# DHS ANALYTICAL REPORTS

8

# Unintended Childbearing in Developing Countries: Levels, Trends, and Determinants

DHS

DEMOGRAPHIC AND HEALTH SURVEYS

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# Unintended Childbearing in Developing Countries: Levels, Trends, and Determinants

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# Preface

One of the most significant contributions of the 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 Analytical Reports* series and the *DHS Comparative Studies* series examine those data across countries in a comparative framework, focusing on specific topics.

The overall objectives of DHS comparative research are to describe similarities and differences between countries and regions, to highlight subgroups with specific needs, to provide information for policy formulation at the international level, and to examine individual country results in an international context. Whereas *Comparative Studies* are primarily descriptive, *Analytical Reports* take a more analytical approach.

The comparative analysis of DHS data is carried out primarily by staff members at the DHS headquarters in Calverton, Maryland. The topics covered are selected by staff members in conjunction with the DHS Scientific Advisory Committee and USAID.

The *Analytical Reports* series comprises in-depth, focused studies on a variety of substantive topics. The studies are based on a variable number of data sets, depending on the topic under study. A range of methodologies is used, including multivariate statistical techniques.

It is anticipated that the *Analytical Reports* will enhance the understanding of significant issues in the fields of international population and health for analysts and policymakers.

Martin Vaessen
Project Director

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# Executive Summary

One of the goals of family planning and reproductive-health programs is to ensure that women have the freedom to decide whether they want children and when, and how many they want. Unfortunately, results show that in many developing countries, that objective has not yet been achieved. A large proportion of children in those countries result from unintended pregnancies. In spite of that fact, most of the studies on the topic have been conducted in industrialized countries, and much of what is known on the subject comes from there. The objective of this report, therefore, is to use large-scale survey data that are cross-nationally comparable to study the levels, trends, and determinants of unintended fertility in developing countries.

The report is based on the analysis of data from the Demographic and Health Surveys (DHS) conducted in 10 selected countries that have participated in the DHS program at least twice. The countries are Colombia, the Dominican Republic, Egypt, Ghana, Indonesia, Kenya, Morocco, Peru, Senegal, and Zimbabwe.

A conceptual framework was developed for this study to differentiate three categories of pregnancy planning status and the pathways through which unintended childbearing occurs in developing countries. A child was defined as unwanted at conception if the mother, at the time she became pregnant with that child, said that she did not want any more children. The child was classified as a product of a mistimed pregnancy (failure in timing births) if the mother had wanted to delay the pregnancy that resulted in the birth of the child. Unintended childbearing is the sum of both unwanted and mistimed pregnancies.

To minimize errors in reporting that might arise from rationalization, only babies born in the 3 years before the date of a survey interview are included in the analysis. The procedure for calculating the age-specific fertility and total fertility rates was adapted to estimate the number of mistimed, unwanted, and unintended births that a woman would experience if she were exposed to the current risk of childbearing throughout her reproductive years. Both bivariate and multivariate logistic regression techniques are used to assess the effects of relevant socioeconomic and demographic variables.

The results show that respectively 46, 41, and 59 percent (in round numbers) of children born in Colombia, the Dominican Republic, and Peru in the 3 years before their later surveys were either unwanted or mistimed at conception. The proportion ranged from 31 to 55 percent in four sub-Saharan African countries and from 19 to 35 percent in three North African/Asian countries.

The major findings of the study are as follows:

- On average, a woman in a sub-Saharan African country will end up having an average of two unintended children if she is exposed to the current risk of pregnancy throughout her reproductive life span. In Egypt and Morocco, the same woman will have about 1.5 unintended births, and in Latin America the average is about 1.5 also.

- In all of the countries studied in sub-Saharan Africa, the proportion of mistimed births was higher than the proportion of unwanted births. In most countries outside the region, the proportion of children—of those born in the 3 years before more recent surveys—who were unwanted seems to exceed that of mistimed births.

- Although the proportion of children mistimed at conception has been declining in most countries, the proportion of unwanted births has increased in most countries.

- A short preceding birth interval is the most important variable in the study in explaining mistimed childbearing. The effect of birth-interval length on mistiming is particularly strong in Egypt, Indonesia, and the Dominican Republic, where it alone accounts for 71, 65, and 58 percent respectively of the effects of the variables in the multivariate model. It also accounts for about 50 percent of the effects in Zimbabwe and Morocco. In general, the shorter the birth interval was, the more likely the women were to describe their pregnancies as mistimed.

- Children of women age 35 and above were less likely to be mistimed than the children of younger women; the recent pregnancies of the older cohort were most often classified as unwanted.

- Marital status of mothers had statistically significant effects on whether a child was classified as mistimed only in the sub-Saharan African countries.

- Except in Senegal and Ghana, children of women who had secondary or higher education were less likely to be unwanted at conception than children of women with no schooling. In Latin America and the Caribbean countries in this study, unwanted childbearing decreased as the number of years of mothers' schooling increased.

- Finally, the number of living children that a woman already had seems to be the most important predictor of whether her recent pregnancy would be unwanted. Women who had six or more living children were much more likely to describe their recent pregnancies as unwanted than women who had fewer children. In some countries, such as Egypt and Indonesia, children whose conception was preceded by six or more living siblings were 20 times as likely to be described as unwanted as children whose conception followed one or no living sibling. This finding suggests an acute unmet need for contraception among women with many living children. Similarly, the older a woman was, the more likely her recent pregnancies were to be unwanted.

Overall, the findings of this report suggest that a sizable proportion of women generally would have chosen to delay their recent pregnancies if they could have and that a large number of them would have preferred to cease childbearing—either because of the number of living children they had or because of their age or marital status at the time of conception. Variations in these results across the various countries in the study are discussed in this report.

# 1 Introduction

Many factors have converged to make the study of unintended childbearing a timely research issue in developing countries. The first is its centrality in family planning and reproductive health. One of the goals of family planning and reproductive health programs is to ensure that women have the freedom to decide whether they want children, and when and how many they want. Unintended childbearing is one of the most basic measures of women's autonomy and capacity for self-determination, because it reflects a woman's capacity to determine whether and when to bear children (Brown and Eisenberg 1995). Unfortunately, available evidence suggests that in many developing countries, the prevalence of unintended childbearing is high.

Although unintended childbearing exists in both developed and developing countries, most of the studies on the topic have been conducted in industrialized countries. The topic has not been widely studied in the developing regions—partly because of the lack of data and partly because of the assumption that unintended childbearing might not be an important issue in societies with a desire for high fertility. Consequently, much of what is known about this topic is based on data from industrialized countries. However, in recent years, especially since the 1994 International Conference on Population and Development in Cairo, the issue of unintended childbearing in both developed and developing countries has become a high-priority reproductive-health topic (United Nations 1995). There is, therefore, a need for a more detailed study of this topic on the basis of data from developing countries. The few studies that are based on developing countries have tended to focus on tracing out the levels or overall prevalence of unintended childbearing. Such an approach has much value in itself, but from the viewpoint of policy, there is a need for a more detailed analysis of this research issue—analysis that includes the identification of key determinants. The objectives of this study are to 1) investigate the prevalence of unintended childbearing in developing countries and show trends over time, 2) illustrate the variations across socioeconomic/demographic categories and assess the relative importance of those factors by using multivariate analysis techniques, and 3) outline implications of the findings for purposes of policy and research.

The second factor that makes this research timely is that the current international reproductive-health agenda is aimed at preventing unintended pregnancies and childbearing among women especially because of the demographic, health-related, and economic advantages that could result. Widespread unintended childbearing tends to increase the average completed-family size, a sociological change that could increase rates of population growth (Westoff 1981). It is also an indirect indicator of the level of unmet need for effective family planning methods in a population and may highlight a probable lack of access or other barriers to the use of effective contraception.

A third factor is that unintended pregnancies also have effects on reproductive health because of the risks associated with abortion. Women's experience with unintended pregnancies is related to their experience with abortion and its reproductive risks (especially so in a developing-country environment). In a Nigerian study, about two of every three women who had had an unwanted pregnancy sought an abortion or obtained one (58% of 66%) (Okonofua et al. 1996:7). That estimate would not include women who died in the process and thus were not available for interview. In the United States alone, unintended pregnancies have been reported to account for about 1.5 million abortions annually, which is roughly half of unplanned pregnancies (Brown and Eisenberg 1995, Forrest and Singh 1990, McCammon 1986). It is estimated that in Latin America 3 to 5 million abortions occur annually; in sub-Saharan Africa, an estimated 3 million annually. Most of them followed unplanned pregnancies (USAID 1996). A recent study in Peru found that about one of every four unintended pregnancies did not result in a live birth (Mensch et al. 1997:24). That is one of the reasons that unintended pregnancy is usually described as a major public-health problem (Brown and Eisenberg 1995).

The cost of unintended pregnancies and childbearing, both to the society and to the individual (Lee and Stewart 1995, Trussell et al. 1995), is a fourth factor. At individual and interpersonal levels, unintended pregnancy leads to sociopsychological and economic strains, is often a cause of breakdown in marriages, and may contribute to poor health outcomes in babies (Cartwright 1988, Laukaran and van den Berg 1980:377). Evidence from the United States suggests that unintended fertility can put a heavy financial burden on society. For example, Trussell et al. (1995, 1997) estimated that the average cost of an unintended pregnancy in the United States was $3,795 in a managed-care program and $1,680 in a publicly funded program. At the national level, the cost to the United States government of unintended pregnancies among adolescents was about $8.6 billion in 1975 (McCammon 1986:760), about $16.6 billion in 1985, and about $25 billion in the early 1990s (Burnhill 1994).

Fifth and finally, since the conditions surrounding the occurrence of unintended childbearing in developed countries may differ from those prevailing in the developing countries, it is not advisable to use findings from the West as the basis for deciding on programs to address the issue in the developing

regions. For example, the large proportion of the studies in the West that have focused on adolescent pregnancies and childbearing reflects the fact that there the problem of unintended childbearing is highly concentrated among teenage women (Forrest 1994, Forrest and Singh 1990). Data from the United States also suggest that about 61 percent of unintended pregnancies in 1978 occurred among current contraceptive users—9 percent because of contraceptive failure and 52 percent because of user failure (Burnhill 1994, Forrest 1994). In 1987, the proportion occurring among contraceptive users had dropped only to 47 percent. This situation is not likely to obtain for the developing regions, where most unintended pregnancies occur among women who are not using contraception. These issues and others have combined to make the study of unintended childbearing a significant research topic, especially in the less developed regions of the world.

## 1.1 THE CONCEPT OF UNINTENDED CHILDBEARING CLARIFIED

Before proceeding further, it is necessary to clarify what the key concept of this study means. In past studies of unintended pregnancies in both developed and developing countries, a plethora of concepts have been used to describe similar issues. The concepts include the following: reactions to pregnancies (Westoff 1980), unplanned pregnancies (Craig and Ritcher-Strydom 1983), intention status (Kost and Forrest 1995), and planning status of children (Baydar 1995). In standard Demographic and Health Surveys (DHS) reports, the term "planning status" is used.[1] However, in recent literature, the term "unintended childbearing" has come to be accepted as the umbrella concept to describe the sum of both mistimed and unwanted childbearing (Tsui et al. 1997, Brown and Eisenberg 1995, Forrest and Singh 1990). That is the sense in which the term is used in this report. Therefore, here "unintended childbearing" will refer to the sum of mistimed and unwanted childbearing. A woman is said to have a mistimed birth, or a failure in timing births, if she did not want to become pregnant at the time when she became pregnant with the child. She is said to have an unwanted child if the child was a product of a pregnancy that occurred when the woman wanted to have no more children. Further clarifications on how the data were obtained in the field are discussed later in the report.

The terms "mistimed pregnancies" and "mistimed childbearing" are used interchangeably in this report, because of the nature of the data available for the study: for a woman to be asked about the planning status of a pregnancy, that pregnancy must have resulted in a live birth sometime in the recent past (or the woman may be currently pregnant). Therefore unplanned pregnancies that resulted in abortion are not included. A woman would not have been asked the questions on the planning status of a pregnancy if she had never had a live birth, regardless of how many pregnancies she might have had, unless she was currently pregnant.

## 1.2 INITIAL LACK OF DATA RECTIFIED

As indicated earlier in this report, one of the reasons that there are only a few studies on unintended pregnancies and childbearing in developing countries is the lack of necessary data. Until recently, it was believed that unintended childbearing might not be an important issue for developing countries, because it was assumed that most women in such countries were unlikely to take a calculative approach to reproduction. In the calculative mode of reproduction, which was assumed to be characteristic of most women in industrial societies, women approach childbearing with a clear idea of how many children they would like to have and—perhaps—when they would like to have them.[2] This assumption probably explained why data on unintended childbearing were not collected in many developing countries during the World Fertility Survey[3] and in the earliest phase of the Demographic and Health Surveys (DHS) program. However, in the later phases of the DHS program, more data have been collected on the topic. The implication of this situation is that the initial excuse of lack of data has gradually faded and it is now possible to explore the topic in more detail. Such an exploration is what this report hopes to initiate. In the following section, a description of the data and analysis plan is presented.

## 1.3 THE NATURE OF THE AVAILABLE DATA

The analysis in this report is based on data from Demographic and Health Surveys (DHS) conducted in 10 countries. The criteria for selecting the 10 countries were that each country had to have participated at least twice in the DHS program and that standard recode data files had to be available about the time that the analysis began. The countries that met the requirements were Ghana, Kenya, Senegal, and Zimbabwe in sub-Saharan Africa; Egypt, Indonesia, and Morocco in North Africa/Asia; and Colombia, the Dominican Republic, and Peru in Latin America and the Caribbean.

[1] There is a subtle difference between the term "planning" and "intention": a woman's intention regarding pregnancy may not be consistent with her planning behavior. Readers who are interested in tracing out the difference should read Adler (1992:22). Generally, intention relates to a state of mind or a feeling; planning is concerned with the conscious process of deciding, usually backed with action.

[2] Some published works show that even in the industrialized West, the approach to reproduction is not as rational as was initially assumed (see Freely and Pyper 1993).

[3] When the World Fertility Survey was fielded, the question of mistimed and unwanted fertility was not incorporated into the core questionnaire; however, a separate though optional Fertility Regulation Module was prepared to address such topics (Westoff 1981).

To date, three phases of the DHS project have been implemented: phase 1 (or DHS-I), phase 2 (DHS-II), and phase 3 (DHS-III). The data included in this report span all three phases of the DHS program. Generally, each phase of the DHS project was more comprehensive than the one that preceded it. Hence, data on unintended pregnancies were mostly absent from DHS-I except in the case of one question. In fact, questionnaires for Senegal and Zimbabwe did not have even that question in their first DHS. In the second and third phases of the DHS program, more information was obtained on the planning status of both recent births and current pregnancies. Because of those differentials in coverage (between phases and countries), it was possible to analyze trend data for only eight countries; that analysis was limited to trends in overall levels of mistimed and unwanted childbearing. A summary description of the years of surveys and the number of respondents is presented in Table 1.1. That table presents the terminology and concepts that are used in the later tables.

Table 1.1 Description of data available for each country

| | Earlier survey | | | | Later survey | | | |
|---|---|---|---|---|---|---|---|---|
| Region and country | DHS phase | Year of survey | Number of women | Under-age-3 children | DHS phase | Year of survey | Number of women | Under-age-3 children |
| **Sub-Saharan Africa** | | | | | | | | |
| Ghana | DHS-I | 1988 | 4,488 | 2,565 | DHS-III | 1993 | 4,562 | 2,204 |
| Kenya | DHS-I | 1988-89 | 7,150 | 4,388 | DHS-III | 1993 | 7,540 | 3,645 |
| Senegal | DHS-I | 1986 | 4,415 | NA | DHS-II | 1992-93 | 6,310 | 3,361 |
| Zimbabwe | DHS-I | 1988-89 | 4,201 | NA | DHS-III | 1994 | 6,128 | 2,364 |
| **Asia/North Africa** | | | | | | | | |
| Egypt | DHS-I | 1988-89 | 8,911[a] | 5,171 | DHS-II | 1992[a] | 9,864 | 4,974 |
| Indonesia | DHS-II | 1991 | 22,909[a] | 8,679 | DHS-III | 1994[a] | 28,168 | 10,131 |
| Morocco | DHS-I | 1987 | 5,982[a] | 3,615 | DHS-II | 1992 | 9,256 | 3,055 |
| **Latin America/Caribbean** | | | | | | | | |
| Colombia | DHS-II | 1990 | 8,644 | 2,301 | DHS-III | 1995 | 11,140 | 3,077 |
| Dominican Republic | DHS-I | 1986 | 7,649 | 2,664 | DHS-II | 1991 | 7,320 | 2,397 |
| Peru | DHS-I | 1986 | 4,999 | 1,796 | DHS-II | 1991-2 | 15,882 | 4,960 |

[a] Based on ever-married women only.

Another characteristic of the DHS data is that they are cross-sectional and retrospective. Data on mistimed and unwanted childbearing were obtained from women who had given birth to a baby in the 3 to 5 years before the survey date and from women who were pregnant at the time of survey. One of the limitations of this approach to data collection, in contrast to using prospective or facility-based data, is that it is not easy to obtain information on pregnancies that resulted in abortions or miscarriages. The field procedure was as follows. All eligible women (15 to 49 years old) were asked whether they were then pregnant. Those who said they were were asked, "At the time you became pregnant, did you want to become pregnant *then,* did you want to wait until *later,* or did you not want to become pregnant at all?" The responses formed the basis for classifying current pregnancies as wanted then, wanted later (mistimed), or wanted no more children (unwanted). Wanted and rightly timed pregnancies were those that occurred at the time that the respondent wanted them to; mistimed pregnancies were those that occurred sooner than the respondents desired (conceptually, they would be classed as wanted); and unwanted pregnancies were those that respondents had when they wanted no more children. Unintended pregnancy is the summation of mistimed and unwanted pregnancies.

The same criteria were used for defining unintended, mistimed, and unwanted births, except that the questions were asked of women who had given birth in the 3 years to 5 years before the survey date. There was a slight difference in the wording. The wording of the question was as follows: "At the time you became pregnant with (NAME), did you want to become pregnant then, did you want to wait until later, or did you want no more children at all?" The intent of the question was to provide a more straightforward way of determining wanted fertility (the level of fertility that would prevail in a population if only wanted births occurred) and also the extent of contraceptive need for spacing. If the question had worked well in the field, rarely would a teenager who had no surviving children respond that she wanted no more children at the time of her recent pregnancy. A quick examination of the data used for this report indicates that in all the countries, children of women then age 19 or younger were rarely in the unwanted category. Therefore it can be concluded that the questions probably worked well in the field.

From the way the questions were asked in the field and in view of the objectives of the questions, it became clear that the definition of whether a child was wanted, mistimed, or unwanted

referred to the feelings of the parent at the time of conception. The definition has nothing to do with whether the child fell into any of those categories at birth or at the time of interview. In some surveys, the question on unintended childbearing was asked of women who had given birth in the 5 years before the date of interview; in other surveys, the questions were asked of women who had given birth in the preceding 3 years. To ensure uniformity, the cases in this report were limited to births in the 3 years before the date of interview.

## 1.4 CONCEPTUAL FRAMEWORK AND ANALYSIS PLAN

The analysis in this report is based on a conceptual framework that has been used as a heuristic device to aid readers in understanding the approach taken in ordering the various elements that affect unintended pregnancies and births. The conceptual framework is diagrammatically represented in Figures 1.1 and 1.2. Figure 1.1 presents three categories of pregnancies. At one end of a continuum are the consciously planned pregnancies; at the other end are the unconsciously planned; in the middle are pregnancies that were neither planned nor expected. In the first group are pregnancies among women who had carefully planned and anticipated them—all things being equal, most of them will be classified as both wanted and rightly timed. The pregnancies described as unconsciously planned are those that occur among fecund women who were not planning to have a baby but were having sexual relations without using an effective method of contraception. Women in this category include those who were using ineffective contraceptives and those who were careless users of effective contraceptives. Pregnancies among this group are very likely to be mistimed, and many of them may be unwanted. The last group are those who had surprise pregnancies, resulting from rapes, unexpected sexual intercourse, or failures of effective methods of contraception. Usually they are unwanted pregnancies.

Regardless of the way the pregnancy occurs, when a woman discovers that she is expecting a baby, various reactions on her part are possible. This is when a woman—whether wittingly or unwittingly—counts the cost. Of course, a major factor in the reaction process is any planning that preceded it. However, there are various other factors that a woman in such a circumstance might take into consideration. Many of them are shown in Figure 1.2: They include the woman's number of living children, her economic circumstances, the length of the preceding birth interval, and the marital status and age of the woman. Some of those may be motivating (positive or predisposing); others may be undesirable (negative or unattractive). A woman (alone or in conjunction with her spouse or significant others) may score the factors positively or negatively and weigh them. If the positives heavily outweigh the negatives, the pregnancy may be classified as rightly timed. If not, it may be classified as mistimed or

Figure 1.1 Diagram of unintended pregnancy and childbearing

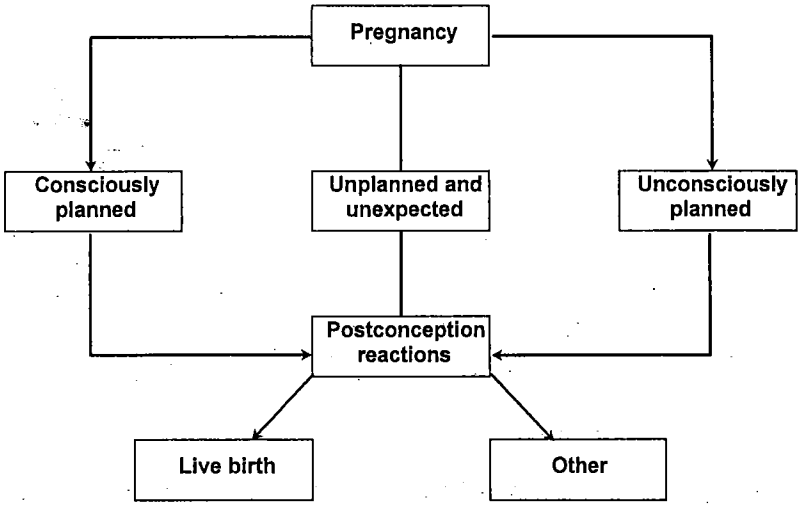
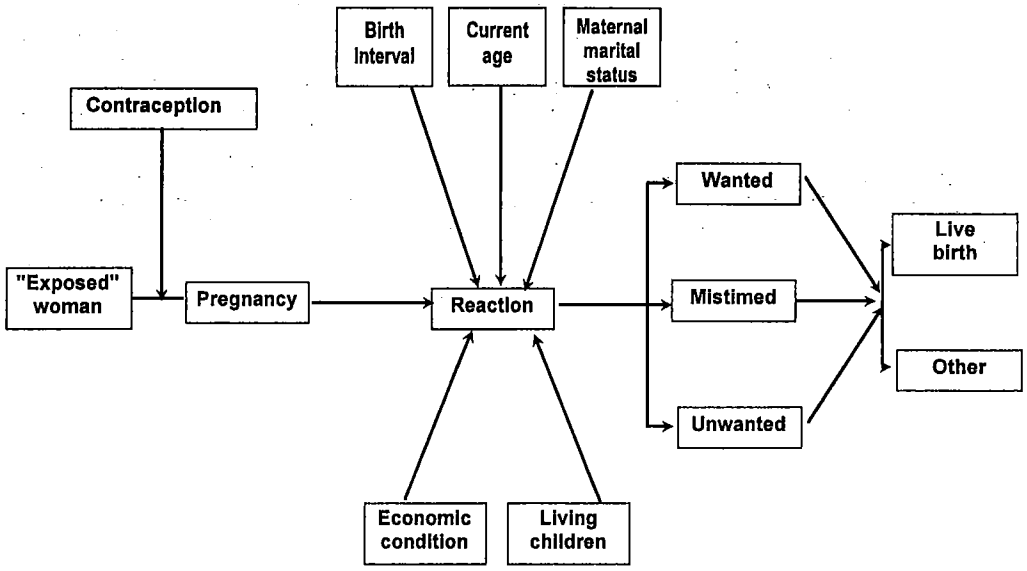


Figure 1.2 Diagram of determinants of unintended childbearing




unwanted. For example, a 26-year-old woman whose marital status and economic circumstances seem right, and who has waited more than a year or two since marriage without bearing a child, might consider it wonderful if she found herself pregnant. However, she might consider it a disaster if the pregnancy were a result of a contraceptive failure and she were at a critical point in her career, where a break from working would spell financial woe for herself and her spouse (see Adler 1992).

Although the opinion of the spouse is very important, there is no information on that in this analysis. The opinions of others may weigh heavily in how a woman finally classifies a pregnancy. Moreover, whether a woman carries the pregnancy to term or has a live birth is a function of other factors, which are not the focus of this report. The data available for analysis are for pregnancies that did result in live births (or current pregnancy, when applicable). There are other factors that are reported in the literature to be important determinants of unintended pregnancies but for which we have no data in this report. Those include behavior in regard to contraception, such as a temporary cessation in the use of effective contraception (Wiedlandt and Hansen 1989); carelessness in use of contraceptives (Denton and Scott 1994); ethnic background or race (Williams 1991); grief or loss; and life-cycle events such as changes in sexual partner, geographical mobility, and menopause (Adler 1984:29-30).

From the conceptual framework (Figures 1.1 and 1.2), an analysis plan was derived for examining the relationship between the various predictor variables (determinants) and the outcome variables (mistimed and unwanted childbearing). As has been indicated earlier in this chapter, whether an index pregnancy or birth was mistimed or unwanted refers to its status at the time of conception. The question that was considered key in selecting variables for inclusion as determinants in this analysis was, Why would a woman consider her pregnancy mistimed or unwanted? Various reasons (depending on the woman's cultural context) might be that it occurred too soon after another surviving child had been born (preceding birth intervals), she considered herself too young or too old to be seen as pregnant (age of mother), it occurred out of wedlock (marital status), she already had many surviving children (number of living children), or she considered her economic situation unsuitable (socioeconomic factors). Those variables are used to build the statistical models used in this report.

## 1.5 DEFINITION OF VARIABLES AND SPECIFICATION OF MODELS

The key demographic variables examined in this report are age of the mother at the time of conception of the child, preceding birth interval, marital status at the time of survey, and number of living children. The socioeconomic variables included in the model are number of years of schooling, household socioeconomic status, and exposure to the mass media. Age of the mother at the time of conception is grouped into younger than 20, 20 to 24, 25 to 29, 30 to 34, and 35 or older; preceding birth interval was recoded into less than 18 months, 18 to 24 months, 25 to 35 months, and 36 months or more. First births (children without preceding birth intervals) are coded "other" and are

included in the models. For bivariate analysis, marital status was classified as currently married or other. However, in the logistic regression analysis (because Egypt and Indonesia have only ever-married women), two categories were used: currently married and currently single (divorced, widowed, and never married). The term "number of living children," as used in this report, refers to the number of living children at the time of conception of the index child and is recoded into 0-1, 2-3, 4-5, and 6 or more. To obtain an index of household economic status (or economic index), household characteristics and possessions were used as proxies. The items used were drinking water piped into residence, washing water piped into residence, possession of a radio, possession of a bike (bicycle or motorcycle) in household, possession of a car in household, floor made of concrete or wood, and household using a flush toilet. Having at most two of those seven items was considered low economic status; possession of three to four was considered middle status; possession of more than four was considered high economic status. Media exposure was based on three levels: whether a person listened to radio daily (as in Colombia, the Dominican Republic, Indonesia, and Zimbabwe) or weekly (as in Ghana, Kenya, Senegal, Morocco, and Peru) or read a newspaper or watched television weekly. Persons who had access to none of these were scored zero, those who had access to only one were scored one, and so on. In Egypt, the variable on radio is not available, so only two media sources are recorded for Egypt. Years of schooling was used to indicate the level of education of mothers; the levels were coded into categories of 0, 1-5, 6-10, and 11 or more years.

The major packages that have been used for analysis are the Statistical Package for the Social Sciences (SPSS) and the Integrated System for Survey Analysis (ISSA). Both packages were used for univariate and bivariate distribution of the data, but the SPSS was also used for the multivariate logistic regression analysis. To investigate whether there is any association between the level of fertility and the prevalence of unintended childbearing in each country, a synthetic approach similar to that used for calculating the age-specific fertility rate (ASFR) and total fertility rates (TFR)[4] was used to derive the age-specific mistimed fertility (ASMF), age-specific unwanted fertility (ASUF), and then age-specific unintended fertility (ASUIF). From those measures, total mistimed fertility (TMF), total unwanted fertility (TUF), and total unintended fertility (TUIF) were obtained. All of the rates were based on births in the 3 years before the date of interview. To obtain the corresponding rate for all women in surveys that were based on ever-married samples only (Egypt and Indonesia), an adjustment factor based on the household listing was applied. That factor is a ratio of all women age 15 to 49 in the household to the number of ever-married women age 15 to 49; it is applied to obtain the correct denominator for indices based on all women. This adjustment factor is available in countries with ever-married samples.

Logistic regression was used to analyze the effects of the variables after controlling for the effects of other variables in the model. The logistic regression model can be written as

$$1) \qquad \ln (P/(1-P)) = B_0 + B_1X_1 + B_2X_2 + \ldots + B_nX_n$$

(where ln is the natural log and P is the probability that a pregnancy will be described as mistimed or unwanted) and can be written as

$$2) \qquad P = 1/(1+exp - (B_0 + B_1X_1 + B_2X_2 + \ldots + B_nX_n)),$$

where $B_0$, $B_1$, $B_2$, . . . $B_n$ are coefficients and $X_1$, $X_2$ . . . $X_n$ are independent variables, and *exp* stands for exponentiation. To fit the model for mistimed childbearing, the dependent variable was coded 1 if a child was mistimed and 0 (zero) otherwise. The same procedure was used for unwanted childbearing. The likelihood ratio test was used to assess the significance of the effects of each variable (see Norusis 1992).

## 1.6 LIMITATIONS OF THE DATA

One of the problems of using survey data to study reproductive intentions is the necessity of reliance on responses to questions after the fact. Evaluation is therefore subject to various forms of *ex post facto* rationalization, with a possible bias toward classifying an unplanned pregnancy as planned (Westoff 1988:257). However, it has been found in the United States that responses of women to questions on surveys were consistent over a period of 5 years: 74 percent of the women reported having the same feelings about the same pregnancies after 5 years as they had had initially (Westoff 1980:137), although some pregnancies previously classified as mistimed had been reclassified as rightly timed. In a developing-country environment, a Peruvian study also tried to assess the reliability of reported wantedness of a baby by following up a sample of 218 respondents from the 1991-92 Peruvian DHS and reinterviewing them in 1994 concerning the wantedness of the same children (Mensch et al. 1995:12-13). The responses indicated that 74 percent of them gave consistent responses in both interviews. Westoff and colleagues have tried to do the same thing in Morocco, where they found that the planning status of children was more consistently reported for recent births. Because of the finding that the quality of data decreases as the interval between the event (pregnancy) and the date of surveys increases, this analysis focuses on children born less than 3 years before the survey date.

[4] In Demographic and Health Surveys (DHS), age-specific fertility rates are calculated from the birth history as the number of births to women in a specified age group divided by the number of woman-years of exposure during the same period. That is, ASFR [a,t] = b [a,t]/e[a,t], where a = 5-year age groups 15 to 19 and 45 to 49, b[a,t] = births to women in age group a during the period t, and e [a,t] = woman-years of exposure among women in age group a during the period t (see Arnold and Blanc 1990:2). In this report, t refers to 3 years before the date of survey.

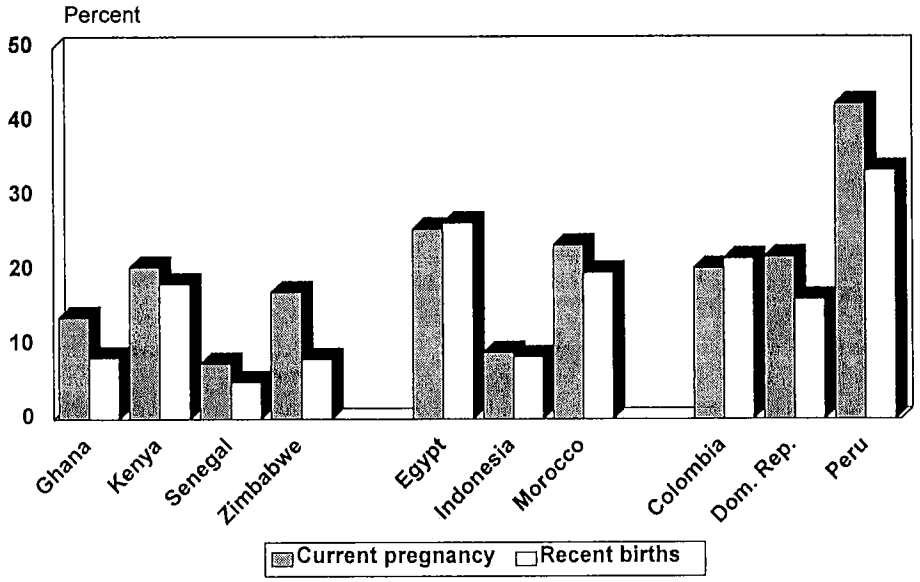
One way to assess the extent to which *post facto* rationalization can affect the results of the analysis in this report is to compare the proportion of current pregnancies that were reported as mistimed or unwanted with the proportion of mistimed or unwanted births in the 3 years before survey date. The assumption is that the two proportions should be close if there is relatively low prevalence of abortions, miscarriages, and stillbirths. However, there are reasons why the proportion of current pregnancies reported as mistimed or unwanted may differ from the proportion of recent births so reported. In the case of unwanted pregnancies, we expect to have a higher proportion so reported among currently pregnant women because many current pregnancies that are highly unwanted may not result in a live birth and so not contribute to unwanted childbearing.[5] We expect a lower proportion of reported unwanted pregnancies, however, if there has been a recent increase in the use of effective methods of contraception by women at risk of unwanted pregnancy, or if there have been recent policy changes that made abortion widely available.

In Figures 1.3 and 1.4, the prevalence of mistiming and unwantedness among current pregnancies and recent births is compared. The result of that comparison shows that both proportions were quite close in most of the countries—especially that of mistiming in sub-Saharan Africa. However, the proportion reported as mistimed or unwanted tends to be higher in current pregnancies than in recent births.

The conclusion that could be drawn from Figures 1.3 and 1.4 is that although some evidence of *post facto* rationalization may exist, it is not likely to bias the general conclusions of the analysis in this report.[6]

Another limitation of the data available for this analysis is caused by their relationship to contraceptive practices. One of the pieces of information necessary for examining the relationship between an unintended pregnancy and use of contraceptives is contraceptive behavior at the time of conception. Such data are

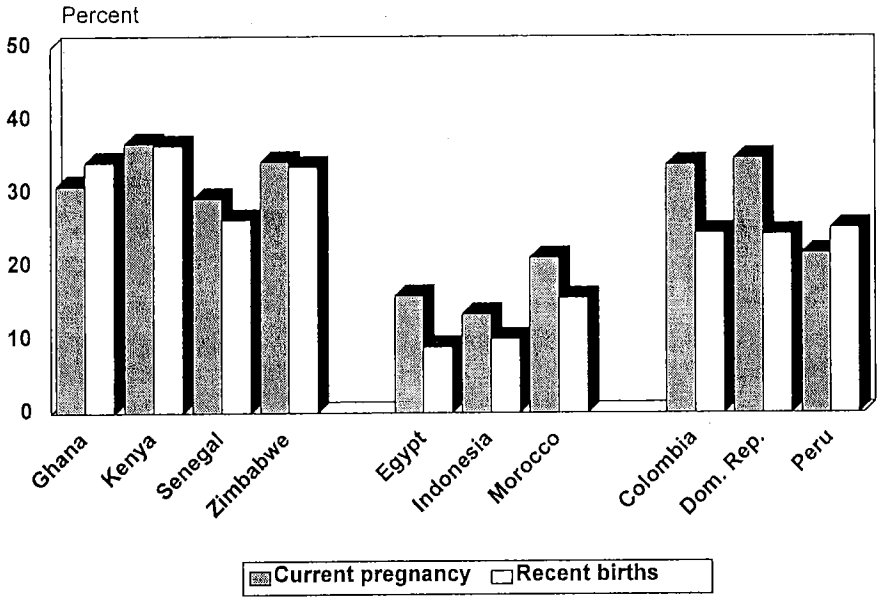
Figure 1.3 Comparison of the prevalence of unwanted pregnancies: Current pregnancy versus children born in the 3 years before the survey




[5] Joyce and Grossman (1990:2-3), reasoning from an economistic framework of revealed preference, argued that there is a threshold of wantedness, below which a woman would terminate a pregnancy. If this is true, there is a likelihood that highly unwanted pregnancies will not result in live births, a factor reducing the proportion of live births classifiable as unwanted at conception. It is recognized, however, that there are some women who, on moral grounds, will not terminate a pregnancy irrespective of the degree of unwantedness.

[6] Readers who are interested in what is happening with contraceptive prevalence in the 10 countries surveyed may see the table on trends in contraceptive prevalence (Table 1a) in the appendix. However, because Table 1a is for currently married women, it may not accurately reflect trends among single women, who also usually have a greater risk of mistimed and unwanted childbearing.

Figure 1.4 Comparison of the prevalence of mistimed pregnancies: Current pregnancy versus children born in the 3 years before the survey




not available for sub-Saharan African countries in this study, except for Zimbabwe. The data available for all of the countries on use of contraceptives refer either to an indefinite past (ever use) or at the time of interview (current use). Therefore, it is not easy to extrapolate the relationship between the occurrence of unintended pregnancies and method of contraception. Some women may take the use of contraceptive methods more seriously after having a recent birth resulting from an unintended pregnancy. However, others may not. A simple cross-tabulation of current use (or nonuse) of contraception with recent experience of mistimed, unwanted, and unintended childbearing is presented in Table 1b in the appendix. The results indicate that mothers who were using contraception at the time of the survey are more likely to have had a recent unintended birth than those who were not using. The association between the mother's current use of contraception and her recent child being unwanted at conception is stronger than the association between contraceptive use and its being mistimed: in eight of 10 countries, the proportion of unwanted births whose mothers were currently using a method of contraception is higher than among mothers who were not using. However, since the causal ordering of use of contraceptives and unintended childbearing is unclear in the conceptual framework, further analysis of the variable is omitted from this report.

# 2 Levels and Trends

It was stated earlier in this report that the level of unintended childbearing observed in a population tends to have an association with what stage the population is in along the course of the fertility transition. The association is especially noticeable in the case of unwanted fertility (Bongaarts 1997, Kulkani and Choe 1997). Levels of unwanted fertility tend to be low when a population has the high fertility rates that characterize pretransition populations, increase as fertility levels begin to fall, and then decrease when fertility is at low levels. Thus, the level of unwanted fertility tends to form an inverted U shape as a population moves from high to low fertility regimes. In this section of the report, results of the analysis done on levels and trends of unintended childbearing and its components (mistimed and unwanted childbearing) are presented for the 10 countries studied (Table 2.1). This discussion will deal first with the levels of mistimed, unwanted, and unintended childbearing across the countries and then with the trends.

## 2.1 LEVELS

Among the 10 countries studied for this report, the prevalence of mistimed childbearing is highest in sub-Saharan Africa (see Table 2.1). Focusing only on the period before the later survey, the range of mistimed childbearing in the region was 26 percent to 37 percent of births in the 3 years before the survey, with Kenya having the highest rate. Since mistimed childbearing relates to failure in timing births, it is likely that the contraceptive need for spacing births is of very serious concern to women in sub-Saharan Africa. The prevalence of mistimed childbearing was intermediate in the countries of Latin America and the Caribbean during that time, with a range of 24 to 25 percent. The lowest prevalence of mistimed childbearing was in North Africa/Asia. The prevalence of unwanted childbearing was highest in Latin America and the Caribbean, with a range of 16 to 33 percent of recent births; sub-Saharan Africa had the lowest prevalence of unwanted childbearing.

Overall, the highest level of unintended pregnancies in the 3 years before the dates of survey (see Table 2.1) observed was in Peru. About 59 percent of all live births in Peru in the 3 years before the more recent survey were unintended at conception, even though the level seems to have decreased slightly between 1986 and 1992. Much of the decrease in the level of mistimed pregnancies occurred between the two surveys. The other highest levels of unintended childbearing were in the Dominican Republic during the period before the earlier survey (60%) and in Kenya during the period before the later survey (55%). The level of unintended pregnancy seems to have been lower in North Africa/Asia than in the other two regions. The range of unintended childbearing was between 24 percent and 42 percent of all childbearing during the period before the earlier

Table 2.1 Percentage of births in the 3 years before surveys that were mistimed, unwanted, and unintended in selected DHS countries, and annual percentage change

| Region and country (dates of surveys) | Mistimed | | | Unwanted | | | Unintended | | |
|---|---|---|---|---|---|---|---|---|---|
| | Earlier survey | Later survey | Annual percentage change | Earlier survey | Later survey | Annual percentage change | Earlier survey | Later survey | Annual percentage change |
| **Sub-Saharan Africa** | | | | | | | | | |
| Ghana (1988, 1993) | 29.7 | 34.2 | +2.7 | 5.0 | 8.3 | +11.8 | 34.7 | 42.5 | +4.0 |
| Kenya (1988-89, 1993) | 41.7 | 36.5 | -3.0 | 11.2 | 18.2 | +14.9 | 52.9 | 54.7 | +0.8 |
| Senegal (1986, 1993) | NA | 26.4 | NA | NA | 5.0 | NA | NA | 31.4 | NA |
| Zimbabwe (1988, 1994) | NA | 33.6 | NA | NA | 8.1 | NA | NA | 41.7 | NA |
| **Asia/North Africa** | | | | | | | | | |
| Egypt (1988-89, 1992) | 16.6 | 9.0 | -11.4 | 25.4 | 26.4 | +1.0 | 42.0 | 35.4 | -3.9 |
| Indonesia (1991, 1994) | 17.1 | 10.1 | -12.4 | 7.0 | 8.4 | +6.1 | 24.1 | 18.5 | -7.0 |
| Morocco (1987, 1992) | 24.0 | 15.7 | -7.5 | 17.5 | 19.7 | +2.7 | 41.5 | 35.4 | -3.1 |
| **Latin America/Caribbean** | | | | | | | | | |
| Colombia (1990, 1995) | 20.4 | 24.6 | +4.3 | 21.5 | 21.6 | +0.1 | 41.9 | 46.2 | +2.1 |
| Dominican Republic (1986, 1991) | 34.4 | 24.4 | -5.9 | 25.4 | 16.1 | -7.5 | 59.8 | 40.5 | -6.6 |
| Peru (1986, 1991-92) | 30.6 | 25.3 | -3.3 | 34.6 | 33.4 | -0.7 | 65.2 | 58.7 | -1.9 |

Note: Percentage change represents an annual rate of change per hundred, calculated by dividing the difference between rates at the times of the later and the earlier survey by the exact number of years between them.
NA=Data on this measure were not available.

survey and between 18 percent and 35 percent during the period before the second survey. In Africa, there seemed to be a very high level of mistiming in relation to unwanted childbearing; in the three Latin American countries, both mistiming and unwanted childbearing were very common. In the two sub-Saharan African countries for which data were available for the periods before both the earlier and the later survey, the ratio of unwanted pregnancies to mistimed ones was between 1:2 and 1:6, whereas in the three Latin American countries the ratio was generally closer to 1:1.

The high level of unwanted childbearing in some of the countries in this report is corroborated by an earlier study (Westoff 1981). In his study of unwanted fertility in the six developing countries of Colombia, Panama, Peru, Indonesia, Korea, and Sri Lanka, even though he was using the World Fertility Surveys data and a slightly different approach to measurement of unwanted fertility, Westoff observed that the level was highest in Peru and Colombia and lowest in Indonesia. The cumulative number of unwanted births among women whose last wanted birth occurred 20 years before being surveyed was 2.8 in Peru, 2.2 in Colombia, and 0.8 in Indonesia. The same pattern seems observable in this report also.

## 2.2 TRENDS

The overall level of mistimed childbearing declined in six of the eight countries for which data were available from two surveys (Table 2.1). The largest annual declines in mistimed childbearing were in Indonesia (12%), Egypt (11%), and Morocco (8%)—those countries are all in the North Africa/Asia region, and their samples were limited to ever-married women only. In the two sub-Saharan African countries, an annual increase of about 3 percent was observed in Ghana, whereas in Kenya the rate decreased by about 3 percent annually. Unlike the level of mistimed childbearing, the level of unwanted childbearing increased between the two surveys in six of the eight countries, primarily in North Africa/Asia and sub-Saharan Africa. In Latin America and the Caribbean, the level of unwanted childbearing either remained virtually unchanged (in Colombia) or declined (in the Dominican Republic and Peru). The only country with a substantial annual decline in unwanted childbearing was the Dominican Republic (-8%).

The data showed a declining trend in both mistimed and unwanted childbearing in the Dominican Republic and Peru only; they showed increasing trends in Ghana and Colombia. In all three of the countries in North Africa and Asia, unintended childbearing decreased overall between the two surveys. However, the declines were entirely a result of the large percentage decline in mistiming combined with small increases in unwanted childbearing.

One might want to know how the observed level in these DHS data compares with the level of unintended pregnancies that has been observed in the industrial West. Although the data are not completely comparable, an analysis of the incidence of mistimed and unwanted births among married women in the United States (Anderson 1981) showed that the proportion of mistimed children was 31 percent in 1961-65 and 23 percent in 1971-76. Similarly, unwanted births declined from 24 percent to 9 percent during the same interval. Between 1977-82 and 198488, the proportion of unintended births increased from 36.5 percent to 39.9 percent. During the same interval, mistimed births increased from 26.6 percent to 27.7 percent and unwanted births increased from 9.9 percent to 12.2 percent (Forrest and Singh 1990:212-214). Those figures are not a correct reflection of the level of unintended pregnancies, however, because a significant proportion of unintended pregnancies end up being aborted. For example, in 1982, it was estimated that about 54 percent of all unintended pregnancies ended in abortions, while by 1987 the proportion had dropped to 50 percent.

Estimates suggest that the proportion of unintended pregnancies in the United Kingdom may be lower than that in the United States. A study of births in England in 1984 showed that about a quarter (27%) were unintended (Cartwright 1988). In 1989, an analysis that combined survey data with abortion notification data (Allaby 1995) estimated that about 47 percent of pregnancies in England and Wales were unintended and about two of every five unintended pregnancies (43%) ended in abortions. In Halifax, Canada, a study of 200 postpartum mothers found that 32.5 percent of their pregnancies were unintended and that 51 percent of those were unwanted (Denton and Scott 1994), a finding that showed a decline of about 26 percent from the level of unintended pregnancy (44%) observed in the same region in 1971.

## 2.3 AGE PATTERN OF MISTIMED AND UNWANTED CHILDBEARING

To further investigate the maternal age pattern of unintended childbearing in the 10 countries in this report, age-specific rates were computed for mistimed, unwanted, and unintended childbearing. The age-specific mistimed fertility rate (ASMFR) in the 3 years before the survey date is calculated as the number of mistimed births to women in a specified age group in the 3 years before the survey date divided by the number of woman-years of exposure in that age group during the period. Similarly, the age-specific unwanted fertility rate (ASUFR) in the 3 years before the survey date is calculated as the number of births unwanted at conception to women in a specified age group divided by the total number of years of exposure of women in that age group during the period. In any age group, the age-specific unintended fertility rate (ASUIFR) is the summation of ASMFR and ASUFR. In Egypt and Indonesia, where the samples are restricted to ever-married women, an inflation factor based on the proportion married in the household schedule has been applied to inflate the number of women to encompass both never-married and ever-married women. The resultant rates were compared to

the observed age-specific fertility rates for the same periods (3 years before interview date). The results are presented in Figure 2.1. The actual numbers that were used in the charts are presented in Table 2a in the appendix.

In all the countries, the uppermost curve represents age-specific fertility rates including both wanted and unintended births. The next lower curve represents unintended fertility rates. The gap between the two curves represents the proportion of all fertility that is intended (fertility resulting from pregnancies that occurred when the women wanted them to). If the gap exists up to a maternal age of 49—as is the case in almost every country—it suggests that even at the upper end of the reproductive span some women still gave birth to planned children. However, if the age-specific fertility curve joins that of unintended fertility earlier than age 49, it suggests that pregnancies occurring since the age of convergence are unintended. As the results in Figure 2.1 suggest, even if effective contraception were to be acceptable and accessible to women of those ages, some women would still continue to have children until menopause (for various reasons), given that some children were still considered planned up to a maternal age of 49.

The age pattern of mistiming and unwanted childbearing is also very interesting, especially the ages at which the two curves intersect. In general, the rate of mistimed childbearing tends to be high at younger ages and to decrease as a woman's age increases. The trend is the reverse for unwanted childbearing. Therefore, in almost all the countries, there is an intersection between the age-specific rate of mistimed childbearing and that of unwanted childbearing. The lower the age at which the curves intersect, the greater the level of desire to limit fertility in the population seems to have been. Of the four sub-Saharan African countries in this report, the intersection between the two curves occurs earliest in Kenya and latest in Senegal and Ghana. This contrast seems to be a reflection of the rapidly declining desire for fertility in Kenya and the slow pace of the decline in Senegal and Ghana (see Table 2.2). A similar point could be made about the countries of North Africa and Asia, where Egypt seems to have experienced the most rapid decline in desire for fertility and also seems to be the country in which the intersection of mistiming and unwantedness occurred earliest. Of course, desire for fertility may not always translate to actual reduction in fertility. In the countries of Latin America and the Caribbean, the similarity in the ages at intersection seems to resemble the similarity of the declines shown in Table 2.2. Another interesting observation about the pattern of intersection between the two curves in Figure 2.1 is that it occurs around ages 35 to 39 in sub-Saharan African countries and much earlier in other regions. One general point that seems to emerge from the maternal age pattern of unintended childbearing is that it usually mirrors the overall schedule of fertility, even though its level is much lower.

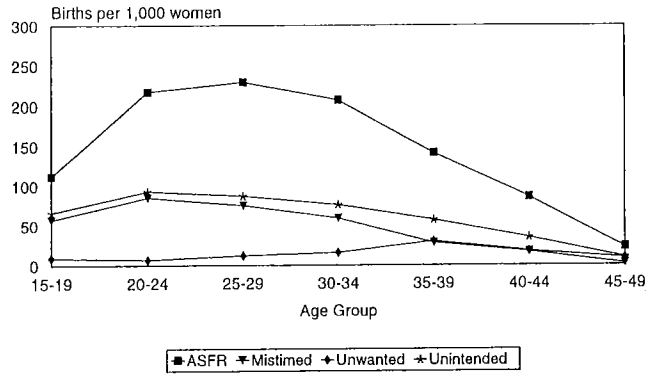
Table 2.2 Trends in the mean number of children desired among ever-married women between the time when the World Fertility Survey data were collected in each country and the periods when Demographic and Health Surveys rounds were conducted

| Region and country | WFS | DHS | DHS-II or DHS-III | Percentage decline |
|---|---|---|---|---|
| **Sub-Saharan Africa** | | | | |
| Ghana | 6.0 | 5.5 | 4.7 | 22 |
| Kenya | 7.2 | 4.7 | 3.9 | 46 |
| Senegal | 8.8 | 6.1 | 6.2 | 30 |
| Zimbabwe | NA | 5.3 | 4.7 | NA |
| **North Africa/Asia** | | | | |
| Egypt | 4.1 | 2.9 | 2.9 | 29 |
| Indonesia | 4.1 | 3.2 | 3.1 | 24 |
| Morocco | 4.9 | 3.7 | 3.8 | 22 |
| **Latin America/Caribbean** | | | | |
| Colombia | 4.1 | 3.0 | 2.8 | 32 |
| Dominican Republic | 4.6 | 3.6 | 3.2 | 30 |
| Peru | 3.8 | 2.9 | 2.6 | 32 |

NA=Data were not available.
Source: Adapted from Bankole and Westoff (1995, Table 3.3).

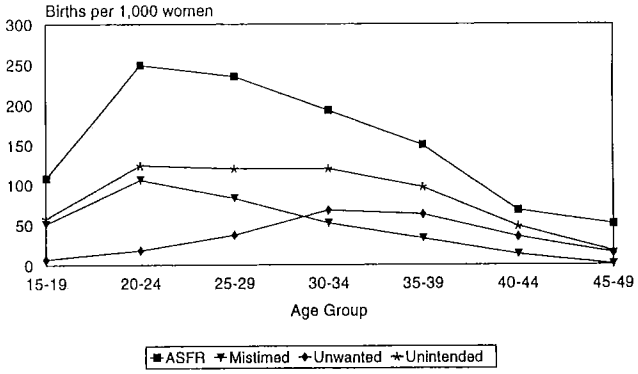
Figure 2.1 Maternal-age-specific fertility rate, and maternal-age-specific rates for mistimed, unwanted, and unintended births, Demographic and Health Surveys

Ghana



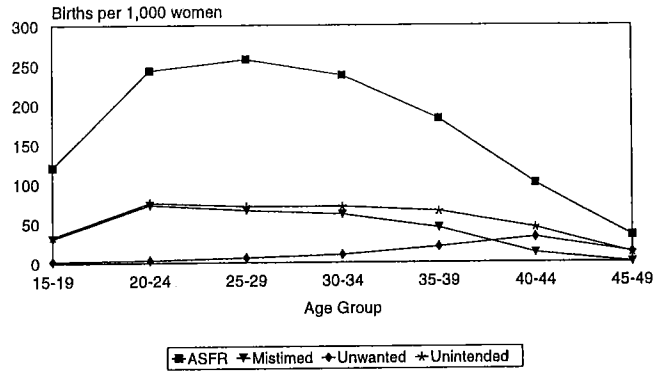

Note: Rates are based on births in the 3 years before the survey.

Kenya



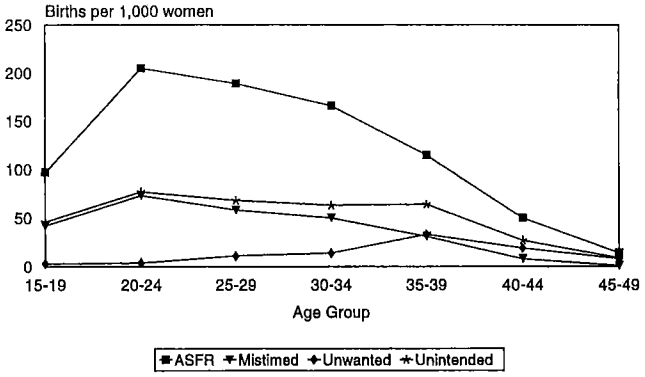

Note: Rates are based on births in the 3 years before the later survey.

Senegal



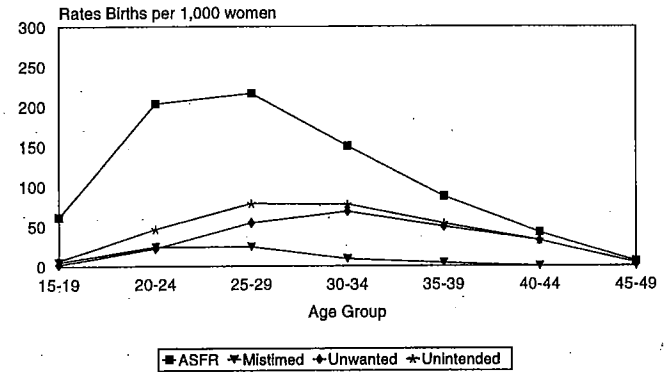

Note: Rates are based on births in the 3 years before the later survey.

Zimbabwe



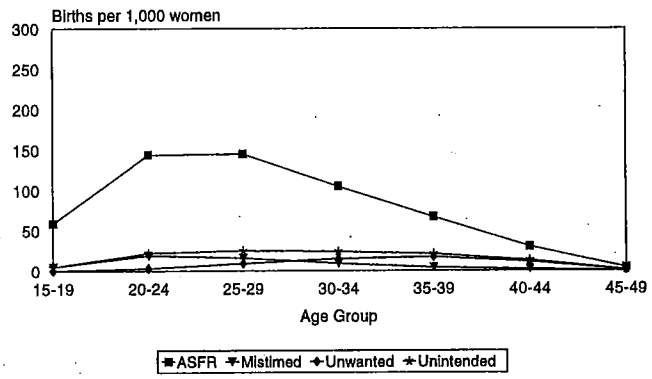

Note: Rates are based on births in the 3 years before the later survey.

Egypt

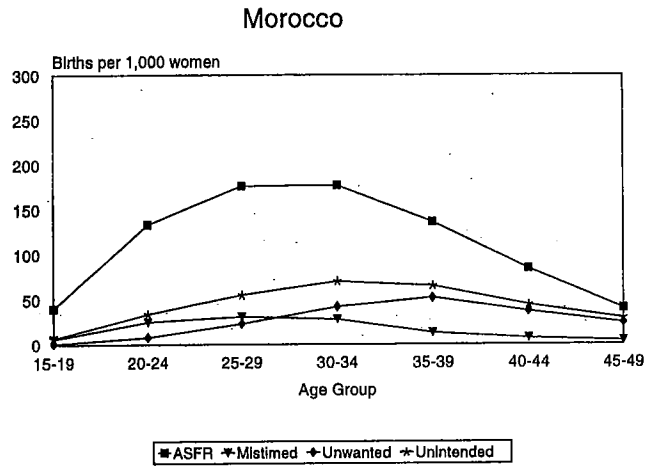



Note: Rates are based on births in the 3 years before the later survey.

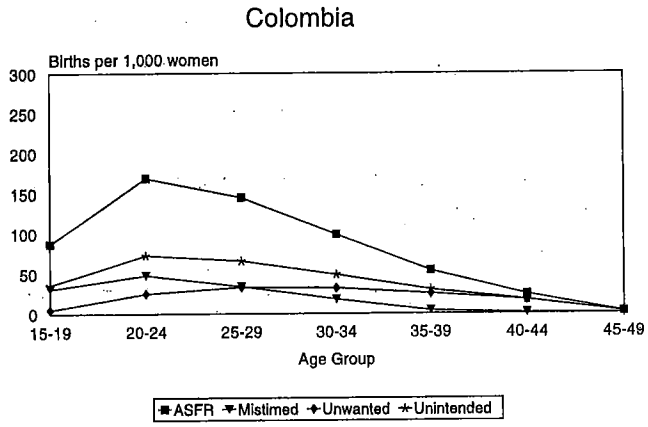
Indonesia



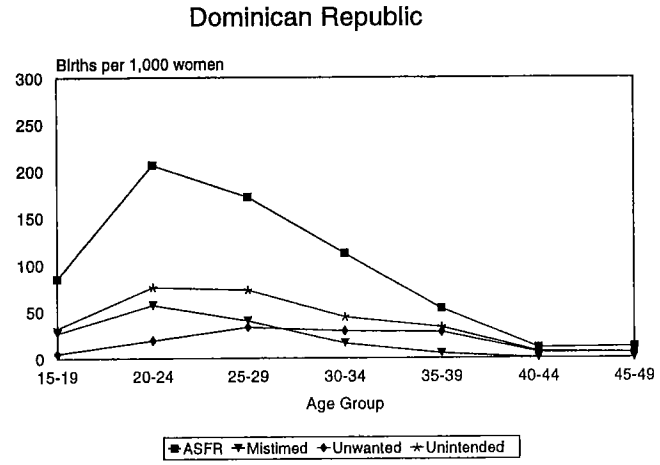

Note: Rates are based on births in the 3 years before the later survey.



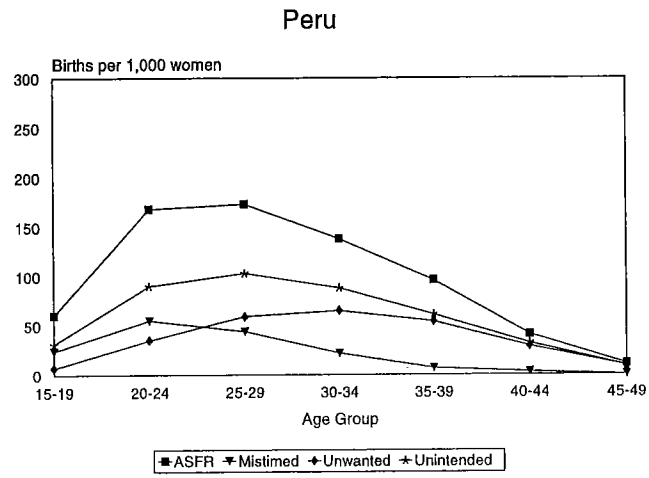

Note: Rates are based on births in the 3 years before the later survey.




Note: Rates are based on births in the 3 years before the later survey.




Note: Rates are based on births in the 3 years before the later survey.




Note: Rates are based on births in the 3 years before the later survey.

## 2.4 UNINTENDED CHILDBEARING AND FERTILITY LEVELS

Table 2.3 presents the results of a synthetic measure of mistimed, unwanted, and unintended fertility calculated in a way similar to the calculation of the total fertility rate (TFR). The total mistimed fertility rate (TMFR) is obtained by summing the ASMFR in 5-year age groups from age 15 to age 49, and multiplying that sum by five. The total unwanted fertility rate (TUFR) and the total unintended fertility rate (TUIFR) are obtained in a similar way, and their interpretation is similar to that of conventional total fertility rates. For example, the TUIFR is the number of unintended children that a woman would have from age 15 to age 49 if she experienced the age-specific unintended fertility rate observed in the population during the period to which the ASUIFR refers. The TFR column presents the number of children that a woman will have if when she goes through her reproductive ages she experiences the current level of fertility in each age group. The column for total mistimed fertility rate and the column for total unwanted fertility rate indicate the number of the woman's children that will be mistimed or unwanted if the current age-specific rates for mistimed and unwanted fertility continue. The last column shows what proportion of this woman's total fertility will be unintended. The results in Table 2.3 show that women in the four sub-Saharan African countries have thehighest rate of mistimed childbearing; on average, a 15-year-old woman who experiences the current age-specific mistiming rate during her reproductive life span will end with about 1.5 mistimed children by age 50. This rate is about five times higher than the rate in Egypt and Indonesia, and about two times the rate

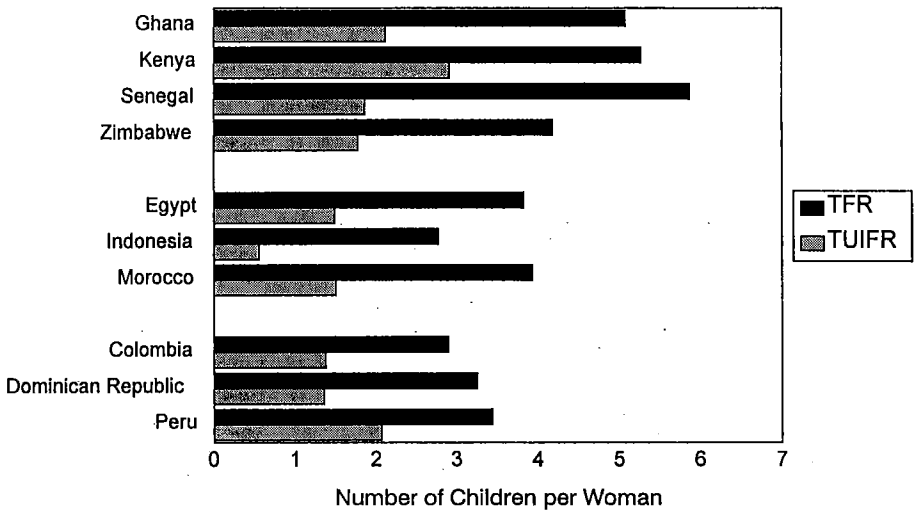
in countries of Latin America or the Caribbean. Another observation is that in sub-Saharan African countries, the rate of mistimed childbearing is higher than the rate of unwanted childbearing—in many cases it is about two to three times greater—whereas in other regions, the rate of unwanted fertility is usually greater than or equal to the rate of mistimed fertility. Figures 2.2 and 2.3 present the comparisons clearly.

The general pattern of association between the TFR and unintended fertility seems to be that in a population where total fertility rates are low (fewer than three children), the proportion of unintended fertility is relatively low. An example is Indonesia, which has the lowest TUIFR as well as the lowest TFR (Table 2.3). Similarly, in populations that have pretransitional fertility (TFR 6 or more), the proportion of fertility that is unintended is also moderately low. An example of this finding is in Senegal, which has the highest total fertility rate but very low total unintended fertility as a proportion of TFR. Other countries are at various stages in the course of the fertility transition, with proportions of unintended fertility generally high.

Table 2.3 Levels of unintended fertility rate in relation to total fertility rate in the 3 years before the date of interview, for the later survey

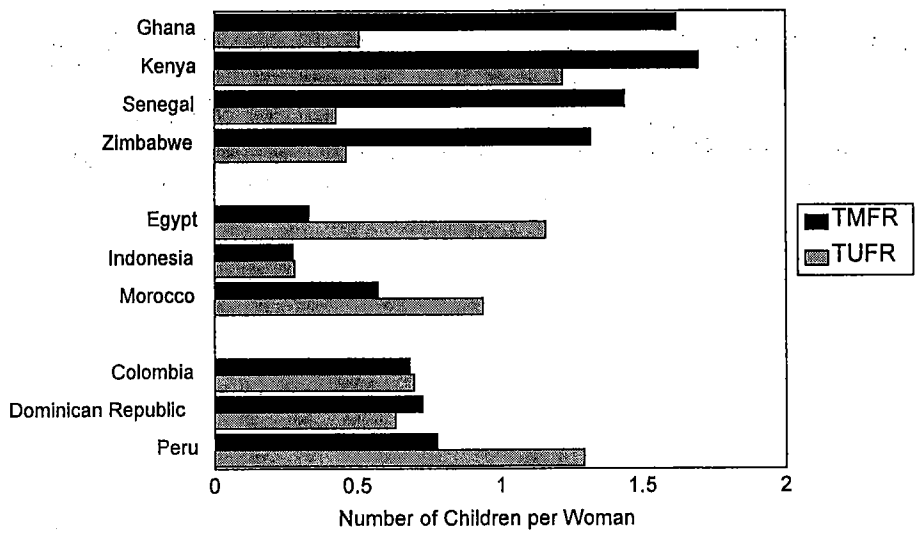
| Region and country | Total fertility rate (TFR) | Total fertility rate that was | | | Percentage of TFR unintended |
|---|---|---|---|---|---|
| | | Mistimed | Unwanted | Unintended | |
| **Sub-Saharan Africa** | | | | | |
| Ghana | 5.1 | 1.6 | 0.5 | 2.1 | 41.2 |
| Kenya | 5.3 | 1.7 | 1.2 | 2.9 | 54.7 |
| Senegal | 5.9 | 1.4 | 0.4 | 1.8 | 30.5 |
| Zimbabwe | 4.2 | 1.3 | 0.5 | 1.8 | 42.9 |
| **North Africa/Asia** | | | | | |
| Egypt | 3.8 | 0.3 | 1.2 | 1.5 | 39.5 |
| Indonesia | 2.8 | 0.3 | 0.3 | 0.6 | 21.4 |
| Morocco | 3.9 | 0.6 | 0.9 | 1.5 | 38.5 |
| **Latin America/Caribbean** | | | | | |
| Colombia | 2.9 | 0.7 | 0.7 | 1.4 | 48.3 |
| Dominican Republic | 3.3 | 0.7 | 0.6 | 1.3 | 39.4 |
| Peru | 3.4 | 0.8 | 1.3 | 2.1 | 61.8 |

## Figure 2.2 Total fertility rate (TFR) and total unintended fertility rate (TUIFR) in the 3 years before the survey




Note: Rates are based on births in the 3 years before the later survey.

Figure 2.3 Total mistimed fertility rate (TMFR) and total unwanted fertility rate (TUFR) in the 3 years before the survey




Note: Rates are based on births in the 3 years before the later survey.

# 3 Socioeconomic Determinants of Unintended Childbearing

The three socioeconomic variables discussed in this section (maternal education, exposure to the mass media, and index of economic status) are taken to reflect the social and economic conditions that may impinge on a woman's decision to categorize a given pregnancy as wanted, mistimed, or unwanted (see Figure 1.2). The procedure adopted in this survey to measure these variables was described in section 1.5. Past studies in the West have found that socioeconomic factors, such as level of education and some index of economic status or poverty, affect the level of unintended pregnancy (Anderson 1981, Forrest 1994, Williams 1991). In the context of developing countries, the socioeconomic factors that are used in this study are education (measured by years of schooling) and media exposure (measured by listening to radio daily or weekly, watching television weekly, and reading a newspaper weekly). The summary results of how those variables are associated with mistiming and unwantedness of previous pregnancies are presented in Table 3.1. In the following sections, each of the factors is discussed one by one.

## 3.1 EDUCATION

Education can be interpreted as a measure of self-efficacy, of competence and capacity to make informed decisions, and of access to information through print and mass media that may be unavailable to the unschooled. It has been convincingly argued that educated women are less fatalistic and are more attuned to scientific reasoning than the less educated. It is argued that education affects the psyche and shifts the allegiance of a person in a developing-country environment from a traditional culture to a modern culture. An educated woman, then, is presented as a shrewd and competent actor who believes that she has the capacity to get the best out of the world without succumbing helplessly to the whims and caprices of nature (Caldwell 1979, 1984). Consequently, it is expected that an educated woman would not have a pregnancy that she was not prepared for, if she had access to the means of preventing it. Previous studies in the United States have found that education is negatively associated with unintended pregnancies (Anderson 1981, Williams 1991).

In light of that characterization, the prevalences of mistimed and unwanted pregnancies were cross-classified with a woman's years of schooling. Columns two to five of Table 3.1 show the results. The first thing that is noticeable in the table is that the relationship of women's education to mistimed pregnancies differs from its relationship to unwanted pregnancies. In eight of the 10 countries, mistimed pregnancies increase somewhat as the number of years of schooling increases. However, in the Latin American/Caribbean countries and Morocco, the proportion of births that were unwanted at conception decreased linearly with the years of schooling. In Egypt and Indonesia, the linear decline in the proportion of births that were unwanted at conception and years of schooling became clear only if those with no schooling were ignored. The percentage of children unwanted at conception was higher among mothers with 1 to 5 years of schooling than among those with no schooling. The pattern of association between maternal education and the proportion of births unwanted is discernible in Figure 3.1. The proportion of children unwanted was higher among mothers with no schooling than among those with 11 or more years of schooling (except in Ghana and Senegal). In sub-Saharan African countries, there is no clear pattern of association between education and mistimed or unwanted pregnancies (except in Zimbabwe). Because the association between mistimed childbearing and unwanted childbearing and maternal education goes in opposite directions, the pattern becomes mixed when both types are added together as unintended childbearing.

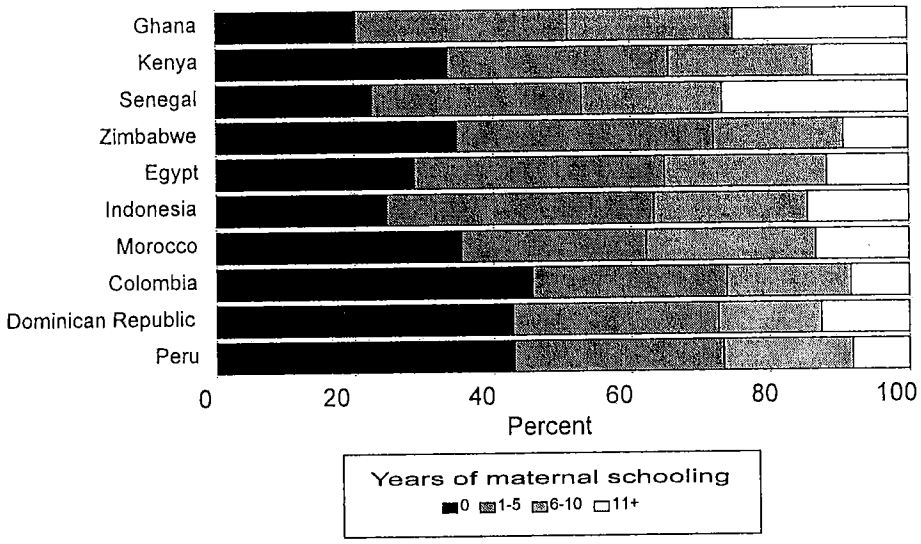
The linear decline in unwanted fertility that is observed in Latin American countries and to a large degree in North Africa/Asia and Zimbabwe is supported by findings from the West. Similarly, the weak relationship of education with unintended childbearing is also in line with findings of previous studies in the West. The study of unwanted/wanted children among ever-married women in the United States between 1973 and 1988 showed that the incidence of unwanted births decreased as the number of years of schooling increased, and the relationship was statistically significant (Williams 1991:215). However, an analysis by Anderson (1981:67) of unintended childbearing among married women in the United States showed that its relationship with educational status is weak, especially when marital duration is taken into account.

In the current study, the relationship of education to mistimed and unwanted childbearing is also examined after taking into account the effects of other demographic and socioeconomic variables such as marital status, number of living children, age of mother at the time of birth, preceding birth interval, exposure to media, and economic index. Logistic regression was used to sort out the relationships (see section 1.5 for more details). The results are presented in Table 3.2, and they show that the relationship between mothers' education and unwanted pregnancies was inverse in Latin America and the Caribbean, and it was statistically significant in Colombia and Peru. Although the relationship was statistically significant in four other countries, it was not as consistent; children of educated mothers seemed more likely to be unwanted at conception than children of mothers with little or no education. Mistimed childbearing was significantly related to mothers' education in all the countries except the Dominican Republic (Table 3.3). In most of the cases, too, the odds that a

Table 3.1 Percentage of mistimed, unwanted, and unintended births in the 3 years before the later survey, among groups of women in selected Demographic and Health Surveys

| Region and country | Maternal education (years) | | | | Number of media of mass communications mother was exposed to | | | | Maternal economic index | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1-5 | 6-10 | 11+ | 0 | 1 | 2 | 3 | Low | Middle | High |
| **Sub-Saharan Africa** | | | | | | | | | | | |
| **Ghana** | | | | | | | | | | | |
| Mistimed | 29.5 | 36.0 | 39.5 | 20.0 | 30.9 | 37.1 | 38.6 | 26.2 | 35.5 | 31.5 | 20.9 |
| Unwanted | 7.2 | 10.9 | 8.5 | 8.9 | 8.6 | 8.3 | 7.2 | 9.8 | 8.9 | 5.7 | 7.7 |
| Unintended | 36.7 | 46.9 | 48.0 | 29.9 | 39.5 | 45.4 | 45.8 | 36.0 | 44.4 | 37.2 | 28.6 |
| **Kenya** | | | | | | | | | | | |
| Mistimed | 25.4 | 32.8 | 42.8 | 34.3 | 32.3 | 38.8 | 40.1 | 33.7 | 36.3 | 41.0 | 29.9 |
| Unwanted | 24.9 | 23.9 | 15.5 | 10.1 | 18.5 | 20.0 | 15.7 | 12.8 | 19.0 | 17.4 | 9.1 |
| Unintended | 50.3 | 56.7 | 58.3 | 44.4 | 50.8 | 58.8 | 55.8 | 46.5 | 55.3 | 58.4 | 39.0 |
| **Senegal** | | | | | | | | | | | |
| Mistimed | 22.8 | 37.6 | 45.0 | 32.6 | 16.9 | 25.1 | 38.4 | 41.7 | 23.5 | 33.1 | 33.1 |
| Unwanted | 5.0 | 6.7 | 4.5 | 5.9 | 4.1 | 5.4 | 4.9 | 7.0 | 5.0 | 4.0 | 7.7 |
| Unintended | 27.8 | 44.3 | 49.5 | 39.5 | 21.0 | 30.5 | 43.3 | 48.7 | 28.5 | 37.1 | 40.8 |
| **Zimbabwe** | | | | | | | | | | | |
| Mistimed | 26.2 | 33.6 | 34.5 | 36.7 | 34.8 | 32.7 | 37.6 | 26.4 | 35.9 | 28.7 | 25.6 |
| Unwanted | 12.4 | 13.3 | 6.7 | 3.3 | 9.4 | 8.9 | 5.8 | 5.7 | 8.1 | 8.7 | 5.7 |
| Unintended | 38.6 | 46.9 | 41.2 | 40.0 | 44.2 | 41.6 | 43.4 | 32.1 | 44.0 | 37.4 | 31.3 |
| **North Africa/Asia** | | | | | | | | | | | |
| **Egypt** | | | | | | | | | | | |
| Mistimed | 8.0 | 6.0 | 10.0 | 13.6 | 8.3 | 8.6 | 11.3 | NA | 6.7 | 10.2 | 10.4 |
| Unwanted | 29.2 | 37.0 | 23.9 | 11.9 | 31.0 | 27.9 | 13.9 | NA | 27.3 | 29.2 | 23.3 |
| Unintended | 37.2 | 43.0 | 33.9 | 25.5 | 39.3 | 36.5 | 25.2 | NA | 34.0 | 39.4 | 33.7 |
| **Indonesia** | | | | | | | | | | | |
| Mistimed | 7.4 | 8.0 | 10.6 | 14.3 | 8.6 | 9.6 | 11.3 | 10.5 | 9.8 | 11.2 | 5.2 |
| Unwanted | 8.0 | 12.6 | 7.2 | 4.7 | 7.8 | 8.9 | 9.1 | 6.8 | 7.5 | 10.7 | 20.5 |
| Unintended | 15.4 | 20.6 | 17.8 | 19.0 | 16.4 | 18.5 | 20.4 | 17.3 | 17.3 | 21.9 | 25.7 |
| **Morocco** | | | | | | | | | | | |
| Mistimed | 15.1 | 16.9 | 18.1 | 22.8 | 15.6 | 14.8 | 15.9 | 18.0 | 15.2 | 16.5 | 15.9 |
| Unwanted | 21.0 | 15.9 | 14.5 | 7.9 | 18.0 | 20.7 | 21.5 | 14.4 | 20.0 | 18.9 | 19.8 |
| Unintended | 36.1 | 32.8 | 32.6 | 30.7 | 33.6 | 35.5 | 37.4 | 32.4 | 35.2 | 36.4 | 35.7 |
| **Latin America/Caribbean** | | | | | | | | | | | |
| **Colombia** | | | | | | | | | | | |
| Mistimed | 12.3 | 20.9 | 27.7 | 29.9 | 17.1 | 20.5 | 27.4 | 24.9 | 21.6 | 27.0 | 24.9 |
| Unwanted | 46.3 | 28.5 | 18.1 | 8.4 | 39.7 | 28.1 | 21.2 | 17.2 | 30.2 | 24.9 | 16.7 |
| Unintended | 58.6 | 49.4 | 45.8 | 38.3 | 56.8 | 48.6 | 48.6 | 42.1 | 51.8 | 51.9 | 41.6 |
| **Dominican Republic** | | | | | | | | | | | |
| Mistimed | 18.4 | 24.5 | 26.3 | 23.5 | 24.2 | 23.3 | 26.8 | 23.1 | 25.0 | 23.2 | 24.3 |
| Unwanted | 33.2 | 23.0 | 11.5 | 9.7 | 20.4 | 15.8 | 11.9 | 6.3 | 18.2 | 15.5 | 10.0 |
| Unintended | 51.6 | 47.5 | 37.8 | 33.2 | 44.6 | 39.1 | 38.7 | 29.4 | 43.2 | 38.7 | 34.3 |
| **Peru** | | | | | | | | | | | |
| Mistimed | 11.8 | 21.9 | 31.0 | 28.3 | 20.7 | 21.7 | 27.3 | 27.5 | 23.8 | 25.0 | 28.5 |
| Unwanted | 59.9 | 42.3 | 25.9 | 11.2 | 49.0 | 44.7 | 32.7 | 22.8 | 39.8 | 36.9 | 17.5 |
| Unintended | 71.7 | 64.2 | 56.9 | 39.5 | 69.7 | 66.4 | 60.0 | 50.3 | 63.6 | 61.9 | 46.0 |

Figure 3.1 Percentage of unwanted children according to mothers' years of schooling




Note: Rates are based on births in the 3 years before the later survey.

Table 3.2 Coefficients and odds ratios from logistic regression model of unwanted childbearing, after controlling for other socioeconomic and demographic factors, for the later survey

| Region and country | Maternal education (years) | | | | Number of media of mass communications mother was exposed to | | | Maternal economic index | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | None | 1-5 | 6-10 | 11+ | 0-1 | 2 | All 3 | Low | Middle | High | |
| **Sub-Saharan Africa** | | | | | | | | | | | |
| **Ghana** | *p<0.05* | | *χ²=9.4* | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.560 | 0.497 | 1.088 | 0.00 | 0.017 | 0.398 | 0.00 | -0.289 | 0.054 | 190 |
| Std. error | 0.00 | 0.249 | 0.205 | 0.507 | 0.00 | 0.232 | 0.403 | 0.00 | 0.261 | 0.48 | 319 |
| Odds ratio | 1.00 | 1.75 | 1.64 | 2.97 | 1.00 | 1.02 | 1.49 | 1.00 | 0.75 | 0.95 | 2204 |
| **Kenya** | *p<0.001* | | *χ²=20.0* | | ns | | | p<0.05 | | χ²=6.0 | |
| Coefficient | 0.00 | 0.579 | 0.534 | 0.445 | 0.00 | 0.109 | 0.237 | 0.00 | 0.214 | -0.492 | 717 |
| Std. error | 0.00 | 0.144 | 0.141 | 0.225 | 0.00 | 0.139 | 0.261 | 0.00 | 0.157 | 0.293 | (19) |
| Odds ratio | 1.00 | 1.78 | 1.71 | 1.56 | 1.00 | 1.12 | 1.27 | 1.00 | 1.24 | 0.61 | 3655 |
| **Senegal** | *ns* | | | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.272 | -0.653 | -0.908 | 0.00 | 0.074 | 1.095 | 0.00 | -0.171 | 0.591 | 319 |
| Std. error | 0.00 | 0.346 | 0.396 | 0.942 | 0.00 | 0.234 | 0.482 | 0.00 | 0.245 | 0.312 | (11) |
| Odds ratio | 1.00 | 1.31 | 0.52 | 0.40 | 1.00 | 1.01 | 2.99 | 1.00 | 0.84 | 1.81 | 3361 |
| **Zimbabwe** | *ns* | | | | *ns* | | | *p<0.05* | | *χ²=8.4* | |
| Coefficient | 0.00 | 0.415 | 0.464 | 0.473 | 0.00 | -0.396 | -0.413 | 0.00 | 0.695 | 0.410 | 321 |
| Std. error | 0.00 | 0.253 | 0.261 | 0.434 | 0.00 | 0.274 | 0.354 | 0.00 | 0.235 | 0.445 | (11) |
| Odds ratio | 1.00 | 1.51 | 1.61 | 1.61 | 1.00 | 0.67 | 0.66 | 1.00 | 2.00 | 1.51 | 2438 |
| **Asia/North Africa** | | | | | | | | | | | |
| **Egypt** | *p<0.001* | | *χ²=23.8* | | p<0.05 | *χ²=5.4* | | *p<0.001* | | *χ²=27.6* | |
| Coefficient | 0.00 | 0.431 | 0.567 | 0.237 | 0.00 | -0.369 | na | 0.00 | 0.497 | 0.409 | 1897 |
| Std. error | 0.00 | 0.103 | 0.168 | 0.167 | 0.00 | 0.158 | na | 0.00 | 0.101 | 0.108 | (11) |
| Odds ratio | 1.00 | 1.54 | 1.76 | 1.27 | 1.00 | 0.69 | na | 1.00 | 1.64 | 1.5 | 5036 |
| **Indonesia** | *p<0.001* | | *χ²=35.3* | | *p<0.001* | *χ²=14.6* | | *p<0.001* | | *χ²=49.2* | |
| Coefficient | 0.00 | 0.670 | 0.688 | 0.394 | 0.00 | 0.304 | 0.421 | 0.00 | 0.614 | 1.584 | 1665 |
| Std. error | 0.00 | 0.131 | 0.137 | 0.197 | 0.00 | 0.093 | 0.138 | 0.00 | 0.099 | 0.363 | (11) |
| Odds ratio | 1.00 | 1.95 | 1.99 | 1.48 | 1.00 | 1.36 | 1.52 | 1.00 | 1.85 | 4.87 | 10776 |
| **Morocco** | *ns* | | | | *p<0.01* | *χ²=9.9* | | *p<0.05* | | *χ²=6.3* | |
| Coefficient | 0.00 | 0.016 | 0.063 | -0.259 | 0.00 | 0.324 | 0.857 | 0.00 | 0.036 | 0.376 | 647 |
| Std. error | 0.00 | 0.220 | 0.343 | 0.485 | 0.00 | 0.130 | 0.319 | 0.00 | 0.143 | 0.158 | (11) |
| Odds ratio | 1.00 | 1.02 | 1.07 | 0.77 | 1.00 | 1.38 | 2.36 | 1.00 | 1.04 | 1.46 | 3055 |
| **Latin America/Caribbean** | | | | | | | | | | | |
| **Colombia** | *p<0.05* | | *χ²=11.1* | | *ns* | | | *p<0.001* | | *χ²=19.9* | |
| Coefficient | 0.00 | -0.049 | -0.208 | -0.679 | 0.00 | -0.150 | -0.291 | 0.00 | 0.250 | 0.679 | 990 |
| Std. error | 0.00 | 0.217 | 0.244 | 0.286 | 0.00 | 0.143 | 0.153 | 0.00 | 0.155 | 0.158 | (11) |
| Odds ratio | 1.00 | 0.95 | 0.81 | 0.51 | 1.00 | 0.86 | 0.75 | 1.00 | 1.28 | 1.97 | 3113 |
| **Dominican Republic** | *ns* | | | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | -0.016 | -0.306 | -0.211 | 0.00 | 0.026 | -0.917 | 0.00 | 0.351 | -0.081 | 521 |
| Std. error | 0.00 | 0.206 | 0.225 | 0.264 | 0.00 | 0.170 | 0.480 | 0.00 | 0.168 | 0.221 | (11) |
| Odds ratio | 1.00 | 0.98 | 0.74 | 0.81 | 1.00 | 1.03 | 0.40 | 1.00 | 1.42 | 0.92 | 2607 |
| **Peru** | *p<0.01* | | *χ²=12.4* | | *p<0.05* | *χ²=6.7* | | *p<0.01* | | *χ²=11.6* | |
| Coefficient | 0.00 | -0.274 | -0.275 | -0.659 | 0.00 | -0.171 | -0.276 | 0.00 | 0.212 | -0.191 | 1763 |
| Std. error | 0.00 | 0.119 | 0.135 | 0.195 | 0.00 | 0.101 | 0.108 | 0.00 | 0.096 | 0.118 | (11) |
| Odds ratio | 1.00 | 0.76 | 0.76 | 0.52 | 1.00 | 0.84 | 0.76 | 1.00 | 1.24 | 0.83 | 5435 |

Note: Significance level and chi-square value refer to the variable under which they appear.
$\chi^2$ = Chi-square value based on likelihood ratio test.
*ns* = Not significant at the 5-percent level.

Table 3.3 Coefficients and odds ratios from logistic regression model of mistimed childbearing, after controlling for other socioeconomic and demographic factors, for the later survey

| Region and country | Maternal education (years) | | | | Number of media of mass communications mother was exposed to | | | Maternal economic index | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | None | 1-5 | 6-10 | 11+ | 0-1 | 2 | All 3 | Low | Middle | High | |
| **Sub-Saharan Africa** | | | | | | | | | | | |
| **Ghana** | *p<0.05* | | *χ²=8.8* | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.151 | 0.310 | -0.081 | 0.00 | 0.201 | -0.058 | 0.00 | -0.058 | -0.396 | 187 |
| Std. error | 0.00 | 0.148 | 0.113 | 0.318 | 0.00 | 0.125 | 0.251 | 0.00 | 0.131 | 0.292 | (19) |
| Odds ratio | 1.00 | 1.16 | 1.36 | 0.92 | 1.00 | 1.22 | 0.94 | 1.00 | 0.94 | 0.67 | 2204 |
| **Kenya** | *p<0.001* | | *χ²=20.6* | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.098 | 0.433 | 0.225 | 0.00 | 0.021 | -0.045 | 0.00 | 0.155 | -0.187 | 276 |
| Std. error | 0.00 | 0.125 | 0.115 | 0.158 | 0.00 | 0.097 | 0.176 | 0.00 | 0.112 | 0.182 | (19) |
| Odds ratio | 1.00 | 1.1 | 1.54 | 1.25 | 1.00 | 1.02 | 0.96 | 1.00 | 1.17 | 0.83 | 3655 |
| **Senegal** | *p<0.001* | | *χ²=23.7* | | *p<0.001* | | *χ²=33.7* | *ns* | | | |
| Coefficient | 0.00 | 0.326 | 0.717 | 0.454 | 0.00 | 0.629 | 0.421 | 0.00 | 0.137 | -0.073 | 396 |
| Std. error | 0.00 | 0.164 | 0.149 | 0.368 | 0.00 | 0.107 | 0.214 | 0.00 | 0.108 | 0.163 | (19) |
| Odds ratio | 1.00 | 1.39 | 2.05 | 1.58 | 1.00 | 1.88 | 1.52 | 1.00 | 1.15 | 0.93 | 3361 |
| **Zimbabwe** | *p<0.001* | | *χ²=26.7* | | *ns* | | | *p<0.05* | | *χ²=12.7* | |
| Coefficient | 0.00 | 0.306 | 0.438 | 1.044 | 0.00 | 0.177 | -0.130 | 0.00 | -0.379 | -0.659 | 258 |
| Std. error | 0.00 | 0.173 | 0.166 | 0.215 | 0.00 | 0.130 | 0.183 | 0.00 | 0.132 | 0.233 | (19) |
| Odds ratio | 1.00 | 1.36 | 1.55 | 2.85 | 1.00 | 1.19 | 0.88 | 1.00 | 0.68 | 0.52 | 2438 |
| **Asia/North Africa** | | | | | | | | | | | |
| **Egypt** | *p<0.001* | | *χ²=23.1* | | *ns* | | | *p<0.05* | | *χ²=8.8* | |
| Coefficient | 0.00 | -0.292 | 0.162 | 0.755 | 0.00 | -0.228 | na | 0.00 | 0.383 | 0.362 | 393 |
| Std. error | 0.00 | 0.167 | 0.198 | 0.175 | 0.00 | 0.168 | na | 0.00 | 0.139 | 0.149 | (19) |
| Odds ratio | 1.00 | 0.75 | 1.18 | 2.13 | 1.00 | 0.80 | na | 1.00 | 1.47 | 1.44 | 5036 |
| **Indonesia** | *p<0.001* | | *χ²=46.1* | | *p<0.05* | | *χ²=7.3* | *ns* | | | |
| Coefficient | 0.00 | 0.104 | 0.396 | 0.850 | 0.00 | 0.184 | -0.032 | 0.00 | 0.086 | -0.844 | 505 |
| Std. error | 0.00 | 0.135 | 0.130 | 0.153 | 0.00 | 0.079 | 0.107 | 0.00 | 0.086 | 0.510 | (18) |
| Odds ratio | 1.00 | 1.11 | 1.49 | 2.34 | 1.00 | 1.20 | 0.97 | 1.00 | 1.09 | 0.43 | 10776 |
| **Morocco** | *p<0.05* | | *χ²=9.6* | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.286 | 0.458 | 1.065 | 0.00 | 0.067 | 0.005 | 0.00 | 0.044 | -0.103 | 146 |
| Std. error | 0.00 | 0.195 | 0.280 | 0.339 | 0.00 | 131.000 | 0.272 | 0.00 | 0.141 | 0.159 | (19) |
| Odds ratio | 1.00 | 1.33 | 1.58 | 2.90 | 1.00 | 1.07 | 1.01 | 1.00 | 1.04 | 0.9 | 3055 |
| **Latin America/ Caribbean** | | | | | | | | | | | |
| **Colombia** | *p<0.001* | | *χ²=37.2* | | *p<0.05* | | *χ²=8.1* | *p<0.05* | | *χ²=7.7* | |
| Coefficient | 0.00 | 0.342 | 0.750 | 1.151 | 0.00 | 0.318 | 0.100 | 0.00 | 0.174 | -0.153 | 260 |
| Std. error | 0.00 | 0.280 | 0.290 | 0.307 | 0.00 | 0.128 | 0.133 | 0.00 | 0.139 | 0.135 | (19) |
| Odds ratio | 1.00 | 1.41 | 2.12 | 3.16 | 1.00 | 1.37 | 1.11 | 1.00 | 1.19 | 0.86 | 3113 |
| **Dominican Republic** | *ns* | | | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.104 | 0.097 | 0.157 | 0.00 | 0.150 | 0.052 | 0.00 | -0.016 | 0.145 | 222 |
| Std. error | 0.00 | 0.222 | 0.225 | 0.247 | 0.00 | 0.121 | 0.272 | 0.00 | 0.131 | 0.155 | (19) |
| Odds ratio | 1.00 | 1.11 | 1.10 | 1.17 | 1.00 | 1.16 | 1.05 | 1.00 | 0.98 | 1.16 | 2622 |
| **Peru** | *p<0.001* | | *χ²=33.4* | | *ns* | | | *ns* | | | |
| Coefficient | 0.00 | 0.445 | 0.826 | 0.777 | 0.00 | 0.025 | -0.079 | 0.00 | 0.006 | 0.083 | 512 |
| Std. error | 0.00 | 0.152 | 0.160 | 0.190 | 0.00 | 0.100 | 0.102 | 0.00 | 0.094 | 0.101 | (19) |
| Odds ratio | 1.00 | 1.56 | 2.26 | 2.18 | 1.00 | 1.02 | 0.92 | 1.00 | 1.01 | 0.109 | 5435 |

Note: Significance level and chi-square value refer to the variable under which they appear.
$\chi^2$ = Chi-square value based on likelihood ratio test.
*ns* = Not significant at the 5-percent level.

child would be reported as mistimed were higher if the mother were educated than if she was not. In some cases, the odds ratio is as high as three.

## 3.2 EXPOSURE TO MASS MEDIA

Where it works well, exposure to mass media widens the horizons of the people and may free them from parochialism, anachronistic views, and narrowmindedness, and it may enhance an individual's capability for making informed choices (given the resources to act). Mass media offer educational advantages, introduce other world views beyond what the local elders prescribe or proscribe, and enjoy legitimizing authority as sources of knowledge and opinion. In much of the developing world, mass media are an instrument through which governmental actions, laws, policies, and information are communicated to the people. That role is especially characteristic of radio. Instruction from radio broadcasts tends to be regarded as authoritative and sacrosanct—especially by the less educated. By presenting a view that life could be better than it is, mass media may create dissatisfaction within individuals about their current state and get them to aspire to a better life. That mental shift is perhaps the major goal of commercial advertisements in the media. It must be noted that because the messages and contents of the media vary, and because the nature and the intensity of access to media is not measured or known, it is idealistic to assume that the effect will be the same across countries and continents. It will suffice here to determine some pattern: that people who have more access are different from those who have less access. At best, this variable is an indirect index of local access to information about the outside world. Details of how the index was constructed were presented earlier in this report (see section 1.5). The results of a bivariate pattern are presented in Table 3.1.

Table 3.1 shows that in almost all the countries, people with access to only one media source experienced higher levels of unwanted pregnancy than those who had access to three. The relationship of media access and mistiming is not very clear. When all other variables are taken into account, the relationship between mass media exposure and mistimed childbearing is statistically significant in only three countries (Senegal, Indonesia, and Colombia), and the magnitude of the effect is not large. Its relationship with unwanted childbearing is statistically significant in North Africa/Asia and in Peru and Senegal. In Peru and Egypt, the greater the number of media a woman was exposed to, the lower the odds of her classifying recent pregnancies as unwanted. In other countries, the tendency is in the opposite direction (Tables 3.2 and 3.3).

## 3.3 ECONOMIC INDEX

Previous studies in developed countries have found that poverty is associated with the level of unintended pregnancies in a society (Forrest 1991, Williams 1991, Anderson 1981). However, it is not clear what the relationship will be in a less developed environment. There are no data in the DHS that measure poverty directly. Therefore, a woman's economic status was indirectly assessed by constructing a composite index based on household characteristics and possessions. Details of how the economic index was computed were presented earlier in this report (see section 1.5). The results of the bivariate analysis of the relationship between the index of economic status and the incidence of mistimed and unwanted childbearing are shown in Table 3.1. The association is not clear, which suggests that there may be many factors that confound the relationship. When all the effects of other socioeconomic and demographic variables are taken into account (Table 3.3), this economic index was not significantly related to mistimed childbearing except in Colombia, Egypt, and Zimbabwe. Even then, its pattern of association is not consistent across countries: high economic status reduces the odds of mistimed childbearing in Zimbabwe but increases the odds somewhat in Egypt. Although the effect of economic index on mistimed childbearing was weak or nonexistent in many countries, it nevertheless related to the odds that a child was unwanted at conception in seven of the 10 countries. In all the countries where the effects of economic index on unwanted childbearing are statistically significant, women living in households with higher economic status usually had higher odds of unwanted births (Table 3.2).

In summary, the results show that when the effects of all other variables in the model are taken into account, education is the only socioeconomic variable that remains a significant predictor of mistimed childbearing in nine of the 10 countries in the study. Similarly, education is significantly associated with the odds of a child being unwanted at conception in six of the 10 countries. Other socioeconomic variables were not significant predictors of mistiming in most countries, especially in sub-Saharan Africa. However, the index of household economic status is significantly associated with unwanted childbearing in most countries. In the Dominican Republic, no socioeconomic variable was significantly associated with mistimed or unwanted childbearing.

# 4 Demographic Determinants of Unintended Childbearing

## 4.1 MATERNAL AGE

Generally, age is a measure of both biological and social maturity. The age of a woman at the time of conception could influence whether the pregnancy is mistimed or unwanted—because age may indirectly reflect a woman's level of material, biological, social, and emotional preparedness for the responsibilities of childrearing. Previous studies have found that the age of a woman at the time of pregnancy is associated with the tendency to describe a pregnancy as unintended (Allaby 1995, Forrest 1994, Pratt and Horn 1985). In one study it was found that unintended pregnancies declined with age (Allaby 1995:94), but in some others a U-shaped relationship was observed (Forrest 1994:1486, Forrest and Singh 1990:212). Even though the relationship between maternal age and unintended childbearing seems unclear in the more developed countries, further examination of the available evidence shows that the reason for this unclear relationship is related to the fact that unwanted childbearing has a different association with age than mistimed childbearing does. This pattern is evinced in the paper by Pratt and Horn (1985:2) and its extension by Williams and Pratt (1990). The finding was confirmed by results shown earlier in this report (section 2.3 and Figure 2.1).

In the current analysis, mistimed childbearing is separated from unwanted childbearing to see how their association with maternal age differs. Maternal age refers to age at the time of conception. The results are presented in Table 4.1 and Figure 4.1, which show that mistiming tends to be inversely related to maternal age at conception. The proportion of children who were products of mistimed pregnancies tends to decline linearly with mothers' age. The results also indicate that in Latin America and the Caribbean, children of teenage mothers were four to five times more likely to be mistimed than children of women age 35 to 49. In sub-Saharan Africa, the ratio of mistimed children born to teenage mothers is about twice the ratio among women age 35 to 49. In the countries of North Africa/Asia, the results show a consistent linear decline in the proportion mistimed with maternal age after age 19.

This finding seems logical. Sexual activity among young people is often opportunistic and sporadic (Rogo 1996). Therefore, teenagers are more likely than older women to end up with mistimed pregnancies. In many cases, teenage women who become pregnant prefer to defer childbearing until they are more materially secure, more emotionally mature, and more prepared for the responsibilities of parenting. It has been stated repeatedly in the literature that an early pregnancy—especially if unplanned—tends to generate poverty, because it blocks avenues to economic progress by truncating the mother's education, reducing the mother's employment prospects, lowering family income, and compromising the mother's personal development (Spitz et al. 1996, Ferrando 1993, Singh and Wulf 1990).

The age pattern of mistimed childbearing is different from that of unwanted childbearing. The proportion of childbearing that is unwanted tends to increase with maternal age at conception—especially after the teenage years—in most countries (Figure 4.2). However, the relationship is U- or J-shaped in Ghana and Zimbabwe. The ratio of the proportion of children unwanted at conception among teenage mothers to the proportion of children unwanted at conception among mothers age 35 or more was lowest in Ghana (3:1) and highest in Indonesia (49:1). The pattern of association between maternal age and the level of childbearing reported as mistimed or unwanted at conception is in line with the observations of Williams and Pratt (1990), observations based on data from the National Survey of Family Growth in the United States.

When the effects of other demographic variables were taken into account in a logistic regression, it was observed that maternal age is a statistically significant predictor of mistimed and unwanted pregnancies in almost every country examined in this report. However, the direction of the relationship was not the same for mistiming as for unwanted pregnancies: age varied positively with unwanted pregnancies, whereas it varied inversely with mistimed pregnancies (Tables 4.2 and 4.3). This observation is a confirmation of the results in Figures 4.1 and 4.2 and in Table 4.1. The major implication of the findings is that younger women are significantly more likely than older women to have a mistimed birth and significantly less likely to have an unwanted birth. Overall, maternal age at the time of conception is a very strong predictor of unwanted childbearing in all the countries except Peru. In most of the countries where this variable is significant, the odds ratios of children born to women age 35 or higher being unwanted at conception are two to six in relation to children born to teenagers.

## 4.2 MARITAL STATUS

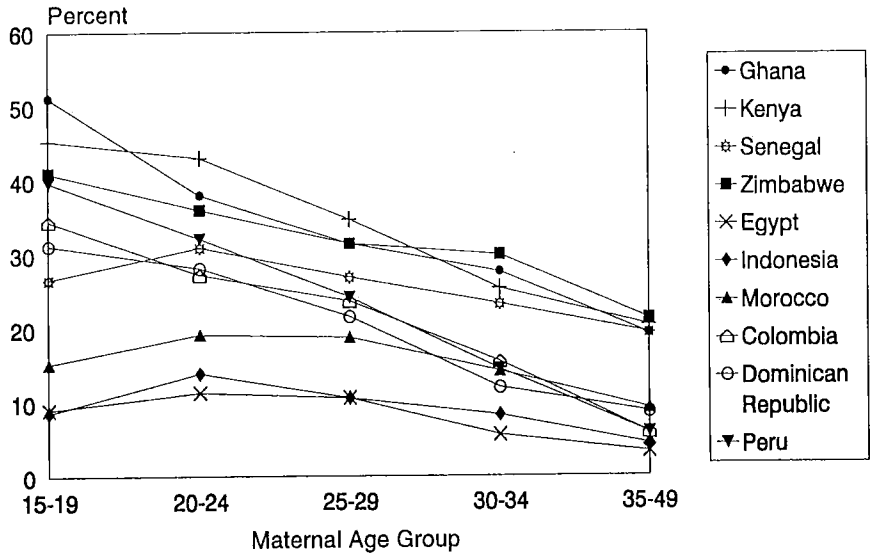
Although the meaning and definition of marriage are undergoing rapid change in various cultures, previous studies (especially in developed countries) have found that a woman's current marital status was consistently a strong predictor of mistimed and unwanted pregnancies (Denton and Scott 1994, Forrest 1994, Cartwright 1988). Never-married women were usually more likely than ever-married ones to describe their pregnancies as mistimed or unwanted. It has been noted, however, that when the social stigmatization of out-of-wedlock births is

Table 4.1 Percentage of mistimed, unwanted, and unintended births in the 3 years before the later survey, according to mothers' age at conception and current marital status

| Region and country | Mothers' age at conception | | | | | Current maternal marital status | | |
|---|---|---|---|---|---|---|---|---|
| | <20 | 20-24 | 25-29 | 30-34 | 35-49 | Never married | Currently married | Other |
| **Sub-Saharan Africa** | | | | | | | | |
| **Ghana** | | | | | | | | |
| Mistimed | 51.1 | 38.0 | 31.4 | 27.6 | 19.3 | 74.0 | 30.7 | 42.9 |
| Unwanted | 7.1 | 3.3 | 6.8 | 8.5 | 22.0 | 12.0 | 7.4 | 11.4 |
| Unintended | 58.2 | 41.3 | 38.2 | 36.1 | 41.3 | 86.0 | 38.1 | 54.1 |
| **Kenya** | | | | | | | | |
| Mistimed | 45.3 | 43.0 | 34.2 | 25.4 | 20.4 | 63.2 | 34.6 | 28.6 |
| Unwanted | 6.4 | 7.2 | 19.1 | 37.8 | 43.1 | 17.4 | 17.2 | 26.2 |
| Unintended | 51.7 | 50.2 | 53.3 | 63.2 | 63.5 | 80.6 | 51.8 | 54.8 |
| **Senegal** | | | | | | | | |
| Mistimed | 26.6 | 30.9 | 26.9 | 25.3 | 19.4 | 68.4 | 24.2 | 38.5 |
| Unwanted | 1.6 | 1.8 | 2.1 | 4.9 | 19.8 | 9.0 | 4.7 | 8.7 |
| Unintended | 28.2 | 32.7 | 29.0 | 30.2 | 39.2 | 77.4 | 28.9 | 47.2 |
| **Zimbabwe** | | | | | | | | |
| Mistimed | 41.0 | 36.0 | 31.4 | 29.9 | 21.3 | 60.5 | 31.8 | 36.2 |
| Unwanted | 3.2 | 1.9 | 6.1 | 10.0 | 35.7 | 12.0 | 7.1 | 16.8 |
| Unintended | 44.2 | 37.9 | 37.5 | 39.9 | 57.0 | 72.5 | 38.9 | 53.0 |
| **North Africa/Asia** | | | | | | | | |
| **Egypt** | | | | | | | | |
| Mistimed | 9.0 | 11.3 | 10.6 | 5.6 | 3.3 | NA | 9.1 | 3.6 |
| Unwanted | 3.8 | 12.5 | 27.8 | 48.4 | 62.7 | NA | 26.3 | 37.8 |
| Unintended | 12.8 | 23.8 | 38.4 | 54.0 | 66.0 | NA | 35.4 | 41.4 |
| **Indonesia** | | | | | | | | |
| Mistimed | 8.6 | 13.9 | 10.6 | 8.3 | 4.4 | NA | 10.1 | 10.5 |
| Unwanted | 0.6 | 1.8 | 7.1 | 16.2 | 29.7 | NA | 8.4 | 9.1 |
| Unintended | 9.2 | 15.7 | 17.7 | 24.5 | 34.1 | NA | 18.5 | 19.6 |
| **Morocco** | | | | | | | | |
| Mistimed | 15.2 | 19.2 | 18.8 | 14.2 | 9.2 | NA | 15.7 | 15.2 |
| Unwanted | 2.7 | 7.3 | 14.6 | 25.3 | 45.0 | NA | 19.6 | 24.2 |
| Unintended | 17.9 | 26.5 | 33.4 | 39.5 | 54.2 | NA | 35.3 | 39.4 |
| **Latin America/ Caribbean** | | | | | | | | |
| **Colombia** | | | | | | | | |
| Mistimed | 34.5 | 27.2 | 23.7 | 15.5 | 5.9 | 39.0 | 22.4 | 24.0 |
| Unwanted | 7.1 | 15.2 | 23.7 | 34.8 | 56.7 | 16.0 | 21.1 | 22.6 |
| Unintended | 41.6 | 42.4 | 47.4 | 50.3 | 62.6 | 55.0 | 43.5 | 46.6 |
| **Dominican Republic** | | | | | | | | |
| Mistimed | 31.2 | 28.1 | 21.6 | 12.0 | 8.7 | 31.1 | 21.3 | 25.4 |
| Unwanted | 6.6 | 8.9 | 22.4 | 29.4 | 52.4 | 10.8 | 11.9 | 17.8 |
| Unintended | 37.8 | 37.0 | 44.0 | 41.4 | 61.1 | 41.9 | 33.2 | 43.2 |
| **Peru** | | | | | | | | |
| Mistimed | 39.7 | 32.1 | 24.2 | 14.5 | 5.9 | 42.7 | 22.5 | 26.8 |
| Unwanted | 12.0 | 22.7 | 35.5 | 49.1 | 62.8 | 18.0 | 36.5 | 31.3 |
| Unintended | 51.7 | 54.8 | 59.7 | 63.6 | 67.8 | 60.7 | 59.0 | 58.1 |

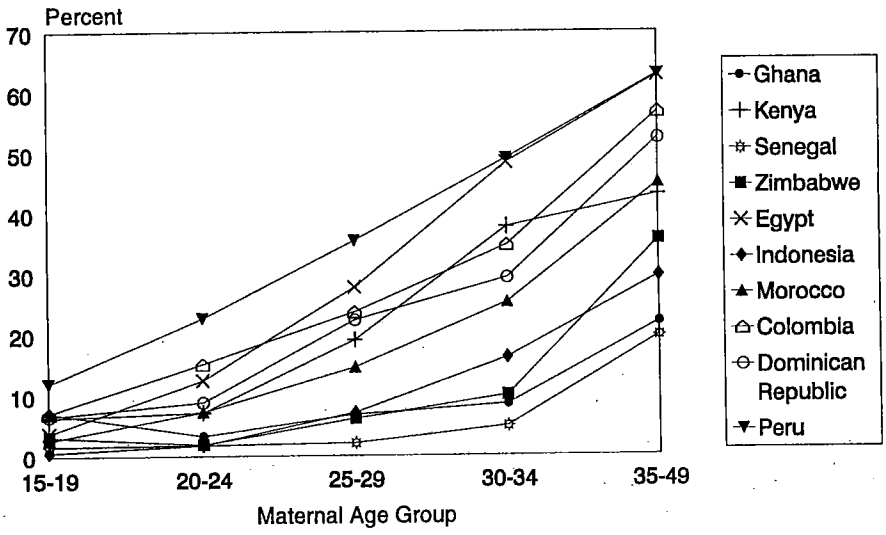
NA=Not applicable.

## Figure 4.1 Percentage of mistimed births according to mothers' age at conception




Note: Rates are based on births in the 3 years before the later survey.

## Figure 4.2 Percentage of unwanted births according to mothers' age at conception




Note: Rates are based on births in the 3 years before the later survey.

Table 4.2 Coefficients and odds ratios from logistic regression model of unwanted childbearing, after controlling for the effects of other socioeconomic and demographic factors, for the later survey

| Region and country | Maternal marital status | | Number of living children | | | | Preceding birth interval | | | | | Maternal age | | | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single | Married | 0-1 | 2-3 | 4-5 | 6+ | <18 | 18-24 | 25-35 | 36+ | First births | <20 | 20-24 | 25-29 | 30-34 | 35+ | |
| **Sub-Saharan Africa** | | | | | | | | | | | | | | | | | |
| **Ghana** | *p<0.001* | *χ²=19.0* | | *p<0.001* | *χ²=74.1* | | *ns* | | | | | | *p<0.001* | | *χ²=20.5* | | |
| Coefficient | 0.915 | 0.00 | 0.00 | 0.712 | 2.302 | 3.039 | 0.00 | 1.040 | 1.148 | 1.395 | 0.782 | 0.00 | -1.008 | -0.918 | -1.367 | -0.777 | 190 |
| Std. error | 0.207 | 0.00 | 0.00 | 0.332 | 0.378 | 0.440 | 0.00 | 0.696 | 0.653 | 0.642 | 0.722 | 0.00 | 0.373 | 0.418 | 0.260 | 0.481 | 19 |
| Odds ratio | 2.50 | 1.00 | 1.00 | 2.04 | 10.00 | 20.89 | 1.00 | 2.83 | 3.15 | 4.04 | 2.19 | 1.00 | 0.36 | 0.40 | 0.26 | 0.46 | 2204 |
| **Kenya** | *p<0.001* | *χ²=84.0* | | *p<0.001* | *χ²=163.3* | | | *p<0.01* | | *χ²=15.1* | | | *p<0.001* | | *χ²=21.8* | | |
| Coefficient | 1.164 | 0.00 | 0.00 | 0.844 | 1.736 | 2.867 | 0.00 | -0.607 | -0.664 | -0.511 | -0.98 | 0.00 | -0.246 | 0.227 | 0.641 | 0.276 | 717 |
| Std. error | 0.126 | 0.00 | 0.00 | 0.206 | 0.237 | 0.264 | 0.00 | 0.212 | 0.196 | 0.195 | 0.291 | 0.00 | 0.229 | 0.254 | 0.278 | 0.299 | (19) |
| Odds ratio | 3.20 | 1.00 | 1.00 | 2.33 | 5.67 | 17.58 | 1.00 | 0.54 | 0.52 | 0.60 | 0.38 | 1.00 | 0.78 | 1.26 | 1.90 | 1.32 | 3655 |
| **Senegal** | *p<0.001* | *χ²=26.8* | | *p<0.001* | *χ²=87.6* | | *ns* | | | | | | *p<0.01* | | *χ²=29.3* | | |
| Coefficient | 1.719 | 0.00 | 0.00 | 0.610 | 1.371 | 3.031 | 0.00 | -0.312 | -0.397 | 0.066 | 0.355 | 0.00 | 0.266 | 0.023 | 0.121 | 1.225 | 319 |
| Std. error | 0.318 | 0.00 | 0.00 | 0.489 | 0.532 | 0.540 | 0.00 | 0.517 | 0.470 | 0.462 | 0.657 | 0.00 | 0.466 | 0.552 | 0.576 | 0.572 | (11) |
| Odds ratio | 5.58 | 1.00 | 1.00 | 1.84 | 3.94 | 20.72 | 1.00 | 0.73 | 0.67 | 1.07 | 1.42 | 1.00 | 1.30 | 1.02 | 1.13 | 3.41 | 3361 |
| **Zimbabwe** | *p<0.001* | *χ²=41.7* | | *p<0.001* | *χ²=31.6* | | *ns* | | | | | | *p<0.001* | | *χ²=44.00* | | |
| Coefficient | 1.502 | 0.00 | 0.00 | 0.589 | 1.339 | 2.182 | 0.00 | -0.748 | -0.419 | -0.271 | -0.108 | 0.00 | -0.318 | 0.528 | 0.481 | 1.875 | 321 |
| Std. error | 0.224 | 0.00 | 0.00 | 0.402 | 0.452 | 0.479 | 0.00 | 0.629 | 0.543 | 0.526 | 0.649 | 0.00 | 0.429 | 0.487 | 0.532 | 0.544 | (11) |
| Odds ratio | 4.49 | 1.00 | 1.00 | 1.80 | 3.82 | 8.87 | 1.00 | 0.47 | 0.66 | 0.76 | 0.90 | 1.00 | 0.73 | 1.70 | 1.62 | 6.52 | 2438 |
| **Asia/North Africa** | | | | | | | | | | | | | | | | | |
| **Egypt** | *ns* | | | *p<0.001* | *χ²=528.2* | | | *p<0.001* | | *χ²=61.6* | | | *p<0.01* | | *χ²=15.5* | | |
| Coefficient | 0.364 | 0.00 | 0.00 | 2.032 | 3.218 | 3.809 | 0.00 | -0.235 | -0.192 | 0.080 | -2.469 | 0.00 | -0.227 | -0.011 | 0.233 | 0.294 | 1897 |
| Std. error | 0.406 | 0.00 | 0.00 | 0.154 | 0.177 | 0.213 | 0.00 | 0.156 | 0.142 | 0.140 | 0.452 | 0.00 | 0.237 | 0.240 | 252.000 | 0.266 | (11) |
| Odds ratio | 1.44 | 1.00 | 1.00 | 7.63 | 25.00 | 45.10 | 1.00 | 0.79 | 0.83 | 1.08 | 0.08 | 1.00 | 0.80 | 0.99 | 1.26 | 1.34 | 5036 |
| **Indonesia** | *p<0.01* | *χ²=7.0* | | *p<0.05* | *χ²=455.0* | | | *p<0.001* | | *χ²=46.9* | | | *p<0.001* | | *χ²=28.8* | | |
| Coefficient | 0.746 | 0.00 | 0.00 | 2.742 | 3.602 | 4.121 | 0.00 | -0.168 | -0.174 | 0.348 | -1.583 | 0.00 | -0.683 | -0.696 | -0.464 | -0.087 | 1665 |
| Std. error | 0.268 | 0.00 | 0.00 | 0.220 | 0.237 | 0.257 | 0.00 | 0.247 | 0.232 | 0.219 | 0.5 | 0.00 | 0.384 | 0.382 | 0.387 | 0.393 | (11) |
| Odds ratio | 2.11 | 1.00 | 1.00 | 15.50 | 36.70 | 61.61 | 1.00 | 0.85 | 0.84 | 1.42 | 0.21 | 1.00 | 0.50 | 0.50 | 0.63 | 0.92 | 10776 |
| **Morocco** | *p<0.001* | *χ²=16.8* | | *p<0.001* | *χ²=165.5* | | | *p<0.001* | | *χ²=28.2* | | | p<0.01 | | *χ²=15.2* | | |
| Coefficient | 1.633 | 0.00 | 0.00 | 1.472 | 2.327 | 2.988 | 0.00 | -0.581 | -0.801 | -0.632 | -1.651 | 0.00 | 0.150 | 0.151 | 0.274 | 0.725 | 647 |
| Std. error | 0.374 | 0.00 | 0.00 | 0.230 | 0.252 | 0.270 | 0.00 | 0.209 | 0.192 | 0.188 | 0.382 | 0.00 | 0.398 | 0.402 | 0.420 | 0.420 | (11) |
| Odds ratio | 5.12 | 1.00 | 1.00 | 4.36 | 10.25 | 19.84 | 1.00 | 0.56 | 0.45 | 0.53 | 0.19 | 1.00 | 1.16 | 1.16 | 1.31 | 2.06 | 3055 |

*Continued . . .*

Table 4.2—*Continued*

| Region and country | Maternal marital status | | Number of living children | | | | Preceding birth interval | | | | | Maternal age | | | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single | Married | 0-1 | 2-3 | 4-5 | 6+ | <18 | 18-24 | 25-35 | 36+ | First births | <20 | 20-24 | 25-29 | 30-34 | 35+ | |
| **Latin America/ Caribbean** | | | | | | | | | | | | | | | | | |
| **Colombia** | *ns* | | | *p<0.001* | *$\chi^2$=230.2* | | | *p<0.001* | *$\chi^2$=82.9* | | | | *p<0.01* | | *$\chi^2$=13.3* | | |
| Coefficient | 0.138 | 0.00 | 0.00 | 1.725 | 2.493 | 2.909 | 0.00 | -0.046 | -0.243 | -0.585 | -2.103 | 0.00 | -0.052 | 0.047 | 0.102 | 0.657 | 990 |
| Std. error | 0.119 | 0.00 | 0.00 | 0.144 | 0.212 | 0.280 | 0.00 | 0.199 | 0.194 | 0.183 | 0.288 | 0.00 | 0.206 | 0.222 | 0.246 | 0.271 | (11) |
| Odds ratio | 1.15 | 1.00 | 1.00 | 5.61 | 12.10 | 18.33 | 1.00 | 0.96 | 0.78 | 0.56 | 0.12 | 1.00 | 0.95 | 1.05 | 1.11 | 1.93 | 3113 |
| **Dominican Republic** | *p<0.05* | *$\chi^2$=5.4* | | *p<0.001* | *$\chi^2$=117.7* | | | p<0.01 | *$\chi^2$=18.6* | | | | *p<0.001* | | *$\chi^2$=37.4* | | |
| Coefficient | 0.387 | 0.00 | 0.00 | 1.519 | 2.543 | 2.025 | 0.00 | -0.079 | 0.224 | 0.126 | -1.038 | 0.00 | -0.807 | -0.123 | -0.030 | 0.671 | 521 |
| Std. error | 0.175 | 0.00 | 0.00 | 0.200 | 0.257 | 0.325 | 0.00 | 0.234 | 0.210 | 0.203 | 0.321 | 0.00 | 0.249 | 0.263 | 0.301 | 0.347 | (11) |
| Odds ratio | 1.47 | 1.00 | 1.00 | 4.57 | 12.72 | 7.58 | 1.00 | 0.92 | 1.25 | 1.13 | 0.35 | 1.00 | 0.45 | 0.88 | 0.97 | 1.96 | 2607 |
| **Peru** | *ns* | | | *p<0.001* | *$\chi^2$=374.9* | | | *p<0.001* | *$\chi^2$=120.3* | | | *ns* | | | | | |
| Coefficient | -0.005 | 0.00 | 0.00 | 1.409 | 2.332 | 2.696 | 0.00 | -0.122 | 0.085 | -0.265 | -1.647 | 0.00 | -0.174 | -0.218 | -0.205 | -0.009 | 1763 |
| Std. error | 0.076 | 0.00 | 0.00 | 0.104 | 0.139 | 0.187 | 0.00 | 0.147 | 0.140 | 0.138 | 0.194 | 0.00 | 0.146 | 0.161 | 0.178 | 0.197 | (11) |
| Odds ratio | 0.99 | 1.00 | 1.00 | 4.09 | 10.30 | 14.82 | 1.00 | 0.89 | 1.09 | 0.77 | 0.19 | 1.00 | 0.84 | 0.80 | 0.81 | 0.99 | 5435 |

Note: Significance level and chi-square value refer to the variable under which they appear.
$\chi^2$=Chi-square value based on likelihood ratio test.
*ns*=Not significant at the 5-percent level.

Table 4.3 Coefficients and odds ratios from logistic regression model of mistimed childbearing, after controlling for the effects of other socioeconomic and demographic factors, for the later survey

| Region and country | Maternal marital status | | Number of living children | | | | Preceding birth interval | | | | | Maternal age | | | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single | Married | 0-1 | 2-3 | 4-5 | 6+ | <18 | 18-24 | 25-35 | 36+ | First births | <20 | 20-24 | 25-29 | 30-34 | 35+ | |
| **Sub-Saharan Africa** | | | | | | | | | | | | | | | | | |
| **Ghana** | *p<0.01* | *$\chi^2$=8.9* | | *p<0.001* | *$\chi^2$=20.6* | | | *p<0.001* | *$\chi^2$=34.8* | | | | *p<0.001* | *$\chi^2$=57.8* | | | |
| Coefficient | 0.350 | 0.00 | 0.00 | 0.470 | 0.851 | 0.582 | 0.00 | 0.593 | 0.522 | -0.094 | 0.035 | 0.00 | -0.640 | -1.125 | -1.397 | -1.887 | 187 |
| Std. error | 0.117 | 0.00 | 0.00 | 0.143 | 0.194 | 0.294 | 0.00 | 0.315 | 0.293 | 0.290 | 0.309 | 0.00 | 0.160 | 0.192 | 0.224 | 0.269 | (19) |
| Odds ratio | 1.42 | 1.00 | 1.00 | 1.60 | 2.34 | 1.79 | 1.00 | 1.81 | 1.69 | 0.91 | 1.04 | 1.00 | 0.53 | 0.32 | 0.25 | 0.15 | 2204 |
| **Kenya** | *p<0.001* | *$\chi^2$=14.7* | | *p<0.01* | *$\chi^2$=16.5* | | | *p<0.001* | *$\chi^2$=89.4* | | | | *p<0.001* | *$\chi^2$=24.0* | | | |
| Coefficient | 0.346 | 0.00 | 0.00 | 0.297 | 0.286 | -0.190 | 0.00 | 0.505 | 0.131 | -0.514 | -0.235 | 0.00 | -0.205 | -0.570 | -0.801 | -0.845 | 276 |
| Std. error | 0.090 | 0.00 | 0.00 | 0.115 | 0.156 | 0.200 | 0.00 | 0.167 | 0.157 | 0.162 | 0.176 | 0.00 | 0.115 | 0.147 | 0.186 | 0.221 | (19) |
| Odds ratio | 1.41 | 1.00 | 1.00 | 1.35 | 1.33 | 0.83 | 1.00 | 1.66 | 1.14 | 0.60 | 0.79 | 1.00 | 0.81 | 0.57 | 0.45 | 0.43 | 3655 |
| **Senegal** | *p<0.001* | *$\chi^2$=86.1* | | *p<0.001* | *$\chi^2$=46.2* | | | *p<0.001* | *$\chi^2$=106.5* | | | | *p<0.005* | *$\chi^2$=35.2* | | | |
| Coefficient | 1.424 | 0.00 | 0.00 | 0.585 | 1.091 | 1.196 | 0.00 | -0.027 | -0.649 | -1.244 | -0.967 | 0.00 | -0.019 | -0.484 | -0.726 | -1.100 | 396 |
| Std. error | 0.153 | 0.00 | 0.00 | 0.137 | 0.171 | 0.211 | 0.00 | 0.193 | 0.177 | 0.183 | 0.214 | 0.00 | 0.142 | 0.170 | 0.200 | 0.226 | (19) |
| Odds ratio | 4.16 | 1.00 | 1.00 | 1.80 | 3.00 | 3.31 | 1.00 | 0.97 | 0.52 | 0.29 | 0.38 | 1.00 | 0.98 | 0.62 | 0.48 | 0.33 | 3361 |
| **Zimbabwe** | *p<0.001* | *$\chi^2$=28.3* | | *p<0.001* | *$\chi^2$=36.4* | | | *p<0.001* | *$\chi^2$=109.8* | | | | *p<0.001* | *$\chi^2$=58.3* | | | |
| Coefficient | 0.715 | 0.00 | 0.00 | 0.657 | 1.311 | 1.192 | 0.00 | 0.459 | -0.102 | -0.957 | -1.0711 | 0.00 | -0.591 | -1.194 | -1.498 | -2.058 | 258 |
| Std. error | 0.134 | 0.00 | 0.00 | 0.158 | 0.224 | 0.280 | 0.00 | 0.316 | 0.277 | 0.247 | 0.29 | 0.00 | 0.145 | 0.199 | 0.241 | 0.292 | (19) |
| Odds ratio | 2.04 | 1.00 | 1.00 | 1.93 | 3.71 | 3.29 | 1.00 | 1.58 | 0.90 | 0.38 | 0.34 | 1.00 | 0.55 | 0.30 | 0.22 | 0.13 | 2438 |
| **Asia/North Africa** | | | | | | | | | | | | | | | | | |
| **Egypt** | *ns* | | | *p<0.001* | *$\chi^2$=31.6* | | | *p<0.001* | *$\chi^2$=279.5* | | | *ns* | | | | | |
| Coefficient | -0.247 | 0.00 | 0.00 | -0.270 | -1.013 | -1.519 | 0.00 | -0.370 | -0.934 | -1.837 | -2.595 | 0.00 | -1.164 | -0.092 | -0.385 | -0.506 | 393 |
| Std. error | 0.788 | 0.00 | 0.00 | 0.127 | 0.222 | 0.396 | 0.00 | 0.150 | 0.149 | 0.179 | 0.202 | 0.00 | 0.172 | 0.191 | 0.248 | 0.326 | (19) |
| Odds ratio | 0.78 | 1.00 | 1.00 | 0.76 | 0.36 | 0.22 | 1.00 | 0.69 | 0.39 | 0.16 | 0.07 | 1.00 | 0.85 | 0.91 | 0.68 | 0.60 | 5036 |
| **Indonesia** | *ns* | | *ns* | | | | | *p<0.001* | *$\chi^2$=328.6* | | | | *p<0.001* | *$\chi^2$=63.9* | | | |
| Coefficient | 0.245 | 0.00 | 0.00 | 0.158 | 0.101 | 0.155 | 0.00 | -0.165 | -0.580 | -1.310 | -1.927 | 0.00 | 0.045 | -0.444 | -0.698 | -1.318 | 505 |
| Std. error | 0.224 | 0.00 | 0.00 | 0.095 | 0.154 | 0.227 | 0.00 | 0.145 | 0.140 | 0.135 | 0.148 | 0.00 | 0.113 | 0.135 | 0.165 | 0.223 | (18) |
| Odds ratio | 1.28 | 1.00 | 1.00 | 1.17 | 1.11 | 1.17 | 1.00 | 0.85 | 0.56 | 0.27 | 0.15 | 1.00 | 1.05 | 0.64 | 0.50 | 0.27 | 10776 |
| **Morocco** | *ns* | | | *p<0.001* | *$\chi^2$=21.3* | | | *p<0.001* | *$\chi^2$=76.6* | | | | *p<0.01* | *$\chi^2$=14.5* | | | |
| Coefficient | 0.239 | 0.00 | 0.00 | 0.381 | 0.439 | -0.394 | 0.00 | -0.083 | -0.434 | -0.924 | -1.427 | 0.00 | -0.073 | -0.316 | -0.630 | -0.795 | 146 |
| Std. error | 0.360 | 0.00 | 0.00 | 0.153 | 0.190 | 0.261 | 0.00 | 0.188 | 0.180 | 0.187 | 0.221 | 0.00 | 0.199 | 0.217 | 0.242 | 0.281 | (19) |
| Odds ratio | 1.27 | 1.00 | 1.00 | 1.46 | 1.55 | 0.67 | 1.00 | 0.92 | 0.65 | 0.40 | 0.24 | 1.00 | 0.93 | 0.73 | 0.53 | 0.45 | 3055 |

*Continued . . .*

Table 4.3—*Continued*

| Region and country | Maternal marital status | | Number of living children | | | | Preceding birth interval | | | | | Maternal age | | | | | -2LLR (df) Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single | Married | 0-1 | 2-3 | 4-5 | 6+ | <18 | 18-24 | 25-35 | 36+ | First births | <20 | 20-24 | 25-29 | 30-34 | 35+ | |
| **Latin America/ Caribbean** | | | | | | | | | | | | | | | | | |
| **Colombia** | *ns* | | | *p<0.01* | *$\chi^2$=13.6* | | | *p<0.001* | *$\chi^2$=79.5* | | | | *p<0.001* | *$\chi^2$=43.0* | | | |
| Coefficient | 0.135 | 0.00 | 0.00 | -0.314 | -0.687 | -0.912 | 0.00 | -0.338 | -0.540 | -1.185 | -1.137 | 0.00 | -0.407 | -0.523 | -0.913 | -1.647 | 260 |
| Std. error | 0.099 | 0.00 | 0.00 | 0.126 | 0.240 | 0.405 | 0.00 | 0.182 | 0.180 | 0.172 | 0.166 | 0.00 | 0.120 | 0.143 | 0.194 | 0.311 | (19) |
| Odds ratio | 1.14 | 1.00 | 1.00 | 0.73 | 0.50 | 0.40 | 1.00 | 0.71 | 0.58 | 0.31 | 0.32 | 1.00 | 0.67 | 0.59 | 0.40 | 0.19 | 3113 |
| **Dominican Rep.** | *p<0.05* | *$\chi^2$=4.0* | | *p<0.01* | *$\chi^2$=26.4* | | | *p<0.001* | *$\chi^2$=129.3* | | | | *p<0.001* | *$\chi^2$=15.6* | | | |
| Coefficient | 0.269 | 0.00 | 0.00 | -0.233 | -1.309 | -0.898 | 0.00 | -0.412 | -0.970 | -1.513 | -1.531 | 0.00 | -0.212 | -0.342 | -0.908 | -0.925 | 222 |
| Std. error | 0.135 | 0.00 | 0.00 | 0.137 | 0.282 | 0.423 | 0.00 | 0.175 | 0.173 | 0.176 | 0.164 | 0.00 | 0.137 | 0.174 | 0.255 | 0.389 | (19) |
| Odds ratio | 1.31 | 1.00 | 1.00 | 0.79 | 0.27 | 0.41 | 1.00 | 0.66 | 0.38 | 0.22 | 0.22 | 1.00 | 0.81 | 0.71 | 0.40 | 0.40 | 2622 |
| **Peru** | *ns* | | | *p<0.001* | *$\chi^2$=56.6* | | | *p<0.001* | *$\chi^2$=73.3* | | | | *p<0.001* | *$\chi^2$=58.8* | | | |
| Coefficient | 0.101 | 0.00 | 0.00 | -0.481 | -1.112 | -0.971 | 0.00 | -0.145 | -0.397 | -0.831 | -0.809 | 0.00 | -0.301 | -0.445 | -0.777 | -1.521 | 512 |
| Std. error | 0.073 | 0.00 | 0.00 | 0.097 | 0.166 | 0.252 | 0.00 | 0.140 | 0.137 | 0.137 | 0.133 | 0.00 | 0.099 | 0.120 | 0.155 | 0.220 | (19) |
| Odds ratio | 1.11 | 1.00 | 1.00 | 0.62 | 0.33 | 0.38 | 1.00 | 0.86 | 0.67 | 0.44 | 0.45 | 1.00 | 0.74 | 0.64 | 0.46 | 0.22 | 5435 |

Note: Significance level and chi-square value refer to the variable under which they appear.
$\chi^2$ = Chi-square value based on likelihood ratio test.
ns = Not significant at the 5-percent level.

diminished, single women may be less likely to describe their pregnancies as unintended (Forrest and Singh 1990).

In this report, the data on marital status refer to status at the time of survey, so mothers' current marital status may not be applicable to their status at the time of conception of every child in this analysis. The findings on the association between marital status and unintended childbearing are presented in Table 4.1. Of the 10 countries analyzed in this report, eight (those in sub-Saharan Africa and in Latin America and the Caribbean) have data on never-married women. Egypt (North Africa) and Indonesia (Asia) have data on ever-married women only. Although Morocco collected data on never-married women in the 1992 DHS, the child-based data used here did not yield information on children born to never-married women. The prevalence of mistiming is highest among never-married women and tends to be low among currently married women. Overall, mistimed childbearing is highest in sub-Saharan Africa (usually about 60 percent or more of births in the preceding 3 years) and is lowest in North Africa.

The association between marital status and unwanted childbearing tends to be similar to that of mistimed pregnancies, especially in sub-Saharan Africa. In Latin America and the Caribbean, married women tended to report a higher proportion of recent children as unwanted than never-married women did. In Peru the proportion of unwanted births among married women is twice that reported by never-married women, although the reverse is true in Senegal.

After taking into account the effects of other socioeconomic and demographic variables in a multivariate analysis, it was observed that unwanted childbearing was significantly associated with marital status in the sub-Saharan African countries, the Dominican Republic, Indonesia, and Morocco (Table 4.2). However, the relationship between marital status and mistimed childbearing was significant only in four sub-Saharan African countries and the Dominican Republic. In each of those countries, the children of women who were not married were at increased odds of being considered mistimed (Table 4.1). This likelihood may be a reflection of the tendency among most women in those sub-Saharan African countries and the Dominican Republic to prefer having children within a marital home.

## 4.3 PRECEDING BIRTH INTERVALS

In earlier studies, short preceding birth intervals have been found to be associated with the likelihood of classifying a pregnancy as unintended (Cartwright 1988). The relationship between preceding birth interval and unintended pregnancies is probably a function of the socially acceptable interbirth intervals in a particular culture as well as of the circumstances of the women at the time of conception. Women who give birth to children within very short intervals may be the subject of gossip and diffused sanctions. A study by Bledsoe et al. (1994) found that the use of modern contraceptives among married women in The Gambia was aimed primarily at achieving respectable intervals between births. Social concerns, and whether her reproductive pattern fits into the socially acceptable mode, will largely influence how a woman feels after discovering that she has become pregnant soon after a preceding birth. In this report, pregnancies that occurred within the first year of the previous baby's birth are taken as the reference category. The bivariate analysis of the data shows that the pattern of association between the two variables is distinct in sub-Saharan Africa (Table 4.4). There, mistimed births show an inverted-U-shaped relationship with the length of the preceding birth interval. In other regions, the relationship is linear: the longer the length of the preceding birth interval, the less likely it is for a pregnancy to be described as mistimed.

The prevalence of unwanted pregnancies increases with the length of preceding birth intervals in about half the 10 countries in this study; the relationship is curvilinear in three others; the relationship is irregular in the rest of the countries (Table 4.4). In a multivariate analysis that controls for the effects of other demographic variables, it is observed that in most countries, as the length of birth interval increases, women are less likely to describe pregnancies as mistimed (Table 4.3). In considering sub-Saharan Africa, that statement is true in Senegal, but the relationship has an inverted-U shape in other countries. As to unwanted childbearing and birth interval, the relationship is not significant in sub-Saharan Africa (except Kenya), but it is significant in other regions (Table 4.2). The odds of describing first births as mistimed are very low compared to the odds of so describing children with short preceding birth intervals (Table 4.3). In most countries, the odds of describing first births as mistimed are similar to or lower than the odds of describing children with preceding intervals of 3 years as mistimed.

In summary, in many countries, the effects of the length of preceding birth intervals were usually very great—further examination of the reduction in variance on mistimed childbearing by each variable in the model revealed that preceding birth interval alone usually accounts for more than half of the total effects of all the variables combined. This finding is especially true of countries in North Africa/Asia. For example, in Egypt, it explained 71 percent of the total effects; in Indonesia, it accounted for 65 percent; in Colombia, it accounted for about 59 percent. The pattern of the effect of preceding birth interval is that longer intervals usually reduced the odds of an index child being classified as mistimed, and first births (those with no preceding birth interval) were especially less likely to be classified as mistimed once the effects of other variables had been taken into account. Only in Ghana and Kenya did this association seem to have some exceptions.

Table 4.4 Percentage of mistimed, unwanted, and unintended births in the 3 years before the survey, according to preceding birth interval and number of living children at the time of conception, for the later survey

| Region and country | Preceding birth intervals | | | | | Number of living children | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <18 | 18-24 | 25-35 | 36+ | None (first child) | 0-1 | 2-3 | 4-5 | 6+ |
| **Sub-Saharan Africa** | | | | | | | | | |
| **Ghana** | | | | | | | | | |
| Mistimed | 33.3 | 45.5 | 41.3 | 24.9 | 41.5 | 37.1 | 33.0 | 32.9 | 22.2 |
| Unwanted | 5.0 | 7.3 | 8.6 | 10.2 | 4.9 | 4.2 | 5.1 | 17.7 | 31.1 |
| Unintended | 38.3 | 52.8 | 49.9 | 35.1 | 46.4 | 41.3 | 38.1 | 50.6 | 52.3 |
| **Kenya** | | | | | | | | | |
| Mistimed | 37.0 | 49.2 | 39.5 | 24.3 | 40.1 | 40.5 | 40.9 | 32.9 | 20.8 |
| Unwanted | 25.9 | 20.3 | 20.0 | 23.5 | 5.1 | 5.7 | 12.7 | 28.7 | 52.4 |
| Unintended | 62.9 | 69.5 | 59.5 | 47.8 | 45.2 | 46.2 | 53.6 | 61.6 | 73.2 |
| **Senegal** | | | | | | | | | |
| Mistimed | 42.9 | 43.6 | 28.0 | 16.7 | 25.8 | 24.7 | 27.3 | 28.6 | 26.0 |
| Unwanted | 3.6 | 4.3 | 4.6 | 7.2 | 2.3 | 1.7 | 1.7 | 4.1 | 23.4 |
| Unintended | 46.5 | 47.9 | 32.6 | 23.7 | 28.1 | 26.4 | 29.0 | 32.7 | 49.4 |
| **Zimbabwe** | | | | | | | | | |
| Mistimed | 50.6 | 58.7 | 45.6 | 23.4 | 32.1 | 33.7 | 34.8 | 34.6 | 28.4 |
| Unwanted | 8.4 | 7.0 | 7.9 | 11.6 | 3.2 | 2.7 | 5.0 | 14.0 | 36.1 |
| Unintended | 59.0 | 65.7 | 53.5 | 35.0 | 35.3 | 36.4 | 39.8 | 48.6 | 64.5 |
| **North Africa/Asia** | | | | | | | | | |
| **Egypt** | | | | | | | | | |
| Mistimed | 24.6 | 15.7 | 9.4 | 3.9 | 3.7 | 11.0 | 10.2 | 4.3 | 2.1 |
| Unwanted | 24.9 | 28.0 | 31.7 | 41.4 | 0.5 | 2.9 | 30.6 | 60.9 | 74.4 |
| Unintended | 49.5 | 43.7 | 41.1 | 45.3 | 4.2 | 13.9 | 40.0 | 65.2 | 76.5 |
| **Indonesia** | | | | | | | | | |
| Mistimed | 26.6 | 21.9 | 15.1 | 7.2 | 6.6 | 10.4 | 11.0 | 7.8 | 7.0 |
| Unwanted | 7.7 | 8.8 | 9.5 | 13.7 | 0.2 | 0.6 | 13.0 | 25.5 | 36.1 |
| Unintended | 34.3 | 30.7 | 24.6 | 20.9 | 6.8 | 11.0 | 24.0 | 33.3 | 43.1 |
| **Morocco** | | | | | | | | | |
| Mistimed | 25.6 | 24.0 | 17.7 | 11.5 | 9.5 | 14.9 | 19.9 | 17.6 | 7.6 |
| Unwanted | 28.0 | 21.3 | 21.5 | 26.3 | 2.0 | 3.7 | 16.6 | 31.7 | 51.2 |
| Unintended | 53.6 | 45.3 | 39.2 | 37.8 | 11.5 | 28.6 | 36.5 | 49.3 | 57.8 |
| **Latin America/ Caribbean** | | | | | | | | | |
| **Colombia** | | | | | | | | | |
| Mistimed | 39.3 | 31.2 | 25.2 | 14.9 | 27.2 | 29.0 | 20.6 | 12.4 | 6.3 |
| Unwanted | 35.6 | 36.7 | 36.5 | 28.4 | 1.9 | 5.7 | 39.8 | 62.4 | 74.7 |
| Unintended | 74.9 | 67.9 | 61.7 | 43.3 | 29.1 | 34.7 | 60.4 | 74.8 | 81.0 |
| **Dominican Republic** | | | | | | | | | |
| Mistimed | 45.6 | 35.6 | 23.3 | 13.3 | 21.4 | 26.8 | 25.7 | 9.9 | 9.7 |
| Unwanted | 18.3 | 18.1 | 25.7 | 25.2 | 2.4 | 4.4 | 24.4 | 54.5 | 52.8 |
| Unintended | 63.9 | 53.7 | 49.0 | 38.5 | 23.8 | 31.2 | 50.1 | 64.3 | 62.5 |
| **Peru** | | | | | | | | | |
| Mistimed | 37.3 | 30.4 | 22.0 | 15.5 | 32.5 | 34.3 | 21.1 | 9.3 | 6.6 |
| Unwanted | 37.6 | 42.3 | 52.7 | 40.5 | 4.1 | 10.4 | 45.9 | 70.3 | 80.5 |
| Unintended | 74.9 | 72.7 | 74.7 | 56.0 | 36.6 | 44.7 | 67.0 | 79.6 | 87.1 |

## 4.4 NUMBER OF LIVING CHILDREN

The proportion of mistimed pregnancies has been found to decrease as the number of children increases, while the proportion of unwanted pregnancies increased with parity (Anderson 1981:63). In this study, this general pattern seems to be supported (Table 4.4). The proportion of children described as mistimed generally declines as the number of living children increases. However, the proportion of unwanted pregnancies increased as the number of living children increased. Although the decline in pregnancies described as mistimed is gradual as the number of living children increases, the increase in pregnancies described as unwanted is generally steep. This pattern implies that a large proportion of children borne by women who already had several surviving children were actually unwanted. For example, in Ghana the proportion of children described as unwanted at conception by women who already had six or more living children was seven times the proportion described as unwanted by women with one child only or no living children. The ratio of those proportions was 14:1 in Senegal, 26:1 in Egypt, and 60:1 in Indonesia (Table 4.4). When the effects of other socioeconomic and demographic variables in the model were accounted for in a multivariate model (Table 4.2), however, the odds ratio of an index child's being described as unwanted by women with six or more children in relation to its being so described by women with no children or only one child increased—to 21:1 in Ghana, 21:1 in Senegal, and 45:1 in Egypt.

Similarly, when the effects of other demographic and socioeconomic variables were taken into account in a multivariate model, the odds of a child's being described as mistimed do not decrease with increasing number of living children, especially in sub-Saharan Africa (Table 4.3), a result that is unlike what was suggested by Table 4.4. In fact, in all four sub-Saharan African countries, as well as in Indonesia and Morocco, women with one child only or no living children had higher odds of describing a child as mistimed than women with four to five living children. However, in the surveyed countries in Latin America and the Caribbean, the odds of describing a child as mistimed is lower among women with more than one child living than among women with one child only or no living children. The same pattern is evident in Table 4.4 before multivariate analysis.

The relationship between the number of living children at conception and the odds of describing the current pregnancy as mistimed is statistically significant and positive in all the countries except Indonesia (Table 4.3). Unwanted childbearing is statistically significant in all countries (Table 4.2), but the odds ratios are generally higher in the three countries of North Africa/Asia than in other regions (Table 4.2). For example, the odds of unwanted childbearing among women with six or more living children in sub-Saharan Africa were nine to 21 times that among women with one child or no children; yet in North Africa/Asia, the odds were 20 to 62 times, and in Latin America and the Caribbean the odds were about eight to 18.

Overall, analysis of the data showed that the most important predictor of the odds that a child will be reported as being unwanted at conception is the number of living children a woman has at the time of conception. This variable was highly significant across all regions. The pattern of association is such that the higher the number of living children, the higher the odds that an index child will be reported as unwanted at conception.

# 5 Determinants of Unintended Childbearing

So far in this report, the results of the multivariate analysis have been examined separately for mistimed and for unwanted childbearing. The variable that sums the two dependent variables together—unintended childbearing—has not been analyzed in a multivariate model. In this section, the primary objective is to consolidate the results from the preceding sections on socioeconomic and demographic determinants of mistimed and unwanted childbearing so as to present the whole-model results on a variable—unintended childbearing—that combines both mistimed and unwanted childbearing. Table 5.1 contains the odds ratios

Table 5.1 Odds ratios of demographic and socioeconomic covariates of unintended childbearing (result for each variable after taking the effects of the other variables in the table into account), for the later survey

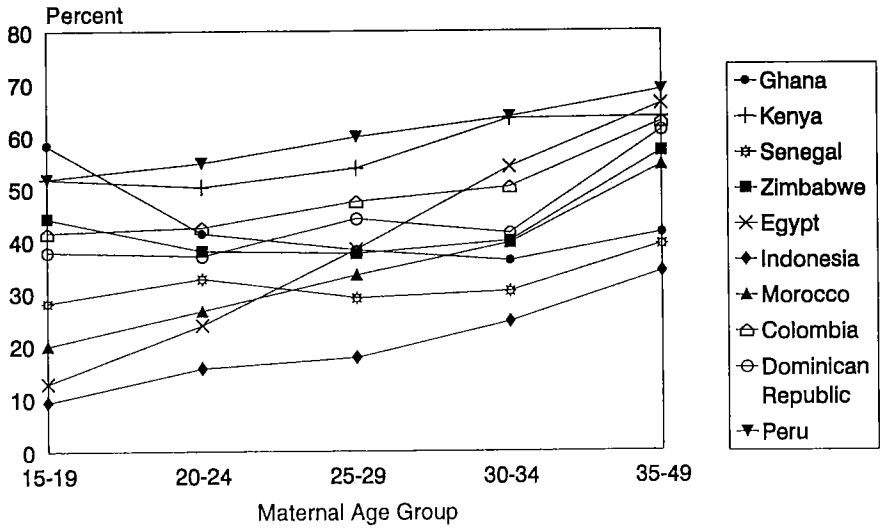
| | Sub-Saharan Africa | | | | North Africa/Asia | | | Latin America/Caribbean | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Covariates/ value categories | Ghana | Kenya | Senegal | Zimbabwe | Egypt | Indonesia | Morocco | Colombia | Dominican Republic | Peru |
| **Maternal age** | *p<0.001* | *p<0.01* | *p<0.001* | *p<0.001* | *p<0.05* | *p<0.001* | *p<0.05* | *p<0.001* | *p<0.001* | *p<0.001* |
| <20 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 20-24 | 0.44*** | 0.77* | 0.99 | 0.55*** | 0.79 | 0.94 | 0.93 | 0.68** | 0.62*** | 0.73** |
| 25-29 | 0.28*** | 0.64** | 0.61** | 0.34*** | 0.90 | 0.57*** | 0.73 | 0.63*** | 0.75 | 0.60*** |
| 30-34 | 0.18*** | 0.75 | 0.46*** | 0.25*** | 1.03 | 0.57*** | 0.64* | 0.48*** | 0.60* | 0.46*** |
| 35+ | 0.17*** | 0.51** | 0.56** | 0.39*** | 1.15 | 0.72* | 0.91 | 0.63* | 1.17 | 0.41*** |
| **Preceding birth interval** | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* |
| <18 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 18-24 | 2.31** | 1.18 | 0.92 | 1.25 | 0.62*** | 0.79 | 0.63** | 0.65* | 0.63** | 0.75* |
| 25-35 | 2.25** | 0.75 | 0.49*** | 0.76 | 0.48*** | 0.55*** | 0.43*** | 0.46*** | 0.48*** | 0.73* |
| 36+ | 1.38 | 0.46*** | 0.33*** | 0.36*** | 0.48*** | 0.48*** | 0.37*** | 0.24*** | 0.33*** | 0.38*** |
| Others | 1.28 | 0.50** | 0.39*** | 0.30*** | 0.08*** | 0.17*** | 0.17*** | 0.19*** | 0.21*** | 0.26*** |
| **Maternal marital status** | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *ns* | *p<0.01* | *p<0.001* | *p<0.05* | *p<0.01* | *ns* |
| Married | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Single | 1.83*** | 2.50*** | 5.45*** | 3.18*** | 1.31 | 1.58** | 2.68*** | 1.21* | 1.45** | 1.07 |
| **Number of living children** | *p<0.0001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* | *p<0.001* |
| 0-1 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 2-3 | 1.80*** | 1.79*** | 1.86*** | 2.06*** | 2.70*** | 2.42*** | 2.49*** | 2.80*** | 1.67*** | 2.32*** |
| 4-5 | 4.48*** | 3.21*** | 3.26*** | 4.61*** | 7.59*** | 4.52*** | 4.74*** | 6.20*** | 2.82*** | 5.43*** |
| 6+ | 6.01*** | 6.96*** | 7.19*** | 7.50*** | 13.21*** | 6.46*** | 6.32*** | 10.15*** | 2.30** | 10.14*** |
| **Maternal education (years)** | *p<0.001* | *p<0.001* | *p<0.01* | *p<0.001* | *p<0.001* | *p<0.001* | *ns* | *p<0.01* | *ns* | *p<0.01* |
| None | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1-5 | 1.39* | 1.62*** | 1.48* | 1.60** | 1.31** | 1.60*** | 1.21 | 1.13 | 1.00 | 0.96 |
| 6-10 | 1.54** | 2.18*** | 1.79*** | 1.81*** | 1.65*** | 1.95*** | 1.31 | 1.45 | 0.87 | 1.30* |
| 11+ | 1.31 | 1.71** | 1.37 | 3.20*** | 1.78*** | 2.55*** | 1.83* | 1.69* | 0.96 | 1.09 |
| **Maternal economic index** | *ns* | *p<0.01* | *ns* | *ns* | *p<0.001* | *p<0.001* | *ns* | *p<0.05* | *ns* | *ns* |
| Low | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Middle | 0.89 | 1.27* | 1.11 | 0.87 | 1.75*** | 1.41*** | 1.07 | 1.40** | 1.17 | 1.19* |
| High | 0.70 | 0.70* | 1.10 | 0.59* | 1.61*** | 1.49 | 1.20 | 1.33* | 1.12 | 0.98 |
| **Media** | *ns* | *ns* | *p<0.001* | *ns* | *p<0.001* | *p<0.001* | *p<0.05* | *p<0.05* | *ns* | *p<0.001* |
| 0-1 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 2 | 1.21 | 1.06 | 1.82*** | 1.06 | 0.69** | 1.30*** | 1.29* | 1.16 | 1.12 | 0.88 |
| 3 | 1.09 | 1.01 | 1.76** | 0.79 | NA | 1.12 | 1.56 | 0.92 | 0.70 | 0.75** |
| $\chi^2$ value (df) | 230 (19) | 417 (19) | 469 (19) | 312 (19) | 1450 (18) | 1001(19) | 460 (19) | 530 (19) | 290 (19) | 822 (19) |
| Number of children | 2,204 | 3,655 | 3,361 | 2,438 | 5,036 | 10,776 | 3,055 | 3,113 | 2,622 | 5,438 |

Note: Significance level and chi-square value refer to the variable under which they appear.
*ns* = Not significant (at 0.05)
* = Significant at 0.05.
** = Significant at 0.01.
*** = Significant at 0.001.
NA = Data not available.
df = Degrees of freedom.

from a multivariate logistic regression analysis of unintended childbearing. The level of statistical significance of each variable was obtained by using the likelihood ratio method. In each case, the results were obtained only after taking into account the effects of every other variable in the model. The results show that the effect of maternal age on unintended childbearing is statistically significant in all 10 countries. Children borne by mothers age 20 and above have lower odds of being unintended at conception than children of teenage mothers; the exceptions are children of women age 30 and above in Egypt and of women age 35 and above in the Dominican Republic. However, although the effect of maternal age on unintended childbearing is statistically significant in all countries, the odds ratios did not show a consistent pattern across the age groups. For example, the odds ratios of unintended childbearing decrease and maternal age increases in Ghana, Indonesia, and Peru; and the ratios form a J- or reverse-J shape (as in Egypt, Morocco, and Zimbabwe). The lack of a uniform pattern confirms what has been found in studies in industrialized countries (Allaby 1995, Forrest 1994, Forrest and Singh 1990). The major explanation is that the relationship between maternal age and mistimed childbearing differs from the age pattern of unwanted childbearing. So, when both measures are combined to form unintended childbearing, the direction of the age effect becomes inconsistent. The relative weakening of this association between maternal age and unintended childbearing can be seen when the pattern in Figure 5.1 is compared to the pattern shown by Figures 4.1 and 4.2.

The length of the preceding birth interval is strongly associated with unintended childbearing in all countries in this study after taking into account the effects of other variables in the model. Except in Ghana, the odds of classifying a birth as

## Figure 5.1 Percentage of unintended births according to mothers' age at conception




Note: Rates are based on births in the 3 years before the later survey.

unintended at conception are much lower if the preceding birth interval is 24 or more months than if it is less than 18 months. This tendency suggests that longer preceding birth intervals may make a child more likely to be described as intended. In all the studied countries outside of sub-Saharan Africa, the longer the preceding birth interval, the lower the odds of a woman's reporting a child as unintended at conception. Likewise, in all countries outside of sub-Saharan Africa, first births have the lowest odds of being classified as unintended. Similar odds obtain for Senegal.

In previous analysis of the effect of marital status on mistimed childbearing (Table 4.3), statistical significance was observed only in sub-Saharan African countries and the Dominican Republic. However, in Table 5.1, the effect of marital status on unintended childbearing is statistically significant in all countries except Egypt and Peru. Children of women not in a union at the time of survey had an increased likelihood of being unintended at conception in comparison to children of women in a union. The odds ratios are, on average, greater and more statistically significant in sub-Saharan Africa than in other regions.

The results also show (Table 5.1) that the number of living children at the time of interview was a strong predictor of the odds of reporting a child as unintended. That factor is statisti-

cally significant in all countries in this study. Children of mothers with one child only or no living children at the time of conception were the least likely to be classified as unintended. The odds of mothers with six or more living children reporting children as unintended were two to 13 times higher than those of mothers with one child only or no living children. The odds ratios varied slightly across regions: in sub-Saharan Africa, the odds of a child's being classified as unintended if the mother had six or more surviving children were on average six to seven times greater than those of a child preceded by one child only or no living children; in Latin America and the Caribbean, the odds ratio ranges from two in the Dominican Republic to 10 in Colombia and Peru, whereas in North Africa/Asia, the odds ratios are about six in Indonesia and Morocco and 13 in Egypt.

Socioeconomic variables had some effects, although they were not as consistent across regions (with the exception of mothers' education). The effects of mothers' level of education is statistically significant in all countries except the Dominican Republic and Morocco. The general pattern of association between unintended childbearing and mothers' education is that children of mothers with higher levels of education are more likely to be unintended than children of women with lower education. The effect of economic status on unintended childbearing was statistically significant in only four countries: Kenya, Egypt, Indonesia, and Colombia. In each of those countries (except Kenya), higher economic status tends to be associated with higher odds of having unintended childbearing than low status. In countries of sub-Saharan Africa where the pattern is in the expected direction, the variable is not statistically significant. Media exposure has statistically significant effects on unintended childbearing in six countries, but only one of those (Senegal) was in sub-Saharan Africa. Except in Egypt and Peru, women who had more media exposure tended to have higher odds of having unintended childbearing than those who had low exposure.

# 6 Summary and Conclusions

In this report, the levels, trends, and determinants of mistimed and unwanted childbearing in 10 developing countries have been presented. The results show that the prevalence of unintended childbearing in the 3-year period before the earlier survey ranged from 24 percent in Indonesia to 65 percent in Peru. In the period before the later survey, the level of unintended childbearing in the North African/Asian countries ranged from 18 percent to 35 percent; in the countries of Latin America and the Caribbean, from 41 percent to 59 percent; and in sub-Saharan Africa, from 31 percent to 55 percent. Various determinants of mistimed and unwanted childbearing were investigated according to the conceptual framework presented at the beginning of this report. Logistic regression was used to sort out the effects of each of the determinants net of the effects of other variables in the analysis. For mistimed childbearing, the most important determinants (assessed by their contributions to -2 likelihood ratio) are the length of the preceding birth interval, maternal age, and mothers' years of schooling. For unwanted childbearing, the most important determinants are number of living children, mothers' age, marital status, and preceding birth interval. The data suggest that a sizable proportion of women generally would have chosen to have longer birth intervals if they could have, and that a large number of them indirectly showed a preference for ceasing childbearing either because of the number of living children they already had or because of their age or their marital status at the time of conception. Socioeconomic variables tend to have relatively weaker effects on indicators of unintended childbearing, a point that may be a reflection of how much those variables independently affect women's capacity to determine the timing and the cessation of childbearing.

One of the issues that may arouse readers' curiosity is the finding that variables such as maternal education and household economic status do not always show the expected effect: an inverse relationship with the odds of having a mistimed or unwanted child. In many cases, especially in the case of mistimed childbearing, the association is in the opposite direction: children of women with more education or of those in the upper economic status households are at greater odds of being mistimed or unwanted. This is a confirmation of a similar finding from a study conducted in Nigeria (Okonofua 1996:10) and from a cross-national study by Westoff (1981). One explanation for this occurrence could be that as fertility control comes within a person's calculus of conscious choice, and as people become more aware of the desirability of family planning, the individual may come to expect every birth to be a result of careful planning—an expectation caused by the opening up of alternatives. When the expectation is not met, the informed individuals—that is, those who believe that they could control the timing or the number of their children—are more likely to report children as mistimed or unwanted than respondents who do not believe that issues of fertility can be under their conscious control. In developing countries, the people who are likely to catch the vision of family planning earliest are the more educated and those in higher socioeconomic echelons. Such people may be more likely to report higher unintended fertility than those in lower educational and socioeconomic categories. According to Westoff (1981), the higher level of mistiming and unwanted childbearing results from a redefining of pregnancies as mistimed or unwanted that would have been unquestioningly accepted in the past. The high prevalence of mistimed or unwanted pregnancies may be an indirect indication of some unmet need for contraception, a need that could be met if modern methods of contraception were accessible.

Another possible explanation for a positive association between childbearing reported mistimed and higher level of maternal education is that people with more education are more likely than those with less education to lead the way in general—not only in reducing their ideal family size but also in disregarding traditional norms related to child spacing (such as postpartum sexual abstinence and prolonged breastfeeding) even before they have fully absorbed the facts of modern contraceptive ideals. Hence, those social leaders may end up having still more mistimed children. This pattern of association is expected to be transitional; it should be corrected as access to contraception improves and its acceptance increases.

The question may be asked as to whether the prevalence of contraception in any country has any relationship with the observed level of unintended childbearing. Drawing a correlation between prevalence rates of contraception and the observed levels of unintended childbearing shows that the coefficient of determination ($r^2$) between the two variables is 34 percent. However, since this percentage is at the national level, it may have little implication for policy. This study did not link contraceptive practice with experience of unintended childbearing at an individual level, because in most of the surveys the necessary data are not available. For that analysis to be done, it is necessary to know whether a woman was using a method of contraception when the pregnancy occurred. In most cases, data are available only on current method of contraception and ever-use of contraception; such data may not be informative about the circumstances leading to the experience of an unintended pregnancy some time ago.

It must be stressed that the available literature on the relationship between contraceptive practices at the individual level and the experience of unintended pregnancy are mostly from developed countries where use of contraceptives is high. Those studies show that nonuse and ineffective use of contraception are a precursor to a large majority of unintended pregnancies. Burnhill (1994) reported that about 53 percent of all unplanned pregnancies in the United States in 1987 occurred among a small proportion

(10%) of sexually active women age 15 to 44 who were not using contraception, and that a large proportion (23% of all) of the unintended pregnancies were among teenagers. The same result was observed by Forrest (1994), whose conclusion was that in the United States, the risk of unintended pregnancy is high among both "misusers" and nonusers of contraceptives. Similarly, discontinuation of contraceptives and method switching have been highlighted as important risk factors in unintended fertility (Rosenberg at al. 1995). It is estimated that out of about one million unintended pregnancies that occur each year in the United States, 39 percent occur among current users of contraception—either owing to method failure or owing to user failure—while 61 percent occur among users who either discontinue contraception or change methods.

In view of the above scenario, the high levels of unintended childbearing that have been remarked in this report indirectly suggest that there is a high unmet need for effective contraception in most of the countries studied. The high proportion of mistimed pregnancies (particularly in sub-Saharan Africa) clearly suggests an unmet need for better spacing, while the high and increasing proportion of unwanted pregnancies suggests a high and increasing unmet need for cessation of childbearing (see Westoff and Bankole 1995). Meeting that need mandates an increase in people's access to methods of contraception. There is a need for public information, for education and communication campaigns directed at both men and women regarding the level of determination necessary to avoid unintended childbearing, whether through abstinence or through use of contraceptives (Brown and Eisenberg 1995). It cannot be overstressed: every pregnancy should be intended and desired at conception. The level of mistimed childbearing, which is very high among adolescents in many countries, needs to be reduced. Meanwhile, there is a need for more research on the cost of unintended childbearing in developing countries, on interventions to prevent mistimed and unwanted childbearing as well as on the pattern of unintended childbearing in the course of fertility transition.

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# APPENDIX A

Table 1a Percentage of currently married women using contraception, and annual percentage change

| Region and country (dates of surveys) | Using a traditional method | | | Using a modern method | | |
|---|---|---|---|---|---|---|
| | Earlier survey | Later survey | Annual per-centage change | Earlier survey | Later survey | Annual per-centage change |
| **Sub-Saharan Africa** | | | | | | |
| Ghana (1988, 1993) | 7.9 | 10.1 | +5.0 | 5.1 | 10.4 | +18.6 |
| Kenya (1988-89, 1993) | 9.1 | 5.7 | - | 18.3 | 27.7 | +12.2 |
| Senegal (1986, 1993) | 8.9 | 2.7 | - | 2.4 | 4.8 | +14.7 |
| Zimbabwe (1988, 1994) | 7.0 | 6.0 | - | 36.1 | 42.2 | +2.9 |
| **Asia/North Africa** | | | | | | |
| Egypt (1988-89, 1992) | 2.4 | 2.3 | - | 35.5 | 44.8 | +6.5 |
| Indonesia (1991, 1994) | 2.6 | 2.7 | +1.2 | 47.1 | 52.1 | +3.2 |
| Morocco (1987, 1992) | 6.9 | 6.0 | - | 28.9 | 35.5 | +4.9 |
| **Latin America/Caribbean** | | | | | | |
| Colombia (1990, 1995) | 14.2 | 12.7 | - | 57.3 | 63.3 | +2.2 |
| Dominican Republic (1986, 1991) | 4.9 | 5.6 | +2.9 | 55.5 | 60.7 | +1.9 |
| Peru (1986, 1991-92) | 23.4 | 26.6 | +2.6 | 26.1 | 36.3 | +7.5 |

Table 1b Percentage of mistimed, unwanted, and unintended births in the 3 years before the later survey, according to mothers' contraceptive use

| Region and country | Mother using contraception | Mother not using contraception |
|---|---|---|
| **Sub-Saharan Africa** | | |
| **Ghana** | | |
| Mistimed | 39.2 | 33.2 |
| Unwanted | 9.9 | 8.0 |
| Unintended | 49.1 | 41.2 |
| **Kenya** | | |
| Mistimed | 34.5 | 37.2 |
| Unwanted | 24.1 | 16.2 |
| Unintended | 58.6 | 53.4 |
| **Senegal** | | |
| Mistimed | 43.7 | 24.9 |
| Unwanted | 9.4 | 4.6 |
| Unintended | 53.1 | 31.5 |
| **Zimbabwe** | | |
| Mistimed | 34.0 | 33.1 |
| Unwanted | 7.2 | 9.4 |
| Unintended | 41.2 | 42.5 |
| **North Africa/Asia** | | |
| **Egypt** | | |
| Mistimed | 9.5 | 8.7 |
| Unwanted | 31.2 | 22.7 |
| Unintended | 40.7 | 31.4 |
| **Indonesia** | | |
| Mistimed | 11.8 | 8.1 |
| Unwanted | 8.7 | 8.0 |
| Unintended | 20.5 | 16.1 |
| **Morocco** | | |
| Mistimed | 19.2 | 13.1 |
| Unwanted | 23.2 | 17.5 |
| Unintended | 42.4 | 30.6 |
| **Latin America/Caribbean** | | |
| **Colombia** | | |
| Mistimed | 24.3 | 24.9 |
| Unwanted | 21.8 | 21.3 |
| Unintended | 46.1 | 46.2 |
| **Dominican Republic** | | |
| Mistimed | 24.1 | 24.7 |
| Unwanted | 16.1 | 16.1 |
| Unintended | 40.2 | 40.8 |
| **Peru** | | |
| Mistimed | 26.4 | 24.4 |
| Unwanted | 30.4 | 35.9 |
| Unintended | 56.8 | 60.1 |

Table 2 Percentage of women who were pregnant at the time of the later survey, and the planning status of their pregnancies

| Region and country | Number of women | Percent currently pregnant | Mistimed | Unwanted | Unintended |
|---|---|---|---|---|---|
| **Sub-Saharan Africa** | | | | | |
| Ghana | 4,562 | 7.9 | 31.0 | 13.7 | 44.7 |
| Kenya | 7,540 | 7.6 | 36.8 | 20.5 | 57.3 |
| Senegal | 6,310 | 7.1 | 29.3 | 7.5 | 36.8 |
| Zimbabwe | 6,128 | 8.4 | 34.3 | 17.1 | 51.4 |
| **North Africa/Asia** | | | | | |
| Egypt | 9,864 | 9.5 | 16.0 | 25.6 | 41.6 |
| Indonesia | 28,168 | 6.2 | 13.5 | 9.0 | 22.5 |
| Morocco | 9,256 | 6.7 | 21.2 | 23.4 | 54.6 |
| **Latin America/Caribbean** | | | | | |
| Colombia | 11,140 | 5.4 | 33.9 | 20.3 | 54.2 |
| Dominican Republic | 7,320 | 6.4 | 34.8 | 21.8 | 56.6 |
| Peru | 15,882 | 5.2 | 21.8 | 42.4 | 64.2 |

Table 2a Age-specific fertility rate (ASFR) in comparison with age-specific mistimed fertility rate (ASMFR), age-specific unwanted fertility rate (ASUFR), and maternal-age-specific unintended fertility rate (ASUIFR)

| | Age group | | | | | | |
|---|---|---|---|---|---|---|---|
| | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| **Ghana** | | | | | | | |
| ASFR | 0.112 | 0.217 | 0.229 | 0.207 | 0.141 | 0.086 | 0.023 |
| ASMFR | 0.057 | 0.085 | 0.075 | 0.059 | 0.028 | 0.017 | 0.002 |
| ASUFR | 0.009 | 0.007 | 0.012 | 0.016 | 0.030 | 0.018 | 0.009 |
| ASUIFR | 0.066 | 0.092 | 0.087 | 0.075 | 0.058 | 0.035 | 0.011 |
| **Kenya** | | | | | | | |
| ASFR | 0.108 | 0.249 | 0.235 | 0.193 | 0.150 | 0.068 | 0.051 |
| ASMFR | 0.051 | 0.106 | 0.083 | 0.052 | 0.033 | 0.013 | 0.001 |
| ASUFR | 0.007 | 0.018 | 0.037 | 0.068 | 0.063 | 0.035 | 0.015 |
| ASUIFR | 0.058 | 0.124 | 0.120 | 0.120 | 0.096 | 0.048 | 0.016 |
| **Senegal** | | | | | | | |
| ASFR | 0.121 | 0.243 | 0.257 | 0.237 | 0.182 | 0.100 | 0.034 |
| ASMFR | 0.031 | 0.073 | 0.066 | 0.061 | 0.044 | 0.012 | 0.000 |
| ASUFR | 0.002 | 0.003 | 0.006 | 0.010 | 0.020 | 0.032 | 0.012 |
| ASUIFR | 0.033 | 0.076 | 0.072 | 0.071 | 0.064 | 0.044 | 0.012 |
| **Zimbabwe** | | | | | | | |
| ASFR | 0.097 | 0.205 | 0.189 | 0.166 | 0.115 | 0.050 | 0.014 |
| ASMFR | 0.042 | 0.073 | 0.058 | 0.050 | 0.031 | 0.008 | 0.001 |
| ASUFR | 0.003 | 0.004 | 0.011 | 0.014 | 0.033 | 0.019 | 0.008 |
| ASUIFR | 0.045 | 0.077 | 0.069 | 0.064 | 0.064 | 0.027 | 0.009 |
| **Egypt** | | | | | | | |
| ASFR | 0.061 | 0.203 | 0.216 | 0.150 | 0.087 | 0.042 | 0.006 |
| ASMFR | 0.005 | 0.024 | 0.024 | 0.009 | 0.004 | 0.000 | 0.000 |
| ASUFR | 0.002 | 0.022 | 0.054 | 0.068 | 0.049 | 0.032 | 0.004 |
| ASUIFR | 0.007 | 0.046 | 0.078 | 0.077 | 0.053 | 0.032 | 0.004 |
| **Indonesia** | | | | | | | |
| ASFR | 0.059 | 0.144 | 0.145 | 0.105 | 0.067 | 0.030 | 0.004 |
| ASMFR | 0.005 | 0.019 | 0.016 | 0.009 | 0.004 | 0.002 | 0.000 |
| ASUFR | 0.000 | 0.003 | 0.009 | 0.015 | 0.017 | 0.011 | 0.001 |
| ASUIFR | 0.005 | 0.022 | 0.025 | 0.024 | 0.021 | 0.013 | 0.001 |
| **Morocco** | | | | | | | |
| ASFR | 0.040 | 0.133 | 0.176 | 0.177 | 0.136 | 0.084 | 0.040 |
| ASMFR | 0.006 | 0.025 | 0.031 | 0.028 | 0.013 | 0.007 | 0.004 |
| ASUFR | 0.001 | 0.008 | 0.023 | 0.042 | 0.052 | 0.037 | 0.024 |
| ASUIFR | 0.007 | 0.033 | 0.054 | 0.070 | 0.065 | 0.044 | 0.028 |
| **Colombia** | | | | | | | |
| ASFR | 0.087 | 0.169 | 0.145 | 0.099 | 0.054 | 0.024 | 0.002 |
| ASMFR | 0.031 | 0.048 | 0.034 | 0.018 | 0.004 | 0.001 | 0.000 |
| ASUFR | 0.005 | 0.025 | 0.033 | 0.032 | 0.025 | 0.017 | 0.002 |
| ASUIFR | 0.036 | 0.073 | 0.067 | 0.050 | 0.029 | 0.018 | 0.002 |
| **Dominican Republic** | | | | | | | |
| ASFR | 0.085 | 0.206 | 0.172 | 0.112 | 0.053 | 0.011 | 0.012 |
| ASMFR | 0.027 | 0.057 | 0.040 | 0.016 | 0.005 | 0.000 | 0.000 |
| ASUFR | 0.005 | 0.019 | 0.033 | 0.029 | 0.028 | 0.006 | 0.006 |
| ASUIFR | 0.032 | 0.076 | 0.073 | 0.045 | 0.033 | 0.006 | 0.006 |
| **Peru** | | | | | | | |
| ASFR | 0.060 | 0.168 | 0.173 | 0.138 | 0.096 | 0.041 | 0.011 |
| ASMFR | 0.024 | 0.055 | 0.044 | 0.022 | 0.007 | 0.003 | 0.000 |
| ASUFR | 0.007 | 0.035 | 0.059 | 0.065 | 0.054 | 0.029 | 0.009 |
| ASUIFR | 0.031 | 0.090 | 0.103 | 0.087 | 0.061 | 0.032 | 0.009 |

# Appendix B

## Summary of DHS-I, DHS-II, and DHS-III Surveys, 1985-1997

| Region and Country | Date of Fieldwork | Implementing Organization | Respondents | Sample Size | Male/Husband Survey | Supplemental Studies, Modules, and Additional Questions |
|---|---|---|---|---|---|---|
| **SUB-SAHARAN AFRICA** | | | | | | |
| **DHS-I** | | | | | | |
| Botswana | Aug-Dec 1988 | Central Statistics Office | AW 15-49 | 4,368 | | AIDS, PC, adolescent fertility |
| Burundi | Apr-Jul 1987 | Département de la Population, Ministère de l'Intérieur | AW 15-49 | 3,970 | 542 Husbands | CA, SAI, adult mortality |
| Ghana | Feb-May 1988 | Ghana Statistical Service | AW 15-49 | 4,488 | 943 Husbands | CA, SM, WE |
| Kenya | Dec-May 1988/89 | National Council for Population and Development | AW 15-49 | 7,150 | 1,133 Husbands | |
| Liberia | Feb-Jul 1986 | Bureau of Statistics, Ministry of Planning and Economic Affairs | AW 15-49 | 5,239 | | TBH, employment status |
| Mali | Mar-Aug 1987 | Institut du Sahel, USED/CERPOD | AW 15-49 | 3,200 | 970 Men 20-55 | CA, VC, childhood physical handicaps |
| Ondo State, Nigeria | Sep-Jan 1986/87 | Ministry of Health, Ondo State | AW 15-49 | 4,213 | | CA, TBH |
| Senegal | Apr-Jul 1986 | Direction de la Statistique, Ministère de l'Economie et des Finances | AW 15-49 | 4,415 | | CA, CD |
| Sudan | Nov-May 1989/90 | Department of Statistics, Ministry of Economic and National Planning | EMW 15-49 | 5,860 | | FC, M, MM |
| Togo | Jun-Nov 1988 | Unité de Recherche Démographique, Université du Benin | AW 15-49 | 3,360 | | CA, SAI, marriage history |
| Uganda | Sep-Feb 1988/89 | Ministry of Health | AW 15-49 | 4,730 | | CA, SAI |
| Zimbabwe | Sep-Jan 1988/89 | Central Statistical Office | AW 15-49 | 4,201 | | AIDS, CA, PC, SAI, WE |
| **DHS-II** | | | | | | |
| Burkina Faso | Dec-Mar 1992/93 | Institut National de la Statistique et de la Démographie | AW 15-49 | 6,354 | 1,845 Men 18+ | AIDS, CA, MA, SAI |
| Cameroon | Apr-Sep 1991 | Direction Nationale du Deuxième Recensement Général de la Population et de l'Habitat | AW 15-49 | 3,871 | 814 Husbands | CA, CD, SAI |
| Madagascar | May-Nov 1992 | Centre National de Recherches sur l'Environement | AW 15-49 | 6,260 | | CA, MM, SAI |
| Malawi | Sep-Nov 1992 | National Statistical Office | AW 15-49 | 4,850 | 1,151 Men 20-54 | AIDS, CA, MA, MM, SAI |
| Namibia | Jul-Nov 1992 | Ministry of Health and Social Services, Central Statistical Office | AW 15-49 | 5,421 | | CA, CD, MA, MM |
| Niger | Mar-Jun 1992 | Direction de la Statistique et des Comtes Nationaux | AW 15-49 | 6,503 | 1,570 Husbands | CA, MA, MM, SAI |
| Nigeria | Apr-Oct 1990 | Federal Office of Statistics | AW 15-49 | 8,781 | | CA, SAI |
| Rwanda | Jun-Oct 1992 | Office National de la Population | AW 15-49 | 6,551 | 598 Husbands | CA |
| Senegal | Nov-Aug 1992/93 | Direction de la Prévision et de la Statistique | AW 15-49 | 6,310 | 1,436 Men 20+ | AIDS, CA, MA, MM, SAI |
| Tanzania | Oct-Mar 1991/92 | Bureau of Statistics, Planning Commission | AW 15-49 | 9,238 | 2,114 Men 15-60 | AIDS, CA, MA, SAI |
| Zambia | Jan-May 1992 | University of Zambia | AW 15-49 | 7,060 | | AIDS, CA, MA |

| | | | | | | |
|---|---|---|---|---|---|---|
| **DHS-III** | | | | | | |
| Benin | Jun-Aug 1996 | Institut National de la Statistique | AW 15-49 | 5,491 | 1,535 Men 20-64 | AIDS, CA, MA, MM, SAI |
| Central African Republic | Sep-Mar 1994/95 | Direction des Statistiques Démographiques et Sociales | AW 15-49 | 5,884 | 1,729 Men 15-59 | AIDS, CA, CD, MA, MM, SAI |
| Comoros | Mar-May 1996 | Centre National de Documentation et de la Recherche Scientifique | AW 15-49 | 3,050 | 795 Men 15-64 | CA, MA |
| Côte d'Ivoire | Jun-Nov 1994 | Institut National de la Statistique | AW 15-49 | 8,099 | 2,552 Men 12-49 | CA, MA, SAI |
| Eritrea | Sep-Jan 1995/96 | National Statistics Office | AW 15-49 | 5,054 | 1,114 Men 15-59 | AIDS, CA, MA, MM, SAI |
| Ghana | Sep-Dec 1993 | Ghana Statistical Service | AW 15-49 | 4,562 | 1,302 Men 15-59 | CA, MA |
| Kenya | Feb-Aug 1993 | National Council for Population and Development | AW 15-49 | 7,540 | 2,336 Men 15-54 | AIDS, CA, MA, SAI |
| Madagascar | Sep-Dec 1997 | Institut National de la Statistique, Direction de la Démographie et des Statistiques Sociales | AW 15-49 | 7,060 | | AIDS, CA, MA |
| Malawi (KAP)[a] | Jun-Oct 1996 | National Statistical Office | AW 15-49 | 2,683 | 2,658 Men 15-54 | AIDS |
| Mali | Nov-Apr 1995/96 | CPS/MSSPA et DNSI | AW 15-49 | 9,704 | 2,474 Men 15-59 | AIDS, CA, MA, MM, SAI |
| Mozambique | Mar-Jul 1997 | Instituto Nacional de Estatístical Ministéro de Saúde | AW 15-49 | 8,779 | 2,335 Men 15-64 | CA, MA, MM, SAI |
| Senegal (Interim) | Jan-Apr 1997 | Division de Statistiques Démographiques, Direction de la Prévision et de la Statistique | AW 15-49 | 8,593 | 4,306 Men 20+ | AIDS |
| Tanzania (KAP)[a] | Jul-Sep 1994 | Bureau of Statistics, Planning Commission | AW 15-49 | 4,225 | 2,097 Men 15-59 | AIDS, PC |
| Tanzania (In-depth) | Jun-Oct 1995 | Bureau of Statistics, Planning Commission | AW 15-49 | 2,130 | | Adult and childhood mortality estimation |
| Tanzania | Jul-Nov 1996 | Bureau of Statistics, Planning Commission | AW 15-49 | 8,120 | 2,256 Men 15-59 | AIDS, CA, MA, MM |
| Uganda | Mar-Aug 1995 | Statistics Department, Ministry of Finance and Economic Planning | AW 15-49 | 7,070 | 1,996 Men 15-59 | AIDS, CA, MA, MM, SAI |
| Uganda (In-depth) | Oct-Jan 1995/96 | Institute of Statistics and Applied Economics, Makerere University | AW 20-44 | 1,750 | 1,356 Partners | Negotiating reproductive outcomes |
| Zambia | Jul-Jan 1996/97 | Central Statistics Office | AW 15-49 | 8,021 | 1,849 Men 15-59 | AIDS, CA, MA, MM |
| Zimbabwe | Jul-Nov 1994 | Central Statistical Office | AW 15-49 | 6,128 | 2,141 Men 15-54 | AIDS, CA, MA, MM, PC, SAI |
| **NEAR EAST/NORTH AFRICA** | | | | | | |
| **DHS-I** | | | | | | |
| Egypt | Oct-Jan 1988/89 | National Population Council | EMW 15-49 | 8,911 | | CA, CD, MM, PC, SAI, WE, WS |
| Morocco | May-Jul 1987 | Ministère de la Santé Publique | EMW 15-49 | 5,982 | | CA, CD, S |
| Tunisia | Jun-Oct 1988 | Office National de la Famille et de la Population | EMW 15-49 | 4,184 | | CA, S, SAI |
| **DHS-II** | | | | | | |
| Egypt | Nov-Dec 1992 | National Population Council | EMW 15-49 | 9,864 | 2,466 Husbands | CA, MA, PC, SM |
| Jordan | Oct-Dec 1990 | Department of Statistics, Ministry of Health | EMW 15-49 | 6,461 | | CA, SAI |
| Morocco | Jan-Apr 1992 | Ministère de la Santé Publique | AW 15-49 | 9,256 | 1,336 Men 20-70 | CA, MA, MM, SAI |
| Yemen | Nov-Jan 1991/92 | Central Statistical Organization | EMW 15-49 | 5,687 | | CA, CD, SAI |

| | | | | | | |
|---|---|---|---|---|---|---|
| **DHS-III** | | | | | | |
| Egypt | Nov-Jan 1995/96 | National Population Council | EMW 15-49 | 14,779 | | CA, FC, MA, WS |
| Jordan | Jun-Oct 1997 | Department of Statistics | EMW 15-49 | 5,548 | | AIDS, CA, MA, MM |
| Morocco (Panel) | Apr-May 1995 | Ministère de la Santé Publique | AW 15-49 | 4,753 | | |
| **ASIA** | | | | | | |
| **DHS-I** | | | | | | |
| Indonesia | Sep-Dec 1987 | Central Bureau of Statistics, National Family Planning Coordinating Board | EMW 15-49 | 11,884 | | PC, SM |
| Nepal (In-depth) | Feb-Apr 1987 | New Era | CMW 15-49 | 1,623 | | KAP-gap survey |
| Sri Lanka | Jan-Mar 1987 | Department of Census and Statistics, Ministry of Plan Implementation | EMW 15-49 | 5,865 | | CA, NFP |
| Thailand | Mar-Jun 1987 | Institute of Population Studies Chulalongkorn University | EMW 15-49 | 6,775 | | CA, S, SAI |
| **DHS-II** | | | | | | |
| Indonesia | May-Jul 1991 | Central Bureau of Statistics, NFPCB/MOH | EMW 15-49 | 22,909 | | PC, SM |
| Pakistan | Dec-May 1990/91 | National Institute of Population Studies | EMW 15-49 | 6,611 | 1,354 Husbands | CA |
| **DHS-III** | | | | | | |
| Bangladesh | Nov-Mar 1993/94 | Mitra & Associates/NIPORT | EMW 10-49 | 9,640 | 3,284 Husbands | PC, SAI, SM |
| Bangladesh | Nov-Mar 1996/97 | Mitra & Associates/NIPORT | EMW 10-49 | 9,127 | 3,346 EMM | CA, MA, SM |
| Indonesia | Jul-Nov 1994 | Central Bureau of Statistics/ NFPCB/MOH | EMW 15-49 | 28,168 | | MM, PC, SAI, SM |
| Kazakstan | May-Aug 1995 | Institute of Nutrition, National Academy of Sciences | AW 15-49 | 3,771 | | CA, MA |
| Kyrgyz Republic | Aug-Nov 1997 | Institue of Obstetrics and Pediatrics | AW 15-49 | 3,848 | | CA, MA, anemia testing |
| Nepal | Jan-Jun 1996 | Ministry of Health/New ERA | EMW 15-49 | 8,429 | | CA, MA, MM |
| Philippines | Apr-Jun 1993 | National Statistics Office | AW 15-49 | 15,029 | | MM, SAI |
| Turkey | Aug-Oct 1993 | General Directorate of MCH/FP Ministry of Health | EMW <50 | 6,519 | | CA, MA |
| Uzbekistan | Jun-Oct 1996 | Research Institute of Obstetrics and Gynecology | AW 15-49 | 4,415 | | CA, MA |
| LATIN AMERICA/CARIBBEAN | | | | | | |
| **DHS-I** | | | | | | |
| Bolivia | Feb-Jul 1989 | Instituto Nacional de Estadística | AW 15-49 | 7,923 | | CA, CD, MM, PC, S, WE |
| Bolivia (In-depth) | Feb-Jul 1989 | Instituto Nacional de Estadística | AW 15-49 | 7,923 | | Health |
| Brazil | May-Aug 1986 | Sociedade Civil Bem-Estar Familiar no Brasil | AW 15-44 | 5,892 | | CA, S, SM, abortion, young adult use of contraception |
| Colombia | Oct-Dec 1986 | Corporación Centro Regional de Población, Ministerio de Salud | AW 15-49 | 5,329 | | CA, PC, S, SAI, SM |
| Dominican Republic | Sep-Dec 1986 | Consejo Nacional de Población y Familia | AW 15-49 | 7,649 | | CA, NFP, S, SAI, family planning communication |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dominican Republic (Experimental) | Sep-Dec 1986 | Consejo Nacional de Población y Familia | AW 15-49 | 3,885 | | S, SAI |
| Ecuador | Jan-Mar 1987 | Centro de Estudios de Población y Paternidad Responsable | AW 15-49 | 4,713 | | CD, SAI, employment |
| El Salvador | May-Jun 1985 | Asociación Demográfica Salvadoreña | AW 15-49 | 5,207 | | CA, S, TBH |
| Guatemala | Oct-Dec 1987 | Instituto de Nutrición de Centro América y Panamá | AW 15-44 | 5,160 | | CA, S, SAI |
| Mexico | Feb-May 1987 | Dirección General de Planificación Familiar, Secretaría de Salud | AW 15-49 | 9,310 | | NFP, S, employment |
| Peru | Sep-Dec 1986 | Instituto Nacional de Estadística | AW 15-49 | 4,999 | | NFP, employment, |
| Peru (Experimental) | Sep-Dec 1986 | Instituto Nacional de Estadística | AW 15-49 | 2,534 | | |
| Trinidad and Tobago | May-Aug 1987 | Family Planning Association of Trinidad and Tobago | AW 15-49 | 3,806 | | CA, NFP, breastfeeding |
| **DHS-II** | | | | | | |
| Brazil (NE) | Sep-Dec 1991 | Sociedade Civil Bem-Estar Familiar no Brasil | AW 15-49 | 6,222 | 1,266 Husbands | AIDS, PC |
| Colombia | May-Aug 1990 | PROFAMILIA | AW 15-49 | 8,644 | | AIDS |
| Dominican Republic | Jul-Nov 1991 | Instituto de Estudios de Población y Desarrollo (PROFAMILIA), Oficina Nacional de Planificación | AW 15-49 | 7,320 | | CA, MA, S, SAI |
| Paraguay | May-Aug 1990 | Centro Paraguayo de Estudios de Población | AW 15-49 | 5,827 | | CA, SAI |
| Peru | Oct-Mar 1991/92 | Instituto Nacional de Estadística e Informática | AW 15-49 | 15,882 | | CA, MA, MM, SAI |
| **DHS-III** | | | | | | |
| Bolivia | Nov-May 1993/94 | Instituto Nacional de Estadística | AW 15-49 | 8,603[b] | | AIDS, CA, CD, MA, MM, S, SAI |
| Brazil | Mar-Jun 1996 | Sociedade Civil Bem-Estar Familiar no Brasil | AW 15-49 | 12,612 | 2,949 Men 15-59 | AIDS, CA, MA, MM, PC, S |
| Colombia | Mar-Jun 1995 | PROFAMILIA | AW 15-49 | 11,140 | | AIDS, CA, MA, PC |
| Dominican Republic | Aug-Dec 1996 | CESDEM/PROFAMILIA | AW 15-49 | 8,422 | 2,279 Men 15-64 | CA, MA |
| Guatemala | Jun-Dec 1995 | Instituto Nacional de Estadística | AW 15-49 | 12,403 | | AIDS, CA, MA, MM, S |
| Haiti | Jul-Jan 1994/95 | Institut Haitien de l'Enfance | AW 15-49 | 5,356 | 1,610 Men 15-59 | AIDS, CA, CD, MA, SAI |
| Peru | Aug-Nov 1996 | Instituto Nacional de Estadística e Informática | AW 15-49 | 28,951 | 2,487 Men 15-59 | CA, MA, MM |

[a] No health or birth history section in questionnaire.
[b] Household questionnaire was administered in 26,144 households.

AIDS acquired immune deficiency syndrome
AW all women
CA child anthropometry
CD causes of death (verbal reports of symptoms)
CMW currently married women
EMW ever-married women
FC female circumcision
M migration
MA maternal anthropometry
MM maternal mortality
NFP natural family planning
PC pill compliance
S sterilization
SAI service availability information
SM social marketing
TBH truncated birth history
VC value of children
WE women's employment
WS women's status

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