreach worker, a barrio supply point, the media and all others. It is also possible that the net differences reflect problems in the meaning or measurement of the different categories of this variable. Outreach workers and barrio supply points are new strategies of the programme compared to doctors, etc who have existed before the programme. A nationwide effort of the media is likewise more recent than family planning clinics. It appears that the second interpretation is more likely to be correct. If we examine the effect of a supply point nearest R's home (equation 3), it turns out to be a very strong factor, with those obtaining their supplies from a FP fieldworker or a barrio supply point displaying the largest positive deviation of all sources from

[1] Note that we include the categories 'does not know FP' and 'does not know where to go', for this independent variable and the next, respectively. Cases falling in such categories could be regarded as missing cases in relation to the variables under consideration. But there are users among respondents in these categories, and thus we include them, for the contrast with the remaining categories in each variable.

Table 12.9 Adjusted deviations from the mean percentage currently using by kind of use: currently-married fecund non-pregnant women

	Measure 1 = current use of any method (grand mean = 47.7%)					Measure 2 = current use of an efficient method (grand mean = 21.2%)					Measure 3 = continuation, after 12 months following acceptance (grand mean = 77.5%)				
	Equation[a]					Equation[a]					Equation[a]				
	1	2	3	4	N	1	2	3	4	N	1	2	3	4	N
Husband's occupational index[b]															
Lowest	−4.3	− 3.9	− 3.5	− 3.5	1598	−3.8	−3.3	−3.1	−3.1	1598	−2.3	−1.6	−1.6	−1.7	571
	−2.5	− 1.1	− .4	− .4	1623	−5.6	−4.4	−4.1	−4.1	1623	.9	.4	− .6	.5	606
	5.6	4.3	3.6	3.6	1685	5.5	4.4	4.1	4.1	1685	1.7	1.8	1.7	1.8	884
Highest	.8	.5	.1	.1	1764	3.4	2.8	2.7	2.7	1764	− .7	− .9	−1.0	− .9	1004
Most important source of FP knowledge															
Visit to doctor, clinic, hospital		8.9	6.1	6.1	2111		9.3	8.1	8.1	2111		1.5	1.3	1.3	1228
Home visit by nurse, midwife, teacher		4.3	1.6	1.6	1037		3.2	1.9	2.0	1037		−3.8	−4.1	−4.0	526
Outreach worker, BSP		− 4.4	− 6.7	− 6.7	278		−2.2	−3.6	−3.5	278		.1	.4	.4	1311
Media and all others		− 4.6	− 3.1	− 3.1	2924		−6.7	−6.0	−6.0	2924		*	*	*	
Does not know FP		−26.7	−11.7	−11.7	320		−8.8	−2.0	−2.0	320		−	−	−	−
Supply point nearest R's home															
FP clinic			4.2	4.1	4466			1.3	1.3	4466			.3	.2	2394
FP fieldworker, BSP			9.8	10.0	302			8.6	8.6	302			− .7	.2	141
Hospital without FP clinic, private doctor, and all other sources			9.1	9.1	534			6.9	6.8	534			1.8	1.6	326
Does not know where to go/does not require frequent resupply			−19.5	−19.1	1368			−9.0	−9.0	1368			−5.7	−4.5	204
Location of nearest supply point															
Within barangay				.0	3067				.0	3067				−1.1	1103
Outside barangay but within city or municipality				.4	3412				− .0	3412				.5	1851
Outside city or municipality				− 1.0	191				1.7	191				2.7	111

Table 12.9 (*cont*)

	Measure 1 = current use of any method (grand mean = 47.7%)				Measure 2 = current use of an efficient method (grand mean = 21.2%)				Measure 3 = continuation, after 12 months following acceptance (grand mean = 77.5%)			
	Equation[a]				Equation[a]				Equation[a]			
	1	2	3	4	1	2	3	4	1	2	3	4
R^2 with regression on controls (%)	10.8	14.3	16.8	19.5	7.5	10.4	13.3	14.4	6.9	9.9	10.1	10.2
R^2 with the variable added to the regression equation (%)	11.2	16.8	19.5	19.5	8.4	13.3	14.4	14.4	7.0	10.1	10.2	10.2

*Media is combined with the outreach worker and barrio supply point category because of the small number of cases for the media category.
[a]Controls used:
Equation 1 = age, region, residence, ethnicity, religion, wife's education, husband's education, age at first marriage.
Equations 2, 3 and 4 = age, region, residence, ethnicity, religion, wife's education, husband's education, age at first marriage, woman's work pattern, actual number of living children and current pregnancy, total number of children desired and open birth interval.
[b]See appendix A for the occupation categories and their corresponding SES index.

the grand mean (for the first two measures of the dependent variable). Hence, the most that can be inferred from the influence of the FP fieldworker, barrio supply point and media as most important sources of FP knowledge on current use is that greater efforts on their parts are still needed to match the impact of family planning clinics, doctors, nurses, midwives and teachers on contraceptive prevalence. After all, even with the introduction of source of supplies and accessibility in equations 3 and 4, the signs of the deviation do not change, although the deviations are smaller in magnitude as a result of the associations between these three variables, source of FP knowledge, source of supplies and accessibility.

The inclusion of accessibility or location of nearest supply point in the full model (equation 4) does not add to the variance explained for any of the three measures of the dependent variable. Such a lack of statistical and significant association between accessibility and current use is not surprising. Many methods do not require supplies, such as rhythm and withdrawal, and these two methods emerged as the most favoured methods currently used. Furthermore, some methods that require supplies initially do not require frequent re-supply (eg IUD). Nevertheless, with the current use of any method as a measure, a weak association is indicated with the farthest supply point reducing the average contraceptive prevalence by 1 per cent. There is an indication that accessibility has some role in contraceptive use. The reverse pattern observed when current use of an efficient method is used as a measure of the dependent variable may not be surprising. Most of these efficient methods, IUD and female sterilization in particular, are obtained in the cities or poblaciones where hospitals and clinics are usually located. Women who desire to use these methods are less likely to be discouraged by a longer journey to obtain the device or surgery.

It is also evident that when the continuation rate is used as an alternative measure of the dependent variable, all the predictors under consideration do not show any statistical and significant effects. Perhaps the serious bias in this measure does play a great role, causing statistical distortions. Therefore, in the multivariate analysis of current use of any method, we prefer the first two measures.

Multivariate analysis: method-specific current use

Let us now shift our attention from contraceptive use in general, to contraceptive use of selected specific methods. Recall that in the RPFS data, information on programme variables was limited to some methods: availability of supply at home at time of interview was confined to pill, condom, and foam tablets; perceived (not actual) source of supply, accessibility and cost were limited to pill, IUD, condom and female sterilization. Given these data constraints, we choose to address two specific interests.

First, the factors, relevant programme variables included, which affect continuation of the pill, IUD, condom, and rhythm, following acceptance are investigated. (Female sterilization is excluded because its continuation is assumed to be 100 per cent.) For pills, IUD, and condom, focus will be on the effect of the above programme variables and region on continuation of the method net of demographic, motivational and socio-economic characteristics. The demographic controls which are significant factors are age, age at first marriage, and actual number of living children. Motivational variables are total number of desired children and open birth interval. Women who desire more children are less likely to adopt a method. Likewise, women who make subjective estimates that the probability of their getting pregnant is low will tend not to use any method. Westoff and Pebley (1981) suggested excluding such women in the estimation of need for contraception. A crude indicator of this perceived infecundity or fecundity used in the present analysis is open birth interval. Wife's education and husband's occupational score are the socio-economic controls. (In the exploratory stage of the method-specific analysis, the latter variable turned out to be a significant variable.)

For continuation of rhythm, the main interest is to discover the net effect of region, residence, actual number of living children, total number of children desired, open birth interval and regularity of menstrual period after controlling for current age, age at first marriage and husband's occupational score.

We expected substantial differences in patterns of association between the programme variables and continuation of the above relevant specific methods in the urban and rural areas. But highly skewed distribution in the dependent variable (in the range of 6–94 per cent) prevented separate analysis of the urban and rural subsample. The second interest is to examine patterns of association between programme variables and current use of specific methods with separate estimates for

Table 12.10 Adjusted[a] deviations from the mean percentage continuing use of a method after 18 months following acceptance, by predictor and method: currently married fecund non-pregnant women

Predictor	Method					
	Pill		IUD		Condom	
	Deviation	N	Deviation	N	Deviation	N
Method available in house						
Yes	25.9	249	*	*	19.2	108
No	−18.8	344	*	*	−11.6	179
Perceived source of supply						
FP clinic	− 1.5	490	− .2	197	− 1.2	218
Hospital without FP clinic, private doctor, commercial and other sources	5.9	71	†	6	11.6	50
FP fieldworker/BSP	†	32	‡	‡	†	19
Perceived accessibility of supply (travel time)						
Close	.7	325	−1.6	121	4.9	170
Moderate	− 1.9	184	†	45	− 8.6	89
Far	1.4	84	†	31	†	28
Perceived cost						
Free	− 2.1	328	2.1	106	−.8	197
Not free	2.5	265	−2.5	91	1.8	90
Region						
Metro Manila – Luzon	1.8	384	11.7	125	1.7	169
Visayas – Mindanao	− 1.0	209	−6.7	72	− 2.4	118
Grand mean	57.6		84.1		39.2	
R^2	36.5		17.8		35.0	

*This variable was not asked for IUD in the survey.
†Less than 50 cases.
‡No cases in this category.
[a]Adjusted for age, education of wife, age at first marriage, occupation of husband, actual number of living children, total number of desired children, open birth interval and all other variables in the table.

urban and rural women. The same set of controls used in the analysis of continuation is maintained. Pill and condom current use are analysed for both urban and rural areas but due to data constraints current use of female sterilization relative to other methods is restricted to the rural sample.

Let us now turn to an examination of the results with the continuation rate as the dependent variable (table 12.10). The grand mean percentage of currently married fecund and exposed women who continue use of the pill, IUD and condom 18 months following acceptance are 57.6, 84.1 and 39.2 per cent, respectively. Regressing the continuation rate of each of the three methods on the demographic, motivational and socio-economic controls yields an R^2 of 17.7 per cent for pill, 16.5 per cent for IUD, and 22.4 per cent for condom. These controls explain a significant proportion of the variance in the continuation of each of these three methods.

Adding the five predictors in the model gives interesting results. Availability of supplies of pills and condoms in the home is a statistically significant factor in their continuation. Having such methods at home would increase the average continuation by 26 per cent for pill and 19 per cent for condom.

Perceived source of supply significantly affects

continuation of both pill and condom. With family planning clinics perceived as source, continuation tends to be shorter than the average, but with hospitals without family planning clinics, private doctors, commercial and other sources perceived as source, continuation is longer than average. Such an outcome may not be surprising since users of methods perceived to be obtained from the latter sources are more likely to be highly motivated than those who report the family planning clinics where such methods are free.

For condom, differential accessibility is significant and negatively related to continuation. The farther the perceived distance to supplies, the less likely the continued use of the method. For the pill, this same association turns out statistically insignificant. However, a negative association, although weak, is shown if we ignore the positive deviation manifested by the farthest category. For IUD, a positive association appears to be evident with those who perceived closeness to supplier tending to have lower continuation than the average. This may not be surprising since users of this method need not continually travel to obtain the method, unlike pill and condom users. Likewise, IUD users may have been more highly motivated than pill and condom users and less likely to be discouraged by a long journey to obtain the device.

Perceived cost does not have a statistical and significant effect on continuation of any of the three methods.

Region is not a strong factor for pill and condom continuation; but it statistically and substantially affects IUD continuation. IUD users in the Luzon islands tend to have longer continuation than their counterparts in the Visayas and Mindanao islands.

We turn now to analysis of current use of the pill, condom and female sterilization by urban and rural residence (table 12.11). We first discuss use of the pill and condom. The significant effect of availability of supplies at home for current use of pill and condom relative to other methods holds true regardless of residence. The substantial influence of perceived source of supply, as already noted in pill and condom continuation, is maintained. More interesting is the finding that when pills and condoms are most readily obtained from the FP fieldworker/barrio supply point in the rural areas, use tends to increase almost 4 and 10 per cent, respectively.

The very weak association between perceived distance and pill continuation as stated above is again displayed when pill current use relative to other methods is the measure in both urban and rural areas. This is an indication that users of pill are more likely to be highly motivated than condom users and are less likely to be discouraged by a long journey to obtain it. The significant effect of perceived accessibility on condom continuation discerned above seems to take place in the urban and not in the rural areas.

As discovered above in the analysis of continuation, perceived cost does not have a statistical and significant effect. Recall that pill and condom users who perceived obtaining their supply from hospitals without family planning clinics, private doctors, commercial and other sources tended to have longer continuation rates. Perhaps the weak association between perceived cost and pill/condom use implies that such users are highly motivated and are less likely to be discouraged by spending some amount to acquire these methods. Another possible interpretation is that this 'perceived cost' as a predictor of pill/condom current use relative to other methods may not have a direct bearing on use, since at the time of the survey (and up to the present) such methods have been offered free by the programme. Pill and condom current users might have been induced to use them because such methods are free and therefore the perceived cost did not affect their behaviour.

Region plays an important role in affecting use of pills or condom in relation to the other methods in the rural areas. That is, rural women in the Luzon islands are more likely to use pill or condom than their counterparts in the Mindanao and Visayas regions.

Looking briefly at the results for current use of female sterilization (rural sample) in table 12.11, we note that those respondents whose nearest source of sterilization is a non-family planning clinic (ie private doctors, hospitals without family planning clinics) are more likely to be sterilized. Again the findings indicate the high motivation of sterilized women. Such women appear not to mind travelling a long distance and spending some amount, as seen in the direction of the relevant regression coefficients.

Let us now turn to the determinants of rhythm continuation, the method ranking second in prevalence. Regression results are presented in table 12.12.

Of the six predictors considered, only open birth interval and regularity of menstruation turn out to affect rhythm continuation signifi-

Table 12.11 Adjusted deviations from the mean percentage currently using pill, condom, and female sterilization[a]

Predictor	Residence/method							
	Urban				Rural			
	Pill		Condom		Pill		Condom	
	Deviation[b]	N	Deviation[b]	N	Deviation[c]	N	Deviation[d]	N
Method available in house								
Yes	56.0	208	31.9	202	55.3	264	33.4	284
No	−13.1	878	−7.2	869	−10.8	1320	−7.1	1293
Does not know the method	—[e]	11	—[e]	26	—[e]	36	—[e]	42
Perceived source of supply								
FP clinic	− .0	873	−1.2	793	.4	1206	−1.9	1161
Hospital without FP clinic, private doctor, commercial and other sources	2.6	172	3.5	226	2.9	124	6.8	132
FP fieldworker/BSP	—[e]	12	+[e]	20	4.3	109	9.9	133
Does not know the method/NI	—[e]	40	−1.3	58	− 7.4	181	− .0	193
Perceived accessibility of supply (travel time)								
Close	− .4	788	1.0	781	− 1.4	568	− .0	593
Moderate	− .5	299	−3.2	227	− .4	568	− .4	547
Far	+[e]	37	—[e]	31	− 1.4	296	.8	286
Does not know the method/NI	+[e]	43	3.0	58	7.8	188	.2	193
Perceived cost								
Free	.3	540	.7	606	.1	831	− .0	1008
Not free	3.4	324	3.7	234	4.0	313	8.7	171
Does not know the method/NI	− 5.4	233	−5.1	257	− 2.7	476	−3.4	440
Region								
Metro Manila/Luzon	[f]		[f]		1.0	783	[f]	
Visayas/Mindanao					− 1.0	837		
Grand mean	17.2		12.2		12.9		11.1	
R^2	55.4		25.2		57.6		31.6	

[a] The dependent variable is a dichotomy, scored 100 for use of the specific method and zero for use of all other methods. Base population excludes sterilized cases.
[b] Adjusted for age, education of wife, age at first marriage, occupation of husband, actual number of living children, total number of desired children, open birth interval and all other variables in the table.
[c] Adjusted for age, education of wife, age at first marriage, open birth interval and all the other variables in the table.
[d] Adjusted for age at first marriage, occupation of husband, actual number of living children, total number of children desired, open birth interval, and all other variables in the table.
[e] Less than 50 cases in this category.
[f] Region came out significant in the exploratory stage only for use of the pill in rural areas, hence adjusted effects of region are only presented for this part of the analysis.

Table 12.12 Adjusted[a] deviations from the mean percentage continuing use of rhythm after 18 months: currently married fecund non-pregnant women

Predictor	Deviation	N
Region		
Metro Manila	−3.3	104
Luzon	−1.7	177
Visayas	.3	182
Mindanao	3.5	167
Residence		
Urban	1.4	265
Rural	−1.0	365
Number of living children[b]	−.9	630
Number of children desired[b]	1.2	630
Open birth interval[b]	.1[c]	630
Regularity of menstrual period[d]		
Regular	1.0	553
Irregular	−7.6	77
Grand mean	81.5	
R^2	7.1	

[a] Controls: current age, age at first marriage, and husband's occupation.
[b] Unstandardized (metric) regression coefficient.
[c] Significant at 0.05 level.
[d] Significant at 0.01 level.

cantly. With regular use of contraception, the length of interval is increased, so that contraceptive use becomes the predictor and length of open interval the dependent variable. With more efficient methods, this causality is more evident than with less efficient methods. Rhythm is a less efficient method and the length of open birth interval may be more of a determinant rather than the outcome. Hence, we may interpret the pattern of association as that of the open birth interval proxying for fecundity, real and perceived. That is, the more a woman perceives that she is at low risk of getting pregnant, the more she resorts to the use of rhythm. As expected, women menstruating regularly tend to continue using rhythm more than those who menstruate irregularly.

12.4 CONCLUSIONS AND IMPLICATIONS

Findings from the descriptive analyses suggest that the majority of the 32 per cent currently married fecund women who were never users were young with less than four children, with low education, residing in Luzon region and in the rural areas, Roman Catholics, never worked, with farmers as husbands and did not intend to use FP in the future. These have to be reached and motivated if the goal of NRR = 1 is to be attained by the family planning programme.

Of the ever-users who stopped using a method (about 20 per cent), a majority were in their late twenties, with four or more children, with low education, residing in Luzon and in the rural areas, Roman Catholics, never worked, and with husbands engaged in skilled manual jobs. Current users (34 per cent) showed the same distribution as the stoppers by background characteristics, except with regard to age where most were in their thirties. Again those who tend to be stoppers are another target the programme should consider. Specifically, since these stoppers appear to be women who experimented once or twice with contraception and then abandoned it for reasons such as side effects, accidental pregnancy,

husband's objection and others, there is a need to exert more effort to do something about such causes of discontinuing a method.

The more likely explanation of the sudden fall at the last age group in use is the belief of respondents that they are no longer capable of bearing children and not their reluctance to accept family planning.

Continuation rates estimated from the RPFS 1978 tended to be substantially biased upwards. This results from the assumption that there were no terminations of use due to pregnancy or shifting to other methods within the period between the date given as start and interview (by current users) and the date of stopping (by stoppers). In future surveys aiming at more plausible estimates of continuation rates, collection of such detailed intervening events are called for.

According to the descriptive analysis, visit to a doctor, clinic or hospital was the most important source of family planning knowledge of current users and stoppers while friends, relatives and husbands were the most important source for never users. Media and other forms of communication were also cited by a quite substantial proportion of current users and never users, indicating their important role in spreading the family planning and welfare programme.

Nevertheless, multivariate analyses suggest that those who claimed media, an outreach worker, and the barrio supply point as their most important sources of family planning knowledge were less likely to use a contraceptive than those who claimed visit to a doctor, clinic, hospital and home visit by nurse, midwife or teacher. This implies that greater efforts of outreach workers and media are required to match the impact of family planning clinics, doctors, nurses, midwives and teachers on contraceptive prevalence.

Although fieldworkers and barrio supply points as sources of FP knowledge tended not to have a great impact on current use, as sources of supplies they played an important role. Furthermore, there was an indication that accessibility (travel time to source) had some influence, although the association was weak, with the furthest supply point reducing the average contraceptive prevalence by 1 per cent. Establishment of supply points or any FP source near the clients appears to increase current use. In areas where such supply points have not been established, there is a need for their presence.

Analyses of determinants of some selected methods reveal that availability of supplies of pill and condom in the home is strongly associated with their continuation or current use in both the urban and rural areas as is the type of most convenient source of supply of the pill, condom and female sterilization. When pill and condom were most readily obtained from the FP fieldworker/barrio supply point, their average use tended to increase by almost 4 and 10 per cent, respectively. When pill, condom and female sterilization were most readily obtained from family planning clinics, use was lower than when the closest source was hospitals without a family planning clinic, a private doctor, or commercial and other sources. Such a pattern may be due to the role played by motivation. Those obtaining such methods from non-family planning clinic sources may have been more highly motivated.

In urban areas, the closer the perceived distance to condom supplies, the more likely it is used. For pill, IUD, and female sterilization, the observed patterns of association between perceived distance and use of such methods appears to be mainly due to the role of motivation as a determinant. Similar points may be raised with respect to the lack of relationship, or positive relationship, between perceived cost and use of the pill, IUD, condom and female sterilization. Possibly women resorting to such methods are highly motivated and are less likely to be discouraged by a long journey or expenses to obtain them. In future multivariate studies, it would be illuminating to include motivation to stop or space as a predictor.

Region is not a strong factor influencing pill, condom, rhythm and female sterilization use but it is strongly associated with IUD use. IUD users in the Luzon islands tend to have longer continuation than their counterparts in the Visayas and Mindanao islands. Perceived fecundity and regularity of menstruation are significant factors affecting rhythm use. The more a woman perceives that she is at low risk of getting pregnant the more she resorts to the use of rhythm. As expected, women menstruating regularly tend to continue using rhythm longer than those who menstruate irregularly.

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APPENDIX A OCCUPATIONAL CATEGORIES AND THEIR CORRESPONDING SES INDEX

FIRST QUARTILE
SES Index
44–100
Occupational categories
Physicians, surgeons and dentists, professors and teachers, nurses, midwives, professional medical workers, medical technicians, lawyers and jurists, clergy, charitable and social welfare workers, accountants, social scientists and related occupations, artists, writers, entertainers, and related workers, draftsmen, technicians and semi-professional workers, NEC, government officials,

directors, managers and working proprietors, ship and aircraft officers, athletes, sportsmen and related workers, other administrative and regulatory officers, government bookkeepers, accounting clerks and cashiers, stenographers and typists, office machine operators, telephone, telegraph and related telecom workers, mail carriers and messengers, inspectors, supervisors, traffic controllers and dispatchers, clerical workers, working proprietors (wholesale and retail trade), insurance and real estate salesmen, auctioneers, commercial travellers, manufacturers' agents, managers and working proprietors (catering and lodging services), transport conductors, members of the armed forces, fire fighters, policemen, guards and related workers, waiters, bartenders and related workers, service, sports and related workers, NEC like hospital and clinic attendants, embalmers and undertakers, hostesses, well drillers, mineral treaters and related workers, machinery and electrical fitters, machine assemblers, precision-instrument makers and other electrical and electronics workers, metal processors, toolmakers, machinists, plumbers, welders, platers, and related workers, chemical processors and other production workers, compositors, pressmen, engineers, bookbinders and related workers, miners and quarrymen, ship, seacraft workers.

SECOND QUARTILE
SES Index
24–43
Occupational categories
Photographers and related camera operators, salesmen and related workers, shop assistants and related workers, loggers and other forestry workers, housekeepers, cooks, maids and related workers, service workers, transport, building caretakers, cleaners and related workers, launderers, dry cleaners and pressers, ushers, attendants in places of entertainment, dealers, croupiers, 'bookies' and bet takers, shoe shine, porters, etc, spinners, weavers, knitters, dyers and related workers, potters, kilnmen, glass and clay formers and related workers, food and beverage processors, tobacco preparers and tobacco product makers, tailors, dressmakers, sewers, embroiderers, upholsterers, footwear makers and leather workers, carpenters, cabinetmakers, construction workers, and related workers, drivers (road transport), stationary engine and excavating and lifting equipment operators and related freight handlers and labourers, NEC, packers, labellers and related workers, other transport workers.

THIRD QUARTILE
SES Index
13–32
Occupational categories
Farmers and farm managers, barbers, beauticians, hairdressers and related workers.

FOURTH QUARTILE
SES Index
3–12
Occupational categories
Fishermen and related workers, farm workers.

13 Accessibility of Family Planning, Community Development and their Impact on the Birth Rate of Rural Philippines

Luisa T. Engracia, Dolores M. Mortel and Luisa B. Nartatez

13.1 INTRODUCTION

Concern about fertility in the Philippines has centred not only on its characteristically high levels but also on its seeming resistance to development efforts. During the period immediately following the Second World War, the birth rate was high and fluctuating, showing no sign of impending decline. On the other hand, except during a brief period of recovery from the ravages of the war, moderate to substantial strides were achieved in social and economic spheres. The demographic response to such changes, however, had been inconsequential. Except for the continuing trend to delayed marriage, the overall socio-economic transformation that was taking place caused fertility to drop only slightly, if at all, towards desirable levels. On balance, the population growth rate had even accelerated because, while fertility remained high, mortality had declined as a result of improved public health delivery services. It was not long before the pressures of rapid population growth, attenuated by worldwide economic slumps, were beginning to create a strain on the economy of the country. This was the train of events through the late 1960s.

Towards the end of the 1970s, signs emerged that the birth rate was finally heading downward. Data from the Republic of the Philippines Fertility Survey (RPFS) showed a pattern of declining fertility commencing in the early part of the 1970 decade. The RPFS estimate of total fertility rate (TFR) or average completed family size for the year 1965 was 6.9 children, a level which hardly changed in the five-year period that followed. It was only some time after 1970 that fertility was observed to have steadily decreased down to a level of 5.0 by around 1977 (Reyes 1981).

Some demographic analysts in this country contend that the changes in the levels of overall fertility are simply due to shifts in nuptiality pattern. Birth rates are falling, according to this contention, because relatively fewer women are participating in childbearing. While data do exist which indicate trends towards later age at marriage and, to a lesser extent, trends towards increased celibacy, evidence from the RPFS indicates that marital fertility likewise has declined. Moreover the timing of the decline of marital fertility rates closely matches that of the total fertility rates; that is, before 1970, marital rates were almost constant; then in a period of five years the average completed family size among ever-married women was reduced by more than one child, ie from 10.0 to 8.8 (chapter 3, Levels and Trends of Fertility in the Philippines).

Whether purely coincidental or not, the decline of fertility in this country came at a time when an intensified government effort of population control was launched in the form of an official adoption of a family planning programme that leaned heavily towards encouragement of contraceptive practice. As a possible indication of success, the years following the official recognition of the family planning programme saw an increasing popularity of the use of birth control methods as revealed by reports on the annual number of family planning acceptors. According to Population Center Foundation figures, in 1970 there were about 176 000 reported acceptors of family planning methods. A year later, this number more than doubled with 391 000 acceptors as of 1971. By 1973, the corresponding figure was 751 000. Granting that these figures are indicative of the wide acceptance of the programme, the question which naturally arises is whether the programme influenced the country's fertility level at all. In other words, did the programme make any significant contribution to the decline in birth rates?

It is to be noted that around the same time that voluntary interference with fertility was being

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pursued, important social and economic changes were under way. Women were increasingly assuming more important roles in development; their educational achievements were approaching those of their male counterparts, and they were more actively participating in the labour force. Moreover, while the rate of growth of the country's gross national product in the early 1970s registered a slight decrease from its level the previous decade, the share of industry in net domestic product increased while that of agriculture diminished. Given the widely known inverse association between socio-economic level and fertility, it can be argued that the favourable socio-economic development experienced by the country may account for some of the recent decline in the birth rate. It is a popular belief that general social and economic development usually triggers breakdown of traditional pronatalist attitudes and behaviour, ultimately bringing about fertility decline.

If, indeed, the recent observed decline in the birth rate of the country signals the onset of the country's transition from high to low fertility, the need to understand the nature of this change becomes more pressing than ever. Is the decline reflective of a successful family planning programme or is it mainly an inherent consequence of the overall socio-economic development process? If both of these factors share the credit, what is the relative share of each? With answers to these questions, policy-makers would do well to decide on priorities and allocate resources among programmes aimed, directly or indirectly, at reducing population control.

The problem raised above is the major concern of the present study. The study's overall aim is to analyse the relative contributions of programme and non-programme factors on fertility change in the Philippines. Programme factors refer to those aspects of an organized family planning programme that characterize its scheme of delivery of contraceptive supplies and services and its method of information dissemination. Non-programme factors, on the other hand, refer to indicators of socio-economic development that are hypothesized to bear on fertility behaviour.

This chapter has two sections. The first presents an analysis of contraceptive and childbearing attitudes and practices of Filipino women from a comparative perspective, that is, practices around the start of the country's family planning programme compared with prevailing practices some six years later. The purpose of this section is to document changes in contraceptive and fertility behaviour and set the background for the discussions in the second section. The latter will attempt to quantify the impact of the family planning programme vis-à-vis the possible influences of socio-economic development, on contraceptive and fertility behaviour.

For the first objective, results from the 1972 Survey on Knowledge, Attitude and Practice of Contraception and Fertility in the Philippines (1972 KAP Survey) and the 1978 Republic of the Philippines Fertility Survey (RPFS) will be compared. The former includes data from a national sample of 9232 ever-married women between the ages 15–49; the latter includes 9268 similar women. The impact analysis of the second section consists of analysis of a sub-sample of the RPFS 1978, namely rural women. Data for these women include community level information that will be brought to bear on the issues raised above.

Finally, as background material for this study, a short description of the Philippines population programme is given in Appendix A.

13.2 CONTRACEPTIVE AND FERTILITY BEHAVIOUR OF FILIPINO WOMEN: A COMPARATIVE PERSPECTIVE

The first national survey to gather data on patterns of contraceptive behaviour in the Philippines after the establishment of the government supported family planning programme was conducted in 1972. Some of the results of this survey are presented here as baseline information against which we compare the extent of changes in contraceptive use and childbearing practices during the post-programme years as gleaned from the 1978 survey.

Knowledge and practice of contraception

As of 1972, knowledge of contraception was already widespread, probably as a result of prior efforts of private institutions to promote family planning methods. Among ever-married Filipino women about six of every seven women by then had heard of a method of contraception (table 13.1). With the government's intensified campaign on family planning during the first few years of the programme, level of contraceptive knowledge soared even higher. By 1978, knowledge of contraception was almost universal – 94 per cent of the interviewed women claimed to have heard of family planning.

Table 13.1 Percentage of ever-married women who have ever heard of any contraceptive method by selected characteristics, 1972 and 1978

Characteristics	Percentage ever heard	
	1972	1978
All women	85.6	94.2
Age of the woman		
< 20	81.6	91.4
20–24	85.3	93.3
25–29	86.8	96.2
30–34	87.3	95.3
35–39	86.7	94.8
40–44	85.1	94.3
45–49	82.3	90.3
Education		
None	51.6	66.4
Elementary	80.2	91.1
Intermediate	88.3	96.4
High school	94.1	98.5
College	98.0	99.5
Region		
Metro Milan	96.1	97.9
Luzon	83.4	94.4
Visayas	92.3	94.9
Mindanao	55.3	90.7
Type of residence		
Urban	94.9	97.6
Rural	80.3	92.6
Number of living children		
0	83.7	88.0
1	84.9	94.4
2	86.6	94.9
3–4	84.8	96.3
5–6	86.1	93.8
7+	86.2	92.3

Sources: 1972 KAP Survey, 1978 RPFS

The gains in knowledge of family planning methods occurred throughout the population of ever-married women. Contraception was most known among ever-married women who were aged 25–29, college graduates, residents of Metro Manila or other urban areas and who had about three or four children. It is noteworthy that significant gains in contraceptive knowledge occurred among the less educated women and among the residents of Mindanao.

Respondents in both the 1972 KAP Survey and 1978 RPFS who claimed to have heard of a method of contraception were asked which methods they knew about. Responses to this question are shown in the first two columns of table 13.2. The methods which a particular respondent did not spontaneously mention were described to her by the interviewer, after which she was asked whether or not she recognized the method. The last two columns of table 13.2 show the responses to this type of question.

Table 13.2 Percentage of ever-married women who knew about (unaided recall) and recognized (aided recall) specific methods of contraception, 1972 and 1978

Method	Knew about		Recognized	
	1972	1978	1972	1978
Pill	40.9	77.7	52.2	90.2
Rhythm	36.0	32.6	42.2	65.9
IUD	30.5	57.9	42.2	86.4
Withdrawal	26.2	19.5	31.5	65.3
Abstinence	22.3	2.7	—	36.3
Condom	19.6	63.3	27.3	87.6
Female sterilization	7.0	25.4	10.6	74.7
Male sterilization	5.2	13.2	8.9	69.6
Douche	2.8	1.0	5.1	21.2

Sources: 1972 KAP Survey, 1978 RPFS

The results indicate that the pill was the most well-known method of contraception both in terms of the proportion of women who mentioned it spontaneously and the proportion who recognized it when described to them. While less than half of the women mentioned it without unaided recall in 1972, more than three-quarters of the ever-married women did so in 1978. Likewise the proportion who recognized it with aided recall increased substantially from 52 to 90 per cent. Indeed, what is generally evident from table 13.2 is that the programme methods, namely the pill, IUD, condom and sterilization, gained widespread recognition during the interval between 1972 and 1978. On the other hand, relatively fewer women in 1978 than in 1972 knew about or recognized withdrawal and abstinence as methods of contraception.

A more significant achievement of the family planning programme would have been increase in actual practice of the methods being promoted by the programme. The data on ever-use of specific

Table 13.3 Percentage of ever-married women who have ever used specific contraceptive methods by current age and by number of living children, 1972 and 1978

	1972					1978				
	Pill	IUD	Condom	Rhythm	With-drawal	Pill	IUD	Condom	Rhythm	With-drawal
All women	10.6	2.8	1.9	12.7	8.4	24.7	7.0	20.1	23.1	31.0
Current age										
<20	6.8	2.3	0.3	5.2	1.3	4.3	1.7	9.0	6.8	12.7
20–24	10.4	2.4	1.7	9.1	5.7	19.6	4.4	20.7	17.4	28.0
25–29	13.7	3.2	2.1	14.3	9.1	30.9	7.4	25.5	27.2	36.0
30–34	13.7	4.0	2.7	16.4	10.6	30.5	9.3	25.1	27.7	37.3
35–39	11.6	3.3	2.1	14.4	9.5	30.6	8.9	23.4	28.5	34.9
40–44	7.4	2.3	1.6	12.0	8.1	22.0	7.6	16.1	20.2	30.0
45–49	2.9	0.7	0.9	8.2	7.2	12.2	3.7	7.1	15.6	17.9
Number of living children										
<4	10.5	2.9	1.8	10.7	8.1	21.0	5.8	19.4	22.4	28.9
4+	10.9	2.8	2.1	14.1	9.5	28.0	8.1	20.7	23.6	33.0

Sources: 1972 KAP Survey, 1978 RPFS

methods of contraception shown in table 13.3 allow a cursory assessment of the performance of the programme in these terms during the first few years of operation.

Without regard to the method, there had been an overall increase in the proportion of ever-users of contraception between 1972 and 1978. With regard to use of specific methods, however, the changes are more interesting and complex. The proportion of ever-users of the pill more than doubled between 1972 and 1978. While in 1972 only one of every ten women who had been a contraceptive user reported to have used the pill, about one of every four did so in 1978. Users of the IUD likewise more than doubled, although it remained the least popular of the five methods mentioned. Surprisingly, it was the condom and withdrawal which adopters were most drawn to. Proportion-wise, condom users increased tenfold during the six-year period; withdrawal users also four times. It thus appears that while there was greater acceptance as the family planning programme progressed, the trend was most favourable for the less reliable methods.

With respect to the pattern of use by age of the woman, table 13.3 reveals that the greatest proportions of ever-users of contraception were those who were at the peak of their childbearing period, ie at ages 25–39. As expected, women at very early and late childbearing ages are least likely to have used contraception. This unpopularity of contraceptive use among very young women seems to support the notion that family planning, in the context of the Philippines, is pursued primarily for limiting births rather than for spacing them. That is, women resort to contraception once they have attained their desired family size and not before then.

Excepting women less than 20 years of age, who shunned use of the pill (6.8 per cent in 1972 as against 4.3 per cent in 1978) all other age-groups increased their reliance on the pill. Practice of withdrawal and rhythm also increased in all age groups.

The contention that family planning is primarily for family size limitation finds support from the data shown in the second panel of table 13.3, which shows greater proportions of ever-users of contraception among women who had already given birth to at least four children. This held true both for 1972 and 1978, although the levels of use were higher in the later year.

Against this backdrop of trends in contraceptive knowledge and use, we now examine the trend in childbearing.

Fertility

Despite the favourable shift in contraceptive knowledge and use, comparison of the 1972 and 1978 fertility data suggests no corresponding shift

in fertility levels. As shown in table 13.4, the total number of children ever born reported during the two surveys remained practically the same at the aggregate level. Perhaps the timing changed, women bearing their children earlier in their reproductive period but attaining the same completed family size. Thus we find in table 13.4 higher cumulative fertility in 1978 than in 1972 at ages below 20, lower cumulative fertility between the ages 25–45, and similar levels of completed family size. The differences, however, are small and nothing conclusive can be said.

By categories of education, the pattern of change consists of a slight increase in fertility among uneducated women, compensated by a decline among high school and college educated women. With respect to the type of residence, the overall mean number of children ever born in both urban and rural areas took a downward course, as also occurred in the two categories of labour force participation.

Note, however, that the analysis of fertility using the retrospective fertility data of the RPFS 1978 alone has led to quite a different conclusion (see chapter 3, Levels and Trends of Fertility in the Philippines). Here there is evidence that fertility declined, at least for the period after 1970. Given the strong evidence of high quality of the RPFS data (Reyes 1981), we stand by the conclusion that there were some declines in fertility after 1970.

To summarize the preceding discussions, we make special note of the empirical evidence that level of use of contraception had significantly increased during the 1970s even if the methods adopted were not necessarily the most efficient ones. Fertility also declined but perhaps not to the extent one would expect given the substantial achievements in popularizing contraceptive knowledge and use.

Table 13.4 Mean number of children ever born by selected characteristics, 1972 and 1978

Characteristics	Mean number of children ever born	
	1972	1978
All women	4.68	4.58
Age		
< 20	.76	.85
20–24	1.86	1.89
25–29	3.26	2.96
30–34	4.65	4.27
35–39	5.93	5.66
40–44	7.06	6.74
45–49	7.08	7.00
Education		
None	5.75	5.81
Elementary	5.03	5.05
High school	4.08	3.83
College	3.30	2.97
Labour force participation		
Working	4.88	4.75
Non-working	4.61	4.45
Type of residence		
Urban	4.32	3.99
Rural	4.90	4.86

Source: 1972 KAP Survey, 1978 RPFS

13.3 FAMILY PLANNING, SOCIO-ECONOMIC DEVELOPMENT AND FERTILITY

Many scholars have expressed scepticism about the efficiency of family planning programmes. The sceptics hold the view that reduction in fertility is simply a response to general social and economic development and not a consequence of direct interventions aimed at fertility (Blake 1965; Davis 1967). The causal link between development and fertility is briefly described as follows. Rising levels of education, income and the whole gamut of social change brought about by modernization will generally lead to preferences for smaller family size and will induce individuals to seek the means to maintain these preferences. Those in the upper socio-economic strata are usually the first to respond to these changes. They become the harbinger of low fertility norms which are expected to be diffused down to the lower classes. When preferences for small family size prevail in almost all sectors of the society there will be created a demand for contraceptive services and supplies. A natural consequence will then be the development, given the appropriate technology, of methods of birth limitation and the availability of supplies and services even in commercial channels. To put it more succinctly, this hypothesis holds that the conditions for lower fertility – desire for fewer children, demand for contraceptives, and supply of the means of contraception, in that order – are natural consequences of general socio-economic development.

On the other hand, proponents of family planning programmes argue that, in the absence of government intervention through explicit population control programmes, the effect of socio-economic development will be slow (Berelson 1969) and may even dissipate once the pressure of rapid population growth gets out of hand. Even in the absence of development, fertility decline can be effected through an intensified campaign of family limitation, supported with a distribution scheme of supplies and services. Motivation, as seen by family planning proponents, consists mainly of special communication efforts and provision of contraceptive supplies and services. The decline of fertility will then be contingent upon the strategies for motivating and for making available the means of birth limitations.

This study sides with neither of these extreme views but maintains the middle position that both socio-economic development and an explicit population control programme or family planning are necessary conditions to effect a reduction in fertility levels. The desire for and the means to limit family size emanate from the broad social and economic transformation but, unless supplemented by a strong family planning programme, the desired fertility reduction would be slow. For the purposes of the present study, it is hypothesized that recent changes in the fertility of this country have been brought about partly by socio-economic factors and partly by the family planning programme itself, which was launched about eight years before the survey. The task is therefore to determine which of these two factors have affected fertility the most. In other words, this study is aimed at analysing the impact of socio-economic development and of the family planning programme on fertility levels to the extent that the available data will permit.

Data and methods

With respect to the analytical techniques of measuring the impact of family planning on birth rates, the choice is admittedly a difficult one. A number of methodological approaches have been developed (United Nations 1978), the applications of which are greatly dependent on the types of data available.

Conventional sources of data for family planning evaluation are the administrative records of programme implementers. Data from these sources generally include number of acceptors, methods used, discontinuity rates, etc. Beyond such types of service statistics, the need for other types of information has been recognized. More specifically, data on the accessibility of the target population to family planning clinics, the availability of contraceptive supplies, the motivation for use, the personal satisfaction of users, and many others, are highly informative. Data on personal characteristics of acceptors and non-acceptors alike also provide invaluable information for family planning evaluation in so far as they provide clues for identifying the target population. Sample surveys can fill this gap in data needs.

This study assesses the contribution of the family planning programme towards the decline in fertility in the rural sector. Two types of questionnaires administered as part of the RPFS provide the data for this analysis: an individual level and a community level questionnaire. In the individual level questionnaire, the sample of ever-married women were asked about their birth histories, their knowledge and use of contraception and the extent to which they have access to organized family planning clinics, among others. The community level questionnaires, on the other hand, elicited information about the communities where the sample respondents resided. Specifically, it collected information about the presence or absence in the community of certain types of facilities which are generally regarded as indices of the level of development of the communities, such as facilities for transportation and modern communication, health, education, etc. It also ascertained the presence or absence of a family planning clinic, family planning workers and other outlets of contraceptive supplies. For all types of facilities, the questionnaire ascertained the presence or absence of that facility. If there was none, the distance, mode of travel and time required to reach the nearest one was asked.

The community level module of the RPFS was administered only in rural sample barangays. Of the 716 sample barangays covered by the RPFS, 357 were rural. Non-response to the community questionnaire in five barangays leaves a total of 352 rural barangays for the present study, including 4623 sampled ever-married women. The respondent for the community level questionnaire was a well-informed person in the community, namely, the barangay captain or village chief.

The theoretical underpinning of the present analysis posits that family planning programme

and socio-economic development affect fertility levels through their influence on the use of contraception. The analysis therefore includes an assessment of the prevalence of contraceptive use in the light of programme efforts as well as overall socio-economic development. However, since the ultimate measure of success of the programme lies in its contribution to fertility reduction, this paper also evaluates the fertility effects of the family planning programme, on the one hand, and the development process, on the other.

Socio-economic development is measured here at two levels, individual and community. Individual level indicators of socio-economic status include woman's education and her husband's occupation. As a measure of the degree of social and economic development of the community, an index is constructed based upon the availability of the following types of facilities: (1) telephone, (2) telegraph, (3) mail delivery, (4) newspaper outlet, (5) a movie house, (6) a secondary school and (7) electricity. The index of development is constructed[1] in the following manner:

Low — if there is no electricity and fewer than three of the other facilities are present in the community

Medium — if there is no electricity and at least three of the other facilities are present; or, if there is electricity and fewer than three of the other facilities are available

High — if there is electricity and at least three of the other facilities are present.

In the RPFS questionnaire, the presence of the following family planning facilities were ascertained: (1) a family planning clinic, (2) a private doctor providing family planning services, (3) a full time outreach worker (FTOW) or barangay supply point officer (BSPO) and (4) a pharmacy selling contraceptives. In as much as the focus of the present study is organized family planning services, we consider only (1) above, that is, the presence or absence of a family planning clinic. The FTOW/BSPO is also a component of the organized family planning programme; however, almost all barangays (roughly 95 per cent) had either one of them.

An index of the degree of accessibility to family planning clinics was constructed for each community according to the following criteria:

Within — if a family planning clinic is present in the community

Near — if a family planning is outside the community but within 3 km distance

Far — if the nearest family planning clinic is at least 3 km away from the community.

The analysis of the effects of family planning accessibility and socio-economic development on current use of efficient contraception makes use of a logistic regression model[2] where the explanatory variables are as described above and where the response variable is a dichotomy, using or not using an efficient method (which includes the pill, IUD, condom and sterilization). A control variable, current age of the woman (three categories: <30 years, 30–39, 40+), completes the four-variable model. The number of variables is limited, as the intention is to focus on the relative effects of accessibility and development. For this purpose, we prefer to keep the model simple and easy to interpret. (Moreover, further variables will lead to many cells in the contingency table lacking cases, which presents estimation problems.)

In the present application, a logit function is defined as follows:

$$\text{logit } Y = f(\text{AGE}, \text{DEV}, \text{ACC})$$

where:

logit Y = is the natural logarithm of the ratio of the proportion contracepting to the proportion non-contracepting

AGE = current age of the woman

DEV = degree of community development

ACC = degree of accessibility to a family planning clinic

The analysis involves fitting models involving combinations of these variables and their interactions and selecting the model which best fits the data, according to certain statistical criteria.

In the analysis of the relative impact of family planning on current fertility, the dependent variable is current fertility, defined as the number of children born in the five years before the survey. Multiple classification analysis (MCA) is used to analyse variations in current fertility in terms of the following explanatory variables: wife's education (WEDUC), husband's education (HEDUC), husband's occupation (HOCC), degree of development of the community of residence (DEV), and the degree of accessibility to organized family planning (ACC). The control variables are age of

[1] Various other ways of index construction were tried; this one was finally chosen for its simplicity.

[2] For the statistical discussion of this method of analysis, the reader is referred to Nelder and Wedderburn (1972).

the respondent (AGE) and parity as of five years ago (PAR).

Results

One of the critical elements of a successful family planning programme is the degree to which it makes available to acceptors and potential users both information and contraceptive services and supplies.

The objective of any distribution scheme is, of course, to maximize the availability of contraception to those who most need it, ie the target population. With regard to family planning clinics, this means establishment of the clinics in areas that are readily accessible to the target population and that minimize the acquisition cost of contraceptive supplies and services. Assuming that the target population consists primarily of residents of remote and less developed communities, we find that in the Philippines the distribution of family planning clinics still leaves much to be desired. The distribution of rural ever-married women respondents, as shown in table 13.5, suggests a strong inverse relationship between accessibility to family planning clinics and level of development of the community of residence; the less developed a community, the farther it is from an organized family planning clinic. Of the 3185 respondents from the communities classified as least developed, 1927 or about 60 per cent are more than 3 km away from the nearest community that has a family planning clinic. Only 13 per cent of these women actually lived at the sites of these clinics. This is in contrast to the majority of the residents in the relatively most developed rural communities, where these clinics are conveniently located. None of them need travel more than 3 km if they wish to visit family planning clinics.

In the following sections, we examine the patterns of contraceptive use and childbearing among urban and rural ever-married women and among rural ever-married women by categories of family planning accessibility and level of development of their community of residence.

Contraceptive use

Levels of contraceptive use differ considerably between the rural and urban residents, as evident in table 13.6. Less than half of the rural respondents who were exposed to childbearing were using contraception at the time they were interviewed, while about three-fifths of the corresponding urban respondents were currently contracepting. Moreover, not only did the level of contraceptive use differ, the types of methods used by contraceptors also varied according to the type of residence. Urban users relied more on the efficient methods like the pill, IUD, condom and sterilization. Use of these methods was twice as high in urban as in rural areas, even though both sectors have similar proportions of users of rhythm and withdrawal.

Turning the focus to variations within the rural areas, it is interesting to note that current use of a method was related to the accessibility of family planning clinics. However, the level of community development is related to current use. Proximity to a family planning clinic indeed increases the probability that a woman is a current user of contraception, with the proportion of current users varying from about 36 to 52 per cent along the distance scale. Likewise, use of the more reliable methods is related to accessibility. For sterilization alone, proportionately twice as many couples who resided in a community with a clinic were protected, compared to those whose community of residence did not include a clinic. This is perhaps expected when we consider that sterilization is a clinic-based method and couples tend to undergo the operation only if the cost, in terms of both time and effort to get to the clinic, is minimal. In this respect it differs from the supply-

Table 13.5 Distribution of the sample of rural ever-married women by accessibility of a family planning clinic and by level of development of the community of residence

Level of development of community of residence	Total	Accessibility of family planning clinic		
		Within	Near	Far
Total	4623	1013	1327	2283
High	235	166	69	0
Medium	1203	426	421	356
Low	3185	421	837	1927

Table 13.6 Percentage distribution of urban and rural ever-married women[a] by accessibility of family planning clinic and level of development of community of residence by type of contraceptive method currently used

	Non-users	Contraceptive method							
		All methods	Pill	IUD	Condom	Rhythm	Withdrawal	Sterilization[b]	Others
Rural	57.6	42.4	4.6	2.1	4.1	10.7	12.4	5.1	3.4
Accessibility of family planning clinic									
Within	48.5	51.5	6.6	3.4	5.1	11.6	12.7	8.9	3.1
Near	52.6	47.3	5.7	2.3	5.7	13.5	14.0	4.0	2.1
Far	64.5	35.5	3.2	1.4	2.7	8.6	11.4	4.1	4.2
Level of development of community									
High	35.4	64.6	8.9	5.7	6.3	15.8	10.8	13.3	3.8
Medium	49.5	50.5	7.0	3.2	4.7	9.1	16.7	7.3	2.5
Low	62.2	37.8	3.5	1.5	3.7	10.9	10.9	3.8	3.5
Urban	40.3	59.7	8.0	4.5	5.6	12.2	12.6	10.0	6.8

[a]Confined to women who are exposed to childbearing.
[b]Includes male and female sterilization.

type of contraceptive methods, such as the pill and condom, which may be distributed by family planning outreach workers and which women themselves need not actively or voluntarily seek. These latter types of methods were equally popular among women who lived 'within' and 'near' the clinics.

The same group of rural women exhibit a wider disparity in contraceptive use when classified according to their degree of exposure to aspects of modernization. The proportion of the exposed women in the least developed or least modernized communities practising birth control was only about 38 per cent as against 65 per cent in the most developed of the rural communities. Among those who resided in communities that were moderate in the level of development, about half of the women were current contraceptive users. Again, the implications of these differentials are greater if we consider only the use of effective methods. Half of the users in the highly developed communities were found to be using the more effective methods, such as the pill, IUD, condom and sterilization, whereas the majority of the users from the less developed communities were using the more traditional methods, such as rhythm and withdrawal.

Summing up the evidence that has been presented so far, we take special note of an apparent bias in the manner in which family planning clinics have been established in rural Philippines. As the data on the distribution of clinics indicates, the more developed a community is, the greater chance that a family planning clinic is somewhere to be found. While perhaps from a cost-benefit analysis this may be a better strategy, considering that the population is likely to be concentrated in such types of areas, there is surely a need to take a closer look into how the contraceptive needs of the widely dispersed yet numerous population residing in the less developed communities may be best served.

It has also been demonstrated that the practice of birth control is conditioned by the ease with which the means to such control is obtained, or in other words, accessibility to a family planning clinic. While this may not have come as a surprise, it is perhaps interesting, to say the least, that beyond mere accessibility there are other community or institutional factors, specifically those related to aspects of modern living, that strongly influence the contraceptive behaviour of a population.

Childbearing behaviour

The analysis of current fertility, measured by the

Table 13.7 Percentage distribution of urban and rural ever-married women by accessibility of a family planning clinic by number of children in last five years

Type of residence and and accessibility of family planning clinic	Total	Number of children in last five years			
		0	1	2	3+
Rural	100.0	28.1	30.5	29.5	11.8
Accessibility of FP clinic					
Within	100.0	29.3	30.1	29.9	10.7
Near	100.0	30.0	31.0	28.7	10.3
Far	100.0	26.5	30.5	29.9	13.1
Level of development of community					
High	100.0	34.0	29.8	28.9	7.2
Medium	100.0	29.5	32.4	26.1	11.9
Low	100.0	27.2	29.9	30.9	12.1
Urban	100.0	37.6	31.2	23.0	8.2

number of children born to ever-married women in the five-year period immediately preceding the survey, is limited to women who were continuously in the married state during that period. Table 13.7 shows the percentage distribution of these women according to their number of children in the last five years and according to measures of accessibility and level of socio-economic development of their community of residence.

More than 70 per cent of rural women reported having given birth to at least one child during that five-year period and, amazingly, one out of 12 gave birth to three or more children during that same length of time. These proportions seem almost invariable when examined across categories of proximity or accessibility to a family planning clinic. Practically the same proportion of women gave birth to one or two children in all three categories of that variable. There is only slight empirical evidence of higher fertility for women residing farthest from a clinic, namely, a higher proportion of women having three or more children and a lower proportion childless.

On the other hand, a gradient from low to high fertility seems more apparent along the socio-economic development index. A convincingly higher proportion (34 per cent) of women residing in highly developed communities did not give birth to children during the five-year period before the survey, and many fewer (7.2 per cent) gave birth to more than two children. The corresponding figures for the residents of the least developed communities are 27 and 12 per cent, respectively.

It is interesting to note that the contrast in this respect between rural and urban areas is even more distinct than the contrast within rural areas by accessibility and by development. The proportion of urban women who bore no children during the period was larger by almost ten percentage points and the proportion who had two or more children smaller by almost four percentage points. On balance, we might say that urbanization or the degree of modernization of a couple's place of residence shows more bearing on fertility than features of the family planning programme.

Multivariate analysis of contraceptive use

We now present the results of the multivariate analysis of the effects of family planning and socio-economic development on contraceptive use.

The first step in the analysis involves model fitting, that is, trying to determine which model best describes the data. In the present application, using a logit linear model, this means searching for that linear combination of the independent variables – age, level of accessibility to a family planning and level of community development – which gives the least deviation in the logarithms of the odds of being a contraceptive user.

The computer package Generalized Linear Interactive Modelling (GLIM) has been used for this purpose. A measure known as the deviance (which is analogous to the residual sum of squares in traditional regression analysis) provides an indication of the fit of a model. The statistical significance of the deviance is determined by a

chi-squared test. A deviance that is smaller than the theoretical chi-squared value at a given level of statistical significance and degrees of freedom suggests a good fit. Among several good fitting models for a given set of observations, the choice of the best model falls on that one which is most parsimonious, that is, one which has a non-significant deviance and one for which no other complex model (in terms of having more parameters to be estimated) has a significantly smaller deviance.

Having settled on one preferred model, the analysis then proceeds to the interpretation of the estimates of the parameters of this model. The estimated parameters in a logit-linear model actually represent differences in logit-means. The parameters for a main effect represent the difference between the logit-means of the cell corresponding to a given level of an independent variable and the logit-means of the cell corresponding to the reference category. With some mathematical transformation, the main effect parameters can also be expressed as odds-ratios or the relative change in the odds from one level of an independent variable to another. From the estimated parameters, fitted values of the odds or of the proportions may likewise be derived. These provide much simpler ways of interpreting the results of the logit analysis.

For the present application, table 13.8 shows the fit of the various models involving main effects and interaction terms of the independent variables. The models are labelled in such manner that they indicate the effects which they include. For example, model 4, AGE + DEV, represents a model in which age and community development are assumed to have additive effects on the response variable and where no interaction is assumed present. The model that hypothesizes an interaction between these two variables is AGE.DEV, as in model 7. Note that the models are hierarchical, meaning that if an interaction is present, the main effects of the variables in the interaction are also present. In table 13.8, those models marked with asterisk (*) are those that may be said to describe the data adequately on the basis of the statistical test of their deviances. The goal is therefore to choose from among these competing models.

As indicated by model 10, an additive model of the effects of the three independent variables adequately describes the data. This suggests that variations in the logarithms of the odds of being a contraceptive user have systematic components corresponding to differences in age, accessibility to family planning clinics and degree of development of the community of residence. The findings concerning the latter two support our earlier conclusions from the bivariate analysis.

Table 13.8 Fitted logit-linear models of contraceptive use

Model		Deviance	Degrees of freedom
Grand mean		141.90	26
1	AGE	129.30	24
2	DEV	55.29	24
3	ACC	79.03	24
4	AGE + DEV	42.34	22
5	AGE + ACC	67.45	22
6	DEV + ACC	34.06	22
7	AGE.DEV	40.45	18
8	AGE.ACC	64.40	18
9	DEV.ACC	23.02*	18
10	AGE + DEV + ACC	21.95*	20
11	AGE + DEV.ACC	11.23*	16
12	DEV + AGE.ACC	19.72*	16
13	ACC + AGE.DEV	20.22*	16
14	AGE.DEV + AGE.ACC	18.32*	12
15	AGE.DEV + DEV.ACC	9.80*	12
16	AGE.ACC + DEV.ACC	9.07*	12
17	AGE.DEV + AGE.ACC + DEV.ACC	7.92*	8

*denotes $\chi^2 > .10$.

We next test whether two-way interactions between any pair of these variables improved on the fit of the additive model. This is done by successively comparing model 10 with models 11, 12 and 13 which included the interactions DEV. ACC and AGE.ACC and AGE.DEV, respectively, The models with AGE.ACC and AGE.DEV do not improve on the additive model, implying that there are no differentials by age in the effect of family planning accessibility and community development on current use of an efficient method.

The interaction between family planning accessibility and development, DEV.ACC, however, proves to be statistically significant (model 11). The inclusion of this term reduces the deviance by over 10 units (21.95—11.23) with only 4 degrees of freedom lost. This model, in fact, turns out to be the most parsimonious of the possible models, since the addition of more interaction terms, as in models 14—17, does not significantly improve the fit. We therefore chose model 11 as our preferred model. This model implies that age, family planning accessibility and community development all have independent effects on contraceptive use, and that the effect of accessibility depends on the level of community development.

The estimates of the parameters of the best fitting model are shown in table 13.9. Note that the grand mean parameter is actually the logit of the mean for the reference category, which is the cell corresponding to the first level of all the independent variables, ie those women who are less than 30 years of age, residing in the least developed rural communities but within which a family planning clinic had been established. The rest of the estimates represent deviations in logit means between different categories of the independent variables. In table 13.10, we also show the fitted values of the odds of being a current user of an efficient method of contraception. This enables us to make a direct comparison of the contraceptive behaviour among the different categories of the women as predicted by the model.

The fitted values of the odds are all below 1.00, which implies that among rural Filipino women, in general, non-users of contraception still outnumber the users. The range of the odds is from 0.09 to 0.81. At one extreme, we find women who are above 40 years of age, residents of the least developed communities and farthest from a family planning clinic; these show the least use of contraception. At the other extreme, the group most inclined to adopt contraception consists of middle-aged women who are most conveniently located in terms of both family planning clinics and facilities of modern living.

Both table 13.9 and table 13.10 provide evidence that current use of contraception is related to age. Women aged 30—39 are more likely to be

Table 13.9 Main effects and interaction effects of the best fitting logit-linear model of current use of efficient contraception

Parameter	Estimate
Main effects	
Grand mean	−1.6180[a]
Age	
< 30	—
30—39	.2364[a]
40 +	− .1949
Interaction effects	
Accessibility by development	
Within, low	—
Within, medium	.4664[a]
Within, high	1.1700[a]
Near, low	− .2057
Near, medium	.3993
Near, high	.4474
Far, low	− .6019[a]
Far, medium	− .0537
Far, high	*

*No estimate available because of 0 marginal.
[a]Estimates which are at least twice their standard errors.

Table 13.10 Fitted values of the odds of currently using an efficient method of contraception

Level of community development and accessibility of family planning		Age of woman		
		< 30	30—39	40 +
Low	Within	.20	.25	.16
	Near	.16	.20	.13
	Far	.11	.14	.09
Medium	Within	.32	.40	.26
	Near	.30	.37	.24
	Far	.19	.24	.15
High	Within	.64	.81	.53
	Near	.31	.39	.26
	Far	—	—	—

current users of contraception than are their younger counterparts, the odds being 27 per cent higher ($e^{.2364} = 1.27$) for the former. Women aged 40 and over, however, are no more likely to be current users than women who are less than 30 years old.

With respect to accessibility of a family planning clinic, the contrast is significant only between communities where family planning clinics are located and those where the nearest clinic is more than 3 km away. A woman is more likely to be a current user of contraception if she lives in the same community or near a community which has a family planning clinic than if she lived far. The odds ratio, however, is only 0.55 ($= e^{-.6019}$) in favour of the former.

On the other hand, the effect of the level of development is more obvious and appears to be very strong. Relative to the least developed communities, the odds are 59 per cent higher in moderately developed communities and more than 200 per cent higher in the well developed communities.

An interesting interaction exists between accessibility and community development. This is evident by computing the odds ratio between the first two levels of accessibility for the three levels of community development, using the fitted odds values in table 13.10. We find that in communities that are 'low' and 'medium' in level of community development, the odds ratios are very close to one. This means that in these communities, the probability that a woman is using contraception remains the same whether a clinic is established within the community itself or outside but within a relatively short distance. In highly developed communities, however, the odds are twice more in communities with clinics than in those without.

Multivariate analysis of current fertility

The technique of multiple classification analysis (MCA) is adopted for the analysis of current fertility, which is defined as the number of children born in the five-year period before the survey. The results are shown in tables 13.11 and 13.12. In this portion of the analysis, indicators of socio-economic status of individuals have been included as independent variables in addition to the community level variables. Current age of the woman

Table 13.11 Multiple classification analysis of effects of the number of children born in the last five years (with two-way interaction of factors)

Variable	N	Unadjusted	Adjusted for factors	Adjusted for factors and covariates
Grand mean	1.26			
Wife's education				
Elementary	2196	.02	.01	.01
High school	2125	.01	.00	.02
College	300	−.21	−.14	−.08
Husband's education				
Elementary	1906	.01	−.01	−.01
High school	2408	.01	.00	.01
College	307	−.15	.05	.00
Husband's occupation				
White collar worker	395	−.24	−.20	−.13
Agricultural worker	3104	.03	.01	.02
Blue collar worker	1122	.01	.04	.00
Community development				
Low	3185	.03	.02	.01
Medium	1201	−.04	−.03	−.01
High	235	−.16	−.12	−.12
Family planning accessibility				
Within	1012	−.03	.01	.01
Near	1326	−.06	−.06	−.04
Far	2283	.05	.03	.02
R^2				.177

Table 13.12 Analysis of covariance of number of children born in the last five years to rural women

Factor	df	Mean square	F
Main effects	12	70.958	82.608[a]
1 Husband's education	2	.334	.388
2 Wife's education	2	6.844	7.968[a]
3 Husband's occupation	2	7.855	9.145[a]
4 Level of community development	2	2.799	3.259[b]
5 Family planning accessibility	2	2.918	3.397[b]
Covariates			
Age	1		
Parity	1		
Two-way interaction	39	.842	.980
1 x 2	4	.871	1.014
1 x 3	4	.289	.336
1 x 4	4	.562	.654
1 x 5	4	.645	.751
2 x 3	4	1.316	1.532
2 x 4	4	.715	.832
2 x 5	4	1.051	1.224
3 x 4	4	.430	.501
3 x 5	4	.835	.972
4 x 5	3	1.571	1.828
Explained	51	17.340	20.187
Residual	4569	.859	
Total	4620	1.041	

[a]Significant at 0.01.
[b]Significant at 0.05.

and her parity five years before the survey are introduced as covariates.

The wife's education and her husband's occupation account for large amounts of variation in current fertility. In fact, they turn out to be the strongest predictors of fertility among the factors considered. The community level factors, which are the special interest of this analysis, also turn out to be significant. The effects on current fertility of family planning accessibility, however, are very marginal. For example, the unadjusted difference in current fertility between those who have access to a clinic within their barangay and those who are far from it is 0.19, but after adjusting for the other factors and covariates, the difference almost disappears. Only the level of community development and the husband's occupation retain substantial effects after adjustment for the other factors and covariates.

13.4 SUMMARY AND CONCLUSIONS

This paper addresses the problem of assessing the effect of the family planning programme vis-à-vis socio-economic development on the level of the birth rate in the rural Philippines.

Preliminary analysis of the changes in patterns of contraceptive use and fertility behaviour between 1972 and 1978 indicate that, while there was a remarkable increase in contraceptive use during that period, there was only a minimal (if any at all) decline in the birth rate. Employing multivariate techniques, we find that levels of contraceptive use vary positively with the degree to which family planning clinics are accessible to the target population. However, the same analysis indicates an even more substantial relationship with the level of development of the community of residence. Similarly, fertility varies with the

accessibility of family planning services, but most of this relationship disappears with control for socio-economic factors.

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APPENDIX A THE FAMILY PLANNING PROGRAMME OF THE PHILIPPINES

The beginning of the Philippines Population Programme, known earlier as the National Family Planning Programme, dates back before its formal adoption by the Philippine Government as a strategy to reduce a rapidly growing population in 1970. As early as the 1920s Protestant missionaries began advocating discreetly the need to practise family planning. They carried their activities through the 1950s.

In 1965, the predecessors of the present Family Planning Organization of the Philippines (FPOP) were organized, namely: the Planned Parenthood Movement of the Philippines, by the National Council of Churches in the Philippines and the Family Planning Association of the Philippines, by Catholic leaders.

A number of other agencies, in addition to FPOP, followed suit in engaging in activities designed to encourage fertility decline before 1970. Notable among these were the Institute of Maternal and Child Health (IMCH), the Responsible Parenthood Council and the Manila City Health Department (MCHD).

In 1967, President Marcos, together with 17 other heads of state, signed the UN Declaration of Population which states that:

> The population problem must be recognized as a principal element in long-range national planning if governments are to achieve their economic goals and fulfill the aspirations of their people.[3]

In response to this declaration, the Project Office for Maternal and Child Health was established in 1968 in the Department of Health (presently known as Ministry of Health) and charged with the responsibility for population planning programme activities.

Executive Order 171, in 1969, established the first Commission on Population, a group to study the population in the country in all its aspects and to recommend policies and programmes in conjunction with economic and social development plans. The Commission concluded that the high rate of population growth in the country should be reduced and recommended the adoption of a family planning programme.

In 1970, responding to the recommendations of the 1969 Commission, a National Population Programme, with the aim of reducing the population growth rate, was launched by the Government through Executive Order 233. The Commission was charged primarily with the co-ordination and direction of the programme.

In August 1971, Republic Act (RA) 6365, better known as the Population Act, was signed into law. It established a national population policy which states that:

> For the purpose of furthering national developments, increasing the share of each Filipino in the fruits of economic progress and meeting the grave social and economic challenge of high rate of population growth, a national program of family planning which respects the religious beliefs of the individuals involved shall be undertaken.[4]

Presidential Decree (PD) no 79, in December

[3] Statement on population by World Leaders. World Leaders' Declaration on Population (presented at the United Nations on Human Rights Day, December 1967): 13.

[4] Policy Compilation (Commission on Population, June 1980).

1972, revised the Population Act to strengthen the programme and to involve both the public and the private sectors. Since then, PD no 79 has been amended three times by PDs nos 166 (March 1973), 803 (September 1975) and 1204 (September 1977) to meet increasing programme needs and challenges. The said amendments recognized the role of the private sector in the formulation and implementation of population policy by granting them three seats on the Commission's Board of Commissioners and expanded the role of the Commission by authorizing it to distribute contraceptives through commercial channels and paramedical personnel after proper training and certification.

In pursuit of the objectives of the programme, four major activities are undertaken:

1 SERVICE DELIVERY

Service delivery activities involve planning, organizing and monitoring clinic service activities of all the participating agencies in the programme. Particular attention is focused on the recruitment and maintenance of acceptors and in the improvement of contraceptive effectiveness. Service activities are administered through one of the following: (1) the integrated system, whereby family planning activities are incorporated into the structure of clinics and hospitals, usually government operated; (2) private clinics, which deliver on a full-time basis family planning services and other related activities; (3) private physicians, who have been trained by the programme through institutions certified by the Commission on Population (POPCOM) and provided with continuing supply of contraceptives; (4) agro-industrial clinics, coordinated and supervised by the Ministry of Labor and Employment's (MOLE) Family Planning Office and providing services to labourers; (5) itinerant/mobile teams, such as FPOP, the Family Planning International Assistance and the Regional Sterilization Teams, which basically provide sterilization services; and, lastly, (6) Barangay Service Point Officer (BSPO)/Full-Time Outreach Worker (FTOW) who act as basic supply and resupply points for condom and resupply points of oral contraceptives in the rural areas beyond the reach of family planning clinics.

2 INFORMATION, EDUCATION AND COMMUNICATION (IEC)

Information, education and communication is the strategy designed to create the need for family planning through various available media including interpersonal motivation, print, radio, TV and cinema. It provides intensive support to service delivery and fosters public consciousness on population concerns by continuously keeping the public informed on programme developments. It is through IEC that the policy of making family planning a part of a broader educational programme for all Filipinos is being achieved, because it is designed to reach not just the eligible population but the youth as well. Those who are in-school and out-of-school are reached through the Population Education Programs of the Ministry of Education and Culture (MEC) and the Ministry of Social Services and Development (MSSD), respectively.

3 TRAINING

Training as a major programme activity ensures manpower availability and improved capability in the provision of quality family planning services of all programme workers. It also aims to strengthen and increase the effectiveness of fieldworkers and volunteer service providers in motivating and servicing the eligible population to practise family planning and eventually internalize population concepts.

4 RESEARCH AND EVALUATION

The fourth major activity of the programme is research and evaluation, which develops and implements research studies that will provide timely and accurate information for programme implementation and population policy formulation. In essence, research and evaluation projects are implemented to provide long and short-term measures of programme development and fertility reduction; identify new approaches and strategies through development projects; and implement research utilization projects which aim to increase utilization of research information/findings and user participation in all research projects.

As regards the expansion of the family planning programme through the years, data are presented here on number of clinics established. Other programme-related data such as operations costs, manpower, etc are not included because they are either incomplete or not readily retrievable.

Before 1973, clinics had been established mainly in cities and town centres and served the more

Table A1 Number of open family planning clinics in the Philippines by broad regional groupings and by year

Year		Philippines	Metro Manila	Luzon	Visayas	Mindanao
Before 1970	N	289	79	124	42	44
	%	100.0	27.34	42.91	14.35	15.22
1970	N	682	116	315	143	108
	%	100.0	17.01	46.19	20.97	15.84
1971	N	1204	168	548	235	253
	%	100.0	13.95	45.52	19.52	21.01
1972	N	1802	200	860	429	313
	%	100.0	11.10	47.72	23.81	17.37
1973	N	2170	242	1013	528	387
	%	100.0	11.15	46.68	24.33	17.83
1974	N	2412	250	1104	574	484
	%	100.0	10.36	45.77	23.80	20.07
1975	N	2626	340	1179	585	522
	%	100.0	12.95	44.90	22.28	19.88
1976	N	2868	429	1218	648	573
	%	100.0	14.96	42.47	22.59	19.98
1977	N	3537	718	1359	751	709
	%	100.0	20.30	38.42	21.23	20.05

Source: POPCOM

urbanized sector of the population. Aware of the need to distribute the location of clinics so as to minimize overlap of operations and maximize the effects, POPCOM issued, in the beginning of 1973, a guideline (which was later revised in 1976) on the establishment of clinics. The guideline stipulated that the basic considerations in the establishment of family planning clinics were population size of the community and its density. The basic staff requirement was a trained physician, nurse and/or midwife. A clinic may, however, be established only if a trained physician is available. In actual practice, however, a number of clinics are without doctors and staffed only by a nurse and/or midwife.

Table A1 shows the cumulative number of open clinics as of the year indicated and their geographic distribution. The table reveals that before 1970 a total of 289 clinics had started dispensing family planning services in the country. More than two out of five clinics were found in Luzon while more than a quarter were in Metropolitan Manila. The rest were distributed almost equally between Mindanao and Visayas.

By the end of the first year of the programme, that is by 1970, the number of clinics/hospitals providing family planning services had more than doubled to 682. A majority of the new clinics were set up by the Ministry of Health in Luzon and Visayas. The years that followed saw further increases in the number of clinics, although the rate of establishment of new ones followed a downward trend. By 1977, the country had a total of about 3537 clinics/hospitals offering family planning services for a population of about 45 million people. More than a third of these clinics were located in Luzon; Metro Manila, Visayas and Mindanao each had about the same number of clinics.

Part V

Infant and Child Mortality

Introduction

A lamentable fact about demographic research in the Philippines, as with many other developing countries, is the relatively fewer resources devoted to the study of mortality as compared with fertility. Indeed, large scale fertility surveys and national demographic surveys that focus on fertility dominate the demographic data collection activities in this country; there have hardly been any mortality surveys designed to collect data for the principal purpose of analysing mortality levels, trends, and differentials in the same fashion as fertility surveys. Of course there have been health and nutrition surveys, but these have been undertaken largely as part of the programme of social statistics compilation. Besides, while health and nutrition status of the population are indicators, to a certain extent, of mortality levels, such information is admittedly no substitute for death statistics in determining mortality levels and trends.

This lop-sided nature of most data collection activity has come about for a number of reasons. It is a well-known fact that in this present stage of demographic transition the implications of fertility on population size, growth and composition are far more important than are the implications of mortality. Hence, for anticipating the course of the future population reliable and more detailed primary data about the fertility process are more essential than corresponding data on mortality. Accordingly, demographers have focused their attention on fertility.

The development of demographic methodology has improved our ability to examine mortality. Since John Graunt first developed the method of constructing life tables, the analysis of mortality has advanced considerably. Recent developments now make possible the estimation of mortality levels using incomplete data or even data that have been collected primarily for purposes other than mortality estimation. For example, the age distribution derived from a census, if relatively reliable, can provide accurate mortality estimates using the methodologies that have been developed expressly for this purpose. Data from fertility surveys, specifically birth histories of mothers, can be utilised for mortality analysis. The consequence of all these developments is the capability to produce good indicators of mortality levels — of course subject to the condition that the basic data are accurate and that the assumptions upon which the methodologies depend are adequately met.

Which brings us to the main topic of this part, which is the estimation of mortality indicators using data from the RPFS 1978. In chapter 14, Infant and Child Mortality in the Philippines: Levels, Trends and Differentials, the authors illustrate the use of a variety of methodologies and provide estimates of infant and child mortality at various levels of disaggregation and socio-economic characteristics. The estimates were made using different approaches, both direct and indirect, and the resulting estimates are compared with one another.

Not surprisingly, the estimates derived from the application of different methods yielded disparate results. The indirect estimates, based on the techniques developed by Brass, Trussell and Feeney, in general provided higher estimates than the direct estimates which utilized the birth history data of the RPFS. The latter place the level of infant mortality at slightly higher than 50 deaths per 1000 for the period around the middle of the 1970s. There are clear indications that mortality, in particular infant mortality, has been declining in the last few decades. Flieger, Abenoja and Lim (1981) estimated the country's IMR to be around 113 in 1960 and 93 in 1970. Their estimate for 1975, however, which was about 77, was considerably higher than the authors estimate here — proof that our knowledge of

this demographic process is indeed uncertain, owing to the limited data available.

One advantage in the use of survey data over census or registration data in the estimation of mortality rates is that the former makes it possible to make estimates for relevant socio-economic subgroups of the population. Surely this is an advantage, for it allows the analysts to determine the factors that are associated with low or high mortality and therefore provides the planners and policy makers some basis for deciding on the kind of interventions necessary to effect a desired change. In the study presented in this chapter, the authors do just this and conclude that differential access to health services has led to disparities in infant and child mortality. They also found support for the claim that socio-economic status is an important determinant of infant and child mortality, as they observe that infant rates are lower among the better educated, workers in the non-agricultural sector and residents of urban areas. The authors conclude their paper with the recommendation that in order to improve (general) mortality conditions, 'greater efforts should be focused ... in the rural areas through dispersal of health facilities and a programme of rural development with emphasis on equitable distribution of income'.

14 Infant and Child Mortality in the Philippines: Levels, Trends and Differentials

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14.1 INTRODUCTION

The study of mortality has been rather neglected during the past few decades and most studies have concentrated on mortality patterns in industrialized countries, where mortality is low. Recently mortality has been given increased emphasis by the United Nations and specialized agencies. In the Philippines the analysis of levels, trends, and differentials in infant and child mortality is particularly important in view of the following:

1 Infant and child mortality has a considerable impact on the average expectation of life and the rate of population growth.
2 It has a disproportionate share in total mortality.
3 It is particularly sensitive to existing environmental and sanitary conditions. Studies have demonstrated that mortality decline has not been uniform across population subgroups and pockets of high mortality still persist, particularly among infants and children.

Direct use of mortality data from Philippine civil registration data would be misleading in assessing levels and trends of mortality. Despite the historical tradition of keeping the vital records, the civil registration still suffers from a serious problem of under-registration. Not only are deaths under-registered, but the extent of under-registration varies across geographical areas and social strata, thus reducing further the utility of data from the civil registration.

Infant and child mortality is a very useful indicator of the country's socio-economic and health conditions and an important guide for the restructuring of public health programmes.

The primary objective here is to present estimates of the level and trend of infant and child mortality, through the application of direct and indirect estimation techniques. In addition, differentials in infant and child mortality by selected social, economic and demographic characteristics will be discussed.

This research will utilize the results of the Republic of the Philippines Fertility Survey/ World Fertility Survey (RPFS/WFS) conducted in 1978. The RPFS 1978 elicited the complete birth history from every ever-married woman aged 15–49 included in the sample. The birth history gives the date of termination of each birth, the type of termination (whether a live birth or a non-live birth), the sex of the child and the date of death and the age at death if the child had not survived to the interview. The birth history yields the data required by both the direct and indirect methods of infant and child mortality estimation.

The Brass (1968), Sullivan (1972), Trussell (1975) and Feeney (1976) techniques to derive infant and child mortality rates will be applied. William Brass (1968) pioneered these techniques, with Sullivan (1972) and Trussell (1975) contributing elaborations. All these techniques utilize tabulations of the proportion dead among children ever born to women classified by standard five-year age groups or marriage duration categories.

Feeney's (1976) research resulted in the development of a new method that allows for changing mortality and does not require knowledge of the rate of change. The new method is simple to apply and produces estimates of the infant mortality rate for about 15 years before the census or survey in which the data were collected. This method provides an estimated number of 'years prior to census' (YPC) for each age group of women. The YPC figure indicates the point of time to which the estimated rate applies. This method was used to obtain estimated trends in the infant mortality rate (IMR).

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 197–214. Voorburg, Netherlands: International Statistical Institute.

The infant mortality estimates derived by use of the Brass, Sullivan, Trussell and Feeney techniques must be interpreted with caution, bearing in mind the limitations of the methodologies employed.

14.2 MORTALITY TRENDS AND DIFFERENTIALS: A REVIEW

Trends

The shortcomings of the vital registration system notwithstanding, various estimates have been produced of the Philippines death rate at different points in time. Aromin (1961) first portrayed the trend in death rates over a number of years. Disregarding epidemic and war years, Aromin placed the crude death rate (CDR) at 27 per thousand population at the beginning of the century, a rate which was maintained until about 1930. The CDR moved downward to a level of around 14 in 1960. By 1975, the CDR had declined further to 8.7 per thousand, according to estimates by the Office of Population Studies (OPS), San Carlos University, Cebu City.

Several mortality estimates which have been produced since 1960 have reflected the growing sophistication of demographic estimations procedures that were developed specifically for situations in which data are defective. Zablan (1975) estimated the crude death rate (CDR), infant mortality rates (IMR) and life expectancy at birth by applying the methodology of Brass to data on children ever born (CEB) and children still living (CSL) obtained from the 1960 and 1970 population censuses and from the 1968 and 1973 National Demographic Surveys. Flieger, on the basis of the Sample Vital Registration data for 1971, estimated a CDR and in 1975 Mijares published death rates estimated from the Sample Vital Registration System.

Zablan's (1975) compilation of available estimates indicates a pattern of gradually declining mortality from the beginning of the twentieth century until the Second World War. She characterized the decline in mortality as occurring in two stages: a period of rapid increase after the Second World War (1948–68), when the annual increases in life expectancy at birth varied from 0.71 to 0.82 years, and a period of slow growth (1968–73) when the life expectancy at birth increased annually by 0.38 years on average.

Table 14.1 presents selected national mortality estimates obtained from various sources for the 1960–78 period. Different investigators have obtained different estimates for the same reference period due to the fact that differing data sources were utilized and different estimation techniques were employed. Nevertheless, the estimates are generally consistent in indicating a gradual decline

Table 14.1 Selected national mortality estimates for the Philippines, 1960–78[a]

Investigator	Reference period	Crude death rate	Infant mortality rate	Life expectancy at birth
OPS	1960	12.8	113.0	52.8
UPPI	1960	13.7	105.5	52.8
Aromin	1960	12.9		58.0[b]
Osteria-Baltazar	1961	11.7	68.0	58.0
UPPI	1968	10.1	76.2	58.7
OPS	1970	10.8	93.0	55.8
Engracia	1970	10.4	80.0	58.0
UPPI	1970	11.8		59.6
Flieger	1971	11.6		
Osteria-Baltazar	1971	9.6	64.0	62.0
Mijares	1973	9.6		
UPPI	1973	9.2	67.6	60.5
OPS	1975	8.7	76.0	59.4
Gonzaga	1978		62.0	

[a]Rates per 1000; life expectancy at births in years. All measures are for both sexes combined. Where sources indicate separate measures for each sex, simple averages have been taken.
[b]Projected value for period 1960–5.
Sources: Flieger, Abenoja and Lim (1981), table 1: 24–5 and ESCAP 1978

in the death rate and the concomitant increase in life expectancy at birth over the 18-year period.

In most developing countries the major influences on mortality levels and trends are socio-economic development and medical and health factors. The availability of imported medical technology that greatly diminished the risk of death from infections and parasitic diseases has brought about significant improvement in the life expectation at birth after the Second World War. The substantial decline in infant and child mortality, experienced particularly in the early 1960s, strongly indicates that these improvements might have contributed more to the acceleration in life expectancy at birth than to the decline in adult mortality.

Mortality differentials

Most of the available evidence on mortality differentials comes from studies in developed countries. One well-known investigation of causal factors in infant mortality in eight cities in the US drew attention to the influence of many biological and socio-economic factors (Woodbury 1926). A more recent study on differentials in infant and child mortality was the Inter-American Investigation of Mortality in Childhood, sponsored by the World Health Organization (WHO), carried out between 1968–71, and implemented in 15 different places (of which 13 were in Latin America, and one each in Canada and in the United States of America) (see Puffer and Serrano 1973). In the

Table 14.2 Selected regional mortality estimate for the Philippines, 1968–73 (rates per 1000)

Region	1968 UPPI			1973 UPPI[a]			NCSO 1973[b]
	Crude death rate	Infant mortality rate	Life expectancy	Crude death rate	Infant mortality rate	Life expectancy	Crude death rate
Philippines	10.1	76.2	58.7	9.2	67.6	60.6	9.6
Ilocos and Mount. Province	7.8	47.6	65.2	9.4	73.0	61.4	8.5
Cagayan Valley	8.9	76.2	58.7	10.2	81.9	57.5	11.4
Central Luzon	9.4	69.1	60.3	7.6	50.8	64.6	18.0
Southern Tagalog	11.0	86.9	56.5	8.1	62.9	61.7	9.5
Bicol	9.2	64.8	61.2	6.8	64.8	64.3	12.3
Western Visayas	8.9	65.9	61.0	9.9	70.2	60.0	9.8
Central Visayas	10.9	81.7	57.6	9.3	61.6	62.0	11.7
Eastern Visayas	11.6	82.1	57.5	11.2	86.9	56.5	
Western Mindanao	5.1	46.2		8.4	81.5	57.6	
Northern Mindanao	9.8	76.8	58.6	10.8	90.3	55.8	8.7
Southern Mindanao			65.5				
Metro Manila	7.5	64.7	61.3	7.2	57.8	62.8	6.7

[a]Population Institute, University of the Philippines (1975). Regional Differentials in Mortality: Philippines 1973 System Research Note no 64.

[b]Tito A. Mijares (1975). *The Development and Maintenance of a Sample Vital Registration System in the Philippines.* NCSO. Manila.

Sources: Population Institute, University of the Philippines System, unpublished data.

Zelda C. Zablan (1977). The Prospects of Regional Mortality in the Year 2000. Paper presented at the UPPI-PREPF Workshop on Determinants of Population in the Year 2000. Manila.

Philippines there have been few studies of differentials. Using the 1968 and 1973 National Demographic Surveys as primary sources of data, Zablan (1975) and Alcantara (1975) attempted to analyse regional differentials and socio-economic differentials in infant mortality, respectively. Gonzaga (1979) carried out preliminary analysis of urban–rural differentials in infant mortality, utilizing preliminary results of the RPFS 1978. Regional differences in mortality in the Philippines using different sources have been examined by Mijares (1975); Smith, Zablan and Viriña (1975); Zablan (1975), Flieger (1976); Abenoja and Flieger (1979). These studies revealed that mortality levels vary by region, attesting to the fact that national estimates mask the wide intra-country variations. The regions with the lowest expectations of life are the Cagayan Valley, Eastern Visayas and those located in Mindanao. Such regions have been characterized by rather low levels of economic and social progress. As far as the regions are concerned, the differentials in mortality tend to widen rather than to narrow over time (see table 14.2).

14.3 ESTIMATES OF INFANT AND CHILD MORTALITY FROM THE RPFS 1978

Direct estimates of infant and child mortality are obtained from the pregnancy histories of women interviewed in the RPFS. Direct estimates of infant mortality based on retrospective data are known to be subject to error. It has frequently been noted that certain types of live births are more likely to be omitted than others because of poor memory or misunderstanding of the questionnaire: older women are more likely to fail to report children who have died, particularly those who died shortly after birth and during periods distant from the date of survey. Moreover, in societies where preference for particular sex of a child is decidedly strong, the less preferred sex is frequently omitted. Not only are births and deaths omitted, but the date of occurrence may be misreported.

The evaluation done by Reyes (1981) of the RPFS 1978 showed encouraging results. An examination of the sex ratios at births revealed no selective omission by sex of child. The proportion dead of children ever born for male and for female births by age of mother at the survey showed the expected relationship of an increasing proportion dead with increasing age of mother. Probabilities of dying for infants and children ($_1q_0$, $_4q_0$, $_5q_0$) analysed for periods before the survey showed a steady reduction in mortality risks through the 1950s but showed only a modest decline since the 1960s, lending support to an earlier finding of a period of slackened mortality decline starting around 1968 following a period of rapid decline over the 1948–68 period (Zablan 1975).

The probability of dying within the first year of life for varying periods in the past showed the characteristic U-shaped pattern with mother's age at child's birth.

From the birth history, the number of children born and the children surviving per woman can be calculated. The indirect estimation techniques of Brass, Sullivan, Trussell and Feeney were applied to derive infant and child mortality estimates as well as the level of overall mortality for the various regions and socio-economic groups.

Levels of infant and child mortality

Indirect estimates

All of the estimates of $_2q_0$ and $_5q_0$ presented in this section are obtained through the Trussell method[1] (West model). Table 14.3 exhibits estimates for each residence category, ie urban–rural, as well as region of residence. Each of these mortality estimates corresponds to a particular period of time expressed as years before the survey (represented as t^*). The averages of model life tables implied by the three estimates of child mortality, together with the average number of years to which the estimates refer, are included in table 14.3. The $_1q_0$, $_4q_0$, and e_0 from the West model life table of the average level are also shown. The estimates corresponding to average level refer to the average time period indicated, while the estimates obtained directly from the Trussell method correspond to different periods of time. Values corresponding to the average level do not overstate the age gradient of mortality since they simply reflect the age gradient specified by the model life table for that average level.

The results indicate a moderately higher level of child mortality in the rural sector than in the urban areas. According to our figures the average life expectancy of a child born recently in urban

[1] See appendix A, Comparative Analysis of the Three Indirect Estimation Methods, for the justification of the choice of method.

Table 14.3 Indirect estimates of child mortality, average mortality level, average time period estimates (t^*), and corresponding $_1q_0$, $_4q_1$ and e_0 by urban–rural residence and region

Residence category and region	$_2q_0$	$_3q_0$	$_5q_0$	Mortality level	Average t^* (x) year	$_1q_0$, $_4q_1$ and e_0 corresponding to average level		
						$_1q_0$	$_4q_1$	e_0
Philippines	57.8	75.5	84.8	17.64	3.50	71.4	29.4	59.8
Urban	55.9	57.9	75.1	18.33	3.31	63.8	24.6	61.4
Rural	60.5	79.0	93.1	17.13	3.76	77.2	33.1	58.5
Region								
Metro Manila	60.9	72.9	76.8	18.02	2.95	67.1	26.6	60.7
Luzon	58.7	63.8	77.2	18.59	3.66	61.0	26.2	62.1
Visayas	75.2	93.3	78.8	16.68	3.43	82.4	36.6	57.4
Mindanao	83.6	76.9	103.3	16.22	3.96	87.8	40.2	56.3

NOTE: $_1q_0$, $_2q_0$, $_3q_0$, $_4q_1$, and $_5q_0$ are expressed per 1000.

areas is three years more than for a child born in rural areas. As of 1974, infant mortality rates for the entire Philippines and for urban and rural areas are about 71, 64, and 77 per thousand respectively. The results clearly show that children born in the rural areas have considerably lesser chances of survival than children born in the urban areas. The rural disadvantage is undoubtedly due to a combination of lower socio-economic level in the barrios and towns and the relatively poorer access to medical and health services.

Regional variations are also evident. Four major geographical regions are considered: Metro Manila, Luzon, Visayas and Mindanao. The results reveal that mortality is considerably lower in Metro Manila and Luzon than in the Visayas and Mindanao region. This is as expected, because industrialization and urbanization go hand in hand with low fertility and mortality levels. The regional figures seem to indicate that infant and child mortality levels are related to the level of urbanization and development.

Direct estimates

Although the overall levels of infant and child mortality can be considered low, the data disclose wide variations by population subgroups. Table 14.4 reinforces the findings in table 14.3 that the rural areas are greatly disadvantaged; the urban infant mortality rate (IMR) is 32 per cent lower than the corresponding rural rate and the urban child mortality rate (CMR) 43 per cent lower than the rural figure. The neo-natal mortality differential is smaller. These observations underscore the influence of environmental factors on the risk of mortality during the early period of life.

Trends in infant mortality

The Feeney method yields seven estimates of q(1), ie the probability of dying in the first year of life, derived from the proportion dead among children ever born to mothers of different ages as well as estimates of the point in time to which

Table 14.4 Direct estimates of infant and child mortality, 1973–7, by residence of mother

Mother's place of residence	Infant mortality rate (IMR)			Child mortality rate (CMR)
	Neo-natal	Post-neonatal	Total	
Urban	22	23	45	52
Rural	25	41	66	92
Total (Philippines)	23	34	57	81

Table 14.5 Indirect estimates of infant mortality rates at specific points in time before the survey, using the Feeney technique by place of residence

Residence and age group of mother	Infant mortality rate (IMR) and year		Number of years before the survey to which the IMR estimates refer
	IMR 1000 (1)	Time t	
A Philippines			
20–24	60	1976.2	1.8
25–29	56	1974.4	3.6
30–34	57	1972.5	5.5
35–39	57	1970.1	7.9
40–44	64	1967.3	10.7
45–49	66	1964.1	13.9
B Urban			
20–24	59	1976.5	1.5
25–29	46	1974.8	3.2
30–34	48	1973.0	5.0
35–39	44	1970.7	7.3
40–44	53	1967.9	10.1
45–49	55	1961.8	13.2
C Rural			
20–24	62	1976.5	1.6
25–29	61	1974.7	3.3
30–34	61	1972.9	5.1
35–39	62	1970.5	7.5
40–44	69	1967.7	10.3
45–49	71	1964.6	13.4

each estimate corresponds. The time trends in infant mortality obtained from utilizing the Feeney method are exhibited in table 14.5. The method assumes that the mortality decline has been linear. The estimates show a declining trend of mortality over time which is reversed at the end. The irregularity is due to the fact that the estimates corresponding to the most recent periods are based on the experience of women aged 15–19 and 20–24, who are known to have infant mortality above the average. This type of result appears systematically in the applications of Feeney's method.

Table 14.6 presents direct estimates of infant and child mortality by period of birth. The figures reveal that there is a steady decline in ${}_1q_0$, ${}_4q_1$ and ${}_5q_0$ (ie probability of dying between birth and exact age one, probability of dying between

Table 14.6 Direct estimates of infant and child mortality, by five-year birth cohorts, calendar years 1949–76 based on the RPFS 1978 and vital statistics

Year	Number of births	Number of deaths at ages			Probability			Vital statistics IMR
		1	1–4	5	${}_1q_0$	${}_4q_1$	${}_5q_0$	
1949–53	1555	140	87	227	90	62	146	113.2
1954–58	4022	266	196	462	66	52	115	102.3
1959–63	6780	392	241	633	58	38	92	79.7
1964–68	9231	514	311	825	56	36	89	71.7
1969–73	11128	622	352	974	56	34	88	64.4
1974–76	6459	383	145	653	59	–	–	56.3

NOTE: ${}_1q_0$, ${}_4q_1$, and ${}_5q_0$ are expressed per 1000.
Source: RPFS 1978 and vital statistics 1949–76

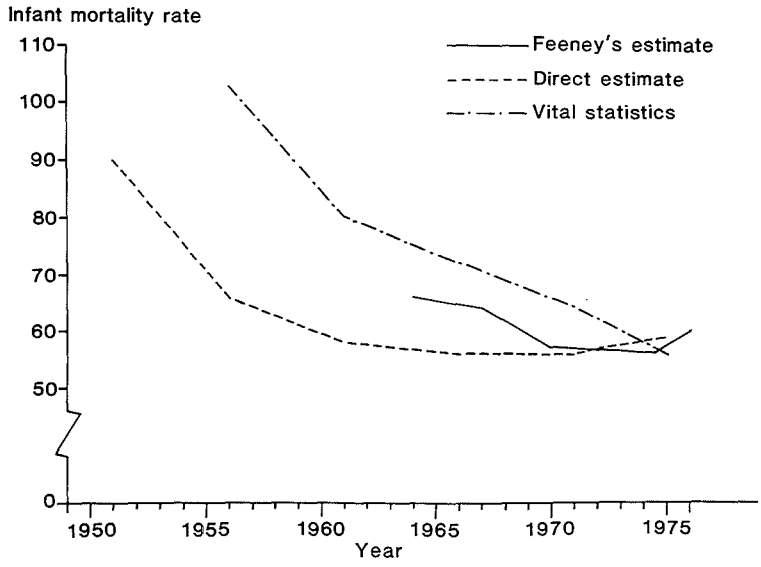

Figure 14.1 Trends in infant mortality
Source: ——— Feeney's estimate from table 14.5
– – – – Direct estimate from table 14.6
—·—· Vital statistics. Taken from table 14.6

age one and exact age four, and probability of dying between birth and exact age five, respectively) from the late 1940s to the early 1970s. Fairly rapid decline is exhibited by 1950–60 estimates while very slight change is depicted from the early 1960s onwards.

In order to compare the indirect estimates with direct estimates, the rates in table 14.6 are plotted in figure 14.1 together with the trend estimates presented in table 14.5 and the 1949–76 estimates derived from vital registration statistics. Although the levels indicated by the indirect estimates are above the direct estimates derived from the RPFS 1978, the general trends indicated by both estimates are reasonably parallel. Perhaps the most important point to note is that both series of estimates lead to the conclusion that infant mortality in the Philippines has been declining at least over the last decade or so. The results also indicate that the level and trend of infant mortality between 1964 and 1974, approximately, are reasonably well estimated by the method proposed by Feeney.

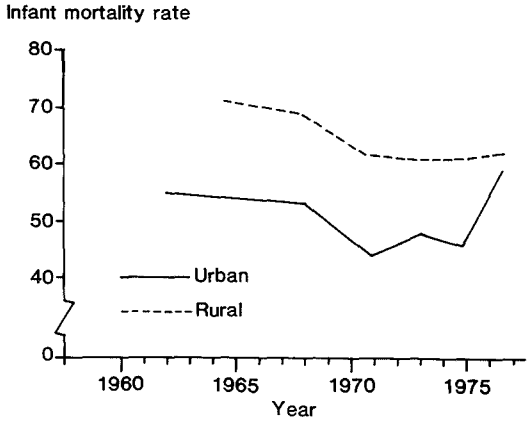

Figure 14.2 Trends in infant mortality by type of place of residence

Figure 14.2 shows graphically the trends in the indirect estimates of infant mortality in urban and rural areas based on the RPFS 1978. The dramatic difference in infant mortality rates in the urban and rural areas is clearly evident. Nevertheless for both sectors of the population infant mortality appears to have been on the decline over the recent past.

Components of infant mortality rates: trends

We now focus on the distribution of infant deaths within the first year of life. Table 14.7 presents

Table 14.7 Neo-natal, post-neonatal and infant mortality rates by calendar years

Calendar year	Mortality rates[a] (per 1000)								
	Neo-natal			Post-neonatal			Infant[a]		
	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes
1950–54	23	20	26	63	53	58	96	72	84
1955–59	25	18	22	41	45	43	66	63	65
1960–64	28	20	25	33	37	35	61	58	60
1965–69	27	23	25	32	27	30	59	50	55
1970–74	26	21	24	38	28	33	64	49	57
1975–76	25	24	24	34	34	34	59	58	58

[a]Rates are true period rates.

the probabilities of dying for children who died during the first four weeks (neo-natal) and between the age of one and eleven months (post-neonatal) together with the resulting infant mortality rates, by calendar year and sex. The rates suggest that the reduction in infant mortality is associated with a shift towards increasing concentration of infant deaths in the first month. Post-neonatal mortality accounts for nearly six-tenths of the infant deaths and it is considerably higher than the neo-natal mortality. For almost all cohorts infant death is more likely for males than females. Neo-natal mortality appears unchanging over the last decade or so, while post-neonatal mortality shows a rising trend over the same period. Death risks during the first month of life may have stabilized, not as a result of improvement in the biological factors determining survival during this period, but as a reflection of a slow shift away from childbearing in the high risk years, as will be shown below. On the other hand, the worsening post-neonatal mortality, in light of the improvements in maternal and child health services and socio-economic conditions over the years, is plausible only to the extent that crowding of births has led to poor quality of maternal care.

Infant and child mortality in the latter half of the 1960s was lower than in the ensuing years. The beginning of the 1970s appeared to reflect an upsurge in infant and child mortality followed by a slow but persistent decline between 1972 and 1976. A comparison over the cohorts born in 1965–9, 1970–4 and 1975–6 shows an unchanging level of mortality under age one together with a 4 per cent reduction in mortality under five years. It is quite expected that the amelioration of child mortality precedes that of infant mortality.

Table 14.8 Direct estimates of the infant mortality rate (IMR)[a] by selected demographic characteristics of mother

Selected demographic characteristics	Infant mortality
A Age of mother at birth of child	
15–19	53
20–24	48
25–29	49
30–34	55
35–39	69
40–44	82
45–49	55
B Residence and parity	
Urban	
1–2 children	33
3–4 children	40
Rural	
1–2 children	46
3–4 children	62
Total Philippines	
1–2 children	39
3–4 children	52
C Length of previous interval[b]	
Under 18 months	142
18–23 months	97
24–35 months	36
36 months	39

[a]IMR refers to the 1973–7 period.
[b]IMR refers to the next-to-last live birth.

Table 14.9 Indirect estimates of child mortality, average mortality level, average time period of estimates (t^*), and corresponding $_1q_0$, $_4q_1$, and e_0 by different socio-economic characteristics of the mother

Socio-economic characteristics	$_2q_0$	$_3q_0$	$_5q_0$	Average mortality level	Average t^* (x) years	$_1q_0$, $_4q_1$, and e_0 corresponding to average level		
						$_1q_0$	$_4q_1$	e_0
A Level of education								
No grade completed	85.6	134.3	140.2	13.77	5.32	118.4	62.5	50.4
Primary	115.1	110.8	109.3	14.28	4.17	111.7	57.3	51.7
Intermediate	74.6	76.8	95.8	16.69	3.86	82.3	36.5	57.4
High school	97.8	64.2	42.5	19.11	3.44	55.5	19.3	63.3
College	46.5	34.3	40.2	19.43	2.63	52.2	17.3	63.1
B Literacy								
Can read	54.8	70.7	80.7	17.90	5.32	68.5	27.5	60.4
Cannot read	114.5	122.8	155.5	12.92	5.42	130.3	72.2	48.3
C Religion								
Roman Catholic	53.7	68.7	86.9	17.83	5.47	69.3	28.0	60.2
Iglesia ni Kristo	28.7	64.7	48.0	19.86	5.91	47.7	14.6	65.2
Protestant	82.1	72.3	70.4	17.27	5.39	75.6	32.1	58.8
Aglipayan	56.6	82.3	78.2	17.57	5.08	72.2	29.9	51.6
Islam	158.2	192.0	198.6	10.07	5.28	174.4	102.8	41.2
D Dialect								
Cebuana	62.9	82.6	95.7	17.47	5.44	73.3	30.6	59.3
Tagala	62.8	48.5	71.7	18.57	5.41	61.2	22.9	62.0
Ilocana	52.3	49.8	85.0	18.51	5.37	61.9	23.3	61.9
Hilongga	49.2	86.5	78.6	17.68	5.62	71.0	29.1	59.8
Bicolana	64.8	62.6	66.4	17.67	5.23	71.1	29.2	59.8
Muslim	64.6	79.8	98.6	16.83	5.00	80.6	35.4	57.8
E Occupation								
Professional	71.4	62.7		18.04	4.16	66.9	26.5	60.7
White collar	51.2	72.1		18.68	4.94	60.1	22.2	62.3
Blue collar	13.6	45.1		20.04	4.99	45.9	13.5	65.6
Farmers and agriculture	44.9	74.5		17.38	5.22	74.3	31.3	59.1
Did not work	77.5	87.8		18.10	5.31	66.3	26.1	60.8

NOTE: $_1q_0$, $_2q_0$, $_3q_0$, $_4q_1$, $_5q_0$ are expressed per 1000.

Infant and child mortality differentials

Demographic

In general, infant mortality is higher for older than younger women (table 14.8). It is lowest among the women in the age groups 20–24 and 25–29 and gradually rises, reaching a high of 82 deaths per 1000 births among women aged 40–44.

Regardless of locale, infant mortality demonstrates a positive relationship with parity. The rate for women with three to four children, as compared to women with one to two children, is 17 per cent higher in urban areas and 27 per cent higher in the rural sector.

When pregnancies are closely spaced the survivorship of the first child in a given birth interval may suffer, perhaps as a result of sudden weaning after the second child is conceived. The survivorship of the second child is also affected, probably because the mother's health is affected by closely spaced pregnancies. The data in table 14.9, panel C show a distinct relationship between infant mortality and the length of the birth interval. The infant mortality rate is 142 when the

length of the interval is less than 18 months. Increasing this length to 18–23 months results in a 32 per cent reduction in the rate. An interval of three years or more depresses the rate by almost three-quarters. Some of this pattern may be related to the fact that the birth interval following a child death is usually shorter. If a child dies in early infancy, lactation ends and ovulation returns earlier than it would otherwise and a shorter interval may result.

Socio-economic and demographic differentials

Differentials in infant and child mortality by region and place of residence (urban or rural) have been discussed in a preceding section. The following discussion will focus on differentials according to educational attainment, literacy, religion, dialect, labour force participation and occupation of the mother.

Estimates in table 14.9 demonstrate the significant influence of educational attainment of the mother on the infant's or child's chances for survival. The probability of dying before age two, three or five is several times higher for children of women who never had any schooling completed than for mothers who have had at least a secondary level of education. The IMR decreases progressively from 118 for mothers who had not attended school to 52 for those with college education. It is clear that an increase in educational attainment would bring about considerable mortality improvements. With more schooling, mothers are made aware of better health and nutrition practices, resulting in the general reduction of infant deaths and the improvement of life expectancy in the long run. In addition, higher education guarantees better paying jobs and higher occupational status, which are conducive to lower mortality.

In the Philippines, literacy is relatively high. About 8 out of 10 Filipinos belong to the literate category. The literacy rate (ie proportion of population 10 years old and over who can write, read or understand a simple message) is a general measure of the educational status of a population. The disadvantages of being a child of an illiterate mother are large (table 14.9). A child of an uneducated mother is two and three-quarter times more likely to die between ages one and five than a child of a mother who can read.

Different levels of mortality are frequently found among the various religious, ethnic or racial groups. Estimates of mortality by type of religious affiliation are also exhibited in table 14.9. The Philippine population is predominantly Catholic, with 85 per cent of Filipinos classified as such in the RPFS 1978. In general, children of Muslim women appear to experience distinctly higher infant and child mortality than the Christian children. Among the Christians, adherents of Iglesia ni Kristo and Roman Catholicism have the highest life expectancy at birth and lowest infant mortality rate.

The lower mortality of the Christians in the Philippines may reflect not only their relatively favourable economic position, but also the impact of cultural patterns emphasizing cleanliness and attention to preservation of good health. The better education of Christian mothers may also contribute to lower infant and child mortality.

Estimates in table 14.9 indicate that the offspring of Tagalog and Ilocano women have greater chances of surviving than the children of Cebuano and Muslim women. Muslim women's children belong to the least advantaged group, having an infant mortality rate of 80.62 and a life expectancy at birth of almost 58 years.

Table 14.9 presents estimates of infant and child mortality by mother's work status. The results indicate that children of mothers not in the labour force experience greater risk of dying in infancy and childhood than do children of women in the labour force. Women not in the labour force might be less financially capable on the average than women who work and thus less able to take advantage of medical and health facilities.

All the mortality measures indicate that children of working mothers have higher chances of survival than children of non-working mothers.

Differentials in mortality according to the type of occupation of the mother present inconsistent patterns, in part because several occupational categories have very few cases. It is evident that children of women who are in the professional, administrative and clerical occupations have lower mortality than the other occupational groups. This result undoubtedly reflects their favourable socio-economic position. The worst mortality characterizes children of women engaged in farming. Most farming women reside in rural areas, where conditions encourage higher mortality. In addition, this occupation has great occupational hazards and risks.

Our examination of differentials in infant and child mortality based on indirect measurement demonstrates a distinct contrast between the socio-economically advantaged group and the least

advantaged group. Obviously, many factors contribute to the high mortality of lower socio-economic groups: poor nutrition, inadequate preventive health measures, inadequate health facilities, poor personal health practices, illiteracy, low income, poor environmental sanitation and so on. Social class disparities are measured by the educational attainment and occupation of the mother. The observed differentials are significant. The results suggest that children belonging to the more privileged group enjoy survival chances as favourable as those populations in more economically advanced countries. Our findings also show that children of mothers having university education or employed in professional and white collar occupations have life expectancies at birth of more than 60 years.

14.4 SUMMARY AND CONCLUSION

The indirect estimation techniques prove to be useful in supplementing mortality information derived from direct estimation procedures. A comparison of results based on the direct and indirect techniques suggests that although the latter may underestimate infant mortality to some extent, the discrepancies are generally quite modest. Either approach, applied to the RPFS data, has the advantage of providing estimates of socio-economic differentials and of time trends in infant mortality that would be difficult and extremely expensive to derive from registration data, for example under a dual record approach.

Results from our study confirm a trend toward lower infant and child mortality as well as the existence of moderate regional mortality differences and very substantial urban–rural mortality. We suspect that the disparities in the levels of infant and child mortality among regions reflect differences in access to health service and levels of socio-economic development. Variations in the degree of access to medical services can be eliminated or minimized through the following: improvement in the use of health services by equitable distribution of medical and health facilities; promotion of public awareness and motivation for health; more effective recruitment of health and medical manpower; and by providing more professional and medical workers, especially in the rural areas.

This study also reveals large gaps between the survival chances of children in different socio-economic strata of the population.

The incidence of infant and child mortality declined with increasing education, urban residence and increasing distance from the country's dominant city Metro Manila. Women who worked in non-agricultural occupations were less likely to have experienced a death among their children than those working in agriculture or those who never worked. Documentation of such differences should help to guide a national health policy.

The study reveals that infant and child mortality has declined over the years. Changes over time can be attributed to advances in medical technology and perhaps to improved public health measures.

Further improvements in the level of infant and child mortality can be attained through an efficient health service network and a more aggressive health policy that is supported by a socio-economic development programme. Greater efforts should be focused on general mortality improvement in the rural areas through dispersal of health facilities and a programme of rural development with emphasis on equitable distribution of income. Improvement in general levels of education will also lead to improvement in family and personal health practices, environmental sanitation and nutrition habits and will foster a more permanent decline in mortality.

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Table A1 Indirect estimates of child mortality calculated according to the Brass, Sullivan and Trussell techniques, by place of residence and regional model

Place of residence, estimation technique and regional model	$_2q_0$	$_3q_0$	$_5q_0$	Average
A Philippines				
Brass	.0731	.0788	.0890	.0803
Sullivan				
South model	.0660	.0716	.0821	.0732
West model	.0671	.0713	.0806	.0730
Trussell				
South model	.0571	.0748	.0897	.0739
West model	.0593	.0738	.0881	.0737
B Urban				
Brass	.0693	.0628	.0741	.0688
Sullivan				
South model	.0643	.0579	.0691	.0638
West model	.0654	.0576	.0678	.0636
Trussell				
South model	.0532	.0608	.0766	.0635
West model	.0583	.0579	.0579	.0630
C Rural				
Brass	.0735	.0841	.0941	.0839
Sullivan				
South model	.0667	.0766	.0870	.0768
West model	.0677	.0764	.0855	.0765
Trussell				
South model	.0583	.0801	.0947	.0777
West model	.0605	.0790	.0931	.0775

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APPENDIX A COMPARATIVE ANALYSIS OF THE THREE INDIRECT ESTIMATION METHODS

Tables A1 and A2 compare the mortality estimates for type of place and region of residence, respectively, obtained from the Brass, Sullivan and Trussell techniques.[2] Both the Sullivan and Trussell estimation techniques are based on the Coale-Demeny life tables (Coale and Demeny 1966). The results depend on the choice of a particular family of life tables considered most appropriate for the country that is being studied. Though the West model life tables are universally used, there is evidence that the mortality pattern of the South model seems to represent the observed Filipino pattern better than other sets and the estimated vital rates and stable age distribution from the estimated life table in turn provide the most consistent results.[3] The estimates are quite similar irrespective of the technique or the life table utilized. The greatest difference is to

[2] The Brass estimates are based on the use of P_1/P_2 as the parameter for choosing the multiplier (see Brass 1975: 55). The Trussell estimates were from the modified version of the coefficients provided in table A5: B.

[3] UNFPA-NCSO Population Research Project Monograph Series no 2. Age and Sex Population Projections for the Philippines by Provinces: 1970–2000: 13. Manila.

Table A2 Indirect estimates of child mortality calculated according to the Brass, Sullivan and Trussell techniques, by place of residence and regional model

Place of residence, estimation technique and regional model	$_2q_0$	$_3q_0$	$_5q_0$	Average
A Metro Manila				
Brass	.0577	.0679	.0723	.0660
Sullivan				
South model	.0595	.0693	.0726	.0671
West model	.0590	.0681	.0717	.0662
Trussell				
South model	.0597	.0705	.0746	.0683
West model	.0591	.0690	.0737	.0672
B Luzon				
Brass	.0484	.0576	.0710	.0590
Sullivan				
South model	.0582	.0640	.0764	.0662
West model	.0578	.0630	.0754	.0654
Trussell				
South model	.0592	.0651	.0782	.0675
West model	.0587	.0638	.0772	.0665
C Visayas				
Brass	.0640	.0850	.0786	.0759
Sullivan				
South model	.0756	.0936	.0836	.0843
West model	.0750	.0921	.0826	.0832
Trussell				
South model	.0759	.0953	.0860	.0857
West model	.0752	.0933	.0788	.0824
D Mindanao				
Brass	.0722	.0719	.0981	.0807
Sullivan				
South model	.0825	.0770	.1023	.0873
West model	.0823	.0759	.1009	.0864
Trussell				
South model	.0841	.0783	.1046	.0890
West model	.0836	.0769	.1033	.0880

be found between the Brass and Trussell (West model) estimates of the probabilities of surviving between birth and age one for Philippines, urban and rural areas, Luzon and the Visayas region. The probability of surviving between birth and age one was computed from the proportion dead among CEB to the youngest age group of women (15–19). Estimates based on this age group are very sensitive to the exact age pattern of early childbearing since a very young maternal age together with a first order birth is generally associated with higher than average mortality and this is poorly accounted for by the indirect estimation methodology. The other method of assessing the consistency of the estimates obtained by different methods is by comparing the mortality levels indicated by the Coale-Demeny life-table system that correspond to each set of estimates.

The model life-table levels corresponding to the estimates of infant mortality displayed in tables A1 and A2 are shown in tables A3 and A4.[4] The results indicate that the level of mortality

[4] Results of the Brass techniques are not based on the Coale-Demeny model life tables, but it is feasible to determine the corresponding Coale-Demeny life-table level in each of the regional families that conforms to each particular Brass estimate of infant and child mortality.

Table A3 Coale-Demeny life-table levels corresponding to indirect estimates of child mortality, by estimation technique and place of residence

Place of residence, estimation technique and regional model	Model life-table level corresponding to estimate of			
	$_2q_0$	$_3q_0$	$_5q_0$	Average mortality level
A Philippines				
South model				
Brass	19.90	19.31	12.27	19.16
Sullivan	20.64	20.06	18.97	19.89
Trussell	21.58	10.72	18.20	19.83
West model				
Brass	17.49	16.99	16.11	16.86
Sullivan	18.08	17.65	16.83	17.50
Trussell	19.30	17.43	16.19	17.64
B Urban				
South model				
Brass	20.30	20.97	19.80	20.36
Sullivan	20.82	21.48	20.31	20.87
Trussell	21.98	21.18	19.54	20.90
West model				
Brass	17.82	18.42	17.40	17.88
Sullivan	18.18	18.90	18.95	18.68
Trussell	18.98	18.69	17.31	18.33
C Rural				
South model				
Brass	19.86	18.76	17.72	18.78
Sullivan	20.57	14.52	18.48	19.52
Trussell	21.44	19.18	17.66	19.45
West model				
Brass	17.46	16.53	15.69	16.56
Sullivan	17.97	17.20	16.42	17.20
Trussell	18.64	16.97	15.78	17.13

for each of the infant mortality measures is fairly similar for all the estimation techniques, regardless of the type of model used. In most of the estimates for the areas considered the difference is less than one full model life table.

It is important to note that for the three techniques utilized, results indicate that the mortality level diminishes as one moves from the level corresponding to $_2q_0$ to the level corresponding to $_5q_0$ for the Philippines and rural areas. This overall pattern apparently reflects recent declines in mortality. The decline in the mortality levels between the estimates corresponding to the younger and elderly women really denotes that children born to older women were subject to higher mortality (as shown by lower mortality levels), in accordance with the observed mortality decline.

It is worth noting that the mortality levels associated with $_1q_0$ estimates provided by Brass and Trussell techniques do not conform to the general pattern of decreasing levels with estimates based on women of increasing age. Generally lower levels of mortality corresponding to estimated $_1q_0$ than $_2q_0$ are depicted in all areas considered. The $_1q_0$ estimates derived from these estimates tend to be generally inflated due to the fact that they rely heavily on births to very young mothers and are disproportionately first order births.

If mortality had been declining during the recent past, the estimates obtained by using a method requiring the assumption of constancy in mortality conditions will contain systematic biases. The magnitude of biases will depend on the speed of the decline and the duration of exposure to mortality risk of children ever born.

Table A4 Coale-Demeny life-table levels corresponding to indirect estimates of child mortality, by estimation technique and place of residence

Place of residence, regional model and estimation technique	Model life-table level corresponding to estimate of			
	$_2q_0$	$_3q_0$	$_5q_0$	Average mortality level
A Metro Manila				
South model				
Brass	21.57	20.48	20.01	20.69
Sullivan	20.64	20.86	18.97	19.89
Trussell	21.37	20.18	19.73	20.43
West model				
Brass	18.95	17.98	17.58	18.17
Sullivan	18.03	17.65	16.83	17.50
Trussell	18.77	17.85	17.44	18.02
B Luzon				
South model				
Brass	22.49	21.52	20.12	21.38
Sullivan	21.46	20.85	19.56	20.62
Trussell	21.35	20.73	19.38	20.49
West model				
Brass	19.79	18.91	17.67	18.79
Sullivan	18.88	18.40	17.28	18.19
Trussell	18.81	18.33	17.13	18.09
C Visayas				
South model				
Brass	20.85	18.67	19.33	19.62
Sullivan	19.64	17.78	18.81	18.74
Trussell	19.61	17.59	18.57	18.59
West model				
Brass	18.31	16.46	17.00	17.26
Sullivan	17.32	15.86	16.66	16.61
Trussell	17.30	15.76	16.99	16.68
D Mindanao				
South model				
Brass	19.99	20.03	17.27	17.27
Sullivan	18.93	19.49	16.79	18.40
Trussell	18.77	19.36	16.53	18.22
West model				
Brass	17.57	17.60	16.37	17.18
Sullivan	16.69	17.24	15.14	16.36
Trussell	16.58	17.15	14.94	16.22

Estimates obtained from the proportion dead among children ever born to women belonging to different age groups on the basis of the procedures discussed above correspond to mortality at one particular point of time. Recent developments in indirect estimation methodology allow the estimation of a particular point of time to which the various mortality estimates correspond for different age groups of women (Coale and Trussell 1977). This procedure assumes that mortality has been declining at a constant rate before the survey. The number of years in the past to which the average level of mortality refers can be produced by utilizing appropriate regression equations (see table A5) for each separate mortality estimate.

Table A5 Regression coefficients (for South and West mortality patterns) to be used in estimating multipliers for the Trussell and Sullivan version where children ever born are classified by age of mother

A Sullivan version

Coale-Demeny mortality pattern and age group	i	q(x)/D(j)	A(i)	B(i)
South				
20–24	2	q(2)/D(2)	1.33	−.61
25–29	3	q(3)/D(3)	1.20	−.44
30–34	4	q(5)/D(4)	1.14	−.32
West				
20–24	2	q(2)/D(2)	1.30	−.54
25–29	3	q(3)/D(2)	1.17	−.40
30–34	4	q(5)/D(4)	1.13	−.33

Regression equation: $K(i) = \frac{q(x)}{D(i)} = A(i) + B(i) * \left(\frac{P(2)}{P(3)}\right)$

B Trussell version

Coale-Demeny mortality pattern and age group	i	x	q(x)/D(j)	A(i)	B(i)	C(i)
South						
15–19	1	1	q(1)/D(1)	1.0819	−3.0005	.8689
20–24	2	2	q(2)/D(2)	1.2846	−.6181	−.3024
25–29	3	3	q(3)/D(3)	1.2223	.0851	−.4704
30–34	4	5	q(5)/D(4)	1.1905	.2631	−.4487
West						
15–19	1	1	q(1)/D(1)	1.1415	−2.7070	.7663
20–24	2	2	q(2)/D(2)	1.2563	−.5381	−.2637
25–29	3	3	q(3)/D(3)	1.1851	.0633	−.4177
30–34	4	5	q(5)/D(4)	1.1720	.2341	−.4272

Regression equation: $\frac{q(x)}{D(j)} = A(i) + B(i) * \left(\frac{P(1)}{P(2)}\right) + C(i) * \left(\frac{P(2)}{P(3)}\right)$

Presentation of detailed results based on Brass, Sullivan, and Trussell methods in the following analysis is no longer necessary since the mortality estimates produced by the three methods are quite homogeneous. Only the detailed analysis of the results of the most recently developed technique by Trussell (West model) have been presented. Comparative analysis has shown that infant mortality or ${}_1q_0$ estimates seem to be unreliable regardless of which particular technique is utilized. Hence infant mortality is not estimated directly from the proportion dead to children of women belonging to the youngest age group. Instead, we have estimated the average mortality level that corresponds to the estimates of ${}_2q_0$, ${}_3q_0$ and ${}_5q_0$ and then obtain the ${}_1q_0$ together with ${}_4q_1$ and e_0 from the appropriate West models.

Table A6 Feeney's method

Display 1 Estimation of the mean age at childbearing from mean parity ratios for successive five-year age groups

1000 × mean parity ratio for women aged x–5 to x $\left(\frac{x}{x-5}\right)$	Displacement of mean age at childbearing (M) from x (M = x + displacement)
063–110	+ 10
111–167	+ 9
168–230	+ 8
231–293	+ 7
294–353	+ 6
354–409	+ 5
410–461	+ 4
462–508	+ 3
509–552	+ 2
553–593	+ 1
594–630	0
631–665	− 1
666–697	− 2
698–728	− 3

Display 2 Estimation of infant mortality rates from proportions of deceased children among children born to women in five-year age groups

Age group	IMR	YPC
20–24	(− 44.7 + 30.5M)Q − 2.6	11.0 − .325M + .17Q
25–29	(294 + 14.9M)Q − 2.9	16.5 − .424M + .16Q
30–34	(357 + 10.4M)Q − 2.8	20.6 − .494M + .77Q
35–39	(362 + 9.7M)Q − 7.8	24.9 − .556M + .80Q
40–44	(282 + 11.0M)Q − 8.5	30.1 − .633M + .87Q
45–49	(216 + 11.1M)Q − 7.5	33.4 − .641M + 1.58Q

NOTE: The proportion of deceased children is represented by Q, the mean age at childbearing by M.

Table A7 Regression coefficients to be used for estimating $t^*(x)$ for the case of declining mortality when $t^*(x)$ is the number of years before the survey to which each mortality estimate corresponds and children ever born are classified by age of mother

Age group	i	x	A(i)	B(i)	C(i)
15–19	1	1	1.0970	5.5628	− 1.9956
20–24	2	2	1.3062	5.5677	.2962
25–29	3	3	1.5305	2.5528	4.8962
30–34	4	5	1.9991	− 2.4261	10.4282

Basic estimating equation:

$$t^*(x) = A(i) + B(i) * \left(\frac{P(1)}{P(2)}\right) + C(i) * \left(\frac{P(2)}{P(3)}\right)$$

Part VI

Conclusion

15 The Findings and their Policy Implications

Mercedes B. Concepción

15.1 INTRODUCTION

As the First Country Report stated, the RPFS uncovered a number of specific findings relating to fertility. The first principal finding was that the rising age at marriage, evident in earlier research, is still continuing. When women in 1978 were compared with the women enumerated 30 years earlier, the average deferment in age at marriage was around two years. At the time of the RPFS, the singulate mean age at marriage (SMAM) was 24.4 years. In general, the differentials by level of education, region of residence and place of residence have tended to narrow over time. Nevertheless, educational level was by far the most clearly related variable to age at marriage. No strong pattern could be discerned in the other differentials. Philippine marriages are highly stable and marriage is nearly universal.

The second important result was that fertility had started to fall, dropping by 2.5 per cent annually during the period 1970–7. Within marriage, the reduction started by age 25 but became marked among women in their forties. Differences in fertility behaviour stemmed from a mix of geographic, socio-economic and modernizing influences. The urban dwellers, the college educated, the Metro Manilans, those married to white collar workers, had smaller family sizes.

The third prominent conclusion was the distinct preference for smaller families manifested by respondents. The average total family size desired by women of all ages was 4.4 children. However, very little variation was evident within specific family sizes according to age or marital duration. The percentage of women wanting no more children increased significantly at each parity.

The fourth major disclosure was that although contraceptive awareness was extensive and preferences for smaller families well-defined, the use of efficient contraception at the time of the survey was modest. The level of overall use was certainly considerable. Knowledge levels were remarkable – nearly all the ever-married women had heard of at least one method. Although nine out of ten had heard of the pill and almost as many knew of the IUD, only a quarter of the wives had ever tried the pill and a mere one in 14 had had an IUD insertion.

The fifth important discovery was that the duration of breastfeeding exerted the greatest influence on the length of the pregnancy interval because of its suppressing effect on ovulation. Post-partum abstinence was of relatively short duration and, consequently, had less effect. Temporary separation of spouses seemed unrelated to the length of pregnancy intervals.

15.2 THE FINDINGS

Subsequent second-stage analyses of the RPFS as reported in the preceding chapters of this publication reinforce and sharpen the preliminary findings described above as summarized from the *First Report*.

In their assessment of Philippine cohort nuptiality trends based on census and survey data (chapter 1) Smith, Alcantara and de Guzman contend that 'the existence of a substantial upward movement in the age at marriage and of a relatively late age at marriage in recent decades is beyond dispute'. Proceeding from this base, the authors addressed the question of future nuptiality patterns by estimating the remaining experience of the cohorts encountered at different periods of their marital life at the time of each of the three surveys, 1968, 1973 and 1978. Employing the maximum likelihood estimation of the parameters of the Coale model nuptiality schedule based on the age-at-marriage distributions reported in these three surveys, the expected upward trend across cohorts, excepting the oldest cohort, was manifest in each of the surveys. The shifts in marriage timing from one age group to another were quite substantial and suggest an acceleration of the long-term trend in

Engracia, Luisa T., Corazon Mejia-Raymundo and John B. Casterline, eds (1984). *Fertility in the Philippines: Further Analysis of the Republic of the Philippines Fertility Survey 1978:* 217–222. Voorburg, Netherlands: International Statistical Institute.

the average age at marriage. The authors believe that the cohorts currently entering the married state 'will post an aggregate record of marriage delay unprecedented for the Philippines and, indeed, for any major population of South East Asia'.

de Guzman reporting on the patterns and determinants of nuptiality in the Philippines (chapter 2) found respondent's region of residence and her education to be the two outstanding predictors of nuptiality. Wife's education and occupation proved to be more powerful explanatory variables than the husband's education and occupation. Urban and rural differences disappeared once wife's and husband's education were controlled. Large and significant differentials in age at marriage by socio-economic variables were discovered within the 13 administrative regions similar to those found at national level. However, these socio-economic variables accounted for only 16 per cent of the total variance in age at marriage, implying that a considerable amount of variation in marriage age is attributable to factors other than those covered by the author.

Using the reconstructed birth histories of the women sampled in the RPFS, Morada and Alegre (chapter 3) undertook a bivariate analysis of marital fertility rates. Total marital fertility rates (TMFRs) declined over the six-year period 1970–5. Examination of the age-specific marital fertility rates revealed an increase at the younger ages toward the mid-1970s and a sharp decrease in rates after age 30. Metro Manila was the sole region where the TMFR was exceeded by the national TMFR. With the exception of the youngest age group of women, the expected rural–urban difference in the TMFR was evident, with rural women bearing more children than their urban counterparts throughout the entire childbearing period. Since the categories for husband's occupation were linked to urban–rural residence, the TMFR of farm workers' wives surpassed those of women married to non-farm workers. The inverse relationship between a woman's educational level and her fertility was apparent in the fact that women with primary schooling or less reported the highest TMFR and those who had at least a high school diploma, the lowest, beginning at age 25. The Tagalogs displayed the lowest TMFR followed by the Ilocanas. At the other extreme, Hilonggas stood out with the highest fertility trailed by the Cebuanas.

Raymundo (chapter 4) decomposed the change in the total fertility rate (TFR) between 1970 and 1975 according to change in marital status and education, on the one hand, and to changes in age-specific fertility cross-classified by marital status and education, on the other. The results confirmed the contribution of age-specific fertility changes within marital categories as the primary source of fertility reduction during this period. Only 7 per cent of such changes were due to changes in educational composition within marital categories. But nearly two-thirds of the nuptiality effect was explained by changes in educational distribution. When the proportions of the decline attributable to various age groups were calculated, the absolute contribution of nuptiality (indicated by changes in the fertility of women below 25) to the decrease in TFR stayed the same from the late 1960s to the early 1970s. An impressive proportion of the decline in TFR between 1970 and 1975 was traced to women in the peak childbearing groups, 25–34 years of age. It remains true that age at marriage is still the strongest determinant of cumulative fertility, outweighing education as a predictor of completed family size.

The childbearing process was examined by Cabigon (chapter 5) as a sequence of events starting from entry into marriage up to the last order birth using life-table techniques. The basic measure used in the investigation was the 'birth function' defined as the cumulative proportion of women closing an interval by duration in months of the interval. The analysis provides support to the contention that Philippine fertility decline was initiated in the 1970s. The data suggest that a change in the reproductive behaviour of women in the peak childbearing period may have occurred. First birth intervals were found to be shorter than all others. There are indications that those contracting marriage late tend to have shorter birth intervals than those who enter marriage at an early age. The relatively few pre-marital conceptions imply that date of cohabitation may be used to indicate the start of the woman's exposure to the risk of conception. The study demonstrates the need to control for age at the start of the interval, calendar period, parity, and cohort in any attempt to inquire into the spacing of births.

Morada and Alegre (chapter 6) attempted to show how childbearing attitudes (desired number of children, additional number of children wanted and desire for the last pregnancy) are affected by demographic, socio-economic and cultural conditions. Responses to the desired family size question showed evidence of rationalization. Yet, the actual exceeded the desired family size after the fourth living child. No trend emerged in the

number desired across age cohorts once the number of living children was taken into account. The actual number equalled that desired at about 15 years of marital duration. The effects of child mortality on family size desires was evident at low parities but disappeared for those with seven or more living children. The number of children desired varied inversely with educational attainment. In the multiple regression analysis of these childbearing attitudes, the number of living children turned out to be the strongest predictor of all three attitude indicators. Births in the past five years proved to be a strong predictor of family size preference and of the number of the additional children wanted. The number of child deaths was also strongly and positively related to number of children desired and to whether or not the last pregnancy was wanted. Among the factors included in the model, respondent's education and work experience did not seem to affect their fertility preferences, due perhaps to the broad categories utilized for these two variables. Once contraceptive use was controlled both place of residence and ethnicity became strong predictors of family size preference. The latter had also a significant effect on the number of additional children wanted.

Results of the analysis undertaken by Cabigon and Hufana (chapter 7) on the determinants of age at first birth revealed that wife's educational attainment acts strongly to defer first births. The effect of education was slightly mediated by wife's occupation before marriage. The latter proved to be a strong factor in delaying first births, with white collar workers tending to defer their first births by two years, on the average. Wife's schooling exerted a greater impact on the timing of the next birth than did husband's education. Education also mediated the effects of both childhood residence and ethnicity. But once age at marriage was entered into the model, all effects of wife's social origin acted through this variable.

Supplementing the aforementioned study, Cabigon (chapter 8) extended the analysis to birth intervals beyond the first. The role of intermediate variables in mediating the effects of socio-economic–cultural and background origins on the timing of the next birth was examined. Educational effects on the length of the birth interval were found to be stronger than the social origin effects. As in the preceding study, age at marriage weakened all other effects save that of women's economic activity within the first interval. At higher intervals the effect of labour force participation within the interval significantly lengthened selected intervals only. Thus, this finding underscores the point made by Engracia and Herrin (chapter 11) that the factors influencing the work-fertility linkages vary with the life circumstances of the woman, her family and the labour market. By way of contrast, the death at infancy of the birth initiating the interval shortened the length of any given interval substantially and significantly. Finally, breastfeeding and contraceptive practice within the interval delayed significantly the occurrence of subsequent births.

One of the intermediate variables influencing conception is marital dissolution. The disruption of marriage shortens the time of exposure to pregnancy risk. In this connection, de Guzman (chapter 9) found that less than one in 13 Philippine marriages were dissolved either through death or separation of the spouses. After controlling for age and marital duration, widows were found to have given birth to one child less, on the average, than women whose marriages were intact. Women separated from their husbands differed from widows by half a child less. When exposure time within marriage was held constant, the parity of widows and of those separated from their spouses were reduced by 0.2 and 0.75 children, respectively, indicating the significant effects on fertility of non-exposure to pregnancy risk arising from marital dissolution.

Research on the influence of infant and child mortality on fertility shows that the effects may by felt in one of four ways: (1) physiological; (2) replacement; (3) insurance; and (4) societal. Investigating the first two effects, de Guzman (chapter 10) used measures of subsequent fertility as a function of prior mortality. He found the physiological effect to be substantial – the death of a previous live birth shortened the birth interval by some three to four months, on the average. Starting from any parity, more subsequent births were observed when loss of a child had been experienced up to such parity. When age and exposure as well as other variables were considered, the occurrence of two child deaths implied at least half a birth more, subsequently. The study disclosed that women who had suffered the loss of a child were more prone to delay the first use of contraception, more apt to report lower current use and were less likely to resort to efficient methods. In brief, the physiological effect of child mortality was powerful, that of replacement weaker and less evident.

The labour force participation and fertility of Filipino married women was examined by

Engracia and Herrin (chapter 11) from the viewpoint that the work-fertility relationship runs both ways while at the same time being specified by a common set of determinants. The analysis distinguished between two time dimensions of work participation and fertility, viz. cumulative and current. To allow for simultaneity of the work-fertility relationship a multiple regression analysis using two-stage least squares was employed. In the first time dimension, the fertility measure employed was children ever born (CEB) and the indicator of work was ever work during marriage. The coefficient of ever worked on CEB turned out to be negative and significant; that of CEB on work participitation positive and significant. The negative effect of work on fertility was clearly shown among older women, those residing in rural areas and among wives of white collar workers. The case where parity increased the probability of a wife working was marked only among urban (outside Metro Manila) women and among wives of agricultural or manual workers. The first result was taken to mean that economic activity within marriage decreases the total CEB while the second was viewed as an effect of income inadequacy where additional income is required to support additional births, hence women tend to work more. In the second time dimension, the relationship between current fertility as measured by the presence of pre-school children and that of current work was analysed. Here, current work participation significantly increased the number of children born in the five years preceding the survey while current fertility markedly reduced the probability of female labour force participation in the current period. Work participation significantly increased fertility only in the case of younger, low parity and rural women. The presence of a pre-school child in the household reduced significantly the economic activity of all women except the young, non-rural residents and wives of manual workers. The first relationship is interpreted as a positive effect of additional income which allows the woman to afford more children in the current period. The second is seen as the effect of conflicts in time stemming from child care needs. The analysis suggests that in the short run the need to care for infants and pre-school children limits work participation. In the long run, the large family predisposes women to become economically active to supplement family income.

Delving into the factors affecting use and non-use of contraception, Cabigon (chapter 12) found that never users were mainly young, rural-based, of low education, and reporting less than four children. Those who had stopped contraceptive use at the time of survey (mostly because of side effects and accidental pregnancy) were generally in their late twenties, also rural-based, with some years of schooling and had given birth to four or more children. The only difference between stoppers and current users was that the latter were in their late thirties. Cabigon disclosed that the RPFS continuation rates were severely biased in an upward direction. Current users and stoppers were more likely to cite a doctor, clinic or hospital as a source of family planning knowledge than the never users, who obtained their information from friends, relatives or spouses. Contraceptive use tended to be high if the source of knowledge was a doctor, clinic or hospital, otherwise it was likely to be low. When other variables were taken into account, the relationship between distance to supply source and current use was very weak although in the expected negative direction. In analysing each method separately, the perceived distance effect on current use was most evident for condom users. Furthermore, the relationships between perceived distance or cost and use of methods often went in the 'wrong' direction, thus indicating the importance of motivation as a spur to utilization.

Following a review of the national planning programme efforts in the 1970s, Engracia, Mortel and Nartatez (chapter 13) undertook a multivariate analysis of current contraceptive use and recent fertility with the aim of comparing the effects of the family planning programme efforts with that of development. Using the indicators obtained from the community module which was only applied to rural barangays, contraceptive prevalence was found to be affected by accessibility of family planning services in the expected direction. However, the development effects proved to be stronger. Fertility in the five years before the survey exhibited the minimal effect of family planning service accessibility. On the other hand, socio-economic development variables were dominant.

The estimates of infant and child mortality obtained by direct and indirect techniques as reported by Esclamad, de Guzman and Engracia (chapter 14) revealed higher estimates for the indirect techniques. In tracing the trend in infant mortality, the authors found that infant mortality rates (IMR) had dropped by nearly 40 per cent from the mid-1950s to 1975. The IMR was higher in rural areas, in the Visayas and Mindanao areas, among the least educated, and among Muslims.

The differences by work status were unclear with women who never worked as well as those currently working manifesting high IMR levels. The results suggest that the IMR is associated with the provision of health services, social status and the type of infant care provided.

15.3 IMPLICATIONS FOR POLICY

The identification of the determinants of nuptiality, fertility and contraceptive use gains importance in the quest for interventions in a woman's life cycle and in the range of options which may be open to her during her reproductive lifetime. If the nation's objective of reducing population growth rates through modifications in the fertility level is to be realized, the particular strategies to be followed, the subgroups of women to be reached, the timing and the manner of such strategies must be defined.

But before doing so, it would be useful to identify the particular stages in the woman's life cycle where interventions might prove most effective or where the woman might be persuaded to modify her reproductive behaviour. Furthermore, it would be critical to offer significant choices and options inviting enough to induce women to curtail childbearing.

The findings described in the preceding section point to the single and those 25—34 years of age as the two groups of women that have to be reached to delay their entry into marriage and influence their childbearing performance.

Reaching these two target groups of women at the appropriate time means investment in approaches leading to deferment of marriage. In some instances in the past, projects relating to vocational training and income generation have been implemented with the expectation that such means will provide sufficient stimulus to women to postpone marriage and permit other options for those married to limit the number of their children. The nuptiality analyses undertaken on the RPFS demonstrated that a relatively late age at marriage is concomitant with expanding roles for women which have been made possible through higher education and through increased economic opportunities. Where broad social change is lacking, results of the type described by Cabigon of shortened birth intervals and 'making up' for late entry into marriage are to be expected.

To be meaningful, programmes aimed at delaying age at marriage should not be centred only on the unmarried. Social development planning and programming should also be directed to the married so that their social and economic options may be expanded and sufficient incentives to reduce their family size provided.

The married women of peak reproductive ages, 25—34 years, are prime targets for fertility reduction campaigns. The findings enumerated above highlight the fact that such women have given birth to three to four children, have resorted to contraception at some time and would prefer to have just the number of children they already have. Offering these women proper incentives for curtailing family size may prove particularly attractive at their stage in life.

The Philippine family planning programme delivers contraceptives and imparts information to women on how they can limit or space births. However, the programme has fallen short of providing women with viable and concrete justification for curtailing or postponing the childbearing process. This may explain the 'KAP-gap' and the increasing number of women who report that the last pregnancy was unwanted.

Policy-makers should bear in mind that the change to the wife and mother role does not necessarily mean that women have no other choice but to keep on producing babies. As the women pass through their reproductive life the potential exists for them to revise their plans for the future in accord with changing circumstances and opportunities. If attractive alternatives to motherhood are offered, the women may be persuaded to revise their fertility intentions downward. And the peak reproductive ages are the ages when these women are most vulnerable.

Making women aware of the possible options open to them is insufficient. Policy-makers should make realistic alternatives available to all women and offer appropriate inducements to render such alternatives attractive enough for women to forsake motherhood for a time.

Not all the factors determining entry into marriage and childbearing have been identified in the studies comprising the secondary analyses of RPFS data. It has been seen that the need for additional income, the woman's and her family's circumstances, the employment market, all influence the causal chains linking a woman's fertility and her participation in the work force. Comprehensive policies should be designed to improve educational and employment opportunities for women in urban and rural areas, for the more advantaged as well as the less advantaged social groups. Policies

aimed at maximizing not only enrolment but also attendance rates among female students should be promulgated. This would entail exploring and addressing some of the factors hindering female school attendance. Furthermore, educational policies covering those out-of-school should be directed to women who have not had the advantages of formal schooling, to provide them with training for marketable occupational skills so that they can have stable sources of income.

From the policy perspective, it is important to know whether higher education causes fertility to decline or is merely an observed characteristic of social groups who tend to have reduced fertility. If the latter be the case, increasing educational outlays will not necessarily decrease fertility because the increased expenditures will not automatically change individuals' socio-economic status. Thus, raising educational attainment may be insufficient in itself to curb rapid population growth.

Practical policies are required to stimulate productive activities involving women in order to maximize their work opportunities. Programmes like the *Kilusang Kabuhayan at Kaunlaran* (the national livelihood programme) which provide chances for improvements in income can complement policies in the formal sector. Some examples of projects initiated under this livelihood programme are small-scale manufacturing of garments, poultry raising and hog fattening, fruit and vegetable processing, aquaculture, and manufacture of forestry-related products.

The production efforts of viable small-scale enterprises involving women may be facilitated by the provision of credit accompanied by appropriate technical assistance and by training courses in marketable skills. Initiatives outside the farm for rural women to increase their productivity and income may be expanded through investment in small-scale public and private labour intensive production systems and through the promotion of small-scale diversified rural activities to enhance self-employment opportunities for women.

As society modernizes, the opportunity costs of children as well as direct maintenance costs to their parents increase. Expanding women's employment prospects in the modern sector and enhancing women's educational levels can lead to a rise in the opportunity costs of offspring to couples. However, policy-makers must be cautious in designing measures increasing the direct costs of children to parents since any advantages gained in reducing fertility through these means will be outweighed by the harmful effects of such measures on the quality of life of the poor.

Progress in women's education has played a major role in infant and child mortality declines. As found in the RPFS, the IMR varied inversely with the extent and distribution of health and educational services, social status and type of infant care. Thus, improved health service delivery, while serving as a strategy for the attainment of other development goals, can at the same time be considered as a vehicle for the reduction of infant and child mortality.

Finally, there is increasing evidence that strong family planning programmes in developing countries have contributed substantially to fertility declines. The RPFS has revealed the need to improve the availability of medical personnel as credible channels and purveyors of information, expand the number of contraceptive supply outlets, and provide easy access to family planning supply sources. Through these and other service delivery aspects, the programme can expect increased contraceptive acceptance and utilization.