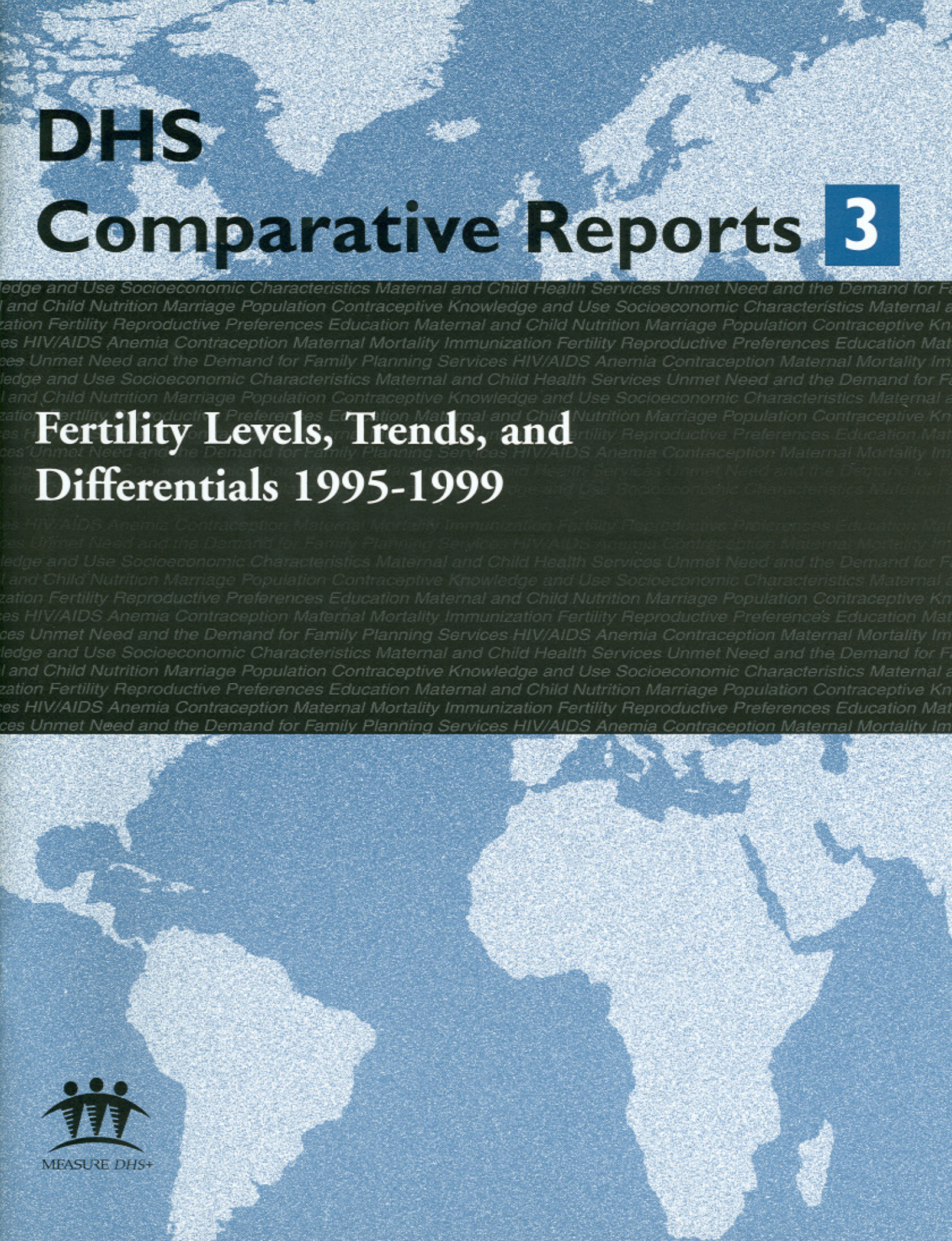
DHS Comparative Reports 3

Fertility Levels, Trends, and Differentials 1995-1999



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Fertility Levels, Trends, and Differentials 1995-1999

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Preface

One of the most significant contributions of the MEASURE *DHS+* program is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries. The *DHS Comparative Reports* series examines these data across countries in a comparative framework. The *DHS Analytical Studies* series focuses on specific topics. The principal objectives of both series are to provide information for policy formulation at the international level and to examine individual country results in an international context. Whereas *Comparative Reports* are primarily descriptive, *Analytical Studies* take a more analytical approach.

The *Comparative Reports* series covers a variable number of countries, depending on the availability of data sets. Where possible, data from previous DHS surveys are used to evaluate trends over time. Each report provides detailed tables and graphs organized by region. Survey-related issues such as questionnaire comparability, survey procedures, data quality, and methodological approaches are addressed as needed.

The topics covered in *Comparative Reports* are selected by MEASURE *DHS+* staff in conjunction with the MEASURE *DHS+* Scientific Advisory Committee and USAID. Some reports are updates and expansions of reports published previously.

It is anticipated that the availability of comparable information for a large number of developing countries will enhance the understanding of important issues in the fields of international population and health by analysts and policymakers.

Martin Vaessen
Project Director

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Executive Summary

Fertility continues to fall around the world. Based on DHS surveys conducted between 1990 and 1999, this report shows fertility rates, trends, and differentials for 43 countries. Eight types of measures are presented including total and age-specific fertility rates, general and crude birth rates, the mean number of children born to women, total marital fertility rates and marital duration-specific fertility rates, age at first birth, parity progression ratios, and birth intervals. These indicators are presented for the total country and by women's residence, education, work status, and migration status, and by the education and occupation of their husband. Trends are examined for all countries using birth history data and for 22 countries by comparison with a previous DHS survey in each country. The Bongaarts proximate determinants indexes are calculated to assess the impact of these trends on fertility.

The total fertility rate (TFR) for the three years preceding the survey in each country ranges from a high of 7.2 children per woman in Niger to 2.3 children per woman in Vietnam. Ten countries, Yemen and nine countries in sub-Saharan Africa, have TFRs of 6 children or more per woman. The high fertility in these countries is due mainly to early entry into motherhood and little behavior aimed at limiting births. Birth intervals for these countries are not long; however, short birth intervals do not account for the high fertility levels. Likewise, contraception has little impact on fertility in these countries. Although relatively few in number, women with secondary education in these countries have substantially lower fertility levels, with an average of 3.7 births per woman for the ten countries.

Seven countries in the regions surveyed report TFRs below 3 children per woman. Fertility limiting behavior including relatively high levels of contraceptive use and long intervals between births, is responsible for most of the low fertility levels in these countries. Delayed entry into motherhood contributes to reduced fertility levels in four of the countries. Although information on induced abortion is available for three of the countries in this group, it plays a very small role in the level of fertility.

There are substantial differences in fertility levels by socioeconomic characteristics. In all countries, fertility is higher in rural than in urban areas. In all but a few countries outside of sub-Saharan Africa, urban fertility rates are less than 3 children per woman. Fertility is lowest for women born in urban areas.

By education, women with at least a secondary education have the lowest fertility levels. The largest differences by education are found in the Latin America/Caribbean region, with an average difference between women with no schooling and women with secondary or more schooling of 3.1 children. Husband's education has a mixed effect on fertility. A curvilinear relationship exists in about half of the sub-Saharan countries where fertility is higher for women whose husbands have primary education than for those whose husbands have either no education or secondary or higher education.

Women's work status is important for lowering marital fertility in all but six countries; in these it makes no substantial difference. In all but two countries, women whose husbands work in agriculture have the highest marital fertility rates. In all but five countries, fertility is most depressed among women whose husbands have professional or clerical occupations.

Fertility has declined in all countries except Colombia. The average decline per year for the 22 countries with more than one survey was 1.3 percent. Declines of one or more births over a period of four years occurred most commonly in sub-Saharan Africa, where more than half of the surveyed countries had a decline of 20 percent or more. A word of caution is needed here because the decline may have been exaggerated as a result of omission or displacement of births. For example, the direct calculated current TFR for India based on women's reports is estimated to be 0.5 children too low because of the omission of recent births.

1 Introduction

Many studies indicate that the effects of socioeconomic and cultural factors on fertility vary from one region to another. Moreover, the existence of substantial variations in fertility behavior across socioeconomic categories—place of residence, level of education, and occupation—is a pervasive finding of social demography (Cleland, 1985; Freedman and Blanc, 1992; Rodriguez and Aravena, 1991; Singh and Casterline, 1985; United Nations, 1987). A pervasive decline in fertility in less developed countries is occurring in all regions of the world. This decline is a result of decreasing desire for large families due to improved infant and child mortality, increasing modernization, and the increased ease of controlling fertility (Rutstein, 1998). Confirming the scenario of fertility decline by Rutstein (1998), the economic crises of the 1980s have spurred changes in fertility even in the most resistant region, sub-Saharan Africa (Capo-chichi and Juarez, 2001; Eloundou-Enyegue et al., 2000). Declines in fertility have lead to reduced gender inequality and greater female empowerment (Dyson, 2001; Sanderson, 2001).

The objectives of this study are to examine current fertility levels, assess fertility trends, and analyze socioeconomic differentials in fertility in developing countries of sub-Saharan Africa, Asia, the Near East and North Africa, and Latin America and the Caribbean. The study provides an update to previous comparative studies on fertility based on data from Demographic and Health Surveys (DHS) (Arnold and Blanc, 1990; Muhuri et al., 1994; Mboup and Saha, 1998).

The report includes data from 43 countries in which DHS surveys were conducted between 1995 and 1999 in the third and fourth phases of the DHS program. Several measures of fertility are presented according to women's residence, migration status, level of education, current work status, and husband's education and occupation. The report examines trends in fertility for all 43 countries, using birth history data. In addition, for the 22 countries for which data are available from at least two DHS surveys, the study examines fertility trends. The study also examines age at first birth, parity progression ratios, and information on the length of birth intervals to evaluate changes in the onset of reproduction, spacing of births, and termination of childbearing. Finally, the study uses the Bongaarts proximate determinants framework to assess the levels of fertility inhibition due to later marriage and cohabitation, lactational amenorrhea and postpartum abstinence, and contraception.

2 Data and Definitions

The data analyzed here come from 43 countries in which DHS surveys were conducted (Table 2.1). Twenty-two of these countries are in sub-Saharan Africa, four countries are in the Near East/North Africa, nine countries are in Asia, and eight countries are in Latin America/Caribbean.

2.1 Fertility Data

The fertility rates presented in this report are based on data collected in the reproduction section of the DHS questionnaire. In this section, each woman was first asked about the number of sons and daughters living with her, the number living elsewhere, and the number who had died. Next, her complete birth history was collected, including the child's sex, date of birth, and survival status.

The quality of DHS data on fertility has been evaluated for surveys between 1986 and 1989 by Arnold (1990) and between 1990 and 1993 by Gage (1995). A comparison of changes in accuracy between repeat surveys is given in Marckwardt and Rutstein (1996). There are two principal problems with data for the calculation of fertility rates: misreporting of date of birth and omission of children.

Transference

A number of surveys have shown evidence of some misreporting resulting in a transfer of birth dates across the boundary for inclusion of children in questions on maternal and child health. In most surveys where this transfer has occurred, the maternal and child health section was applied to children under age five. In these surveys, the transfer results in an apparent dearth of children born four years before survey and an apparent excess of children born five and six years before the survey. Given that the current fertility rates are calculated over the period up to two years before the survey, they will be unaffected by misreporting date of birth in these surveys.

It is believed that some interviewers misreport the date of birth of children in order to avoid asking the questions in the maternal and child health section. An effort was made in the design of the DHS Phase III model questionnaire to lighten the interviewer's burden by restricting the maternal and health survey questions to only children born in the three years before the survey. This change meant that when the maternal and child health section was used, the questions would usually be applied to one child rather than to the two to three children previously eligible. Not all DHS Phase III surveys followed the model in this regard; many continued to use eligibility for children born in the five preceding years, and a few used the four preceding years.

An evaluation by Rutstein (1999) of the effect on transfer of births by this change in the eligibility criterion found that in some surveys, transference of birth dates across this new boundary still occurred. In the case of countries that used the new boundary, current fertility rates could be biased downward by transfer of age at birth. This bias can be corrected by adjusting the period on which the fertility rates are based to include the years showing an excess of births.

Omission

Omission of children is a much more serious problem for the estimation of fertility rates than transference is because there is no easy correction. Omission of children has been thought to occur more frequently for births that took place long before the survey, especially for children who died at a very young age. Although there is evidence that omission of nonsurviving children does occur in some surveys (especially for children who died in the neonatal period), this has only a moderate effect on current

Table 2.1 DHS surveys included in this report, Demographic and Health Surveys, 1986-1999

Region and country	DHS-I	DHS-II	DHS-III	Second DHS-III or DHS-IV
Sub-Saharan Africa				
Benin			1996	
Burkina Faso		1993	1999	
Cameroon		1991	1998	
Central African Republic			1994-1995	
Comoros			1996	
Côte d'Ivoire			1994	
Eritrea			1995	
Ghana	1988		1993	1998
Guinea				1999
Kenya	1989	1993	1998	
Madagascar		1992	1997	
Mali	1987		1996	
Mozambique			1997	
Niger		1992	1998	
Senegal	1986	1993	1997	
South Africa			1998	
Tanzania		1992	1996	1999
Tchad			1997	
Togo	1988		1998	
Uganda			1995	
Zambia		1992	1996	
Zimbabwe	1988-1989		1994	1999
Near East/North Africa				
Egypt		1992	1995	1997
Jordan		1990	1997	
Turkey		1993	1998	
Yemen			1997	
Asia				
Bangladesh			1994	1997
India		1992-1993	1998-1999	
Indonesia	1987	1991	1994	1997
Kazakhstan			1995	1999
Kyrgyz Republic			1997	
Nepal			1996	
Philippines		1993	1998	
Uzbekistan			1996	
Vietnam			1997	
Latin America/Caribbean				
Bolivia	1989		1993-1994	1998
Brazil	1986	1991[a]	1996	
Colombia	1986	1990	1995	
Dominican Republic	1986	1991	1996	
Guatemala	1987		1995	1999
Haiti			1994	
Nicaragua			1997	
Peru	1986	1991-1992	1996	

[a] Northeast region only

DHS-I: Demographic and Health Surveys, Phase I

DHS-II: Demographic and Health Surveys, Phase II

DHS-III: Demographic and Health Surveys, Phase III

DHS-IV: Demographic and Health Surveys, MEASURE *DHS*+

fertility rates.[1] Of greater importance is omission of recently born living children. This omission is common in many censuses and surveys without a birth history. The evaluations of the quality of DHS surveys have shown that surveys with birth histories may also be subject to omission of recent births. Although the interviewer may be partly responsible for this omission, respondents may also be reluctant to disclose the presence of young children in order to protect them.

2.2 Fertility Measures

Eight measures of fertility are presented because no single measure is ideal for all purposes:

1. The total fertility rate (TFR) and its component age-specific fertility rates (ASFRs)
2. The general fertility rate (GFR)
3. The crude birth rate (CBR)
4. The mean number of children ever born (mean CEB) for women age 40-49
5. The total marital fertility rate (TMFR) and its component duration-specific marital fertility rates (DSMFRs)
6. The median age at first birth (MAFB)
7. The parity progression ratios (PPRs)
8. The birth intervals (BIs).

Each measure has different strengths and weaknesses. The level of fertility is given by the total fertility rate, the general fertility rate, the crude birth rate, and the total marital fertility rate. The pattern of fertility is given by the age-and duration-specific fertility rates, the median age at first birth, the parity progression ratios, and the length of birth intervals.

The total fertility rate is a widely used measure that adjusts for differences due to age distributions. However, its relative sampling error is large when some age groups include only a small number of women. The advantage of the general fertility rate is that its relative sampling error is smaller than that of the TFR, but it is not age standardized. Both the TFR and GFR are synthetic cohort measures representing the current situation. In contrast, the third measure—the mean number of children ever born to women age 40-49—represents the childbearing experience of a real age cohort and reflects mainly past fertility behavior. The median age at first birth, mean birth intervals, and parity progression ratios are used to evaluate changes in fertility in terms of the onset of reproduction, spacing of births, and termination of childbearing, respectively. Although over time the TFR can provide information on change in the average number of children per woman, it cannot give insight into the nature of this change, which is provided by period parity progression ratios, that measure the proportion of women moving from one parity to the next.

[1] As an example, suppose that instead of the measured neonatal mortality rate of 50 neonatal deaths per 1,000 births, the real rate was 100 per 1,000. If the measured total fertility rate were 4.0, then the real fertility rate including the omitted births would be 4.2, an increase of 5 percent.

Age-specific fertility rates are calculated from birth histories by dividing the number of births to women in a specific age group, during a specific period, by the number of woman-years of exposure during the same period.[2] The formula used is

$$ASFR(a,t) = b(a,t) / e(a,t),$$

where a is five-year age group, $b(a,t)$ is births to women in age group a during period t (here three years before the survey), and $e(a,t)$ is woman-years of exposure among women in age group a during period t. In surveys that included only ever-married women—Bangladesh, Egypt, Indonesia, Jordan, Nepal, Turkey, and Yemen—the denominator of the rate is inflated to include all women, using the proportion ever-married from the household schedule.[3]

The total fertility rate at time t is calculated by summing the age-specific fertility rates for five-year- age groups and multiplying by 5. The TFR may be interpreted as the number of births that a woman would have if she survived all her reproductive years and experienced the age-specific fertility rate prevailing in a given period.

The general fertility rate is the ratio of the number of births among women age 15-44 during the three years preceding the survey to the sum of the woman-years of exposure during the same period.

Duration-specific marital fertility rates are calculated as follows:

$$DSMFR(j,t) = b(j,t) / e(j,t),$$

where j is five-year marital duration group, $b(j,t)$ is all births to women at marital duration j during period t (here the three years before the survey), and $e(j,t)$ is all woman-years of exposure among women at marital duration j during the period t. Marital duration is measured from the time of first marriage or first cohabitation. Because DHS surveys do not include a full marriage history, it is not possible to distinguish only births that occurred within marriage or cohabitation and exposure times only for married or cohabiting women. Instead, all births and all exposure since first marriage or cohabitation are taken for the numerators and denominators, respectively. (In the rest of this report, the shortened term *marriage* is used to represent both formal marriage and cohabitation.)

The total marital fertility rate represents the average number of children born in the first 24 or 29 years of marriage to a hypothetical woman experiencing the fertility rates of a specific period. The TMFR is calculated by summing the DSMFRs for five-year marital duration groups and multiplying by 5. The TMFR as used here includes all births and exposure since first marriage.

Depending on the size of the survey and the distribution of women according to background variables, fertility rates may be based on relatively small numbers of women. In this report, the discussion of fertility rates by socioeconomic variables for a three-year reference period is based on women age 15-39 and for up to 14 years of marital duration.[4] The choice of women age 15-39 instead of women 15-44 or 15-49 is because there are often few cases in some subgroups after age 39 for some socioeconomic categories (e.g., women with secondary education). Age-specific fertility rates and duration-specific marital fertility rates are in parentheses if the estimate is based on 125 to 249 unweighted woman-years of exposure in the age subgroup or marital-duration subgroup. The estimate is replaced with an asterisk

[2] The month of interview is excluded.

[3] The inflation factors are the number of ever-married women of each single age 15-49 (from the household sample) divided by the number of all women of each single age 15-49 (ever-married and never-married women). It is assumed that never-married women have had no births.

[4] Duration-specific marital fertility rates for up to 29 years are presented in Appendix A.

when there are fewer than 125 woman-years of exposure. TFRs and TMFRs are in parentheses or replaced with an asterisk if at least one of the ASFRs or DSMFRs, respectively, is based on 125 to 249 woman-years of exposure or fewer than 50 woman-years of exposure. The same guidelines apply in presenting general fertility rates, which are based on exposure in the 15-44 age group. For the mean number of children born to women age 40-49, the estimate is replaced with an asterisk if there are fewer than 25 women age 40-49. Parentheses are used if there are between 25 and 49 women who are age 40-49.

Finally, life table methodology[5] is used to estimate parity progression ratios by period (the probability of progressing to the next parity within five years of the previous birth, called the quintum) and by the length of the interval between births (tempo). The analysis of these two components of family formation is relatively simple if birth histories of women who have completed their reproductive years are examined. The ratios can be measured directly from the distribution of family size, and the length (or timing) for each birth can be calculated. The survey situation is more complicated because complete longitudinal data are not available. Except for older women, most survey respondents are not at the end of their reproductive years. Consequently, information on birth histories is incomplete, and parity progression ratios cannot be calculated directly. It is important to distinguish two problems posed by the incomplete nature of the data: selectivity and censoring (Rodriguez and Hobcraft, 1980; Ryder, 1983).

Selectivity refers to the fact that the transition from parity n to parity $n+1$ can only be calculated for women who have reached parity n or higher at the time of the survey. For example, the transition from parity 2 to parity 3 can only be analyzed for women having two or more children at the time of the survey. Such women may be selected for early marriage, may be more fecund, and may be less educated than those of the same age who have not yet reached parity 2.

Censoring refers to the fact that some women, having reached parity n at the time of the survey, are included in the analysis although they have not yet reached the next parity, $n+1$. For these women, two outcomes are possible: either they will never reach parity $n+1$ or they will reach it after an unknown interval beyond the survey date. Censoring renders the definition of PPR and BI ambiguous.

Censoring can be overcome by using life table techniques, which are designed for dealing with this kind of problem. Selectivity can be accounted for by introducing appropriate controls into the analysis and by studying the process of family formation as a function of the women's sociodemographic characteristics (Rodriguez and Hobcraft, 1980). Hence, in this study, life table methods are used to examine parity progression ratios and birth intervals.

2.2 Socioeconomic Variables

The DHS model questionnaire contains a limited number of questions about the socioeconomic characteristics of women. For most countries, information on education and urban-rural residence is available, and many surveys also collect some information on women's employment and migration status. The DHS model questionnaire includes a few questions on the socioeconomic characteristics of husbands of ever-married women, including their education and occupation (Muhuri et al., 1994).

The TFR, mean CEB, and TMFR are presented by urban-rural residence, migration status, education, women's current work status, and husband's occupation. For countries where the sample is ever-married women, however, fertility measures are not estimated for migration status and current work status because data for never-married women are not available.

[5] The trimean will be used here to estimate length of birth interval. The trimean = (Q1 + 2*Q2 + Q3) / 4, where Q1 indicates the first quartile, that is, the 25^{th} percentile; Q2 the second quartile, that is, the median; and Q3 indicates the third quartile, that is, the 75^{th} percentile.

Urban-Rural Residence

Urban residence or rural residence is not reported by the woman herself but instead is determined by the location of the sample point or cluster in which she is interviewed (which is classified as urban or rural in the sampling frame). Because most surveys were based on a de facto sample that included overnight visitors to the household, the location for visitors may be different from the type of place in which they usually live.

Migration Status

To determine migration status, a woman's childhood place of residence is compared with the place where she was interviewed. The woman is categorized as an *urban native* if both places were urban, as a *rural-to-urban migrant* if the childhood place of residence was rural and the place of the interview was urban, as an *urban-to-rural migrant* if the earlier place was urban and the later place was rural, and as a *rural native* if both places were rural.

Unlike the current place of residence, the childhood place of residence is determined by information supplied by the respondent. In the DHS questionnaire, the respondent is asked whether she spent most of the time until she was 12 years old "in the city, in a town, or in the countryside." For all countries, city and town are considered urban.

Education

The categories used for women's and husband's levels of education are *no schooling*, *primary*, and *secondary or higher*. This analysis considers only the information on level of education and does not take account of the number of years spent at this level. Here it may be noted that a given level of education does not necessarily correspond to the same number of years of education in every country because educational systems differ among countries. For example, primary school is five years in Bangladesh, Colombia, and Peru; six years in Bolivia, Egypt, Indonesia, Jordan, and Senegal; seven years in Cameroon, Kenya, Zambia, and Zimbabwe; and eight years in Brazil, the Dominican Republic, and Ghana.

Current Work Status

Women's work categories include working for cash or kind (paid worker), working on the family farm or in the family business (unpaid family worker), and not working.

Husband's Occupation

Occupations were grouped into five categories: 1) *agriculture* (whether self-employed or labor), 2) *skilled and unskilled manual labor*, 3) *sales and services*, 4) *professional and clerical positions*, and 5) *other occupations*. Fertility rates for women whose husband was in the *other occupations* category and for women whose husband has never worked are not shown because there were too few women in these groups.

3 Fertility Rates

3.1 Overall Fertility

Table 3.1 shows four summary measures of overall fertility. As noted earlier, all period rates (TFRs and GFRs) pertain to the three-year period preceding the survey. The TFR for women age 15-49 ranges from 2.3 in Vietnam to 7.2 in Niger, with substantial variation within and among regions. In sub-Saharan Africa, the TFR ranges from 2.9 in South Africa to 7.2 in Niger. Most of the countries in sub-Saharan Africa show a TFR of more than five children per woman. The fertility for the Near East/North Africa region varies greatly from 2.6 in Turkey to 6.5 in Yemen. Of the countries surveyed in Asia, only Nepal has a TFR higher than four (4.6).[6] In the Latin America/Caribbean region, the TFR ranges from 2.5 in Brazil to 5.0 in Guatemala.

Table 3.1 also presents the TFRs for women age 15-39 and 15-44. For almost all countries not in sub-Saharan Africa, the TFRs for age groups 15-39 and 15-49 are close, demonstrating that women have most of their births before they reach the age of 40, after which fertility is low. However, most sub-Saharan Africa countries have differences greater than 0.3 children between the TFRs for women 15-39 and 15-49. In this region, fertility at ages over 40 is still important.

A comparison of the cumulative measure of childbearing, children ever born (CEB), with the TFR gives a rough indication of the trend in fertility over time. Table 3.1 shows that the number of children ever born is higher than the TFR (for women 15-49) for all countries. The difference between the number of children ever born and the TFR is two or more children in four countries (Bangladesh, Comoros, Jordan, and Nicaragua). For nine countries in sub-Saharan Africa, the difference between the number of children ever born and the TFR is less than one child. The smallest difference, only 0.1 children, occurs in Eritrea.

Comparison of total marital fertility rates indicates that in the 30 years following their first marriage, women in sub-Saharan Africa gave birth to between 4.2 (Zimbabwe) and 7.7 (Niger) children, except in South Africa, where women had only 2.7 children. Marital fertility rates in Haiti, Nepal, Guatemala, Jordan, and Yemen are as high as rates for sub-Saharan countries (5.1, 5.2, 5.6, 6.1, and 7.6 children, respectively). The lowest TMFRs occurred in Kazakhstan, Brazil, South Africa, and Vietnam (2.5 to 2.8).

[6] There is considerable evidence of omission of recent births in some states in the India National Family Health Survey of 1998-1999 (Retherford et al., 2001). The current TFRs for all of India are therefore suspect. Based on calculations by the author, the extent of the underestimation is on the order of 0.5 children for the current TFR for women 15-49 years of age (TFR between 3.31 and 3.39). A paper by Retherford and Mishra (2001) estimates the TFR to be between 3.39 and 3.55.

The author has evaluated the reporting of births in all the countries included in this report using indexes measuring omission and displacement. Only Bangladesh and India indicate high levels of omission from the index values. The author estimates that 3.6 is a more likely TFR for Bangladesh than the reported 3.3 children per woman. Three countries, Kazakhstan, Uzbekistan, and Vietnam have index values indicating displacement levels that may affect the TFR. Visual examination of the births by year prior to the survey indicates that all of these countries show declining number of births well before the cut-off date for the child health section of the questionnaire. Therefore, the index values are more likely the result of year-to-year fluctuations than of true displacement. These evaluations are available from the author.

Table 3.1 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, Demographic and Health Surveys, 1995-1999

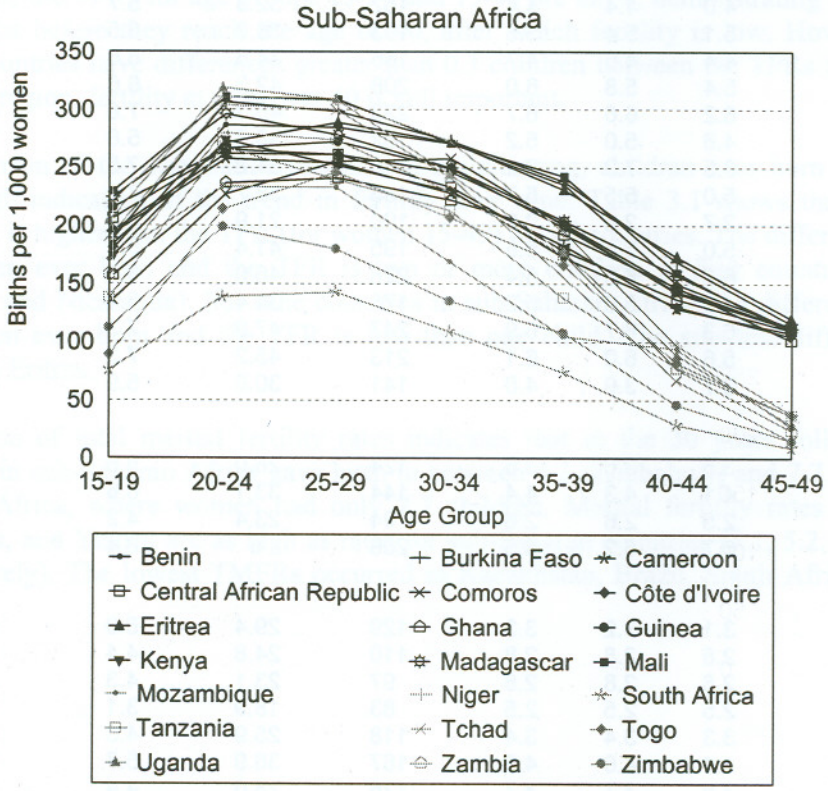
Region and Country	Total fertility rate			General fertility rate	Crude Birth Rate	Mean number of children ever born	Total marital fertility rate			
	Women 15-39	Women 15-44	Women 15-49	Women 15-44		Women 40-49	0-14 years	0-19 years	0-24 years	0-29 years
Sub-Saharan Africa										
Benin	5.4	5.8	6.0	202	40.2	7.1	4.3	5.4	6.1	6.3
Burkina Faso	5.8	6.3	6.4	215	42.5	7.4	4.3	5.4	6.2	6.6
Cameroon	4.5	4.7	4.8	170	35.2	6.2	3.7	4.6	5.1	5.3
Central African Republic	4.7	5.0	5.1	182	38.0	5.7	3.7	4.5	5.0	5.1
Comoros	4.2	4.5	4.6	147	31.2	6.7	4.4	5.2	5.7	6.0
Côte d'Ivoire	4.8	5.2	5.3	185	38.5	6.7	3.8	4.6	5.2	5.5
Eritrea	5.4	5.9	6.1	198	37.5	6.2	4.1	5.2	6.1	6.6
Ghana	4.0	4.4	4.4	152	32.3	5.7	3.4	4.1	4.6	4.7
Guinea	5.1	5.4	5.5	193	36.9	6.5	3.8	4.9	5.5	5.7
Kenya	4.4	4.6	4.7	166	34.6	6.6	3.8	4.6	5.0	5.2
Madagascar	5.4	5.8	6.0	208	42.3	6.6	4.3	5.2	5.9	6.3
Mali	6.2	6.6	6.7	233	45.1	7.6	4.5	5.7	6.6	7.0
Mozambique	4.6	5.0	5.2	182	38.7	5.8	3.6	4.4	4.9	5.2
Niger	6.5	7.0	7.2	248	51.2	7.5	4.8	6.2	7.2	7.7
Senegal	5.0	5.5	5.7	185	38.7	7.1	4.2	5.3	6.2	6.6
South Africa	2.7	2.8	2.9	100	21.9	3.7	2.1	2.5	2.7	2.7
Tanzania	5.0	5.4	5.6	195	41.4	6.7	3.9	5.0	5.5	5.8
Tchad	6.0	6.3	6.4	228	46.0	6.8	4.7	5.8	6.5	6.7
Togo	4.6	5.0	5.2	175	34.4	6.4	3.9	4.8	5.4	5.7
Uganda	6.3	6.7	6.9	247	47.9	7.3	4.8	5.9	6.7	7.1
Zambia	5.6	6.0	6.1	213	45.2	7.3	4.6	5.6	6.3	6.7
Zimbabwe	3.7	3.9	4.0	141	30.8	5.9	3.1	3.7	4.0	4.2
Near East/North Africa										
Egypt	3.5	3.6	3.6	124	28.0	5.5	3.6	4.1	4.3	4.4
Jordan	4.1	4.3	4.4	144	33.1	6.8	4.8	5.5	5.9	6.1
Turkey	2.5	2.6	2.6	94	23.4	4.2	2.7	3.0	3.1	3.1
Yemen	5.7	6.2	6.5	206	u	8.4	4.9	6.2	7.1	7.6
Asia										
Bangladesh	3.1	3.2	3.3	129	29.4	6.0	3.2	3.7	4.0	4.1
India	2.8	2.8	2.8	110	24.8	4.4	3.0	3.3	3.4	3.4
Indonesia	2.6	2.8	2.8	97	23.1	4.3	2.7	3.1	3.3	3.4
Kazakhstan	2.5	2.5	2.5	83	18.9	3.1	2.3	2.4	2.5	2.5
Kyrgyz Republic	3.3	3.4	3.4	118	25.9	4.5	2.9	3.1	3.2	3.2
Nepal	4.4	4.6	4.6	167	36.9	5.7	3.9	4.6	5.0	5.2
Philippines	3.5	3.7	3.7	126	28.0	4.4	3.6	4.1	4.4	4.5
Uzbekistan	3.3	3.3	3.3	123	26.7	4.6	3.1	3.3	3.3	3.3
Vietnam	2.3	2.3	2.3	80	19.0	3.8	2.5	2.7	2.8	2.8
Latin America/Caribbean										
Bolivia	3.9	4.2	4.2	142	30.4	5.1	3.7	4.2	4.6	4.7
Brazil	2.4	2.5	2.5	88	21.5	3.7	2.3	2.5	2.6	2.7
Colombia	2.8	3.0	3.0	107	26.4	3.8	2.7	3.0	3.1	3.2
Dominican Republic	3.1	3.2	3.2	119	27.7	4.3	3.0	3.3	3.4	3.5
Guatemala	4.7	5.0	5.0	176	38.0	5.7	4.1	4.9	5.4	5.6
Haiti	4.3	4.7	4.8	155	33.8	5.4	3.8	4.5	5.0	5.1
Nicaragua	3.4	3.6	3.6	131	29.3	5.6	3.1	3.6	3.9	4.1
Peru	3.3	3.5	3.5	121	27.4	4.9	3.1	3.6	3.9	4.1

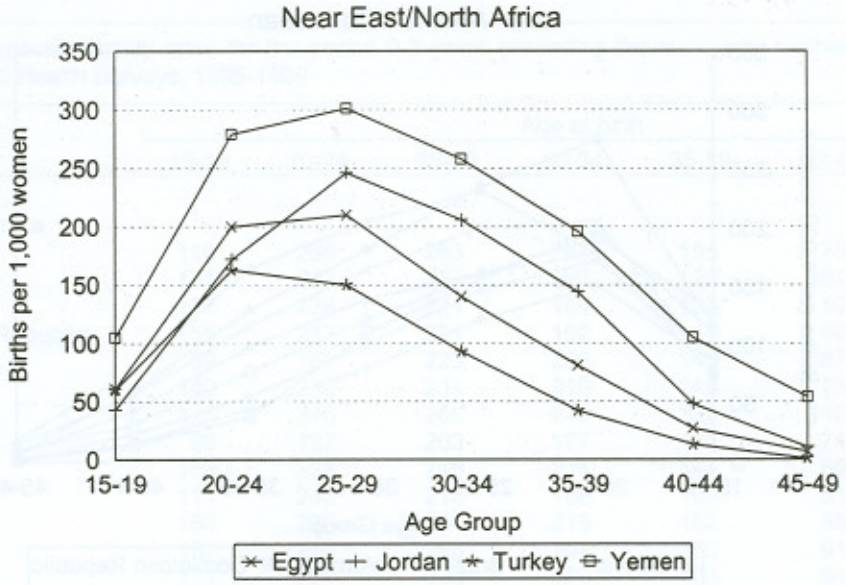
u = Unknown (not available)

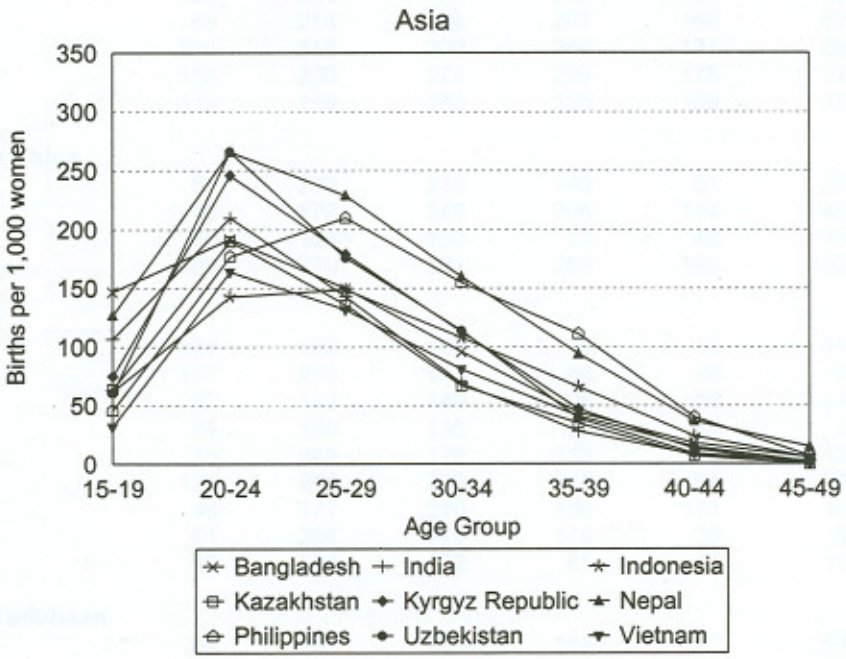
Age-Specific Fertility Rates

The age-specific fertility rates presented by region in Figure 3.1 and in Table 3.2 show that the smallest differences between countries are generally found in the oldest age groups. In the youngest age group, the fertility rate is largely affected by the age at which women marry. The age-specific fertility rate for sub-Saharan women age 15-19 ranges from 59 births per 1,000 women for Comoros, where the median age at marriage is 19, to 218 per 1,000 in Niger, where the median age at first marriage is 15. Only four of the 21 sub-Saharan countries have age-specific rates for 15-19 below 100: Comoros (59), South Africa (76), Ghana (88), and Togo (89). At the other end of the reproductive span, all countries except South Africa, Cameroon, and Zimbabwe have an ASFR for age 40-44 greater than 50.

Figure 3.1 Age-specific fertility rates for the period 0-2 years preceding the survey, women 15-49, Demographic and Health Surveys, 1995-1999




Near East/North Africa
Births per 1,000 women
350
300
250
200
150
100
50
0
15-19
20-24
25-29
30-34
35-39
40-44
45-49
Age Group
Egypt
Jordan
Turkey
Yemen


Asia
Births per 1,000 women
350
300
250
200
150
100
50
0
15-19
20-24
25-29
30-34
35-39
40-44
45-49
Age Group
Bangladesh
India
Indonesia
Kazakhstan
Kyrgyz Republic
Nepal
Philippines
Uzbekistan
Vietnam

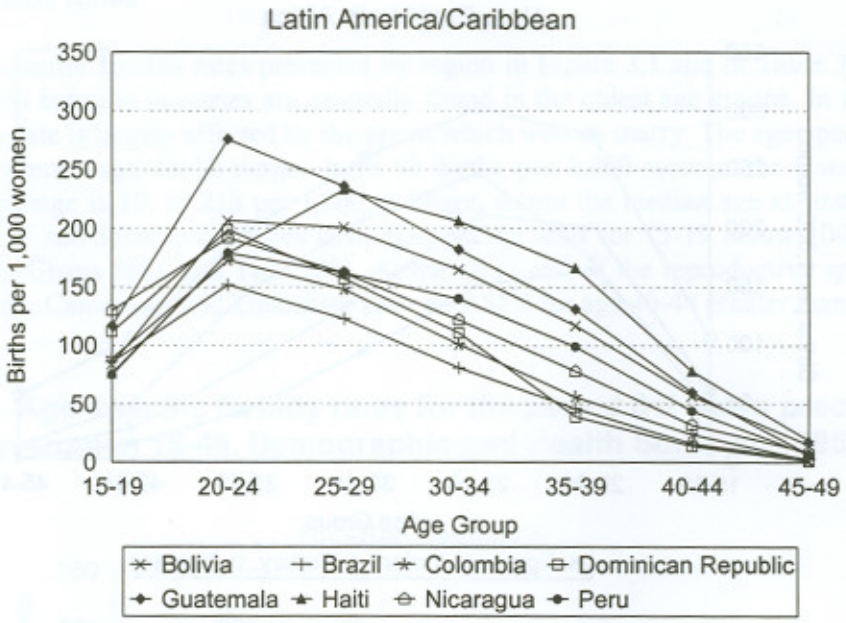

Latin America/Caribbean
Births per 1,000 women
350
300
250
200
150
100
50
0
15-19
20-24
25-29
30-34
35-39
40-44
45-49
Age Group
Bolivia
Brazil
Colombia
Dominican Republic
Guatemala
Haiti
Nicaragua
Peru

Table 3.2 Age-specific fertility rates for the period 0-2 years preceding the survey by mother's age at birth, Demographic and Health Surveys, 1995-1999

Region and country	Age at birth						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Sub-Saharan Africa							
Benin	119	266	263	244	195	78	27
Burkina Faso	131	293	282	247	199	104	31
Cameroon	137	226	221	185	123	49	20
Central African Republic	155	237	231	192	117	60	23
Comoros	59	184	223	226	147	67	25
Côte d'Ivoire	140	232	231	210	149	73	25
Eritrea	125	245	269	245	189	110	37
Ghana	88	197	203	177	136	74	11
Guinea	168	238	246	214	144	69	26
Kenya	111	248	218	188	109	51	16
Madagascar	180	279	254	215	152	88	25
Mali	187	299	296	244	205	91	21
Mozambique	171	234	233	169	105	94	27
Niger	218	311	308	273	195	97	38
Senegal	103	219	240	245	186	99	41
South Africa	76	139	143	109	74	29	9
Tanzania	138	268	240	213	138	78	37
Tchad	190	304	300	242	156	67	15
Togo	89	214	246	207	166	82	37
Uganda	204	319	309	244	177	89	29
Zambia	158	280	274	229	175	77	24
Zimbabwe	112	199	180	135	108	46	15
Near East/North Africa							
Egypt	61	200	210	140	81	27	7
Jordan	43	172	246	206	144	48	11
Turkey	60	163	150	93	42	13	1
Yemen	105	279	301	258	196	105	54
Asia							
Bangladesh	147	192	150	96	44	18	6
India	107	210	143	69	28	8	3
Indonesia	62	143	149	108	66	24	6
Kazakhstan	64	190	136	67	35	7	0
Kyrgyz Republic	75	246	179	113	47	13	0
Nepal	127	266	229	160	94	37	15
Philippines	46	177	210	155	111	40	7
Uzbekistan	61	266	176	114	39	9	3
Vietnam	32	164	132	81	41	15	2
Latin America/Caribbean							
Bolivia	84	207	201	165	117	57	15
Brazil	86	152	123	81	46	16	3
Colombia	89	173	148	101	56	24	2
Dominican Republic	112	199	157	111	39	14	1
Guatemala	117	276	236	182	131	60	7
Haiti	76	179	233	206	166	78	19
Nicaragua	130	192	162	122	78	32	9
Peru	75	179	162	140	99	44	7

Among the countries of the Near East/North Africa region, the highest level of teenage fertility is found in Yemen (105). In Asia, the highest teenage rate is 147 in Bangladesh, and the lowest is 32 in Vietnam. In the Latin America/Caribbean region, the rate ranges from 130 in Nicaragua to 75 in Peru.

Outside of sub-Saharan Africa, at ages 40-44, only Yemen has a rate above 100 (105). Three countries, all in the Latin America/Caribbean region, have a fertility rate above 40 at age 40-44: Haiti (78), Guatemala (60), and Bolivia (57). At age 45-49, only Yemen has an ASFR above 20.

3.2 Socioeconomic Differences in Fertility

It has generally been hypothesized that women who are educated, whose spouses are educated, who are working, and who are living in urban areas have lower fertility than women who are not educated, who are not working, and who are living in rural areas. Tables 3.3 and 3.4 summarize differences in fertility by residence and migration status, respectively. Tables 3.5 and 3.6 show education and work status differentials, and Table 3.7 presents marital fertility rates by husband's characteristics.

As mentioned in Section 2.2, the small number of women in some socioeconomic categories makes it difficult to estimate TFRs for women age 15-49 and age 15-44 and TMFRs for marriage durations up to 29 years and up to 24 years. Consequently, only TFRs for women age 15-39, TMFRs for marriage durations up to 14 years, and CEBs for women age 40-49 are used to study the socioeconomic differences in fertility. The restriction of the analysis to women age 15-39 is unlikely to bias the differentials because most childbearing occurs before age 40.

Urban-Rural Residence

Fertility (as measured by the TFR for age 15-39) is higher in rural areas than in urban areas in all of the surveyed countries (Table 3.3). South Africa; Egypt; Turkey, all countries of Asia; and all countries of the Latin America/Caribbean region except Guatemala, Haiti, and Bolivia have a TFR of less than three children in urban areas. Rural TFRs are particularly high—six or more children per woman—in nine of the 22 countries in sub-Saharan Africa, but only in Yemen among the other regions. The smallest difference (0.3 children) between urban and rural TFRs is found in the Central African Republic; the greatest difference is found in Bolivia and Tanzania (both 2.7 children). In sub-Saharan Africa, the greatest differences between urban and rural TFRs are found in Tanzania, Togo (both 2.6 children), Burkina Faso, and Eritrea (both 2.5 children). In Asia, the smallest difference is in Indonesia (0.5 children) and the greatest is in Nepal (1.9 children). In the Latin America/Caribbean, region the smallest difference between urban and rural TFRs is that of one child in Brazil.

Marital fertility for the 15 years following the first marriage is also higher in rural areas than in urban areas in all countries except Indonesia (where there is no difference). A similar pattern of rural-urban difference is observed for the number of children ever born to women age 40-49, except that in the Central African Republic and Mozambique, the number of children ever born in urban areas is larger than that in rural areas by 0.3 and 0.1 children, respectively.

Migration Status

First-generation migrants often retain the fertility traditions of their group of origin (Goldstein and Tirasawat, 1972). In countries where the pace of urbanization is rapid, the study of fertility differentials based solely on current place of residence may be inadequate. Moreover, data on urban-rural residence do not take account of the length of time a woman has lived in her current home. For example, a woman classified as urban may have lived in an urban area for only a short time before she was interviewed.

Table 3.3 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, by urban-rural residence, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (Women 15-39)		Total marital fertility rate (0-14 years)		Mean number of children ever born (Women 40-49)	
	Urban	Rural	Urban	Rural	Urban	Rural
Sub-Saharan Africa						
Benin	4.4	6.1	3.8	4.6	6.5	7.5
Burkina Faso	3.7	6.2	3.3	4.4	6.3	7.6
Cameroon	3.5	5.0	3.1	4.0	5.7	6.4
Central African Republic	4.5	4.8	3.6	3.7	5.9	5.6
Comoros	3.4	4.5	(4.0)	4.5	6.3	6.9
Côte d'Ivoire	3.9	5.5	3.3	4.0	6.1	7.0
Eritrea	3.7	6.2	3.6	4.3	5.4	6.6
Ghana	3.5	5.3	3.2	4.1	5.3	6.5
Guinea	4.1	5.5	3.3	4.1	6.2	6.6
Kenya	3.0	4.8	3.0	4.1	4.6	7.0
Madagascar	3.9	6.0	3.5	4.6	5.3	7.2
Mali	5.0	6.7	4.1	4.7	7.1	7.8
Mozambique	4.3	4.7	3.5	3.7	5.9	5.8
Niger	5.2	6.9	4.6	4.9	7.2	7.6
Senegal	3.9	5.9	3.8	4.5	6.5	7.5
South Africa	2.2	3.6	1.7	2.8	3.2	4.7
Tanzania	3.1	5.8	2.7	4.3	5.3	7.1
Tchad	5.6	6.1	4.6	4.7	6.4	6.9
Togo	3.0	5.6	2.9	4.4	5.2	7.0
Uganda	4.5	6.6	4.0	4.9	6.4	7.4
Zambia	4.8	6.2	4.2	4.8	7.1	7.5
Zimbabwe	3.0	4.4	2.8	3.7	4.7	6.8
Near East/North Africa						
Egypt	2.9	4.0	3.1	4.0	4.7	6.5
Jordan	3.9	4.6	4.7	5.4	6.5	8.3
Turkey	2.3	3.0	2.5	3.3	3.8	5.0
Yemen	4.7	6.1	4.7	5.0	7.8	8.5
Asia						
Bangladesh	2.0	3.3	2.5	3.3	4.6	6.1
India	2.2	3.0	2.6	3.1	3.8	4.7
Indonesia	2.3	2.8	2.7	2.7	4.0	4.5
Kazakhstan	2.0	3.0	1.9	2.8	2.5	4.4
Kyrgyz Republic	2.3	3.8	2.1	3.3	3.1	5.3
Nepal	2.7	4.6	3.1	4.0	4.6	5.8
Philippines	2.8	4.4	3.3	4.1	3.7	5.3
Uzbekistan	2.7	3.6	2.5	3.4	3.6	5.5
Vietnam	1.5	2.4	1.9	2.7	2.7	4.2
Latin America/Caribbean						
Bolivia	3.1	5.8	3.2	4.7	4.3	6.5
Brazil	2.3	3.3	2.2	2.8	3.3	5.2
Colombia	2.5	4.0	2.4	3.5	3.3	5.1
Dominican Republic	2.7	3.9	2.7	3.6	3.8	5.4
Guatemala	3.9	5.4	3.6	4.5	4.8	6.4
Haiti	3.1	5.2	3.0	4.5	4.0	6.1
Nicaragua	2.8	4.6	2.7	3.8	4.8	7.0
Peru	2.6	5.1	2.7	4.2	4.1	6.8

Note: Rates in parentheses are based on 125 to 249 unweighted woman-years of exposure and are subject to increased sampling variation.

Table 3.3 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, by urban-rural residence, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (Women 15-39)		Total marital fertility rate (0-14 years)		Mean number of children ever born (Women 40-49)	
	Urban	Rural	Urban	Rural	Urban	Rural
Sub-Saharan Africa						
Benin	4.4	6.1	3.8	4.6	6.5	7.5
Burkina Faso	3.7	6.2	3.3	4.4	6.3	7.6
Cameroon	3.5	5.0	3.1	4.0	5.7	6.4
Central African Republic	4.5	4.8	3.6	3.7	5.9	5.6
Comoros	3.4	4.5	(4.0)	4.5	6.3	6.9
Côte d'Ivoire	3.9	5.5	3.3	4.0	6.1	7.0
Eritrea	3.7	6.2	3.6	4.3	5.4	6.6
Ghana	3.5	5.3	3.2	4.1	5.3	6.5
Guinea	4.1	5.5	3.3	4.1	6.2	6.6
Kenya	3.0	4.8	3.0	4.1	4.6	7.0
Madagascar	3.9	6.0	3.5	4.6	5.3	7.2
Mali	5.0	6.7	4.1	4.7	7.1	7.8
Mozambique	4.3	4.7	3.5	3.7	5.9	5.8
Niger	5.2	6.9	4.6	4.9	7.2	7.6
Senegal	3.9	5.9	3.8	4.5	6.5	7.5
South Africa	2.2	3.6	1.7	2.8	3.2	4.7
Tanzania	3.1	5.8	2.7	4.3	5.3	7.1
Tchad	5.6	6.1	4.6	4.7	6.4	6.9
Togo	3.0	5.6	2.9	4.4	5.2	7.0
Uganda	4.5	6.6	4.0	4.9	6.4	7.4
Zambia	4.8	6.2	4.2	4.8	7.1	7.5
Zimbabwe	3.0	4.4	2.8	3.7	4.7	6.8
Near East/North Africa						
Egypt	2.9	4.0	3.1	4.0	4.7	6.5
Jordan	3.9	4.6	4.7	5.4	6.5	8.3
Turkey	2.3	3.0	2.5	3.3	3.8	5.0
Yemen	4.7	6.1	4.7	5.0	7.8	8.5
Asia						
Bangladesh	2.0	3.3	2.5	3.3	4.6	6.1
India	2.2	3.0	2.6	3.1	3.8	4.7
Indonesia	2.3	2.8	2.7	2.7	4.0	4.5
Kazakhstan	2.0	3.0	1.9	2.8	2.5	4.4
Kyrgyz Republic	2.3	3.8	2.1	3.3	3.1	5.3
Nepal	2.7	4.6	3.1	4.0	4.6	5.8
Philippines	2.8	4.4	3.3	4.1	3.7	5.3
Uzbekistan	2.7	3.6	2.5	3.4	3.6	5.5
Vietnam	1.5	2.4	1.9	2.7	2.7	4.2
Latin America/Caribbean						
Bolivia	3.1	5.8	3.2	4.7	4.3	6.5
Brazil	2.3	3.3	2.2	2.8	3.3	5.2
Colombia	2.5	4.0	2.4	3.5	3.3	5.1
Dominican Republic	2.7	3.9	2.7	3.6	3.8	5.4
Guatemala	3.9	5.4	3.6	4.5	4.8	6.4
Haiti	3.1	5.2	3.0	4.5	4.0	6.1
Nicaragua	2.8	4.6	2.7	3.8	4.8	7.0
Peru	2.6	5.1	2.7	4.2	4.1	6.8

Note: Rates in parentheses are based on 125 to 249 unweighted woman-years of exposure and are subject to increased sampling variation.

To study the fertility behavior of migrants and nonmigrants, a variable combining childhood place of residence and current place of residence has been constructed. The results are presented in Table 3.4. Overall, fertility is expected to be lowest among urban natives and highest among rural natives, with the fertility of the two other groups being in between.

The data show that in all countries, the TFR is lowest for urban natives (tied for lowest in three countries). In all but seven countries the highest TFR is for rural natives (tied for highest in three countries). Rural-to-urban migrants have the highest TFRs in the Central African Republic and Mozambique, and urban-to-rural migrants have the highest TFRs in Comoros, Tchad, Uzbekistan, the Dominican Republic, and Haiti. The mean number of children ever born, which is a measure of completed fertility, shows that all but four countries (the Central African Republic, Comoros, Côte d'Ivoire, and Mozambique) have the highest number of children born to rural native women age 40-49. In Kenya and the Dominican Republic, rural natives are tied with urban-to-rural migrants for the highest number of children ever born. Urban native women age 40-49 have the lowest number of children ever born in all countries surveyed except Comoros, Niger, and Tchad. In the Central African Republic and Côte d'Ivoire, urban natives are tied for the lowest fertility levels.

Women's Education

It is hypothesized that as education increases, fertility declines. This statement is generally but not always true. In eight of the countries surveyed, the pattern does not hold because women with a primary education have higher TFRs than women with no schooling (Table 3.5). These countries are the Central African Republic, Madagascar, Mozambique, Tchad, and Uganda in sub-Saharan Africa; Jordan in the Near East/North Africa region; and Indonesia and the Philippines in Asia. In all countries, women with secondary or higher education have the lowest TFRs.

In sub-Saharan countries, the difference between TFRs for women with no schooling and women with secondary or more schooling ranges from 3.2 children in Benin and Burkina Faso to one child in the Central African Republic and Mozambique. In the Near East/North Africa region the differences range from a high of 2.7 (Yemen) to 0.1 (Jordan). In Asia, the largest difference in the TFR between women with no schooling and women with secondary schooling or more is 2.3 children in Nepal, and the smallest difference is 0.2 children in Indonesia. In the three central Asian republics—Kazakhstan, the Kyrgyz Republic, and Uzbekistan—there are not enough women who have either no schooling or primary schooling to present differential results for TFR. In the Latin America/Caribbean region, the differences by schooling level are the highest of any region, from 2.2 in Colombia to 3.9 in Peru, with an average difference of 3.1 children.

When completed fertility (mean number of children ever born to women age 40-49) is considered, similar educational differences are observed in many countries. The exceptions are Cameroon, the Central African Republic, Guinea, Madagascar, Mozambique, Niger, Tchad, and Uganda in sub-Saharan Africa and Indonesia and the Philippines in Asia. The exceptions come about because women with no schooling have not reported higher CEBs than women with primary schooling. However, five of the 11 exceptions have differences of 0.1 children or less.

In general, the lowest number of children ever born is found among women with secondary or more education. The largest differences in children ever born between no schooling and secondary schooling or more occur in Yemen (4.7 children), followed by Peru (4.0), Nicaragua (3.9), Turkey (3.8), and Guatemala (3.7). The smallest differences between these two categories occur in the Central African Republic (0.2 children), Indonesia (0.7), and Mozambique (0.8).

Table 3.5 also presents the total marital fertility rate for women married up to 14 years, by education level. The lowest TMFR is generally found among women with secondary education. The only exceptions

Table 3.4 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, by migration status, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (women 15-39)				Total marital fertility rate (0-14 years)				Mean number of children ever born (women 40-49)			
	Urban native	Rural to urban	Urban to rural	Rural native	Urban native	Rural to urban	Urban to rural	Rural native	Urban native	Rural to urban	Urban to rural	Rural native
Sub-Saharan Africa												
Benin	4.1	5.2	5.9	6.2	3.7	(4.1)	4.5	4.6	6.1	7.1	7.4	7.5
Burkina Faso	u	u	u	u	u	u	u	u	u	u	u	u
Cameroon	3.3	4.2	4.3	5.3	2.9	3.6	(3.6)	4.1	5.7	5.8	6.3	6.4
Central African Republic	4.4	5.2	4.6	4.8	3.6	(3.7)	3.7	3.7	5.6	6.6	5.7	5.6
Comoros	3.3	4.1	4.6	4.5	(3.9)	*	*	4.5	6.5	5.0	7.8	6.8
Côte d'Ivoire	3.8	4.2	5.2	5.6	3.3	3.5	3.9	4.1	6.1	6.1	7.1	7.0
Eritrea	3.1	4.8	4.9	6.3	3.4	3.8	*	4.3	5.2	5.5	6.1	6.6
Ghana	2.7	3.3	4.7	4.7	2.5	*	3.7	3.7	4.6	4.8	5.8	6.4
Guinea	u	u	u	u	u	u	u	u	u	u	u	u
Kenya	2.9	3.1	4.8	4.8	(2.9)	(3.0)	(3.9)	4.1	4.0	4.9	7.0	7.0
Madagascar	3.4	4.9	5.5	6.1	5.2	(4.1)	4.1	4.7	4.9	6.1	7.1	7.3
Mali	4.7	5.4	6.4	6.7	4.1	4.0	(4.3)	4.7	6.8	7.5	7.2	7.8
Mozambique	3.9	5.2	5.1	4.6	3.2	4.0	3.9	3.7	5.5	6.3	6.4	5.7
Niger	4.9	6.0	6.7	6.9	4.5	4.8	*	4.9	7.2	7.3	6.7	7.6
Senegal	3.7	4.6	5.6	5.9	3.7	(4.2)	4.3	4.5	6.3	7.1	7.3	7.5
South Africa	2.0	2.5	2.4	3.7	1.6	1.9	(1.6)	3.0	2.9	3.8	3.3	4.8
Tanzania	2.9	3.2	4.5	5.9	2.6	(2.9)	(3.2)	4.4	4.9	5.5	5.6	7.2
Tchad	5.6	5.7	6.2	6.1	4.5	4.7	(4.9)	4.7	6.5	6.2	6.8	6.9
Togo	3.0	3.0	5.4	5.6	2.9	3.0	4.3	4.4	5.1	5.6	6.7	7.1
Uganda	4.2	4.6	6.2	6.6	(3.9)	4.0	*	5.0	5.3	6.6	7.0	7.4
Zambia	4.7	4.9	6.0	6.3	4.3	4.2	4.8	4.8	6.8	7.4	7.3	7.5
Zimbabwe	2.8	2.8	3.9	4.2	(2.6)	2.6	(3.2)	3.4	4.3	4.6	6.2	6.4
Near East/North Africa												
Egypt	u	u	u	u	3.0	3.8	3.8	4.1	u	u	u	u
Jordan	u	u	u	u	4.6	4.9	(4.7)	5.6	u	u	u	u
Turkey	u	u	u	u	u	2.7	(3.2)	3.3	u	u	u	u
Yemen	u	u	u	u	4.5	5.1	*	5.0	u	u	u	u
Asia												
Bangladesh	u	u	u	u	u	u	u	u	u	u	u	u
India	u	u	u	u	u	u	u	u	u	u	u	u
Indonesia	u	u	u	u	2.6	2.7	2.8	2.7	u	u	u	u
Kazakhstan	1.8	2.3	2.7	3.1	1.8	2.2	*	2.8	2.3	2.6	4.1	4.4
Kyrgyz Republic	2.0	2.6	3.8	3.8	1.9	2.2	*	3.4	2.7	3.8	4.2	5.5
Nepal	u	u	u	u	3.1	*	*	4.0	u	u	u	u
Philippines	u	u	u	u	u	u	u	u	u	u	u	u
Uzbekistan	2.5	4.1	4.5	3.6	2.4	(3.2)	*	3.4	3.4	4.5	5.1	5.5
Vietnam	u	u	u	u	2.0	(1.9)	(2.6)	2.7	u	u	u	u
Latin America/Caribbean												
Bolivia	2.9	4.3	5.3	6.0	3.0	3.7	4.4	4.9	4.0	5.6	6.0	6.7
Brazil	2.2	2.6	2.9	3.4	2.2	2.3	2.2	3.0	3.1	3.8	4.6	5.4
Colombia	2.4	2.7	3.8	4.1	2.4	2.4	3.1	3.6	3.2	3.6	4.6	5.3
Dominican Republic	2.7	2.7	4.2	3.8	2.8	2.6	3.8	3.6	3.5	4.3	5.4	5.4
Guatemala	3.5	5.1	4.3	5.7	3.3	(4.6)	3.8	4.8	4.3	6.0	5.9	6.6
Haiti	2.9	3.8	5.3	5.2	2.8	3.3	*	4.5	3.6	4.8	5.5	6.1
Nicaragua	2.7	3.5	4.2	4.7	2.6	3.1	3.4	3.9	4.6	5.9	6.6	7.2
Peru	2.5	3.6	4.5	5.4	2.6	3.2	3.8	4.5	3.9	5.4	6.4	7.0

Note: Total fertility rate and number of children ever born are not available for countries with ever-married samples because information on migration for never-married women was not collected. Rates in parentheses are based on 125 to 249 unweighted woman-years of exposure in at least one age group or one marital duration group, respectively. An asterisk indicates rate is based on fewer than 125 woman-years of exposure and is not shown.
u = Unknown (not available)

Table 3.5 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, by women's education, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (women 15-39)			Total marital fertility rate (0-14 years)			Mean number of children ever born (women 40-49)		
	No schooling	Primary	Secon-dary+	No schooling	Primary	Secon-dary+	No schooling	Primary	Secon-dary+
Sub-Saharan Africa									
Benin	6.0	4.5	2.8	4.5	4.1	(2.9)	7.3	6.4	4.8
Burkina Faso	6.1	4.5	2.9	4.4	(3.8)	*	7.5	6.6	4.5
Cameroon	5.7	4.7	3.4	4.3	3.8	3.0	6.2	6.5	5.2
Central African Republic	4.7	4.9	3.7	3.7	3.8	3.3	5.7	5.7	5.5
Comoros	4.8	4.3	2.8	4.8	*	*	6.9	5.8	4.2
Côte d'Ivoire	5.3	4.6	3.0	3.9	3.8	2.8	6.8	6.1	5.3
Eritrea	6.1	5.0	3.0	4.2	4.1	(3.4)	6.3	5.8	5.0
Ghana	5.0	4.5	3.3	3.9	3.7	2.9	6.5	6.2	4.5
Guinea	5.3	4.6	3.3	3.9	3.9	2.7	6.6	6.8	5.5
Kenya	5.4	4.7	3.3	(3.8)	4.2	3.2	7.1	6.8	4.9
Madagascar	5.9	6.0	3.9	4.3	4.7	3.6	6.8	7.2	4.6
Mali	6.5	5.4	3.7	4.6	4.1	(3.6)	7.7	7.4	6.5
Mozambique	4.5	4.8	3.5	3.5	3.8	(2.6)	5.8	5.8	5.0
Niger	6.8	5.5	4.1	4.9	4.4	(4.3)	7.5	7.7	6.1
Senegal	5.5	4.6	2.8	4.3	4.3	(3.4)	7.2	7.1	5.4
South Africa	4.1	3.4	2.4	(2.6)	2.5	1.9	4.9	4.2	3.0
Tanzania	5.8	4.8	3.5	4.0	3.9	(3.8)	7.0	6.3	4.5
Tchad	6.0	6.3	4.7	4.6	4.8	(4.8)	6.8	6.9	5.1
Togo	5.6	4.2	2.5	4.3	3.9	2.6	6.9	6.0	3.8
Uganda	6.4	6.5	4.7	4.6	5.0	4.1	7.3	7.4	6.3
Zambia	6.2	6.1	4.2	4.8	4.8	4.0	7.7	7.5	6.2
Zimbabwe	4.8	4.2	3.2	*	3.3	2.8	6.3	6.1	4.3
Near East/North Africa									
Egypt	4.4	3.4	2.4	4.1	3.4	3.0	6.4	5.5	3.3
Jordan	4.1	4.3	4.0	*	5.1	4.7	8.1	7.8	5.6
Turkey	3.9	2.7	1.8	3.7	2.7	2.1	5.8	3.8	2.0
Yemen	6.1	5.2	3.4	5.0	4.8	4.2	8.5	5.6	3.8
Asia									
Bangladesh	3.8	3.0	2.1	3.5	3.0	2.6	6.1	6.0	4.6
India	3.4	2.8	2.1	3.3	3.0	2.5	5.0	4.2	3.1
Indonesia	2.6	2.9	2.4	2.5	2.7	2.7	4.3	4.6	3.6
Kazakhstan	*	*	2.5	*	*	2.3	*	4.0	3.1
Kyrgyz Republic	*	*	3.3	*	*	2.9	(1.0)	*	4.5
Nepal	4.8	3.8	2.5	4.0	3.6	2.9	5.8	5.3	3.7
Philippines	4.5	4.7	3.1	*	4.2	3.4	5.4	5.5	3.6
Uzbekistan	*	*	3.3	*	*	3.1	*	*	4.6
Vietnam	3.3	2.6	2.1	*	2.9	2.4	5.1	4.5	3.3
Latin America/Caribbean									
Bolivia	6.5	5.3	2.8	4.7	4.3	3.0	6.4	5.8	3.3
Brazil	4.7	3.2	2.0	(3.4)	2.7	2.1	5.8	4.2	2.6
Colombia	4.6	3.6	2.4	*	3.0	2.4	5.8	4.3	2.7
Dominican Republic	4.9	3.6	2.4	4.1	3.4	2.5	5.8	4.8	2.5
Guatemala	6.4	4.8	2.9	4.8	4.3	2.8	7.0	5.1	3.3
Haiti	5.5	4.4	2.5	4.3	3.9	(2.5)	5.7	4.9	2.9
Nicaragua	5.3	4.1	2.4	4.2	3.5	2.4	7.3	5.4	3.4
Peru	6.4	4.7	2.5	4.9	3.9	2.6	7.2	5.7	3.2

Note: Figures in parentheses are based on 125 to 249 unweighted woman-years of exposure or, for mean number of children ever born, 25 to 49 women. An asterisk indicates figure is based on less than 125 unweighted woman-years of exposure, or, for mean number of children ever born, fewer than 25 women and is not shown.

are Indonesia and Tchad. Like the TFR and the number of children ever born, the relationship between TMFR and primary education in not consistent. In six countries, women with primary schooling have TMFRs that exceed those of women with no schooling by more than 0.1 children (Kenya, Madagascar, Mozambique, Tchad, Uganda, and Indonesia). In all countries with sufficient numbers of women to make an assessment, the lowest TMFR occurs for women with secondary or higher education. In Indonesia, women with primary schooling and secondary and higher schooling have the same TMFR for up to 14 years of marriage.

Women's Employment Status

Table 3.6 shows the TFR for women age 15-39, the number of children ever born for women age 40-49, and the TMFR for women married up to 14 years by employment status. In sub-Saharan Africa, only South Africa shows a difference in total fertility of one child or more between women who are not working and women who are working. In ten of the 22 sub-Saharan countries surveyed, the difference in TFR between working and nonworking women is 0.2 children or less. In six of the other 12 countries, working women have more children than nonworking women; in six of the countries the opposite is true. In countries of Asia with data on work status for single women and in the surveyed countries in the Latin America/Caribbean region, working women have a lower TFR.

Total marital fertility rates (up to 14 years) are lower for working women in all but six countries. Of these six, three have no difference between working and nonworking women (Cameroon, Niger, and Tchad), and two have TMFRs higher for working women by only 0.1 children (Central African Republic and Guinea).

Husband's Education

Table 3.7 presents marital fertility rates by husband's characteristics (husband's education and occupation). For currently married women, husband refers to the current husband; for formerly married women, husband refers to the most recent husband. In all countries surveyed, the lowest marital fertility occurs among women whose husband has secondary or more education.

A curvilinear relationship between fertility and husband's education is observed in about half of the countries in sub-Saharan Africa with data for all three education groups. In Madagascar, marital fertility among women whose husband has primary education exceeds by 0.7 births the rate among women whose husband has no schooling. In the Central African Republic, Tchad, and Uganda, this excess is 0.5 births. In the Near East/North Africa region and in Asia, there is no or little difference in TMFR among women whose husband has no or primary education.

Husband's Occupation

In almost all countries surveyed, the highest total marital fertility for duration up to 14 years since first marriage occurs among women whose husband works in agriculture; the exceptions are Niger, where the rate for women whose husband is a manual worker (skilled/unskilled) is higher by 0.3 births, and Indonesia, where the rate for women whose husband is in sales and service is higher by 0.1 births. The lowest fertility occurs among women whose husband has a professional or clerical occupation. There are five exceptions to this finding: the Central African Republic and Kenya, where wives of manual laborers have lower fertility, and Mali, Uzbekistan, and Nicaragua, where wives of sales and service workers have lower fertility. In Nepal and Yemen, the wives of professional or clerical workers are tied for lowest fertility with the wives of sales and services workers.

Table 3.6 Fertility rates for the period 0-2 years preceding the survey and mean number of children ever born, by women's employment status, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (women 15-39)		Total marital fertility rate (0-14 years)		Mean number of children ever born (women 40-49)	
	Working	Not working	Working	Not working	Working	Not working
Sub-Saharan Africa						
Benin	5.6	5.0	4.3	(4.4)	7.1	7.3
Burkina Faso	5.7	6.0	4.2	4.5	7.4	7.6
Cameroon	4.7	4.3	3.7	3.7	6.2	6.2
Central African Republic	4.8	4.6	3.7	3.6	5.7	5.6
Comoros	3.9	4.5	4.2	4.5	6.5	7.0
Côte d'Ivoire	5.0	4.5	3.7	3.8	6.7	6.4
Eritrea	5.0	5.5	3.9	4.2	6.1	6.3
Ghana	4.2	3.9	3.3	(3.4)	5.7	4.9
Guinea	5.2	4.9	3.9	3.8	6.5	6.4
Kenya	4.4	4.6	3.6	4.2	6.6	6.6
Madagascar	5.4	5.5	4.2	4.5	6.6	6.6
Mali	6.1	6.2	4.5	4.6	7.6	7.6
Mozambique	4.5	4.7	3.5	3.9	5.8	5.8
Niger	6.5	6.6	4.8	4.8	7.6	7.2
Senegal	5.2	4.7	4.3	4.1	7.1	6.9
South Africa	2.1	3.1	1.6	2.5	3.4	4.1
Tanzania	5.1	4.9	3.9	4.1	6.7	6.4
Tchad	5.8	6.1	4.7	4.7	6.8	6.8
Togo	4.7	4.8	3.8	4.3	6.4	6.3
Uganda	6.3	6.3	4.7	4.9	7.4	7.0
Zambia	5.7	5.6	4.5	4.7	7.2	7.4
Zimbabwe	3.4	4.2	2.8	3.4	5.7	6.1
Near East/North Africa						
Egypt	u	u	2.9	3.8	u	u
Jordan	u	u	4.0	4.9	u	u
Turkey	u	u	2.3	2.9	u	u
Yemen	u	u	4.6	5.0	u	u
Asia						
Bangladesh	u	u	2.9	3.3	u	u
India	u	u	2.7	3.1	u	u
Indonesia	u	u	u	u	u	u
Kazakhstan	1.2	3.9	1.2	3.4	2.9	3.9
Kyrgyz Republic	1.8	4.5	1.7	3.7	4.3	5.0
Nepal	u	u	3.8	4.1	u	u
Philippines	2.5	4.5	3.0	4.2	4.2	4.8
Uzbekistan	2.1	4.4	2.1	3.9	4.4	5.0
Vietnam	u	u	2.5	(3.2)	u	u
Latin America/Caribbean						
Bolivia	3.3	4.7	3.2	4.2	4.9	5.4
Brazil	1.7	3.2	1.7	2.9	3.5	3.9
Colombia	2.3	3.5	2.2	3.2	3.4	4.4
Dominican Republic	2.4	3.6	2.4	3.5	3.9	4.8
Guatemala	3.0	5.7	3.0	4.7	4.6	6.4
Haiti	4.3	4.5	3.5	4.1	5.5	5.2
Nicaragua	2.8	3.9	2.5	3.5	5.1	6.1
Peru	2.8	3.9	2.8	3.5	4.8	5.0

Note: Total fertility rate and number of children ever born are not available for countries with ever-married samples because information on women's work status for never-married women was not collected. Rates in parentheses are based on 125 to 249 unweighted women-years of exposure.
u = Unknown (Not available)

Table 3.7 Marital fertility rates for the period 0-2 years preceding the survey, by husband's education and occupation, Demographic and Health Surveys, 1995-1999

Region and country	Total marital fertility rate (0-14 years)						
	Husband's education			Husband's occupation			
	No schooling	Primary	Secon-dary+	Agricul-ture	Skilled/ unskilled	Sales/ service	Professional/ clerical
Sub-Saharan Africa							
Benin	4.6	4.3	3.5	4.7	4.3	(3.6)	(3.0)
Burkina Faso	4.4	(3.7)	*	4.4	(4.1)	4.0	(3.4)
Cameroon	4.2	3.8	3.3	4.1	*	3.5	3.4
Central African Republic	3.3	3.8	3.7	3.7	3.5	3.6	(3.7)
Comoros	4.6	*	(3.9)	(4.8)	4.7	*	*
Côte d'Ivoire	4.0	4.3	3.1	4.1	3.7	3.7	2.8
Eritrea	4.2	4.3	3.6	4.3	4.1	3.7	(3.6)
Ghana	3.9	(4.1)	3.1	4.1	3.1	2.9	(2.4)
Guinea	4.0	3.9	3.3	4.1	3.7	3.7	(3.2)
Kenya	*	4.2	3.5	4.2	3.6	3.7	3.7
Madagascar	4.1	4.8	3.7	4.6	3.5	3.7	(2.9)
Mali	4.6	4.4	3.8	4.7	(4.6)	4.2	4.3
Mozambique	3.6	3.9	3.0	3.7	3.6	3.7	3.3
Niger	4.9	4.8	(4.5)	4.9	(5.2)	4.7	(4.6)
Senegal	4.4	(4.0)	3.7	4.7	4.4	3.9	3.5
South Africa	(2.8)	2.6	1.9	*	2.2	2.1	1.8
Tanzania	u	u	u	u	u	u	u
Tchad	4.5	5.0	4.9	4.7	4.6	4.6	4.5
Togo	4.5	4.0	3.4	4.6	3.3	3.4	3.1
Uganda	4.5	5.0	4.4	5.0	4.6	4.7	4.3
Zambia	(4.7)	4.9	4.3	5.0	4.4	4.4	3.7
Zimbabwe	*	3.5	2.9	3.5	3.2	3.0	2.3
Near East/North Africa							
Egypt	3.9	3.8	3.3	4.2	3.6	3.6	3.1
Jordan	*	4.8	4.8	*	5.1	4.6	4.5
Turkey	*	3.0	2.4	3.4	2.8	2.6	2.4
Yemen	5.0	5.0	4.9	5.4	5.1	5.0	5.0
Asia							
Bangladesh	3.4	3.4	2.6	3.2	3.2	*	3.1
India	3.2	3.0	2.8	3.1	3.1	2.8	2.5
Indonesia	2.7	2.7	2.7	2.7	2.7	2.8	2.6
Kazakhstan	*	*	2.3	(2.8)	2.2	(2.2)	(2.1)
Kyrgyz Republic	*	*	2.9	3.7	2.7	2.5	(2.4)
Nepal	4.0	4.1	3.6	4.2	3.7	3.5	3.5
Philippines	*	4.1	3.4	4.1	3.6	3.3	3.1
Uzbekistan	*	*	3.1	3.3	2.9	(2.8)	3.1
Vietnam	*	3.1	2.4	u	u	u	u
Latin America/Caribbean							
Bolivia	*	4.6	3.2	4.8	3.6	3.2	2.7
Brazil	3.3	2.5	2.1	3.2	2.3	2.2	2.1
Colombia	(3.3)	3.0	2.4	3.4	2.7	2.4	2.2
Dominican Republic	3.9	3.2	2.7	3.8	3.1	2.8	2.5
Guatemala	4.7	4.4	3.2	4.9	3.7	(3.7)	(3.3)
Haiti	4.7	4.3	2.8	4.6	3.1	(3.4)	(2.6)
Nicaragua	4.0	3.4	2.5	3.9	3.0	2.2	2.3
Peru	(4.5)	4.0	2.8	4.2	3.0	2.8	2.4

Note: Rates in parentheses are based on 125 to 249 unweighted woman-years of exposure. An asterisk indicates that rate is based on fewer than 125 woman-years of exposure and is not shown.
u = Unknown (not available)

Between women whose husband works in agriculture and those whose husband works in professional and clerical occupations, the difference in marital fertility is greatest in the Latin America/Caribbean region, where it is more than one birth in all surveyed countries and is two births or more in Bolivia and Haiti. In sub-Saharan Africa, the difference between agricultural and professional/clerical is larger than one birth in eight countries: Benin, Côte d'Ivoire, Ghana, Madagascar, Senegal, Togo, Zambia and Zimbabwe. The Near East/North Africa region and Asia only have one country each in which the difference between agricultural and professional/clerical is larger than one birth: Egypt and the Kyrgyz Republic.

3.3 Fertility Trends

Fertility trends are analyzed here in two ways. One way is to use data from the birth history in a single survey. A second way is to compare data from two surveys. Table 3.8 shows the change in TFR for women 15-44 between periods four to seven and 0-3 years preceding the survey, calculated using the birth history of the most recent survey.[7]

The rates shown in Table 3.8 indicate that recent declines occurred in all surveyed countries, except for Colombia, where fertility did not change (Figure 3.2). The average decline for the countries was 0.8 births, which represents an average percent decline of 15 percent. Declines of one birth or more occurred mostly in sub-Saharan Africa, where half of the surveyed countries had declines of this magnitude. Five sub-Saharan countries had a decline of 20 percent or more. In the other regions, only three countries had a decline of 20 percent or more (Bangladesh, Nicaragua, and Vietnam) and three had a decline of one birth or more (Bangladesh, Vietnam, and Yemen). In general, the larger declines occurred in countries where the fertility in the period four to seven years before the survey was higher. A word of caution should be added here since some of the declines (as in India) may have been exaggerated due to omission and/or displacement of recent births. Indeed, a study in rural Mali indicates that some women are fearful of verbalizing numbers of children because of the supernatural risks that would be incurred (Castle, 2001).

Small declines—less than 10 percent and less than 0.5 births—occurred in three and four countries, respectively, of the eight countries in the Latin America/Caribbean region. Only four countries from a different region had a decline of less than 10 percent: Ghana, Tanzania, Tchad, and Zambia. Four countries outside of the Latin America/Caribbean region had a decline of less than 0.5 births in total fertility: Ghana, Indonesia, Kazakhstan, and Turkey.

Table 3.9 examines trends in fertility in 22 countries by comparing the results of the most recent DHS survey with the results of an earlier DHS survey for rates calculated for the period up to two years before each survey. This comparison is appropriate because the methods of data collection and rate calculation are identical between the two surveys. A comparison of TFRs calculated for the 1990-1994 DHS surveys and the 1995-1999 DHS surveys for the ten countries in sub-Saharan Africa shows that fertility has declined by an average of 1.3 percent per year during this period.[8] The average masks the wide range of declines from a decline of 3.0 percent and 2.8 percent per year in Ghana and Cameroon, respectively, to a small increase (0.5 percent) in Niger and no change in Burkina Faso. The other regions show similar variation in rates of decline, with small annual average increases in the lower fertility countries of Colombia and Turkey and high rates of decline in India and Jordan (2.8 percent and 3.5 percent per year, respectively).

[7] It should be noted that due to limiting the age of respondents to 49 years at the time of the survey, the rate for the earlier period (four to seven years preceding the survey) is based on data that are partially truncated beginning in the sixth year prior to the survey.

[8] To calculate the annual percentage decline, the following formula is used:

$$r = \ln (TFR_0 / TFR_1) / t \times 100$$

where r is annual growth rate, TFR_0 is TFR during 1994-1995, TFR_1 is TFR in 1995-1999, and t is years between the two surveys.

Table 3.8 Total fertility rates for women 15-44 for the periods 0-3 and 4-7 years preceding the survey, and absolute change and percent change, Demographic and Health Surveys, 1995-1999

Region and country	Total fertility rate (women 15-44) 0-3 years preceding survey	4-7 years preceding survey	Absolute change	Percent change
Sub-Saharan Africa				
Benin	6.0	7.1	-1.1	-16.2
Burkina Faso	6.5	7.6	-1.1	-14.2
Cameroon	4.9	6.2	-1.3	-21.3
Central African Republic	5.0	6.3	-1.3	-20.1
Comoros	4.7	6.2	-1.5	-23.5
Côte d'Ivoire	5.3	7.2	-1.9	-26.8
Eritrea	5.8	6.7	-0.9	-13.0
Ghana	4.4	4.8	-0.4	-7.8
Guinea	5.5	7.0	-1.5	-20.6
Kenya	4.6	5.2	-0.6	-11.0
Madagascar	5.8	6.7	-0.9	-13.3
Mali	6.6	8.2	-1.6	-19.4
Mozambique	5.3	6.3	-1.0	-16.4
Niger	7.2	8.1	-0.9	-11.4
Senegal	5.6	6.7	-1.1	-16.4
South Africa	2.8	3.4	-0.6	-16.6
Tanzania	5.4	6.0	-0.6	-9.3
Tchad	6.5	7.2	-0.7	-9.6
Togo	5.1	6.2	-1.1	-17.4
Uganda	6.6	7.4	-0.8	-10.7
Zambia	5.9	6.4	-0.5	-7.1
Zimbabwe	3.9	4.7	-0.8	-16.5
Near East/North Africa				
Egypt	3.7	4.5	-0.8	-17.8
Jordan	4.4	5.0	-0.6	-12.3
Turkey	2.6	2.9	-0.3	-11.7
Yemen	6.3	7.8	-1.5	-19.2
Asia				
Bangladesh	3.3	4.4	-1.1	-24.2
India	2.9[a]	3.7	-0.8[a]	-23.8[a]
Indonesia	2.8	3.1	-0.3	-10.7
Kazakhstan	2.5	2.9	-0.4	-12.4
Kyrgyz Republic	3.4	3.9	-0.5	-12.5
Nepal	4.6	5.3	-0.7	-11.8
Philippines	3.7	4.2	-0.5	-10.8
Uzbekistan	3.4	4.2	-0.8	-19.6
Vietnam	2.4	3.4	-1.0	-30.0
Latin America/Caribbean				
Bolivia	4.2	4.7	-0.5	-10.4
Brazil	2.5	3.0	-0.5	-14.1
Colombia	3.0	3.0	0.0	-2.6
Dominican Republic	3.2	3.6	-0.4	-10.6
Guatemala	5.0	5.3	-0.3	-4.5
Haiti	4.8	5.3	-0.5	-9.3
Nicaragua	3.7	4.6	-0.9	-20.0
Peru	3.6	4.0	-0.4	-10.7

[a] After adjustment for omission of recent births, the TFR for 0-3 years is 3.4, which results in a change of -0.3 births and -8 percent.

Figure 3.2 Change in the total fertility rate between the periods 0-3 and 4-7 years before the survey, Demographic and Health Surveys, 1995-1999

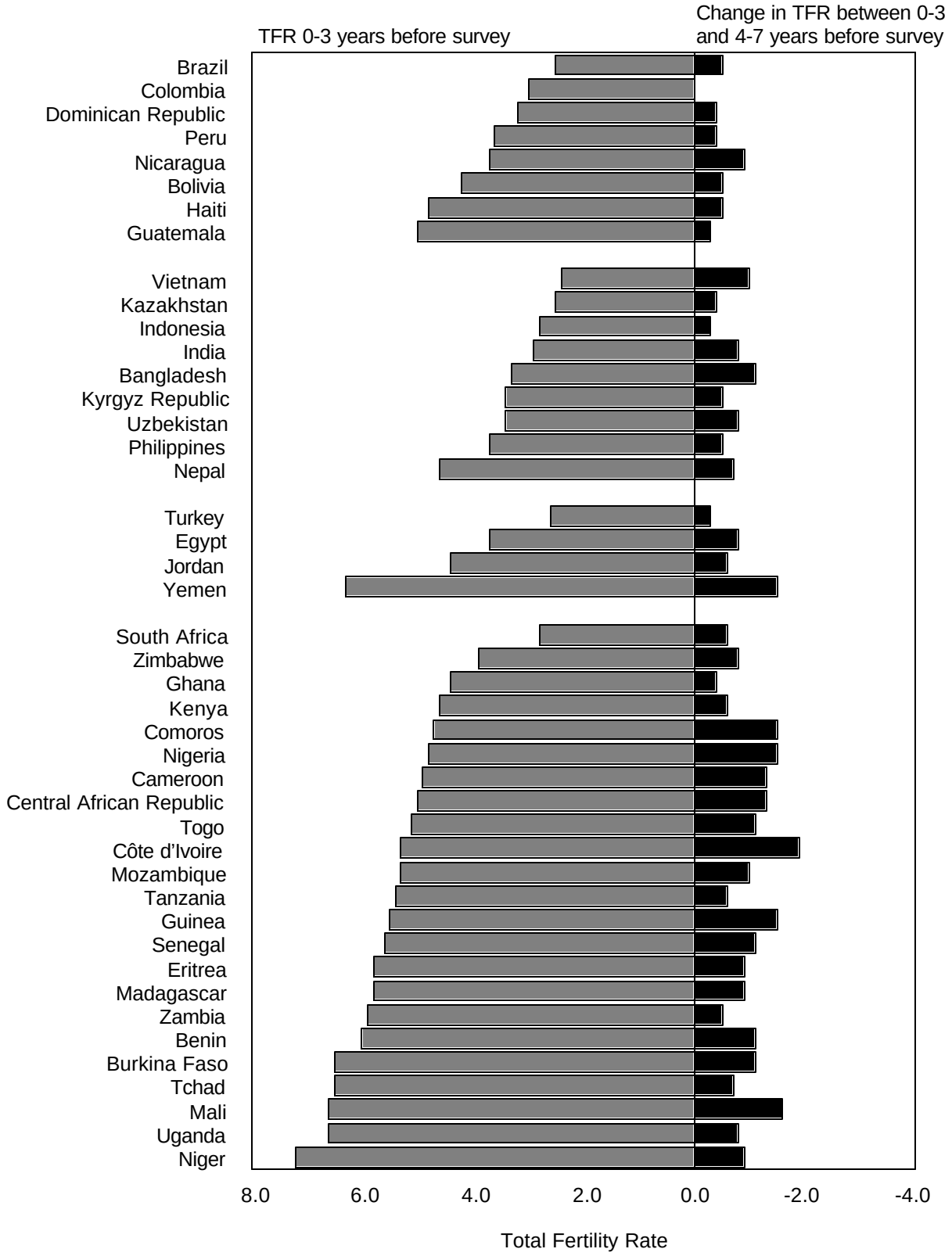


Table 3.9 Total fertility rates for women 15-44 for the period 0-2 years preceding survey and percent annual decline, Demographic and Health Surveys, 1990-1999

Region and country	Year of survey		Total fertility rate (women 15-44)		Percent annual decline
	Preceding survey	Latest survey	Preceding survey	Latest survey	
Sub-Saharan Africa					
Burkina Faso	1993	1999	6.3	6.3	0.0
Cameroon	1991	1998	5.7	4.7	2.8
Ghana	1993	1998	5.1	4.4	3.0
Kenya	1993	1998	5.2	4.6	1.3
Madagascar	1992	1997	6.0	5.8	0.7
Niger	1992	1998	6.8	7.0	-0.5
Senegal	1992-1993	1997	5.9	5.5	1.4
Tanzania	1996	1999	5.6	5.4	1.2
Zambia	1992	1996	6.3	6.0	1.2
Zimbabwe	1994	1999	4.2	3.9	1.5
Near East/North Africa					
Egypt	1991	1997	3.9	3.6	1.3
Jordan	1990	1997	5.5	4.3	3.5
Turkey	1993	1998	2.5	2.6	-0.8
Asia					
Bangladesh	1993-1994	1997	3.4	3.2	1.7
India	1992-1993	1998-1999	3.4	2.8	2.9
Indonesia	1990	1997	3.0	2.8	1.0
Philippines	1993	1998	4.1	3.7	2.1
Latin America/Caribbean					
Bolivia	1993-1994	1998	4.7	4.2	2.5
Colombia	1990	1995	2.8	3.0	-1.4
Dominican Republic	1991	1996	3.3	3.2	0.6
Peru	1991-1992	1996	3.5	3.5	0.0

4 Other Fertility Components

4.1 Onset of Childbearing: Age at First Birth

Median age at first birth is calculated for cohorts using the life table method and is presented here to examine when the transition to parity 1 is accomplished from one country to another. The median age at first birth is based on retrospective reports by women and represents the exact age by which half of a cohort had had a birth. Previous studies have found some reporting problems among older women, who appear to displace the exact timing of these events to higher ages (Gage, 1995; Westoff et al., 1994). The same result can occur if some of the older women omit reporting their first birth, perhaps births of children who died soon after birth.

Of the countries surveyed between 1995 and 1999, the lowest median age at first birth occurred in Bangladesh (17.2 years), which is also known for its low ages at first marriage (Table 4.1). Niger is the only other country where more than half of the women had had a birth before their 18th birthday (median of 17.8 years). Such low ages at first birth increase morbidity and mortality risks for both the child and the mother. The countries with the highest ages at first birth are Jordan, the Philippines, and Vietnam, with median ages of 23.2, 23.2, and 23.3 years, respectively. Thus, there is about a five-year difference between the countries with the highest and lowest median ages at first birth. The reduction of the fertile period due to the variation in this component is 18 percent.[9] The variation in total fertility due to a five-year delay in having the first birth is likely to be greater, however, because of the high level of fecundity during the later teen years and the early twenties. The variation in fertility according to age at first birth is shown in Figure 4.1.

Most women in sub-Saharan Africa begin their reproductive life earlier than women in the Latin America/Caribbean region or Asia, with the median age at first birth varying from 17.8 years in Niger to 21.4 years in Eritrea (Table 4.1). Except for Comoros, Eritrea, Ghana, South Africa, and Togo, more than half of the women had had a birth before age 20. There is a lack of correlation between age at marriage, age at first birth, and level of fertility in many of the sub-Saharan countries. This is because, while age at first marriage has been rising, so has nonmarital fertility (Westoff et al., 1994; Njogu and Martin, 1991; Casterline and Trussel, 1980). Indeed, the total fertility rate exceeds the total marital fertility rate in South Africa because there are more never-married women with births than married women with births. Although age at first marriage has been rising in several countries, there has been less change in age at first birth.

In the North Africa/Near East region, age at first birth ranges from a low of 19.5 in Yemen to a high of 23.2 in Jordan.

In Asia, the variation in age at first birth is the greatest of any region, having both the lowest and highest ages (Bangladesh and the Philippines). In the Latin America/Caribbean region, there is little variation in median age at first birth. The lowest age is in Nicaragua, which is also the only country to have a median age of less than 20 in this region (19.7 years). Most of the other countries have medians close to 21 or 22 years. Brazil, Colombia, and Haiti have the highest medians (22.4, 22.1, and 22.1 years, respectively), but these countries have very different total fertility rates (2.5, 3.0, and 4.8 births, respectively).

[9] Assuming that the median age at the end of the fertile period is 45.0 years, the length of the fertile period is then 27.8 years when the median age at first birth is lowest (17.2 years) and is 5.1 years shorter (18 percent = 100 x 5/27.8) when the median age at first birth is highest (23.2 years).

Table 4.1 Median age at first birth among women age 25-49 by urban-rural residence, migration status, and education, Demographic Health Surveys, 1995-1999

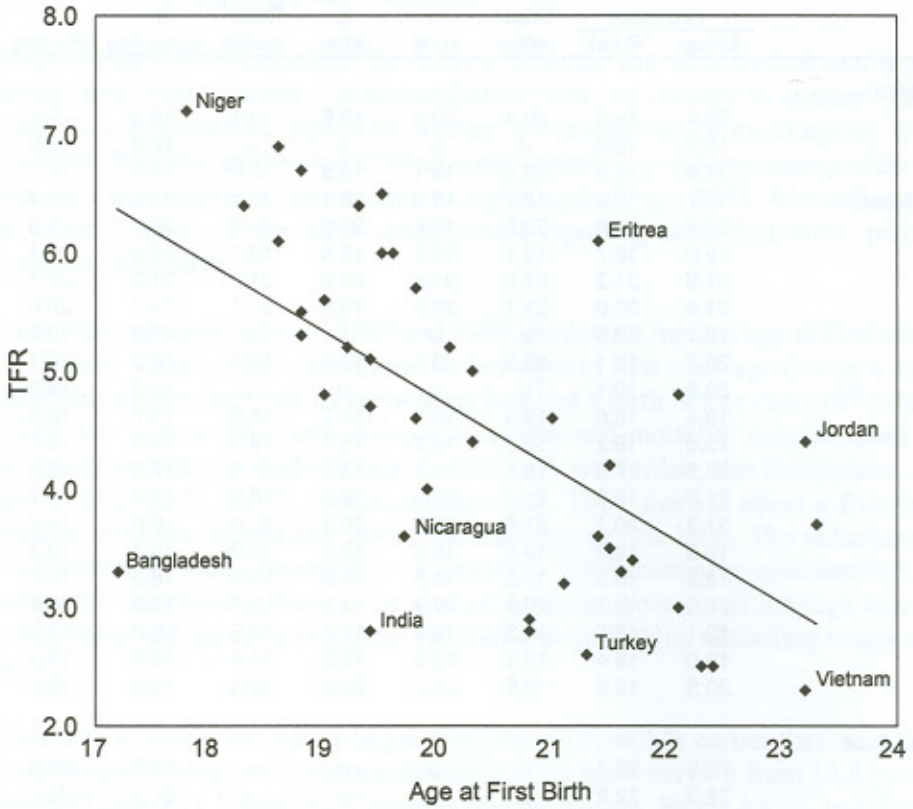
Region and country	Urban-rural residence		Migration status				Education			Total
	Urban	Rural	Urban native	Urban to rural	Rural to urban	Rural native	No schooling	Primary	Secondary +	
Sub-Saharan Africa										
Benin	20.4	19.3	20.4	20.3	19.6	19.1	19.3	20.0	22.9	19.6
Burkina Faso	19.8	19.2	u	u	u	u	19.2	19.0	23.3	19.3
Cameroon	19.4	18.9	19.6	19.1	18.9	18.9	18.7	18.7	19.9	19.0
Central African Republic	18.7	19.9	18.7	18.9	19.1	20.1	19.8	18.7	19.1	19.4
Comoros	22.2	20.7	22.5	19.8	20.6	20.7	20.3	21.0	a	21.0
Côte d'Ivoire	19.0	18.7	19.1	18.8	18.6	18.7	18.8	18.1	20.2	18.8
Eritrea	21.9	21.2	21.9	21.8	20.9	21.2	21.2	21.1	23.7	21.4
Ghana	21.0	20.0	21.1	20.6	19.8	20.1	19.7	20.0	21.0	20.3
Guinea	19.4	18.5	u	u	u	u	18.5	19.0	21.0	18.8
Kenya	20.7	19.1	20.6	20.8	19.0	19.2	18.2	18.7	21.6	19.4
Madagascar	20.8	19.1	u	u	u	u	18.5	18.8	21.8	19.5
Mali	19.4	18.6	19.4	19.3	18.7	18.6	18.7	18.6	21.2	18.8
Mozambique	19.0	19.2	19.1	18.8	18.8	19.3	19.0	19.1	21.8	19.2
Niger	18.6	17.6	18.8	18.4	18.3	17.6	17.6	18.4	21.4	17.8
Senegal	21.0	19.0	21.4	19.5	19.6	18.9	19.2	20.7	23.6	19.8
South Africa	21.3	20.1	21.6	20.6	20.3	20.0	19.8	19.7	21.5	20.8
Tanzania	19.5	18.9	19.5	19.5	18.9	18.9	18.1	19.2	23.4	19.0
Tchad	18.5	18.3	18.5	18.5	18.0	18.3	18.3	18.5	19.7	18.3
Togo	20.8	19.7	20.8	20.9	19.7	19.7	19.8	19.8	22.0	20.1
Uganda	19.1	18.5	19.2	19.0	18.7	18.5	18.0	18.6	20.0	18.6
Zambia	19.0	18.4	19.1	18.8	18.5	18.4	18.2	18.2	20.4	18.6
Zimbabwe	20.5	19.6	20.9	20.3	20.0	19.5	18.8	19.2	21.1	19.9
North Africa/Near East										
Egypt	22.9	20.1	u	u	u	u	19.7	20.5	a	21.4
Jordan	23.3	22.2	u	u	u	u	21.3	20.7	23.9	23.2
Turkey	21.7	20.7	22.4	20.7	21.3	20.6	19.6	20.8	24.4	21.3
Yemen	19.3	19.5	u	u	u	u	19.3	19.1	23.8	19.5
Asia										
Bangladesh	18.2	17.0	u	u	u	u	16.8	17.0	19.3	17.2
India	20.6	19.0	u	u	u	u	18.5	19.0	21.8	19.4
Indonesia	22.3	20.2	u	u	u	u	19.6	19.8	23.6	20.8
Kazakhstan	22.4	22.1	22.5	22.4	21.5	22.1	*	*	22.3	22.3
Kyrgyz Republic	22.2	21.5	22.4	22.0	21.9	21.4	*	*	21.7	21.7
Nepal	19.8	19.8	u	u	u	u	19.6	19.7	21.5	19.8
Philippines	24.3	22.2	u	u	u	u	20.5	21.1	24.5	23.3
Uzbekistan	22.2	21.2	22.3	22.1	21.1	21.2	*	*	21.6	21.6
Vietnam	25.0	22.7	u	u	u	u	22.4	21.9	23.5	23.2
Latin America/Caribbean										
Bolivia	21.8	20.8	22.0	21.0	20.4	20.9	21.0	20.3	22.7	21.5
Brazil	22.6	21.4	22.9	21.8	21.2	21.4	20.0	20.9	23.9	22.4
Colombia	22.7	20.7	22.9	21.9	20.5	20.7	19.5	20.4	24.0	22.1
Dominican Republic	21.9	19.9	22.4	21.0	20.1	19.9	18.6	19.4	24.6	21.1
Guatemala	21.0	19.7	21.6	20.0	20.9	19.4	19.1	20.0	22.8	20.3
Haiti	23.1	21.4	23.3	22.8	21.0	21.4	21.1	22.0	a	22.1
Nicaragua	20.1	18.9	20.3	19.4	19.1	18.9	18.0	18.8	21.9	19.7
Peru	22.3	20.0	22.6	20.6	20.2	19.9	19.5	19.9	23.5	21.5

Note: The median age at first birth is calculated only for women 25-49 because, for many countries in Asia, the Near East/North Africa region, and the Latin America/Caribbean region, more than half the women in cohorts 15-19 and 20-24 have not yet had a birth. Median age at first birth by migration is not available for countries with ever-married samples because migration status for never-married women was not collected. An asterisk indicates figure is based on fewer than 25 unweighted women and is not shown.

u = Unknown (not available)

[a] Median age at first birth is not calculated because more than half of the women have not yet had a birth.

Figure 4.1 Relationship between the total fertility rate and age at first birth, Demographic and Health Surveys, 1995-1999



4.1.1 Socioeconomic Differences in Age at First Birth

There is considerable evidence of differentials in age at first birth by socioeconomic and other background variables (United Nations, 1987). The variables considered in this analysis are urban-rural residence, migration, and education.

Urban-Rural Residence

For most of the countries, age at first birth is higher for women in urban areas than for women in rural areas (Table 4.1). The average urban-rural difference in median age at first birth is smaller in sub-Saharan Africa than in the other regions and greater in the Latin America/Caribbean region. In sub-Saharan Africa, two countries, the Central African Republic and Mozambique, have higher ages at first birth in rural areas than in urban areas. Only nine of the 22 sub-Saharan countries have medians that are one or more years higher in urban areas than in rural areas. In the other regions, most countries (16 out of 20) have a difference of one year or greater. In the Latin America/Caribbean region, all differences are one year or greater.

Seven countries have an urban age at first birth that is two or more years higher than the rural age at first birth: Egypt, Indonesia, the Philippines, Vietnam, Colombia, the Dominican Republic, and Peru. It should be noted that in the rural areas of these countries, age at first birth is higher than that observed in the urban areas of many countries in sub-Saharan Africa.

Urban-Rural Migration

Median age at first birth is a retrospective indicator. A woman could spend her first years of reproductive life in a rural area and yet be interviewed in an urban area (or vice versa). It is interesting to compare the median age at first birth for women native to each of the two areas (urban and rural) with that for migrants. In sub-Saharan Africa, where urban-rural differences are less marked, the differences in median age at first birth for urban natives and for rural natives increases slightly in the context of migration (Table 4.1). In all but two countries, urban natives have a higher median age at first birth than rural natives. The two exceptions are the Central African Republic and Mozambique.

In 22 countries of all the regions, the difference between urban natives and rural natives is greater than the urban-rural difference. In seven countries, all in sub-Saharan Africa, it is the same.

In most countries, women who moved to urban areas have a lower age at first birth than urban natives. The lowest differences between urban natives and migrants occur in sub-Saharan Africa, where there is no substantial difference in almost half of the countries with data. On the other hand, migrants to rural areas have lower ages at first birth than rural natives in many countries, thus having the lowest median ages of all the migration categories.

Women's Education

Table 4.1 shows age at first birth by level of education in three categories (no schooling, primary incomplete or complete, and secondary or higher). For most countries, there is a positive relationship between level of education and age at first birth. Age at first birth is usually lowest for women with no education and then increases with educational attainment. Although differences between women with primary education and women with no schooling are not always pronounced (or in the same direction), women with secondary education have the highest age at first birth in all countries studied, except for the Central African Republic. The average increase in age at first birth between primary and no schooling is only 0.3 years and there are ten countries where women with no schooling have a higher age at first birth. In contrast, the average increase in age at first birth between primary and secondary education is 2.7 years, and there are no countries where women with primary education have a higher median age at first birth than women with secondary education. The regions with the largest delay in first births by education are Near East/North Africa and Latin America/Caribbean, where women with secondary education have their first child on average four years later than women with no education.

In sub-Saharan Africa, the most notable variation in age at first birth by education is found in Tanzania, where age at first birth is 5.3 years greater for women with secondary education than for women with no education. Contrasting with other countries in sub-Saharan Africa, the difference in age at first birth between women with primary education and no education in Tanzania is also the highest (1.1 years).

In the Near East/North Africa region, the differences in age at first birth between women with primary and women with no education are small: about 0.3 years on average. On the other hand, the differences between women with secondary or higher education and women with primary education are the highest of any of the regions: 3.8 years on average. Indeed, in Egypt, less than half of the women 25-49 at the time of the survey with secondary education had their first birth by age 25 so that it is not possible to calculate an unbiased median.

In Asia, on average, there is hardly any increase in age at first birth between women with no schooling and primary education (0.2 years) and only a modest average increase between women with primary and secondary or higher education (2.6 years). In part, these results are due to the fact that three of the countries–Kazakhstan, the Kyrgyz Republic and Uzbekistan—have too few women with no

schooling or only primary schooling to present medians for these groups. Where medians can be presented, the largest difference between women with secondary education and women with no schooling occurs in Indonesia and the Philippines (4.0 years), and the smallest is in Vietnam (1.1 years).

Differences in age at first birth by educational level (especially between women with secondary or more education and women with no education) are also observed in the Latin America/Caribbean region. This difference is more than 3.5 years in all countries except Bolivia, where it is 1.7 years. In the Dominican Republic, the difference is about six years, the highest of any country with calculated medians for these two education levels.

4.1.2 First Births to Younger Adolescents

A birth to a girl who has not yet finished her own physical, mental, emotional, and social development creates problems for herself, her child, her family, and the rest of society. In addition to the increased health risks for both the mother and baby, juvenile births also diminish women's autonomy, bargaining power, and appreciation of self-worth. Although the DHS surveys collect information directly from women 15 years of age and older, through the birth history, estimates can be made about fertility at ages younger than 15.

Table 42 presents the percentage of girls 15, 16, and 17 who had had a birth. Overall, the percentage varies with age from 3percent to 8percent to 16 percent, respectively. Regionally, sub-Saharan Africa has the highest levels of births to juveniles. However, there is a large amount of variation within the regions. In sub-Saharan Africa, at age 15, 8 percent of girls in Côte d'Ivoire and 7 percent in the Central African Republic and Niger have had a birth. At age 16, in more than half of the countries, 10 percent or more of girls have had a birth. The countries with the highest percentages of girls16 years old with a child are Niger (20 percent); Guinea (18 percent); and Cameroon, Côte d'Ivoire, and Mali (all 16 percent). At age 17, only one country in sub-Saharan Africa has fewer than 10 percent of girls who have had a birth (Comoros, 5 percent). At this age, the countries with the highest percentages are Niger (39 percent), Mali and Uganda (33 percent each), and Tchad and Guinea (32 percent each).

Among the four Near East/North African countries, all have less than 10 percent of girls with a birth at any of the three ages. In Asia, there are three countries with levels of juvenile childbearing for 10 percent or more of girls: Bangladesh, where the percentages for ages 15, 16, and 17 are 9, 24, and 33 percent, respectively; India, where the percentages are 3, 7, and 15 percent, respectively; and Nepal, where the percentages are 1, 6, and 15 percent, respectively.

In the Latin America/Caribbean region, no country has more than 5 percent of girls age 15 who have given birth. At age 16, however, 12 percent of girls in Nicaragua have started childbearing. At age 17, in six of the eight countries, more than 10 percent of girls have had a child. At this age in two countries, a fifth or more of girls have had a juvenile birth: 22 percent in Nicaragua and 20 percent in the Dominican Republic.

4.1.3 Postponement of Childbearing to Age 30 or Above

Late childbearing is becoming increasingly popular in the more developed countries as women desire to complete their education and establish their career before beginning a family. This pattern of delaying the first child until late in the reproductive period may become established in the middle classes of the more developed of the less developed countries (LDCs), principally those in Asia and the Latin America/Caribbean region. Table 4.3 examines late initial childbearing by presenting the percentage of women 35 years of age and over who had their first child at age 30 years or above. The five-year difference in current age versus age at first birth is used to reduce the effects of truncation on the summary measures.

Table 4.2 Percentage of teenagers 15-17 years old who have had a birth, by age, Demographic and Health Surveys, 1995-1999

Region and country	Age		
	15	16	17
Sub-Saharan Africa			
Benin	1.4	4.3	15.3
Burkina Faso	2.5	3.8	14.3
Cameroon	2.9	15.6	26.2
Central African Republic	7.0	12.0	24.0
Comoros	2.6	3.1	5.2
Côte d'Ivoire	8.0	16.0	28.0
Eritrea	1.5	10.4	12.5
Ghana	0.6	5.0	11.6
Guinea	5.7	17.9	31.7
Kenya	1.7	4.3	14.1
Madagascar	6.0	11.6	29.3
Mali	5.2	16.4	33.2
Mozambique	3.6	15.2	28.0
Niger	7.4	20.3	39.1
Senegal	2.9	7.9	16.1
South Africa	2.0	5.0	11.0
Tanzania	0.9	9.0	9.7
Tchad	4.4	9.9	31.7
Togo	1.1	5.9	14.6
Uganda	4.6	12.9	33.1
Zambia	1.9	10.7	20.3
Zimbabwe	3.0	4.0	13.0
Average	**3.5**	**10.1**	**21.0**
Near East/North Africa			
Egypt	0.6	2.0	6.3
Jordan	0.5	1.7	2.4
Turkey	1.3	1.6	4.9
Yemen	1.0	3.2	9.3
Average	**0.9**	**2.1**	**5.7**
Asia			
Bangladesh	8.5	23.5	32.6
India	3.4	7.4	14.6
Indonesia	1.2	2.3	6.6
Kazakhstan	0.0	0.0	3.3
Kyrgyz Republic	0.0	0.0	1.7
Nepal	1.1	6.4	15.0
Philippines	0.3	0.8	3.6
Uzbekistan	0.0	0.0	0.3
Vietnam	0.0	0.6	1.4
Average	**1.6**	**4.6**	**8.8**
Latin America & Caribbean			
Bolivia	2.6	2.7	10.7
Brazil	3.1	7.5	15.4
Colombia	3.1	7.1	9.3
Dominican Republic	3.1	8.6	19.7
Guatemala	2.6	5.9	18.0
Haiti	2.0	4.0	11.0
Nicaragua	5.1	12.4	22.4
Peru	1.6	5.9	9.1
Average	**2.9**	**6.8**	**14.5**
Grand Average	**2.7**	**7.6**	**15.8**

Table 4.3 Percentage of women age 35 or older who had a birth at age 30 or older, by residence and education, Demographic and Health Surveys, 1995-1999

Region and country	Residence		Education			Total
	Urban	Rural	No schooling	Primary	Secondary or more	
Sub-Saharan Africa						
Benin	2.9	1.9	1.9	1.3	11.3	2.2
Burkina Faso	2.4	1.7	1.8	0.0	5.6	1.8
Cameroon	2.3	1.8	3.1	0.9	1.5	1.9
Central African Republic	3.5	4.7	5.0	3.0	0.0	4.2
Comoros	7.9	4.4	4.5	5.7	17.8	5.3
Cote d'Ivoire	2.8	2.2	2.7	0.2	4.4	2.4
Eritrea	7.8	7.9	8.1	6.1	8.7	7.9
Ghana	4.7	3.6	4.2	3.3	4.0	3.9
Guinea	3.1	1.9	2.0	0.9	5.7	2.2
Kenya	5.0	1.4	1.7	1.6	3.5	2.0
Madagascar	7.0	3.2	4.6	2.6	8.3	4.3
Mali	2.1	2.4	2.2	1.7	6.7	2.3
Mozambique	1.7	4.4	3.8	4.1	0.6	3.9
Niger	0.9	1.9	1.8	0.0	0.0	1.7
Senegal	2.0	1.8	1.4	0.7	7.1	1.9
South Africa	5.0	4.4	4.6	3.7	5.6	4.8
Tanzania	0.6	1.6	1.5	1.0	7.2	1.4
Tchad	1.2	1.5	1.5	1.0	1.7	1.5
Togo	4.4	2.5	2.5	2.8	7.0	3.1
Uganda	3.0	1.4	1.5	1.4	2.5	1.5
Zambia	1.3	1.5	2.1	0.7	2.8	1.4
Zimbabwe	1.2	2.1	2.7	1.1	3.4	1.8
Average	**3**	**3**	**3**	**2**	**5**	**3**
Near East/North Africa						
Egypt	7.2	2.6	2.6	3.7	12.3	5.0
Jordan	6.2	4.5	2.6	4.8	7.4	6.0
Turkey	4.1	2.7	2.0	2.6	9.1	3.6
Yemen	2.2	2.9	2.7	0.0	6.5	2.7
Average	**5**	**3**	**2**	**3**	**9**	**4**
Asia						
Bangladesh	0.6	0.6	0.5	0.8	0.7	0.6
India	3.1	1.3	0.9	1.5	4.2	1.8
Indonesia	3.9	3.5	3.9	2.6	6.5	3.7
Kazakhstan	5.0	2.6	*	*	4.1	4.1
Kyrgyz Republic	5.9	3.1	*	*	3.9	4.1
Nepal	4.4	2.2	2.2	3.2	4.7	2.4
Philippines	10.6	8.2	6.1	5.5	12.3	9.5
Uzbekistan	3.8	2.1	*	*	2.8	2.8
Vietnam	11.1	5.2	4.7	4.2	7.8	6.5
Average	**5**	**3**	**3**	**3**	**5**	**4**
Latin America/Caribbean						
Bolivia	6.2	5.9	5.6	3.7	8.8	6.1
Brazil	7.7	4.4	4.0	5.0	9.6	7.1
Colombia	8.3	6.0	2.6	6.5	9.8	7.7
Dominican Republic	8.4	4.3	2.5	3.2	15.4	7.0
Guatemala	4.7	2.9	3.4	2.7	6.9	3.7
Haiti	10.5	6.3	6.6	7.9	17.5	7.8
Nicaragua	3.2	3.3	2.1	1.8	6.6	3.3
Peru	8.3	3.6	2.4	2.8	11.9	7.0
Average	**7**	**5**	**4**	**4**	**11**	**6**
Grand Average	**4**	**3**	**3**	**3**	**7**	**4**

Note: An asterisk indicates percentage is based on fewer than 25 unweighted women and is not shown.

Overall, about 4 percent of women 35 years of age or older began childbearing at age 30 years or older. There is some variation by region, with late initial childbearing lowest in sub-Saharan Africa (3 percent) and highest in the Latin America/Caribbean region (6 percent). Bangladesh has the lowest percentage of women with a first birth at age 30 or above (0.6 percent). In nine of 22 sub-Saharan countries, less than 2 percent of women started childbearing at age 30 or above. The Philippines is the country with the highest percentage of women with late entry into childbearing, where more than 9 percent of women began at age 30 or above. In the Latin America/Caribbean region, five of eight countries had about 7 percent or more women who began childbearing late. Although there are somewhat higher percentages of women with late initial births in urban areas than in rural areas, the highest percentages starting childbearing late are women with secondary education in the Near East/North Africa and in the Latin America/Caribbean regions. For this education group, the countries with the highest percentage are Comoros and Haiti (nearly 18 percent each) and the Dominican Republic (15 percent).

4.2 Parity Progression and Birth Intervals

In the preceding sections, it has been shown that the fertility transition has advanced in the countries of the Latin America/Caribbean region and Asia, as well as in some countries of sub-Saharan Africa. One objective of this section is to examine two aspects of family formation. The first is the proportion of women at a particular parity who attain the next parity, or the parity progression ratio, which is related to the quantity or quantum of fertility. The other is the time elapsed from one parity to the next, or the distribution of birth intervals, which is related to timing or the tempo of fertility (Ryder, 1980).

4.2.1 Parity Progression

Table 4.4 indicates that in sub-Saharan Africa, when the transition from parity 1 to 2 is examined, the lowest PPRs are observed in South Africa and Zimbabwe (48 percent and 69 percent, respectively). The low proportion of women progressing to parity 2 in these two countries is probably related to the use of contraceptive methods for limiting or spacing births.

PPRs of 90 percent or higher are found in the high-fertility countries, Burkina Faso, Mali, Niger, Tchad, and Uganda, with PPRs up to 94 percent.

An earlier comparative analysis (Mboup and Saha, 1998) found that the PPR in Zimbabwe was 78. The decline may be due to an extension of early contraceptive use. In nine other sub-Saharan countries, it is possible to compare PPRs with those of the survey (Table 4.5). Among these nine, the 1 to 2 PPR dropped by 10 percent and 12 percent in Ghana and Cameroon, respectively. The percentage progressing from parity 1 to 2 dropped by 3percent in Zambia and Madagascar, and by 4 percent in Niger. Only in Burkina Faso did the 1 to 2 PPR increase (3 percent).

In most countries in sub-Saharan Africa, the probability of progression from parity 5 to 6 is fairly high, that is, greater than 70 percent. Of the countries included in this report, only Ghana, South Africa, and Zimbabwe have PPRs for parity 5 to 6 of less than 70 percent. In the latter two countries, the PPR for parity 5 to 6 is somewhat higher than that for parity 4 to 5. This increase may be because women who attain parity 5 are selected for high fertility; their fertility level essentially depends on their natural reproductive capacity. However, this increase may also be because there are sampling variations that are more pronounced with the small numbers of cases at the higher parities. The rest of the sub-Saharan countries have PPRs for parity 5 to 6 that are equally divided between 70 to 79 percent and 80 to 89 percent. The countries with the highest PPRs for parity 5 to 6 are again those with the highest PPRs for parity 1 to 2 and the highest levels of fertility (Burkina Faso, Mali, and Niger).

Table 4.4 Parity progression ratios (quintums) for the six-year period preceding the survey, Demographic and Health Surveys, 1995-1999

Region and country	Parity progression ratio					Percentage reaching parity 6
	Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	
Sub-Saharan Africa						
Benin	899	885	845	843	791	45
Burkina Faso	937	933	896	886	850	59
Cameroon	781	783	786	738	735	26
Central African Republic	799	773	824	799	804	33
Comoros	853	890	795	757	763	35
Côte d'Ivoire	726	779	807	796	728	26
Eritrea	855	840	854	830	846	43
Ghana	768	701	746	667	620	17
Guinea	820	864	813	791	779	35
Kenya	831	752	701	676	757	22
Madagascar	854	877	837	829	792	41
Mali	900	890	881	876	859	53
Mozambique	812	852	726	745	721	27
Niger	918	920	933	909	879	63
Senegal	882	800	841	849	791	40
South Africa	484	415	402	388	444	1
Tanzania	891	773	818	737	770	32
Tchad	925	922	919	938	807	59
Togo	794	802	827	814	815	35
Uganda	918	915	905	866	828	55
Zambia	844	862	857	838	822	43
Zimbabwe	692	598	566	427	568	6
Near East/North Africa						
Egypt	887	711	613	569	559	12
Jordan	953	887	821	721	679	34
Turkey	708	432	414	447	561	3
Yemen	922	928	913	897	860	60
Asia						
Bangladesh	737	639	561	499	567	7
India	835	644	567	526	564	9
Indonesia	525	407	403	406	462	2
Kazakhstan	603	340	412	342	293	1
Kyrgyz Republic	757	584	531	375	386	3
Nepal	911	783	719	697	685	24
Philippines	782	705	598	615	584	12
Uzbekistan	861	672	521	342	307	3
Vietnam	636	356	363	355	279	1
Latin America/Caribbean						
Bolivia	744	644	621	644	680	13
Brazil	600	422	368	468	461	2
Colombia	584	533	466	452	508	3
Dominican Republic	716	700	410	423	544	5
Guatemala	800	739	677	817	800	26
Haiti	773	824	806	797	740	30
Nicaragua	668	594	584	533	581	7
Peru	644	579	536	545	615	7

Note: Parity progression ratio is the proportion of women at each parity who attain the next parity within five years.

Table 4.5 Trends in parity progression ratios (quintums) for the six-year period preceding the survey, Demographic and Health Surveys, 1995-1999

Region and country	Parity progression ratio					
	Parity 1 to 2			Parity 5 to 6		
	Previous survey	Latest survey	Change	Previous survey	Latest survey	Change
Sub-Saharan Africa						
Burkina Faso	909	937	28	871	850	-21
Cameroon	899	781	-118	801	735	-66
Central African Republic	793	799	6	851	804	-47
Ghana	872	768	-104	708	620	-88
Kenya	844	831	-13	712	757	45
Madagascar	885	854	-31	898	792	-106
Niger	954	918	-36	906	879	-27
Senegal	882	882	0	893	791	-102
Zambia	876	844	-32	896	822	-74
Zimbabwe	782	692	-90	684	568	-116
Near East/North Africa						
Egypt	918	887	-31	627	559	-68
Jordan	964	953	-11	842	679	-164
Turkey	813	708	-105	571	561	-10
Asia						
Bangladesh	809	737	-72	560	567	7
India	836	835	-1	604	564	-40
Indonesia	669	525	-144	486	462	-24
Philippines	843	782	-62	719	584	-135
Latin America/Caribbean						
Bolivia	780	744	-36	727	680	-47
Brazil	769	600	-169	562	461	-101
Colombia	625	584	-41	520	508	-12
Dominican Republic	797	716	-82	572	544	-28
Peru	793	644	-149	596	615	19

Note: Parity progression ratio is the proportion of women at each parity who attain the next parity within five years.

Mboup and Saha (1998) found that most countries in sub-Saharan Africa had parity progression ratios for parity 5 to 6 that were above 80 percent. In the countries in this report, less than half have such high ratios. Indeed, the PPRs have decreased in all countries with comparable trend data, except Kenya, which shows a 5 percent rise.

One way of summarizing the parity progression ratios is the percentage of women who reach parity 6 among women who have had at least one birth. In sub-Saharan Africa, the percentage who reach parity 6 from parity 1 varies from 1 percent in South Africa and 6 percent in Zimbabwe, to 63 percent in Niger. Other countries with percentages over 50 percent are Burkina Faso, Mali, Tchad, and Uganda.

The PPRs in Asia and the Near East/North Africa region vary considerably. In Indonesia, Kazakhstan, and Vietnam in Asia and in Turkey in the Near East/North Africa region, where the fertility transition is well advanced, the PPR from parity 1 to 2 is already low (71 percent or less). By contrast, the PPRs at higher parities are greater than 80 percent in Yemen, where the proportion progressing to parity 6 is 86 percent. Overall, the PPRs observed in Yemen and in the early parities in Jordan are as high as those observed in some sub-Saharan countries such as Niger.

There is wide variation in the levels of the PPRs in Asia and the Near East/North Africa region as women progress in parity. The steepest decline occurs in Uzbekistan, from 86 percent for the parity 1 to 2 progression ratio to 31 percent for the parity 5 to 6 progression ratio. Yemen and Indonesia show the least decline in PPR (about 6 percent) but the PPR levels at each parity are very different.

In Turkey, there is a steep fall in the PPR between parities 1 and 2 and 2 and 3, but then there is a substantial rise between parities 4 and 5 and 5 and 6.

As measured by the parity 1 to 6 transition, fertility in Asia and the Near East/North Africa region is generally low with the exception of Yemen. In eight of the 13 countries, fewer than 10 percent of mothers reach parity 6. In Yemen, 60 percent reach parity 6. The country with the next highest percentage is Jordan, where 34 percent reach parity 6 from parity 1.

Six of the seven countries with earlier surveys in Asia and the Near East/North Africa region have had declines in PPRs for parity 1 to 2. The declines vary from basically no change in India to 14 percent in Indonesia. For parity 5 to 6, the PPRs declined in six countries, from the largest decline of 16 percent in Jordan to 1 percent in Turkey. In Bangladesh the PPR rose by less than 1 percent between parity 5 and 6.

In the Latin America/Caribbean region, where the fertility transition is well advanced, PPRs from 1 to 2 are lower on average than those of any other region, varying from 58 percent in Colombia to 80 percent in Guatemala. After parity 1, Haiti and Guatemala have the highest PPRs, that is, greater than 70 percent. For all the remaining countries of the Latin America/Caribbean region, the PPRs are 70 percent or less after parity 1. The lowest PPRs are generally found in Brazil, the Dominican Republic, and Colombia, with PPRs reaching 37 percent, 47 percent, and 47 percent, respectively, for the transition between parity 3 and 4.

The summary measure shows that in five of the eight Latin American/Caribbean countries, less than 10 percent of mothers reached parity 6. In the countries with the highest percentages, Guatemala and Haiti, 26 and 30 percent of mothers had a sixth birth.

Decreases over time in parity progression ratios are also evident in the Latin America/Caribbean region. For PPRs for parity 1 to 2, the declines range from 4percent in Bolivia and Colombia to 17 percent in Brazil. For the transition between parity 5 and 6, the PPRs declined in four countries but rose in Peru by 2 percent.

4.2.2 Socioeconomic Differences in Parity Progression Ratios

This section examines the differentials in PPRs according to urban-rural residence and women's education.

Urban-Rural Residence

To study the relationship between residence and fertility, separate PPRs for urban women and for rural women have been calculated (Table 4.6). Because it is difficult to discuss this large mass of ratios, the discussion is limited to a summary indicator; the percentage of women who progress from parity 1 to parity 6 (PPR 1 to 6) is used for each area of each country.

There is no country in which the percentage of women who progress from parity 1 to 6 in urban areas is equal to or greater than that in rural areas. On average, the greatest urban-rural difference occurs in sub-Saharan Africa (average difference of 23 percent). The smallest average difference between urban and rural areas in PPR 1 to 6 occurs in Asia (8 percent), and the Near East/North Africa and Latin America/Caribbean regions fall in between (differences of 17 and 18 percent, respectively). Sub-Saharan Africa also has the countries with the largest differences between urban and rural areas, Burkina Faso, with a difference of 58 percent, and Tanzania, with a difference of 45 percent. The smallest differences occur in the countries with low fertility: Indonesia (1 percent); Brazil (2 percent); the Kyrgyz Republic (3 percent); and South Africa, Turkey, and Uzbekistan (all 4 percent). It is likely that Kazakhstan and Vietnam also have very small urban-rural differences in the percentage attaining parity 6, but because of small numbers of women at parity 5, the PPR for 5 to 6 is unstable and not shown.

By parity level, the differences between urban and rural areas in PPR increase in the Near East/North Africa region and after parity 3 in sub-Saharan Africa (Figure 4.2). The differences decrease with parity, except for parity 5, in Asia. In the Latin America/Caribbean region, the urban-rural differences in PPR are about constant until parity 5, when the difference decreases. A lot of these differences between areas by parity are related to rural-urban migration, since women at lower parities are more likely to be natives than women at higher parities. If a woman is a migrant, then she brings with her a history of fertility behavior that occurred in an area different from that in which she is currently living. Part of the variation in the urban-rural differences by parity may be due to differing levels of migration between the regions.

Women's Education

The effect of education on the PPR is observed by calculating life tables by birth order separately for three broad educational groups: no education, primary education, and secondary or higher education (Table 4.7). Overall, women with a secondary education show much lower PPRs than women with no education or some primary education. This differential emerges in the transition from parity 1 to 2 and becomes fully fledged in the transition from parity 2 to higher parities.

Only four countries, all in sub-Saharan Africa, have PPRs from parity 1 to 6 for women with primary education that are larger than those for women with no education. For women with secondary or higher education (where there are a sufficient number of cases), the 1 to 6 PPR is 20 percent or less.

Three notable exceptions are Uganda (42 percent), Jordan (33 percent), and Yemen (30 percent), but even in these countries, the PPR 1 to 6 is lower for women with secondary or higher education than for women with lower levels of education. Only four other countries have 1 to 6 PPRs above 20 percent: Mali (26 percent), Zambia (25 percent), the Central African Republic (22 percent), and Madagascar (21 percent). In Asia and the Latin/America Caribbean region, none of the 1 to 6 PPRs for women with secondary education exceeds 8 percent.

Table 4.6 Parity progression ratios (quintums) for the six-year period preceding the survey, by urban-rural residence, Demographic and Health Surveys, 1995-1999

Region and country	Residence	Parity progression ratio: Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	Parity 1 to 6
Sub-Saharan Africa							
Benin	Urban	808	831	756	738	727	273
Benin	Rural	949	916	900	887	818	567
Burkina Faso	Urban	697	776	647	559	569	111
Burkina Faso	Rural	982	946	921	927	872	692
Cameroon	Urban	703	662	710	615	624	127
Cameroon	Rural	815	828	813	785	783	337
Central African Republic	Urban	757	816	848	728	773	295
Central African Republic	Rural	829	751	811	838	829	350
Comoros	Urban	814	842	771	533	(676)	(190)
Comoros	Rural	872	902	809	813	796	412
Côte d'Ivoire	Urban	639	689	755	736	687	168
Côte d'Ivoire	Rural	778	838	835	823	759	340
Eritrea	Urban	739	741	742	873	817	290
Eritrea	Rural	887	867	881	824	858	479
Ghana	Urban	654	594	518	388	275	21
Ghana	Rural	837	741	848	744	715	280
Guinea	Urban	694	852	694	738	712	216
Guinea	Rural	872	869	856	809	800	420
Kenya	Urban	762	575	486	479	(535)	(55)
Kenya	Rural	857	811	758	698	775	285
Madagascar	Urban	778	745	706	768	737	232
Madagascar	Rural	878	921	870	845	809	480
Mali	Urban	855	823	825	850	839	414
Mali	Rural	919	916	905	886	864	584
Mozambique	Urban	731	712	775	650	666	174
Mozambique	Rural	838	884	719	758	744	300
Niger	Urban	847	804	894	798	826	401
Niger	Rural	933	943	943	929	889	686
South Africa	Urban	467	291	309	230	281	3
South Africa	Rural	505	588	517	551	551	47
Senegal	Urban	822	677	709	826	694	226
Senegal	Rural	917	880	896	869	845	530
Tanzania	Urban	796	548	584	170	381	17
Tanzania	Rural	932	838	864	850	817	469
Tchad	Urban	826	914	922	877	860	526
Tchad	Rural	957	924	919	956	794	617
Togo	Urban	679	629	696	695	696	144
Togo	Rural	849	872	872	851	843	463
Uganda	Urban	842	814	812	688	739	283
Uganda	Rural	928	931	919	887	837	589
Zambia	Urban	760	782	820	777	783	297
Zambia	Rural	915	918	888	879	857	561
Zimbabwe	Urban	565	502	464	250	(267)	(9)
Zimbabwe	Rural	778	646	618	508	639	101
Near East/North Africa							
Egypt	Urban	875	601	478	403	359	
Egypt	Rural	897	801	699	664	651	
Jordan	Urban	958	883	811	690	642	
Jordan	Rural	935	915	868	836	856	
Turkey	Urban	658	378	344	402	621	
Turkey	Rural	809	559	512	516	527	
Yemen	Urban	887	914	854	839	735	
Yemen	Rural	937	935	935	916	889	
Asia							
Bangladesh	Urban	613	433	334	423	305	
Bangladesh	Rural	754	667	586	507	581	
India	Urban	779	513	451	472	453	
India	Rural	853	683	597	538	585	
Indonesia	Urban	568	387	314	375	358	
Indonesia	Rural	511	414	431	418	514	
Kazakhstan	Urban	465	251	424	(277)	*	
Kazakhstan	Rural	741	468	409	367	346	
Kyrgyz Republic	Urban	561	476	320	500	(338)	
Kyrgyz Republic	Rural	835	631	622	331	398	
Nepal	Urban	826	529	572	446	(478)	
Nepal	Rural	920	808	733	713	698	
Philippines	Urban	720	656	551	530	490	
Philippines	Rural	849	756	643	673	645	
Uzbekistan	Urban	797	535	441	219	(219)	
Uzbekistan	Rural	898	759	560	415	324	
Vietnam	Urban	409	201	188	(119)	*	
Vietnam	Rural	693	395	381	368	286	
Latin America/Caribbean							
Bolivia	Urban	678	528	507	488	583	
Bolivia	Rural	912	866	785	823	767	
Brazil	Urban	585	400	340	446	442	
Brazil	Rural	670	519	464	510	484	
Colombia	Urban	539	474	410	380	394	
Colombia	Rural	708	673	565	537	604	
Dominican Rep.	Urban	643	665	335	370	536	
Dominican Rep.	Rural	854	777	513	480	551	
Guatemala	Urban	762	677	552	802	778	
Guatemala	Rural	836	793	756	832	811	
Haiti	Urban	652	705	714	550	622	
Haiti	Rural	881	890	855	918	788	
Nicaragua	Urban	586	513	503	410	440	
Nicaragua	Rural	806	723	686	685	701	
Peru	Urban	556	471	420	421	473	
Peru	Rural	849	797	727	691	750	

Note: Parity progression ratio is the proportion of women at each parity who attain the next parity within five years. Parentheses indicate ratio is based on 25 to 49 unweighted women reaching lower parity. An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

Figure 4.2 Urban-rural differences in parity progression ratios by region, Demographic and Health Surveys, 1995-1999

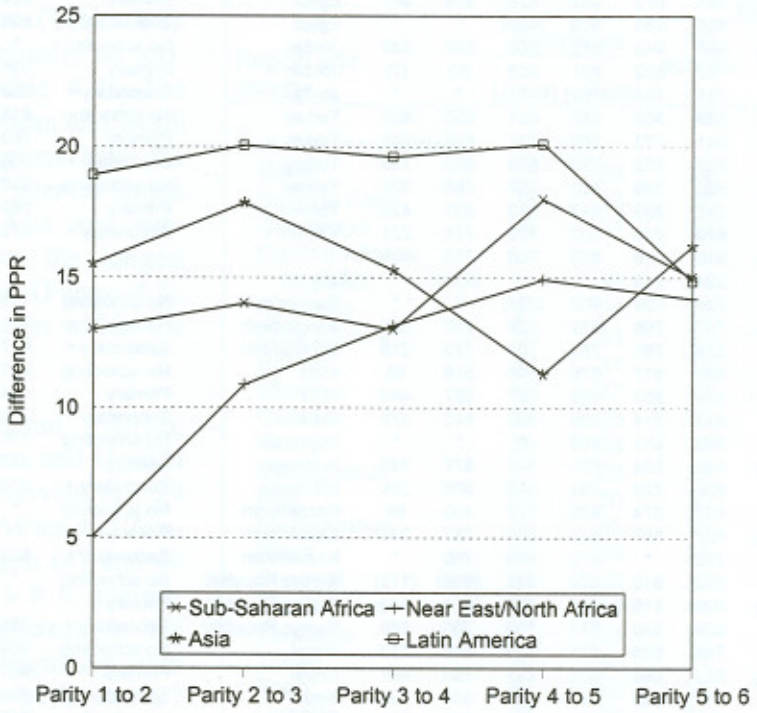


Table 4.7 Parity progression ratios (quintums) for the six-year period preceding the survey, by education, Demographic and Health Surveys, 1995-1999

Region and country	Education	Parity progression ratio: Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	Parity 1 to 6
Sub-Saharan Africa							
Benin	No schooling	933	919	850	875	820	522
Benin	Primary	793	872	932	828	639	341
Benin	Secondary +	858	688	653	(486)	*	*
Burkina Faso	No schooling	968	943	912	900	853	639
Burkina Faso	Primary	762	822	801	803	(6)	(2)
Burkina Faso	Secondary +	714	754	(409)	*	*	*
Cameroon	No schooling	889	902	857	821	855	482
Cameroon	Primary	841	773	769	717	693	248
Cameroon	Secondary +	637	652	732	672	682	139
Central African [illegible]	No schooling	805	749	820	797	785	309
Central African [illegible]	Primary	847	839	847	842	833	422
Central African [illegible]	Secondary +	679	726	802	723	774	221
Comoros	No schooling	910	916	853	780	738	409
Comoros	Primary	824	943	*	*	(910)	*
Comoros	Secondary +	786	739	600	(337)	*	*
Côte d'Ivoire	No schooling	797	796	831	828	750	327
Côte d'Ivoire	Primary	679	795	783	704	723	215
Côte d'Ivoire	Secondary +	530	617	676	740	516	85
Eritrea	No schooling	874	862	868	827	857	463
Eritrea	Primary	813	814	836	805	845	376
Eritrea	Secondary +	843	631	653	*	*	*
Ghana	No schooling	899	854	859	747	677	333
Ghana	Primary	856	729	794	645	808	258
Ghana	Secondary +	657	574	623	577	490	66
Guinea	No schooling	857	857	822	807	787	383
Guinea	Primary	732	*	872	830	760	*
Guinea	Secondary +	592	810	674	531	(656)	(112)
Kenya	No schooling	996	819	732	657	874	343
Kenya	Primary	859	840	741	703	760	285
Kenya	Secondary +	748	586	574	639	686	110
Madagascar	No schooling	864	898	865	941	785	496
Madagascar	Primary	903	923	879	858	843	530
Madagascar	Secondary +	751	779	740	669	724	209
Mali	No schooling	918	909	892	884	864	568
Mali	Primary	881	858	826	864	830	448
Mali	Secondary +	717	697	775	758	(869)	(255)
Mozambique	No schooling	841	830	576	785	748	236
Mozambique	Primary	800	848	872	742	701	308
Mozambique	Secondary +	845	275	421	(460)	*	*
Niger	No schooling	940	931	939	913	883	661
Niger	Primary	785	910	925	946	886	554
Niger	Secondary +	815	777	879	(828)	*	*
Senegal	No schooling	897	846	871	873	814	470
Senegal	Primary	901	796	811	882	698	358
Senegal	Secondary +	685	561	689	555	(811)	(119)
South Africa	No schooling	609	585	577	503	497	51
South Africa	Primary	627	541	510	452	469	37
South Africa	Secondary +	446	350	314	284	373	5
Tanzania	No schooling	901	801	787	785	800	356
Tanzania	Primary	910	760	817	742	764	320
Tanzania	Secondary +	528	813	332	(277)	(553)	22
Tchad	No schooling	935	923	921	943	806	603
Tchad	Primary	918	910	913	926	818	578
Tchad	Secondary +	780	*	948	(939)	(937)	*
Togo	No schooling	821	871	881	843	862	458
Togo	Primary	791	752	863	862	761	337
Togo	Secondary +	673	643	498	385	(629)	(52)
Uganda	No schooling	936	942	878	859	875	582
Uganda	Primary	926	919	934	886	807	569
Uganda	Secondary +	859	843	846	762	908	423
Zambia	No schooling	883	905	813	827	829	446
Zambia	Primary	886	912	879	853	859	520
Zambia	Secondary +	747	727	820	795	698	247
Zimbabwe	No schooling	(747)	*	(588)	(556)	(605)	*
Zimbabwe	Primary	807	639	672	428	575	85
Zimbabwe	Secondary +	630	561	450	364	557	32
Near East/North Africa							
Egypt	No schooling	898	807	733	685	648	235
Egypt	Primary	859	690	598	502	454	81
Egypt	Secondary +	894	633	422	360	223	19
Jordan	No schooling	*	947	918	830	796	*
Jordan	Primary	935	960	804	822	636	377
Jordan	Secondary +	953	879	820	699	686	329
Turkey	No schooling	818	769	722	631	654	187
Turkey	Primary	763	441	343	342	502	20
Turkey	Secondary +	556	225	272	(81)	*	*
Yemen	No schooling	926	937	938	903	875	643
Yemen	Primary	963	903	874	958	782	569
Yemen	Secondary +	870	933	756	726	669	298
Asia							
Bangladesh	No schooling	783	702	645	576	594	121
Bangladesh	Primary	751	619	465	335	509	37
Bangladesh	Secondary +	617	460	393	489	(464)	(25)
India	No schooling	861	757	655	574	597	146
India	Primary	864	679	527	440	504	69
India	Secondary +	791	439	344	320	337	13
Indonesia	No schooling	636	462	513	391	551	32
Indonesia	Primary	482	409	416	438	460	16
Indonesia	Secondary +	574	395	329	326	371	9
Kazakhstan	No schooling	*	*	*	*	*	*
Kazakhstan	Primary	*	*	*	*	*	*
Kazakhstan	Secondary +	603	340	408	343	310	9
Kyrgyz Republic	No schooling	*	*	*	*	*	*
Kyrgyz Republic	Primary	*	*	*	*	*	*
Kyrgyz Republic	Secondary +	756	584	531	375	386	34
Nepal	No schooling	909	817	757	710	694	277
Nepal	Primary	967	799	599	485	(499)	(112)
Nepal	Secondary +	899	513	466	(714)	*	*
Philippines	No schooling	(858)	(861)	(624)	(448)	*	*
Philippines	Primary	858	800	672	721	703	233
Philippines	Secondary +	755	667	565	542	474	73
Uzbekistan	No schooling	*	*	*	*	*	*
Uzbekistan	Primary	*	*	*	*	*	*
Uzbekistan	Secondary +	861	673	521	342	307	32
Vietnam	No schooling	783	794	(574)	*	*	*
Vietnam	Primary	734	561	468	306	262	15
Vietnam	Secondary +	600	271	301	374	255	5
Latin America/Caribbean							
Bolivia	No schooling	930	924	736	783	778	385
Bolivia	Primary	839	780	733	739	712	253
Bolivia	Secondary +	673	490	461	434	521	34
Brazil	No schooling	983	708	771	594	427	136
Brazil	Primary	639	542	440	476	425	31
Brazil	Secondary +	572	326	254	411	583	11
Colombia	No schooling	*	903	(598)	*	(708)	*
Colombia	Primary	670	631	523	479	514	54
Colombia	Secondary +	530	434	387	325	343	10
Dominican Republic	No schooling	932	880	715	598	637	223
Dominican Republic	Primary	801	761	488	410	551	67
Dominican Republic	Secondary +	613	599	227	372	(413)	(13)
Guatemala	No schooling	871	914	757	920	846	469
Guatemala	Primary	794	739	700	807	826	274
Guatemala	Secondary +	810	593	505	(495)	*	*
Haiti	No schooling	853	904	946	821	789	472
Haiti	Primary	788	853	766	816	698	293
Haiti	Secondary +	611	522	431	(578)	*	*
Nicaragua	No schooling	846	755	796	699	689	245
Nicaragua	Primary	772	708	670	565	553	114
Nicaragua	Secondary +	525	409	366	292	418	10
Peru	No schooling	949	901	871	789	750	441
Peru	Primary	851	733	641	602	689	166
Peru	Secondary +	545	462	392	360	379	13

Note: Parity progression ratio is the proportion of women at each parity who attain the next parity within five years. Parentheses indicates the ratio is based on 25 to 49 unweighted women reaching lower parity. An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

4.2.3 Birth Intervals

The average birth interval as calculated by the median duration of closed intervals between births is 33 months (Table 4.8). Overall, there is practically no variation by parity (Table 4.9). The Latin America/Caribbean and North Africa/Near East regions have the shortest averages of interval length (31 months), and Asia and sub-Saharan Africa have the longest averages (34 months) (Figure 4.3). There is some variation within the regions, however.

In sub-Saharan Africa, Comoros, Madagascar, and Uganda have the shortest intervals (all 29 months), and South Africa and Zimbabwe have the longest (47 and 40 months, respectively). It is interesting to note that whereas in the Comoros, intervals beginning with first or second order births last 27 months on average, in South Africa, they last 50 months, a difference of 23 months (Table 4.9). In Comoros, first and second order intervals are the shortest of the intervals by parity, and in South Africa, they are the longest.

Birth intervals of less than 30 months on average occur in two of the four countries of the Near East/North Africa region (Jordan and Yemen), in the Philippines in Asia, and in Guatemala and the Dominican Republic in the Latin America/Caribbean region. Jordan has the shortest average interval (26 months) and the shortest interval by birth order (23 months for intervals beginning with birth order 1 or 2).

Table 4.8 Preceding birth intervals (median), by residence and education, Demographic and Health Surveys, 1995-1999

Region and country	Residence		Education			Total
	Urban	Rural	No schooling	Primary	Secondary or more	
Sub-Saharan Africa						
Benin	35	34	34	34	37	34
Burkina Faso	38	34	35	35	41	35
Cameroon	33	31	30	33	33	32
Central African Republic	31	30	31	30	32	31
Comoros	30	28	29	29	31	29
Côte d'Ivoire	34	33	33	33	36	33
Eritrea	32	31	31	32	30	31
Ghana	43	37	38	38	39	38
Guinea	37	35	35	35	40	35
Kenya	35	33	34	33	34	33
Madagascar	31	29	29	29	30	29
Mali	31	30	30	31	32	30
Mozambique	34	35	35	34	38	35
Niger	32	30	31	30	35	31
Senegal	34	33	33	32	35	33
South Africa	54	43	44	47	49	47
Tanzania	37	33	35	33	36	34
Tchad	30	32	31	31	32	31
Togo	40	35	35	38	40	36
Uganda	28	29	31	29	28	29
Zambia	32	32	33	32	33	32
Zimbabwe	43	39	39	40	40	40
Near East/North Africa						
Egypt	37	30	31	35	33	32
Jordan	26	25	28	26	25	26
Turkey	41	32	31	38	44	37
Yemen	29	28	29	26	28	28
Asia						
Bangladesh	43	36	36	37	41	37
India	31	31	31	30	31	31
Indonesia	48	44	44	48	42	45
Kazakhstan	39	29	*	*	32	32
Kyrgyz Republic	34	31	*	*	32	32
Nepal	33	32	33	30	29	32
Philippines	29	28	26	28	29	28
Uzbekistan	32	30	*	*	31	31
Vietnam	48	35	30	36	36	36
Latin America/Caribbean						
Bolivia	33	29	31	29	35	31
Brazil	38	30	31	33	40	36
Colombia	38	29	30	31	38	34
Dominican Republic	31	27	28	28	32	29
Guatemala	32	28	28	29	34	29
Haiti	32	30	31	30	30	30
Nicaragua	33	29	28	30	38	30
Peru	37	30	31	31	37	33

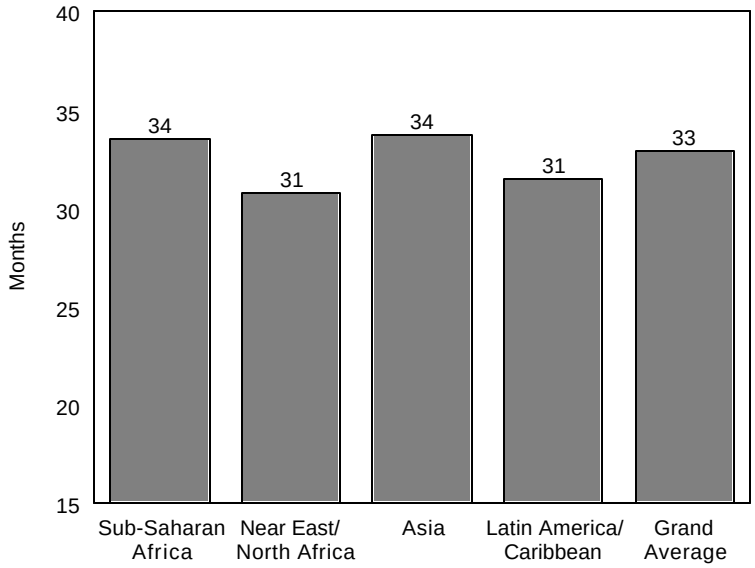
Note: An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

Table 4.9 Preceding birth intervals (median) by sex, survival, and birth order of preceding child, Demographic and Health Surveys, 1995-1999

Region and country	Sex of preceding child		Survival of preceding child		Birth order of preceding child		
	Male	Female	Living	Dead	1-2	3-5	6 or higher
Sub-Saharan Africa							
Benin	34.0	33.6	34.8	27.7	33.9	33.9	33.4
Burkina Faso	34.6	34.9	36.1	28.5	33.9	35.2	35.4
Cameroon	32.0	31.1	32.5	25.2	31.5	31.6	31.5
Central African Republic	30.6	30.7	31.4	26.1	30.4	31.4	29.6
Comoros	28.6	29.1	29.7	23.5	26.9	30.6	29.9
Côte d'Ivoire	33.0	33.4	34.1	26.7	34.4	32.8	31.9
Eritrea	31.2	31.3	31.7	27.7	31.7	32.2	29.1
Ghana	38.9	37.4	39.1	28.8	38.2	38.8	37.5
Guinea	35.2	35.6	36.4	26.5	35.3	35.6	34.9
Kenya	32.9	32.9	33.7	25.0	32.5	33.1	33.3
Madagascar	29.5	29.2	30.0	25.8	28.9	29.5	29.8
Mali	30.3	30.3	31.7	26.1	29.9	30.7	30.2
Mozambique	35.2	33.9	35.8	29.1	34.7	34.8	33.4
Niger	30.9	30.4	32.3	26.2	29.9	31.4	30.7
Senegal	33.0	33.0	33.5	29.3	33.0	33.2	32.8
South Africa	47.1	47.0	47.9	30.6	49.7	45.6	36.1
Tanzania	33.6	33.7	34.2	28.1	33.4	33.8	33.9
Tchad	31.0	31.2	32.1	27.0	30.5	31.8	31.1
Togo	35.6	36.5	36.7	30.6	36.5	36.2	34.5
Uganda	29.4	29.2	29.7	26.5	29.0	29.3	29.7
Zambia	32.3	31.6	32.7	26.7	31.3	31.7	33.9
Zimbabwe	40.1	39.8	41.3	28.5	39.5	41.6	39.4
Near East/North Africa							
Egypt	33.6	30.8	33.0	25.4	30.5	34.2	34.2
Jordan	26.1	24.9	25.8	18.8	22.6	27.8	29.9
Turkey	38.0	36.1	38.4	21.6	37.6	37.5	33.6
Yemen	28.9	27.8	28.8	23.4	26.1	28.3	30.0
Asia							
Bangladesh	37.1	36.2	37.9	26.8	37.8	36.1	33.4
India	31.1	30.6	31.6	25.2	30.7	31.1	29.9
Indonesia	44.9	45.8	46.9	31.7	47.3	46.2	35.8
Kazakhstan	31.0	32.2	32.1	23.9	30.7	33.2	*
Kyrgyz Republic	32.3	31.6	32.9	19.6	29.2	37.5	38.2
Nepal	33.0	31.1	32.7	26.4	31.4	32.4	32.9
Philippines	28.7	27.8	28.5	24.7	26.7	30.2	28.6
Uzbekistan	32.4	29.4	31.1	22.3	28.1	35.0	38.7
Vietnam	36.3	35.1	36.3	24.9	35.7	35.9	33.1
Latin America/Caribbean							
Bolivia	30.2	30.8	31.3	24.3	31.0	30.4	30.1
Brazil	35.5	35.9	36.9	22.9	38.6	30.0	31.0
Colombia	33.4	34.2	34.4	23.0	35.3	32.2	30.0
Dominican Republic	28.9	29.1	29.7	24.8	29.1	29.1	28.0
Guatemala	29.5	28.3	29.2	24.0	28.8	29.4	28.3
Haiti	30.4	30.5	30.9	26.6	29.4	31.2	30.9
Nicaragua	30.8	30.1	30.8	24.1	31.3	31.5	27.6
Peru	32.9	33.1	33.6	27.1	33.7	33.3	31.3

Note: An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

Figure 4.3 Median length of preceding birth interval by region, Demographic and Health Surveys, 1995-1999

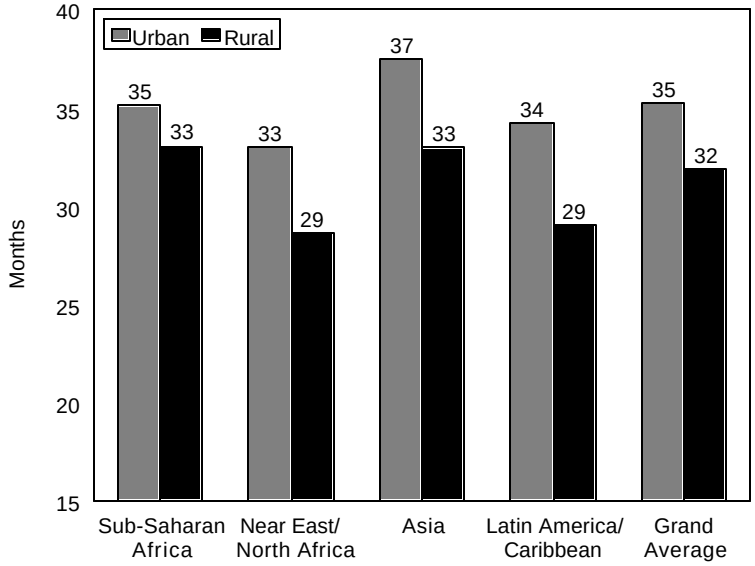


Urban-Rural Residence

In sub-Saharan Africa, urban areas have an average length of birth interval that is two months longer than rural areas (Figure 4.4). The countries with the greatest urban-rural differences in birth interval in sub-Saharan Africa are South Africa and Ghana, where urban areas have average intervals of 11 and six months longer than rural areas, respectively.

In both the Near East/North Africa region and Asia, urban areas have average lengths of intervals that are four months longer than in rural areas. In the Latin America/Caribbean region, the urban

Figure 4.4 Median length of preceding birth interval by residence and region, Demographic and Health Surveys, 1995-1999



advantage is five months on average. However, in Brazil, Colombia, and Peru, this advantage rises to seven months or more.

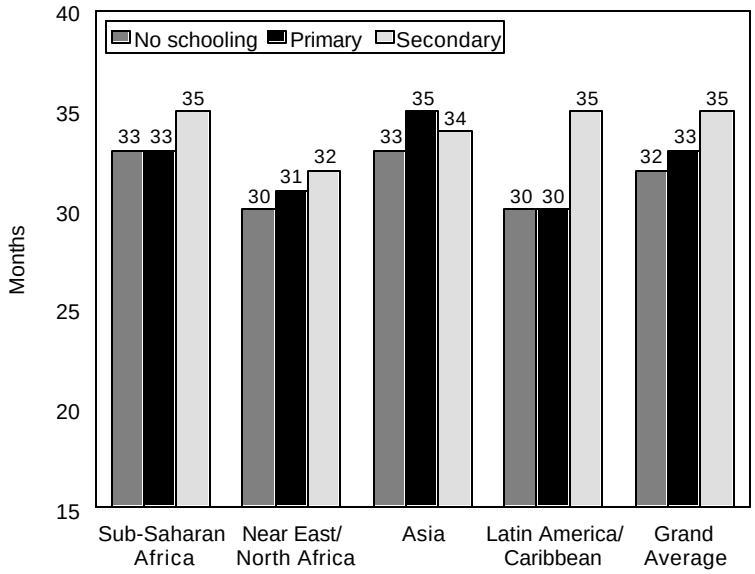
Overall, the longer intervals in urban areas are likely due to higher rates of contraceptive use, enough to offset a decrease in interval length due to shortened postpartum amenorrhea and/or abstinence that may also be found in urban areas.

Women's Education

One would expect that as education of women increases, changes in fertility would begin by reductions in the length of breastfeeding and postpartum abstinence, followed by contraceptive practice that is mainly for limiting the number of births. These changes would lead to shorter birth intervals among more educated women. In none of the regions is this hypothesis confirmed. Indeed, in sub-Saharan Africa, the duration of birth intervals for women with secondary or more education, averaged across parities and countries, is two months longer than for women with no education or for women with primary education (Figure 4.5). In fact, in only two of the 22 sub-Saharan countries does the birth interval for women with no education exceed that for women with secondary or more education, and that is only by one month in Eritrea. In Uganda, the excess is three months. At the other extreme, in Burkina Faso, Guinea, Niger, South Africa, and Togo, the women with secondary or more education have intervals four or more months longer than women with no education.

In the Latin America/Caribbean region, women with secondary or more education have birth intervals that are six months longer, on average, than women with no education. In the Near East/North Africa region, the average of the difference is three months, and in Asia, this difference is one month on average.

Figure 4.5 Median length of preceding birth interval by mother's education and region, Demographic and Health Surveys, 1995-1999



Survival of the Preceding Child

The average duration of birth intervals varies substantially according to the survival of the preceding child. There are three mechanisms that can explain this difference. The first is the cessation of breastfeeding, which leads to a cessation of postpartum amenorrhea. The second is a desire to replace the child, which can lead to a reduction in postpartum abstinence and less use of contraception. A third mechanism is that short birth intervals increase the preceding child's chance of dying.

Overall, the average duration is eight months shorter if the preceding child did not survive until the date of the survey. The smallest reduction in birth interval occurred in Uganda (three months), and the greatest occurred in South Africa and Turkey (both 17 months). Nine other countries had reductions of 10 or more months in the birth interval if the preceding child died: Bangladesh (11), Brazil (14), Ghana (10), Guinea (10), Indonesia (15), the Kyrgyz Republic (13), Vietnam (11), and Zimbabwe (13).

By region, the greatest reductions in the duration of birth intervals occurred in the Near East/North Africa region and Asia (nine months), and the least occurred in sub-Saharan Africa (seven months).

Sex of the Child

Overall, there is almost no difference in the duration of birth intervals according to the sex of the preceding child. In only five countries does the difference between intervals by sex vary by more than one month. In each of those five countries, birth intervals are longer if the preceding birth was of a male child. Egypt and Uzbekistan had intervals three months longer following a male birth, and Ghana, Nepal, and Turkey had intervals two months longer.

Given that male children generally have higher rates of mortality, it could be expected on that basis that birth intervals following a boy's birth would be shorter than those following a girl's due to cessation of breastfeeding and therefore a reduction in the duration of postpartum amenorrhea. Therefore, it is unclear whether the longer intervals following a male birth are due to longer postpartum amenorrhea (due to longer breastfeeding or later introduction of complementary foods), longer postpartum abstinence, or greater use of contraception for spacing births.

Short Birth Intervals

Birth intervals have been shown to have a substantial effect on the mortality of children (Hobcraft et al., 1983). Initial studies of intervals classified into two-year groups indicated that birth intervals shorter than 24 months are associated with elevated mortality risks. A subsequent study using intervals classified into six-month groups revealed that births occurring after an interval of 24 to 35 months also have elevated mortality risks compared with intervals of 36 months or more (Rutstein, 2000).

Tables 4.10 and 4.11 show the percentages of births after intervals of less than 24 months and less than 36 months, respectively, for all births and by residence and education. The discussion here will concentrate on intervals of less than 36 months to avoid unnecessary repetition.

Overall, 58 percent of births of second order or higher occur after an interval of 35 months or less. The Near East/North Africa region has the highest average percentage of short-interval births (62 percent), and Asia has the lowest average percentage (56 percent), with the Latin America/Caribbean region and sub-Saharan Africa in between (60 percent and 58 percent, respectively).

By country, there is wide variation in the percentages of births after a short interval. In South Africa and Indonesia, 33 and 36 percent of children, respectively, are born after a short interval. At the other extreme, in Jordan and Uganda, 74 and 70 percent, respectively, of births have short intervals.

Table 4.10 Percentage of birth intervals less than 24 months, by residence and education, Demographic and Health Surveys, 1995-1999

Region and country	Residence		Education			Total
	Urban	Rural	No schooling	Primary	Secondary or more	
Sub-Saharan Africa						
Benin	15	17	17	15	13	17
Burkina Faso	12	18	17	15	9	17
Cameroon	23	26	29	23	21	25
Central African Republic	24	27	26	27	22	26
Comoros	32	35	35	35	29	34
Côte d'Ivoire	17	22	21	20	16	20
Eritrea	28	25	25	27	31	26
Ghana	12	14	14	13	13	13
Guinea	14	18	17	16	11	17
Kenya	24	23	21	23	24	23
Madagascar	29	31	35	30	28	31
Mali	22	27	27	23	18	26
Mozambique	19	18	20	18	11	19
Niger	21	25	24	27	21	25
Senegal	18	18	17	20	18	18
South Africa	11	16	14	13	14	14
Tanzania	13	18	18	18	15	18
Tchad	26	23	24	24	24	24
Togo	10	16	16	11	9	14
Uganda	35	27	25	29	34	28
Zambia	20	19	18	20	19	19
Zimbabwe	12	11	11	11	11	11
Near East/North Africa						
Egypt	22	28	27	22	28	26
Jordan	43	48	35	40	46	44
Turkey	22	32	30	26	19	26
Yemen	35	37	36	43	37	37
Asia						
Bangladesh	17	18	18	18	16	18
India	29	28	28	28	30	28
Indonesia	16	15	14	14	19	15
Kazakhstan	26	39	*	*	34	34
Kyrgyz Republic	28	30	*	*	30	30
Nepal	25	24	24	26	30	24
Philippines	35	36	41	34	36	36
Uzbekistan	30	30	*	*	30	30
Vietnam	18	19	23	20	18	19
Latin America/Caribbean						
Bolivia	27	30	26	30	27	28
Brazil	27	35	32	33	25	29
Colombia	26	35	33	32	26	30
Dominican Republic	33	38	33	37	33	35
Guatemala	32	32	30	34	28	32
Haiti	26	25	24	27	30	25
Nicaragua	30	34	35	34	26	32
Peru	23	26	25	25	24	24

Note: An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

Table 4.11 Percentage of birth intervals less than 36 months, by residence and education, Demographic and Health Surveys, 1995-1999

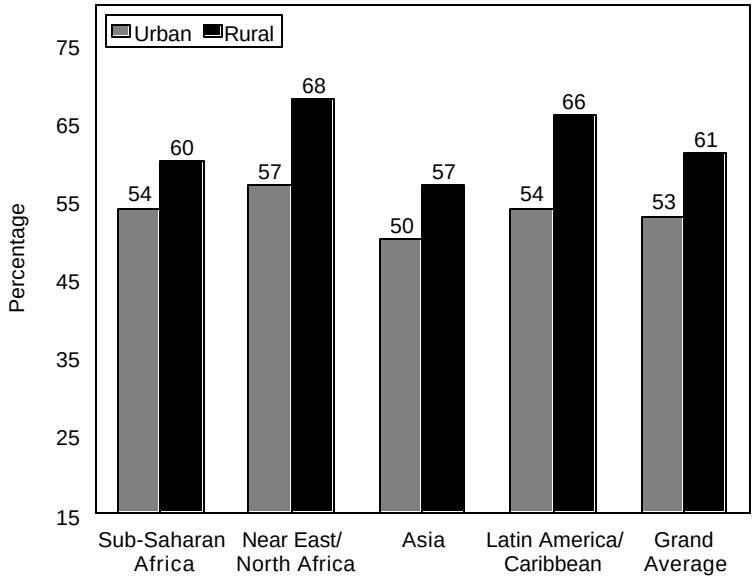
Region and country	Residence		Education			Total
	Urban	Rural	No schooling	Primary	Secondary or more	
Sub-Saharan Africa						
Benin	55	60	59	57	46	58
Burkina Faso	42	55	54	56	36	54
Cameroon	60	64	69	60	58	63
Central African Republic	65	67	66	68	61	66
Comoros	62	70	68	70	63	68
Côte d'Ivoire	55	61	60	59	50	59
Eritrea	61	66	65	64	61	65
Ghana	35	46	46	44	41	44
Guinea	48	54	53	55	42	53
Kenya	53	58	55	59	56	58
Madagascar	64	68	68	68	65	67
Mali	62	68	67	65	59	66
Mozambique	55	53	52	55	47	54
Niger	62	69	69	66	52	68
Senegal	57	62	61	60	56	60
South Africa	26	39	37	33	32	33
Tanzania	47	60	55	59	50	58
Tchad	69	65	65	69	64	66
Togo	40	53	53	45	40	50
Uganda	69	70	64	72	74	70
Zambia	64	64	61	66	60	64
Zimbabwe	33	43	42	40	39	40
Near East/North Africa						
Egypt	48	64	62	52	57	58
Jordan	72	81	70	71	75	74
Turkey	42	57	59	46	35	48
Yemen	66	69	68	72	68	68
Asia						
Bangladesh	37	49	50	47	40	48
India	61	63	62	64	62	63
Indonesia	35	37	37	34	41	36
Kazakhstan	49	63	*	*	57	57
Kyrgyz Republic	52	60	*	*	58	58
Nepal	58	61	59	68	70	61
Philippines	62	69	68	69	64	66
Uzbekistan	59	64	*	*	63	63
Vietnam	37	53	64	50	50	51
Latin America/Caribbean						
Bolivia	54	69	62	68	51	62
Brazil	47	60	60	54	45	51
Colombia	47	64	59	59	47	54
Dominican Republic	58	68	70	64	57	62
Guatemala	60	72	72	68	54	68
Haiti	61	66	63	67	62	65
Nicaragua	55	66	68	63	48	60
Peru	48	65	63	60	48	56

Note: An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

Children of mothers residing in urban areas and children of mothers with secondary education or more are less likely to be born after short birth intervals than children of mothers in rural areas or of mothers with lower than secondary education. The overall difference between urban and rural areas is 8 percent. Figure 4.6 shows the average values. The excess of short-interval births in rural sub-Saharan Africa is 10 percent or more than that of urban areas in six of 22 countries. A 10 percent or greater difference also occurs in two of four Near East/North Africa countries, three of nine Asian countries, and all but one of the eight Latin American/Caribbean countries.

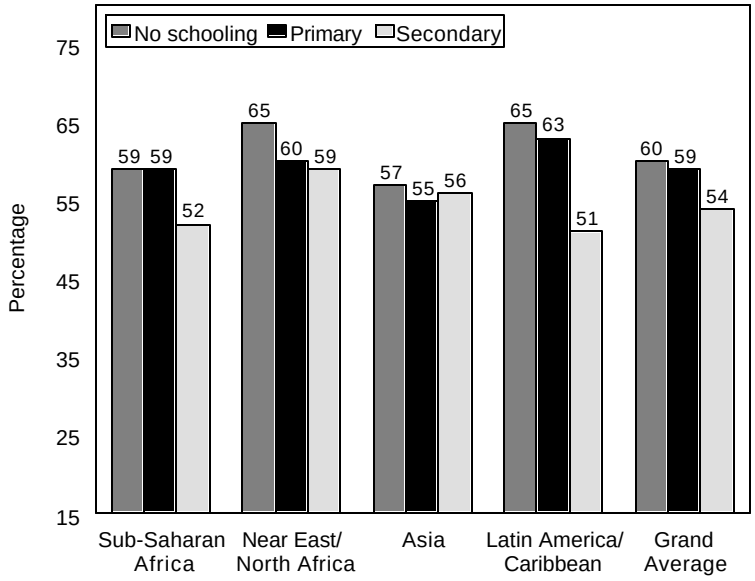
The overall difference between women with no schooling and secondary or more education is 7 percent.[10] Average values for the region by education are shown in Figure 4.7. The Latin America/ Caribbean region has the most countries with a 10 percent or more difference (seven of eight countries) and an average difference for the region of 13 percent. Seven countries in sub-Saharan Africa have 10 percent or more difference, as well as one in Near East/North Africa and two in Asia. In only four countries—Jordan, Indonesia, Nepal, and Uganda—are there more children of women with secondary or more education with short birth intervals than children of women with no schooling.

Figure 4.6 Percentage of preceding birth intervals less than 36 months in length by residence and region, Demographic and Health Surveys, 1995-1999



[10] In three countries in Asia, former Soviet republics, there are too few births to women of less than secondary education to show the percentage of children born after short birth intervals. These countries are not included in the regional or overall averages.

Figure 4.7 Percentage of preceding birth intervals less than 36 months in length by mother's education and region, Demographic and Health Surveys, 1995-1999



5 Proximate Determinants Model

5.1 Bongaarts' Proximate Determinants Model

One useful way to summarize the proximate determinants of fertility is through the use of a model. John Bongaarts (1978) developed the best known of these models. Although this model has received substantial criticism, primarily due to a lack of consideration of demand factors, this criticism rightly applies to a misuse of the model: use of the model to project fertility levels given changes in the model's parameters. As a descriptive tool, the model is useful and does not have the pitfalls involved when it is used for projection. The use here is purely descriptive.

The Bongaarts proximate determinants model summarizes the effects of four principal factors on fertility: entry into regular sexual relations (C_m, the index of marriage), prevalence and efficacy of contraception (C_c), postpartum infecundity due to postpartum lactational amenorrhea and postpartum abstinence (C_i), and incidence of induced abortion (C_a). Other proximate determinants, such as frequency of sexual relations, fecundability, secondary sterility, and fetal death and still birth rates are considered to have minor impacts on differences in fertility due either to reduced variation among countries or small effects on fertility; therefore they are essentially held constant in the model. Each of the four parameters represents a proportionate decrease in actual fertility from potential fertility (TF, total fecundity). Empirical studies by Bongaarts led him to adopt 15.3 children as the average level of fertility that women would have if they had none of the fertility restrictions imposed by the proximate determinants, that is, if they married at age 15, used no contraception, did not breastfeed or abstain from sex after a birth, and had no induced abortions.

C_m, the index of entry into marriage, is calculated as the ratio of the total fertility rate to the total marital fertility rate.[11]

C_c, the index of the effect of contraception, combines method-specific rates of contraceptive use with method-specific effectiveness rates estimated from empirical studies. In our application of the model, we use the effectiveness rates given by Bongaarts as constants that do not vary over countries or within countries.

C_i, the index of the effect of postpartum infecundity, is calculated as the ratio of the waiting time from a birth to conception in the absence of lactational amenorrhea or extended postpartum abstinence to the increased time due to either or both of the postpartum effects. The duration of postpartum infecundity is measured directly in the applications given here.

For most countries, the true incidence of induced abortion is impossible to measure. Due to this fact, C_a is not estimated and is assumed to be 1. For a few countries, notably those of central Asia, Turkey, and Vietnam, abortion rates can be calculated from the DHS data, although their completeness may be questionable because of a reluctance to disclose abortions even in countries where abortion is legal. For these countries, the complete Bongaarts model is presented separately.

5.2 Delayed Entry into Sexual Union

Table 5.1 presents the Bongaarts model parameters and total fecundity for countries as a whole and for urban and rural areas. The reduction in fertility due to delayed entry into regular sexual relations

[11] In the DHS surveys, marital rates are for women who have ever been married (ever-married rates). Women are considered ever married if they were married to or lived with a man at any time. In South Africa, because of the low proportion of women in cohabiting consensual unions and the high proportion of births outside of marriage or a consensual union, women who had a regular sexual partner at the time of the survey were included in the ever-married category for the sake of the marital fertility rate in the calculation of the C_m index.

Table 5.1 Bongaarts' proximate determinants of fertility model parameters, by urban-rural residence, Demographic and Health Surveys, 1995-1999

Region and country	C_m			C_c			C_i			Total fecundity		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Sub-Saharan Africa												
Benin	0.70	0.87	0.80	0.87	0.91	0.89	0.56	0.53	0.54	13.8	15.9	15.2
Burkina Faso	0.67	0.91	0.87	0.77	0.95	0.93	0.57	0.48	0.48	*	16.7	16.3
Cameroon	0.60	0.77	0.71	0.74	0.91	0.86	0.64	0.57	0.58	(12.1)	12.9	12.7
Central African Republic	0.67	0.81	0.75	0.87	0.96	0.93	0.61	0.54	0.57	12.3	11.9	12.0
Comoros	0.50	0.61	0.57	0.80	0.86	0.85	(0.77)	0.66	0.68	*	14.5	13.9
Côte d'Ivoire	0.63	0.76	0.71	0.84	0.95	0.91	0.59	0.55	0.56	12.5	13.7	13.3
Eritrea	0.53	0.82	0.73	0.84	0.99	0.95	0.63	0.56	0.57	15.1	15.4	15.4
Ghana	0.57	0.74	0.68	0.76	0.86	0.83	(0.62)	0.57	0.58	(10.7)	14.2	13.2
Guinea	0.75	0.95	0.88	0.89	0.98	0.95	0.49	0.47	0.48	(12.8)	13.8	13.6
Kenya	0.58	0.67	0.65	0.60	0.71	0.68	(0.71)	0.65	0.66	(11.2)	15.1	14.5
Madagascar	0.60	0.69	0.67	0.74	0.89	0.85	0.70	0.62	0.64	(12.5)	16.0	15.2
Mali	0.75	0.94	0.88	0.87	0.98	0.95	0.63	0.58	0.59	12.4	13.5	13.3
Mozambique	0.71	0.83	0.80	0.85	0.98	0.95	0.64	0.52	0.54	11.0	12.0	11.8
Niger	0.68	0.95	0.89	0.82	0.97	0.95	0.63	0.57	0.58	*	14.5	14.7
Senegal	0.56	0.84	0.71	0.82	0.96	0.91	0.62	0.56	0.58	14.1	14.7	14.6
South Africa[1]	0.33	0.44	0.38	0.40	0.62	0.51	*	0.59	0.59	*	16.0	15.3
Tanzania	0.52	0.77	0.70	0.69	0.86	0.82	0.68	0.59	0.60	(11.3)	15.9	15.0
Tchad	0.80	0.88	0.86	0.94	0.99	0.98	0.60	0.53	0.55	(12.8)	14.0	13.8
Togo	0.55	0.79	0.70	0.82	0.88	0.86	0.58	0.53	0.54	11.6	16.7	15.4
Uganda	(0.63)	0.80	0.78	(0.69)	0.91	0.89	0.71	0.62	0.63	*	15.3	15.3
Zambia	0.61	0.73	0.68	0.75	0.89	0.83	0.69	0.60	0.63	15.1	16.8	16.2
Zimbabwe	0.60	0.72	0.67	0.50	0.63	0.58	0.62	0.61	0.61	(14.6)	15.6	15.5
Average	**0.63**	**0.80**	**0.75**	**0.77**	**0.89**	**0.86**	**0.63**	**0.57**	**0.58**	**12.8**	**14.8**	**14.4**
North Africa/Near East												
Egypt	0.56	0.69	0.63	0.54	0.65	0.60	0.79	0.70	0.73	12.7	13.3	13.0
Jordan	0.52	0.54	0.52	0.57	0.63	0.58	0.86	(0.83)	0.85	16.6	(17.6)	16.8
Turkey	0.65	0.62	0.64	0.48	0.57	0.51	0.79	0.78	0.79	9.7	11.1	10.2
Yemen	0.66	0.78	0.75	0.73	0.90	0.86	0.76	0.71	0.72	13.5	14.0	14.0
Average	**0.60**	**0.66**	**0.64**	**0.58**	**0.69**	**0.64**	**0.80**	**0.76**	**0.77**	**13.1**	**14.0**	**13.5**
Asia												
Bangladesh	0.67	0.87	0.85	0.50	0.56	0.55	0.72	0.66	0.67	*	10.6	10.4
India	0.61	0.79	0.75	0.60	0.64	0.63	0.73	0.65	0.66	8.6	9.3	9.1
Indonesia	0.53	0.77	0.69	0.48	0.49	0.49	0.72	0.64	0.66	13.1	12.3	12.5
Kazakhstan	0.47	0.54	0.50	0.47	0.56	0.52	(0.76)	*	0.76	(8.8)	*	10.3
Kyrgyz Republic	0.60	0.70	0.67	0.49	0.57	0.55	*	0.71	0.72	*	13.8	12.8
Nepal	0.69	0.83	0.82	0.61	0.76	0.74	0.70	0.63	0.64	*	12.1	12.0
Philippines	0.45	0.64	0.53	0.61	0.68	0.65	0.79	0.72	0.75	13.6	14.8	14.2
Uzbekistan	0.64	0.69	0.67	0.57	0.56	0.57	0.82	0.76	0.78	9.1	12.7	11.3
Vietnam	0.38	0.56	0.53	0.42	0.39	0.40	*	0.72	0.73	*	16.1	15.1
Average	**0.56**	**0.71**	**0.67**	**0.53**	**0.58**	**0.57**	**0.75**	**0.69**	**0.71**	**10.6**	**12.7**	**12.0**
Latin America/Caribbean												
Bolivia	0.53	0.72	0.59	0.55	0.76	0.62	0.70	0.64	0.67	15.3	17.2	16.2
Brazil	0.51	0.66	0.54	0.19	0.37	0.29	0.79	0.84	0.80	28.0	16.1	18.7
Colombia	0.49	0.66	0.53	0.34	0.38	0.36	0.83	0.80	0.82	16.4	19.9	17.5
Dominican Republic	0.50	0.72	0.57	0.44	0.44	0.44	0.84	0.82	0.83	14.7	14.9	14.8
Guatemala	0.60	0.72	0.67	0.55	0.77	0.67	0.72	0.64	0.67	16.5	16.1	16.3
Haiti	0.56	0.70	0.64	0.79	0.90	0.86	0.72	0.60	0.63	10.3	15.3	13.7
Nicaragua	0.59	0.74	0.65	0.39	0.50	0.41	0.77	0.72	0.75	16.1	18.3	17.9
Peru	0.51	0.71	0.57	0.43	0.58	0.48	0.73	0.65	0.69	16.6	19.8	18.0
Average	**0.54**	**0.70**	**0.60**	**0.46**	**0.59**	**0.52**	**0.76**	**0.71**	**0.73**	**16.7**	**17.2**	**16.6**

Note: Parentheses indicate the ratio is based on 25 to 49 unweighted women reaching lower parity. An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.
[1] C_m also based on women with regular partners (see footnote 11, page 51).

is greatest in the Latin America/Caribbean region (40 percent, with a C_m index of 0.60) to a low of 25 percent in sub-Saharan Africa (C_m of 0.75).[12] South Africa has the lowest C_m index of all the countries. However, this country's value is misleading since more births occur outside of cohabitation than within.

The lowest values of C_m—indicating the greatest reductions in fertility due to delayed entry into sexual union—occur in Comoros (0.57) in sub-Saharan Africa; Jordan (0.52) in the Near East/North Africa region; the Philippines (0.53), Vietnam (0.53) and Kazakhstan (0.50) in Asia; and Colombia (0.53), Brazil (0.54), the Dominican Republic (0.57), Peru (0.57), and Bolivia (0.59) in the Latin America/Caribbean region. Seven of the 22 countries in sub-Saharan Africa have values of 0.80 or above, as do Nepal and Bangladesh in Asia. In the Latin America/Caribbean region, no countries have a C_m of 0.70 or more, and only Yemen (0.75) does in the Near East/North Africa region.

Urban areas have lower values of C_m than rural areas. By region the urban areas are 0.15 to 0.17 lower in sub-Saharan Africa, Asia, and the Latin America/Caribbean region. Only in the Near East/North Africa region is the difference less (0.06), in part due to a lower C_m for rural areas.

By country, the lowest urban values of C_m occur in Vietnam (0.38), the Philippines (0.45), Kazakhstan (0.47), and Colombia (0.49). In the Latin America/Caribbean region, all countries have an urban C_m of 0.60 or lower. Regarding the countries of other regions, five of nine countries in Asia have urban C_ms of 0.60 or lower, as do ten of 22 countries in sub-Saharan Africa and two of four countries in the Near East/North Africa region. The highest C_m values for urban areas are in Tchad (0.80), Guinea, and Mali (both 0.75).

In rural areas, the highest levels of C_m, indicating little reduction in fertility due to delayed entry into sexual union, occur in sub-Saharan Africa, where four countries have values that exceed 0.90 (Burkina Faso, 0.93; Mali, 0.94; Guinea, 0.95; and Niger, 0.95). Also in sub-Saharan Africa, seven additional countries have rural C_m values between 0.80 and 0.89. In the other regions, the C_m in the rural areas in only two countries equals or exceeds 0.80 (Nepal, 0.83 and Bangladesh, 0.87). Aside from South Africa, in these regions, the rural areas of only two countries have C_m values of less than 0.60: Jordan at 0.54 and Vietnam at 0.56.

5.3 Contraception

The index of the effect of contraception on fertility, C_c, is based on the use of contraceptive methods among women in union by type of method and on the efficacy of the methods. Sub-Saharan Africa is the region with the least effect of contraception, with a value of C_c of 0.86 on average, which is less than the effects of either delayed entry into a union or postpartum infecundity. The Latin America/Caribbean region has the greatest reduction in fertility due to contraception with an average value for C_c of 0.52. Asia, with 0.57, and the Near East/North Africa region, with 0.64, follow.

By country, no countries in Sub-Saharan Africa, except South Africa, or in the Near East/North Africa region have values of C_c less than 0.50. Two of the nine countries in Asia have such low values, but a majority (five of eight) in the Latin America/Caribbean region do. Indeed the values of C_c for Brazil and Colombia are 0.29 and 0.36, respectively. At the other extreme, nine of 22 sub-Saharan countries have C_c values of 0.90 or more, and ten have values between 0.80 and 0.89. Only two other countries have values that exceed 0.80: Haiti and Yemen, both with 0.86.

Urban areas have lower values of C_c, indicating a greater effect of contraception, than rural areas. The differential is greatest in sub-Saharan Africa and in the Latin America/Caribbean region (0.12 and

[12] The values for regions and all countries together are unweighted averages of the model parameters.

0.13 points of difference, respectively). The region with the smallest differential is Asia (difference of 0.05).

In two countries, Vietnam and Uzbekistan, the value of C_c for rural areas is lower than that for urban areas (by 0.03 and 0.01, respectively). Other countries with small differences between urban and rural areas in the effect of contraception on the level of fertility are the Dominican Republic (no difference in C_c), India, Indonesia, and Colombia (urban areas lower by 0.01, 0.04, 0.04, and 0.04, respectively). Large differences, 0.20 or more, occur in Uganda in sub-Saharan Africa and Bolivia and Guatemala in the Latin America/Caribbean region.

5.4 Postpartum Infecundity

C_i measures the effect on fertility of postpartum infecundity due either to lactational amenorrhea or extended postpartum abstinence. The duration of the postpartum infecundity period has been measured directly in the results presented here.

As a regional value, only C_i for sub-Saharan Africa (0.58) is lower than either C_m (0.75) or C_c (0.86), indicating that postpartum effects are more important in this region in restricting fertility than either delayed entry in sexual union or contraception. The value of C_i indicates that fertility is lower than potential fertility by 42 percent because of lactational amenorrhea and extended postpartum abstinence. The other regions have similar values for C_i, from 0.71 to 0.77, indicating a reduction in fertility of about 25 percent.

The variation within regions is less for postpartum infecundity than for the other two proximate determinants in three of the four regions. Only in the Latin America/Caribbean region does C_m vary less than C_i. In sub-Saharan Africa, 15 of the 22 countries have values of C_i less than 0.60. In the other regions, no countries have values less than 0.60. At the other extreme, postpartum infecundity has a reduced effect (less than 20 percent, C_i of 0.80 or more) in a handful of countries: Brazil, Colombia, and the Dominican Republic in the Latin America/Caribbean region; Kazakhstan in Asia; and Jordan in the Near East/North Africa region.

There is not much regional urban-rural difference in C_i, the largest being a value of C_i in rural sub-Saharan Africa that is lower by 0.06 than that of urban areas. The largest country differences between urban and rural areas are in Haiti, Comoros, and Mozambique, 0.12, 0.12, and 0.11, respectively. Only in Brazil does the urban area have a lower value of C_i than the rural area.

5.5 Education

The Bongaarts model was applied to women according to three levels of education: none, primary, and secondary or more. The results are shown in Table 5.2. However, due to small numbers in many of the education groups, the results are not discussed in detail here. Overall, C_m varies from 0.82 to 0.68 to 0.51 for no education, primary, and secondary or more education, respectively. Surprisingly, the values for C_c are just about the same as those for C_m: 0.82, 0.64, and 0.49, respectively. C_i varies from 0.55 to 0.63 to 0.74, respectively, indicating that some of the reduction in fertility due to delayed entry into marriage and increased use of contraception with higher levels of education is being offset by reduced levels of postpartum infecundity.

5.6 Induced Abortion

Five countries—Kazakhstan, the Kyrgyz Republic, Uzbekistan, Turkey, and Vietnam—have data that allow the calculation of induced rates of abortion and hence Bongaarts' model C_a values (Table 5.3). The C_a values are all over 0.90, indicating a small effect in reducing fertility in these countries. The

Table 5.2 Bongaarts' proximate determinants of fertility model parameters, by education, Demographic and Health Surveys, 1995-1999

Region and country	C_m			C_c			C_i			Total fecundity		
	No schooling	Primary	Secon-dary	No schooling	Primary	Secon-dary	No schooling	Primary	Secon-dary	No schooling	Primary	Secon-dary
Sub-Saharan Africa												
Benin	0.87	(0.70)	*	0.92	(0.84)	*	0.52	(0.59)	*	15.7	*	*
Burkina Faso	0.90	*	*	0.95	*	*	0.48	*	*	16.4	*	*
Cameroon	0.92	0.73	(0.57)	0.98	0.85	(0.69)	0.56	0.57	(0.65)	12.1	(13.3)	*
Central African	0.81	0.74	*	0.97	0.91	*	0.53	(0.58)	*	11.8	*	*
Comoros	0.61	*	*	0.89	*	*	(0.66)	*	*	(14.5)	*	*
Côte d'Ivoire	0.79	(0.63)	*	0.96	(0.84)	*	0.55	*	*	13.2	*	*
Eritrea	0.83	(0.65)	*	0.98	(0.89)	*	0.56	(0.57)	*	14.8	*	*
Ghana	0.77	0.68	0.64	0.91	0.84	0.78	(0.53)	(0.60)	0.63	(15.1)	*	11.1
Guinea	0.93	*	(0.59)	0.97	*	(0.81)	0.47	*	*	13.5	*	*
Kenya	0.78	0.69	0.54	0.83	0.72	0.54	(0.63)	0.66	(0.69)	(13.5)	14.0	*
Madagascar	0.75	0.67	0.59	0.98	0.88	0.68	0.59	0.64	0.71	14.9	15.9	*
Mali	0.93	*	*	0.97	*	*	0.58	*	*	13.2	*	*
Mozambique	0.89	0.77	*	0.98	0.93	*	0.50	0.56	*	11.2	12.5	*
Niger	0.93	*	*	0.96	*	*	0.57	*	*	14.6	*	*
Senegal	0.82	(0.58)	(0.44)	0.95	(0.83)	(0.68)	0.56	(0.60)	*	14.1	16.5	*
South Africa	*	0.43	0.35	*	0.63	0.45	*	(0.59)	0.60	*	(14.6)	14.7
Tanzania	0.78	0.69	*	0.91	0.78	*	0.55	0.63	*	16.1	(14.2)	*
Tchad	0.89	(0.83)	*	0.99	(0.96)	*	0.54	(0.56)	*	13.4	*	*
Togo	0.82	0.67	(0.47)	0.89	0.85	(0.77)	0.53	0.55	*	16.0	14.0	*
Uganda	0.86	0.77	*	0.96	0.88	*	0.59	0.64	*	14.3	15.9	*
Zambia	0.78	0.73	(0.53)	0.91	0.86	(0.72)	0.61	0.62	*	15.3	16.4	*
Zimbabwe	*	0.77	0.60	*	0.62	0.52	*	0.61	(0.62)	*	14.7	*
Average	**0.83**	**0.64**	**0.48**	**0.94**	**0.73**	**0.52**	**0.56**	**0.52**	**0.65**	**14.2**	**14.7**	**12.9**
North Africa/Near												
Egypt	0.77	0.68	0.37	0.66	0.58	0.56	0.69	0.73	0.80	13.0	12.4	14.8
Jordan	*	0.57	0.52	*	0.63	0.57	*	(0.85)	0.86	*	(15.0)	16.8
Turkey	0.77	0.71	0.48	0.66	0.51	0.44	(0.70)	0.81	0.83	(11.4)	9.2	(10.5)
Yemen	0.79	*	*	0.89	*	*	0.71	*	*	13.8	*	*
Average	**0.78**	**0.65**	**0.46**	**0.74**	**0.57**	**0.52**	**0.23**	**0.80**	**0.83**	**5.1**	**12.2**	**7.0**
Asia												
Bangladesh	0.92	0.92	(0.71)	0.58	0.53	(0.53)	0.65	0.68	(0.70)	11.3	9.6	*
India	0.89	0.80	0.59	0.57	0.56	0.61	0.63	0.68	0.73	11.0	9.3	8.3
Indonesia	0.74	0.81	0.56	0.59	0.48	0.46	(0.62)	0.64	0.72	(9.7)	12.3	13.5
Kazakhstan	*	*	0.50	*	*	0.52	*	*	0.76	*	*	10.3
Kyrgyz Republic	*	*	0.67	*	*	0.54	*	*	0.72	*	*	12.8
Nepal	0.87	(0.82)	*	0.77	(0.69)	*	0.63	(0.64)	*	12.0	*	*
Philippines	*	0.68	0.49	*	0.69	0.62	*	0.73	0.76	*	14.6	14.0
Uzbekistan	*	*	0.67	*	*	0.57	*	*	0.78	*	*	11.3
Vietnam	(0.60)	0.59	0.49	(0.54)	0.42	0.34	*	(0.70)	0.76	*	(15.5)	16.6
Average	**0.80**	**0.77**	**0.59**	**0.61**	**0.56**	**0.52**	**0.63**	**0.68**	**0.74**	**11.0**	**12.3**	**12.4**
Latin America/Caribbean												
Bolivia	(0.79)	0.73	0.49	(0.85)	0.70	0.50	*	0.65	0.72	*	16.0	15.2
Brazil	(0.91)	0.67	0.47	(0.03)	0.34	0.30	*	0.81	0.79	*	16.0	17.0
Colombia	*	0.65	0.47	*	0.38	0.19	*	0.80	0.84	*	17.0	29.6
Dominican Republic	0.85	0.70	0.44	0.56	0.41	0.45	0.76	0.83	0.86	(13.7)	15.2	(14.0)
Guatemala	0.81	0.69	0.50	0.84	0.65	0.51	0.63	0.66	(0.81)	15.7	17.2	(13.5)
Haiti	0.76	0.65	*	0.92	0.84	*	(0.60)	0.65	*	(14.6)	(13.3)	*
Nicaragua	0.76	0.75	0.53	0.56	0.44	0.36	0.71	0.74	0.79	18.7	17.1	15.8
Peru	0.74	0.73	0.49	0.69	0.53	0.42	(0.60)	0.67	0.73	(21.8)	18.2	16.3
Average	**0.80**	**0.70**	**0.48**	**0.64**	**0.54**	**0.39**	**0.66**	**0.73**	**0.79**	**16.9**	**16.3**	**17.3**
Grand Average	**0.82**	**0.68**	**0.51**	**0.82**	**0.64**	**0.49**	**0.55**	**0.63**	**0.74**	**13.4**	**14.4**	**13.4**

Note: Parentheses indicate the ratio is based on 25 to 49 unweighted women reaching lower parity. An asterisk indicates fewer than 25 unweighted women reached lower parity and the ratio is not shown.

greatest effect of abortion is found in the Kyrgyz Republic, with a value of 0.93. There is little or no difference between urban and rural areas in the five countries. The greatest difference again occurs in the Kyrgyz Republic, where urban areas have a C_a of 0.89 and rural areas have a C_a of 0.94.

Table 5.3 Bongaarts' proximate determinants of fertility model parameters, by urban-rural residence, five selected countries, Demographic and Health Surveys, 1996-1999

Region and country	C_m			C_c			C_i			C_a			Total fecundity		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Turkey	0.65	0.62	0.64	0.48	0.57	0.51	0.79	0.78	0.79	0.97	0.97	0.97	10.0	11.4	10.5
Kazakhstan	0.48	0.54	0.50	0.46	0.56	0.52	(0.76)	(0.76)	0.76	0.94	0.96	0.95	(9.6)	(12.1)	11.1
Kyrgyz Republic	0.60	0.70	0.67	0.49	0.57	0.55	*	0.71	0.72	0.89	0.94	0.93	*	14.7	13.8
Uzbekistan	0.64	0.69	0.67	0.57	0.56	0.57	0.82	0.76	0.78	0.94	0.98	0.96	9.1	13.0	11.8
Vietnam	0.38	0.56	0.53	0.42	0.39	0.40	*	0.72	0.73	1.00	0.99	0.99	*	16.3	15.3

Note: Parentheses indicate parameter is based on 25 to 49 unweighted women. An asterisk indicates paramenter is based on fewer than 25 unweighted women and is not shown.

6 Conclusions

This study examines countries at different stages of the fertility transition. In the Latin America/Caribbean region, Asia, and the Near East/North Africa region, the DHS results depict the magnitude of the continuing transition. The DHS results also assess the signs of the onset of the fertility transition in many countries in sub-Saharan Africa. Among the countries covered, Niger has the highest fertility level, while Vietnam has the lowest. The total fertility rates for women age 15-49 range from 2.3 to 7.2 children per woman (Figure 6.1). The countries can be classified into five groups by TFR level.

Group 1 countries

The first group includes ten countries with TFRs of six children and above. All but one of these countries are located in sub-Saharan Africa. They are Benin, Burkina Faso, Eritrea, Madagascar, Mali, Niger, Tchad, Uganda, and Zambia. Yemen is the only country from another region in this group. With the exception of women in Eritrea, most women in these countries have their first birth by age 20. After the first birth, the parity progression ratio is more than 79 percent for parity 5 to 6 in these countries. It is interesting to note, however, that the high level of fertility in these countries is not mainly due to shorter birth intervals but, rather, is due to early entry into motherhood and to little practice of limiting behavior. Only in Madagascar, Uganda, and Yemen are median birth intervals shorter than 30 months.

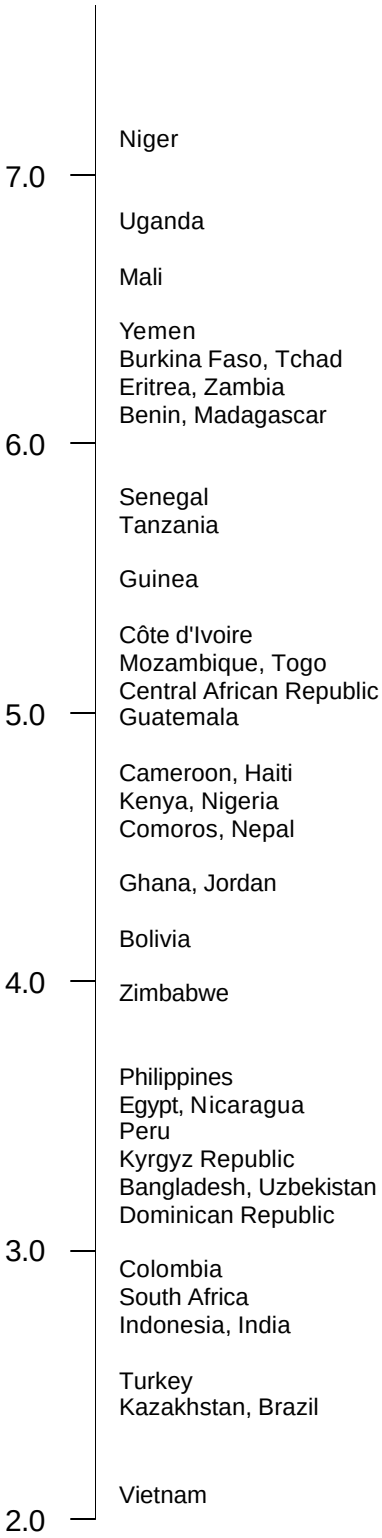
Although in the past, birth intervals for high fertility countries were long due to prolonged durations of lactational amenorrhea and postpartum abstinence linked to traditional practices considered the norm, the countries with high fertility in the late 1990s do not have exceptionally long birth intervals, which range from a high of 35 months to a low of 28 months. Contraception, however, still has little effect on fertility in these countries. The Bongaarts model parameter for contraception C_c is above 0.80 for all of these countries, with half of them having values above 0.90, indicating less than 20 and 10 percent reductions in potential fertility, respectively. However, women in this group of countries who have secondary education have lower fertility rates and also have their first birth relatively late. The average TFR for women with secondary education of these countries is 3.7 births versus 6.2 for all women. In many of the countries in this group, birth intervals tend to be somewhat longer for women with secondary or higher education than for women who have no schooling.

Group 2 countries

In the second group, eight countries with TFRs ranging from 5.0 to 5.9 children per woman are identified. Six countries are in sub-Saharan Africa (the Central African Republic, Côte d'Ivoire, Guinea, Mozambique, Senegal, Tanzania, and Togo) and one country is in the Latin America/Caribbean region (Guatemala). Fertility transition for this group is mixed. All but two countries have TFRs in the lower half of the range.

Fertility has started declining, mostly in the urban areas and among women with primary or more education, in countries such as Côte d'Ivoire, Guinea, Senegal, Tanzania, Togo, and Guatemala. On the other hand, the lower fertility levels observed in the Central African Republic and Mozambique may be associated with high levels of sterility (Larsen, 2001; Larsen and Raggers, 2001). In both these countries, women who have a primary education have higher fertility rates than women who are uneducated. Women in the Central African Republic, Côte d'Ivoire, Guinea, Mozambique, Senegal, and Tanzania enter into motherhood as early as women in the first group of countries (i.e., median age at first birth before age 20). The majority of women in Togo and Guatemala have their first birth slightly after age 20. PPRs are high; that is, they exceed or are equal to 70 percent for all parities in all the countries of the group except Guatemala, where the proportion progressing from parity 3 to 4 is less than 70 percent.

Figure 6.1 Fertility levels in selected DHS countries, Demographic and Health Surveys, 1995-1999



Group 3 countries

The third group includes countries with TFRs of 4.0 to 4.9 children per woman. These countries come from each of the regions, five from sub-Saharan Africa (Cameroon, Comoros, Ghana, Kenya, and Zimbabwe), one from Asia (Nepal), one from the Near East/North Africa region (Jordan), and two from the Latin America/Caribbean region (Boliva and Haiti).

In the preceding comparative report on fertility, covering the first half of the 1990s, only Zimbabwe from sub-Saharan Africa was in this category. All these countries have already experienced substantial fertility declines, although the declines did not occur at the same time. From the medians for age at first birth, it would appear that the timing of the onset of reproduction has contributed little to the lowered fertility levels in Cameroon and Kenya, where age at first birth is about as early as that observed in the first group of countries. However, the C_m parameter (for delayed entry into regular sexual union) from the Bongaarts model indicates that in both countries, there has been an effect of delayed exposure to the risk of pregnancy. The contradiction may be explained by high levels of primary sterility in Cameroon and substantial out-of-wedlock births in Kenya.

Limiting births plays a role in all of the countries in this group, where the cumulative effect of the parity progression ratios varies from 35 percent of women reaching parity 6 from parity 1 in Comoros to 6 percent in Zimbabwe. The countries of the first group have cumulative 1 to 6 ratios of at least 40 percent and reaching to more than 60 percent. Long birth intervals play a role in the lowered fertility levels for only two countries, Ghana and Zimbabwe, which have median lengths of preceding intervals of 38 and 40 months, respectively.

Lowered fertility in both urban and rural areas is characteristic of this group as well as substantial differences between the areas. Bolivia and Haiti have the largest differences in TFR between urban and rural areas, mostly because fertility in rural areas remains high at 5.8 and 5.2 births per woman, respectively.

Women's education has approximately the same effect on fertility as residence, partly because most women with secondary or higher education reside in urban areas. Women with no education in the countries in this group still have a high fertility regime, which is offset by much lower fertility by women with secondary or more education. The one exception to this pattern is Jordan, where the TFR is approximately the same in all of the three education groups.

Group 4 countries

The fourth group includes nine countries with TFRs from 3.0 to 3.9 children per woman. They are located mostly in Asia (Bangladesh, the Kyrgyz Republic, the Philippines, and Uzbekistan) and the Latin America/Caribbean region (Colombia, the Dominican Republic, Nicaragua, and Peru), with one (Egypt) in the Near East/North Africa region. As indicated by their TFR levels, these countries have advanced far in the fertility transition.

For seven countries, entry into motherhood is delayed, with median ages at first birth over 21 years. Only in Bangladesh is entry into motherhood very early (median age of 17.2 years). This country has the earliest entry, which is substantially younger than the countries of the first group, those with TFRs of 6.0 or higher. The lowered fertility level in Bangladesh is due much more to birth limitation and spacing than to a delay in the entry into reproduction. The combined effects of the PPRs indicate that only 7 percent of women with a birth will reach parity 6. The birth interval is long as well, at a median of 37 months.

The Bongaarts parameters for Bangladesh also reflect these differences with the other countries of the group. The C_m parameter for Bangladesh is only 0.85, while that of the countries in this group with

the next highest value is 0.75 (Kyrgyz Republic and Uzbekistan). On the other hand the parameter for contraception, C_c, is 0.55 for Bangladesh, and the value for the postpartum infecundity parameter, C_i, is 0.67, the lowest of the group.

The low fertility levels of the other countries in this group are due to the combined effects of delay in the onset of reproduction and the use of contraception. Lower fertility levels (4.0 or below) are observed in rural areas in seven of these countries, with slightly higher rural fertility for Nicaragua and the Philippines. At 5.1, Peru has the highest rural TFR of the group. Urban-area fertility of the countries in this group is less than 3.0 children per woman by age 39. Except for Bangladesh, the countries in this group are predominantly urban, thus bringing down the country TFRs even in those countries with somewhat higher rural fertility.

Fertility differences by education and other socioeconomic variables are greater in the Latin American/Caribbean region than in the Near East/North Africa or Asia regions.

Group 5 countries

The fifth group of countries—Brazil, India, Indonesia, Kazakhstan, South Africa, Turkey, and Vietnam—have the lowest fertility levels among all the countries, with TFRs from 2.3 to 2.9.[13] Delayed entry into motherhood contributes a reduced amount to the low fertility levels in India, Indonesia and South Africa, where the median age at first birth is less than 21 years. In the latter two of these countries, fertility limiting is important as shown by the low PPRs even at low parities.

Birth spacing is important in reducing fertility in all countries except for India, and Kazakhstan, as indicated by medians for duration of birth intervals of three or more years (up to 47 months in South Africa). In India and Kazakhstan, the median birth interval is somewhat shorter at 31 and 32 months, respectively.

As indicated by the C_c parameter of the Bongaarts model, contraceptive use is important in all these countries, with values ranging from 0.52 in Kazakhstan to 0.29 in Brazil. The exception again is India, with a C_c value of 0.63. Postpartum infecundity plays a substantial role in three of the countries: South Africa (C_i of 0.59), India (0.66), and Indonesia (0.66). Information on induced abortion is available in three of these countries; however, induced abortion plays very little role in lowering fertility, as evidenced by the Bongaarts C_a parameter of at least 0.95.

Residence still plays a part in level of fertility, although all the countries in the fifth group but India are predominantly urban. Rural areas of Brazil and South Africa have TFRs for women under age 40 of more than three children per woman. Women with no education, while a smaller percentage of the population than for countries in the other groups, have relatively high levels of fertility in Brazil, South Africa, and Turkey, with TFRs for women under 40 of 3.9 children or more.

This publication has presented evidence of countries covered by DHS surveys in the latter half of the 1990s and indicates the variation by country along the fertility transition. Compared with the previous

[13] The TFR estimated by Retherford and Mishra (2001) would put India into the fourth group of countries, where its values for age at first birth, birth spacing, use of contraception, postpartum infecundity and the percentage urban fit better than with the other countries of group five. Indeed, the total potential fecundity (TF) calculated by the Bongaarts model, 9.1 births, is the lowest of all countries. If India had the average TF value of the other Asia countries, 12.3, then its predicted TFR would be 3.8, one child higher than the reported TFR. However, induced abortion, an unmeasured determinant, may account for some of the discrepancy between the reported and calculated TFRs. Induced abortion is estimated to range as high as 8 to 11 times the reported number of 600,000. At these levels, between 4.1 and 5.6 million births would have been averted through induced abortion. Without this amount of induced abortion, the TFR would increase to 3.3 to 3.5 births per woman, near the levels estimated by Retherford and Mishra and the author.

report on fertility, a smaller proportion of countries is in the first group and a larger proportion is in the fifth group. Indeed, several countries, which had been covered by the previous report and preceding surveys, have shifted to lower fertility groups: Cameroon, Ghana, Indonesia, Jordan, Kenya, the Philippines, and Senegal. Colombia is the only country to change to a higher group, although with a TFR of 3.0 children per woman, it is just at the lower limit of the group.

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Appendix A

Life Table Estimates (Trimeans) of Birth Intervals by Parity

Table A.1 Birth Intervals (trimean) in months for births in the 6-year period preceding the survey, Demographic and Health Surveys, 1995-1999

Region and country	Birth Interval (trimean) in months					
	Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	Average
Sub-Saharan Africa						
Benin	33	35	34	34	34	34
Burkina Faso	35	36	34	36	36	35
Cameroon	31	31	32	29	31	31
Central African Republic	30	32	31	32	33	31
Comoros	25	28	29	27	30	28
Côte d'Ivoire	35	33	32	34	33	33
Eritrea	31	31	32	31	34	32
Ghana	35	36	36	35	34	35
Guinea	34	34	35	35	35	35
Kenya	31	32	31	31	32	31
Madagascar	28	30	30	30	30	30
Mali	31	32	31	32	32	31
Mozambique	32	33	32	36	34	33
Niger	29	31	30	31	31	30
Senegal	33	31	33	32	33	32
South Africa	38	36	35	32	38	36
Tanzania	34	30	33	31	33	32
Tchad	31	31	32	33	32	32
Togo	35	34	35	35	35	35
Uganda	29	30	29	29	29	29
Zambia	31	30	31	30	33	31
Zimbabwe	38	38	38	32	34	36
Average	**32**	**32**	**32**	**32**	**33**	**32**
Near East/North Africa						
Egypt	28	33	31	31	30	31
Jordan	21	26	27	28	27	26
Turkey	30	33	30	31	32	31
Yemen	25	27	28	28	27	27
Average	**26**	**30**	**29**	**29**	**29**	**29**
Asia						
Bangladesh	34	35	34	33	33	34
India	30	31	31	31	31	31
Indonesia	35	35	34	35	33	34
Kazakstan	24	29	27	26	31	27
Kyrgyz Republic	25	29	32	28	28	29
Nepal	30	32	32	32	32	31
Philippines	24	27	28	28	28	27
Uzbekistan	26	33	32	34	33	31
Vietnam	31	33	31	33	29	31
Average	**29**	**31**	**31**	**31**	**31**	**31**
Latin America/Caribbean						
Bolivia	28	27	29	28	29	28
Brazil	32	30	25	24	25	27
Colombia	30	30	31	28	29	30
Dominican Republic	27	28	28	26	29	28
Guatemala	26	28	29	28	28	28
Haiti	28	30	31	32	31	30
Nicaragua	28	28	32	27	27	28
Peru	28	30	29	29	31	29
Average	**28**	**29**	**29**	**28**	**29**	**29**
Grand Average	**30**	**31**	**31**	**31**	**31**	**31**

Table A.2 Birth intervals (trimean) for the 6-year period preceding the survey, by urban-rural residence, Demographic and Health Surveys, 1995-1999

Region and country	Residence	Birth interval (trimean) in months: Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	Average
Sub-Saharan Africa							
Benin	Urban	34	35	33	31	35	34
Benin	Rural	33	34	33	34	34	33
Burkina Faso	Urban	38	36	39	37	37	37
Burkina Faso	Rural	34	35	35	36	35	35
Cameroon	Urban	28	32	32	30	30	30
Cameroon	Rural	32	32	32	28	31	31
Central African Republic	Urban	29	32	32	32	29	31
Central African Republic	Rural	30	31	31	31	35	32
Comoros	Urban	24	28	29	25	(39)	29
Comoros	Rural	25	28	30	27	29	28
Côte d'Ivoire	Urban	33	33	31	34	36	33
Côte d'Ivoire	Rural	36	33	33	34	31	33
Eritrea	Urban	27	31	31	31	33	31
Eritrea	Rural	32	31	32	30	34	32
Ghana	Urban	35	36	37	36	34	36
Ghana	Rural	36	36	36	35	34	35
Guinea	Urban	34	35	37	37	38	36
Guinea	Rural	35	33	35	35	34	34
Kenya	Urban	32	32	30	26	(28)	30
Kenya	Rural	31	32	30	32	32	31
Madagascar	Urban	30	31	30	31	30	30
Madagascar	Rural	28	29	30	30	31	30
Mali	Urban	32	32	31	33	33	32
Mali	Rural	31	31	32	30	31	31
Mozambique	Urban	31	26	32	30	32	30
Mozambique	Rural	32	34	31	36	36	34
Niger	Urban	28	31	32	32	35	32
Niger	Rural	29	31	30	31	32	30
Senegal	Urban	34	33	31	32	34	33
Senegal	Rural	33	32	33	32	33	32
South Africa	Urban	38	35	36	31	41	36
South Africa	Rural	34	37	34	33	36	35
Tanzania	Urban	44	30	46	38	31	38
Tanzania	Rural	32	30	31	32	33	32
Tchad	Urban	29	30	31	31	30	30
Tchad	Rural	31	31	32	34	32	32
Togo	Urban	39	36	37	37	43	38
Togo	Rural	35	34	35	35	33	34
Uganda	Urban	28	30	27	27	26	27
Uganda	Rural	29	30	29	29	30	29
Zambia	Urban	30	30	31	31	34	31
Zambia	Rural	31	31	31	31	31	31
Zimbabwe	Urban	38	38	40	27	(27)	34
Zimbabwe	Rural	37	36	36	33	35	36
Average	**Urban**	**32**	**32**	**33**	**32**	**33**	**33**
Average	**Rural**	**32**	**32**	**32**	**32**	**33**	**32**

Region and country	Residence	Birth interval (trimean) in months: Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6	Average
Near East/North Africa							
Egypt	Urban	30	34	35	34	32	33
Egypt	Rural	27	30	30	30	30	29
Jordan	Urban	21	26	27	27	29	26
Jordan	Rural	20	24	25	26	25	24
Turkey	Urban	33	35	30	35	36	34
Turkey	Rural	28	28	29	25	27	27
Yemen	Urban	24	30	30	29	28	28
Yemen	Rural	25	27	28	27	27	27
Average	**Urban**	**27**	**31**	**30**	**31**	**31**	**30**
Average	**Rural**	**25**	**27**	**28**	**27**	**27**	**27**
Asia							
Bangladesh	Urban	39	37	33	37	27	35
Bangladesh	Rural	34	36	34	33	33	34
India	Urban	30	31	30	29	30	30
India	Rural	30	31	32	31	31	31
Indonesia	Urban	35	35	35	37	28	34
Indonesia	Rural	34	35	34	34	36	34
Kazakhstan	Urban	25	28	35	(30)	*	30
Kazakhstan	Rural	24	29	25	26	31	27
Kyrgyz Republic	Urban	28	28	32	37	(23)	30
Kyrgyz Republic	Rural	24	30	33	28	29	29
Nepal	Urban	32	35	30	31	(31)	32
Nepal	Rural	30	31	32	32	32	31
Philippines	Urban	25	28	28	28	27	27
Philippines	Rural	25	27	28	28	29	27
Uzbekistan	Urban	26	32	36	33	(26)	30
Uzbekistan	Rural	27	32	31	35	33	32
Vietnam	Urban	36	35	25	(15)	*	28
Vietnam	Rural	30	32	32	32	30	31
Average	**Urban**	**31**	**32**	**32**	**31**	**27**	**31**
Average	**Rural**	**29**	**31**	**31**	**31**	**31**	**31**
Latin America/Caribbean							
Bolivia	Urban	29	27	30	28	31	29
Bolivia	Rural	27	27	29	28	28	28
Brazil	Urban	34	32	27	24	25	28
Brazil	Rural	28	27	24	24	25	25
Colombia	Urban	32	32	34	25	32	31
Colombia	Rural	25	26	28	28	28	27
Dominican Republic	Urban	29	29	27	29	37	30
Dominican Republic	Rural	27	28	27	23	27	26
Guatemala	Urban	30	31	32	29	27	30
Guatemala	Rural	25	27	28	29	28	27
Haiti	Urban	28	31	31	32	27	30
Haiti	Rural	29	30	30	32	31	30
Nicaragua	Urban	28	30	33	27	27	29
Nicaragua	Rural	28	28	30	28	29	29
Peru	Urban	30	31	30	29	34	31
Peru	Rural	28	28	28	30	31	29
Average	**Urban**	**30**	**30**	**31**	**28**	**30**	**30**
Average	**Rural**	**27**	**28**	**28**	**28**	**28**	**28**

Note: Parentheses indicate figure is based on 25 to 49 women. An asterisk indicates figure is based on fewer than 25 women and is not shown.

Table A.3 Birth intervals (trimeans) for the six-year period preceding the survey, by women's education, Demographic and Health Surveys, 1995-1999

Region and country	Education	Birth interval (trimean) in months: Parity 1 to 2	Parity 2 to 3	Parity 3 to 4	Parity 4 to 5	Parity 5 to 6
Sub-Saharan Africa						
Benin	No schooling	33	35	33	33	34
Benin	Primary	31	34	35	35	34
Benin	Secondary +	36	35	37	(38)	*
Burkina Faso	No schooling	34	36	35	36	35
Burkina Faso	Primary	33	34	34	41	(43)
Burkina Faso	Secondary +	41	37	(50)	*	*
Cameroon	No schooling	28	30	32	29	35
Cameroon	Primary	33	32	31	28	27
Cameroon	Secondary +	30	32	33	30	37
Central African Republic	No schooling	30	31	31	32	33
Central African Republic	Primary	30	31	30	32	32
Central African Republic	Secondary +	29	34	32	30	26
Comoros	No schooling	23	26	29	26	29
Comoros	Primary	26	29	*	*	(34)
Comoros	Secondary +	30	30	28	(21)	*
Côte d'Ivoire	No schooling	34	33	33	34	33
Côte d'Ivoire	Primary	34	33	34	32	30
Côte d'Ivoire	Secondary +	35	32	29	42	30
Eritrea	No schooling	31	31	32	30	34
Eritrea	Primary	30	31	29	30	32
Eritrea	Secondary +	28	32	30	*	*
Ghana	No schooling	36	36	36	36	32
Ghana	Primary	37	35	36	34	38
Ghana	Secondary +	34	36	36	35	37
Guinea	No schooling	35	34	35	35	34
Guinea	Primary	35	*	38	34	32
Guinea	Secondary +	35	39	36	43	(33)
Kenya	No schooling	30	32	29	30	34
Kenya	Primary	32	31	31	32	32
Kenya	Secondary +	30	33	30	32	33
Madagascar	No schooling	28	30	31	30	29
Madagascar	Primary	29	30	29	30	32
Madagascar	Secondary +	29	31	32	30	30
Mali	No schooling	31	32	31	31	31
Mali	Primary	35	30	30	29	36
Mali	Secondary +	28	32	34	30	(37)
Mozambique	No schooling	32	33	31	35	33
Mozambique	Primary	32	33	32	36	35
Mozambique	Secondary +	28	48	38	(50)	*
Niger	No schooling	29	30	30	31	32
Niger	Primary	29	30	31	33	32
Niger	Secondary +	28	32	38	(41)	*
Senegal	No schooling	33	32	33	32	34
Senegal	Primary	35	32	32	32	34
Senegal	Secondary +	29	30	29	28	(43)
South Africa	No schooling	33	38	30	30	39
South Africa	Primary	35	35	39	35	36
South Africa	Secondary +	38	36	33	31	37
Tanzania	No schooling	33	30	32	28	33
Tanzania	Primary	35	30	33	33	34
Tanzania	Secondary +	35	33	47	(30)	(31)
Tchad	No schooling	31	32	32	34	32
Tchad	Primary	30	31	29	32	30
Tchad	Secondary +	29	*	41	(29)	(36)
Togo	No schooling	35	34	36	34	35
Togo	Primary	37	37	36	38	36
Togo	Secondary +	41	35	36	35	(38)
Uganda	No schooling	30	31	31	31	29
Uganda	Primary	29	29	28	28	28
Uganda	Secondary +	26	28	26	31	37
Zambia	No schooling	30	33	30	32	32
Zambia	Primary	30	30	31	30	33
Zambia	Secondary +	32	32	33	32	36
Zimbabwe	No schooling	(34)	*	(30)	(46)	(34)
Zimbabwe	Primary	36	36	38	31	35
Zimbabwe	Secondary +	38	38	37	29	34
Near East/North Africa						
Egypt	No schooling	27	29	30	30	30
Egypt	Primary	28	31	30	32	31
Egypt	Secondary +	30	37	33	37	29
Jordan	No schooling	*	26	27	28	30
Jordan	Primary	21	24	25	25	23
Jordan	Secondary +	21	26	27	27	27
Turkey	No schooling	25	28	29	30	29
Turkey	Primary	30	33	31	33	36
Turkey	Secondary +	36	38	27	(24)	*
Yemen	No schooling	25	27	28	27	28
Yemen	Primary	25	27	28	32	26
Yemen	Secondary +	25	34	31	40	29
Asia						
Bangladesh	No schooling	33	36	34	33	32
Bangladesh	Primary	34	35	32	33	34
Bangladesh	Secondary +	38	38	39	48	(26)
India	No schooling	30	31	32	31	32
India	Primary	29	31	31	30	29
India	Secondary +	30	30	30	27	29
Indonesia	No schooling	38	34	32	35	37
Indonesia	Primary	35	36	36	36	34
Indonesia	Secondary +	34	35	31	33	28
Kazakhstan	No schooling	*	*	*	*	*
Kazakhstan	Primary	*	*	*	*	*
Kazakhstan	Secondary +	24	29	28	26	31
Kyrgyz Republic	No schooling	*	*	*	*	*
Kyrgyz Republic	Primary	*	*	*	*	*
Kyrgyz Republic	Secondary +	25	29	32	28	28
Nepal	No schooling	29	32	32	32	32
Nepal	Primary	31	31	29	27	(28)
Nepal	Secondary +	32	32	33	(33)	*
Philippines	No schooling	(26)	(26)	(25)	(25)	*
Philippines	Primary	23	27	28	29	30
Philippines	Secondary +	25	28	27	28	26
Uzbekistan	No schooling	*	*	*	*	*
Uzbekistan	Primary	*	*	*	*	*
Uzbekistan	Secondary +	26	33	32	34	33
Vietnam	No schooling	28	35	(32)	*	*
Vietnam	Primary	29	38	33	30	34
Vietnam	Secondary +	32	32	27	32	28
Latin America/Caribbean						
Bolivia	No schooling	27	27	28	27	29
Bolivia	Primary	26	28	29	28	28
Bolivia	Secondary +	32	30	31	29	31
Brazil	No schooling	26	32	28	24	23
Brazil	Primary	28	29	24	24	23
Brazil	Secondary +	35	31	28	24	27
Colombia	No schooling	*	30	(24)	*	(33)
Colombia	Primary	25	28	31	28	28
Colombia	Secondary +	33	33	33	24	31
Dominican Republic	No schooling	27	26	29	24	31
Dominican Republic	Primary	27	26	27	27	32
Dominican Republic	Secondary +	29	30	31	25	(25)
Guatemala	No schooling	25	29	26	28	28
Guatemala	Primary	26	27	29	31	27
Guatemala	Secondary +	34	33	35	(24)	*
Haiti	No schooling	29	30	33	30	32
Haiti	Primary	28	30	29	34	28
Haiti	Secondary +	30	29	29	(38)	*
Nicaragua	No schooling	26	26	28	26	28
Nicaragua	Primary	27	29	32	29	26
Nicaragua	Secondary +	30	30	31	25	27
Peru	No schooling	26	29	29	29	29
Peru	Primary	29	29	28	30	33
Peru	Secondary +	29	31	30	29	35

Note: Parentheses indicate figure is based on 25 to 49 women. An asterisk indicates figure is based on fewer than 25 women and is not shown.

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1. Westoff, Charles F. 2001. **Unmet Need at the End of the Century.**

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