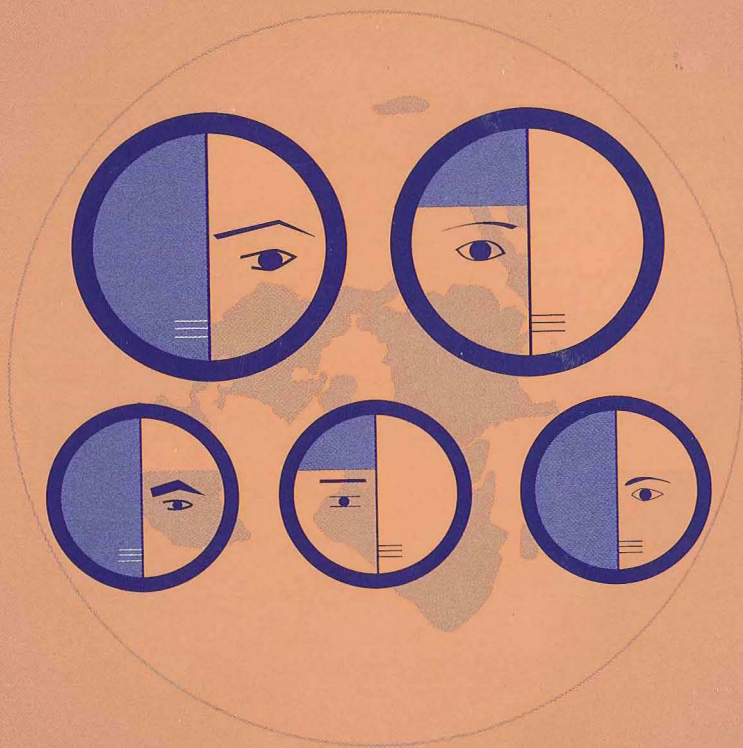Population Bulletin of the United Nations

Prospects for Fertility Decline in High Fertility Countries

United Nations

Department of Economic and Social Affairs
Population Division

Population Bulletin
of the United Nations

Prospects for Fertility Decline
in High Fertility Countries

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PREFACE

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat is responsible for providing the international community with up-to-date information on population and development. The Population Division provides guidance on population and development issues to the General Assembly, the Economic and Social Council and the Commission on Population and Development and undertakes regular studies on population levels and trends, population estimates and projections, population policies, and population and development interrelationships.

The purpose of the *Population Bulletin of the United Nations* is to publish population studies carried out by the United Nations, its specialized agencies and other organizations with a view to promoting scientific understanding of population questions. The present *Bulletin* contains 15 papers presented by researchers from around the world at the Workshop on Prospects for Fertility Decline in High Fertility Countries, held at United Nations Headquarters in New York from 9 to 11 July 2001. The purpose of the workshop was to discuss the prospects for fertility decline in 47 countries where, during the period 1995 to 2000, the average number of children born per woman was 5 or above.

With the world population having reached 6 billion at the turn of the millennium, demographic projections indicate that future growth to the year 2050 will stem largely from higher fertility in less developed regions. The Population Division publication *World Population Prospects: The 2000 Revision* suggests that particularly rapid growth is expected among the group of 47 countries characterized with high fertility.

The continuation of high fertility and population growth poses serious challenges to future economic and social development, for the majority of these high fertility countries are classified as least developed. Heavily indebted and afflicted by the HIV/AIDS epidemic, they have low levels of school enrolment, especially among women, and low levels of contraceptive use. Marriage is almost universal in these countries, which have been in situations of civil conflict in recent years. Those concerns prompted the organization of the three-day Workshop in order to investigate the conditions that hinder or facilitate fertility decline, provide insights into the prospects for decline and indicate policy measures that may facilitate the onset of fertility decline. In view of those objectives, the workshop was structured into three sessions: (1) review of demographic trends in high fertility countries; (2) comparative perspectives on fertility trends; and (3) contexts for fertility decline.

The proceedings of the Workshop are gathered here as a special issue of the *Population Bulletin of the United Nations*. Part one, the report of the Workshop, contains an overview of the Workshop and the presentations

and discussions in each session. Parts two and three contain the papers presented at the Workshop, which have been revised on the basis of the discussions that took place. Papers that provide an overview of demographic and socio-economic aspects in high fertility countries are included in part two, followed by country papers in part three.

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Explanatory notes

Symbols of United Nations documents are composed of capital letters combined with figures. The following symbols have been used in the tables throughout the report:

Two dots (..) indicate that data are not available or are not separately reported.

An em dash (—) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A minus sign (–) before a number indicates a decrease.

A point (.) is used to indicate decimals.

A slash (/) indicates a crop year or financial year, e.g., 1994/95.

Use of a hyphen (-) between dates representing years, for example, 1994-1995, signifies the full period involved, including the beginning and end years.

Details and percentages in tables do not necessarily add to totals because of rounding.

Reference to "dollars" ($) indicates United States dollars, unless otherwise stated.

The term "billion" signifies a thousand million.

The group of least developed countries currently comprises 49 countries: Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, Togo, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Yemen and Zambia.
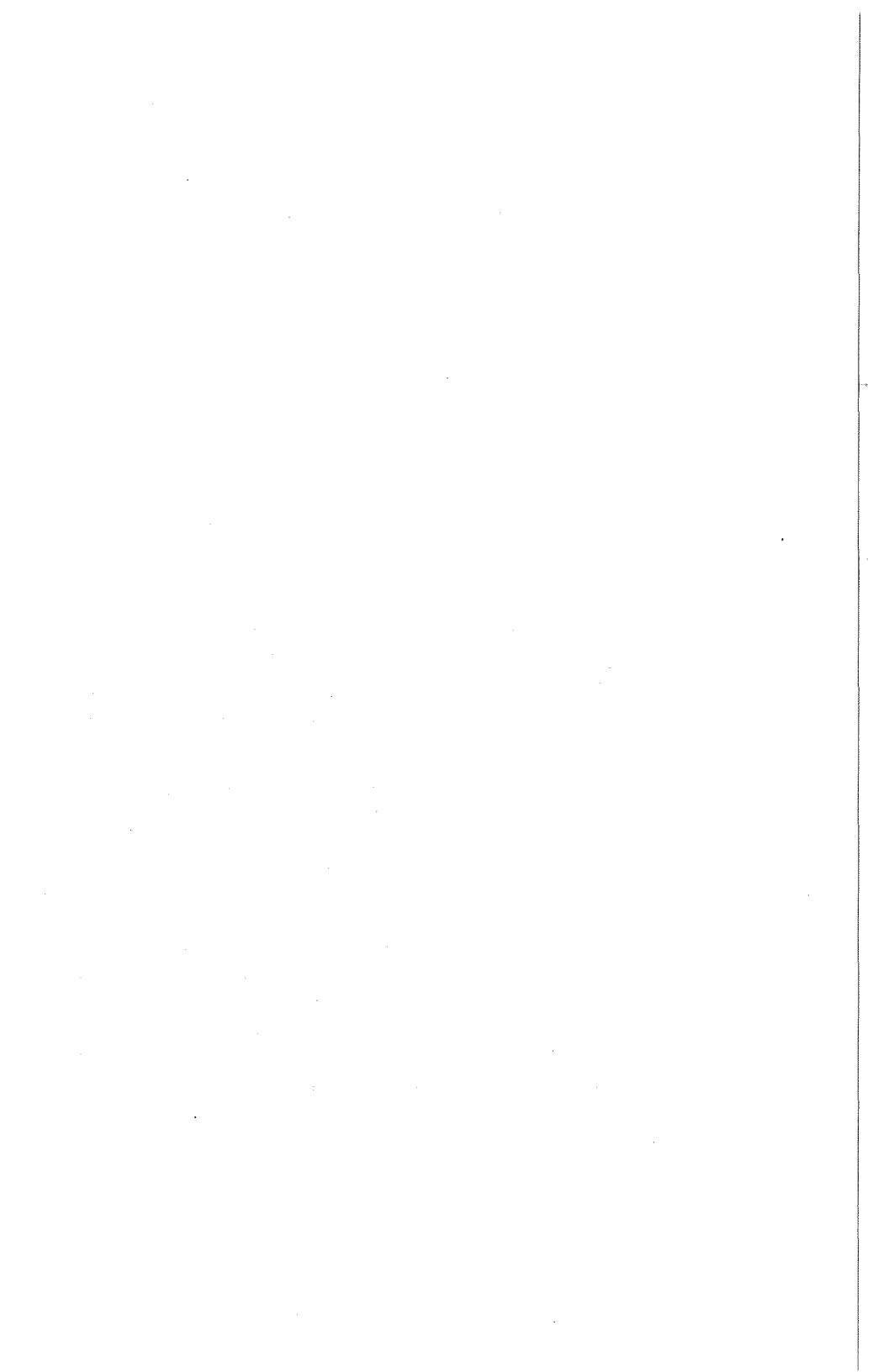
Executive summary

The present report contains the proceedings of the Workshop on Prospects for Fertility Decline in High Fertility Countries, including 15 papers presented by researchers from around the world. The objectives of the Workshop were to investigate the conditions that hinder or facilitate fertility decline, provide insights into the prospects for fertility decline and indicate policy measures that may facilitate fertility decline.

Despite the appreciable fertility decline in many developing countries during the second half of the twentieth century, by the period 1995 to 2000 there remained 47 countries where the total fertility rate stood at or above 5 children per woman. Thirty-six of these countries are in Africa, 10 in Asia and one in Oceania. The United Nations publication *World Population Prospects, The 2000 Revision* suggests that rapid growth is expected among the group of 47 countries: their population will almost double, from 745 million in 2000 to 1.4 billion in 2025. The majority of those countries are also classified as least developed and are heavily indebted. Moreover, in the majority of them school enrolment is very low, especially among women; marriage is almost universal; infant mortality rates are above 100 per 1,000 live births; fertility preferences are high, around 5 children; contraceptive use is very low; and abortion remains illegal.

The report presents the following main findings of the Workshop:

1. Transition towards lower fertility seems to have begun in most of the countries. Six are progressing through the incipient stage of fertility transition. However, in 11 countries, fertility transition has not yet begun.

2. Poor educational enrolment, especially for women, low contraceptive use and high infant mortality were among the most consistent factors found to hinder fertility decline. Such factors as continuing high fertility preferences and lack of accessibility to affordable contraceptive methods could lead to stagnation in the total fertility rate, mitigating other depressive influences.

3. The impacts of the HIV/AIDS epidemic, persistent economic hardships and civil conflict also affect fertility in unanticipated ways. In some affected countries, recent declines in fertility may not be sustained.

4. The prospects for fertility decline are linked to a large degree to propitious changes in the factors mentioned above. However, these changes are unlikely to be rapid. Hence, by 2025, the average number of children per woman is likely to fall to around 4 in the current high fertility countries.
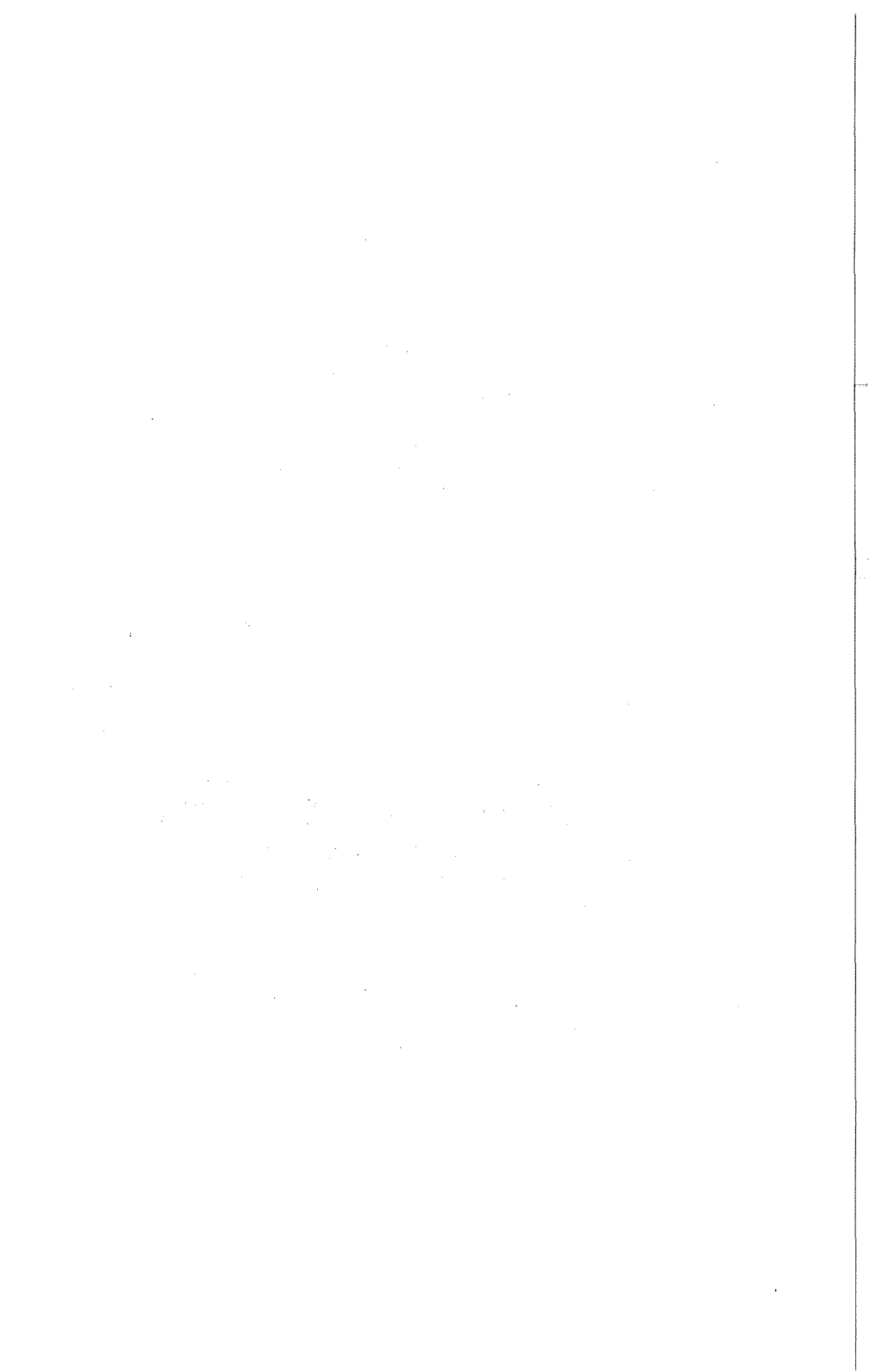
Part One

REPORT OF THE UNITED NATIONS WORKSHOP ON PROSPECTS FOR FERTILITY DECLINE IN HIGH FERTILITY COUNTRIES
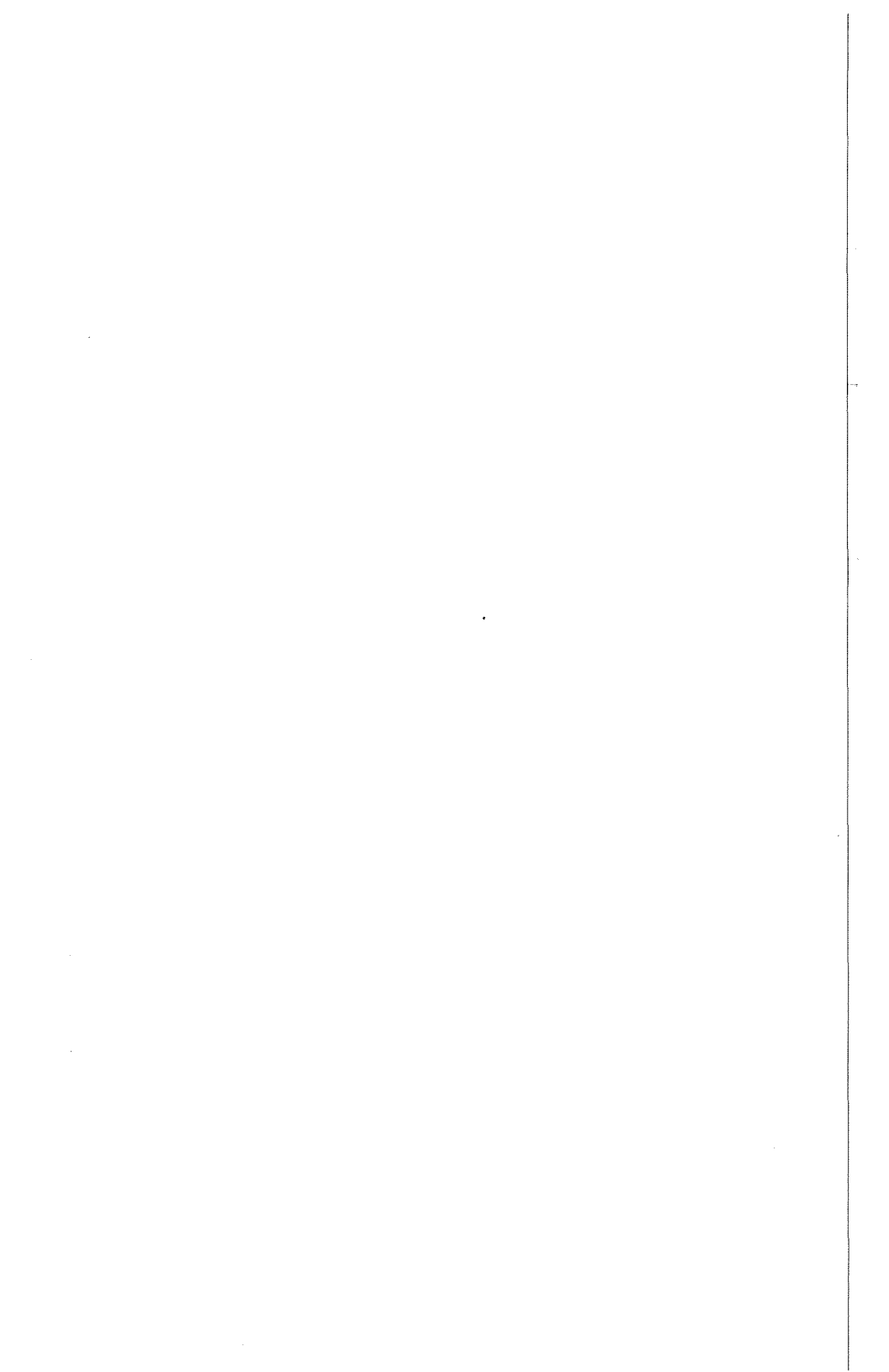
REPORT OF THE WORKSHOP

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat organized the United Nations Workshop on Prospects for Fertility Decline in High Fertility Countries from 9 to 11 July 2001 to discuss the prospects for fertility decline in high fertility countries. Despite the appreciable fertility declines that were observed in many developing countries during the second half of the twentieth century, by 1995 to 2000 there remained 47 countries where the total fertility rate (TFR) was 5 children and above per woman. Most of these countries were located in sub-Saharan Africa.

Joseph Chamie, Director of the Population Division, opened the meeting. He stressed that the two most important objectives were to examine the prospects for fertility decline in countries characterized by high levels of childbearing and to provide some insights on policy-relevant factors that may influence the onset of fertility decline. To reach these objectives, the meeting was divided into three sessions: (1) review of demographic trends in high fertility countries; (2) comparative perspectives on fertility trends; and (3) contexts for fertility decline. The participants included researchers from various disciplines and from different world regions.

The present report offers a brief overview of the proceedings of the meeting. It summarizes the papers presented in each of the meeting's sessions, synthesizes the comments made in the ensuing discussions and consolidates the main points raised over the course of the meeting. The agenda, list of participants and list of documents are included in the annexes.

I. MEETING OVERVIEW

The need for a better understanding of the determinants for and prospects for fertility change was a recurring theme of the Workshop on Prospects for Fertility Decline in High Fertility Countries. With the world population having reached 6 billion at the turn of the millennium, demographic projections indicate that future growth to the year 2050 will largely stem from higher fertility in less developed regions. *World Population Prospects: The 2000 Revision* suggests that particularly rapid growth is expected among the group of 47 countries characterized by high fertility, that is, having a total fertility rate of 5 or more children per woman. The majority of those countries are also classified as least developed.

The meeting was organized in order to investigate the conditions that hinder or influence fertility decline, provide insights into the prospects for decline

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and indicate policy measures that may facilitate the onset of fertility decline. The meeting focused on fifteen scientific papers presented by researchers from around the world. There were also a number of presentations from regional commissions of the United Nations. Five young professionals—from Burkina Faso, Côte d'Ivoire, the Democratic Republic of the Congo, Morocco and Togo—also participated, invited under the Population Division's outreach programme. Time was allotted throughout the meeting for a discussion following each set of presentations, as well as for a panel that offered a critical review on the last day of the meeting.

Human reproductive behaviour is the result of a complex interplay among numerous factors of a demographic, economic, social, cultural and biological nature. Thus, not surprisingly, theories and methods developed by researchers to explain and measure this phenomenon are numerous and complex. A recurring concept throughout the meeting was the central framework of demographic transition theory. By far the most influential framework in demographic research, the theory chronicles a process of change from high to low fertility regimes, drawing on hypotheses often inspired by observation of broad trends having occurred at various times across different regions of the world. Societies may be broadly classified as either "traditional", characterized by high fertility and mortality levels, or "modern", where birth and death rates are low. Societies "in-between" overlap, at each end, with demographic characteristics of both the traditional and modern types. Such societies may be further classified according to the stage or pace of fertility transition: incipient (or beginning of fertility decline), core (rapid decline) and advanced (slowing decline). While the focus of the meeting was on traditional and incipient countries, some presentations also provided valuable insights drawing on experiences from countries in the core and advanced stages.

It was recognized that transition theory alone is not sufficient to explain fully the differentials across all societies. Hence, the need for contextual studies was acknowledged. Another recurring concern was the need for a framework to explain and assess the factors leading to fertility reduction. On the one hand, structural determinants are often presented in the context of demographic transition theory as indicators of development and modernization, including urbanization, socio-economic status and gender relations. On the other hand, proximate determinants of fertility describe the mechanisms that are seen to regulate fertility outcomes in conjunction with the steps of the process: intercourse, conception, and gestation and parturition. They include such factors as marriage and sexual activity, post-partum infecundity and pathological sterility, use and effectiveness of means of contraception, and abortion.

Education, especially for women, and lower infant mortality were among the most consistent basic determinants found to exercise depressive effects on fertility. Impacts of the HIV/AIDS epidemic, persistent economic hardships and civil conflict, and patterns of sexual initiation and cohabitation could affect long-term fertility trends in unanticipated ways. Moreover, certain factors such as continuing high fertility preferences and a lack of accessibility to and affordability of contraceptive methods could lead to stagnation in the total fertility rate.

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An important question, should fertility decline continue, was the level at which the TFR could eventually be expected to stabilize. It was often speculated that the "ideal" would be 2.1 children, which is considered to be population replacement level under conditions of low mortality. How reasonable this assumption is for many of the countries under observation, given the pervasive poverty as well as the trends in mortality and migration, remains to be seen. Even if fertility does eventually reach the replacement level, population growth will still continue at a rapid pace in the short term.

At issue, also, were the quantitative measures of fertility and its determinants as well as data and methodological considerations. Many of the presentations drew on data collected from sample surveys conducted under the auspices of two major cross-national programmes: the ongoing Demographic and Health Survey (DHS) and its predecessor, the World Fertility Survey (WFS). It was suggested that the TFR calculated using such data might be underestimated, as the rate is based on births in a given period (usually 3 to 5 years) before the survey and may suffer from displacement of births to the preceding period. Moreover, samples are generally designed to produce indicators representative at the national or regional level, and small area estimations may have large confidence intervals. While such considerations should not be used to detract from the main issue at hand, nevertheless they hold important implications for examining fertility prospects.

The main consensus reached at the meeting was that a transition towards lower fertility seems to have begun in most of the 47 high fertility countries. The presentations and discussions served to improve the participants' understanding of the patterns, determinants and consequences of high fertility and to enable a scientific examination of the prospects for fertility decline in high fertility societies.

II. REVIEW OF DEMOGRAPHIC TRENDS IN HIGH FERTILITY COUNTRIES

Stephen Kisambira, on behalf of the Population Division, presented the first paper, which reviewed the demographic situation in high fertility countries. Setting the context for the papers and discussions to come, Mr. Kisambira delivered a global review of fertility trends. In the period 1950 to 1955, there were 128 countries where the TFR was at least 5 children per woman. During the second half of the twentieth century, fertility transition progressed in many societies. By the late 1990s, there remained 47 countries characterized with high levels of fertility. Thirty-six of these countries were located in Africa, mostly in the sub-Saharan region, 10 in Asia and one in Oceania. Those were the countries of primary interest to the meeting.

Several socio-economic factors have been associated with the transition to lower fertility, including greater urbanization, increased education and reduced infant mortality. However, the countries where fertility remains high are generally poor and highly indebted, with relatively low levels of school enrolment, especially among women. Most are saddled with infant mortality rates above 100 deaths per 1,000 live births. In contrast, many high income (and concurrently low fertility) countries experience rates as low as 6 deaths per 1,000.

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A few of the high fertility countries have been in situations of civil conflict in recent years. Some have seen the demographic as well as socio-economic effects of structural adjustment programmes. Most countries have no national population policy favouring lower fertility; those that have recently adopted one (such as Nigeria, the most populous nation in Africa) have seen limited results. Abortion remains illegal in most of these countries, except in cases to save the mother's life.

At the individual level, fertility outcomes are strongly associated with contraceptive use and age at marriage. In most high fertility countries, contraceptive prevalence is very low, and the unmet need for family planning is high. Marriage is virtually universal, with the majority of women marrying in their teens and only some 2 per cent remaining single throughout their reproductive lives. Fertility preferences are high, on average around 5 children. Post-partum amenorrhoea tends to be relatively long, although shorter periods of exclusive breastfeeding could have mitigating effects on fertility trends.

The Population Division estimates that fertility decline will occur in all countries over the next two decades or so. Overall, the average TFR among high fertility countries will drop from 6.2 for the period 1995-2000 to around 4 in 2020-2025. However, in 11 countries the TFR is still expected to be over 5 children per woman in the latter period. Nine of these countries are in sub-Saharan Africa and 2 in Asia.

In the discussion that followed the presentation, participants welcomed the timely presentation of the United Nations latest population estimates and projections. Some questions were raised about the underlying basis for some of the projections. In a global review, many of the country-specific details are understandably lost. The role of the proximate determinants, shifting fertility motivations in the light of the spread of HIV/AIDS, alternative childcare arrangements, changes in marriage patterns, increased urbanization and changes in population policies are some of the factors that render generalizations problematic.

The Population Division stated that its projections were not necessarily forecasts and that the hypotheses retained for establishing the parameters were based on recent trends. In particular, the assumption for future fertility trends followed global observations of past declines in the TFR, at a mean decrease of about one less child per decade. It seemed reasonable to be optimistic that recent fertility declines would continue. Obviously, many different scenarios and assumptions could have been taken into account. However, offering detailed analyses here of each determinant and each country would be cumbersome. For example, even the measures of urbanization vary across countries. National definitions of "urban" can be based on population size or density, administrative region, labour force activities or other criteria. The need for contextualization was acknowledged, fostering anticipation among the participants of the in-depth analyses to follow.

III. COMPARATIVE PERSPECTIVES ON FERTILITY TRENDS

Seven papers were presented in the meeting's second session on comparative perspectives on fertility trends. Paulina Makinwa-Adebusoye summarized

her paper on the sociocultural factors affecting fertility in sub-Saharan Africa. This is the region with the largest number of high fertility countries, although it is important to recall that wide differentials exist. The focus was on trends in total fertility rates, desired fertility, contraceptive use and age at marriage over the past four decades. Countries could essentially be grouped into three categories: (1) those that have experienced a marked, rapid decline in fertility from previously high levels; (2) those that have had a fertility decline but at a slower pace; and (3) those in which fertility remains high, at about 6 children or more.

Bearing in mind that there is no such thing as a "typical" African household, some common characteristics can be distinguished and related to known theories of fertility. High fertility is favoured in rural, patriarchal, hierarchical families. The importance of labour in land-based economies, the replacement of lineage and the lower status of women condition social norms and ways of doing things. Polygynous unions are often associated with lower age at marriage among women, which may also encourage girls to withdraw early from school. The issue of childcare was raised for its potential influence on preferences for large family sizes, notably the availability of members of the extended family for child fostering and care, thus shifting part of the burden of child-rearing away from the biological parents. Moreover, a woman may have few opportunities open to her, other than being the mother of many (sometimes 10 or more) children as a means of raising her social standing. Nevertheless, fertility decline has been observed in many African societies. In the face of new socio-economic paradigms, it would not be possible to say with any certainty that further changes in reproductive behaviours will not occur.

The second paper of the session was presented by Jean-Pierre Guengant, entitled "Impact of the proximate determinants on the future course of fertility in sub-Saharan Africa". The author observed that, while fertility decline has started across the region, little is known about its pace, or at what low level the TFR will eventually stabilize. Two contentions were made: that the pace of decline will not likely be as fast as observed elsewhere in the developing world, and that the region itself is witness to large contrasts and diversity.

In sub-Saharan Africa, many of the trends in the proximate determinants are less favourable to fertility decline than in other regions. Contraceptive prevalence is low, just as the rate of adoption of contraceptive use is slow. Moreover, the proportion of users relying on traditional and folk methods, which are generally less efficient, is high. This may reflect stronger preferences for birth spacing than for birth limiting. Family planning programme efforts also tend to be weak. While other research has suggested that efforts may be improving, method availability is still low, even in urban areas.

Improvements in the overall efficiency of the contraceptive method mix could be an important determinant of fertility decline. This was one of a series of hypotheses used to produce projections of the TFR to the year 2050. Other scenarios considered changes in other proximate determinants, including the rate of abortion, length of post-partum amenorrhoea and proportion of women in union. In sum, for fertility to achieve the replacement level of 2.1 children across the region by 2050, a minimum of a one percentage point annual in-

crease in contraceptive prevalence would be needed over the entire period, not to mention changes in other factors such as greater efficiency of the method mix. The author warned against laissez-faire attitudes towards family planning from national Governments, donors and other interested parties. The commitment to investment in family planning programmes should be considered regardless of projections pointing to widespread fertility decline.

The next presentation was delivered by Francis Dodoo on the topic "Fertility preferences and contraceptive use: a profitable nexus for understanding the prospects for fertility decline in Africa". While acknowledging the continuing importance of fertility decline, the author pointed out that an examination of fertility change alone obscures the salience of unmet need for contraception in Africa. According to information from the DHS, a large proportion of women in Africa report unmet need. This point acquires even greater relevance given the relatively high fertility that remains among the continent's "transitional" countries. In addition to the development and resource concerns of high fertility, family planning should be considered as a fundamental human rights issue. However, while the emphasis in family planning has generally been on women, men also exercise considerable influence in this domain. In this context, a distinction should be drawn in the definition of unmet need: first there is the gap in contraceptive knowledge, attitudes and practices that can be filled by family planning programmes; and secondly there is the gap between what people want to do and what they can or cannot do. Often, the consideration of men's preferences reduces the measured level of unmet need. For example, the gap that arises in a situation where a wife wants to practise family planning but the husband does not cannot be "filled" by supply interventions.

Although many external influences may be at play, ultimately the family planning decision starts in the home. This makes it necessary to rationalize the role of fertility preferences and contraceptive use, the primary factor influencing fertility decline. The author continued with a brief regional examination of DHS data on fertility and fertility preferences, using a model allowing for contextualization of the preferences and decision-making processes of both persons involved in the dyad (woman and man). An important element in this cultural make-up could be the central role of men, who bear less of the burden of childbearing and child-rearing but more of the benefits. The eventual outcome in terms of contraceptive use or non-use is seen as the result of negotiation. In general, high levels of unmet need can be found among the populations of mid-Africa. Moreover, there are undoubtedly lessons to be learned from the experiences of countries such as Ghana and Kenya, where data are now available to enable a chronology of changes over time. The author emphasized the benefits of including men in analyses of reproductive decision-making and of examining the roots of gender disadvantage. A particularly interesting question would be whether the Western model of male involvement in child-rearing would eventually take root in Africa.

The next paper, "Mistimed and unwanted childbearing in the course of fertility transition", was presented by Jacob Adetunji. The focus was on the relationship between fertility change and patterns of "excess" fertility, or mistimed and unwanted childbearing. The underlying assumption was the existence

of a delay in the adoption of effective contraception over the course of the transition from high to low fertility desires. Previous studies have examined trends in unwanted fertility by utilizing such data as the proportion of women of reproductive age who wished to stop having children. However, there remains a need to consider further the impacts of mistimed fertility or the proportion of women who had a child sooner than they would have preferred, the risk of which may be more significant in high fertility settings.

The author summarized the results of a cross-national study of DHS data for countries at various fertility levels, using a synthetic cohort approach to examine age-specific rates in terms of total, mistimed and unwanted fertility. The evidence suggests that mistimed and unwanted fertility undergo separate transitions. Levels are low when total fertility rates are high, then increase as fertility begins to decline. A look at age-specific trends can be useful for monitoring shifts in unmet need for family planning across the age spectrum. This implies that concerted efforts are essential to meet all unmet need, for birth spacing as well as for birth stopping.

Samson Wasao presented the fifth paper of the session, entitled "A comparative analysis of the socio-economic correlates of fertility in Cameroon and the Central African Republic". In general, fertility levels are highest where poverty is highest. This paper examined the impacts of selected socio-economic correlates associated with high fertility in the contexts of two African countries. The main sources of data were two Demographic and Health Surveys conducted at roughly the same time for each country under consideration: a 1998 survey conducted in Cameroon and a 1995 survey in the Central African Republic. The goal was to look at patterns in fertility, as measured by the number of children ever born and the number of children surviving to women of reproductive age, in order to help ascertain which socio-economic characteristics were most likely to influence change.

Mr. Wasao considered a number of independent variables in his bivariate and multivariate analyses, including place of residence, education, religion, marriage type and contraceptive use. Some of the associations were as expected, notably, urban residence being associated with lower fertility in Cameroon (multivariate results showing urban women more likely to have no children). Others were less consistent, such as contraceptive use being linked to higher fertility (women currently using a modern contraceptive method more likely to have five or more children). The latter may be related to high fertility desires in this setting, such that women only turn to contraception for birth limiting after having achieved their (large) family size desires. Another atypical finding was the lack of an inverse relationship between primary education and fertility outcomes.

The author's second point concerned prospects for fertility change. He examined trends in age-specific fertility rates in Cameroon and the Central African Republic at given periods before the survey. The results showed consistently lower fertility rates during the later period for each country. This finding led the author to speculate that fertility was declining over time in these two countries. However the path did not necessarily follow a "classical" transition strongly related to educational attainment. Both Cameroon and the Central African Republic have few women with secondary or higher education, and this

variable needs to be examined more closely as an area of policy interest. It is likely that future fertility declines will result as the pool of uneducated women gradually moves into the better-educated category.

The next presentation offering comparative perspectives on fertility trends was delivered by Soukeynatou Fall-Kaba, and focused on the subregion of francophone Africa. This area has one of the highest demographic growth rates as well as the lowest quality of life in the world. Societies here are generally pronatalist and consider fertility highly important, especially for perpetuating the lineage. In comparison with anglophone Africa, fertility decline generally lags behind, although some evidence of change has been noted in selected urban centres.

The presentation focused on three concerns: current levels of fertility; contributions of the proximate determinants, notably age at marriage and contraceptive use; and prospects for fertility decline over the next decade or so. Data were primarily drawn from the DHS for 14 francophone African countries. A first consideration was that fertility levels are generally high, although large differentials persist. While half of the countries maintain a TFR greater than 6 children per woman, levels are much lower in some countries (Cameroon and the Comoros). An important distinction is associated with place of residence, as these countries are mainly rural, so any fertility transition may be slow to appear at the national level. At the same time, the pace of fertility change varies across the region. In some countries the decline in TFR is slow (less than half a per cent annual decline in Guinea, for example), while in others it is much more rapid. A multivariate analysis revealed that fertility change in francophone Africa was largely due to delayed age at first marriage. This contrasts to the situation in anglophone Africa, where increased contraceptive use was a much stronger predictor of fertility decline. Moreover, the author's fertility projections for the year 2010 suggested that, regardless of the hypotheses retained, the TFR will likely remain above 4 children per woman across francophone countries, and in many places above 5 children.

Such findings hold interesting policy implications. For example, given the majority rural populations, the question arises as to where and how best to place programme investments. Urban-rural differentials have been seen to attenuate over the course of fertility transition. However, it seems implausible to expect significant fertility changes in rural francophone Africa without significant improvements in maternity conditions. Given the very low contraceptive prevalence, prioritizing women's education might be a better strategy than simply promoting contraceptive use.

The last paper of the session, delivered by Eltahir Eltigani, focused on levels and trends of fertility in Oman and Yemen. While there has been a relative dearth of quantitative data stemming from these two countries, recent surveys have suggested that they are among the nations with high fertility. However, there are also indications that fertility is declining. The TFR is estimated to have dropped from 8.6 children per woman in Oman in the late 1980s to some 5.1 children in 2000. A noticeable decrease, albeit at a slower pace (from 7.7 to 6.5 children), was also observed in Yemen. At the same time, an analysis of the age structure of fertility shows divergent patterns across the two populations.

In Oman much of the decline was found among younger cohorts, while in Yemen the decline tended to be concentrated among older women. Delayed age at first union, increased duration of breastfeeding and increased contraceptive use underlie these trends.

In addition, the author touched on a number of contextual factors, including political stability and socio-economic development, notably the expansion of educational opportunities (for women and men), as other influences contributing to differentials in fertility. Oman, which experienced greater fertility decline, was characterized by more substantial decreases in the proportion of women with no schooling as well as in infant and child mortality. It would seem that improvements in the standard of living are a necessary and probably sufficient condition for both immediate fertility decline and further declines in the future. Thus, future fertility decline may not easily be expected to be rapid in Yemen in the absence of educational investments and other economic gains.

During the ensuing discussions, some of the participants in the meeting expressed an interest in expanding the research to cover other factors, such as the ways in which the trends in other structural and proximate determinants of fertility in sub-Saharan Africa could be compared to other major regions. It was also suggested that closer examination of within-country differences might be a worthwhile pursuit, such as the French-English dichotomy in Cameroon. The research could potentially address such issues as differences in women's status, possibly using education as a proxy indicator; family structures; and policy. Moreover, factors such as the impact of the spread of HIV/AIDS could be influencing trends in the proximate determinants in unpredictable ways. Potential impacts of HIV prevention activities could include increased condom use, possibly to the detriment of use of orals or injectables, methods that are generally more efficient forms of contraception. Duration of breastfeeding, and subsequently of postpartum amenorrhoea, could be reduced by the fear of increased risk of mother-to-child transmission of HIV.

Featured at length in the discussion were the factors that affect contraceptive prevalence, efficiency and method mix, and attendant consequences such as mistimed and unwanted fertility. Contraceptive efficiency can vary from one country to another and from one area to another, despite the same distribution of the method mix. Low contraceptive use and high unmet need derive not only from supply factors but also from gender biases in a family planning approach that excludes men. Nevertheless, men exercise considerable influence in decisions regarding desired family size, which are affected by sex preferences for children, polygynous unions and the degree of spousal communication. Another issue that drew interest and required further study was pathological infecundability—which is considered to be especially significant in the Central African Republic—and its implications for fertility and contraceptive use.

Contextual factors such as large rural populations and differences in socio-political structures were also factors seen as accounting for differentials not only in fertility levels but also in infant and child mortality. The ramifications of differences in socio-political structure for fertility trends were considered during the discussion of the diverging experiences of Oman and Yemen; none-

theless, the long-term implications of political crises for reproductive outcomes remain unknown. Given that the high fertility countries are mainly rural, the issue of where to place scarce investment funds was raised. In francophone Africa, for example, a more effective strategy might be rural development in order to encourage the retention of prospective migrants, as past investments in urban infrastructure have not generally kept pace with rates of urbanization. However, according to United Nations projections, francophone Africa will become increasingly urban by about 2040, which suggests that it may be more cost-effective to invest in the urban milieu. Regardless of the course of action that should be taken on investment, the promotion of contraceptives as a potentially valuable intervention should not be discounted.

IV. CONTEXTS FOR FERTILITY DECLINE

The session included seven papers on the contexts for fertility decline. The first of these, by Victor Agadjanian, concerned fertility trends in Angola. The purpose was to look at both long-term and short-term trends, in the context of a society plagued by civil war and strife. The challenges of such an analysis were obvious, since few data may be available under conditions of unrest. However, some survey findings have recently become available, including a 1995 living standards measurement study. While poverty in Angola remains pervasive, the country's economy is among the fastest growing in the world, in part, owing to oil exports. An examination of age-specific fertility rates suggests little change over the period 1983 to 1996.

The author stated that, in comparison with other neighbouring countries, fertility in Angola remains high, with the TFR having peaked in the 1980s when the intensity of war was also high. Moreover, contrary to the patterns seen elsewhere, urban-rural differentials in Angolan fertility are less pronounced, and fertility is found to be higher among women with primary schooling compared with their uneducated counterparts. Such patterns lead to the characterization of Angola as a pre-transitional society. High fertility is supported by lower age at first birth and low contraceptive prevalence, especially outside Luanda (the capital city, an area largely unaffected by the war). In fact, time-trend analyses reveal a greater tendency of fertility to rebound in those regions of the country more affected by war as compared with the capital. However, differentials are largely limited to the short-term and occur among select subgroups of the population, with minimal overall lifetime fertility impacts.

The second paper of the session, presented by Akim Mturi, offered a summary of research on fertility trends, determinants and prospects in the United Republic of Tanzania. Findings from various sources point to a moderate fertility decline starting in the late 1970s, with most of the decrease observed among women 25 years of age and over. Analyses of age-specific fertility rates as well as parity progression support this trend. The decline was further accompanied by a notable increase in contraceptive prevalence (accompanied by an influx of donor assistance for family planning in the 1990s) and delayed age at first marriage.

Further fertility decline would likely require dramatic changes in social norms, favouring smaller family size, especially in the context of a family structure in which women bear the burden of childbearing but men dominate in decision-making. Simulation studies of the impact of HIV/AIDS have suggested that the spread of HIV across regions of the United Republic of Tanzania has not been crucial to fertility decline. Rather, fertility decline is more likely to be linked to the spread of family planning services, especially given that the demand for contraception is outpacing its actual use, resulting in high unmet need. Nevertheless, the author suggested that it is unlikely that the TFR will be lower than 4 children per woman in 2025.

The next paper, presented by James Ntozi, was entitled "Prospects for fertility decline in the face of HIV/AIDS in Uganda". This analysis focused on a context in which HIV has been cited as a factor in fertility decline; however, the influences of seropositive status on women's propensity to have or not to have more children are complex and little understood. At the peak of the HIV/AIDS crisis in Uganda in the early 1990s, it was estimated that over 30 per cent of women attending antenatal clinics (sentinel sites) were HIV-positive, although more recently the prevalence of HIV infection appears to be decreasing. Women are also considered more heavily affected owing to their situation of social disadvantage. Levels of infant and child mortality, as well as orphanhood, have been exacerbated by the spread of AIDS. Uganda remains one of the countries in sub-Saharan Africa with sustained high fertility. According to the latest DHS, the TFR is 6.9 children per woman, barely having shifted from the rate of 7.1 estimated in the late 1960s.

A review of the literature reveals many explanatory factors for high fertility in Uganda, including strong pro-marriage traditions, a high value for children, limited use of modern contraception, a lack of prolonged periods of post-partum abstinence, high infant and child mortality, and a lack of a large urban and educated population. Analysis of fertility trends suggests that the TFR is lower in areas more severely affected by HIV (the districts of Rakai and Masaka). Women in HIV-affected households experience lower fertility than those in non-affected households, and this is true across all regions. Behaviour change campaigns promoting condom use and safe sexual practices may be having their effects, especially among younger cohorts. The country's urban population, whose fertility is consistently low, is expected to increase in part as a result of economic liberalization, privatization and greater investments in urban centres. Policies to promote higher levels of attainment in secondary education may also be linked to lower fertility and increased contraceptive use. Thus, while in the past fertility remained high due to pronatalist traditions, structural and normative changes as well as government support for post-primary education should help accelerate fertility decline in the future.

Muyiwa Oladosu followed with his paper on the topic of prospects for fertility decline in Nigeria. Nigeria presents another context of widespread poverty, high fertility and rapid demographic growth (some 2.6 to 2.9 per cent annually). Following an examination of survey data, notably the 1990 and 1999 rounds of the DHS, the author pointed to a number of trends over time—both structural and normative changes—that suggested prospects for

fertility decline. Contraceptive prevalence increased across all age groups over the period of observation. Younger women, and those who worked outside the home, were more likely to be using contraceptives. Furthermore, an increasing number of women were aware of their husband's fertility preferences, suggesting greater levels of spousal communication in matters of reproduction. The proportion of women who had given birth at least once in the last five-year period also decreased across survey rounds, a promising indicator of overall fertility decline.

The fifth paper of the session was delivered by David Shapiro and focused on fertility levels and trends in the Democratic Republic of the Congo. While information from various sources characterizes this country as a high fertility setting, a lack of recent survey data renders analyses difficult. Existing estimates, which place the TFR somewhere between 6.7 and 7.3 children per woman, are largely based on the children-ever-born method of fertility estimations and may report conflicting trends over the 1980s and 1990s depending on the source. The author stated that these estimates seemed inflated and pointed to a number of factors over the past 25 years that supported a lower estimate of the current level of fertility. Trends in infant mortality, women's education and urbanization remain clearly relevant to downward shifts in fertility. Migration patterns brought on by the disruptive effects of civil war and cycles of economic crisis (though not formally measured) also run counter to the idea of any increase in the TFR during the 1990s. A best guess would place current fertility at some 5.5 children per woman. Thus while still high, fertility is likely to have declined in recent years in the Democratic Republic of the Congo.

The next paper, presented by Zeba Sathar, covered fertility trends in Pakistan. Survey findings suggested that the TFR had recently fallen below 5 children per woman, although the country remained an outlier among its Asian neighbours with much lower fertility. Mortality declines had occurred in Pakistan since the post–Second World War era (earlier than in Africa). The population growth rate remained high, at some 2.4 per cent annually. Widespread adoption of contraception was slow to materialize, despite antinatalist government policies and strong financial support for family planning programmes.

Trends during the 1990s showed a definitive decline in Pakistani fertility and a marked increase in contraceptive prevalence (traditional as well as modern methods). Delayed marriage among younger cohorts was evident through increases in the proportion of women aged 15-19 never married. However the mean age at marriage remained high compared to many other Asian countries. A number of reasons for "late" fertility transition in Pakistan were given, including weak social policies (aside from large investments in family planning), poor access to services (notably in the areas of health and schooling) and the low status of women. Men's notions about family planning and women's misperceptions about their husband's approval may have been key factors underlying contraceptive intentions. Potential constraints to future fertility decline included increasing poverty, poor quality services and low school enrolment. On the other hand, fertility change could be facilitated through expansion of effective family planning activities (such as community-based fieldworkers), media influences and other social trends (in particular, increas-

ing numbers of nuclear households). The author speculated that lower fertility could be reached if the high level of unmet need were addressed. A TFR of at least 4 lifetime children, the level at which women's ideal family size stands, should be attainable in the near future.

The final paper on fertility decline in rural Africa, some indicators for analysis of change among the Mossi of Burkina Faso, was presented by Christine Ouedraogo. This paper examined the persistence of high fertility in rural sub-Saharan Africa, drawing on qualitative information from a case study among the Mossi population of Burkina Faso. It was noted that the quantitative data showed stability in the rural TFR in the 1990s, in contrast to appreciable fertility transition in urban areas. Across six villages of Bazega province, the TFR is estimated to have declined slightly, from 6.7 to 6.4 children per woman. This trend was largely attributed to waning acceptance of patriarchal traditions among younger cohorts. Traditionally, under patriarchal, hierarchical systems, high fertility was valued by men to protect the lineage. For women, accumulating large numbers of children was essentially their sole source of prestige, and also served as a source of domestic help and social insurance. Ethnographic studies in recent years have suggested that traditional norms and sources of authority to uphold the systems are losing their influence among the young and educated. Consensual unions are gradually replacing arranged marriages. Even older generations are accepting consensual marriages for their children, if only to avoid the "shame" of seeing their daughter refuse to marry the man they had initially selected.

Agricultural reform was cited as another potential factor favouring fertility decline in rural areas. Greater access to land under increasing privatization and better access to credit for women to start their own production could play a role in transforming the value of children as a source of labour. Among the population under observation, proximity to the markets of Ouagadougou may be a compounding influence. Eventual societal changes include women's sharing in the household accounts and decision-making in the areas of family health and education. Increased women's autonomy, accompanied by improved spousal communication, may have depressive influences on fertility in the long term. As the author observed, women's desire to limit childbearing, on average either before the age of 40 or upon having had about 4 children, is already taking hold in this society even though contraceptive options remain limited. Thus, while significant changes in the TFR may be slow to occur, other transformations—notably in matrimonial processes and family planning desires—point to positive prospects for future fertility decline.

In the discussions following the presentations and in general, the outlook for fertility decline in many of the high fertility settings was optimistic. While declines may not yet have begun among some populations under observation, it was speculated that perhaps there was a "threshold" that needed first to be surpassed. Well known as well as less familiar potential influences on fertility were discussed, with some being better developed during the course of the meeting. The need to contextualize was evident. It was remarked that African fertility patterns in particular tended to be improperly understood, perhaps an artefact of a preference among many researchers to approach the issue from

the point of view of demographic transition theory, rather than first trying to better capture the socio-economic and cultural context. It was also suggested that, particularly in the sub-Saharan region, fertility change in rural areas was critical to seeing shifts in the TFR at the national level. The importance of the urban-rural distinction was underlined in the discussion of results from a study conducted at the French Centre for Population and Development (CEPED), showing that the fertility transition has often been found to start about a decade or so later in rural than in urban areas.

Among the key factors that were found to influence fertility across most contexts were the spread of education, especially for women; reduction of infant mortality rates; adoption of contraceptive methods; improved spousal relations and gender equality; and shifts towards lower ideal family size. Even among these factors a certain number of complexities were raised. While education was generally found to have strong effects on fertility, the relationship was not universally linear with increased years of schooling. It was suggested that women's schooling would not necessarily lead to reduced fertility unless accompanied by improved gender status (for example, if women were encouraged to pursue an education simply to improve their "marriageability"). Quality and content of curriculum were mentioned as a potentially confounding variable. Moreover, declining enrolment rates seen in some African countries, cited as a negative consequence of structural adjustment programmes, could hold important implications for future fertility trends.

It was further observed that, in addition to the influences of the above variables in countries characterized by current high fertility, a number of lessons could undoubtedly be learned from other societies in more advanced stages of fertility transition. Lower infant mortality was cited as a critical factor associated with lower fertility in States in the Gulf region as well as in Latin America and the Caribbean. For example, empirical evidence suggests that the fertility decline in Cuba (where fertility is below replacement) began when the infant mortality rate dropped below 100 deaths per 1,000. It was observed that this level of infant mortality had not yet been reached in most of Africa. This led to a recommendation for research on the prospects for infant mortality decline.

Adoption of contraceptive methods (especially modern methods but also traditional ones) was repeatedly mentioned as an important factor in fertility transition. Contraception, as well as abortion, was seen to have played a decisive role in fertility decline in many Latin American and Caribbean countries. In Asia, several countries have seen strong declines in fertility, even to below-replacement levels, associated with widespread changes in family planning practices. In Bangladesh, for example, rapid declines in the TFR, seemingly related to the presence of effective family planning programmes, occurred despite the population's relatively low socio-economic status.

The key role of gender equality in fertility transition was the subject of lively discussions. The participants expressed the need to fashion more research on women's status and also on men's role in reproductive-related decisions. Improved gender and spousal relations, leading to fathers' greater involvement in child-rearing, could reduce fertility preferences as well as the effects of son preference. The dissipation of the influence of traditional institu-

tions could lead to an increased difference between the timing of marriage and the onset of sexual activity. The question was raised whether trends towards widespread cohabitation seen in some regions, notably in Latin America and the Caribbean, would eventually "spread" to Africa. The future direction of fertility transition in the matriarchal societies of Africa remains unknown.

The participants discussed a number of other variables that diminish the human condition, including civil strife, economic hardship, housing shortages and the spread of HIV/AIDS. In some societies, these variables have been found to exert downward, perhaps only temporary, pressures on fertility. However, questions of the sustainability of the decline were repeatedly raised. This in turn led to speculation as to whether countries where such influences were noted could reasonably be expected to reach replacement levels in the near future. In certain parts of sub-Saharan Africa, the double context of the high value placed on children and difficult reproductive conditions (prevalence of HIV, unsafe abortions etc.) could result in inertia that works against fertility change. The relationship between HIV/AIDS and fertility remains unclear. Increases in both infant and adult mortality rates could result in unexpected changes in fertility desires, either in terms of a reduction in goals (to avoid "burdening" others with the eventual care of AIDS orphans) or a short-term increase (to ensure a large number of surviving descendants). Additional confounding influences could include shifts in contraceptive behaviour from the use of more efficient non-barrier methods (orals, injectables) to less efficient condoms, potentially leading to greater numbers of unplanned pregnancies. The impacts of HIV/AIDS on other proximate determinants, such as patterns of breastfeeding and sexual activity, are even more difficult to ascertain. Moreover, most couples in these settings are unaware of their HIV status. This fact was remarked upon as an obvious limitation of aggregate-level studies and thus underscores the need for further examination of individual-level behaviour change by HIV status, known versus unknown.

ANNEXES

ANNEX I

Agenda

1. Opening of the meeting
2. Review of demographic trends in high fertility countries
3. Fertility trends: comparative perspectives
4. Contexts for fertility decline
5. Panel
6. Closing

ANNEX II

List of participants

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Statistics Division

Violeta Gonzales-Diaz, Statistics Division

Office of the Special Coordinator for Africa and the Least Developed Countries

Ruth Engo, Senior Economic Affairs Officer

ANNEX III

List of documents

Symbol	Agenda item	Title/author
UN/POP/PFD/2001/1	2	The demographic situation in high fertility countries (Population Division)
UN/POP/PFD/2001/2	3	Sociocultural factors affecting fertility in sub-Saharan Africa (Paulina Makinwa-Adebusoye)
UN/POP/PFD/2001/3	3	Impact of the proximate determinants on the future course of fertility in sub-Saharan Africa (Jean-Pierre Guengant and John F. May)
UN/POP/PFD/2001/4	3	Fertility preferences and contraceptive use: a profitable nexus for understanding the prospects for fertility decline in Africa (Francis Nii-Amoo Dodoo)
UN/POP/PFD/2001/5	3	Mistimed and unwanted childbearing in the course of fertility transition (Jacob Adetunji)
UN/POP/PFD/2001/6	3	A comparative analysis of the socio-economic correlates of fertility in Cameroon and the Central African Republic (Samson W. Wasao)
UN/POP/PFD/2001/7	3	Fertility decline in French-speaking Africa: recent and future trends (Soukeynatou Fall-Kaba and Pierre Ngom)
UN/POP/PFD/2001/8	3	Levels and trends of fertility in Oman and Yemen (Eltigani E. Eltigani)
UN/POP/PFD/2001/9	4	Trends in Angola's fertility (Victor Agadjanian and Ndola Prata)
UN/POP/PFD/2001/10	4	Fertility levels and differentials in Tanzania (Akim J. Mturi and Andrew Hinde)
UN/POP/PFD/2001/11	4	Prospects for fertility decline in the face of HIV/AIDS in Uganda (James P. M. Ntozi and Fred E. Ahimbisibwe)
UN/POP/PFD/2001/12	4	Prospects for fertility decline in Nigeria: comparative analysis of the 1990 and 1999 NDHS data (Muyiwa Oladosu)
UN/POP/PFD/2001/13	4	Fertility in the Democratic Republic of the Congo (David Shapiro and B. Oleko Tambashe)
UN/POP/PFD/2001/14	4	Fertility in Pakistan: past, present and future (Zeba A. Sathar)
UN/POP/PFD/2001/15	4	Fertility in rural Africa: some indicators for analysis of change among the Mossi of Burkina Faso (Christine Ouedraogo)

Information papers

UN/POP/PFD/2001/INF.1	Provisional organization of work
UN/POP/PFD/2001/INF.2	Provisional list of participants
UN/POP/PFD/2001/INF.3	Provisional list of documents

Part Two

OVERVIEW OF THE MAJOR ISSUES
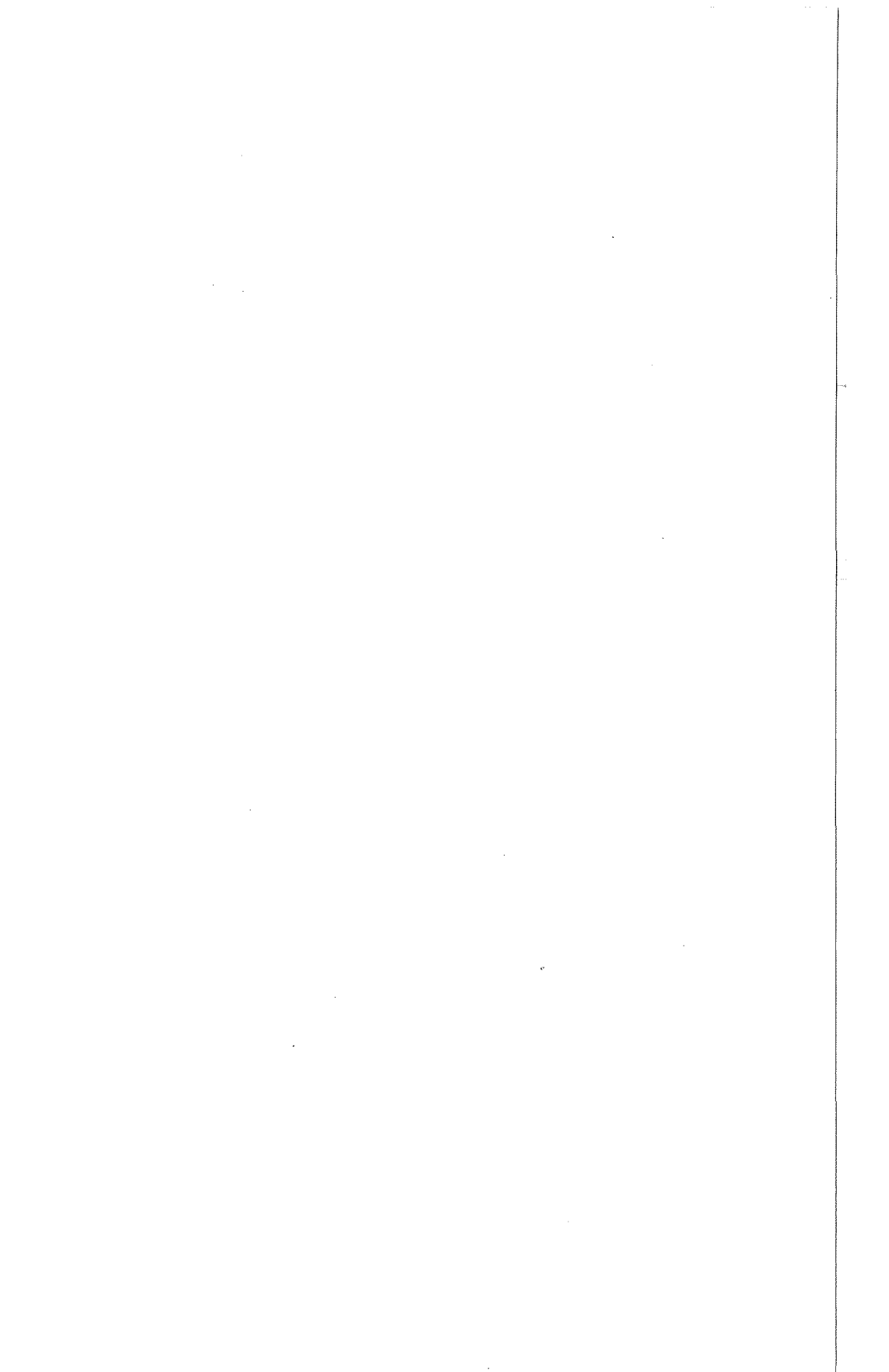
THE DEMOGRAPHIC SITUATION IN HIGH FERTILITY COUNTRIES

Population Division, United Nations Secretariat

Fertility transition in a society may be characterized by five stages, including (1) the pre-transitional stage when the total fertility rate (TFR) is maximal (above 5 lifetime children per woman) and shows very weak or no signs of decline; (2) the incipient (or early) stage when fertility declines from a maximum recorded level to 5 children per woman; (3) the core stage that encompasses fertility levels of 3 to 5 children per woman; (4) the advanced stage corresponding to a TFR lower than 3 children per woman but higher than the replacement level of 2.1 children; and (5) below-replacement fertility that is typical for the post-transitional stage. For the purposes of examining fertility transition, countries may be grouped according to whether or not fertility has started to decline, what level of fertility is observed in a specified period, and at what pace fertility change recently occurred. The countries with current high fertility (47 in all; see table 1) that are of interest in the present paper are found in two of the five stages of fertility transition: the pre-transitional stage and the incipient stage. All are in the developing world.

In addition to presenting an overview of fertility transition, the objective of this paper is to explore, for those high fertility countries, background information on correlates of fertility; trends in marriage, sexual activity and other proximate determinants of fertility; and population policies regarding the level of fertility.[1]

A. OVERVIEW OF FERTILITY TRENDS

During the second half of the twentieth century, particularly after the late 1960s and the early 1970s, fertility declined rapidly in many developing countries. In the period 1950 to 1955, the TFR was higher than 5 children per woman in 128 countries, including 34 countries where it was 7 children or higher. By 1995-2000, the TFR decreased to under 5 children per woman in 81 of the 128 countries. Replacement or below-replacement fertility levels were observed in 14 of those countries. Eastern Asia—the most populous region of the world—has joined the developed world in that its fertility is currently below replacement level. Even among the 34 countries where the TFR was 7 children per woman or more in the period 1950 to 1955, half of them (18 countries) have seen their fertility decrease to levels below 5 children per woman.

Most of the currently high fertility countries are in sub-Saharan Africa. In 1995-2000, the average TFR was at 5.9 children per woman in Western Africa,

6.1 in Eastern Africa and 6.4 in Middle Africa. Scattered pockets of high fertility remained in South Asia and Western Asia.

By the late 1990s, fertility transition had not yet begun in 14 countries or areas, including 13 sub-Saharan African countries and the Occupied Palestinian Territory, with a combined population of 200 million. Estimates of recent trends in the TFR in those pre-transition countries indicate that fertility rates have been either stable or increasing (as in Niger).[2] All of the pre-transitional countries in Africa, with the exception of the Congo, belong to the group of least developed countries as defined by the United Nations. Pre-transitional fertility levels are not uniform: they vary from 5.6 in Chad to more than 7 in a number of countries (table 1).

Another 33 countries (23 from sub-Saharan Africa, 9 from Asia and 1 from Oceania), with a combined population of 550 million, are moving through the incipient stage of fertility transition. In this group, the total fertility rate ranges from 5.0 to 5.1 children per woman in the Central African Republic, the Comoros and Mauritania to 6.7 to 6.9 children per woman in Malawi and Uganda.

The tempo of fertility decline varies among the high fertility countries where the transition has already started. The lack of data precludes analysis of long-term trends for the majority of these countries; however, in most of them the onset of fertility transition occurred no earlier than the mid-1980s. The speed of decline varies from 0.1 children per woman per quinquennium in Guinea to 1.6 children per woman per quinquennium in the Comoros (figure I). It remains an open question whether the timing of the onset of fertility decline is linked to the speed of decline. In the case of countries where fertility has recently started to decline as compared with the countries that completed the incipient stage before 1990,[3] about half were progressing through the incipient stage at a slower pace while in the other half the decline was as fast or faster.

Figure I. Speed of fertility decline during the incipient stage of fertility transition: high fertility countries, 1980s and 1990s

TFR decline, children per woman per year
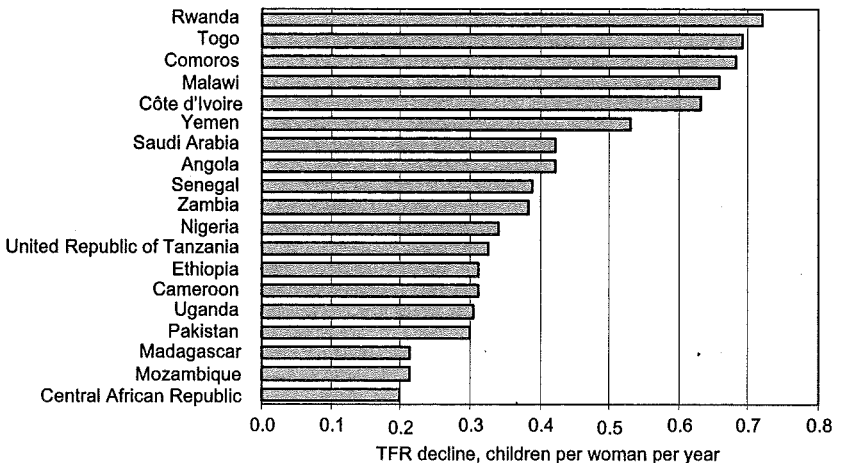
TABLE 1.   MOST RECENTLY OBSERVED TOTAL FERTILITY RATE, ESTIMATED AND PROJECTED FERTILITY RATE
AND POPULATION SIZE IN HIGH FERTILITY COUNTRIES[a]

| Country | Most recent period fertility | | | | Estimated and projected TFR and population size (medium variant) | | | | | |
| | Source of data | | Reference period | TFR | TFR | | | Population (thousands) | | |
	Type[b]	Year			1995-2000	2005-2010	2020-2025	2000	2010	2025
Eastern Africa										
Burundi	S	1987	1983-1987	7.1	6.8	6.6	5.2	6 356	8 662	12 390
Comoros	S	1996	1992-1996	5.1	5.4	4.5	3.2	706	939	1 327
Djibouti.....................	C	1990	1990	6.0	6.1	5.5	4.4	632	679	801
Eritrea......................	S	1995	1993-1995	6.1	5.7	4.9	3.6	3 659	5 097	7 063
Ethiopia	S	1990	1990	7.7	6.8	6.5	5.1	62 908	79 853	113 418
Madagascar..................	S	1997	1993-1997	6.0	6.1	5.3	4.0	15 970	21 096	30 759
Malawi	S	1992	1990-1992	6.7	6.8	5.9	4.7	11 308	14 024	19 544
Mozambique	S	1997	1993-1997	5.6	6.3	5.4	4.1	18 292	21 649	28 012
Rwanda.....................	S	2000	1998-2000	5.8	6.2	5.3	4.0	7 609	9 425	12 883
Somalia....................	S	1980	1980	7.3	7.3	7.0	5.6	8 778	13 065	21 192
Uganda	S	1995	1991-1995	6.9	7.1	6.9	5.4	23 300	32 588	53 765
United Republic of Tanzania....	S	1996	1994-1996	5.6	5.5	4.6	3.2	35 119	44 062	60 395
Zambia	S	1996	1992-1996	6.1	6.1	5.3	4.1	10 421	12 989	19 026
Middle Africa										
Angola	..	..	..	..	7.2	7.0	5.6	13 134	17 765	28 213
Cameroon	S	1998	1994-1998	5.2	5.1	4.3	3.1	14 876	18 347	23 986
Central African Republic	S	1994	1992-1994	5.1	5.3	4.6	3.4	3 717	4 430	5 886
Chad......................	S	1993	1989-1993	5.6	6.7	6.4	4.9	7 885	10 689	16 383
Congo......................	..	..	..	..	6.3	6.1	4.7	3 018	4 084	6 284
Democratic Republic of the Congo..............	C	1984	1984	6.7	6.7	6.4	4.9	50 948	71 272	114 876

TABLE 1 (*continued*)

| Country | Most recent period fertility | | | | Estimated and projected TFR and population size (medium variant) | | | | | |
| | Source of data | | | | TFR | | | Population (thousands) | | |
	Type[b]	Year	Reference period	TFR	1995-2000	2005-2010	2020-2025	2000	2010	2025
Middle Africa (*cont.*)										
Equatorial Guinea	..	..	..	..	5.9	5.7	4.2	457	605	889
Gabon	..	..	..	..	5.4	5.2	3.8	1 230	1 568	2 178
Southern Africa										
Namibia	S	1992	1988-1992	5.4	5.3	4.4	3.2	1 757	2 097	2 776
Western Africa										
Benin	S	1996	1992-1996	6.3	6.1	5.3	4.0	6 272	8 278	11 992
Burkina Faso	S	1992	1988-1992	6.5	6.9	6.7	5.2	11 535	15 764	25 227
Côte d'Ivoire	S	1999	1994-1998	5.2	5.1	4.2	2.8	16 013	19 625	25 024
Gambia	S	1990	1986-1990	5.9	5.2	4.4	3.1	1 303	1 626	2 077
Guinea	S	1999	1995-1999	5.5	6.3	5.4	4.1	8 154	9 996	14 120
Guinea-Bissau	..	..	..	..	6.0	5.8	4.3	1 199	1 531	2 170
Liberia	..	..	..	..	6.8	6.6	5.2	2 913	4 682	7 638
Mali	S	1996	1994-1996	7.0	7.0	6.9	5.4	11 351	15 234	23 461
Mauritania	S	1991	1988-1991	5.0	6.0	5.8	4.3	2 665	3 577	5 351
Niger	S	1998	1994-1998	7.5	8.0	7.8	6.3	10 832	15 550	25 725
Nigeria	S	1999	1995-1999	5.1	5.9	4.9	3.4	113 862	146 935	202 957
Senegal	S	1997	1993-1997	5.7	5.6	4.6	3.3	9 421	12 051	16 511
Sierra Leone	..	..	..	..	6.5	6.3	4.8	4 405	6 283	9 052
Togo	S	1998	1994-1998	5.2	5.8	4.9	3.6	4 527	5 826	8 219

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South-central Asia										
Afghanistan................	S	1973	1972-1973	8.2	6.9	6.7	5.2	21 765	31 308	45 193
Bhutan....................	S	1994	1994	5.6	5.5	4.7	3.5	2 085	2 707	3 843
Maldives	C	1990	1990	6.4	5.8	4.9	3.6	291	393	580
Pakistan..................	S	1991	1987-1990	5.4	5.5	4.6	3.2	141 256	181 385	250 981
South-eastern Asia										
Lao People's Democratic										
Republic	S	1994	1990-1994	6.4	5.3	4.3	2.8	5 279	6 611	8 721
Western Asia										
Iraq	S	1989	1988-1989	5.2	5.3	4.3	2.8	22 946	29 917	40 298
Occupied Palestinian Territory	V	1992	1992	8.4	6.0	5.2	4.0	3 191	4 525	7 145
Oman......................	S	1989	1987-1989	7.9	5.9	5.1	3.9	2 538	3 515	5 411
Saudi Arabia	S	1996	1994-1996	5.7	6.2	5.0	3.6	20 346	27 588	40 473
Yemen	S	1997	1995-1997	6.5	7.6	7.4	5.9	18 349	27 359	48 206
Melanesia										
Solomon Islands	S	1986	1984-1986	6.1	5.6	5.0	3.8	447	619	943

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Source: United Nations Population Division.

NOTES: Countries in **bold** are those where fertility transition has not yet begun.

Two dots (..) indicate that data are not available.

[a] Countries with TFR greater than or equal to 5 children per woman in 1995-2000.

[b] Data sources: C=census; S=survey; V=civil registration.

The data also suggest that in most countries that embarked on the transition, and where independent information is available for both the 1980s and 1990s, fertility decline accelerated in the 1990s.

The United Nations assumes that fertility will decline in all high fertility countries in the coming decades whether or not the TFR has shown signs of decline (tables 1 and 2). However, the speed of decline and the projected level of the TFR are functions of past trends and are modelled so as to take into account the experiences of countries that have already passed through the fertility transition. *The 2000 Revision of World Population Prospects* (United Nations, 2001b) assumes an acceleration of fertility decline in currently high fertility countries in the second decade of the twenty-first century, implying a change in the average TFR from 6.2 children per woman in 1995-2000 to 4.2 children per woman in 2020-2025. The group of currently high fertility countries is expected to become more diverse with respect to fertility outcomes: the cross-national range in fertility levels will increase from 2.9 children per woman in 1995-2000 (TFR between 5.1 and 8.0) to 3.1 children per woman in 2020-2025 (TFR between 2.8 and 5.9).

At the start of the fertility transition, women's fertility rates often decrease faster at older ages than at younger ages. Declines in fertility among younger women, largely due to increases in age at marriage, are more than matched by declines among older women who wish to stop childbearing. As a result, the age profile of period fertility rejuvenates. This happened in most developed countries, at least until the 1970s. A similar pattern of change in the age structure of fertility was typical for many developing countries, particularly those in Asia. This, however, is by no means a general rule. In Africa, for example, all types of decline can be found. In several African countries fertility decline is evenly distributed across prime childbearing ages. As a result, the age profile of period fertility may not change, such as that seen in Côte d'Ivoire (figure II). On the other hand, in Madagascar fertility declined among all women aged 25 and over, but effectively increased at younger ages; as a result, the structure of period fertility became younger. In contrast, in Senegal the decline in TFR (by 1.4 children per woman) was achieved almost exclusively by fertility decline among women younger than 30. Furthermore, in the Niger, increased fertility among women aged 25 and over in conjunction with stable high fertility for

TABLE 2. ESTIMATED AND PROJECTED TOTAL FERTILITY RATE AND PROJECTED
POPULATION GROWTH, BY CURRENT FERTILITY LEVEL

| | Total fertility rate | | Population growth index, 2000-2025 (2000=100) |
| | 1995-2000 | Projected 2020-2025 (medium variant) | |
Group of countries by fertility level in 1995-2000	Average	Average	Average
Countries with TFR higher than 5	6.2	4.2	193
Countries with TFR lower than 5 but higher than 2.1	3.4	2.3	169
Countries with TFR at or below 2.1 . . .	1.6	1.6	99

Source: United Nations (2001b).

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Figure II.   Trends in age-specific fertility rates in selected sub-Saharan countries

Niger

Madagascar

Côte d'Ivoire

Senegal
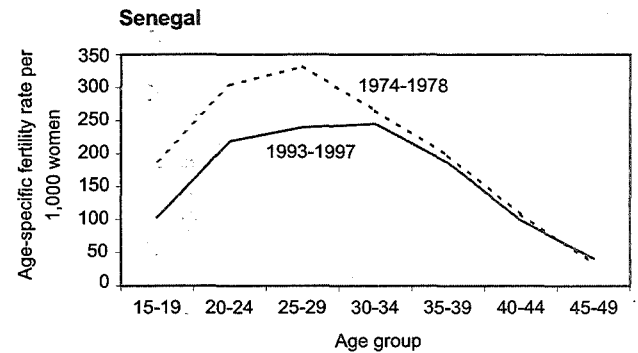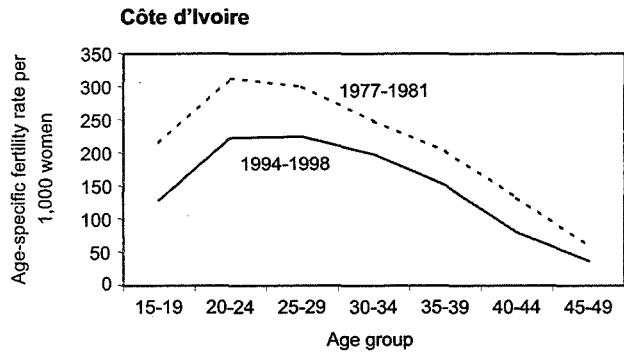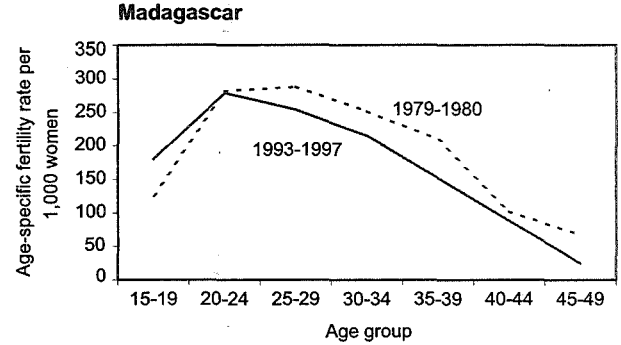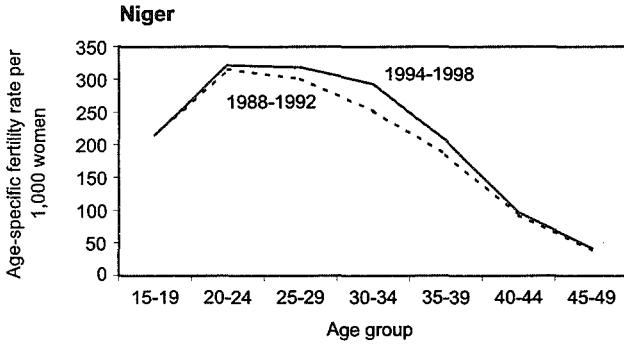
younger women resulted in an overall increase in the TFR (by 0.5 children) from the late 1980s to the mid-1990s. While it is difficult to generalize about the cultural, social or economic factors underlying differences in the age patterns of fertility transition, these differences have important implications for population policies.

Assumptions about the future course of fertility transition combined with data on the current population age composition are used to produce projections of population size (table 1). All high fertility countries are expected to experience several decades of rapid population growth (table 2). The total population of high fertility countries is projected to reach 1.4 billion in 2025—a 93 per cent increase over the 2000 level. However, differences in projected fertility trends underlie profound differences in future population growth among the currently high fertility countries (figure III). For instance, from 2000 to 2025, the population is expected to increase by 60 per cent in the Central African Republic, Côte d'Ivoire and Namibia, but by 160 per cent in Liberia and Yemen. Figure III shows that in countries where fertility transition has not yet begun, the population is expected to more than double in all but two countries.

Figure III.   Projected population growth in high fertility countries,[a] 2000-2025
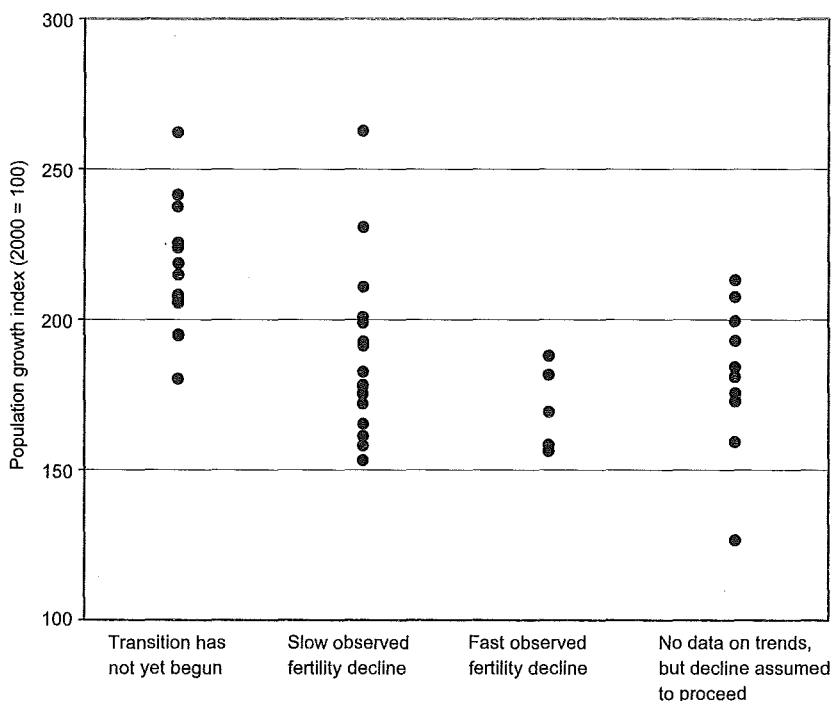
Source: United Nations Population Division.
[a] Countries with TFR over 5 children per woman in 1995-2000.

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B. SOCIO-ECONOMIC CORRELATES

It is widely acknowledged that socio-economic development is one of the major driving forces of fertility transition. However, the timing and speed of transition tend to be poorly predicted by many common economic measures of development (Bongaarts and Watkins, 1996). It is true that poor societies tend to have higher fertility and the rich countries are characterized by low fertility. At the same time, cross-country correlations between the TFR and indicators of economic output per capita (such as GNP per capita), or measures of incidence of absolute poverty (such as the percentage of the population living on less than one dollar per day), are weak though statistically significant (table 3). This is probably because the reproductive behaviours of individuals respond to a greater extent to the sociocultural and lifestyle changes linked to modernization than to simple economic growth, which is but one of its components.

It would be logical to expect a close association of levels and trends in fertility with levels and trends in urbanization, which encompasses the multifaceted transformation of a "traditional" society into a "modern" one. Survey data invariably confirm that at the individual level of analysis fertility is lower in urban areas and most often is lowest in the largest cities. At the macro level, however, the relationship between urbanization and fertility is not as strong (table 3). This may be due in part to widespread differences in national definitions of an urban settlement.[4]

On the other hand, the association between "human capital" indicators and fertility is strong. Child survival and women's education are highly inversely correlated with the total fertility rate (figures IV and V respectively). Together, they explain almost four fifths of the cross-national variation in TFR among the 57 developing countries for which statistics are available. These correlations are especially important because they reflect social improvements that are, unlike urbanization and economic growth, amenable to effective and

TABLE 3.   CORRELATION OF ESTIMATED TOTAL FERTILITY RATE[a]
WITH SELECTED INDICATORS

	Single regressions		
Indicator	Number of countries	R^2	Correlation coefficient
Under-five mortality rate, 1995-2000	121	0.62	0.79
Female gross enrolment ratio in primary and secondary education combined, early 1990s	117	0.67	−0.82
Percentage of population living in urban areas, 2000	121	0.27	−0.52
Percentage of population living on less than one dollar a day (adjusted for PPP), 1990s	60	0.43	0.65
Gross national income per capita (current US dollars), 1999	98	0.25	−0.50
Human development index, 1998	112	0.69	−0.83

Sources: Human Development Report 2000 (United Nations Development Programme, 2000); United Nations (2001b); World urbanization prospects: the 2001 revision. Data tables and highlights (ESA/P/WP.173); "GNI per capita 2001, Atlas method and PPP" (World Bank, 2000), available from *http://www.worldbank.org/data/databytopic/GNIPC.pdf*; and *Statistical Yearbook 1999* (United Nations Educational, Scientific and Cultural Organization, 1999).

[a]United Nations Population Division estimates for 1995-2000.

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efficient policy interventions. Worth noting also is the absence of any particular "sub-Saharan pattern" in the relationships of these indicators with fertility.

The importance of improvements in child survival in triggering and fostering fertility transition is well documented (United Nations, 1987; 1996). These improvements generate various distinct but closely interrelated changes in reproductive behaviour. The effects of child mortality include, at the individual level, the "physiological effect", which links a child's death with a shortening of birth intervals through its impact on reduced breastfeeding, and the "replacement effect", which links a child's death with birth spacing and completed family size through the intervention of family planning. Changes in child survival also operate on reproductive behaviour favouring lower fertility by altering parents' perceptions about their environment, in particular about their children's survival chances.

The decisive role of education in fostering changes in reproductive behaviour has been documented extensively. Higher levels of education, especially of women, are strong predictors of lower fertility. Education provides knowledge, increases exposure to information and media, moderates beliefs, builds the skills for gainful employment, increases female participation in family decision-making and raises the opportunity costs of women's time. The empowerment and autonomy of women transforms the fabric of reproductive behaviour, mainly through women's ability to control their own fertility. The difference in fertility outcomes between women with no education and those with some secondary or tertiary education averages 2.7 children ever born

Figure IV. Relationship between under-five mortality rate and total fertility rate for 121 developing countries, 1995-2000

Source: United Nations (2001b).

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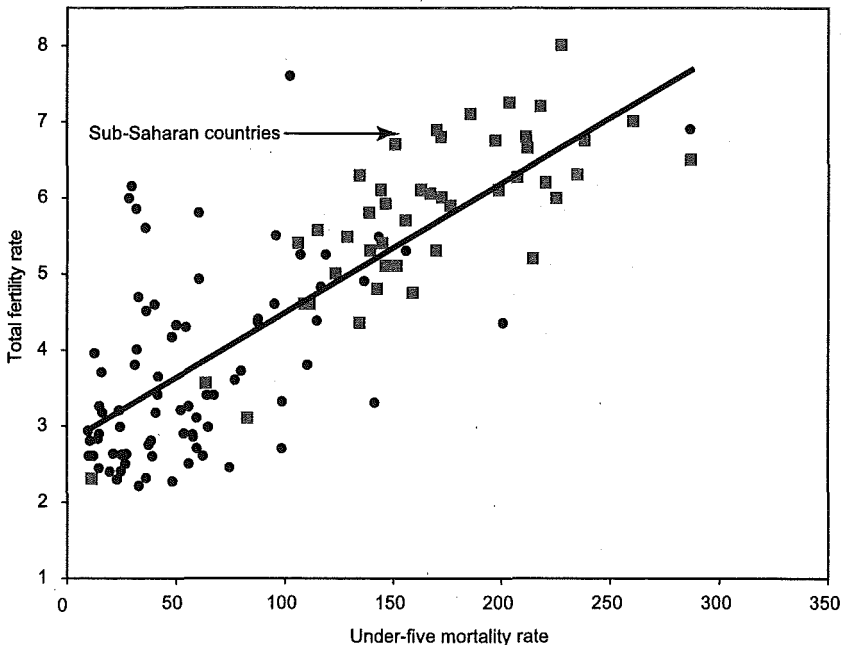
Figure V. Relationship between women's educational attainment in the early 1990s and total fertility rate in the late 1990s for 117 developing countries
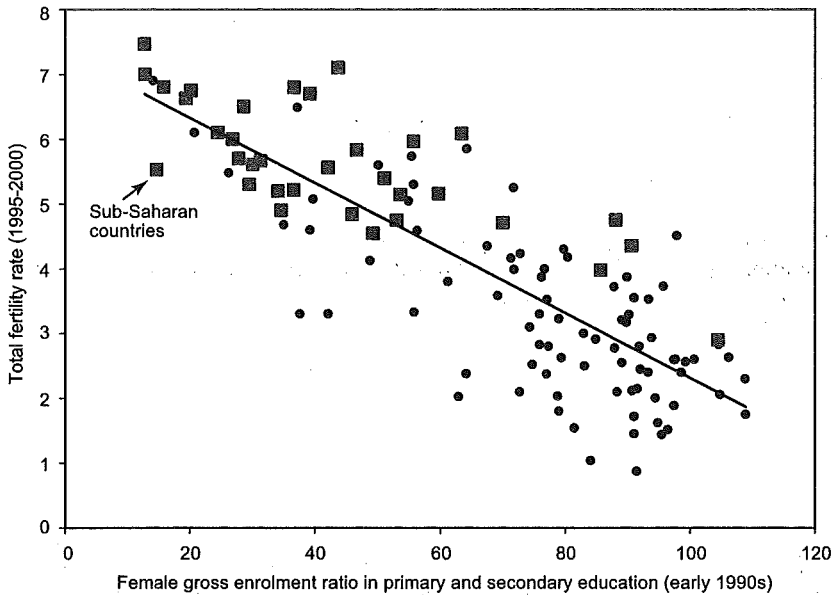
Source: United Nations (forthcoming).

among 50 developing countries (United Nations, forthcoming). Even a few years of formal schooling make a difference: in most countries, women with primary education have fewer children than uneducated women, despite a certain negative relationship between education and infecundity[5] (United Nations, 1995).

The Human Development Index (HDI), intended to serve as an overall measure of socio-economic development,[6] is also negatively and strongly correlated with a country's total fertility rate (table 3 and figure VI). However, one may argue that under-five mortality rates and female enrolment ratios in primary and secondary education are better variables for the purposes of fertility analysis because partial indicators are, in general, better suited for policy intervention than a composite index.

C. PROXIMATE DETERMINANTS OF FERTILITY

1. *Marriage and sexual activity*

In most countries of the world, especially in the less developed ones, the family is the unit in which reproduction takes place. Therefore, women's age at marriage[7] usually marks the beginning of family formation and, as such, affects fertility directly through its impact on the duration of a woman's exposure to the risk of pregnancy. A number of underlying factors associated with age at marriage can also affect fertility indirectly, such as women's education, contraceptive use or fertility preferences. Tables 4 and 5 present the prevalence and timing of marriage among the high fertility countries. The prevalence of

**Figure VI. Relationship between Human Development Index (1998)
and total fertility rate (1995-2000)**
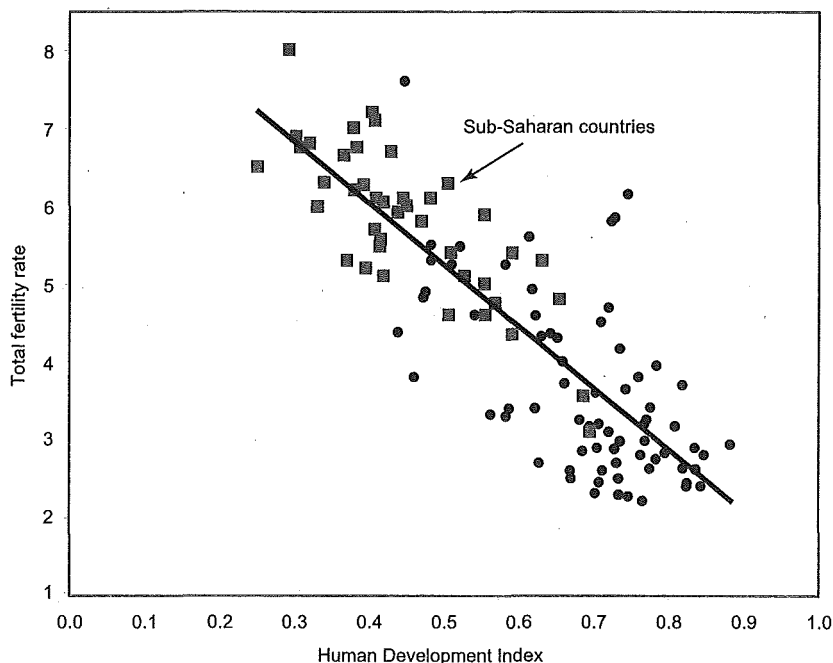
marriage is measured by the proportion of ever-married women aged 45 to 49 and its timing by the median age at first marriage as well as the singulate mean age at marriage (SMAM).

Marriage is almost universal in all high fertility countries; the proportion remaining single among those aged 45 to 49 is barely 2 per cent on average (table 4). Moreover, very early marriage is the norm in the great majority of these countries. In 21 of the 34 countries for which data are available, the percentage of women aged 15 to 19 who are married is 30 per cent or more; in only six countries (Burundi, the Comoros, Namibia, Rwanda, Saudi Arabia and Sierra Leone) is this proportion less than 15 per cent. Early entry into union is also evidenced by patterns in the median age at marriage. By the mid-1990s, in all countries still at least half of women aged 20 to 49 had married in their teenage years. For women in this age group, the median age at first marriage varies from 15.2 years in the Niger to 19.2 in the Comoros. In addition, a look at the SMAM in high fertility countries reveals that in the 1990s women who were first married by age 50 did so on average at about age 21 (table 5).

Analyses of differentials in the median age at first marriage from data collected by the Demographic and Health Surveys revealed that urban women (particularly those who live in the capital) marry later than rural women. There

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is also a strong relationship between female education and age at first marriage: the higher a woman's educational attainment, the later she marries. For example, in the Niger in 1998, the median age at first marriage was 15 years among women who lived in rural areas compared to 16.9 years among women who lived in Niamey, the capital (Attama and others, 1999). Women with a secondary or higher level of education married some five years later (20.5 years) than women who had a primary level education (15.9 years) or no education (15.0 years). Among the high fertility countries under consideration here (see table 5), the mean age at first marriage increased slightly in the majority of them, by one year on average; this increase can likely be attributed to the increase in the proportion of women who achieve higher levels of education.

Although age at first marriage is traditionally considered to mark the onset of a woman's sexual activity and hence exposure to the risk of pregnancy, more and more women are becoming sexually active before marriage, even as age at marriage is rising (United Nations, forthcoming). Table 4 shows that, in the high fertility countries with available data, the median age at first sexual intercourse is on average one year lower than the median age at first marriage. In Côte d'Ivoire and Namibia, the differences between age at first marriage and age at first intercourse are even greater: 2.3 years and 5.7 years respectively among women aged 25 to 49.

Differentials in the age at first intercourse are in general lower among women who live in rural areas and with a lower educational level, according to DHS data. In the Niger, for example, the median age at first intercourse is 15.0 years among women living in rural areas compared to 16.5 years among women living in Niamey (Attama and others, 1999). Marked differences are also seen by women's education: the median age at first intercourse ranges from 15.0 years for women with no education, to 15.9 for those with a primary level education, and to 19.5 years for those with a secondary or higher level of education.

2. *Post-partum insusceptibility and breastfeeding*

Following delivery and before the return of menstruation—a period referred to as post-partum amenorrhoea—women are considered to be "insusceptible" to another conception. During this period, the risk of pregnancy is almost non-existent. The protection from conception due to post-partum amenorrhoea depends on the length and intensity of breastfeeding. For instance, it has been shown that exclusive breastfeeding provides protection from pregnancy for up to six months. In many societies women also abstain from sexual intercourse during the post-partum period.

The median durations of post-partum amenorrhoea, abstinence and insusceptibility are presented in table 6. The period of post-partum insusceptibility varies considerably. In Eastern Africa, it varies from 8.2 months in the Comoros to 19.6 months in Ethiopia. In Middle Africa, it is around 16 months (in Cameroon and Chad, the two countries with data available). In Western Africa, where post-partum insusceptibility is longest, it varies from 15.1 months in Senegal to 22.6 months in Burkina Faso. It is 12.8 months in Namibia, the only Southern Africa country with data.

TABLE 4. MEDIAN AGE AT FIRST MARRIAGE,[a] PERCENTAGE EVER MARRIED AND MEDIAN AGE AT FIRST SEXUAL INTERCOURSE
AMONG WOMEN OF SELECTED AGE GROUPS

Country	Year	Median age at first marriage		Percentage ever married		Median age at first intercourse	
		20-49	25-49	15-19	45-49	20-49	25-49
Eastern Africa							
Burundi	1987	..	19.5	9.0	98.8	..	..
Comoros	1996	19.2	18.5	11.5	100.0	18.8	18.3
Djibouti	..	..	..	..	..	..	..
Eritrea	1995	16.9	16.7	37.6	98.1	16.9	16.8
Ethiopia	2000	16.4	16.0	30.0	99.9	16.4	16.0
Madagascar	1997	18.6	18.5	33.7	98.7	16.9	16.9
Malawi	1992	17.7	..	41.2	100.0	..	..
Mozambique	1997	17.2	..	47.1	97.1	16.0	..
Rwanda	1992	..	20.0	9.8	99.3	19.9	19.7
Somalia	..	..	..	..	..	..	..
Uganda	1995	17.5	17.4	49.8	98.6	16.1	16.0
United Republic of Tanzania	1999	18.4	18.1	27.2	99.2	16.7	16.6
Zambia	1996	18.0	17.7	27.3	99.3	16.4	16.4
Middle Africa							
Angola	1970	..	..	35.7	95.4	..	..
Cameroon	1998	17.7	17.4	35.8	98.5	..	15.8
Central African Republic	1994/95	..	..	42.3	98.1	..	..
Chad	1996/97	..	15.8	48.6	99.9	15.6	15.5
Congo	1984	..	..	55.5	93.2	..	..
Democratic Republic of the Congo	1984	..	..	74.2	96.0	..	..
Equatorial Guinea	1983	..	..	26.3	93.4	..	..
Gabon	1993	..	..	15.9	90.6	..	..
Southern Africa							
Namibia	1992	..	24.8	7.7	88.1	18.9	19.1
Western Africa							
Benin	1996	18.5	18.4	29.1	99.7	17.3	17.3

Burkina Faso	1998/99	..	17.6	34.8	99.8	..	17.5
Côte d'Ivoire	1994	..	18.1	27.7	99.3	15.8	15.8
Gambia	1990	..	..	43.6	100.0	..	..
Guinea	1999	16.5	16.4	46.1	100.0	16.0	16.0
Guinea-Bissau	..	..	..	..	..	..	..
Liberia	1984	..	..	35.7	96.9	..	..
Mali	1995/96	16.0	16.0	49.7	99.8	..	15.8
Mauritania	1988	..	..	36.0	96.4	..	..
Niger	1998	15.2	15.1	61.9	99.8	15.1	..
Nigeria	1999	18.3	17.9	27.5	97.8	17.9	17.8
Senegal	1997	18.0	17.4	29.0	98.3	17.5	17.1
Sierra Leone	1992	..	..	5.8	96.7	..	..
Togo	1998	19.1	18.8	19.9	99.7	17.3	17.3
South-central Asia							
Afghanistan	1979	..	..	53.7	99.0	..	..
Bhutan	..	..	..	..	..	..	..
Maldives	1990	..	..	36.5	99.5	..	..
Pakistan	1991	..	..	21.9	98.0	..	..
South-eastern Asia							
Lao People's Democratic Republic	1995	..	..	19.7	96.3	..	..
Western Asia							
Iraq	1987	..	..	27.9	96.1	..	..
Occupied Palestinian Territory	1997	..	..	24.2	92.4	..	..
Oman	1995	..	..	15.5	99.5	..	..
Saudi Arabia	1996	..	..	7.4	98.5	..	..
Yemen	1997	16.5	16.0	..	99.2	..	..
Melanesia							
Solomon Islands	1986	..	..	..	..	..	..

Sources: Demographic and Health Survey country reports and Gulf Family Health Survey country reports.

NOTE: Two dots (..) indicate that data are not available.

[a] Marriage here refers to recognized marital unions and consensual unions.

TABLE 5. TRENDS IN SINGULATE MEAN AGE AT MARRIAGE[a] AMONG WOMEN AGED 15-49

Country	Earlier period		Later period	
	Year	SMAM	Year	SMAM
Eastern Africa				
Burundi	1979	20.8	1990	22.5
Comoros	1980	19.8	1996	23.6
Djibouti	..	..	..	..
Eritrea	..	..	1995	19.6
Ethiopia	1984	17.1	1994	20.5
Madagascar	1975	20.3	1997	20.6
Malawi	1982	18.3	1992	18.7
Mozambique	1980	17.8	1997	18.7
Rwanda	1978	21.0	1996	23.3
Somalia	..	..	..	..
Uganda	1969	17.7	1991	19.4
United Republic of Tanzania	1988	20.5	1996	20.5
Zambia	1980	19.4	1996	20.3
Middle Africa				
Angola	1960	17.9	1970	19.4
Cameroon	1987	20.0	1998	20.2
Central African Republic	1988	19.1	1994	19.4
Chad	1964	16.5	1996	18.0
Congo	..	..	1984	22.6
Dem. Rep. of the Congo	..	..	1984	20.0
Equatorial Guinea	..	..	1983	21.7
Gabon	1961	17.7	1993	24.3
Southern Africa				
Namibia	1960	21.8	1992	26.4
Western Africa				
Benin	1979	17.7	1996	19.9
Burkina Faso	1985	18.4	1992	18.2
Côte d'Ivoire	1978	18.7	1994	20.9
Gambia	..	..	..	..
Guinea	..	..	1992	18.8
Guinea-Bissau	..	..	..	..
Liberia	1974	19.3	1986	20.2
Mali	1976	18.1	1995	18.4
Mauritania	1977	19.5	1988	20.5
Niger	1988	16.6	1998	17.6
Nigeria	1991	20.3	1999	21.3
Senegal	1976	19.4	1997	21.5
Sierra Leone	..	..	1992	19.8
Togo	1988	20.3	1998	21.3
South-central Asia				
Afghanistan	1972	18.1	1979	17.8
Bhutan	..	..	1990	20.5
Maldives	1977	17.5	1990	19.1
Pakistan	1981	20.3	1998	21.3

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TABLE 5   *(continued)*

	Earlier period		Later period	
Country	Year	SMAM	Year	SMAM
South-eastern Asia				
Lao People's Dem. Republic ...	..	..	1995	21.2
Western Asia				
Iraq	1977	20.8	1987	22.3
Occupied Palestinian Territory ..	1967	21.9	1997	21.7
Oman	1993	20.7	1995	22.0
Saudi Arabia	1987	21.7	1996	24.2
Yemen	1992	20.8	1997	20.7
Melanesia				
Solomon Islands	1976	21.1	1986	21.2

Source: United Nations Population Division database on marriage.

NOTES: Two dots (..) indicate that data are not available.

SMAM = singulate mean age at marriage

[a] Marriage here refers to recognized marital unions and consensual unions.

The period of post-partum amenorrhoea is in general much longer than the period of post-partum sexual abstinence and is therefore the principal determinant of the length of post-partum insusceptibility. In 16 of the 23 countries with data, the median duration of amenorrhoea is 12.5 months; that of abstinence is 3.0 months; and that of insusceptibility is 13.3 months.

As mentioned above, breastfeeding, especially exclusive breastfeeding,[8] affects fertility through the biological suppression of the return of menses in mothers. Table 6 shows that, while breastfeeding lasts very long in the high fertility countries (18 months or more), unfortunately breast milk is often supplemented too early. On average, the median duration of exclusive breastfeeding is just about one month; in 17 countries (out of the 23 countries with data), half of the women give their baby at least water or juice in addition to breast milk within the first month of life. The median duration of full breastfeeding lasts another 1.8 months or so on average.

Data from the DHS can be used to look at differentials in the median durations of post-partum amenorrhoea and abstinence by women's background characteristics. In general, post-partum amenorrhoea is much shorter among urban and more educated women than among rural and less educated women. This is attributable to shorter breastfeeding periods among the former group. Similarly, post-partum abstinence is much longer in rural areas than in urban areas, but there is not a clear relationship between the duration of abstinence and female education. For example, in Burkina Faso in 1998/99, the less educated a woman was, the longer she abstained from sexual intercourse: the median duration in women with a secondary or higher level of education was 6 to 4 months; with a primary level of education, 8.1 months; and with no education, 19.8 months (Langani and others, 2000). In contrast, in Chad in 1996/97, the duration of abstinence was shorter among uneducated women (3.5 months) than among women with at least a primary level of education (4.3 months) (Ouagadjio and others, 1998).

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TABLE 6.   MEDIAN DURATIONS OF POST-PARTUM AMENORRHOEA, SEXUAL ABSTINENCE AND INSUSCEPTIBILITY,
AND MEDIAN DURATION OF BREASTFEEDING AMONG WOMEN AGED 15-49

Country	Year	Median duration of post-partum insusceptibility			Median duration of breastfeeding		
		Amenorrhoea	Abstinence	Insusceptibility	Any BF	Exclusive BF	Full BF
Eastern Africa							
Burundi..............................	1987	19.1[a]	3.5[a]	19.9[a]	23.8[a]	..	..
Comoros	1996	6.5	2.4	8.2	20.1	0.4	0.7
Eritrea..............................	1995	14.2	2.7	16.6	22.0	3.3	5.7
Ethiopia............................	2000	19.0	2.4	19.6	25.5	2.5	4.2
Madagascar.........................	1997	10.9	3.5	12.0	20.7	2.2	2.9
Malawi	1992	11.9	..	..			
Mozambique........................	1997	13.7	11.6	16.5	22.0	0.9	3.6
Rwanda.............................	1992	16.6	0.6	17.1	27.9	5.4	5.5
Uganda	1995	12.6	2.2	13.4	19.5	3.0	3.5
United Republic of Tanzania............	1999	12.0	4.4	14.7	20.9	1.1	2.4
Zambia	1996	11.5	4.7	14.1	20.0	0.6	2.5
Middle Africa							
Cameroon	1998	10.7	11.9	15.5	18.1	0.5	1.5
Central African Republic	1994/1995						
Chad	1996/1997	15.5	3.6	16.6	21.4	0.4	2.6
Southern Africa							
Namibia............................	1992	8.3	6.0	12.8	17.3	0.5	1.7

Western Africa							
Benin..............................	1996	13.4	15.8	18.9	22.8	0.5	0.6
Burkina Faso.........................	1998/1999	15.9	19.2	22.6	27.7	0.4	0.6
Côte d'Ivoire.........................	1994	12.3	11.8	16.6	20.3	0.4	3.7
Guinea.............................	1999	11.6	22.1	22.3	22.4	0.4	5.5
Liberia.............................	1984						
Mali...............................	1995/1996	13.6	2.8	14.4	21.6	0.5	6.8
Mauritania..........................	1988						
Niger..............................	1998	15.8	2.2	16.2	20.6	0.4	2.1
Nigeria.............................	1999	12.8	6.2	15.5	18.5	0.5	2.4
Senegal	1997	13.2	2.9	15.1	20.9	0.5	4.5
Togo	1998	14.0	13.4	17.8	24.4	0.5	1.7
Western Asia							
Oman..............................	1995	..	..	..	19.1[a]	..	..
Saudi Arabia	1996	..	..	..	12.5[a]	..	..
Yemen	1997	6.1	1.7	6.4	17.8	0.5	0.9

Sources: Demographic and Health Survey country reports and Gulf Family Health Survey country reports.

NOTES: Two dots (..) indicate that data are not available.

BF = breastfeeding

[a] Mean duration, months.

3. Contraception, fertility preferences and abortion

The literature on fertility transition in developing countries indicates that past declines have occurred predominantly from increased contraceptive use. Table 7 shows that in currently high fertility countries the level of contraceptive use is very low. The percentage of married women of reproductive age using any method of contraception ranges from 3.3 per cent in Mauritania to 32.7 per cent in Gabon. The proportion using a modern contraceptive method varies from 1.2 per cent in Burundi to 28.5 per cent in Saudi Arabia. In fact, the great majority of these high fertility countries are in Eastern Africa, Middle Africa and Western Africa where the prevalence of contraception among married women is the lowest in the world—20.6 per cent, 10.0 and 14.4 per cent respectively. In addition, the majority of these countries display the slowest increase in contraceptive prevalence—less than 1 percentage point per annum in the 1990s (United Nations, forthcoming). Not surprisingly, the level of unmet need[9] for contraception is very high in these high fertility countries. On average, a quarter of married women of reproductive age have an unmet need for contraception, and only a third of women who need family planning are using contraception (or have a satisfied need). Furthermore, and not surprisingly, the desired family size is still very high in these high fertility countries: on average, 5.8 children for all women and 6.0 children for women in union (table 7).

Since contraceptive use is very low in these countries and has barely increased in the recent past, and yet women's need for contraception is relatively high, one may wonder whether women resort to abortion to prevent unwanted births. Unfortunately, in all the high fertility countries, reliable data on abortion are scarce owing to very restrictive laws on abortion,[10] a relic from the colonial era. In sub-Saharan Africa, data on abortion are obtained mainly from women who were admitted in hospitals for post-abortion complications, or from specialized studies of specific populations such as adolescents, students or patients in health centres. Such data show that the practice of abortion has become more common in several African countries in the last few decades (Guillaume, 2000). Abortion further remains much more frequent among single young women, particularly among adolescent girls who are still in school. In Mozambique, at the Maputo Central Hospital, for example, patients admitted for an abortion were mainly under the age of 30 (74 per cent), unmarried (58 per cent) and still in school (36 per cent) (Agadjanian, 1999). A survey conducted among schoolgirls in Togo found that 23 per cent had had an abortion at least once (Amagee, 1999). Moreover, abortion ratios[11] were consistently higher in urban than in rural areas. For example, surveys conducted among patients in health centres pointed to an abortion ratio of 21 per 100 pregnancies in Bamako, Mali, and over 30 per 100 pregnancies in Abidjan, Côte d'Ivoire (Desgrées du Loû and others, 1999). Those and other studies revealed that the main reasons for having an abortion were the fear of not being able to complete school, the fear of parents' reactions, the fear of having an illegitimate child, the lack of economic resources for bringing up the child and the inability to control fertility. The young woman's potential health problems from an early or unwanted pregnancy were rarely mentioned.

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Most Governments of the countries covered in this paper consider their current levels of fertility to be high and have adopted population policies in recent years for fertility regulation or family planning services (United Nations, 2001a). Both explicit and implicit population policies have been issued in various forms, including through legislation, sections of development plans and official documents prepared by government ministries and commissions. The persistence of high fertility levels and variations therein may reflect the timing of population policy or programme initiation, programme dimensions, extent of implementation and effectiveness and political will, in addition to the range of socio-economic factors such as education levels and infrastructure.

In 1976, according to a population inquiry conducted regularly by the United Nations Population Division, a majority of countries (33 out of 42) did not have policies to modify fertility levels (table 8). By 1999, most countries had adopted policies to lower fertility. Out of the 33 countries that did not have intervention policies in 1976, only 9 remained without any policy to lower fertility two decades later. Two countries, Equatorial Guinea and Togo, adopted policies to maintain the prevailing fertility levels, while Saudi Arabia shifted from the earlier position of maintaining fertility levels to join Gabon with a policy to raise fertility. By 1999, 29 countries had policies to lower fertility.

Among the current high fertility countries in Africa, only six countries (Cameroon, the Gambia, Nigeria, Rwanda, Senegal and Uganda) had population policies integrated in national development plans by 1987; Burundi alone had a separate population policy document (Cochrane, Sai and Nassim, 1990). Other countries that had an explicit population policy at that time included Botswana, Ghana, Kenya, Lesotho, Mauritius and Swaziland, where fertility levels have since declined to below 5 children per woman. Nigeria, the region's most populous country, did not adopt a formal population policy until 1988. In the United Republic of Tanzania, despite a long history (since 1970) of family planning service provision through its child spacing programmes, a national population policy was not adopted until 1992 (Richey, 1999).

The late adoption of population policies and implementation of programmes in many countries appears to have been impeded by government views concerning fertility levels, poverty, conflicts and legal issues. In 1976, most Governments considered their fertility levels to be satisfactory, while others considered fertility levels in their countries to be too low (such as Cameroon, the Central African Republic, Equatorial Guinea and Gabon) (table 9). As table 10 shows, nearly all the high fertility countries were either in conflict or emerging from it during the period 1988 to 1998; and in 2001 a few of them, such as Burundi, the Democratic Republic of the Congo and Uganda, were still experiencing civil strife. In addition, nearly all countries shown are, as defined by the International Monetary Fund, heavily indebted poor countries, which at some point during the past two decades adopted and implemented structural adjustment programmes. In many African countries, the Government does not fund family planning programmes even when they are permitted. In some instances, the commercial sector is an important provider of contraceptive services: available data from Cameroon, Nigeria, Togo and Zambia suggest the propor-

TABLE 7. CONTRACEPTIVE USE, UNMET NEED AND SATISFIED NEED FOR FAMILY PLANNING,
AND DESIRED FAMILY SIZE AMONG WOMEN AGED 15-49

| Country | Year | Contraceptive use and needs among married women | | | | Desired family size by marital status | |
| | | Percentage currently using | | Percentage with need | | | |
		Any method	Modern method	Unmet need	Satisfied need	All	Married
Eastern Africa							
Burundi	1987	8.7	1.2	..	..	5.3	5.5
Comoros	1996	21.0	11.4	34.6	37.7	5.3	5.7
Eritrea	1995	5.9	3.1	27.5	22.4	6.0	6.6
Ethiopia	2000	8.1	6.3	35.8	18.4	5.3	5.8
Madagascar	1997	19.4	9.7	25.6	43.2	5.3	5.7
Malawi	1992	13.0	7.4	36.3	26.4	5.1	5.3
Mozambique	1997	5.6	5.1	6.7	51.9	5.9	6.2
Rwanda	1992	21.2	12.9	40.4	34.4	4.2	4.4
Uganda	1995	14.8	7.8	21.9	37.9	5.3	5.6
United Republic of Tanzania	1999	25.4	16.9	17.2	56.4	5.3	5.7
Zambia	1996	25.9	14.4	5.4	61.4	5.3	5.7
Middle Africa							
Cameroon	1998	19.3	7.1	13.0	59.7	6.0	6.5
Central African Republic	1994/95	14.8	3.3	..	..	..	..
Chad	1996/97	4.1	1.2	9.4	30.6	8.3	8.5
Democratic Republic of the Congo	1984	7.7	2.0	..	..	..	..
Gabon	2000	32.7	11.8	..	..	..	..
Southern Africa							
Namibia	1992	28.9	26.0	23.5	55.1	5.0	5.7
Western Africa							
Benin	1996	16.4	3.4	25.7	38.9	5.5	5.8

Burkina Faso	1998/99	11.9	4.8	25.8	31.5	5.7	5.9
Côte d'Ivoire	1994	11.4	4.3	43.4	20.8	5.5	6.0
Gambia	1990	11.8	6.7				
Guinea	1999	6.2	4.2	24.2	20.5	5.7	5.9
Liberia	1984	6.4	5.5	..	..	..	..
Mali	1995/96	6.7	4.5	25.7	20.7	6.6	6.8
Mauritania	1991	3.3	1.2	..	..	..	..
Niger	1998	8.2	4.6	16.6	33.0	8.2	8.5
Nigeria	1999	15.3	8.6	17.5	46.7	6.2	6.7
Senegal	1997	12.9	8.1	32.6	28.4	5.3	5.7
Togo	1998	23.5	7.0	32.3	42.1	4.5	4.9
South-central Asia							
Afghanistan	1979	1.6[a]	1.6[a]	..	..	..	..
Bhutan	1994	18.8[b]	18.8[b]	..	..	..	..
Pakistan	1991	23.9	16.9	..	..	..	..
South-eastern Asia				..	..	..	..
Lao People's Democratic Republic	1995	18.6	15.0	..	..	..	..
Western Asia							
Iraq	1987	13.7	10.4	..	..	..	..
Oman	1995	23.7	18.2	..	..	6.4	..
Saudi Arabia	1996	31.8	28.5	..	..	6.7	..
Yemen	1997	20.8	9.8	38.6	35.0	..	4.5

Sources: United Nations Population Division databases on contraceptive use, Demographic and Health Survey country reports and Gulf Family Health Survey country reports.

NOTE: Two dots (..) indicate that data are not available.

[a] Prevalence among ever-married women.

[b] Prevalence among women of all marital status.

TABLE 8. TRENDS IN GOVERNMENT POLICIES AND INTERVENTIONS TO MODIFY NATIONAL FERTILITY LEVELS, 1976-1999

	1976		1986		1992	1999

No intervention	Afghanistan
	Benin
	Bhutan
	Burkina Faso
	Burundi
	Cameroon
	Central African
	  Rep.
	Chad
	Comoros
	Congo
	Dem. Rep.
	  Congo
	Equat. Guinea
	Ethiopia
	Gambia
	Guinea
	Guinea-Bissau
		Liberia
		Madagascar
		Malawi
		Maldives
		Mali
		Mauritania
		Niger
		Nigeria
		Rwanda
		Senegal
		Sierra Leone
		Somalia
		Sudan
		Togo
		United Rep.
		  Tanzania
		Yemen
		Zambia
			Afghanistan
			Benin
			Bhutan
			Burkina Faso
			Cameroon
			Central African
			  Rep.
			Chad
			Congo
			Dem. Rep.
			  Congo
			Ethiopia
			Guinea
			Guinea-Bissau
			Liberia
			Madagascar
			Malawi
			Maldives
				Mauritania
				Mozambique
				Sierra Leone
				Somalia
				Sudan
				United Rep.
				  Tanzania
				Zambia
						Afghanistan
						Benin
						Central African
						  Rep.
						Chad
						Dem. Rep.
						  Congo
						Guinea-Bissau
						Iraq
						Mauritania
						Somalia

Maintain	Côte d'Ivoire
	Iraq
	Lao People's
	  Dem. Rep.
		Mozambique
		Oman
		Saudi Arabia
			Lao People's
			  Dem. Rep.
			Mali
			Oman
				Saudi Arabia
				Togo
					Togo	Equat. Guinea
						Togo

Lower	Pakistan
	Uganda
		Burundi
		Comoros
		Gambia
		Niger
		Nigeria
		Pakistan
		Rwanda
		Senegal
		Uganda
		Yemen
				Bhutan
				Burundi
				Cameroon
				Comoros
				Congo
				Ethiopia
				Gambia
				Guinea
				Liberia
				Madagascar
				Malawi
				Maldives
					Mali
					Mozambique
					Niger
					Pakistan
					Rwanda
					Senegal
					Sierra Leone
					Sudan
					Uganda
					United Rep.
					  Tanzania
					Yemen
						Bhutan
						Burkina Faso
						Burundi
						Cameroon
						Comoros
						Congo
						Côte d'Ivoire
						Ethiopia
						Gambia
						Guinea
						Lao People's
						  Dem. Rep.
						Liberia
						Madagascar
						Malawi
						Maldives
							Mali
							Mozambique
							Niger
							Nigeria
							Oman
							Pakistan
							Rwanda
							Senegal
							Sierra Leone
							Sudan
							Uganda
							United Rep.
							  Tanzania
							Yemen
							Zambia

Raise	Gabon	Côte d'Ivoire Equat. Guinea	Gabon Iraq			Gabon Saudi Arabia	

Source: United Nations Population Division database on population policy.

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TABLE 9.   TRENDS IN GOVERNMENT VIEWS CONCERNING PRESENT NATIONAL FERTILITY LEVELS, 1976-1998

Government view concerning present fertility levels	1976		1986		1992	1998
Satisfactory	Benin	Malawi	Angola	Oman	Equat. Guinea	Angola
	Bhutan	Maldives	Benin	Saudi Arabia	Togo	Benin
	Burkina Faso	Mali	Bhutan	Somalia		Central African Rep.
	Burundi	Mauritania	Burkina Faso	Sudan		Chad
	Chad	Mozambique	Chad	Togo		Dem. Rep. Congo
	Congo	Niger	Côte d'Ivoire			Equat. Guinea
	Côte d'Ivoire	Nigeria	Dem. Rep. Congo			Iraq
	Dem. Rep. Congo	Oman	Djibouti			Mauritania
	Ethiopia	Saudi Arabia	Guinea-Bissau			Saudi Arabia
	Gambia	Somalia	Lao People's Dem. Rep.			Somalia
	Guinea	Sudan	Maldives			Togo
	Guinea-Bissau	Togo	Mali			
	Iraq	United Rep. of Tanzania	Mauritania			
	Lao People's Dem. Rep.	Yemen	Mozambique			
		Zambia				

Too high	Afghanistan		Afghanistan	Solomon Islands	Bhutan	Sudan	Afghanistan	Maldives
	Comoros		Burundi	Uganda	Burundi	Uganda	Bhutan	Mali
	Liberia		Cameroon	United Rep. of Tanzania	Comoros	United Rep. of Tanzania	Burkina Faso	Mozambique
	Madagascar		Central African Rep.	Yemen	Congo	Yemen	Burundi	Namibia
	Pakistan		Comoros	Zambia	Ethiopia		Cameroon	Niger
	Rwanda		Ethiopia		Gambia		Comoros	Nigeria
	Senegal		Gambia		Guinea		Congo	Oman
	Sierra Leone		Guinea		Guinea-Bissau		Côte d'Ivoire	Pakistan
	Uganda		Liberia		Liberia		Djibouti	Rwanda
			Madagascar		Madagascar		Eritrea	Senegal
			Malawi		Maldives		Ethiopia	Sierra Leone
			Niger		Mali		Gambia	Solomon Islands
			Nigeria		Mozambique Namibia		Guinea	Sudan
			Pakistan		Niger		Guinea-Bissau	Uganda
			Rwanda		Pakistan		Lao People's Dem. Rep.	United Rep. of Tanzania
			Senegal		Rwanda		Liberia	Yemen
			Sierra Leone		Senegal		Madagascar	Zambia
					Sierra Leone		Malawi	
Too low	Cameroon	Equat. Guinea	Congo	Gabon			Gabon	
	Central African Rep.	Gabon	Equat. Guinea	Iraq				

Source: United Nations Population Division database on population policy.

TABLE 10.   COUNTRIES BY TOTAL FERTILITY RATE, RECENT CONFLICT STATUS
AND IMPLEMENTATION STATUS OF STRUCTURAL ADJUSTMENT PROGRAMMES

Country	TFR	In conflict or emerging from it,[a] 1988-1998	Heavily indebted country having implemented SAPs
Africa			
Angola	7.2	+	
Benin	6.1		×
Burkina Faso	6.9		×
Burundi	6.8	+	×
Cameroon	5.1		×
Central African Republic	5.3	+	×
Chad	6.7	+	×
Comoros	5.4		×
Congo	6.3	+	×
Côte d'Ivoire	5.1		×
Democratic Republic of the Congo	6.7	*	×
Djibouti	6.1	+	×
Equatorial Guinea	5.9		×
Eritrea	5.7	+	
Ethiopia	6.8	+	×
Gabon	5.4		
Gambia	5.2		×
Guinea	6.3		×
Guinea-Bissau	6.0	*	×
Liberia	6.8	+	×
Madagascar	6.1		×
Malawi	6.8		×
Mali	7.0	+	×
Mauritania	6.0		×
Mozambique	6.3	+	×
Namibia	5.3	+	×
Niger	8.0	+	×
Nigeria	5.9		
Rwanda	6.2	+	×
Senegal	5.6		×
Sierra Leone	6.5	*	×
Somalia	7.3	*	×
Sudan		*	×
Togo	5.8		×
Uganda	7.1	+	×
United Republic of Tanzania	5.5		×
Zambia	6.1		×
Asia			
Afghanistan	6.9	*	
Bhutan	5.5		
Iraq	5.3	+	
Lao People's Democratic Republic	5.3		×
Maldives	5.8		
Occupied Palestinian Territory	6.0	*	
Oman	5.9		
Pakistan	5.5		×
Saudi Arabia	6.2		
Yemen	7.6	+	×
Oceania			
Solomon Islands	5.6		

Source: S. Patrick (1998).

[a] *=Current conflict

+=In transition/post-conflict

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tion of contraceptive users served by the private sector ranges between 11 and 50 per cent (Zeitlin, Govidaraj and Chen, 1994). In other cases, at most 1 in 10 contraceptive users is served by the commercial private sector in Mali, the Niger, the United Republic of Tanzania and Uganda.

Legal issues surrounding population policies include the legal requirements for induced abortion, the exclusion of unmarried adolescents from the benefits of family planning programmes and the requirement of spousal consent for obtaining contraceptives. Perhaps the most important of such legal issues is the anti-contraception and abortion law. This law, passed in France in 1920 but since repealed there, remains on the statute books in several former French colonies (Cochrane, Sai and Nassim, 1990). Even though the law may be widely disregarded in practice in many countries where it remains technically in effect, and was repealed as early as 1972 in Mali and 1980 in Senegal and Cameroon, its existence may have impeded advocates for family planning and restricted the sale and distribution of contraceptives. This was in contrast to the situation in the former British colonies, where voluntary organizations were the vanguard of family planning associations. For example, in the absence of a family planning association in the Democratic Republic of the Congo, a paralegal organization was eventually formed, perhaps to ensure that there would be no prosecutions under the 1920 law. In Senegal, the Government formed a family planning association under its own initiative after efforts for the formation of a voluntary one failed.

Restrictive laws on abortion impede the institution of safe abortion services. Even where abortion is not illegal, Governments seldom subsidize it. In most countries, abortion is allowed only on narrow medical grounds and requires professional consultation for authorization.

While the current means of implementation of population policies and programmes are not usually ideal, they do matter. The adoption of a population policy implies budget allocations, training of personnel and arrangement of institutional mechanisms to implement the policy. Adoption of a population policy has been associated with the likelihood that a country will receive international financial and technical assistance. For example, it appears that countries with population policies have benefited from the increased provision of contraceptive services as well as the collection of demographic and health data with support from international organizations (Barret and Tsui, 1999).

NOTES

[1] This paper is based primarily on data drawn from a variety of sources (surveys, censuses and, in a limited number of low fertility countries, civil registration systems) and compiled by the Population Division in the *Fertility Trends and Patterns* database (POP/1/DB/2001/1) and the database for *World Population Prospects: The 2000 Revision* database (United Nations publication, Sales No. E.01.XIII.8).

[2] The absence of fertility decline was documented for Burkina Faso, Chad, Guinea and the Niger by two demographic surveys implemented in each country during the 1990s. For Mali the stability of the TFR at a high level of about 6.8 children per woman was inferred from a single survey carried out in the first half of the decade. The TFR of 8.4 children per woman recorded by

civil registration in the Occupied Palestinian Territory implies a pre-transitional stage. For Angola, Burundi, the Congo, the Democratic Republic of the Congo, Equatorial Guinea, Liberia, Sierra Leone and Somalia, data do not exist for the 1990s; population estimates by the United Nations are based on the assumption that fertility in those countries was stable.

[3] An average decline of 0.6 children per woman per quinquennium was observed for the 56 countries that completed the incipient stage before 1990.

[4] The population size criterion for a settlement to be classified as urban varies, among the developing countries, from 100 dwellings in Peru to 20,000 inhabitants in the Syrian Arab Republic. Many countries apply other criteria not related to population size or density (such as percentage of labour force engaged in non-agricultural activities, location in the centre of an administrative region, or solely the capital city), and several sub-Saharan countries (e.g., Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gabon, Namibia, the Niger, Nigeria, Rwanda and Uganda) do not report the criteria at all.

[5] In Cameroon, Chad, Guinea, Indonesia, Madagascar, the Niger, Nigeria and Uganda, women with primary education have more children than uneducated women—probably because health improvements associated with education have outweighed behavioural changes. These exceptions are few: in all of these countries but two (Indonesia and Uganda), the positive impact of primary education on TFR appears to have reversed itself with respect to recent period fertility rates.

[6] The Human Development Index is a simple average of three basic indicators of population health and welfare: the normalized (by extreme values) life expectancy; educational attainment, as measured by a combination of the adult literacy rate (two-thirds weight) and the combined gross primary, secondary and tertiary enrolment ratios (one-third weight); and gross domestic product per capita in constant dollars adjusted for purchasing power parity.

[7] Marriage here refers to recognized marital unions and consensual unions.

[8] Exclusive breastfeeding is the practice of feeding an infant only with breast milk. The World Health Organization and the United Nations Children's Fund (UNICEF) recommend exclusive breastfeeding for the first six months of life. Full breastfeeding can refer to feeding the child with breast milk and water only, or in some countries with breast milk and water or juice only.

[9] Unmet need is defined on the basis of women's responses to survey questions. Fecund women who respond that they do not want to have any more children or want to postpone their next birth for at least two years, yet are not using contraception (including use by their partners), are defined as having an unmet need for family planning. This group with unmet need also includes currently pregnant women whose pregnancy was unwanted or mistimed and who became pregnant because they were not using contraception. Similarly, women who recently gave birth but are not yet at risk of conception—because they are amenorrhoeic following a birth—are considered to have an unmet need if they report that their last pregnancy was unintended, even if they were using contraception at the time they became pregnant.

[10] In 25 of the 47 high fertility countries, abortion is allowed only to save the life of the pregnant woman; in the rest of the countries, abortion is also allowed if it is to preserve the woman's physical or mental health.

[11] The abortion ratio is the number of pregnancies terminated through abortion over the total number of pregnancies.

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SOCIOCULTURAL FACTORS AFFECTING FERTILITY IN SUB-SAHARAN AFRICA

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A. Introduction

Today, following the path of the more developed countries, a "demographic transition" from high fertility and mortality to low fertility and mortality can be said to be under way in many of the less developed countries (LDCs). In the last 50 years, the average fertility in more developed countries has declined from 2.8 to 1.6 children per woman. Although there are considerable regional variations, average fertility in less developed countries has fallen from 6.2 to slightly less than 3 children per woman, a decline of over 3 lifetime children. Fertility has declined most quickly in Latin America and Asia, from 5.9 to 2.6 children per woman; and less rapidly in North Africa and Western Asia, from 6.6 to 3.5 children per woman. The transition is slowest in sub-Saharan Africa, where fertility declined by only one child on average, from 6.5 to 5.5 children per woman (United Nations Population Fund, 1999).

Although some countries in sub-Saharan Africa have recorded declines in fertility levels in the last three decades, certain household, kinship and community institutions that favour childbearing remain highly influential in many countries, especially in Western and Central Africa. In those countries, contraceptive prevalence rates are low (see table). As the success of contraception—the primary focus of interventions to reduce fertility—depends on an understanding of the motivations to limit family size and space births, the focus in the present analysis is on the demand for children.

The experience of demographic transition in many countries suggests three prerequisites for fertility decline: (*a*) fertility must be within the calculus of conscious choice; (*b*) effective techniques of fertility reduction must be known and available; and (*c*) reduced fertility must be perceived to be advantageous (Cleland and Wilson, 1987). The paper examines the extent to which those factors exist in sub-Saharan Africa by examining family decision-making with respect to fertility, that is, the taking of conscious deliberate choices regarding the number and timing of births.

Following the introduction, the next section of the analysis of the demand for children examines evidence from various census and survey data for the period from 1960 to 1999. Based on those data, an attempt is made to classify African countries according to their perceived progress towards demographic transition. The third section discusses models of fertility decision-making vis-à-vis certain characteristics of the African household that favour high fertility. In the fourth section, the low status of women in African societies and related factors that are associated with sustained high demand for children are reviewed.

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TABLE. TOTAL FERTILITY RATE, DESIRED FERTILITY, UNDER-FIVE MORTALITY, CONTRACEPTIVE USE
AND PROPORTION OF WOMEN MARRIED BY AGE 20 IN AFRICAN COUNTRIES, 1960-1999

Country	Source and year	Reference period	Total fertility rate	Desired fertility	Under-five mortality (per 1,000)	Contraceptive prevalence		Proportion married prevalence by exact age 20	
						Any method	Modern method	Current age 20-24	Current age 35-39
West Africa									
Benin	DS, 1961	1961	6.9	..	..	..	..	..	..
	WFS, 1981/82	1967-1971	7.0	..	..	..	..	..	..
	WFS, 1981/82	1977-1981	7.1	7.5	204	20	1	74.0	71.0
	DHS, 1996	1993-1995	6.3	5.2	167	16	3	65.4	66.9
Burkina Faso ...	NDS, 1960/61	1960/61	6.2	..	..	..	..	..	..
	Census, 1975	1969	6.4	..	..	..	..	..	..
	Census, 1985	1985	7.2	..	..	..	..	..	..
	DHS, 1993	1990-1992	6.9	5.7	187	8	4	85.6	87.1
Côte d'Ivoire ...	WFS, 1980/81	1971-1975	7.9	..	..	..	..	..	..
	WFS, 1980/81	1976-1980	7.7	8.5	162	2	0	79.0	77.0
	Census, 1988	1988	6.8	..	..	..	..	..	..
	DHS, 1994	1991-1993	5.7	5.5	150	11	4	58.3	65.4
Ghana	PES, 1960	1960	7.2	..	..	..	..	..	..
	WFS, 1979/80	1975-1979	6.5	6.1	127	10	6	72.0	72.0
	DHS, 1988	1985-1987	6.4	5.8	155	13	5	63.3	72.3
	DHS, 1993	1990-1992	5.2	4.4	119	20	10	59.7	61.3
	DHS, 1998	1995-1997	4.5	4.2	110	18	11	..	..
Liberia	Census, 1974	1967	6.8	..	..	..	..	..	..
	Census, 1984	1977	6.6	..	..	..	..	..	..
	DHS, 1986	1980-1982	7.0	..	..	..	..	..	..
	DHS, 1986	1983-1985	6.7	6.0	220	6	6	64.2	69.4
Mali	DS	1960/61	7.4	..	..	..	..	..	..
	DHS, 1987	1984-1986	7.1	6.9	250	3	1	92.6	89.5
	DHS, 1995	1992-1994	6.7	6.9	238	7	..	82.1	87.6

Country	Source	Period							
Mauritania	WFS, 1981	1962-1966	6.5	..	..	..	..	..	..
	WFS, 1981	1972-1976	7.2	..	..	..	..	..	..
	WFS, 1981	1977-1981	6.3	8.7	196	1	0	72.0	83.0
	Census, 1988	1988	6.3	..	..	..	..	..	..
Niger	DS, 1960	1960	6.9	..	..	..	..	..	..
	Census, 1977	1977	7.0	..	..	..	..	..	..
	Census, 1988	1988	7.1	..	..	..	..	..	..
	DHS, 1992	1989-1991	7.4	8.2	123	4	2	90.0	94.7
	DHS, 1998	1995-1997	..	8.2	..	..	..	..	..
Nigeria	NFS, 1973	1971-1973	7.3	..	..	..	..	..	..
	WFS, 1981/82	1980-1982	5.9	8.3	165	5	1	..	..
	DHS, 1990 (Ondo)	1983-1986	7.4	..	..	..	..	..	..
	DHS, 1990	1987-1989	6.0	5.8	192	6	4	67.6	70.1
	DHS, 1999	1985-1989	5.2	4.8	133	27	18	52.7	66.6
Senegal	WFS, 1978	1959-1963	7.8	..	..	..	..	..	..
	WFS, 1978	1974-1978	7.2	8.0	262	4	1	77.0	90.0
	DHS, 1986	1983-1985	6.4	6.8	..	5	2	69.6	85.4
	DHS, 1992	1989-1991	6.0	5.9	131	7	5	59.7	81.0
	DHS, 1997	1994-1996	5.7	5.3	139	13	8	..	..
Sierra Leone	Census, 1963	1963	7.5	..	..	..	..	..	..
	Census, 1974	1974	6.5	..	..	..	..	..	..
	Census, 1985	1985	6.4	..	..	..	..	..	..
Togo	DS, 1961	1961	7.0	..	..	..	..	..	..
	Census, 1971	1971	6.6	..	..	..	..	..	..
	Census, 1981	1981	6.0	..	..	..	..	..	..
	DHS, 1988	1985-1987	6.4	5.3	158	..	..	..	..
Central Africa									
Angola	Census, 1960	1960	6.4	..	..	..	..	..	..
	Census, 1970	1970	6.7	..	..	..	..	..	..
	Census, 1985	1983-1985	8.0	..	..	..	..	..	..
Cameroon	DS, 1962	1960-1962	4.6	..	..	..	..	..	..
	WFS, 1978	1974-1978	6.4	8.0	191	2	1	80.0	72.0
	DHS, 1991	1988-1990	5.8	6.8	126	13	4	73.1	83.1

TABLE   (continued)

Country	Source and year	Reference period	Total fertility rate	Desired fertility	Under-five mortality (per 1,000)	Contraceptive prevalence		Proportion married prevalence by exact age 20	
						Any method	Modern method	Current age 20-24	Current age 35-39
Central Africa (*cont.*)									
Central African									
Republic	NDS, 1960	1959-1960	4.9	..	..	..	..	..	..
	Census, 1975	1975	5.7	..	..	..	..	..	..
	Census, 1988	1988	6.1	..	..	..	..	..	..
	DHS, 1994	1991-1993	5.1	6.4	157	15	3	73.5	65.4
Congo	DS, 1961	1960-1961	4.8	..	..	..	..	..	..
	Census, 1974	1974	5.5	..	..	..	..	..	..
	Census, 1984	1984	6.3	..	..	..	..	..	..
Zaire	NDS, 1957	1955-1957	5.1	..	..	..	..	..	..
	Census, 1984	1984	6.7	..	..	..	..	..	..
East Africa									
Burundi	NDS, 1971	1964-1965	7.1	..	..	..	..	..	..
	NDS, 1971	1970-1971	6.1	..	..	..	..	..	..
	DHS, 1987	1983-1986	6.9	5.3	152	7	1	44.3	54.3
	DS, 1990	1990	6.6	..	..	..	..	..	..
Ethiopia	NSS, 1967	1964-1967	6.7	..	..	..	..	..	..
	NSS, 1971	1968-1971	5.8	..	..	..	..	..	..
	DS, 1981	1981	8.8	..	..	..	..	..	..
	FFS, 1990	1990	6.6	..	..	..	..	..	..
Kenya	Census, 1962	1962	6.8	..	..	..	..	..	..
	WFS, 1977/78	1975-1977	8.0	7.2	142	6	4	65.0	76.0
	DHS, 1993	1990-1992	5.4	3.7	96	33	27	46.1	66.4
Madagascar	RHS, 1962	1962	6.6	..	..	..	..	..	..
	Census, 1975	1975	6.4	..	..	..	..	..	..

	DHS, 1992	1989-1991	6.1	5.5	163	17	5	54.1	65.1
	DHS, 1997	1994-1996	6.0	5.3	..	..	..	..	..
Malawi	PCS, 1972	1971-1972	7.9	..	..	..	..	..	..
	NDS, 1982	1982	7.6	..	..	..	..	..	..
	DHS, 1992	1989-1991	6.7	5.1	234	22	14	76.6	65.9
Mozambique ...	Census, 1970	1970	6.2	..	..	..	..	..	..
	Census, 1980	1980	6.2	..	..	..	..	..	..
	DHS, 1992	1994-1996	5.8	5.9	..	6	5	..	..
Rwanda	NDS, 1970	1970	7.8	..	..	..	..	..	..
	NDS, 1983	1983	8.5	..	..	..	..	..	..
	DHS, 1992	1989-1991	6.2	4.2	150	21	13	35.1	49.9
Uganda	Census, 1969	1969	6.8	..	..	..	..	..	..
	DHS, 1988/89	1986-1988	7.4	6.5	180	5	3	72.9	80.2
	DHS, 1995	1992-1994	6.9	5.3	147	15	8	74.7	76.0
United Republic of Tanzania ...	Census, 1967	1967	7.2	..	..	..	..	..	..
	Census, 1988	1988	6.5	..	..	..	..	..	..
	DHS, 1991/92	1990-1992	6.3	6.1	141	10	7	61.0	74.3
	DHS, 1996	1993-1995	5.8	5.5	137	18	13	60.3	70.4
Southern Africa									
Botswana	Census, 1971	1971	6.6	..	..	..	..	..	..
	Census, 1981	1981	7.1	..	..	..	..	..	..
	DHS, 1988	1984-1987	4.9	4.7	53	33	32	18.7	34.2
South Africa (black population)	Census, 1960	1960	6.4	..	..	..	..	..	..
	Census, 1970	1970	5.8	..	..	..	..	..	..
	Census, 1980	1980	5.4	..	..	..	..	..	..
	DHS, 1989	1986-1988	4.6	..	..	..	..	..	..
	DHS, 1994	1991-1993	3.3	..	..	..	..	..	..
Swaziland	Census, 1966	1966	6.9	..	..	..	..	..	..
	Census, 1976	1976	5.7	..	..	..	..	..	..
	Census, 1986	1986	5.1	..	..	..	..	..	..
	FHS, 1988	1988	5.0	..	..	..	..	..	..

Country	Source and year	Reference period	Total fertility rate	Desired fertility	Under-five mortality (per 1,000)	Contraceptive prevalence		Proportion married prevalence by exact age 20	
						Any method	Modern method	Current age 20-24	Current age 35-39
Southern Africa *(cont.)*									
Zambia	Census, 1969	1969	6.9	..	..	..	..	..	..
	Census, 1980	1980	7.4	..	..	..	..	..	..
	DHS, 1992	1989-1991	6.5	5.8	191	14	9	63.6	82.7
	DHS, 1996	1993-1995	6.1	5.3	197	26	14	64.3	80.4
Zimbabwe	Census, 1969	1969	8.3	..	..	..	..	..	..
	Census, 1982	1982	7.1	..	..	..	..	..	..
	DHS, 1992	1985-1987	5.5	4.9	75	43	36	53.1	62.1
	DHS, 1994	1991-1993	4.3	4.3	77	48	42	51.7	65.0
North Africa									
Egypt	WFS, 1980	1976-1980	5.3	4.1	191	24	23	54.0	76.0
	DHS, 1988	1985-1987	4.5	2.9	102	38	36	45.1	63.1
	DHS, 1992	1989-1991	3.9	2.9	85	47	45	..	..
	DHS, 1995	1992-1994	3.6	2.9	81	48	46	..	..
Morocco	WFS, 1980	1976-1980	5.9	5.0	142	18	16	53.0	85.0
	DHS, 1987	1984-1986	4.8	3.7	102	36	29	..	..
	DHS, 1992	1989-1991	4.0	3.4	76	42	36	31.4	56.2
	DHS, 1995	1992-1994	3.3	..	80	50	42	..	..
Tunisia	WFS, 1978	1974-1978	5.9	4.2	107	32	25	29.0	61.0
	DHS, 1988	1985-1987	4.2	3.5	65	50	40	20.8	43.6

Sources: Cohen (1993, 1998); United Nations (1987); Westoff, Blanc and Nyblade (1994); Mboup and Saha (1998); International Statistical Institute (1984); and Feyistan (2000).

NOTES: DHS=Demographic and Health Survey; WFS=World Fertility Survey; DS=Demographic Survey; FHS=Family Health Survey;
NDS=National Demographic Survey; PES=Post-enumeration Survey; NFS=National Fertility Survey;
NSS=National Sample Survey; FFS=Family and Fertility Survey; RHS = Rural Household Sample Survey;
PCS=Population Change Survey
Two dots (..)=Data not available

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Increased availability of demographic survey data in Africa has made assessments of fertility and mortality trends feasible. The table depicts trends in the total fertility rate (TFR), desired fertility, under-five mortality, contraceptive use and proportion of women married by age 20 for African countries that have data at some point during the period 1960-1999. The data are drawn from various sources including censuses, World Fertility Surveys (WFS) and Demographic and Health Surveys (DHS).[1] Owing to variations in data sources, procedures to estimate TFR include the stable population model, P/F ratios and the relational Gompertz model.[2] However, it is necessary to sound a note of caution about data quality. Given variations that are bound to exist in the quality of data from different sources, fertility trends in some countries appear more erratic than they truly are (Cohen, 1993).

Although the evidence from the data presented in the table is fragmentary and of varying quality, there is still enough to provide a rough picture. The total fertility rate and desired fertility[3] provide evidence of an incipient demographic transition in some sub-Saharan African countries. The situation in those countries contrasts sharply with what is observed in numerous other countries, where fertility appears to have stagnated at high levels or is even tending to increase.

1. *Country categorization*

Using data depicted in the table, all African countries can be grouped into three categories according to their position on a demographic transition continuum.[4] Countries whose data demonstrate apparent support for a demographic transition from high to much lower fertility levels are placed in category I. Their selection is based on three criteria: whether or not the country recorded (*a*) marked and continuous fertility decline from an initial peak over time (or stagnation at much lower levels); (*b*) levels of desired fertility that are generally lower than current fertility; and (*c*) substantial increase, over the observation period, in contraceptive prevalence (modern methods). The following countries meet all three criteria and are in category I: Botswana, Côte d'Ivoire, Egypt, Ghana, Kenya, Morocco, Nigeria, Rwanda, Tunisia, Zambia and Zimbabwe.

The countries that are grouped in category II are those that have recorded small declines in the TFR (between 0.5 and 0.9 every 10 years of observation). The category II countries are Benin, Cameroon, the Central African Republic, Malawi, Mauritania, Senegal, Swaziland and the United Republic of Tanzania.

Countries in which fertility levels appear to have stabilized around a peak (TFR approximately 6 children per woman or more) fall into category III. Those countries are Burkina Faso, Burundi, Ethiopia, Liberia, Madagascar, Mali, Mozambique, Togo and Uganda. Other countries in this category include Angola, the Congo, the Democratic Republic of the Congo and the Niger, in which there was an apparent increase in the TFR during the period for which data are available. Countries in category III can be said not to have begun a demographic transition.

Given these apparent differentials in fertility levels, in age at first marriage (shown in the table in terms of proportions of women married by exact age 20) and in contraceptive prevalence, two tentative conclusions can be drawn. First, the observed decline in achieved fertility in the 11 category I countries has resulted primarily from deliberate fertility control to have smaller family sizes—evidence that the concept of "family size ideation" is beginning to take hold. Second, in many other African countries, especially those in category III, fertility decisions are apparently still considered as outside the realm of individual choice. [5]

2. *Factors associated with fertility decline*

Several factors account for declining fertility in the countries in category I, the countries in which "family size ideation" has taken root. These include a reduction in under-five mortality rates, increased contraceptive prevalence, especially the use of modern methods and a decrease in age at first marriage.[6]

The theoretical link between child mortality and fertility is that increases in child survival chances facilitate a corresponding decline in the propensity to "hoard" or "replace", known mechanisms used by couples to ensure that they obtain desired family size. Estimates of under-five mortality in the table show that the countries in category I have witnessed significant declines in under-five mortality during the period under review. In consequence, under-five mortality rates are relatively lower in category I countries than in those in categories II and III.

It is important to note that countries in category I have experienced substantial increases in contraceptive prevalence rates, as shown in the table under "contraceptive use: any method". Findings from several studies confirm that use of contraception, particularly of modern methods, plays a significant role in the transition from high to low fertility levels (Bongaarts, Frank and Lesthaege, 1984; Westoff, 1990; Ross and Frakenberg, 1993).

Drawing on Bongaarts's framework (Bongaarts, 1982), the fertility-inhibiting effect of age at marriage is significant in African countries (Jolly and Gribble, 1993; Adlakha, Ayad and Kumar, 1991). Evidence of a trend towards later age at marriage is presented in the table by differences in the proportion of women who were married by exact age 20 across two cohorts of women (ages 20-24 and 35-39 at the time of the survey). It is no coincidence that the countries in the first group, which show evidence of declining fertility, have also recorded delays in age at marriage.

C. THE AFRICAN HOUSEHOLD VIS-À-VIS MODELS OF FERTILITY DECISION-MAKING

1. *Characteristics of the African household*

Despite some regional variations, several generalizations can be made about African households: (*a*) they are mostly rural; (*b*) they are mostly patriarchal and hierarchical; (*c*) they give great emphasis to perpetuation of

the lineage; (*d*) they are frequently polygynous; and (*e*) they are not nuclear, but rather embrace kinship networks. These characteristics of the African household affect individuals' perceptions of the possibility and desirability (advantageousness) of decision-making with respect to fertility. The social organization of households, especially the place of women within them, tends to inhibit conscious, deliberate choices regarding the number and timing of births.

It is especially important to appreciate that this African household is very much at odds with the typical household in demographers' models of fertility decision-making. The economic theory of fertility that is applied in demography assumes that husbands and wives, acting as a unit, weigh the costs and benefits of children against the costs of other competing goods and subsequently arrive at a desired family size that reflects their interest (Becker, 1960). This conjugal household, with its pooled resources and shared responsibilities, is the one that is viewed as the primary locus of reproductive decision-making. If this were so, then it should be easy to offer couples sufficient incentives to make them prefer smaller family sizes. In most African households, however, couples are more likely to have different interests with regard to fertility and other issues. Decision-making about children is more likely to be predicated on family status and considerations for the preservation of lineage as well as on respect for ancestors. According to some traditional beliefs, ancestors are reincarnated through additional births (Makinwa-Adebusoye and Ebigbola, 1992; National Research Council, 1993).

2. *Theories of fertility*

Since the economic theory of fertility—with its assumptions based on urbanized and industrialized Western countries—does not conform to African reality, Caldwell (1977) has put forth the "wealth-flows theory". Caldwell argues that the intergenerational transfer of wealth, assumed usually from children to parents, is a major determinant of high fertility. This theory addresses the rural nature of most African households and argues that, in a predominantly subsistence agricultural (rural) economy such as that prevailing in most sub-Saharan African countries, large families constitute family assets. However, some studies have shown that wealth flows have little effect on childbearing. In fact, increasing costs of children to their parents are beginning to outweigh any material benefits, to the extent of favouring reduced fertility desires (Makinwa-Adebusoye, 1994).

Observing other aspects of the African household, Fapohunda and Todaro (1988) have suggested the "transactions framework", which places the locus of reproductive decision-making at the individual rather than at the household level. The framework explicitly incorporates the concept of spousal separateness. It is not an uncommon phenomenon in African societies with polygynous households for husbands and wives to belong to the same household, but to operate with separate incomes and have distinct economic responsibilities and interests with regard to child-rearing and issues of resource allocation in general.

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3. *Polygamy, lineage and kinship networks*

The effect of polygamy on fertility is complex. By definition, each poly-gynous household has at least two wives. For instance, data from the Nigerian DHS (National Population Commission, 2000) reveal that 17.2 per cent of households have two or more co-wives and that 35.7 per cent of all currently married women are in polygynous households. In other words, a much larger percentage of women are in polygynous households than there are polygynous households. Another consequence of polygamy is that women marry at a very early age. As men take several wives, this puts pressure on the supply of girls (since the numbers of males and females are about the same). The pressure to have more than one wife leads older men to recruit young girls into marriage, thereby increasing the likelihood of women marrying polygynously to be with-drawn from school and to marry at an early age. As indicated in the table, the proportion of women married by age 20 is as high as 82 per cent in Mali and 90 per cent in the Niger; both countries have high fertility.

Another characteristic of the African household that has direct bearing on the demand for children is its perceived durability or perpetuity. It is generally accepted that the lineage does not die; members die and are replaced through births. Consequently, fertility levels must remain higher than mortality levels if the lineage is not ultimately to disappear. Considerable expansion of member-ship enhances the power and prestige of the lineage and reduces the likelihood of extinction through death. In addition, enormous weight is given to family continuity because each new birth in the lineage is regarded as providing a vehicle for the return of an ancestor. Hence, to prevent a birth is viewed as tantamount to consigning an ancestor to oblivion (Bleek, 1987; Makinwa-Adebusoye and Ebigbola, 1992; National Research Council, 1993; Caldwell and Caldwell, 1987).

Desire to perpetuate the lineage results in large kinship networks. The existence of kinship networks ensures that biological parents often receive economic assistance from close kin through child fostering (Isiugo-Abanihe, 1985; Bledsoe and Isiugo-Abanihe, 1989). The resulting differentials in costs of children compared to a conjugal pair may lead to differences in the demand for children and fertility levels.

D. LOW STATUS OF WOMEN

The extent to which women enjoy any decision-making is powerfully shaped by social institutions (Mason, 1984). The patriarchal, hierarchical and polygynous organization of many African households tends to perpetuate the low status of women in African societies. In such households, most women cannot exert much, if any, control over their lives in the families within which they live. Early marriage, patrilocal residence after marriage and polygynous unions are institutions that perpetuate women's subordinate position and make them generally voiceless and powerless in matters affecting their reproduction. Upon marriage, a woman assumes a low status relative to all members of her husband's extended family. Her status is usually elevated by attainment of high fertility, though it can sometimes be elevated by high educational attainment

or ownership and control of substantial resources (Makinwa-Adebusoye and Ebigbola, 1992). Women are disadvantaged in matters of inheritance and succession and suffer considerable disadvantages with respect to education and access to resources in general. In fact, the bottom line is that women and their children are the legal property of the husband (Aguda, 1992).

Learning from the Changing African Family Project in Nigeria, Caldwell and Caldwell (1987) advanced the argument that men and their lineages rule over reproduction and decide on matters of family size in Nigeria, and elsewhere in Africa. Although no study has directly evaluated this hypothesis with empirical data, the view continues to persist that men are the dominant decision makers on fertility matters in Africa (Makinwa-Adebusoye, 1995). Several studies show that women's subordinate status underlies low contraceptive prevalence and high fertility in Africa. On this point, a number of studies emanated from a 1991 survey of women's status and fertility in Nigeria, which collected data on married couples among five ethnic groups (Hausa, Ibo, Yoruba, Ijaw and Kanuri), and looked at several dimensions of women's decision-making, spousal communication and spousal agreement on the desire for more children and the wife's say in family planning (Kritz and Makinwa-Adebusoye, 1994, 1995 and 1999; Kritz, Makinwa-Adebusoye and Gurak, 2000; Makinwa-Adebusoye and Jensen, 1995; Makinwa-Adebusoye and Kritz, 1997). The studies confirm that the levels of women's decision-making and spousal communication and agreement in reproductive matters vary sharply across ethnic groups and appear to be related to women's status in their respective societies. For instance, spouses from groups in which women's status is lowest (the Kanuri and the Hausa) have higher levels of disagreement on fertility desires than those from ethnic groups in which women's status is higher (Yoruba, Ibo and Ijaw). Moreover, higher levels of decision-making and joint decision-making are recorded among the Yoruba, Ibo and Ijaw in contrast with the Kanuri. Overall, women's disadvantaged status in terms of education, legal rights and inheritance rights reinforces the placement of very great value on high fertility in African societies.

E. CONCLUSIONS

Sub-Saharan Africa is primarily rural, and its highly gender-stratified cultures are very supportive of high fertility. Indeed, pronatalist institutions—notably patrilineal descent, patrilocal residence, inheritance and succession practices, and hierarchical relations—have remained unchanged for generations. This situation has given rise to the widely canvassed viewpoint in the demographic literature on sub-Saharan Africa (Caldwell and Caldwell, 1987; Caldwell and Caldwell, 1990; Frank and McNicoll, 1987) that the pronatalist institutions are so deeply entrenched that they are immutable and likely to remain unresponsive to modern innovations. Implicit in this perspective is the notion that, owing to these entrenched props of high fertility, African countries might not join in the fertility transition already noticeable in other less developed regions. However, data from recent fertility and health surveys do not support this viewpoint. The table provides substantial evidence that a revolution has occurred in reproductive behaviour in Africa over the last three

decades and that fertility decline, which has begun in several countries, may continue across the region.

On the one hand, as previously mentioned, there are many category III countries, ranking lowest on the demographic transition continuum, where individuals appear to have limited recognition that fertility is within one's control. The fact that "ideation of family size preferences" is a concept that has been slow to take hold in these countries is evidenced by apparent increases in fertility and low contraceptive prevalence. The reasons for this may not be unconnected with the persistence of pronatalist societal structures. In addition, high fertility is also connected with pervasive extreme poverty, which engenders general insecurity, especially the insecurity people feel over the survival of their children. In such situations, high fertility is perceived as a rational response.

On the other hand, there are the category I countries that have commenced a seemingly irreversible transition from high to low fertility levels. As the continent is undergoing profound socio-economic changes, fertility decline may occur more rapidly than would otherwise be expected. Makinwa-Adebusoye and Feyisetan (1994) demonstrate this in a study based on Nigeria's 1990 DHS data. Findings reveal an onset of fertility decline among all subgroups of the Nigerian population: rural, urban, educated and non-educated, irrespective of geopolitical location. The lower national TFR of 5.2 recorded in the most recent 1999 Nigerian DHS confirms the trend suggested by the earlier study.

Fertility decline in category I countries strongly suggests that the time has come to qualify the notion that sub-Saharan Africa, as a region, is different from the rest of the world. In this regard, the example of Nigeria is worth noting. The moderate fertility decline in the last decade has occurred in a period during which the country has suffered a severe economic recession resulting in considerable deterioration in the quality of life. The generalized notion that sub-Saharan Africa is unique in its support for large family sizes as a result of its deep-seated and seemingly immutable social organization is no longer valid. In fact, available empirical evidence supports the opposite viewpoint: sociocultural forms, which hitherto sustained high fertility, can give way and are being redefined to accommodate the small family size ideal in the face of new social and economic imperatives. Hence, the need for a paradigm shift to women's empowerment along with the related goals of improving women's reproductive health and securing their own reproductive rights.

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[1] Several scholars have examined the quality of WFS and DHS data. Studies by Makinwa-Adebusoye and Feyisetan (1994), Blanc and Rutenberg (1990), Arnold (1990), Arnold and Blanc (1990), United Nations (1987), Chidambaram and Sathar (1984) and Chidambaram, Cleland and Verma (1980) have noted the limitations of DHS and WFS data with respect to the estimation of levels and trends in fertility. Inaccuracies result from (intentional or unintentional) age misreporting, underreporting of births, inaccurate dating of births and its consequent displacements of births, and age heaping. However, WFS and DHS data have been noted to be comparable in their basic features in several countries. In the present paper, conclusions from available data involve considerations of data quality, but the paper does not attempt data assessment.

[2] See Cohen (1993) for more details on data sources and procedures of estimation.

[3] Estimates of desired fertility, or desired lifetime number of children, are available only for countries that have participated in the WFS or DHS programmes and that have data for two or more points of observation.

[4] Categorization is necessarily subjective in view of variations in the source and quality of data.

[5] Cleland and Wilson (1987) argue that the idea that fertility as a variable over which an individual has control is the most important factor explaining fertility decline.

[6] Since the central focus of this paper is on socio-economic factors associated with sustained high fertility, consideration of fertility decline is limited to analysis of data presented in the table.

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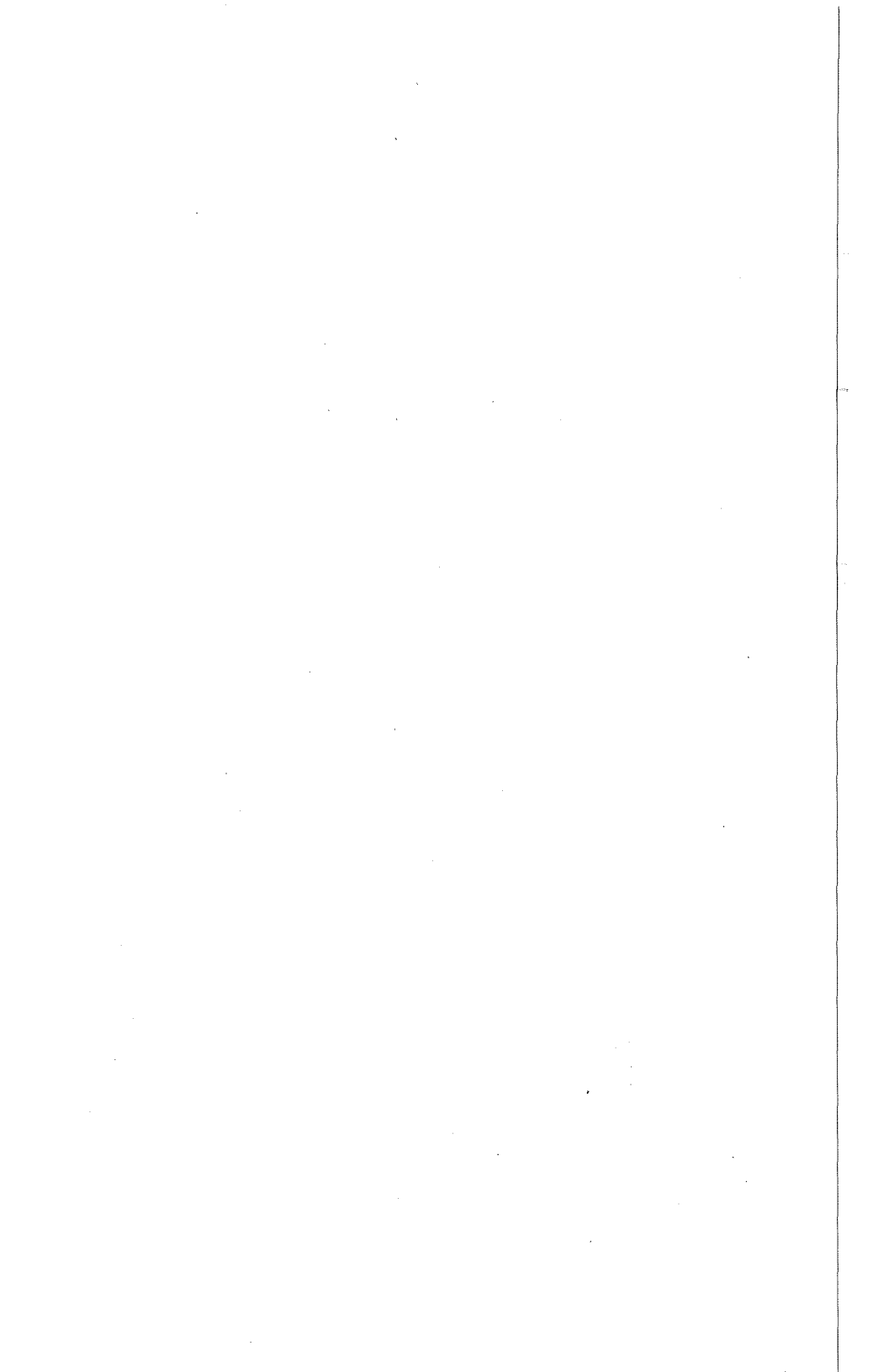
IMPACT OF THE PROXIMATE DETERMINANTS ON THE FUTURE COURSE OF FERTILITY IN SUB-SAHARAN AFRICA

Jean-Pierre Guengant and John F. May***

In contrast to what is now observed in most regions of the world, fertility remains very high in sub-Saharan Africa. Although the onset of fertility decline occurred in several sub-Saharan African countries in the 1990s (Cohen, 1998; Kirk and Pillet, 1998), the magnitude, pace and durability of these declines are not well established. In addition, out of the 49 countries in the region, fertility transition has not started in 14 countries (i.e., in one out of three). Therefore, it cannot be taken for granted that over the next fifty years or so all sub-Saharan countries will catch up with the low levels of fertility experienced today in the rest of the world. In parallel to this tentative fertility transition, the gains in mortality reduction obtained during the past decades are currently threatened and in some cases reversed in 35 countries in the region (i.e., in two out of three) that are considered as "highly affected" by the human immunodeficiency virus/ acquired immunodeficiency syndrome (HIV/AIDS) epidemic (United Nations, 2001). This could also delay, and will probably modify, the smooth completion of fertility transition in sub-Saharan Africa.

The present paper contends that fertility decline in sub-Saharan Africa will not necessarily be as rapid as has been experienced elsewhere in the world. It also argues that in Africa fertility levels will become much more contrasted and diverse across the subregions than is currently assumed (the analysis is conducted for four subregions: Eastern, Middle, Southern and Western Africa). Fertility levels depend on a variety of factors, usually grouped into "proximate determinants" and "intermediate determinants". The latter (i.e., education levels, status of women, rates of employment, health systems etc.) are currently far from favourable in sub-Saharan Africa (see, for instance, Lloyd, Kaufman and Hewett, 2000), although it could be argued that accelerated urbanization will reinforce attitudes towards fertility reduction. Nonetheless, it is particularly difficult to predict whether the major improvements in the social and economic environment that have helped to trigger rapid fertility declines in other parts of the world will occur in most countries of sub-Saharan Africa in the decades to come. For that reason, the paper focuses on the proximate

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determinants of fertility and assesses, mainly from that perspective, the future prospects for fertility decline in sub-Saharan Africa.

The paper will first review the various factors that explain the present high fertility levels and current low levels of contraceptive use in sub-Saharan Africa. Thereafter, various fertility and proximate determinant scenarios using the FAMPLAN model (Stover and Heaton, 1999) will be examined. Finally, other factors (also linked to the proximate determinants) that might influence future fertility trends in sub-Saharan Africa, including the HIV/AIDS epidemic, will be considered.

A. THE CHALLENGE OF FERTILITY DECLINE IN AFRICA

Data available at the end of the year 2000 from demographic surveys offer fairly comprehensive information on contraceptive use in sub-Saharan Africa (United Nations, 2000; United States Bureau of the Census, 2000). Data are available for 39 countries, which account for about 90 per cent of the total population of the region. Moreover, much of this data is quite recent: 24 surveys were undertaken between 1995 and 1999, which yields 1995 as the year of reference for the data, and only four sources refer to the late 1980s. Data are scarce for Middle Africa, however, and only 4 countries (out of 9 in that subregion) could be included in the analysis (see table A.1 in annex).

For the four subregions of sub-Saharan Africa, table 1 aggregates contraceptive prevalence, which is the percentage of married women of reproductive age (15-49 years) who are currently using (or whose partners are using) a contraceptive method. Data used here generally refer to "women in union", who are women both formally married and in informal unions; the limitations of this definition (United Nations, 2000) are explored below. The data show that the overall use of contraception is very low. Detailed results presented in the annex (table A.1) indicate that in only 9 countries in sub-Saharan Africa does the use of contraception exceed 25 per cent of women in union. The use of modern methods is even lower, reflecting the importance of traditional and folk methods in most countries.

TABLE 1. PERCENTAGE OF WOMEN OF REPRODUCTIVE AGE (15-49 YEARS) CURRENTLY IN UNION, USING A CONTRACEPTIVE METHOD, BY SUBREGION[a]

Subregion (number of countries considered/total)	Average year	Population in 2000		Contraceptive prevalence			Weight of traditional and other methods
		(Thousands)	(Per cent)	Clinic or supply method	Traditional and others	Any method	
Eastern Africa (16/18)	1995	250 318	38.5	13.0	5.1	18.2	28.2
Middle Africa (4/9)	1995	95 404	14.7	3.0	6.9	9.9	70.1
Southern Africa (5/5)	1992	49 567	7.6	45.6	1.5	47.1	3.2
Western Africa (14/16)	1995	224 183	34.5	5.1	4.4	9.4	46.4
Sub-Saharan Africa[a]		650 566	100.0	11.0	4.7	15.7	29.8

Sources: United Nations (2001); United Nations 2000; and United States Bureau of the Census (2000), table 55.

[a] Weighted average according to population of the countries considered and total for subregion.

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Another striking feature is the major differences found between the four subregions. First, contraceptive use among women in union varies from nearly 50 per cent for Southern Africa as a whole to less than 10 per cent in Middle and Western Africa. Second, in the two latter subregions, traditional and folk methods represent 70 per cent and 46 per cent of all methods used respectively. The poor efficiency of most of these methods raises several questions. Could the widespread use of traditional and folk contraceptive methods be taken as an indicator of an emerging demand for family planning services, a demand that at present cannot be satisfied by the organized, health/clinic supply sector? Or is this phenomenon the result of generalized defiance of clinic supplied methods? One might also assume that the widespread recourse to traditional and folk contraceptive methods is consistent with the desire for a large family, associated with adequate spacing between births. Consequently, the well-known failures of traditional and folk methods would not be considered a problem by the women since they have "tried" to space their children, but divine or other forces have decided otherwise.

Recent survey results also make it possible to ascertain the slow growth in contraceptive use in sub-Saharan Africa for the recent period (table 2). Data are available for 25 countries, representing about 70 per cent of the total population of the region, over an average period of ten years covering in most cases the late 1980s and the 1990s. It is interesting to note that about two thirds of the countries reviewed have registered an annual growth in contraceptive use of less than one percentage point (see table A.2 in annex). This is true for the use of all methods taken together as well as for clinic or supply methods. Again, the differences between the four subregions are striking. For all methods, the increases in contraceptive use for Southern and Eastern Africa are slightly above one percentage point per year, whereas it is around half a percentage point for Western Africa and for Cameroon (the only country here representing Middle Africa). The average for sub-Saharan Africa as a whole is quite modest both for all the methods taken together and for the clinic or supply methods only (0.8 and 0.7 percentage points respectively).

TABLE 2. ANNUAL CHANGE (GROWTH IN PERCENTAGE POINTS) IN CURRENT USE OF CONTRACEPTION AMONG WOMEN OF REPRODUCTIVE AGE CURRENTLY IN UNION, BY PERIOD AND BY SUBREGION[a]

Subregion (number of countries considered/total)	Average date		Per cent of total population (2000)	Annual change (percentage)		Per cent of total population considered
	Earlier survey	Later survey		Clinic or supply method	Any method	
Eastern Africa (9/18)	1987	1997	38.5	1.1	1.3	59.2
Middle Africa (1/9)	1991	1998	14.7	0.4	0.5	15.6
Southern Africa (4/5)	1982	1992	7.6	1.1	1.0	98.1
Western Africa (10/16)	1988	1996	34.5	0.4	0.4	91.8
Sub-Saharan Africa[a]	1987	1996	100.0	0.7	0.8	69.0

Sources: United Nations (2001); United Nations (2000); and United States Bureau of the Census (2000), table 55.

[a]Weighted average according to population of the countries considered and total for subregion.

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As to the levels of fertility, it is important to note that higher estimates of fertility (which correspond to the slowest, and slower than expected, growth rates in contraceptive use reviewed above) have been incorporated in the *2000 Revision of World Population Prospects* (United Nations, 2001). As a result, the fertility levels estimated for the period 1995 to 2000 are quite different, and for a number of countries significantly higher, than those previously used in the United Nations population projections (1994, 1996 and 1998 *Revisions*). In addition, for those countries that until 2000 experienced no fertility reduction or only an incipient decline—the high fertility countries—the medium fertility assumption posits a fertility decline at an average of one child per decade starting in 2005 or later. Consequently, the total fertility rate (TFR) in 13 sub-Saharan countries is projected to remain above 2.1 children per woman by the end of the projection period, 2045 to 2050 (see table A.3 in annex). In the previous revisions, projected fertility levels were set to reach 2.1 children per woman in the 2030s in most cases.

From the above data, it is clear that fertility remains very high in most sub-Saharan African countries. For the period 1995 to 2000, 37 of the 47 countries considered (nearly 4 out of 5) had a TFR above 5 children per woman, and half had a rate above 6 children. The contrasts are apparent again, if one looks at the different subregions (table 3). For the period 1995 to 2000, the TFRs of the Eastern, Middle and Western subregions were estimated to be at least 6 children per woman. For Middle Africa, the current estimate of 6.4 is above the level ascertained for the period 1950 to 1955. For Eastern and Western Africa, current estimates at around 6 children per woman are nearly one child less than the levels in 1950 to 1955. Finally, only Southern Africa exhibits a current relatively low estimate: 3.3 children per woman (about half of the 1950-1955 level), reflecting a fertility transition process that is well under way.

Current fertility levels are correlated with the levels of contraceptive use, which are to a large extent the results of the efforts of family planning programmes carried out in each country. Cross-national family planning programme effort scores were established in 1982, and measured again in 1989, 1994 and 1999 (Ross and Mauldin, 1996; Ross, Stover and Willard, 1999; Ross and Stover, 2001). These effort scores consist of 30 indices, derived from questionnaires comprising a large number of items. The effort scores are grouped in four components or dimensions: (1) policies and stage-setting activities;

TABLE 3.   ESTIMATED PAST (1950-1955), PRESENT (1995-2000) AND FUTURE (2045-2050) TOTAL FERTILITY RATES IN SUB-SAHARAN AFRICA, BY SUBREGION

Subregion *(number of countries considered/total)*	*Total fertility rate*		
	1950-1955	*1995-2000*	*2045-2050*
Eastern Africa (17/18)	6.92	6.09	2.51
Middle Africa (8/9)	5.91	6.41	2.46
Southern Africa (5/5)	6.45	3.29	2.10
Western Africa (16/16)	6.85	5.95	2.36
Sub-Saharan Africa	6.68	5.77	2.42

Source: United Nations (2001).

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(2) service and service-related activities; (3) record-keeping and evaluation; and (4) availability of contraceptive supply and services. The present paper focuses mainly on the 1994 round, which is the closest in time to the average year of the data presented (i.e., 1995).

According to the analysis, the family planning programme effort scores in 1994 ranged from modest to mediocre in most of the 30 sub-Saharan countries for which they were established (see table A.4 in annex). Indeed, the overall programme effort score, expressed as a proportion of the maximum attainable of 100 per cent, was below the 50 per cent mark for 22 countries (about three quarters of all countries), reflecting less than expected or acceptable efforts geared at family planning programmes. Interestingly enough, sub-Saharan Africa scores much better for "policies and stage-setting activities" than for the other components. Whereas 22 of the 30 countries were above the 50 per cent mark for policies and stage-setting activities, this was the case for only 7, 11 and 6 countries for the other three components, respectively. Thus, even though in most countries some degree of commitment does exist (through leaders' statements, enactment of population policies, adoption of laws and regulations favouring imports and/or advertisement of contraceptives, etc.), in only a handful of countries are the services actually offered, the programmes adequately monitored and contraceptives readily available. The successful countries belong to Southern Africa, with the exception of Lesotho. In Middle and Western Africa, no country achieved combined "service" and "availability" effort scores above 50 per cent in 1994. The same was true for most of Eastern Africa, with the exception of Kenya, Mauritius and Zimbabwe.

The most recent effort scores, prepared for 1999 for 31 sub-Saharan countries, reflect many fewer countries with scores below the 50 per cent mark for the overall programme effort score (only 12 countries out of the 31 surveyed). This latest round also demonstrates that both service delivery and evaluation have improved markedly (explaining the better overall scores) while availability of services remains poor (only 6 countries scored above the 50 per cent mark, the same number as in 1994). Finally, Ghana has joined the group of strong performers (namely, countries that score above 50 per cent for combined "service" and "availability"), the first country in Western Africa to do so (Ross and Stover, 2001).

The limited availability and accessibility of contraceptive services and commodities, and the associated poor quality of family planning activities that are service-related, must be put into perspective with the poor social settings but also with the relatively low demand for family planning services prevailing in most sub-Saharan countries. Although unmet need for family planning is important in the region as a whole, when one adds up current contraceptive use and unmet need, the estimated total demand obtained is often only around 50 or 60 per cent of women in union. These figures are noticeably lower than those found in other parts of the world, where the total demand among women in union generally reaches 70 or 80 per cent, and sometimes more. The lower sub-Saharan demand is probably a consequence of the fact that the need for family planning in this region is more for birth spacing than for limiting, which is associated with high numbers of desired children as expressed by

African women in many surveys (Feyisetan and Casterline, 2000). Various cultural, social, and economic factors lie behind these preferences. One may argue that the demand for limiting will grow as the use of contraception rises and will eventually exceed the demand for spacing (Moreland and Guengant, 1994). As a result of this process, the average number of desired children will decrease, in particular in countries where information, education, and communication (IEC) programmes are implemented to stress the health and socio-economic benefits of family planning and promote smaller family size. However, for a variety of reasons (desire to conform to traditional values, fear of being criticized by religious and other opponents to family planning, etc.), government officials, population policy leaders, health personnel and the media continue to put an exclusive emphasis on spacing and sometimes even condemn family planning for "limiting reasons". This could be viewed as a denial of the resolutions on freedom of informed consent and choice that have been adopted by most African Governments at numerous international conferences.

B.   THE IMPACT OF THE PROXIMATE DETERMINANTS OF FERTILITY

In order to further analyse the preceding findings, the authors tried to evaluate the impact of the proximate determinants on the future course of fertility in sub-Saharan Africa by using the FAMPLAN computer programme developed at the Futures Group International (Stover and Heaton, 1999). Based on the Bongaarts model (Bongaarts, 1978), and starting from a classic cohort-component demographic projection, FAMPLAN enables an evaluation of the relationships between total fertility rates and the proximate determinants of fertility (percentage of women in union, contraceptive use, post-partum insusceptibility, abortion and pathological sterility). The model further considers contraceptive use in terms of the average effectiveness resulting from the method mix (i.e., the percentage of all users according to the method they use). For each method, effectiveness is based on the proportion of users who do not become pregnant during a year of method use, on a scale ranging from one if no users become pregnant to zero if all users become pregnant.

The calculations, both those pertaining to the demographic projections and the analysis of the proximate determinants of fertility, were run for each of the four subregions of sub-Saharan Africa, under various assumptions. It should be noted that the objective of this exercise was not to produce another set of projections nor to give new estimates of future fertility levels, but simply to get a better understanding of the individual and combined impacts of the various factors at work in shaping the future fertility levels in each of the subregions. The values, by the year 2000, of the various parameters used in these projections are presented in table 4. The limitations both in terms of definition and of quality of data of these parameters must be kept in mind.

First, given the low contraceptive prevalence and the importance of traditional methods in sub-Saharan Africa, the estimated contraceptive prevalence rate by 2000 should not be taken at face value. Potential sources of error include sampling variability and the inherently greater difficulty in obtaining accurate and consistent measurement of use of traditional methods, which

affects the percentage distribution of users by method, or method mix (United Nations, 2000). This in turn has an impact on the estimated average effectiveness of contraceptive use on fertility. It should be pointed out, however, that method effectiveness varies according to each method, country and context. A recent review of studies on the subject found that while failure rates for injectables were nearly zero, failure rates ranged from about 4 to 20 per cent for the pill, 1 to 8 per cent for the intrauterine device, and 11 to 40 per cent for barrier methods (Stover and Heaton, 1999). Furthermore, the effectiveness of condom use is deemed lower in developing countries than in developed ones. Finally, there are large variations in the effectiveness of traditional and folk methods, depending on the methods and the cultural context. However, in order to evaluate the impact of a given method mix on fertility, it is necessary to specify an effectiveness rate for each method. Therefore, the authors used the "default" values based on the existing literature and proposed in FAMPLAN (see table 4). Despite the inexact nature of certain of these default assumptions, especially for the traditional and folk methods, it is clear that the method mix of Southern Africa, where nearly two thirds of the methods used have an effectiveness close to one, has a much greater inhibiting impact on fertility than the method mix estimated for Middle Africa, where three quarters of the methods used were "traditional and folk methods", for which effectiveness is far from one.

The percentages of women in union for each region by 2000 were taken from United Nations estimates (United Nations, 2000). These data generally

TABLE 4. PARAMETERS USED FOR RUNNING THE FAMPLAN MODEL FOR ESTIMATING THE RELATIONSHIPS BETWEEN TOTAL FERTILITY RATES AND THE PROXIMATE DETERMINANTS OF FERTILITY IN SUB-SAHARAN AFRICA, BY REGION

	Eastern Africa	Middle Africa	Southern Africa	Western Africa
Total fertility rate, 2000	5.96	6.37	3.16	5.76
Contraceptive prevalence (2000)				
Any method	20.0	10.0	55.0	12.0
Modern method	14.0	2.6	53.4	6.2
Method mix (2000) ....**Effectiveness**				
Sterilization (female) .... (1.00)	10	4	16	4
Sterilization (male) .... (1.00)	..	1	3	..
Pill .... (0.92)	32	6	27	21
Injectable .... (1.00)	17	4	38	9
Intrauterine device .... (0.96)	6	1	11	9
Condom .... (0.81)	5	6	2	7
Vaginal barrier method .... (0.81)	..	3	0	2
Traditional, folk and other method .. (0.50)	30	75	3	48
Total	100	100	100	100
Average effectiveness	0.81	0.60	0.96	0.72
Other proximate determinants				
Per cent of women in union	65	65	45	70
Post-partum insusceptibility (in months) ..	16	16	12	19
Total abortion rate	0	0	0	0
Sterility (per cent of women)	3	6	3	3

Sources: Based on United Nations (2001); United Nations (2000); and Ross, Stover and Willard (1999).

refer to women in union, either married or in consensual or common-law unions, since virtually all surveys provide data on contraceptive use among women in union. However, this poses a problem in societies where much childbearing occurs outside unions. The effect on TFR of births outside union when using the Bongaarts model has already been studied for several sub-Saharan countries (Foote, Hill and Martin, 1993). When neglecting births occurring outside unions, the fertility-inhibiting effect of union patterns is underestimated, which means that estimates of fertility levels are higher than they should be. For the dozens of countries studied, this underestimation ranges between 2 and 10 per cent for most countries. However, it reaches between 15 and 20 per cent for Kenya, Uganda and Liberia, and more than 40 per cent in the case of Botswana where late marriage and substantial proportions of women not in union have a large effect on reducing fertility. Overall, this means that when running the FAMPLAN model using percentages of women in union for each region, the impact of union patterns on fertility levels is somewhat underestimated.

For the other proximate determinants, the initial values adopted for post-partum insusceptibility and sterility were drawn from a recent review of available data (Ross, Stover and Willard, 1999). Compared with the values observed in other parts of the world, average post-partum insusceptibility appears high in all regions, including Southern Africa where it reaches only 12 months. Sterility, measured by the percentage of women who remain childless at age 45 to 49, appears close to what is generally observed in non-pathological settings: 3 per cent in all subregions, except for Middle Africa where it reaches 6 per cent. Finally, the initial values for the total abortion rates were deliberately set to zero for all subregions, as is conventionally accepted in the absence of reliable data.

Using these data, and keeping in mind all the limitations just described, the authors first attempted to evaluate the contraceptive prevalence required to reach the 2050 fertility levels (medium variant) proposed by *World Population Prospects: The 2000 Revision* (United Nations, 2001), provided that all the other factors remained constant. In this case, the dependent variable is the level of contraceptive use, according to the initial method mix and the default effectiveness rates for each method, as well as the values of the other proximate determinants, which are kept constant over the entire 2000 to 2050 projection span.

Under the above assumptions—and to reach around 2.3 children per woman by 2050 in Eastern, Middle and Western Africa, and 2.1 children per woman in Southern Africa—contraceptive use must encompass at least 70 per cent of the women in union in each region, but about 80 per cent in Western Africa and 90 per cent in Middle Africa. The results in the latter regions are to a large extent caused by the method mix skewed to traditional methods of poor efficiency, a proportion that has been maintained constant over the 2000 to 2050 projection period. Such a scenario may correspond to a marked increase in the demand for family planning, leading to universal use of contraception by 2050 but associated with widespread recourse to traditional and folk methods of poor efficiency (except in Southern Africa).

However, in order to reach these high levels of contraceptive use, annual increases of more than one percentage point are required for Eastern, Middle and Western Africa for all projection periods except the last (2040 to 2050). For Southern Africa, where contraceptive use was already high by 2000 and the fertility decline well engaged, the annual percentage point increases needed to reach replacement level, or 2.1 children per woman, in the 2020s are much more modest and slow. Annual percentage point increases are close to zero after 2030, when fertility transition is complete. For Eastern Africa, annual increases by one percentage point under this scenario are consistent with what has been observed recently in this region (table 5). This is not the case for the Middle and Western Africa, where recent increases are around 0.5 points per year.

In fact, the pace of fertility decline and the completion of fertility transition in each subregion (and country) depend on the interplay of the proximate determinants of fertility, according to the initial values and the future evolution of each of these determinants. Hence the idea of testing various scenarios associating different assumptions on annual percentage point increases in contraceptive use, with assumptions on the other proximate determinants, to see the impacts on the TFR (the dependent variable in this case). The assumptions retained are presented below. They might be deemed somewhat simplistic or arbitrary. However, given the speculative nature of the exercise, this should not affect the significance of the results obtained.

TABLE 5. RESULTS OF THE FAMPLAN MODEL: CONTRACEPTIVE PREVALENCE REQUIRED FOR EACH SUBREGION TO REACH THE TOTAL FERTILITY RATES PROJECTED BY THE UNITED NATIONS UNDER THE MEDIUM VARIANT OF THE *2000 REVISION* (CONTRACEPTIVE METHOD MIX, EFFECTIVENESS RATE PER METHOD AND OTHER PROXIMATE DETERMINANTS KEPT CONSTANT)

	Eastern Africa	Middle Africa	Southern Africa	Western Africa
Total fertility rate (2000)	5.96	6.37	3.16	5.76
Projected total fertility rate, 2050	2.37	2.26	2.10	2.34
Contraceptive prevalence (all methods)				
Current, 2000	20.0	10.0	55.0	12.0
Implied prevalence by the year:				
2010	31.4	20.7	61.8	28.9
2020	45.4	39.0	67.2	47.7
2030	57.5	57.5	68.4	65.8
2040	67.8	75.2	69.1	76.7
2050	76.6	91.7	69.1	81.0
Implied annual percentage point increase in contraceptive use for the period:				
2000-2010	1.1	1.1	0.7	1.7
2010-2020	1.4	1.8	0.5	1.9
2020-2030	1.2	1.8	0.1	1.8
2030-2040	1.0	1.8	0.1	1.1
2040-2050	0.9	1.7	0.0	0.4

Sources: Based on United Nations (2001); United Nations (2000); and Ross, Stover and Willard (1999).

Annual percentage point increases in contraceptive prevalence assumptions

1. Percentage point increase of 0.5 per year, maintained constant over 2000-2050.
2. Percentage point increase of 1.0 per year, maintained constant over 2000-2050.
3. Percentage point increase of 1.5 per year, maintained constant over 2000-2050.

Method mix assumptions

1. Constant method mix: for each region, the initial method mix is maintained over the 2000 to 2050 period, with the same "default" effectiveness rates for each method (see table 4).
2. More efficient method mix: for each region, there is a gradual shift from initial method mix to the more efficient one of Southern Africa by 2025 (average effectiveness for Southern Africa estimated at 0.96), and maintained constant thereafter (with the same "default" effectiveness rates for each method).

Percentage of women in union assumptions

1. Constant percentage of women in union: for each region, the initial percentage of women in union (see table 4) is maintained constant over the 2000 to 2050 period.
2. Reduced percentage of women in union: for each region, the initial percentage of women in union is shifted gradually to 50 per cent by 2025 (slightly above the 45 per cent current estimate for Southern Africa) and maintained constant thereafter.

Post-partum insusceptibility assumptions

1. Constant duration of post-partum insusceptibility: for each region, the initial mean duration of post-partum insusceptibility (see table 4) is maintained constant over the 2000 to 2050 period.
2. Reduced duration of post-partum insusceptibility: for each region, the initial mean duration of post-partum insusceptibility is shifted gradually to 12 months by 2025 and to 6 months by 2050.

Abortion rate assumptions

1. Negligible abortion: for each region, the total abortion rate is maintained at zero over the 2000 to 2050 period.
2. Increased abortion: for each region, the total abortion rate is increased gradually from 0 induced abortions per woman in 2000 to 2 by 2025, and maintained at 2 thereafter.

The above assumptions are not relevant (and therefore will not be presented) for Southern Africa, where fertility levels have already decreased markedly, resulting in a relatively high usage of efficient contraceptive methods, a low percentage of women in union (45 per cent) and a low mean duration postpartum insusceptibility (12 months). By contrast, these assumptions are fully relevant for Eastern, Middle and Western Africa, where fertility is still high.

In the various scenarios combining the assumptions, the dependent variable is the total fertility rate. The results obtained help to better understand the factors and policy options associated with slow versus rapid fertility decline in the particular context of each of these regions. Table 6 presents in a schematic way the 12 different scenarios for each region, combining the three assumptions of percentage point increases of contraceptive use (0.5, 1.0 and 1.5 points per year) with the other assumptions made on the method mix and average effectiveness, the proportion of women in union, the mean duration of postpartum insusceptibility and the abortion rate.

TABLE 6. PROJECTION VARIANTS IN TERMS OF ASSUMPTIONS FOR ANNUAL PERCENTAGE POINT INCREASES IN CONTRACEPTIVE PREVALENCE
METHOD MIX, MARRIAGE, POST-PARTUM INSUSCEPTIBILITY AND ABORTION

| *Percentage point increase in contraceptive prevalence over the period 2000-2050* | *Contraceptive prevalence (percentage)* | | | *Projection variants* | | | |
| | *Subregion* | *Year* | | *Contraceptive prevalence* | *Contraceptive prevalence, method mix* | *Other proximate determinants* | *Contraceptive prevalence, method mix, marriage, post-partum insusceptibility and abortion* |
		2000	*2050*				
0.5 point per year	Eastern Africa	20	45	A. Impact of increase in contraceptive prevalence only	B. Impact of more efficient method mix	C. Impact of reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion	D. Impact of more efficient method mix, reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion
	Middle Africa	10	35				
	Western Africa	12	37				
1.0 point per year	Eastern Africa	20	70	A. Impact of increase in contraceptive prevalence only	B. Impact of more efficient method mix	C. Impact of reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion	D. Impact of more efficient method mix, reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion
	Middle Africa	10	60				
	Western Africa	12	62				
1.5 points per year	Eastern Africa	20	95	A. Impact of increase in contraceptive prevalence only	B. Impact of more efficient method mix	C. Impact of reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion	D. Impact of more efficient method mix, reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion
	Middle Africa	10	85				
	Western Africa	12	87				

Sources: Based on United Nations (2001); United Nations (2000); and Ross, Stover and Willard (1999).

The results obtained are presented in table 7. When total fertility rates reach 2.1 children per woman, they are kept constant at that level thereafter. Under projection variant A, "impact of increase in contraceptive prevalence only", with the assumption of an annual increase in contraceptive prevalence of 0.5 percentage point, fertility levels remain well above four children per woman in the three subregions. With an increase of 1.0 percentage point per year, projection A yields varying fertility levels (from nearly 3 children per woman for Eastern Africa to more than 3 children for Western Africa, and to more than 4 children per woman for Middle Africa). It is only when variant A is associated with an increase in contraceptive prevalence of 1.5 percentage points per year that fertility reaches 2.1 children per woman for Eastern Africa and for Western Africa at the end of the projection. The varying impact on fertility of the 0.5, 1.0 and 1.5 percentage point annual increases in contraceptive prevalence by subregion is a direct consequence of the varying efficiencies of the contraceptive methods used in those subregions. The more efficient the method mix, the greater impact a rapid increase in contraceptive prevalence has on fertility. Therefore, for Eastern Africa, where average effectiveness is 0.81, an increase of 0.5 percentage point in contraceptive use reduces the fertility level by about 1.6 children by 2050 (from 4.37 to 2.79 children), in contrast with 1.1 fewer children for Middle Africa (from 5.26 to 4.15 children), where average effectiveness is only 0.60.

The impact of a gradual shift to more efficient methods is evidenced by the results obtained under the projection variant B, "impact of more efficient method mix". Nevertheless, fertility levels by 2050 remain high, at around 4 children per woman in all regions, when variant B is associated with an annual increase in contraceptive prevalence of 0.5 percentage point. However, when associated with an increase in contraceptive prevalence of 1.0 percentage point per year, by 2050 variant B yields fertility levels around 2 children per woman in all three regions, close to the completion of the fertility transition (2.1 children for Eastern Africa, 2.6 for Middle Africa and 2.3 for Western Africa). With annual increases in contraceptive prevalence of 1.5 percentage points (which appears an optimistic assumption today), one can envision fertility levels at 2.1 children per woman in all three subregions before 2040. Evidently, the lower the initial average method effectiveness, the greater the impact on fertility of a shift to more efficient methods.

Projection variant C, "impact of reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion", attempts to measure the combined impacts of variations in the proximate determinants that are not strictly related to family planning programmes. Interestingly, the various results obtained under this variant are roughly similar to those obtained under variant B, "impact of more efficient method mix". When associated with annual increases in contraceptive prevalence of 0.5 percentage points per year, by 2050 variant C yields fertility levels that are close to or above 4 children per woman in the three subregions. In addition, when associated with increases in contraceptive prevalence of 1.0 percentage point per year, variant C yields fertility levels around 2 children per woman for Eastern Africa in the 2040s and for Western Africa in 2050, but more than 3 children

TABLE 7. PROJECTED TOTAL FERTILITY RATES ACCORDING TO SELECTED ASSUMPTIONS FOR
ANNUAL PERCENTAGE POINT INCREASES OF CONTRACEPTIVE PREVALENCE, METHOD MIX
AND THE OTHER PROXIMATE DETERMINANTS OF FERTILITY, BY SUBREGION

Subregion	2000	2010	2020	2030	2040	2050
A. *Impact of increase in contraceptive prevalence only*						
Eastern Africa						
0.5 point	5.96	5.64	5.33	5.01	4.69	4.37
1.0 point	5.96	5.33	4.69	4.06	3.42	2.79
1.5 point	5.96	5.01	4.06	3.11	2.15	(2.1)
Middle Africa						
0.5 point	6.37	6.15	5.93	5.70	5.48	5.26
1.0 point	6.37	5.93	5.48	5.04	4.60	4.15
1.5 point	6.37	5.70	5.04	4.37	3.71	3.04
Western Africa						
0.5 point	5.76	5.51	5.26	5.02	4.77	4.52
1.0 point	5.76	5.26	4.77	4.27	3.78	3.28
1.5 point	5.76	5.02	4.27	3.53	2.78	(2.1)
B. *Impact of more efficient method mix*						
Eastern Africa						
0.5 point	5.96	5.53	5.06	4.62	4.25	3.87
1.0 point	5.96	5.19	4.33	3.50	2.75	(2.1)
1.5 point	5.96	4.85	3.61	2.38	(2.1)	(2.1)
Middle Africa						
0.5 point	6.37	5.99	5.51	5.06	4.70	4.35
1.0 point	6.37	5.72	4.86	4.00	3.30	2.60
1.5 point	6.37	5.45	4.21	2.95	(2.1)	(2.1)
Western Africa						
0.5 point	5.76	5.40	4.98	4.58	4.26	3.93
1.0 point	5.76	5.12	4.36	3.60	2.95	2.29
1.5 point	5.76	4.84	3.74	2.62	(2.1)	(2.1)
C. *Impact of reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion*						
Eastern Africa						
0.5 point	5.96	4.98	3.98	3.46	3.51	3.58
1.0 point	5.96	4.67	3.36	2.50	2.13	(2.1)
1.5 point	5.96	4.36	2.75	(2.1)	(2.1)	(2.1)
Middle Africa						
0.5 point	6.37	5.49	4.58	4.17	4.37	4.62
1.0 point	6.37	5.27	4.12	3.46	3.35	3.23
1.5 point	6.37	5.05	3.68	2.75	2.34	(2.1)
Western Africa						
0.5 point	5.76	4.91	4.01	3.57	3.69	3.85
1.0 point	5.76	4.66	3.51	2.79	2.56	2.31
1.5 point	5.76	4.41	3.02	(2.1)	(2.1)	(2.1)
D. *Impact of more efficient method mix, reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion*						
Eastern Africa						
0.5 point	5.96	4.88	3.74	3.11	3.07	3.04
1.0 point	5.96	4.54	3.05	(2.1)	(2.1)	(2.1)
1.5 point	5.96	4.21	2.37	(2.1)	(2.1)	(2.1)

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TABLE 7   *(continued)*

Subregion	2000	2010	2020	2030	2040	2050
D. *Impact of more efficient method mix, reduced percentage of women in union,* *reduced duration of post-partum insusceptibility and increased abortion*						
Middle Africa						
0.5 point	6.37	5.34	4.21	3.58	3.60	3.64
1.0 point	6.37	5.07	3.58	2.53	(2.1)	(2.1)
1.5 point	6.37	4.80	2.95	(2.1)	(2.1)	(2.1)
Western Africa						
0.5 point	5.76	4.81	3.76	3.18	3.19	3.20
1.0 point	5.76	4.53	3.15	2.19	(2.1)	(2.1)
1.5 point	5.76	4.25	2.55	(2.1)	(2.1)	(2.1)

per woman by 2050 for Middle Africa (a consequence of the low average effectiveness of contraceptive use in this region, kept constant under this variant).

Not surprisingly, projection variant D, "impact of more efficient method mix, reduced percentage of women in union, reduced duration of post-partum insusceptibility and increased abortion", yields much more rapid fertility declines everywhere than the previous variants. However, fertility levels by year 2050 remain above 3 children per woman in the three regions when this variant is associated with annual increases in contraceptive prevalence of 0.5 percentage points. It is only when associated with increases in contraceptive prevalence of 1.0 percentage point per year, and of course of 1.5 percentage points per year, that variant D yields in all regions an eventual TFR of 2.1 children per woman as early as the 2030s or 2040s.

To summarize the above results, fertility transition (i.e., reaching a total fertility rate of 2.1 children per woman) cannot be achieved in any of the three regions when relying only on increases in contraceptive prevalence of less than one percentage point per year. It is only when increases in contraceptive prevalence reach 1.5 percentage points per year that one can envision the completion of fertility transition for Eastern and Western Africa (but not for Middle Africa) at the end of the 50-year projection period. As mentioned above, very few countries have registered these levels of increase in contraceptive prevalence (for any method), and all those that have are located in Eastern and Southern Africa (see annex table A.2). The policy implication of this is quite clear: an increase in contraceptive prevalence is a necessary but not a sufficient condition to achieve fertility transition in sub-Saharan Africa within the next 50 years.

To achieve fertility transition in Eastern, Middle and Western Africa over that time span (50 years) requires not only an annual increase by at least one percentage point in contraceptive prevalence over the entire period, but also the favourable impact of other factors. Those factors—method mix, marriage, post-partum insusceptibility and abortion—can all be modified through policy interventions, but not in the same way. Improving method mix average effectiveness by promoting the use of more efficient methods at the expense of less efficient ones (or by promoting proper use by couples of methods, especially condoms, barrier methods and traditional methods), falls clearly within the field of "family planning efforts" and requires a renewed commitment of local actors and donors for the provision of quality and diversified family planning

services, which is precisely what is lacking in the majority of the sub-Saharan countries.

Marriage or union patterns are the result of complex social processes. Adopting specific legislative measures and launching communication campaigns to change undesirable and unhealthy behaviour, such as too early marriage and too frequent pregnancies, is possible. However, it may take time for such activities to materialize into decreased exposure to unwanted pregnancies. The mean duration of post-partum insusceptibility depends at least in part on the frequency and length of traditional post-partum abstinence and exclusive breastfeeding. Information, education and communication campaigns to encourage long periods of breastfeeding (and exclusive breastfeeding during the first six months) will certainly help maintain the presently high mean postpartum insusceptibility period. However, the success of similar campaigns to maintain long periods of post-partum abstinence is less certain. Finally, the importance of abortion is very hard to assess because it is illegal in most countries and reliable data is lacking. However, recent evidence indicates the rapid emergence of this phenomenon, for example, in Western Africa (Desgrées du Loû and others, 1999). At present, Governments of the region do not seem to be ready to legalize induced abortion as, at the very least, a health measure to prevent the devastating consequences of poorly performed abortions on the health and lives of women. In addition, the higher failure rates of many traditional and folk contraceptive methods, as well as the weaknesses in the mechanisms of supply for modern ones, may lead to extensive recourse to induced abortions whether the practice is legal or not.

To conclude, the current laissez-faire attitudes on the part of national authorities and leaders as well as donors towards family planning programmes and the issue of abortion are conducive to slower fertility transitions in Middle and Western Africa, and possibly in Eastern Africa if deterioration occurs. However, major social changes, which may be induced by a variety of factors such as urbanization, prolonged civil war or social unrest, and large migration movements that follow prolonged droughts or other natural disasters will have significant impacts on union patterns, duration of post-partum insusceptibility and the recourse to abortion. The consequences on the future course of fertility of these phenomena, which are outside the family planning "programme efforts" agenda, may be important, but they are very hard to predict given their very nature.

C. THE HIV/AIDS EPIDEMIC AND FERTILITY CHANGE

The HIV/AIDS epidemic will most likely modify fertility outcomes and also affect attitudes towards family planning and fertility. It should be stressed, however, that it is very difficult at this stage in the HIV/AIDS epidemic to decompose its effects on fertility outcomes, attitudes toward family planning and the indirect impact of high mortality on fertility preferences. Therefore, as more data collection and analysis are needed, only a tentative framework about several of the potential consequences of the epidemic with respect to fertility levels, family planning attitudes and fertility preferences is provided.

First, the HIV/AIDS epidemic will probably affect fertility levels, increasing infecundability and causing more foetal losses (miscarriages) (Zaba and Gregson, 1998). Data from Uganda suggest that fecundability is reduced by up to 30 per cent among HIV-positive women (Stover, 1999). Nevertheless, the impact on fertility of such a large loss might be less severe than expected: should 30 per cent of HIV-positive women suffer from a 30 per cent loss in fecundability, then a TFR of 6 children per woman would be reduced by about 10 per cent (yielding a rate of 5.4 children), provided that all other factors remain constant. The HIV/AIDS epidemic might also decrease the frequency of intercourse among HIV/AIDS infected persons, therefore leading to lower fertility outcomes. By contrast, infected mothers may end up with higher fertility outcomes, if they decide not to breastfeed their young child owing to the fear of mother-to-child transmission. In the absence of post-partum abstinence or recourse to a contraceptive method, those mothers will be exposed to another pregnancy sooner than if they had breastfed their child.

Regarding the attitudes toward family planning, the HIV/AIDS epidemic might discourage the use of contraception among couples who want to have offspring, especially those with one or two HIV-positive partners. However, the fight against the HIV/AIDS epidemic will bring to the fore family planning and reproductive health issues, leading to changes in attitudes and possibly more openness towards the use of selected contraceptives. In particular, the epidemic will most likely increase both the awareness and the use of male and female condoms. Data for 1994 from Côte d'Ivoire suggest that about 50 per cent of female condom users were seeking pregnancy prevention while the rest were concerned with prevention of HIV and other sexually transmitted infections (STIs). This figure might change, and the fear of STI/HIV infection is likely to boost the use of condoms for both family planning and disease prevention (United Nations, 2000). In fact, rapid increases of condom use for STI/HIV prevention may occur in contexts of parallel rapid increase of contraceptive use for pregnancy prevention purposes. However, this cannot be taken for granted, since increases of condom use might also be primarily driven by the desire to protect oneself against STIs, including HIV/AIDS. If most of the information, education and communication programmes were geared primarily to avoid the spread of HIV/AIDS (which is itself a legitimate objective), more people might avoid casual sex, remain faithful to their usual partners and increase sharply the use of condoms, but all these are likely to concern primarily people facing high risk of infection, many of them not in union. Under this scenario, behavioural changes would take place to avoid STI/HIV infection, but this would not necessarily be paralleled by more favourable attitudes towards family planning or more rapid increases in contraceptive use than otherwise. This poses clearly the problem of the content of information, education and communication campaigns in contexts where HIV/AIDS prevalence is high and contraceptive prevalence is low. In such contexts, should information, education and communication campaigns aimed at promoting responsible parenthood and contraceptive use be distinct from the campaigns aimed at STI/HIV prevention? Or should those campaigns be integrated into larger programmes aimed at promoting more responsible attitudes among the

general population towards sexual and reproductive health? It depends in part on each country context, but obviously there is no simple answer.

Finally, the high mortality levels associated with HIV/AIDS are likely to have an impact on fertility preferences, at both the individual and the collective levels. As mentioned above, the epidemic might increase the wishes of parents, especially HIV-infected ones, to have offspring. Further, this might be compounded by pressures from the extended family to perpetuate lineage, facilitated by relocation and fosterage mechanisms for the rearing of children. However, the fear of leaving AIDS orphans might have the opposite effect, that of reducing the fertility aspirations of couples. At a collective level, the HIV/AIDS epidemic will pose a serious threat to child and adult survival prospects and translate into sharply reduced levels of life expectancy at birth. In the most affected countries, the impact of AIDS-related mortality and morbidity has already erased the substantial health gains since the 1960s (United Nations, 2001). Therefore, as deaths would outnumber births, the demographic dynamics might change, leading to the complete abandonment of programmes conducive to fertility decline by Governments and the mitigation of fertility limitation attitudes by couples and individuals alike. The societal trauma that would be brought about by a protracted HIV/AIDS epidemic would probably have far-reaching effects on global attitudes towards procreation and reproduction that are still unforeseeable at this stage.

One may contend that the HIV/AIDS epidemic could test the validity of the classic theory of demographic transition in sub-Saharan Africa because of much higher levels in overall mortality and high AIDS-related mortality rates among young women of reproductive age. The demographic transition in the region could well become a "half-through" transition, or even perhaps in some places a "reverse" transition, where mortality levels increase and fertility levels decrease only to an intermediate level.

D. ADDITIONAL CONSIDERATIONS

Fertility transition is obviously well under way in the Southern part of Africa where it is not unreasonable to assume that TFRs will fall below replacement levels within the next 50 years. In contrast, the pace of fertility transition will be slower in the other three regions, where it is far from certain that TFRs will reach replacement levels within the same time-span. Lifetime fertility in these regions may range between 2 and 5 children per woman by the year 2050, and the situation may be even more diversified at the country level.

It is clear that future fertility levels in sub-Saharan Africa will be determined by a large array of factors, in which the intermediate determinants will play an important role, not to mention the impact of the HIV/AIDS epidemic on fertility and attitudes toward family planning. However, detailed analysis of the proximate determinants of fertility—and in particular the review of the levels of contraceptive use, the pace of increase in contraceptive prevalence and the family planning programme effort scores—has highlighted several important issues that are usually less well documented but that will also undoubtedly determine future fertility outcomes in the region. These issues are

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the "vicious circle" of low demand and poor supply in efforts to expand family planning services; the role of traditional contraception in fertility transition; and the incidence of induced abortion in place of contraception. It is important to consider these problems in detail because they are more easily amenable to policy interventions than those pertaining to the intermediate determinants of fertility and/or the mitigation of the HIV/AIDS epidemic.

The "vicious circle" of low demand and poor supply in efforts to expand family planning services remains difficult to assess. On the one hand, the demand for family planning services is still rather low in sub-Saharan Africa, as shown by the fertility preferences. On the other hand, supply remains rather weak and generally also suffers from the poor status of the health systems. In a word, the low demand for family planning does not encourage the launching of major efforts to expand programmes, and the poor quality of the services offered is in no way conducive to boosting future demand for services.

As to the role of traditional contraception in fertility transition in sub-Saharan Africa, the FAMPLAN analysis demonstrates that a 0.5 percentage point increase per year in contraceptive prevalence alone is not enough to trigger a substantial fertility decline. The analysis also stresses the need for a shift to modern, more efficient methods. This will be necessary, along with an annual increase of at least one percentage point in contraceptive use, if Eastern, Middle and Western Africa are to experience important reductions in fertility.

The failure rates of many traditional and folk contraceptive methods and the weaknesses in the mechanisms to supply modern ones play a role in induced abortion. Indirect measurements of the fertility-inhibiting effect of induced abortion indicate the significant influence of this proximate determinant in many sub-Saharan Africa countries and the disturbing fact that, in several countries, induced abortions inhibit fertility more than contraceptive use (Johnston and Hill, 1996). Unfortunately, abortions are most often poorly performed in sub-Saharan Africa. This causes higher ratios of maternal mortality and may also trigger a higher incidence of other medical conditions (e.g., secondary sterility). It is therefore imperative, if only from a health perspective, to promote policies that will minimize recourse to induced abortion under unsafe conditions.

In terms of policy choices, these three issues—the demand-supply vicious circle, the role of traditional contraception in fertility transition and the rising levels of induced abortion—call for a renewed policy commitment in sub-Saharan Africa to stress, for individuals and couples, the concept of free access to a wide choice of contraceptive methods as well as their freedom to decide on the size of their family. Although most countries in Africa have now adopted the agenda that was discussed at the International Conference on Population and Development in Cairo in September 1994, a large number of the population policies adopted prior to Cairo and often revised afterwards have not progressed much beyond mere recognition of the population and development problems. Implementation of those policy statements has often been left to bureaucratic bodies (e.g., population commissions). Although the latter have been somewhat active in the capital cities, they are less active outside the main cities and in rural areas. In addition, a lack of vision, drive and coordination

has precluded programmes from delivering effective family planning services. Finally, the broadening of the classic demographic approach into a larger reproductive health agenda (including, inter alia, the reduction of maternal mortality, the eradication of excision, the mitigation of domestic female violence) poses problems for most sub-Saharan countries where fertility transition is not yet engaged or is incipient. Indeed, this has sometimes contributed to the lack of focus on much-needed family planning services.

E. CONCLUSION

Three major conclusions can be formulated with regard to the possible trends of sub-Saharan fertility over the next 50 years. First, although fertility declines have started in sub-Saharan Africa, fertility transition may be more modest and will probably be achieved over longer periods of time than initially anticipated. Furthermore, fertility declines will not occur at the same pace everywhere in the region. For several more decades, the fertility declines in Western and Middle Africa are likely to lag behind those that have taken place already in Southern and, to a lesser extent, Eastern Africa.

Second, the data available highlight several stumbling blocks, linked to the proximate determinants of fertility, that will make rapid fertility transition unlikely in sub-Saharan Africa. Increases in contraceptive prevalence rates may be closer to 0.5 than 1.0 percentage point per year, especially in Western and Middle Africa. That is lower than the levels of increase that have triggered the onset of fertility decline in Southern Africa and some countries of Eastern Africa (and much lower than the levels of increase that have led many other developing countries through fertility transition). In addition, the current demand-supply situation for family planning services in sub-Saharan Africa is not conducive to a rapid expansion of contraceptive use levels. Furthermore, a supply-driven approach to fertility control is more difficult to implement in the region since there is a weaker demand for birth spacing and birth limiting. Finally, a shift to modern and effective methods is needed to ensure contraceptive security for women and couples who genuinely want to plan their family. In this respect, the potential rapid rise of induced abortion levels, which is to a large extent the result of the lack of adequate family planning services, might lower fertility further than currently expected.

Third, the demographic transition will continue to be somewhat unpredictable in sub-Saharan Africa, as many unknown factors remain in the equation. Among these, the most important include the political commitment of the national actors and donor community towards the provision of family planning services; the role of the intermediate determinants in determining levels of fertility, as these are also needed to trigger fertility decline; the impact of urbanization, which could help accelerate fertility transition (but only up to a certain point); and the potential influence of the HIV/AIDS epidemic on fertility outcomes, through possible lessened fecundability and changing attitudes towards family planning. Finally, in countries where contraceptive use is very low and fertility levels are very high but have not started yet to decline, it seems urgent to assign to the delivery of effective family planning services the high priority it deserves within the full reproductive health agenda.

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TABLE A.1.   PERCENTAGE OF WOMEN OF REPRODUCTIVE AGE (15-49 YEARS)
CURRENTLY IN UNION USING A CONTRACEPTIVE METHOD, VARIOUS DATES, BY COUNTRY

Country	Survey year	Contraceptive prevalence (percentage)		
		Clinic/supply method	Traditional and others	Any method
Eastern Africa				
Burundi	1987	1.2	7.5	8.7
Comoros	1996	11.4	9.6	21.0
Eritrea	1995	4.0	1.0	5.0
Ethiopía	1990	2.6	1.7	4.3
Kenya	1998	31.5	7.5	39.0
Madagascar	1997	9.7	9.7	19.4
Malawi	1996	14.4	7.5	21.9
Mauritius	1991	48.9	25.8	74.7
Mozambique	1997	5.1	0.5	5.6
Réunion	1990	61.7	4.9	66.6
Rwanda	1996	7.2	6.5	13.7
Uganda	1995	7.8	7.0	14.8
United Republic of Tanzania	1999	15.3	6.4	21.7
Zambia	1996	14.4	10.6	25.0
Zimbabwe	1999	49.4	4.1	53.5
Middle Africa				
Cameroon	1998	7.0	12.3	19.3
Central African Republic	1994/1995	3.3	11.5	14.8
Chad	1996/1997	1.3	2.6	3.9
Dem. Rep. Congo	1991	2.0	5.7	7.7
Southern Africa				
Botswana	1996	40.5	1.2	41.7
Lesotho	1991/1992	18.9	4.3	23.2
Namibia	1992	26.0	2.9	28.9
South Africa	1988	48.4	1.3	49.7
Swaziland	1988	17.2	2.7	19.9
Western Africa				
Benin	1996	3.4	13.0	16.4
Burkina Faso	1998/1999	4.9	7.0	11.9
Cape Verde	1998	46.0	6.9	52.9
Côte d'Ivoire	1998/1999	7.2	7.8	15.0
Gambia	1990	6.7	5.1	11.8
Ghana	1998	12.9	9.2	22.1
Guinea	1992/1993	1.0	0.7	1.7
Liberia	1986	5.5	0.9	6.4
Mali	1995/1996	4.5	2.2	6.7
Mauritania	1990	1.2	2.1	3.3
Niger	1998	4.6	3.6	8.2
Nigeria	1990	3.5	2.5	6.0
Senegal	1997	8.1	4.8	12.9
Sudan (North)	1992/1993	6.9	1.4	8.3
Togo	1998	6.9	16.6	23.5

Sources: United Nations (2000); and United States Bureau of the Census (2000), table 55.

TABLE A.2. ANNUAL CHANGE (GROWTH IN PERCENTAGE POINTS) OF CONTRACEPTIVE USE AMONG WOMEN
OF REPRODUCTIVE AGE CURRENTLY IN UNION, VARIOUS PERIODS, BY COUNTRY

| | Survey period | | | Contraceptive prevalence (per cent) | | | | Annual growth (percentage points) | |
| | | | | Clinic/supply method | | Any method | | | |
Country	Earlier survey	Later survey	Interval (years)	Earlier survey	Later survey	Earlier survey	Later survey	Clinic/supply method	Any method
Eastern Africa									
Kenya	1988/89	1998	10	17.8	31.5	26.9	39.0	1.4	1.3
Madagascar	1992	1997	5	5.1	9.7	16.7	19.4	0.9	0.5
Malawi	1984	1996	12	1.1	14.4	6.9	21.9	1.1	1.3
Mauritius	1975	1991	16	29.2	48.9	45.7	74.7	1.2	1.8
Rwanda	1983	1996	13	0.8	7.2	10.1	13.7	0.5	0.3
Uganda	1988/89	1995	7	2.5	7.8	4.9	14.8	0.8	1.5
United Rep. of Tanzania	1991	1999	8	6.6	15.3	10.4	21.7	1.1	1.4
Zambia	1992	1996	4	8.9	14.4	15.2	25.0	1.4	2.5
Zimbabwe	1988/89	1999	11	36.1	49.4	43.1	53.5	1.3	1.0
Middle Africa									
Cameroon	1991	1998	7	4.3	7.0	16.1	19.3	0.4	0.5
Southern Africa									
Botswana	1984	1996	12	18.6	40.5	27.8	41.7	1.8	1.2
Lesotho	1977	1991/92	15	2.4	18.9	5.3	23.2	1.1	1.2
Namibia	1989	1992	3	26.3	26.0	26.4	28.9	0.0	0.8
South Africa	1975/76	1988	13	35.0	48.4	37.0	49.7	1.1	1.0

Western Africa

Benin	1981/1982	1996	15	0.5	3.4	9.2	16.4	0.2	0.5
Burkina Faso	1993	1998/1999	6	4.2	4.9	7.9	11.9	0.1	0.7
Côte d'Ivoire	1994	1998/1999	5	4.2	7.2	11.4	15.0	0.7	0.8
Ghana	1988	1998	10	5.2	12.9	12.9	22.1	0.8	0.9
Mali	1987	1995/1996	9	1.3	4.5	4.7	6.7	0.4	0.2
Mauritania	1981	1990	9	0.3	1.2	0.8	3.3	0.1	0.3
Niger	1992	1998	6	2.3	4.6	4.4	8.2	0.4	0.6
Nigeria	1981/1982	1990	9	0.6	3.5	4.8	6.0	0.3	0.1
Senegal	1986	1997	11	2.4	8.1	11.3	12.9	0.5	0.1
Sudan (North)	1978/1979	1992/1993	14	3.7	6.9	4.6	8.3	0.2	0.3
Togo	1988	1998	10	3.0	6.9	12.1	23.5	0.4	1.1

Sources: Based on United Nations (2000); and United States Bureau of the Census (2000), table 55.

Country	Total fertility rate	
	1995-2000	2045-2050
Eastern Africa		
Burundi	6.80	2.81
Comoros	5.40	2.10
Djibouti	6.10	2.10
Eritrea	5.70	2.10
Ethiopia	6.75	2.80
Kenya	4.60	2.10
Madagascar	6.10	2.10
Malawi	6.75	2.63
Mauritius	2.00	1.90
Mozambique	6.30	2.10
Réunion	2.30	1.90
Rwanda	6.20	2.10
Somalia	7.25	3.27
Uganda	7.10	2.85
United Rep. of Tanzania	5.48	2.10
Zambia	6.05	2.10
Zimbabwe	5.00	2.10
Middle Africa		
Angola	7.20	3.26
Cameroon	5.10	2.10
Central African Republic	5.30	2.10
Chad	6.65	2.35
Congo	6.29	2.33
Congo (Dem. Rep.)	6.70	2.36
Equatorial Guinea	5.89	2.10
Gabon	5.40	2.10
Southern Africa		
Botswana	4.35	2.10
Lesotho	4.75	2.10
Namibia	5.30	2.10
South Africa	3.10	2.10
Swaziland	4.80	2.10
Western Africa		
Benin	6.10	2.10
Burkina Faso	6.89	2.82
Cape Verde	3.56	2.10
Côte d'Ivoire	5.10	2.10
Gambia	5.20	2.10
Ghana	4.60	2.10
Guinea	6.27	2.10
Guinea-Bissau	5.99	2.10
Liberia	6.80	2.81
Mali	7.00	2.85
Mauritania	6.00	2.10
Niger	8.00	3.82
Nigeria	5.92	2.10
Senegal	5.57	2.10
Sierra Leone	6.50	2.34
Sudan	4.90	2.10
Togo	5.80	2.10

Source: United Nations (2001).

TABLE A.4.   FAMILY PLANNING PROGRAMMES EFFORT SCORES AS ASSESSED IN 1994:
TOTAL AND FOUR DIMENSION SCORES AS PERCENTAGE OF MAXIMUM, BY COUNTRY

Country	Total score	Dimension scores			
		Policy	Services	Evaluation	Availability
Eastern Africa					
Ethiopia	39	61	35	34	18
Kenya	56	48	56	61	63
Madagascar	33	45	35	32	13
Malawi	44	52	44	60	27
Mauritius	75	78	66	98	78
Mozambique	33	47	27	32	30
Uganda	44	52	45	30	39
United Rep. of Tanzania	48	54	45	44	45
Zambia	41	56	35	37	37
Zimbabwe	68	69	71	82	52
Middle Africa					
Angola	24	37	16	32	23
Cameroon	49	54	48	45	47
Central African Republic	40	55	40	35	23
Chad	27	47	23	40	1
Congo	27	48	24	41	0
Southern Africa					
Botswana	66	65	62	58	80
Lesotho	44	64	34	41	38
Namibia	43	60	28	26	60
South Africa	56	57	52	48	66
Western Africa					
Benin	37	37	40	40	31
Côte d'Ivoire	39	54	31	54	25
Ghana	52	65	52	45	41
Guinea	50	66	49	64	24
Guinea-Bissau	36	58	25	20	35
Mali	45	54	51	62	11
Mauritania	32	32	37	50	10
Niger	46	60	45	60	22
Nigeria	42	64	33	30	34
Senegal	50	69	44	61	35
Sierra Leone	47	51	49	41	41

Source: Ross, Stover and Willard (1999).
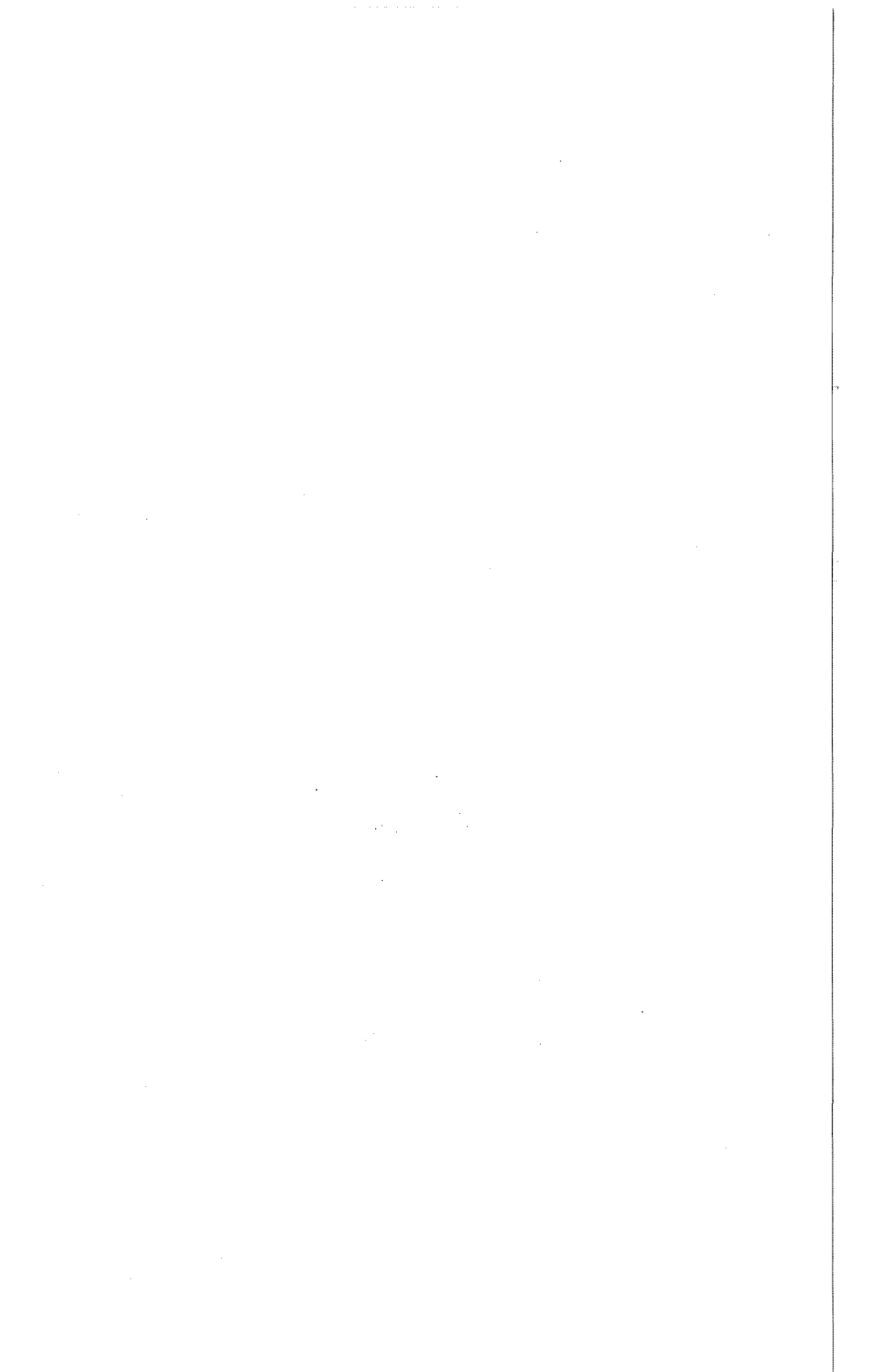
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FERTILITY PREFERENCES AND CONTRACEPTIVE USE: A PROFITABLE NEXUS FOR UNDERSTANDING THE PROSPECTS FOR FERTILITY DECLINE IN AFRICA

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Despite the confirmation of dramatic and long-awaited fertility transitions in selected countries in sub-Saharan Africa, the bulk of the continent retains very high levels of fertility, such that questions about the prospects for fertility decline remain germane. On a continent where barely two decades ago transition was considered unlikely because the sociocultural context was deemed to support, if not promote, high fertility (Bongaarts and Lesthaeghe, 1984; Caldwell and Caldwell, 1987 and 1990), it stands to reason that the success stories, scattered as they may be, may provide considerable insight into facilitating transition elsewhere on the continent.

Not surprisingly, numerous attempts have been made to explain (or understand) African fertility over the last two decades, and the majority of these studies have concentrated on three factors: fertility levels (or their indicators), contraceptive use and fertility preferences. Reasons for this focus exist in the literature. Essentially, the argument states that fertility behaviour is driven by fertility demand or motivation, both of which are reflected in preferences that in turn influence contraceptive use, which represents the most significant determinant of fertility (Ajzen and Fishbein, 1980).

The present paper constitutes an attempt to make sense of how the relationships among these three variables may be useful for understanding the prospects of fertility transition in sub-Saharan Africa. The paper initially describes how the levels of these three variables vary across the continent. Then it provides a brief review of the published literature on the variables concerned before examining the theoretical model that supports existing research. Subsequently, a conceptual alternative to the theoretical framework guiding current thinking on the topic is brought forward (Dodoo and van Landewijk, 1996; Dodoo and Tempenis, 2002). The proposed model should enhance understanding of the prospects for fertility decline by promoting more valid analyses of the nexus in which these three central variables come together. The paper ends with some suggestions about avenues for profitable research in the future.

Based on the available literature, the paper uses a broad brush to paint these three variables in a manner that should clarify the relationships among them. It is hoped that understanding the dynamics that lie at the core of those relationships will provoke discussion about research avenues that will help to

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facilitate more generalized fertility transitions on the continent. The present paper presents a brief overview of the available research and limits its focus to the literature on Africa that has been published in English.

A. BACKGROUND

1. *Levels of fertility*

Although fertility has declined, and very rapidly, in a handful of African countries (e.g., Ghana, Kenya and Zimbabwe), most of the continent, and especially the countries that constitute what is thought of as mid-Africa (i.e., those mainland countries lying south of the Sahara, but north of South Africa), remain untouched by fertility transition, at least outside their principal urban centres. Table 1 shows high levels of fertility for Western, Middle and Eastern Africa, despite more than four decades of family planning programmes. According to data from the Population Reference Bureau (2000), most countries have total fertility rates (TFRs) above 5.0 children per woman. Ghana (4.5), Kenya (4.7) and Zimbabwe (4.0) are the notable exceptions, along with Algeria (3.8), Egypt (3.3), Libyan Arab Jamahiriya (4.1), Morocco (3.1), the Sudan (4.6) and Tunisia (2.8), all of which are in Northern Africa; Botswana (4.1), Lesotho (4.4), and South Africa (2.9) in Southern Africa; and Mauritius (2.0), Réunion (2.2) and Seychelles (2.0) in Eastern Africa. It can be observed from table 1 that any discussion of high fertility in Africa concerns mid-Africa—Western, Central and Eastern Africa—where lessons about prospects for fertility decline may be derived from the transition experiences of Ghana, Kenya and Zimbabwe.

2. *Contraceptive use*

In table 1 the correspondence of fertility rates and contraceptive levels is clear. The low fertility countries of Northern and Southern Africa and of Eastern Africa generally also have levels of modern contraceptive use among more than 25 per cent of married women. In the three countries in mid-Africa in which there has been substantial fertility decline—Ghana, Kenya and Zimbabwe—contraceptive use levels stand at 13 per cent, 32 per cent and 50 per cent respectively. Although the level in Ghana (13 per cent) is relatively low, the fact that Ghana is the only country in Western or Central Africa in which more than 1 in 10 married women use modern contraception underscores the significant role of contraceptive use in fertility decline. Although low themselves, contraceptive levels in the countries of Eastern Africa are somewhat higher than they are in Western and Central Africa.

3. *Fertility preferences*

Although numerous measures of fertility preference can be found in the literature, only one indicator—preference for no more children—is used here to describe the place of preferences in the fertility–contraceptive use–preference nexus. The third column of table 1 presents the proportion of women in mid-Africa who report wanting no more children. As with fertility and contraceptive use, preferences to cease childbearing are lower in Western and Central Africa than they are in Eastern Africa.

TABLE 1. GENERAL RANGES OF FERTILITY, MODERN CONTRACEPTIVE USE
AND FERTILITY PREFERENCES BY REGION OF AFRICA

	Total fertility rate	Modern contraceptive use	Percentage of women wanting no more children
East Africa	5.1-7.0	3-16	32-55
"Outliers"			
Kenya	4.7	32	..
Zimbabwe	4.0	50	..
Mauritius	2.0	60	..
Seychelles	2.0	..	..
Réunion	2.2	67	..
Tanzania	..	..	28
Burundi	..	..	26
North Africa	2.8-4.1	26-52	..
"Outliers"			
W. Sahara	6.8	..	..
Sudan	4.6	7	..
Southern Africa	2.9-4.4	26-55	..
"Outliers"			
Namibia	5.1	..	..
Swaziland	5.9	19	..
Lesotho	4.4	19	..
West/Middle Africa	5.1-7.5	1-8	14-27
"Outliers"			
Ghana	4.8	13	32
Niger	..	..	4

Sources: Total fertility rates and modern contraceptive levels: Population Reference Bureau (2000); percentages of women wanting no more children: Ezeh, Seroussi and Raggers (1996).

NOTE: Two dots (..) indicate data not available.

B. A BRIEF REVIEW OF THE LITERATURE

A review of the existing literature on the relationship between fertility, contraceptive use and fertility preferences, even a concise review such as that presented here, reveals certain notable patterns of investigation. Substantial effort has been devoted to understanding the nature of fertility preferences. For instance, some attention has been paid to providing additional material to help understand the meaning of the non-numeric responses typically given by reasonably sizeable segments of women interviewed in national or regional surveys (Dodoo and Seal, 1994; Olaleye, 1994; Kritz and Makinwa-Adebusoye, 1995). Even more effort has been directed towards the determinants of, or the factors that influence, fertility preferences presumably because these reflect demand for children, a reliable predictor of fertility (Dodoo, 1992; Gage, 1994; Campbell and Campbell, 1997; Isiugo-Abanihe, 1997). Indeed, researchers have gone further to examine the effects of childbearing preferences on fertility (Farooq, Ekanem and Ojelade, 1987; Takyi, 1993) and contraceptive use (Gage, 1994; Isiugo-Abanihe, 1997). Other aspects of fertility preference have

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also been the subject of study, and these include, but are not restricted to, stopping and spacing behaviour. For instance, Rafalimanana and Westoff (2000) have recently examined, among other things, the fertility implications of the gap between preferred and actual birth interval lengths. Recent years have also seen a surge in research on the preferences among males (Becker, 1996; Campbell and Campbell, 1997; Rono, 1998). Despite this, the incorporation of men's preferences into the thinking about fertility outcomes could benefit from further development.

Research on the effect of preferences on fertility is part of a more general body of work that attempts to explicate the determinants of fertility (Farooq, Ekanem and Ojelade, 1987; Bankole, 1995). The challenge of isolating causal effects in cross-sectional data, when one has measures of past fertility but data only on current preferences, has provoked considerable interest in contraceptive use as a key variable for study. While some have sorted through the background factors that determine contraceptive use (Njogu, 1991), others have been interested in the projections about future fertility that can be made from the analysis of contraceptive prevalence (Westoff, 1994). Still others have used contraceptive prevalence to examine intriguing questions about fertility change. For example, Feyisetan and Casterline (2000) examine changes in contraceptive prevalence (within categories of fertility of preference) over a two-decade period to suggest that the substantial increases in contraception that have conditioned the fertility transition in many African countries are not traceable so much to lowered fertility demand as they are to the satisfaction of already existing demand.

Indeed, the literature abounds with research that analyses fertility preferences, contraceptive use or the relationships among these variables. Despite the plethora of papers on these relationships, the conceptual framework that has guided the bulk of work in this area precludes fuller analysis of fertility behaviour and, hence, more confident and valid speculation about the prospects for fertility transition. Until recently, the exclusion of the male perspective, despite men's central role in fertility decision-making, has been a limiting factor (Dodoo, 1993; Ezeh, 1993; Dodoo and van Landewijk, 1996). Even the recent inclusion of men in fertility and related analyses could be further enhanced. Another shortcoming of the published literature is the apparent preponderance of existing research on countries that have experienced some fertility transition. Considerably less work has been done on countries in which fertility remains persistently high, although one might argue that those are the ones most in need of analytical examination. Consequently, comparisons (and decomposition analyses) of the countries where fertility transition has already occurred and those in transition would provide a meaningful contribution to the discussion about prospects for fertility decline. Even though existing works have contributed greatly to the understanding of fertility behaviour, more could be done to expand the perspective on the prospects that exist for fertility decline in Africa. The next section will consider how the conceptual framework that guides much of this work can be enhanced to facilitate an improved understanding of future fertility.

C. CONCEPTUAL FRAMEWORKS FOR STUDYING FERTILITY

The typical model for studying fertility-related behaviour departs from Becker's (1981) New Home Economics model, the underlying assumption of which is that couples function as one unit that pools resources and has a joint budget. Likewise, this conventional model also assumes that both partners share the same fertility desires and goals, which is why it was traditionally deemed appropriate to solicit data about fertility preferences and intentions exclusively from one spouse. Women were deemed the appropriate respondents because they were expected to be more likely to respond correctly to questions about the number and timing of past births.

An example of the conceptual framework that has traditionally been employed in research on fertility decision-making is shown in figure I. Even with this solely female perspective, the idea, as presented earlier, is that fertility preferences conditioned by combinations of background factors constitute a causal precursor to contraceptive use, as the latter becomes the implementing mechanism for translating existing preferences into actual fertility. Even within this causal nexus, the existing literature has not taken full advantage of the potential contribution that derives from understanding the relationships between preferences, contraceptive use and actual fertility. For instance, it does not appear that researchers are anywhere close to estimating algorithms that reveal precisely what levels of preferences can motivate certain levels of contraceptive use or even how contraceptive use itself is related to fertility. Of course, any such formulas should probably be indexed by parameters that include the level of fertility. Despite knowing that preferences drive contraceptive use, which is in turn inversely related to fertility, researchers have not moved far along the line of inquiry regarding how robust the predictive relationships among the three key variables are.

D. EVOLUTION OF THE TRADITIONAL FRAMEWORK: BRINGING MEN INTO THE PICTURE

In addition to improving our ability to comment on the prospects for fertility decline, the inclusion of the male perspective in reproductive decision-making, and thereby the consideration of their preferences in conceptual models of fertility and related behaviour, permits analyses of the relative power women have in reproductive decisions (Dodoo, 1993; Dodoo and van Landewijk, 1996). There is arguably no more fundamental human right than the one that concerns what women do with their bodies and, particularly, the bearing of children solely in accordance with their apparent preferences (Dodoo, 1998a). Time and again, and across the continent, demographic surveys have shown that unmet need for family planning is high in Africa.

A growing literature on the male role argues that the patriarchal nature of social arrangements on the African continent—through lineage, descent, marriage and bride-wealth rules—gives men control over sex and the power to implement their preferences in associated decision-making (Dodoo, 1993; Ezeh, 1993; Dodoo, 1995; Bankole and Ezeh, 1999). This suggests that there is a need to incorporate a couple perspective in fertility and related analyses.

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Figure I.   Conventional framework for contraceptive use determination
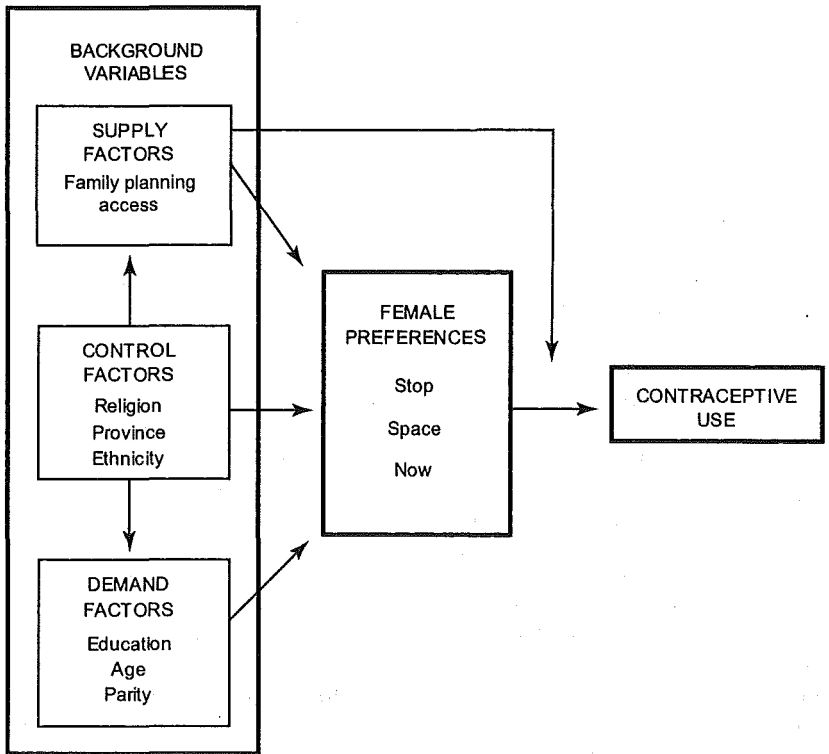
Source: Dodoo and Tempenis (2002).

In marriage, for example, wealth transfers from the groom and his family to the bride and her family compensate the woman's kin for losing her labour and that of her offspring (Comaroff, 1960; Goody, 1973; Isiugo-Abanihe, 1994; Caldwell and Caldwell, 1990). This bride-wealth payment also transfers decision-making authority over childbearing to men (Kayongo-Male and Onyango, 1984; Caldwell and Caldwell, 1990). Men's higher fertility preferences (Mott and Mott, 1985; Fapohunda and Todaro, 1988; Dodoo and Seal, 1994; Dodoo, Luo and Panayotova, 1997), which stem from the lower costs and greater benefits of childbearing that accrue to them relative to women (Boserup, 1985; Fapohunda and Todaro, 1988), then mean that men have traditionally dominated childbearing, at least in a way that is supportive of high fertility. The emerging empirical evidence supports this statement (Bankole, 1995; Dodoo, 1998a), and the emphasis of ongoing work is already expanding to include the identification of the sources of this gender inequality (Dodoo, 1998b; Dodoo and Tempenis, 2002).

Figure II presents a conceptual framework that is similar to the traditional model except that it incorporates the male perspective. The implication is that

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Figure II. **Enhanced framework for contraceptive use determination (joint preferences between husbands and wives)**

BACKGROUND
VARIABLES

SUPPLY
FACTORS
Family planning
access

CONTROL
FACTORS
Religion
Province
Ethnicity

DEMAND
FACTORS
Education
Age
Parity

NEGOTIATION
OF RELATIVE
GENDER
PREFERENCES
Hstop / Wnow
Hspace / Wnow
Hnow / Wnow
Hstop / Wspace
Hspace / Wspace
Hnow / Wspace
Hstop / Wstop
Hspace / Wstop
Hstop / Wstop

CONTRACEPTIVE
USE
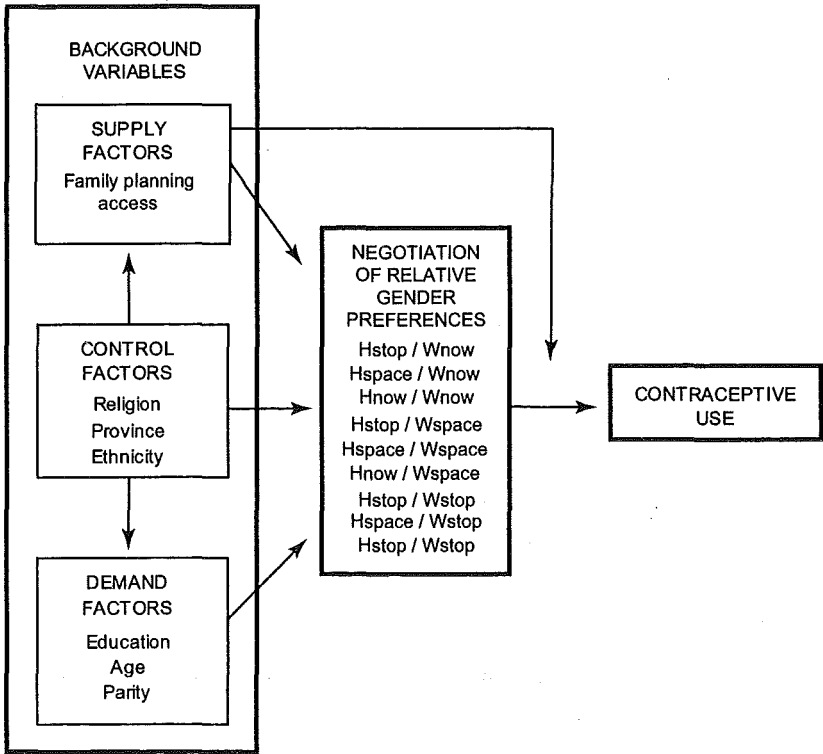
Source: Dodoo and Tempenis (2002).

gender differences in fertility preferences lead to their negotiation within couples (Safilios-Rothschild, 1970; Beckman, 1983; Hollerbach, 1983). It is then possible to decipher the relative power that spouses have in fertility decisions, which enhances understanding of the relevance of autonomy, status and power for women as well as for men. The model, as shown in figure II, enables us to distinguish the different impacts of spacing and stopping preference variances between couples or reproductive dyads. A model of this nature allows us to decipher power differences from six disagreement categories (partner preferences coincide in the other three categories). Although a condensed model might collapse spacing and stopping, distinguishing these is meaningful because there is a substantive distinction between stopping and spacing as far as the intensity of the related contraceptive need and the extent (of time) of contraceptive use. Likewise, having an unwanted child is much costlier for respondents who want to stop than it is for those who want to space, for whom mistimed fertility is less problematic. It is also the case that those who want to space are more likely to be ambivalent about contraceptive use; hence they

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may be less regular users of modern contraception and may also more often turn to traditional methods.

E. The Way Forward

The above remarks provide some clues about profitable ways to address the preference–contraceptive use–fertility nexus in order to better address the issue of prospects for fertility decline. The following list is not exhaustive in scope, but represents useful areas for consideration in future research:

1. Of central importance is the need for the incorporation of men in analyses of fertility and related behaviour on the African continent to become the norm. Further work should consider introducing other parties who hold significance for the reproductive decision (e.g., in-laws of the wife, and particularly mothers-in-law). Couple analyses can also clarify the nature and extent of gender inequality associated with high fertility in Africa. The roots of such disadvantage certainly need to be empirically supported.

2. More systematic assessment of the relationships between the three variables is needed, with the goal of coming up with robust findings about these relationships. The ideal goal would be to derive algorithms that define the relationship of these variables to each other.

3. Comparisons of countries that have evidenced fertility transition with those that have had little or no success in reducing fertility would be beneficial. Decomposition analysis provides one example of a method whose application might help to clarify the differences between the two sets of countries in order to provide viable explanations for the observed fertility variances.

4. In the same vein, more rigorous analysis of countries that have several data points should enhance understanding of the determinants of transition. Both Ghana and Kenya, for instance, have data from three demographic and health surveys that provide fertility, contraception and preference information for both females and males (table 2). In line with the first recommendation above, for example, some insights might be gained by exploring the extent to which male versus female preferences have been responsible for the onset and continuation of fertility transition. The data from Ghana in particular hold promise for understanding the onset of fertility transition, since in that country the transition occurred subsequent to the 1988 survey. In Kenya, however, the first survey that included men (in 1989) was carried out after fertility transition had begun.

5. The interest in the determinants of fertility behaviour should continue. Particularly important is the need to clarify the role or impact of spousal discussion or communication on contraceptive use. Although spousal discussion is more and more frequently presumed to enhance the uptake of contraception, recent findings suggest that such discussions may not actually have the expected causal impact on fertility behaviour (Dodoo and others, 2001). Understanding the validity of this relationship is important in a climate of dwindling resources.

TABLE 2.   TRENDS IN FERTILITY, CONTRACEPTIVE USE AND FERTILITY PREFERENCES,
KENYA AND GHANA, 1988-1998

	1988-1989	1993	1998
Kenya			
Preferences (percentage women wanting no more children)[a,b]	49.4	51.7	53.3
Preferences (percentage men wanting no more children)	48.6[c]	38.4	45.5
Contraceptive use (percentage using modern method)[a]	17.9	27.3	31.5
Fertility (total fertility rate)	6.7[d]	5.4	4.7
Ghana			
Preferences (percentage women wanting no more children)[a,b]	22.8	33.9	35.0
Preferences (percentage men wanting no more children)	19.2[c]	31.8	32.4
Contraceptive use (percentage using modern method)[a]	5.2	10.1	13.3
Fertility (total fertility rate)	6.4	5.5	4.5

Sources: Ghana Demographic and Health Survey 1988 (Accra, Ghana Statistical Service; and Columbia, Maryland, Institute for Resource Development [IRD]/Macro Systems, Inc., 1989); Ghana Demographic and Health Survey 1993 (Accra, Ghana Statistical Service; and Calverton, Maryland, Macro International, Inc., 1994); Ghana Demographic and Health Survey 1998 (Accra, Ghana Statistical Service; and Calverton, Maryland, Macro International, Inc., 1999); Kenya Demographic and Health Survey 1989 (Nairobi, National Council for Population and Development; and Calverton, Maryland, Macro Systems, Inc. [IRD], 1989); Kenya Demographic and Health Survey 1993 (Nairobi, National Council for Population and Development, Central Bureau of Statistics, Office of the Vice President and Ministry of Planning and National Development; and Calverton, Maryland, Macro International, Inc., 1994); and Kenya Demographic and Health Survey 1999 (Nairobi, National Council for Population and Development, Central Bureau of Statistics, Office of the Vice President and Ministry of Planning and National Development; and Calverton, Maryland, Macro International, Inc., 1999).

[a] Figures are from currently married women.

[b] Includes sterilization (male or female).

[c] Figures are from currently married men.

[d] Calculated for three-year period preceding the survey (otherwise for the five-year period).

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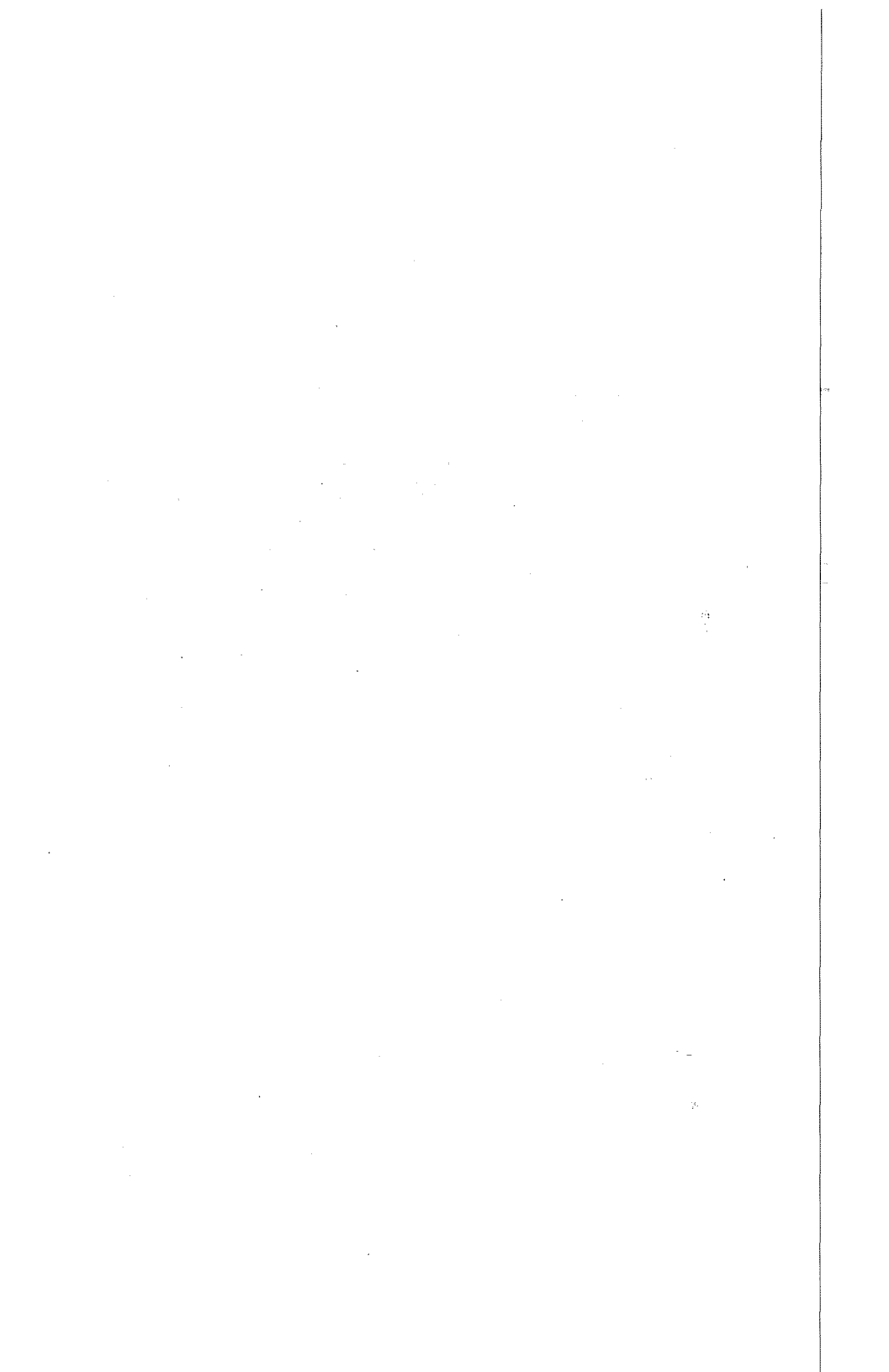
MISTIMED AND UNWANTED CHILDBEARING IN THE COURSE OF FERTILITY TRANSITION[1]

*Jacob A. Adetunji**

A. BACKGROUND

Mistimed childbearing and unwanted childbearing are indicators of imperfect control over the reproductive processes. They mirror the extent of unmet need for effective contraception either to delay pregnancies and space births (mistimed fertility) or to stop childbearing (unwanted fertility). The levels of these indicators vary across countries in ways that are often difficult to explain because they do not correlate with contraceptive prevalence or fertility levels. For example, why would the level of mistimed and unwanted fertility be low in the Niger where the total fertility rate (TFR) is 7.2 and only 5 per cent of women aged 15 to 49 use modern contraception, but high in Peru where 50 per cent of the women use modern contraception and the fertility level is less than half of that in the Niger? One approach that has been adopted to investigate such variations is to focus on the determinants. Among the important determinants of mistimed and unwanted fertility are maternal age; number of living children; preceding birth intervals; and measures of economic status. However, while studies of determinants give us an understanding of factors that are important in explaining individual-level variations within a population, they do little to advance our understanding of the variation across countries or cultures.

One of the promising explanations for the apparently counter-intuitive patterns of mistimed and unwanted fertility across human populations is the linkage to the stages of fertility transition. This line of research, although having emerged in the last few years, has led to some interesting findings. The delay in making the conceptual link between overall fertility levels and the prevalence of mistimed and unwanted childbearing is partly a result of the focus, in initial research efforts to understand the patterns and determinants of mistimed and unwanted childbearing, on the low fertility settings of the West. This occurred in no small part because pertinent data for investigating that issue were not available in developing countries. However, with the availability of World Fertility Survey (WFS) data in the 1970s and 1980s, researchers began to explore the possibility of investigating the pattern of unwanted childbearing in developing regions. Among the earliest systematic investigation of such topics in developing regions was a study by Westoff (1981) in which the

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general patterns of unwanted fertility in six countries were described. This was followed by the work of Blanc (1982), which focused on Latin America. The data situation improved considerably under the Demographic and Health Survey (DHS) project. Available evidence now shows that a large proportion of pregnancies resulting in births in developing countries are neither planned nor wanted. According to a recent estimate from the United Nations Population Fund (1997), about 43 per cent (75 million) of the 175 million pregnancies that occur annually are unwanted. Studies also show that the levels of mistimed childbearing seem higher than levels of unwanted childbearing.

1. *Unwanted childbearing and fertility transition*

In 1989, Westoff, Moreno and Goldman hypothesized that patterns of unwanted childbearing in developing countries had some relationship to the overall patterns and trends in total fertility rates. Similarly, Bongaarts and Lightbourne (1990) suggested that an association existed between aggregate levels of unwanted fertility and the stage at which a country was located along the course of fertility transition. However, those hypotheses attracted no major attention in the literature until towards the end of the 1990s when Bongaarts (1997) further explored the issue. Bongaarts demonstrated that over time, a transition occurred in the proportion of unwanted births observed in a population and that the transition in unwanted fertility seemed to be related to fertility levels.

The connection between total fertility and unwanted (excess) fertility, according to Bongaarts, is as follows: in a natural fertility setting, total fertility will be the sum of wanted and unwanted fertility, i.e., $F_t = WF_t + UF_t$, where F_t is total fertility at time t, WF_t is wanted fertility and UF_t is unwanted fertility at time t. In such a setting, married women continue to have children until they reach their desired family size. Thereafter, they may be having unwanted children in the absence of fertility control. If contraception is introduced to such a population and the contraception is 100 per cent effective, then the actual unwanted fertility is equal to the product of the total fertility and the proportion of married women who are not using contraceptives after completing their desired family size. Thus, according to Bongaarts, unwanted fertility is zero when no women want to stop childbearing. It peaks in the middle of the fertility transition when about half of the women who wanted no more children use effective contraception and again drops to zero when all women who want no more births use effective contraception. This is how it is assumed that a connection exists between observed levels of unwanted fertility and total fertility levels or fertility transition.

2. *Mistimed childbearing and fertility transition*

One of the limitations of the Bongaarts model is the non-separation of mistimed fertility from wanted fertility despite the importance of mistimed fertility as a component of fertility change and contraceptive use in developing countries. The position taken in the present paper is that the prevalence of mistimed childbearing also changes over the course of fertility transition. The

basic premises underlying this position are as follows: (*a*) since unwanted fertility (UF$_t$) changes over the course of fertility decline, and since total fertility (F$_t$) is the sum of wanted (WF$_t$) and unwanted fertility (UF$_t$), then wanted fertility changes over the course of fertility decline; (*b*) however, wanted fertility (WF$_t$) is composed of rightly timed fertility (RF$_t$) and mistimed fertility (MF$_t$), i.e., WF$_t$ = RF$_t$ + MF$_t$; and (*c*) therefore, F$_t$ = RF$_t$ + MF$_t$ + UF$_t$. It is argued here that mistimed fertility will change in the same way that unwanted fertility changes. In a pre-transitional or natural fertility setting, although fertility is high and apparently no conscious attempt is made to limit the number of births, the changes occur owing to strong traditional norms that control the context, timing and spacing of births. Adherence to such social controls and norms is usually widespread, thereby limiting the incidence of mistimed pregnancies and births.

Various studies have found that birth spacing is usually not a major problem in high fertility regimes. However, as modernization sets in, often accompanied by the introduction of modern contraception and increased schooling, adherence to the traditional norms and taboos—the means through which traditional societies regulated birth spacing and timing—weakens. Consequently, the proportion of individuals and couples violating traditional birth spacing norms without substituting effective modern methods may increase. Since desired family size is usually large, the risk of having a mistimed birth is therefore higher than in a low fertility setting, and the prevalence of mistimed pregnancies and births may also increase, often leading to higher fertility rates among some segments of the society. As more and more people adopt effective contraception, and as desired family size decreases, the prevalence of timing failure will decrease—provided user failure is limited. The risk of user failure is high when a large proportion of contraceptive users are employing temporary, user-dependent methods for delaying the onset of childbearing or for achieving long intervals between births.

3. *Investigating the fertility transition linkage*

Bongaarts has argued convincingly that a separate low-high-low transition exists in the level of unwanted childbearing and that such a transition is related to fertility transition, although the nature of his data did not allow for a test across fertility levels. A similar linkage by which mistimed fertility levels could be connected to the course of fertility transition is presented in the preceding paragraphs. Nevertheless, it is necessary to test with empirical data to see if such a relationship actually exists. That is the task that will be undertaken below.

Ideally, to investigate what happens to mistimed and unwanted fertility in a population as it moves from a high to a low fertility regime, it is necessary to follow that population through time. This is neither feasible nor efficient for our purposes. An alternative is to use a hypothetical approach in an attempt to capture the experience of populations at various stages of their demographic transition. The assumption in this case is that the levels of mistimed and unwanted fertility observed in countries with various levels of fertility approximate the experience of a given country as it journeys through various stages

of fertility transition. If the analysis is limited to high fertility countries alone, understanding the relationship that exists between mistimed and unwanted childbearing and declines in fertility levels will be difficult. To show the relationship between mistimed or unwanted fertility and the TFR across a wide spectrum of fertility regimes, it is necessary to include countries with lower levels of fertility. Therefore, the countries included in the present paper span a broad range of fertility levels.

In accordance with the practice in recent literature (Adetunji, 1998a; Tsui, Wasserheit and Haaga, 1997; Brown and Eisenberg, 1995; Forrest and Singh, 1990), a birth is defined here as mistimed if the mother became pregnant at a moment when she would have preferred to delay the pregnancy until a later time. A birth is defined as unwanted if it was a product of a pregnancy that occurred when the mother wanted to have no more children. The terms "unwanted" and "mistimed", therefore, refer only to the time of conception and do not reflect the mother's perception of the child at the time of birth or later in life.

B. DATA AND METHODS

1. Data

This paper is based on an analysis of Demographic and Health Survey data from 11 countries from Africa, Asia, Latin America and Eastern Europe. Initially, 14 countries that had participated at least twice in the DHS programme were randomly selected from a list of countries representing various fertility scenarios, which was supplied by the United Nations Population Division. The countries were selected to represent high fertility settings (Chad and the Niger), countries with declining fertility levels in Africa (Benin, Ghana, Kenya, Mali and Togo), Asia (Bangladesh, Indonesia and Kazakhstan), Latin America (Brazil, Colombia and Peru) and the Middle East (Jordan and Yemen). However, as the necessary data were not available, three countries (Brazil, Jordan and Yemen) had to be dropped from the list, leaving 11 countries for the paper. For 4 of those countries, the first DHS data set available lacked the variables necessary for the analysis of trends.

For all the countries in the study, data on mistimed and unwanted childbearing were obtained from women who had given birth in the three to five years preceding the survey date as well as from those women who were pregnant at the time of the survey. For the present study, only data for women who had given birth in the preceding 36 months were retained. The wording of the relevant survey question was, "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 women's responses were the basis for classifying the 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 respondents wanted them; mistimed pregnancies were those that occurred sooner than the respondents desired (conceptually, these would be wanted); and unwanted pregnancies were those that respondents had when they wanted no more children.

2. *Methods*

From responses to the survey questions, age-specific fertility rates (ASFR) are calculated as follows:

$$\text{ASFR } [a, t] = b \ [a, t] \ / \ e \ [a, t]$$

where a = five-year age groups 15-19 to 45-49, $b \ [a, t]$ = 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). In addition, t refers to 36 months (three years) before the date of the survey, and each woman is assumed to contribute three years of exposure in her current age group. The same formula was used to derive age-specific mistimed fertility (ASMF) and age-specific unwanted fertility (ASUF). From the age-specific rates, total mistimed fertility (TMF) and total unwanted fertility (TUF) were obtained. All of these rates were limited to births in the 36 months before the date of the interview especially since more recent births tend to be more accurately reported by mothers than those in the more distant past (Bankole and Westoff, 1998).

To get a sense of how the level of mistimed and unwanted fertility changes in the course of fertility transition, two approaches were adopted. First, total mistimed fertility and total unwanted fertility rates were checked to see if they differed according to the overall TFR in each country. It was expected that both mistimed and unwanted fertility levels would be low in high fertility settings, high in countries undergoing fertility reduction and low again in low fertility countries. Secondly, an analysis of the age pattern of mistimed and unwanted fertility was undertaken to see if their interaction varied over the course of fertility transition. The results are shown using graphs. Of specific interest was the age at which both lines intersected under various fertility scenarios.

The calculation of unwanted fertility in the present paper differs in one important respect from the calculation used in some previous studies (Bankole and Westoff, 1995; Bongaarts, 1997). In those studies, wanted fertility was based on the difference between stated ideal and current family sizes. A woman whose number of children exceeded the reported ideal number was counted as having unwanted births. That is an indirect approach, and it does not allow for an analysis of mistimed fertility. For the current study, a woman had to indicate that the child in question was actually unwanted at the time of conception. A comparison of the total wanted fertility obtained from both approaches was made in an earlier study (Adetunji, 1998a), and it shows no major differences in most countries. That notwithstanding, a direct comparison of the results of this paper with those using the indirect approach should be undertaken with caution.

There are some possible sources of bias in the data, which should be mentioned before presenting the results. First, the data were collected retrospectively, hence there is the possibility of ex post facto rationalization. This may happen if, owing to other considerations or events after conception, a pregnancy is reported as rightly timed or wanted even though that was not the feeling when the pregnancy was first noticed. For example, an unmarried teenage woman who became pregnant might at first react negatively but later change

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her mind if her partner felt differently and planned to marry her. How often this happens is difficult to say. However, previous studies have shown that the farther the event is in the past, the more likely it is to be rationalized (Bankole and Westoff, 1998). To minimize the effects of ex post facto rationalization, the cases analysed in this paper were restricted only to births in the 36 months (three years) preceding the date of interview.

Another possible source of bias in the data is the lack of information on the opinions of male partners. Men's opinions are still dominant in decisions about fertility in Africa. However, studies that examine how much the opinions of the husband or the child's father weigh on how a woman evaluates the wantedness of her pregnancy are rare. It may often be the case that a woman's expressed intention is not similar to that of her husband. A woman may express the view that she does not want to have another child, but her husband may or may not agree with her. In many cases, the husband and wife do not discuss such issues. Moreover, the data collected on mistimed childbearing focus on situations in which a woman became pregnant earlier than desired. There is no information on those who could not achieve a pregnancy at the time they wanted, which would be earlier than the time of conception.

C. RESULTS

1. Levels and trends

Current fertility among the countries in this study ranged from a high of 7.2 children per woman in the Niger to a low of 2.5 in Kazakhstan. In the high fertility countries (TFR above 6 children per woman), which are all in sub-Saharan Africa (table 1), mistimed total fertility rates tend to be low. For example, in the Niger and Chad, by the time a woman reaches the end of her reproductive lifespan, she would have mistimed less than one pregnancy leading to the birth of a child (0.7 and 0.6 respectively). About 10 per cent of the TFR in the Niger was mistimed, and 9 per cent in Chad. A similar low mistimed fer-

TABLE 1. TOTAL FERTILITY RATES AND LEVELS OF MISTIMED FERTILITY
AND UNWANTED FERTILITY IN SELECTED COUNTRIES

Country (year of survey)	Total fertility rate	Total mistimed fertility rate	Total unwanted fertility rate
Niger (1998)	7.20	0.72	0.10
Chad (1996/97)	6.37	0.57	0.09
Mali (1995/96)	6.71	1.15	0.33
Benin (1996)	5.96	1.07	0.45
Togo (1998)	5.20	1.57	0.57
Kenya (1998)	4.70	1.61	0.67
Peru (1996).	3.54	0.75	1.38
Bangladesh (1996/97)	3.27	0.63	0.48
Indonesia (1997)	2.78	0.24	0.27
Colombia (2000)	2.61	0.74	0.66
Kazakhstan (1995)	2.49	0.20	0.17

Source: Demographic and Health Surveys.

tility rate is observed in countries with a TFR below 4. However, in countries with a TFR between 4 and 5, mistimed fertility is much higher (see figure I).

The risk of unwanted fertility is low in countries with a TFR above 6 and/or below 3, and high among those with a TFR in between this range. For example, in the Niger and Chad, by the time a woman reaches the end of her reproductive lifespan, her chance of having an unwanted birth is virtually nil, because unwanted fertility as a percentage of achieved fertility is 1.4 per cent. Similarly, in Kazakhstan, total unwanted fertility is only 0.17 children per woman, or 6.8 per cent of overall TFR. However, total unwanted fertility is 14 per cent of the TFR in Kenya and 39 per cent in Peru. Colombia seems to have higher total mistimed and unwanted fertility than those with a comparable TFR (see figure II).

Overall, if the levels and weights of mistimed and unwanted fertility are considered across countries (table 1), the findings suggest that both mistimed and unwanted fertility rates are low at the upper and lower extremities of TFR and are higher somewhat in between. Thus, a transition apparently occurs in mistimed and unwanted fertility rates over the course of fertility transition. This is the same conclusion that was reached in a previous analysis of pre-dominantly African countries (Adetunji, 1998b). The findings also support the conclusions of Bongaarts (1997) with regard to unwanted (excess) fertility: that is, the level of unwanted fertility observed in a population tends to vary

Figure I. Total mistimed fertility rates in high and low fertility countries
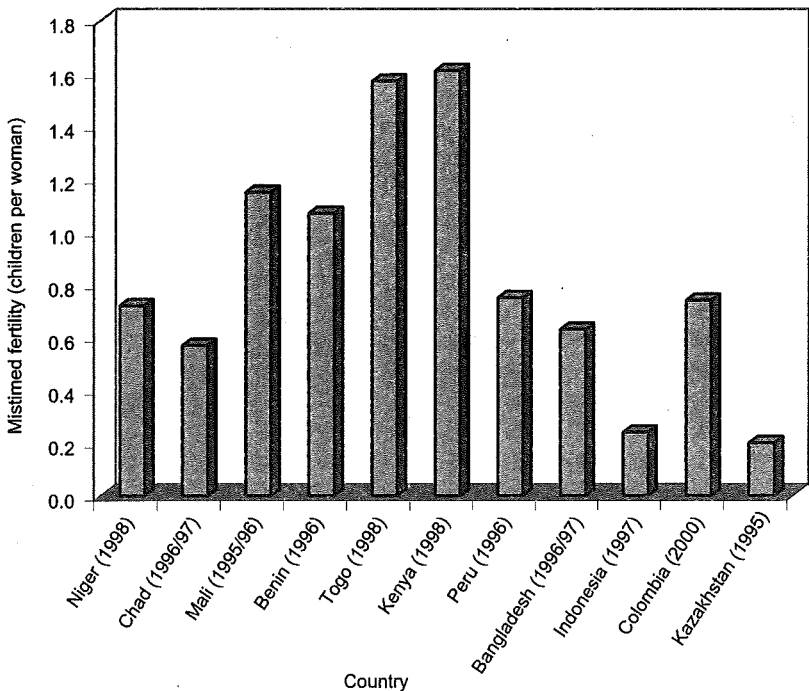
according to the stage where the population is in the course of fertility transition. It is low during a high fertility regime, increases when fertility begins to decline and is again low when the population reaches a low fertility level. Although Bongaarts could not show this empirically owing to the nature of the data used and the approach to measuring unwanted fertility, his logic is quite convincing.

Trends in TFR, TMF and TUF were examined in the seven countries with available time-trend data (table 2). The TFR was found to have increased in only one country (the Niger), remained the same in one country (Peru) and decreased in most (5) of the countries. The greatest inter-survey decline was in Kazakhstan (0.5 children per woman). However, unwanted fertility rates seem to have increased in four of the seven countries—mostly in countries with a TFR below 4. Mistimed fertility rates decreased in most countries with trend data.

2. *Age patterns*

Age is a very important variable when discussing fertility levels and patterns. Using the calculations of age-specific fertility rates and age-specific mistimed and unwanted fertility rates, it was possible to compare the age pattern of mistimed and unwanted childbearing. The results of that comparison, particu-

Figure II. Total unwanted fertility rates in high and low fertility countries
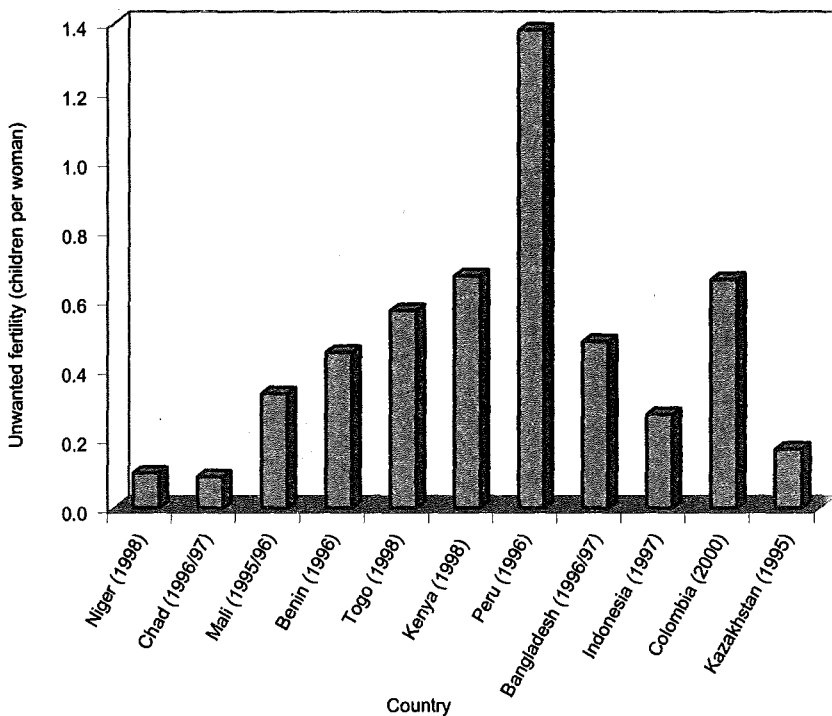
TABLE 2. TRENDS IN THE TOTAL FERTILITY, MISTIMED FERTILITY
AND UNWANTED FERTILITY RATES IN SELECTED COUNTRIES

Country (year of survey)	Total fertility rate		Total mistimed fertility rate		Total unwanted fertility rate		Period change (children per woman)		
	Earlier survey	Later survey	Earlier survey	Later survey	Earlier survey	Later survey	TFR	TMFR	TUFR
Niger (1992, 1998)	6.99	7.20	0.85	0.72	0.18	0.10	+0.21	−0.13	−0.18
Chad (1996/97)	..	6.37	..	0.57	..	0.09	..	..	..
Mali (1995/96)	..	6.71	..	1.15	..	0.33	..	..	..
Benin (1996)	..	5.96	..	1.07	..	0.45	..	..	..
Togo (1998)	..	5.20	..	1.57	..	0.57	..	..	..
Kenya (1993, 1998)	5.40	4.70	1.73	1.61	1.24	0.67	−0.7	−0.12	−0.57
Peru (1991/92, 1996)	3.54	3.54	0.81	0.75	1.33	1.38	0.00	−0.06	+0.05
Bangladesh (1993/94, 1996/97)	3.44	3.27	0.61	0.63	0.56	0.48	−0.17	+0.02	−0.08
Indonesia (1991, 1997)	3.02	2.78	0.49	0.24	0.25	0.27	−0.24	−0.25	+0.02
Colombia (1990, 2000)	2.82	2.61	0.46	0.74	0.64	0.66	−0.21	+0.28	+0.02
Kazakhstan (1995, 1999)	2.49	2.01	0.20	0.19	0.17	0.20	−0.48	−0.01	+0.03

Source: Demographic and Health Surveys.

NOTE: TFR = total fertility rate; TMFR = total mistimed fertility rate; TUFR = total unwanted fertility rate.

larly focusing on the point of intersection, led to some interesting observations across countries (figures III to XIII). First, the schedule of mistimed fertility differs from that of unwanted fertility in each country. In general, age-specific mistimed fertility in countries with an intermediate or high TFR peaks at age 20 to 24. In contrast age-specific unwanted fertility peaks towards the end of the reproductive lifespan. Secondly, in virtually all countries, an intersection occurs between the age-specific mistimed fertility rate and the age-specific unwanted fertility rate, which represents the age at which mistimed fertility is replaced in prominence by unwanted fertility, as seen in the line graphs. The point at which this intersection occurs varies from country to country. Further examination suggests that the age at intersection (or crossover) falls into three separate categories, which can be referred to as types A, B and C.

Type A patterns occur in those countries where the intersection falls near the end of women's reproductive age span. Included in this category are Chad and the Niger. Their intersection (or lack of it) occurs at ages 40 and above. Interestingly, these are also the two countries in the high fertility (or pre-transitional fertility) category. Type B countries are those where the intersection occurs between ages 25 to 29 and 35 to 39: Bangladesh, Benin, Colombia, Indonesia, Kenya, Mali and Togo. The last group (type C), where the intersection occurs before age 25, includes just two countries, Kazakhstan and Peru. The case of Peru seems to be an aberration because its TFR does not appear to correspond to this level of mistimed and unwanted fertility. However, the level of unwanted fertility in Peru is notably 1.4 children per woman (table 1), suggesting that if women had succeeded in implementing their desires, the country's TFR would have been 2.1. Thus, if Peruvian women were able to implement their fertility preferences, the country would have reached replacement-level fertility.

D. ADDITIONAL CONSIDERATIONS

This paper has investigated the relationships between total mistimed fertility, total unwanted fertility and overall fertility patterns. Rather than following a single population over time, a synthetic or hypothetical approach was adopted: the pattern observed in a cross section of countries at various stages of the fertility transition is assumed to approximate the experience of a hypothetical country in the course of its fertility transition. The observed association between TFR and mistimed and unwanted fertility rates seems to be in the expected direction. The levels of mistimed and unwanted fertility are low when the TFR is high, but then increase as fertility levels decline. The rates drop again to low levels when fertility reaches low levels. Those were the expected patterns. They tend to confirm the conclusions reached by Bongaarts (1997) for unwanted (or excess) fertility. They also tend to support the conclusions of an initial study focusing on sub-Saharan Africa (Adetunji, 1998b).

Thus, the fact that a consistent conclusion is reached using different analytical approaches and different data sets from different countries lends credence to the arguments and hypothesis put forward in this paper. Nevertheless,

in interpreting these results, it must be borne in mind that more work is still needed on this topic. The number of countries represented here is small, and the associations in question were observed at aggregate levels. Mistimed and unwanted childbearing are individual reactions to pregnancies.

Again, the best way to ascertain the changes in mistimed and unwanted fertility levels over the course of fertility transition is to observe those levels in the same population as it experiences high, medium and low fertility. Pertinent data that are necessary to do such analyses are not yet available. While awaiting further data for such an investigation, the available evidence seems reliable enough to warrant some discussion.

What do the present findings suggest in relation to the prospects for fertility decline in high fertility settings? As fertility levels move from the pre-transitional stage to the transitional stage, an initial rise in the proportion of mistimed pregnancies should be expected, reflecting unmet contraceptive need for spacing. At this stage, the most popular contraceptive methods are likely to be effective but temporary methods. Secondly, the level of unwanted fertility is expected to increase, reflecting a downward trend in fertility preferences. Until the higher levels of mistimed births give way to high levels of unwanted births, prospects for a lasting reduction in the TFR are small. Similarly, unless appreciable progress is made in reducing unwanted births, fertility reduction will progress very slowly.

One of the points that came out of this study concerns the intersection between age-specific mistimed and unwanted fertility rates. The intersection represents the age at which mistimed childbearing is exceeded or supplanted by unwanted fertility. From the viewpoint of family planning programmes, the age at which the age-specific mistimed fertility rate intersects with the age-specific unwanted fertility rate is the appropriate age for shifting the emphasis from effective temporary methods to more permanent methods of contraception. Prior to that age, the predominant methods of choice among women at risk of pregnancy are reversible methods. A recommended objective of family planning programmes in developing countries is to minimize the proportion of women experiencing mistimed and unwanted pregnancies that result in a birth. One way to do this is to reach women and men with relevant information as well as a supply of contraceptive methods when needed. The goal is to minimize the gap between the time when a woman needs an effective contraceptive method and when she begins to use one. Until this happens, a sizeable number of mistimed and excess births will continue to occur in many developing countries, thereby delaying the completion of fertility transition.

E. CONCLUSION

The results presented in this paper suggest that the levels of mistimed and unwanted fertility depend on where a country is in the course of fertility transition. The levels are high in countries that have begun the transition and have intermediate levels of fertility (e.g., TFR between 3.5 and 5 children per woman). One possible reason for the high level of mistimed childbearing is a

time lag between the breakdown of traditional norms and the widespread acceptance of effective contraception. Increased modernization, as evidenced by increased female education and rural-urban migration, tends to herald the breakdown of the traditional norms regulating birth intervals (prolonged breastfeeding, post-partum abstinence, sleeping arrangements for husbands and wives, multiple wives). Adoption of effective methods of contraception that could help couples achieve desired birth intervals might not be immediate. Consequently, couples may discover that their birth intervals are shorter than desired, and a large proportion of potential modern contraceptive users who are not using these methods would exist. In order to prevent mistimed births, couples would be more interested in temporary, reversible methods of contraception than in permanent methods. Secondly, an emerging higher level of unwanted fertility suggests that fertility preferences are well below achieved fertility. The implication is that there are high levels of unmet contraceptive need for stopping.

As countries move from high to low fertility regimes, mistimed and unwanted fertility levels are likely to increase unless concerted efforts are made to curb them. Meanwhile, more studies are needed on this issue. In particular, it would be interesting to see whether unmet need for spacing and for stopping undergo a similar transition as a society moves from a high to low fertility regime. Countries where a large proportion of births are unwanted could achieve a very low TFR by eliminating or minimizing the occurrence of unwanted births. Conversely, when the level of unwanted fertility is low and overall fertility is high, it is likely that as fertility declines both mistimed and unwanted fertility will first rise before dropping to a new equilibrium at low levels. This has implications for family planning programmes and the contraceptive method mix that is appropriate for countries at various stages in fertility transition.

Figure III. Age-specific mistimed and unwanted fertility rates, the Niger, 1998

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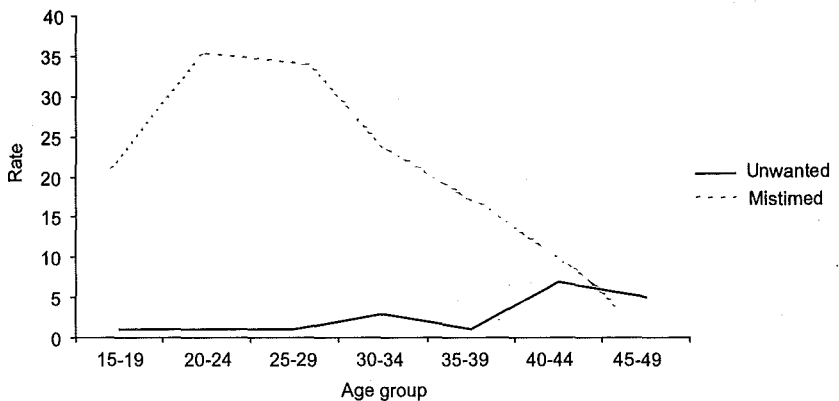
Figure IV.   Age-specific mistimed and unwanted fertility rates, Chad, 1998
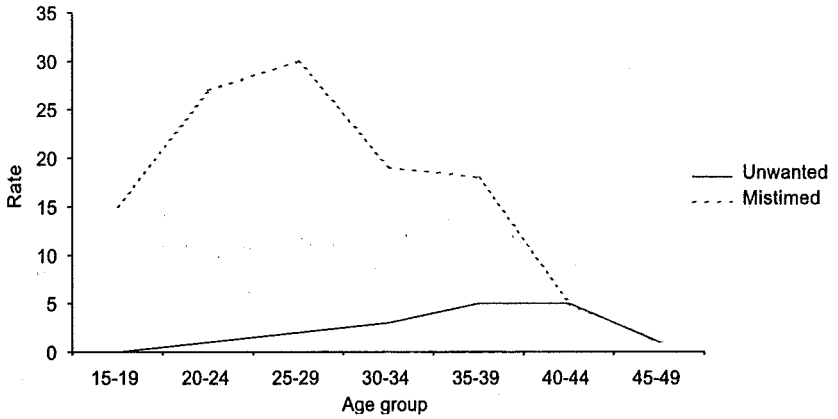
Figure V.   Age-specific mistimed and unwanted fertility rates, Mali, 1996
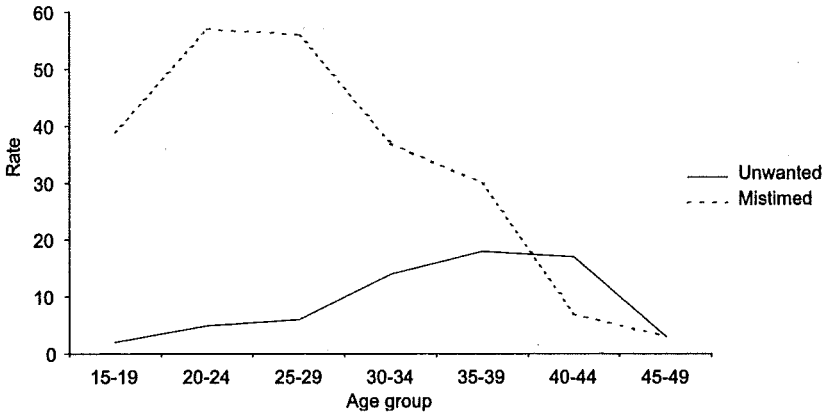
Figure VI.   Age-specific mistimed and unwanted fertility rates, Benin, 1996

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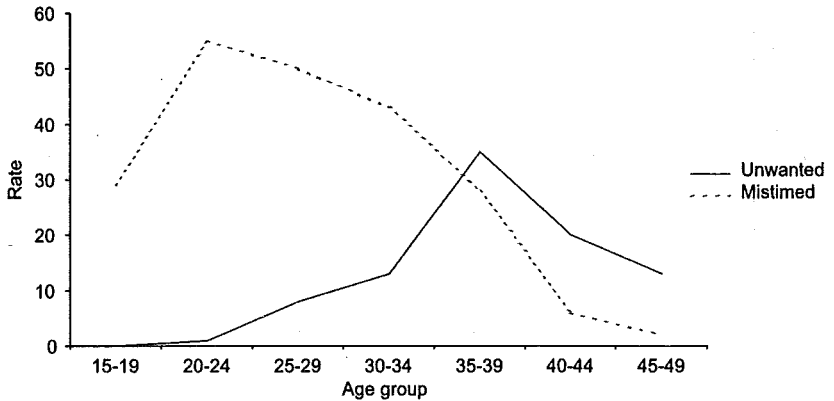
Figure VII.   Age-specific mistimed and unwanted fertility rates, Togo, 1998
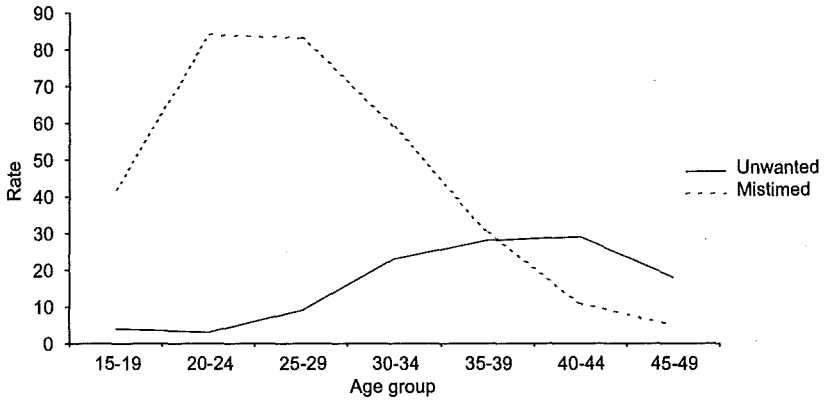
Figure VIII.   Age-specific mistimed and unwanted fertility rates, Kenya, 1998
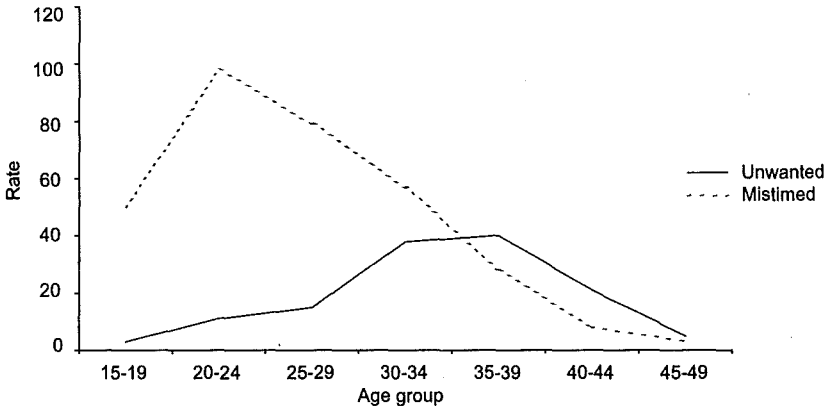
Figure IX.   Age-specific mistimed and unwanted fertility rates, Peru, 1996

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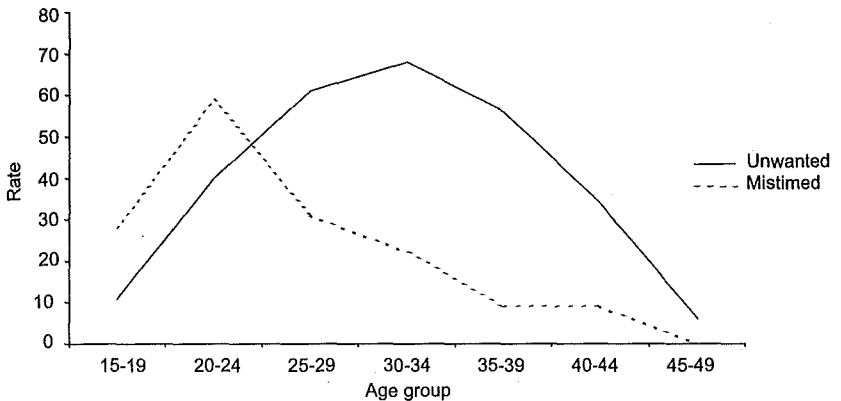
Figure X. Age-specific mistimed and unwanted fertility rates, Bangladesh, 1996/97
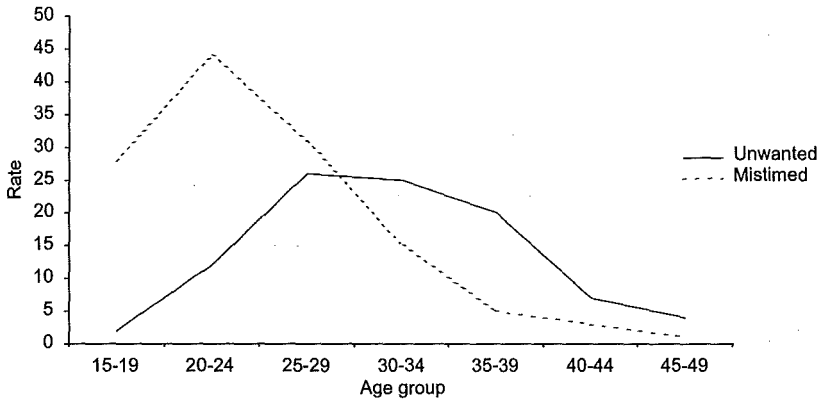
Figure XI. Age-specific mistimed and unwanted fertility rates, Indonesia, 1997
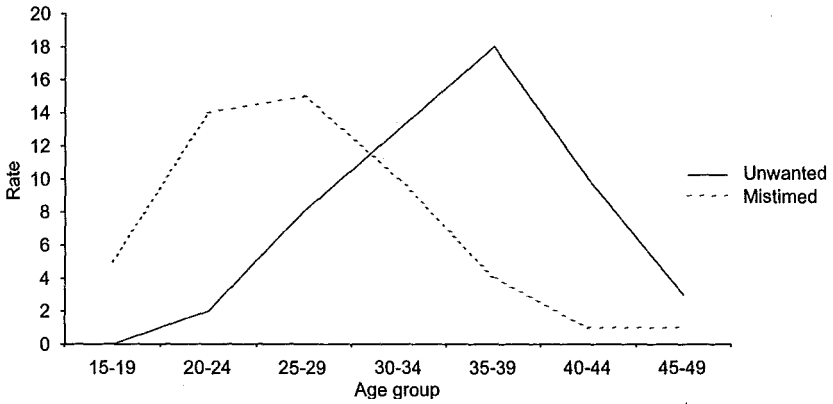
Figure XII. Age-specific mistimed and unwanted fertility rates, Colombia, 2000

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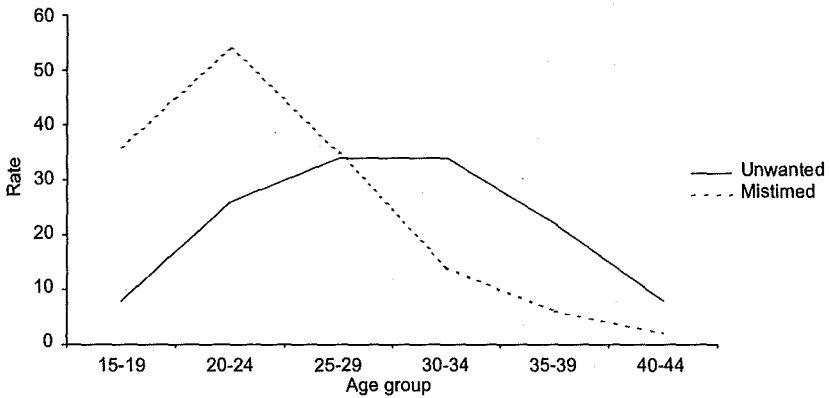
Figure XIII. Age-specific mistimed and unwanted fertility rates, Kazakhstan, 1999
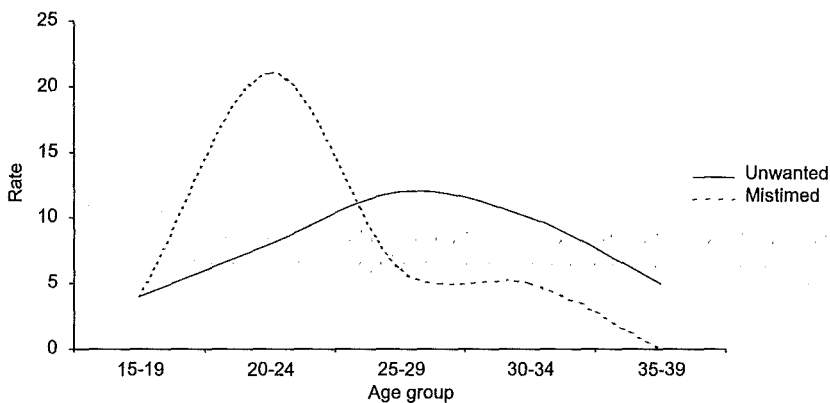
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Part Three

**CONTEXTS FOR
FERTILITY DECLINE**

A COMPARATIVE ANALYSIS OF THE SOCIO-ECONOMIC CORRELATES OF FERTILITY IN CAMEROON AND THE CENTRAL AFRICAN REPUBLIC

*Samson W. Wasao**

A. INTRODUCTION

In most countries of sub-Saharan Africa, population growth rates are still quite high (about 3 per cent per year) and prospects for fertility decline remain largely remote in many countries of the continent. It is well known from the demographic history of the world and from recent country experiences that levels of socio-economic development have powerful influences on fertility change (Singh and Casterline, 1985; United Nations, 1987; Foote, Hill and Martin, 1993). Generally, population growth is fastest in the poorest countries where socio-economic conditions are worst, as can be seen by the high levels of infant and child mortality, lack of basic health infrastructure including family planning services, and low prevalence and use of modern contraception, among other factors. Although mortality decline is occurring rapidly in many African countries, fertility decline has not necessarily followed suit (Tarver, 1996).

In those African countries where fertility transition is clearly taking place, such as Botswana, Kenya, South Africa and Zimbabwe, some associations have been found between changes in socio-economic conditions that either occurred at the onset of the transition or have sustained the transition (Kirk and Pillet, 1998; Kuate, 1998). Although generalizations about entire countries and sometimes about regional variations within countries can be misleading, there is ample evidence that fertility decline tends to follow the contours of social and economic progress across countries and within countries. Differentials in fertility occur mainly as a result of differentials in marriage, contraceptive use and post-partum infecundity (Cochrane and Farid, 1990). Socio-economic factors that exercise important influences in lowering fertility include educational attainment (especially women's education), employment opportunities (women's) and rural or urban residence, as well as availability and accessibility of health and family planning services. Education and rural-urban differentials are among the most widely studied socio-economic factors in analysing individual fertility change. This present study offers a comparative perspective on the relationships between fertility outcomes and selected socio-economic variables in Cameroon and the Central African Republic.

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Cameroon is located in mid-central Africa and consists of the former French Cameroons; the southern portion comprises the former British Cameroons. The country has a surface area of 465,000 square kilometres and is bordered by the Central African Republic on the east, Chad on the north-east, the Congo, Equatorial Guinea and Gabon on the south, and Nigeria on the west. In the south-west, it has a coastline on the Atlantic Ocean about 800 kilometres long. Cameroon has a very diverse population in terms of ethnic composition and geographic spread. The French-speaking section is the largest of the country and supports the bulk of the population (80 per cent). Both English and French are the official languages, and in addition the country has about 24 major African language groups. In terms of religion, nearly half of the people follow traditional beliefs, one third are Christian and the rest are Muslim. In the northern regions of the country, Islam is the dominant religion. Cameroon is one of the world's leading producers of cocoa. Since the 1970s, exploitation of offshore oil deposits has helped to improve the country's prosperity. Agricultural production plays an important role in the national economy and contributes to about one third of the country's GDP. The least developed region is the north, where cattle-raising is the main occupation of the residents.[1] Table 1 shows selected sociodemographic and economic indicators for Cameroon.

The Central African Republic is located in the centre of the continent, bounded by the Sudan on the east, the Congo and the Democratic Republic of the Congo on the south, Chad on the north and Cameroon on the west. It has a land area of 623,000 square kilometres and a population of 3.5 million people. The Central African Republic is one of the least developed countries in Africa. About 80 per cent of the population earns its livelihood by farming, fishing or working in forestry, and only some 3 per cent of the total land area is used for growing crops. The principal sources of revenue for the country are diamonds, coffee, tobacco, cotton and timber exports. Manufacturing activities are very limited. The country is divided into five health administrative units known in French as "régions sanitaires" that are quite diverse in their geographic and ethnic characteristics and economic resources.

From a comparative perspective, Cameroon has about four times the population of the Central African Republic and a higher rate of natural increase. The rate of natural increase in the Central African Republic is below the average for sub-Saharan Africa and Africa as a whole, while that of Cameroon is about the same. The infant mortality rate in the Central African Republic is above the average for sub-Saharan Africa and Africa as a whole, and life expectancy at birth is lower than average. In Cameroon, the infant mortality rate is lower than the regional and continental averages, and life expectancy is higher. Clearly, the demographic and socio-economic indicators shown in table 1 are more favourable in Cameroon than in the Central African Republic, yet their fertility rates are almost the same; 5.2 births per 1,000 women in 1998 in Cameroon and 5.1 births per 1,000 women in 1995 in the Central African Republic.

TABLE 1. SOCIO-ECONOMIC PROFILES OF CAMEROON AND CENTRAL AFRICAN REPUBLIC,
COMPARED WITH SUB-SAHARAN AFRICA AND AFRICA

Country/region	Area (square miles)	Population mid-2000 (millions)	Proportion urban, 1998 (percentage)	GNP per capita, 1998 (US$)	Birth rate (per 1,000 persons)	Death rate (per 1,000 persons)	Annual rate of natural increase (percentage)	Infant mortality rate (per 1,000 live births)	Life expectancy at birth (years)
Cameroon	183 568	15.4	44	610	37	12	2.6	77	55
Central African Republic . . .	240 533	3.5	39	300	38	18	2.0	97	43
Sub-Saharan Africa	9 379 573	657	29	520	41	16	2.5	94	48
Africa	11 698 111	800	33	670	38	14	2.4	88	51

Source: Population Reference Bureau (2000).
NOTE: GNP=gross national product
US$=United States dollars

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The data on fertility and its correlates used for this study were obtained from Demographic and Health Surveys carried out in Cameroon and the Central African Republic in 1998 and 1994/95 respectively. The DHS in each country consisted of a nationally representative survey of women of reproductive age (15-49 years). The surveys were designed to collect information on the sociodemographic and economic characteristics of individuals such as residence, education and marriage type. They also gathered information on fertility outcomes, regulation and preferences, as well as on a number of maternal and child health and nutrition indicators. A limited amount of information was also collected from men of reproductive age (15-54 years).

Although Demographic and Health Surveys do not collect data on income, which would likely be a better measure of individual socio-economic status in either country, the available data on the selected socio-economic factors offer a good opportunity to explore the association between fertility and those factors. Despite the three-year difference in timing between the two surveys, comparison of fertility differentials between the two countries can still be undertaken, given the short period during which no substantial changes in socio-economic conditions occurred in either country.

Two dependent variables that measure fertility outcomes at the individual level are used in this study. These are children ever born and number of children surviving among women of reproductive age. At the aggregate level, the total fertility rate is used to describe associations with the socio-economic variables of interest.

A series of independent variables assessing socio-economic status are also considered: place of residence (rural or urban) and region; education (no formal schooling, primary schooling and secondary or above); religion (Catholic, Protestant, Muslim and others, including traditional religions); marital status (not married, married in a monogamous union and married in a polygamous union); and current use of contraception (none, modern methods and traditional or folk methods).

A descriptive analysis is used to compare fertility outcomes (total fertility rate, children ever born, number of children surviving) by the major socio-economic factors for which comparable data are available for the two countries. Multivariate logistic regression techniques are then used to examine the relationships between the dependent variables, children ever born and number of children surviving, and the socio-economic factors. The dependent variables are categorized into three groups: women with no children, women with between 1 and 4 children, and women with 5 children or more.

D. RESULTS

1. *Descriptive results*

Table 2 shows some basic sociodemographic characteristics of the two countries under study according to DHS data. There are no significant differences in the average ages at marriage and birth between the two countries. The

average age at marriage among women aged 20 to 49 is 17.7 in Cameroon and 17.4 in the Central African Republic, while the average age at first birth among women in the same age group is slightly above 19 in both countries.

The distribution of the population by rural-urban residence reflects the typical rural character of most African countries. The Central African Republic has a larger proportion of men and women who reside in urban areas compared with Cameroon, and also a greater proportion among both sexes residing in the capital city (Bangui) as compared with Cameroon's two biggest cities (Yaoundé and Douala). Among the factors shown in table 2, this is the single favourable factor that Central African Republic has over Cameroon. It is likely that fertility levels in the Central African Republic would be higher than those in Cameroon were it not for the larger proportion of urban residents in the former.

Major differences between Cameroon and the Central African Republic can be seen in the levels of educational attainment. A much larger proportion of women have no education in the Central African Republic (51.6 per cent) than in Cameroon (28.1 per cent). Educational attainment is much higher among men than among women in both countries. The proportion of men with a secondary or higher level of education is over 10 percentage points greater in Cameroon as compared with the Central African Republic.

Table 3 shows levels of fertility as measured by the total fertility rate and children ever born among the women surveyed. Overall, the level of fertility is not significantly different between the two countries: the TFR is just above 5 children per woman in both countries. However, important differentials by selected socio-economic characteristics can be seen. Fertility is lowest in the major urban areas of Yaoundé and Douala for Cameroon (TFR of 3.1 births per woman) and in Bangui for the Central African Republic (TFR of 4.7). The next highest levels of fertility are found in other urban areas and towns. Regions with higher concentrations of urban areas similarly have lower levels of fertility, such as the regions in Cameroon where the cities of Douala (coastal) and Yaoundé (central) are located.

Studies of African fertility dynamics have shown that secondary education (especially for women) has a significant negative association with fertility preferences and outcomes (Foote, Hill and Martin, 1993; Kirk and Pillet, 1998). The distribution of fertility by education in table 3 reflects this association for both countries. For each of the countries, women with at least a secondary school level of education have the lowest TFR while those with no education have higher values of the same rates. Women with no education in Cameroon have higher fertility (by one child) as compared with their counterparts in the Central African Republic.

2. *Multivariate results*

Tables 4 to 7 present odds ratios from the logistic regression models for the two measures of individual fertility used—children ever born and number of surviving children—controlling for the various explanatory variables. Table 4 shows the results for Cameroon. Urban women are nearly twice as likely as rural women to have had no children, and are less likely than rural women

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TABLE 2. PERCENTAGE DISTRIBUTION OF WOMEN AND MEN OF REPRODUCTIVE AGE ACCORDING TO SELECTED SOCIODEMOGRAPHIC CHARACTERISTICS, CAMEROON (1998) AND CENTRAL AFRICAN REPUBLIC (1995)

Cameroon, 1998			Central African Republic, 1995		
Characteristic	*Women*	*Men*	*Characteristic*	*Women*	*Men*
Marital status			Marital status		
Married	66.8	51.1	Married	69.4	58.6
Single	23.4	44.1	Single	19.5	31.8
Divorced/widowed/separated	6.6	4.3	Divorced/widowed/separated	11.1	9.7
Residence			Residence		
Urban	35.3	37.9	Urban	42.6	44.5
Yaoundé/Douala	14.1	16.4	Bangui	21.5	24.2
Other towns	21.2	21.5	Other towns	21.1	20.2
Rural	64.7	62.1	Rural	57.4	55.5
Region			Region		
Yaoundé/Douala	14.1	16.4	RS I	21.2	20.3
Adamaoua/north/extreme north	29.5	26.8	RS II	16.4	17.2
Centre/south/east	22.6	23.0	RS III	18.2	17.7
West/coast	14.5	13.8	RS IV	11.1	8.8
North-west/south-west	19.3	20.0	RS V	11.6	11.7
			Bangui	21.5	24.2

Education

None	28.1	14.9
Primary	38.6	39.3
Secondary	31.7	40.9
Higher/superior	1.6	4.9

Religion

Catholic	38.6	39.4
Protestant	31.7	30.2
Muslim	18.8	19.3
Other	8.4	11.0

Married women aged 40-49
  without any birth 5.7

Average age at birth among women
  aged 20-24 .... 19.3

Average age at marriage,
  women aged 20-49 .... 17.7

Education

None	51.6	20.4
Primary	34.8	49.8
Secondary or higher	13.5	29.8

Religion

Catholic	34.6	32.8
Protestant	55.0	56.2
Muslim	8.9	9.0
Animist	1.0	1.4
Other	0.6	0.6

Married women aged 40-49
  without any birth 8.0

Average age at birth among women
  aged 20-24 .... 19.2

Average age at marriage,
  women aged 20-49 .... 17.4

Sources: Cameroon Demographic and Health Survey 1998, p. 26; Central African Republic Demographic and Health Survey 1994/95, p. 25.

NOTE: RS=health region

TABLE 3.   FERTILITY BY WOMEN'S SOCIO-ECONOMIC CHARACTERISTICS, CAMEROON (1998) AND CENTRAL AFRICAN REPUBLIC (1995)

	Cameroon, 1998			Central African Republic, 1995		
Characteristic	Total fertility rate	Children ever born	Characteristic		Total fertility rate	Children ever born
Residence			Residence			
Urban	3.9	5.7	Urban		4.9	5.9
Yaoundé/Douala	3.1	5.1	Bangui		4.7	5.9
Other towns	4.5	6.1	Other towns		5.1	5.9
Rural	5.8	6.4	Rural		5.2	5.6
Region			Region			
Yaoundé/Douala	3.1	5.1	RS I		5.3	5.6
Adamaoua/north/extreme north	6.6	6.4	RS II		5.9	6.2
Centre/south/east	5.4	6.3	RS III............................		5.3	6.0
West/coast	4.7	6.3	RS IV		4.6	4.9
North-west/south-west	4.6	6.3	RS V		4.8	5.3
			Bangui		4.7	5.9
Education			Education			
None	6.6	6.2	None		5.2	5.7
Primary	5.3	6.5	Primary		5.3	5.7
Secondary or higher	3.6	5.2	Secondary or higher		3.9	5.5
TOTAL	5.2	6.2	TOTAL		5.1	5.7

Source: Demographic and Health Surveys.

to have had higher numbers of children ever born. The same scenario is true for the Central African Republic (table 5), although the numbers here are not statistically significant. Similarly, in both countries, for number of children surviving (tables 6 and 7), urban women are more likely to be in the category of women who have no children surviving and are less likely to belong to the other two categories with higher numbers of children. Again, for Cameroon fertility by urban residence is statistically significant, but the same is not true for the Central African Republic. These results are consistent with those of other studies of fertility patterns in Africa that have mostly shown that urban residence has a substantial influence on fertility outcomes (Singh and Casterline, 1985; Muhuri, Blanc and Rutstein, 1994; Martin, 1995). Here too lower fertility is associated with urban residence, with women living in urban areas having fewer children than their rural counterparts (United Nations, 1987; Cochrane and Farid, 1990; Martin, 1995).

Generally, in most studies of fertility in developing countries, education is the factor with the greatest influence on fertility preferences and outcomes. Lower fertility is consistently associated with higher levels of education. This relationship is not conclusive for either Cameroon or the Central African Republic, at least with regard to primary education. It appears that in these two countries, the primary and secondary levels of education do not have the expected association with fertility. For Cameroon, women with a primary level of education are significantly more likely (about 1.5 times) to have given birth to at least five children than women with no education, while there is no significant difference in fertility between women with a secondary education and those with no education (table 4). A slightly different picture emerges for the Central African Republic (table 5), for which women with primary level education are less likely to have between one and four children ever born, but are more likely to have at least five children ever born.

Polygynous marriages in Africa have generally been associated with high fertility because they are viewed as placing the co-wives in a bargaining position vis-à-vis each other and the husband. Women in areas of widespread practice of polygyny tend to start having sexual intercourse at an early age and to have high fertility goals (Ezeh, 1997). In such forms of social organization, it is claimed that children are the only tool a woman can use in laying claim to spousal property and inheritance (Foote, Hill and Martin, 1993). Surprisingly, the results in the present study indicate that in both Cameroon and the Central African Republic, women in polygynous marriages are less likely to have larger families as compared with those in monogamous marriages.

In both countries, women who are users of modern contraception are significantly less likely to have had any children, but are also more likely to have five or more children ever born. This suggests that women are using contraceptives either to space births or to stop after achieving desired fertility preferences.

The time a woman has stayed in marriage is, as would be expected, significantly associated with the number of children. For each country, marital duration is directly associated with the number of children ever born: the longer the duration, the higher number of children ever born. A similar association can be seen for the number of children surviving.

Independent variable	Model 1 No children	Model 2 1-4 children	Model 3 5 or more children
1. Residence			
Rural (ref)	1.00	1.00	1.00
Urban	1.78***	0.83*	0.81*
2. Education			
None (ref)	1.00	1.00	1.00
Primary	1.11	0.73**	1.47**
Secondary or higher ...	0.92	1.05	1.04
3. Region			
North-east (ref)	1.00	1.00	1.00
Central	0.81	1.20	0.82
West	0.63	1.23	0.85
North-west	0.93	1.32*	0.98
4. Religion			
Catholic (ref)	1.00	1.00	1.00
Protestant	1.14	0.86	1.15
Muslim	1.36	0.97	0.82
Other	1.09	1.28	0.67*
5. Marriage type			
Monogamy (ref)	1.00	1.00	1.00
Polygamy	1.08	1.29***	0.66***
6. Use of contraception			
Use of modern method..	0.39***	0.86	2.09***
No modern method (ref)	1.00	1.00	1.00
7. Marital duration	0.84**	0.91**	1.23***
8. Ideal family size	0.97	0.97	1.05**
Pseudo R2	**0.202**	**0.120**	**0.356**
P>χ2	**0.000**	**0.000**	**0.000**
N	**2916**	**2916**	**2916**

Source: Computed from DHS raw data file.
NOTE: ***p=<0.01; **p=<0.05; *p=<0.10
    N=sample size

E. PROSPECTS FOR FERTILITY DECLINE

Cross-sectional analyses of socio-economic determinants of fertility are helpful in providing a snapshot of the associations between fertility and selected explanatory factors. Such analyses are limited, however, in the ability to provide us with an idea of the future direction of fertility trends. Although fertility rates are still high in sub-Saharan Africa as compared with other regions of the world, fertility decline is already under way in a few countries, such as Botswana, Kenya and Zimbabwe (Locoh, 1994; Kirk and Pillet, 1998). In other countries of sub-Saharan Africa, including the two studied here, trends in fertility change are less clear and as such require further investigation. At the same time, a look at fertility data over time provides some indication that fertility is starting to decline even in some of those countries.

TABLE 5. ODDS RATIOS FROM THE LOGISTIC REGRESSIONS FOR THE IMPACTS OF SELECTED SOCIO-ECONOMIC VARIABLES ON CHILDREN EVER BORN, CENTRAL AFRICAN REPUBLIC, 1994/95

Independent variable	Model 1 No children	Model 2 1-4 children	Model 3 5 or more children
1. Residence			
Rural (ref)	1.00	1.00	1.00
Urban	1.03	0.92	1.09
2. Education			
None (ref)	1.00	1.00	1.00
Primary	0.83	0.99	1.24*
Secondary or higher ...	0.66**	1.27*	1.16
3. Region			
RS I (ref)	1.00	1.00	1.00
RS II	0.71	1.15	0.95
RS III	0.64**	1.13	1.23
RS IV	1.12	1.18	0.69
RS V	1.03	1.03	0.95
4. Religion			
Catholic	0.94	1.56	0.50
Protestant	0.93	1.62	0.51
Muslim	1.20	1.34	0.52
Other (ref)	1.00	1.00	1.00
5. Marriage type			
Monogamy (ref)	1.00	1.00	1.00
Polygamy	1.24*	1.05	0.84
6. Use of contraception			
Use of modern method..	0.25***	0.96	2.20**
No modern method (ref)	1.00	1.00	1.00
7. Marital duration	0.83***	0.93***	1.21***
8. Ideal family size	0.97	0.91**	1.19***
Pseudo R2	**0.225**	**0.085**	**0.340**
P>χ2	**0.000**	**0.000**	**0.000**
N	**3323**	**3323**	**3323**

Source: Computed from DHS raw data file.

NOTE: ***p=<0.01; **p=<0.05; *p=<0.10

N=sample size

Figure I shows trends in age-specific fertility rates for women aged 15 to 44 in Cameroon for two selected periods in time: 0 to 3 years and 5 to 9 years preceding the 1998 DHS. For each age group, fertility was lower in the most recent period (0-3 years preceding the survey) as compared with the earlier period (5-9 years). This clearly points to the fact that both younger and older women were adjusting their fertility downward with the passage of time, a pattern that is increasingly supported by findings from other studies of fertility change in high fertility countries. For example, a study of fertility change in sub-Saharan Africa for the 1980s and 1990s indicated that in Cameroon, the percentage decline in TFR over the 13-year period between the 1978 World Fertility Survey and the 1991 Demographic and Health Survey was about 9 per cent (Kirk and Pillet, 1998). While this is a modest decline, it is nevertheless an indicator of the future trend in fertility change.

Independent variable	Odds ratios		
	No children	1-4 children	5 or more children
Residence			
Rural (ref)	1.00	1.00	1.00
Urban	1.64***	0.76**	0.94
Education			
None (ref)	1.00	1.00	1.00
Primary	1.20	0.63**	1.94**
Secondary or higher	0.96	0.89	1.40
Region			
North-east (ref)	1.00	1.00	1.02
Central	0.82	1.17	1.12
West	0.85	1.08	1.02
North-west	0.72	1.09	1.00
Religion			
Roman Catholic (ref)	1.00	1.00	1.00
Protestant	1.21	0.90	1.08
Muslim	1.39*	0.99	0.77
Others	1.13	1.45**	0.51**
Marriage type			
Monogamy (ref)	1.00	1.00	1.00
Polygamy	1.17	1.13	0.79*
Use of contraception			
Modern	0.38***	0.71**	2.70***
No method	1.00	1.00	1.00
Marital duration	0.87***	0.93**	1.20**
Sexually active	2.59***	0.90	0.57***
Pseudo R2	**0.1642**	**0.083**	**0.331**
P>χ2	**0.000**	**0.000**	**0.000**
N	**2916**	**2916**	**2916**

Source: Computed from DHS raw data file.

NOTE: ***p=<0.01; **p=<0.05; *p=<0.10

N=sample size

Figure II shows age-specific fertility rates for the Central African Republic at two points: 0 to 3 years and 4 to 7 years preceding the 1994/95 DHS. Again, the age-specific fertility rates were lower among each age group for the more recent period (0-3 years preceding the survey) as compared with the earlier period (4-7 years). The gap in fertility rates was largest for the younger cohorts but progressively narrowed with age. According to Kirk and Pillet (1998), the Central African Republic is among the countries that have been characterized by stable or increasing fertility in recent years. Decline in the TFR in the recent period (at least 7 years back) was to the magnitude of about 0.5 children per woman. However, the authors caution that owing to data limitations (including severe birth displacements) and very low levels of contraceptive use, no conclusions should be reached about significant fertility change in some of the countries studied, including the Central African Republic.

Independent variable	Odds ratios		
	No children	*1-4 children*	*5 or more children*
Residence			
Rural (ref)	1.00	1.00	1.00
Urban	0.99	0.83*	1.31*
Education			
None (ref)	1.00	1.00	1.00
Primary	0.82*	0.92	1.55**
Secondary or higher	0.72*	1.21	1.34
Region			
RS I (ref)	1.00	1.00	1.00
RS II	0.95	1.11	0.98
RS III	0.75	1.11	1.32
RS IV	1.49**	1.04	0.81
RS V	1.31	0.99	0.69
Religion			
Catholic	1.22	1.15	0.82
Protestant	1.17	1.22	0.81
Muslim	1.21	0.94	0.95
Others (ref)	1.00	1.12	1.00
Marriage type			
Monogamy (ref)	1.00	1.00	1.00
Polygamy	1.16	1.11	0.76**
Use of contraception			
Use of modern method . . .	0.18***	0.76	3.20***
No modern method (ref) .	1.00	1.00	1.00
Marital duration	0.86***	0.94***	1.20***
Sexually active	5.08***	0.85***	0.41***
Pseudo R2	**0.208**	**0.048**	**0.319**
P>χ2	**0.000**	**0.000**	**0.000**
N	**3323**	**3323**	**3323**

Source: Computed from DHS raw data file.

NOTE: ***p=<0.01; **p=<0.05; *p=<0.10

N=sample size

Among the socio-economic factors attributed to this change in fertility is educational attainment, which depresses fertility through various mechanisms such as adoption of smaller family norms, better knowledge and use of modern contraception, and later ages at first marriage and first birth among educated women. As more women in Cameroon move into the higher education group, this effect of education on fertility is expected to be more pronounced in the future. However, recent DHS data show low levels of education in both countries, especially in the Central African Republic, where among women aged 15 to 49, 52 per cent have no education and 14 per cent have at least a secondary education (Ndamobissi, Mboup and Nguelebe, 1995). In Cameroon, 28 per cent of the women aged 15 to 49 have no education while 32 per cent have a secondary education (Fotso and others, 1999). Among women aged 20 to 24,

Figure I.   Age-specific fertility rates, by selected periods preceding the survey, Cameroon, 1998
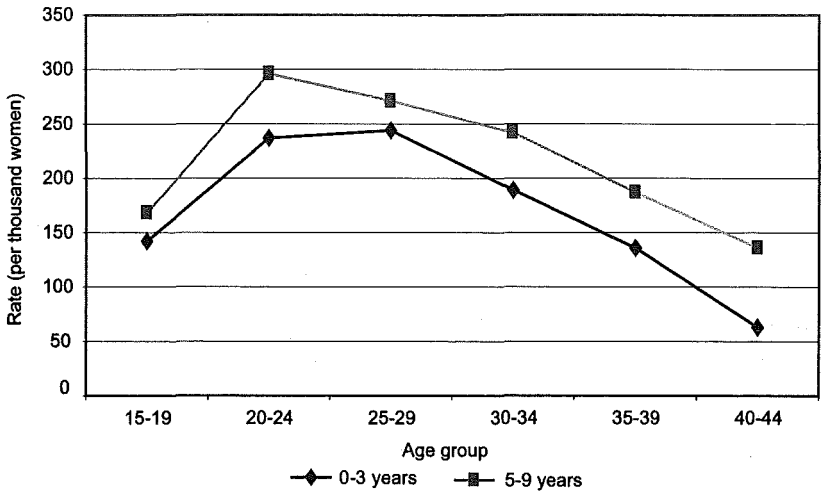
Figure II.   Age-specific fertility rates, by selected periods preceding the survey, Central African Republic, 1994/95

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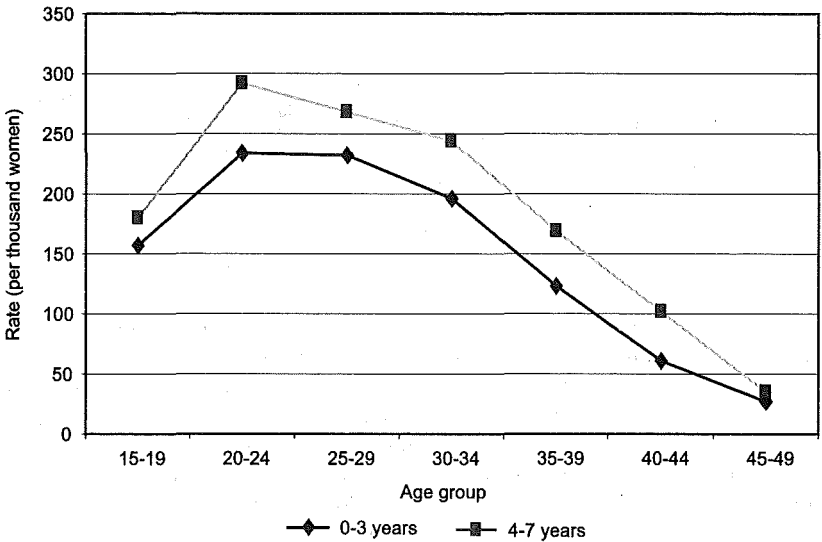
the proportion with no education is 42 per cent in the Central African Republic and 22 per cent in Cameroon. Nonetheless, these disparities are not reflected in the current fertility levels, which are about the same in both countries.

Considerable improvements in women's education will be necessary to reduce the pool of uneducated women in order to speed up the expected (negative) effect on fertility. As more women enter the pool of those with a secondary or higher level of education, fertility may begin to decline in a more predictable manner in the Central African Republic. One way that education depresses fertility is through delayed age at marriage. According to the United Nations (2000), the average mean age at first marriage was higher in Cameroon (26.7 years for men and 20.2 years for women) than in the Central African Republic (24.4 for men and 19.4 for women). Other things being equal, fertility would be expected to decline faster in Cameroon than in the Central African Republic.

Another decisive factor in the lowering of fertility is the level of childhood mortality (Locoh, 1994; Kirk and Pillet, 1998). Generally, high levels of childhood mortality in Africa are associated with high levels of fertility (Foote, Hill and Martin, 1993). Compared to countries where fertility transition is already under way, such as Kenya and Zimbabwe, where under-five mortality is about 100 per 1,000 births, the high levels of under-five mortality of 151 per 1,000 births in Cameroon and 157 per 1,000 births in the Central African Republic are not conducive to the onset of fertility decline. This is perhaps the single critical factor that accounts for the high, and similar, levels of fertility in the two countries, other disparities notwithstanding.

Equally important is the low level of vaccination, which endangers child health and supports high levels of fertility preferences. The proportion of children who are fully vaccinated (that is, those who have received BCG, measles and three doses of DPT and polio) is 36 per cent in Cameroon and 37 per cent in the Central African Republic (Fotso and others, 1999; Ndamobissi, Mboup and Nguelebe, 1995), as compared with 65 per cent in Kenya and 75 per cent in Zimbabwe (National Council for Population and Development and Central Bureau of Statistics [Kenya], 1999; Central Statistical Office [Zimbabwe] and Macro International, Inc., 2000). Prospects for fertility decline in both countries will depend also on increasing child vaccination and reining in other factors incidental to child mortality.

Another factor that has been associated with fertility decline in Cameroon and other African countries is that of economic crises, especially as exacerbated by the implementation of the World Bank structural adjustment programmes. For example, Eloundou-Enyegue, Stokes and Cornwell (2000) argue that in Cameroon, economic crisis impacted both the rural and urban sectors in such a way that fertility declined by 20 per cent in less than a decade (between 1987 and 1995). While the decline was largely observed among urban populations, the authors argue that the magnitude of the observed change suggests a sustained decline in fertility in Cameroon.

Improvements in other socio-economic characteristics that directly affect the proximate determinants of fertility, including marriage and contraceptive use, should further facilitate the fertility decline that is already suggested by the

age-specific fertility patterns as discussed above. Women's education already stands out as a strong catalyst for delayed age at marriage, thereby reducing lifetime fertility. Improvements in accessibility to health services may increase accessibility to and use of modern contraception, pushing fertility outcomes downwards. According to a World Bank ranking, the Central African Republic presents one of the lowest indicators of access to health services in sub-Saharan Africa. It is also possible that the economic hardships currently experienced by many African countries, including the Central African Republic, may force people there to opt for fewer children, as some authors have indicated is already happening in Cameroon. The longer-term effect of economic hardships on fertility is not easy to predict, however. Although future trends are always difficult to predict in any precise manner, the present analysis suggests that fertility has began to decline in Cameroon and to some extent in the Central African Republic, and that the trend is most likely to continue.

NOTE

[1] Background information on the study countries was obtained from *Microsoft Encarta Online Encyclopedia 2001*, available from *http://encarta.msn.com* (accessed June 2001).

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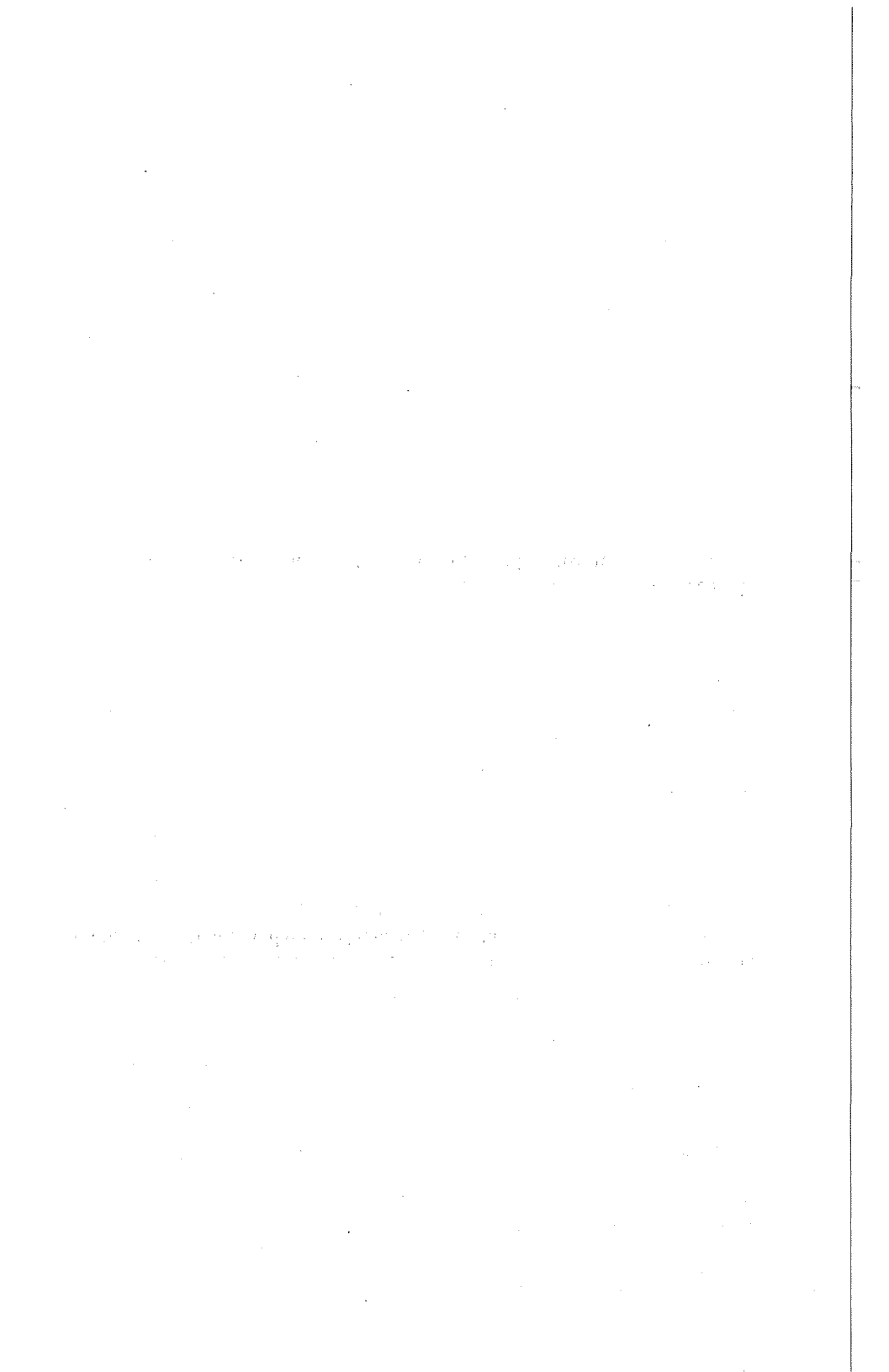
FERTILITY DECLINE IN FRENCH-SPEAKING AFRICA: RECENT AND FUTURE TRENDS[1]

Soukeynatou Fall-Kaba and Pierre Ngom***

A. Introduction

Sub-Saharan Africa is the region with the highest population growth rates in the world. In a population whose age structure is relatively young, this dynamic contributes to the persistence of a level of population growth that is difficult to reconcile with the need to ensure sustainable human development. Controlling fertility is thus considered a priority. While this awareness of the population stakes has given rise to the development of population programmes underpinned by family planning programmes, implementation of the strategies developed in this context seems to have achieved rather mixed results. With the exception of a few countries, such as Botswana, Kenya, Zimbabwe and recently Ghana, where there are clear signs that fertility is beginning to decline, the fertility transition process is taking a long time to get started in sub-Saharan Africa (Ofusu, 1995). One of the factors identified as a primary cause of this situation is the high rate of early nuptiality in a context of low contraceptive prevalence.

In these pronatalist societies, marriage and procreation are indissociable (Locoh, 1995). Procreation plays an important role in such societies because it contributes not only to the stability of the couple but also to the perpetuation of the family line and the social group (Ela, 1995). However, these models are dynamic and therefore sensitive to the constraints imposed on the institution of the family by modernization and growing poverty. As a result, changes are taking place, one of the most significant of which is clearly the increase in age at first marriage (Locoh, 1995). Analysing the impact of the economic crisis on marriage from a biographical standpoint, Antoine and others (1995) concluded that, over a period of 20 years, women's median age at first marriage had increased by seven years in Dakar. The trend towards growing numbers of unmarried women is not confined to the capital of Senegal. It has also been observed in Abidjan, Bamako and Brazzaville (Antoine and others, 1990; 1998) and appears to be spreading to other urban centres and to rural areas (Pison and others, 1997). Since it means that women have their first child at a later age, it is a key factor in the transition process in the countries of sub-Saharan Africa (Vimard, 1997).

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In order to bring about a lasting change in fertility, however, the increase in age at first marriage must gradually be reinforced by an increase in contraceptive use (Tabutin, 1995). Despite the efforts made under family planning programmes, modern contraception prevalence rates are still relatively low in the countries of sub-Saharan Africa. Unfavourable socio-economic conditions, lack of sustainable political support, weak institutions and the absence of proper social and economic infrastructures, including readily accessible family planning services, all explain why very few people participate in family planning programmes (Ofusu, 1995). If, as Vimard (1997) suggests, economic, cultural and political factors are the structural determinants of demographic change, then it is necessary to consider what the future holds for the transition processes that have begun in French-speaking sub-Saharan Africa.

The present study draws on data from the demographic surveys carried out in the French-speaking countries of sub-Saharan Africa during the period 1980 to 1999 in order to review the fertility transition process in the subregion, examine the main determinants of fertility decline and project future trends. To place those trends in context, comparisons will be made with the English-speaking countries of the subregion.

B. FERTILITY LEVELS IN THE FRENCH-SPEAKING COUNTRIES
OF SUB-SAHARAN AFRICA IN THE 1990S

The study of recent trends in fertility in the French-speaking countries of sub-Saharan Africa covers Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Côte d'Ivoire, Guinea, Madagascar, Mali, Niger, Rwanda, Senegal and Togo. Figure I shows the total fertility rates for the French-speaking countries in sub-Saharan Africa in the 1990s. It shows that levels are still very high but vary considerably: from 4.6 and 4.8 children per woman in the Comoros and Cameroon, respectively, to 6.7 and 7.2 in Mali and the Niger.

Figure I illustrates how countries may be divided into three groups:

Group I. Low fertility countries: Comoros and Cameroon. In these two countries, the fertility decline is quite advanced. The total fertility rate is less than 5 children per woman, comparable to the rates observed in Kenya (4.7) or Ghana (4.4) in 1998;

Group II. Intermediate fertility countries: Central African Republic, Côte d'Ivoire, Guinea, Senegal and Togo. These countries have a total fertility rate of between 5 and 6 children per woman. In this group, the lowest fertility level is in the Central African Republic and is probably attributable to the fact that this country is in the infertility belt that extends from the Democratic Republic of the Congo to the southern tip of Chad via southern Sudan and to the Central African Republic in the east, and from the Congo, Gabon and Equatorial Guinea to Cameroon in the west (Evina, 1990). The total fertility rate in this group is comparable to that of the United Republic of Tanzania in 1996 (5.8);

Group III. High fertility countries: Benin, Burkina Faso, Chad, Madagascar, Mali, Niger and Rwanda. These countries have a total fertility rate of at least 6 children per woman. Fertility levels in this group are comparable to those of Malawi in 1990 (6.7), Uganda in 1995 (6.9), Nigeria in 1990 (6.0) or Eritrea in 1995 (6.1).

Figure I. Fertility levels in French-speaking sub-Saharan Africa
in the 1990s
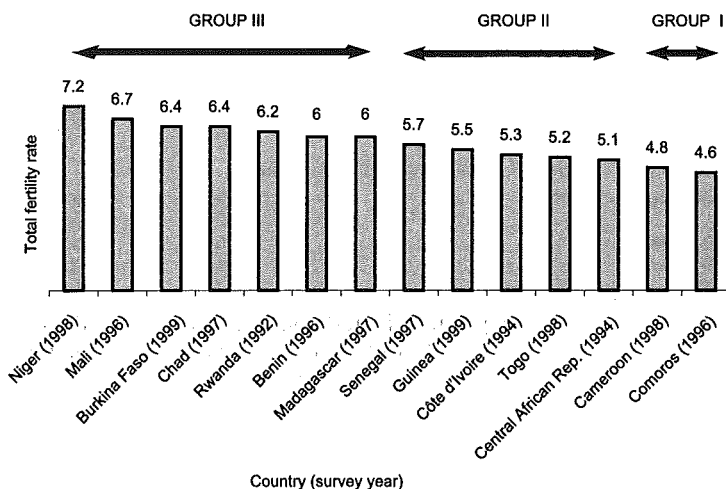
The data in figure I show that fertility is still relatively high in the French-speaking countries of sub-Saharan Africa. Of the 14 countries covered by the study, seven, or half, have a total fertility rate of at least 6 children per woman. Comparisons with other English-speaking countries in Africa show that French-speaking sub-Saharan Africa is not an isolated case as far as fertility levels in the 1990s are concerned. The situation there is comparable to that in the English-speaking countries of both Western Africa and Southern Africa.

Major disparities according to area of residence

The variations in fertility according to type of place of residence reflected in table 1 underscore the major disparities in fertility levels between urban and rural areas. Like reproductive behaviour, these marked differences between urban and rural areas are one of the distinctive features of the subregion, and their importance is heightened by the fact that the majority of the population lives in rural areas. The trends observed in the subregion in the 1990s reveal that the total fertility rate in rural areas is 1.7 children higher on average than in urban areas. The Central African Republic, in the infertility belt; Chad, characterized by political instability and the resulting social tensions; and Burkina Faso and Togo, high fertility countries with an urban fertility rate close to that of group I countries, are notable exceptions. The low fertility rate in the urban areas of Burkina Faso and Togo seems to have less to do with the use of modern contraceptive methods than with the economic crisis, which, by causing employment and housing problems, among others, is affecting the behaviour of married couples (Locoh, 1991).

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Country (survey year)	Type of place of residence		
	All	Urban	Rural
Group I. Low fertility countries			
Comoros (1996)	4.6	3.8	5.0
Cameroon (1998)	4.8	3.8	5.4
Group II. Intermediate fertility countries			
Central African Republic (1994)	5.1	4.9	5.2
Togo (1998)	5.2	3.2	6.3
Côte d'Ivoire (1994)	5.3	4.6	6.0
Guinea (1999)	5.5	4.4	6.1
Senegal (1997)	5.7	4.3	6.7
Group III. High fertility countries			
Madagascar (1997)	6.0	4.2	6.7
Benin (1996)	6.0	4.9	6.7
Rwanda (1992)	6.2	4.5	6.2
Burkina Faso (1999)	6.4	3.9	6.9
Chad (1997)	6.4	5.9	6.5
Mali (1996)	6.7	5.4	7.3
Niger (1998)	7.2	5.6	7.6

Source: Demographic and Health Surveys.

C.   FERTILITY TRENDS IN FRENCH-SPEAKING AFRICA, 1980-1999:
A THREE-SPEED TRANSITION

The present study of fertility trends over the past two decades (1980-1999) is restricted to the French-speaking countries of sub-Saharan Africa that have conducted at least two Demographic and Health Surveys or have data from one Demographic and Health Survey and one World Fertility Survey. Overall, fertility is declining in French-speaking sub-Saharan Africa (figure II), but the study also reveals a diversity of transition processes, underscoring the need to speak of fertility transitions rather than a fertility transition in the French-speaking countries of sub-Saharan Africa. The angle of the segments on the right side of figure II, representing recent fertility trends in each country, indicates that countries can be divided into the following three categories, based on the speed of their transition:

Category I.   The "forerunners": Cameroon, Côte d'Ivoire and Togo. The fertility decline in these three countries is relatively rapid. In the period 1980-1999, the annual relative decline in the total fertility rate[2] was 2.5 per cent in Cameroon, 2.2 per cent in Côte d'Ivoire and 1.9 per cent in Togo. While this is the biggest downward trend among the French-speaking countries, it is far less marked than that in Kenya (3.3 per cent) and Ghana (3.1 per cent) over the same period;

Category II.   Moderate transition countries: Benin, Mali and Senegal. The second category comprises countries whose fertility has declined at a relatively moderate rate, ranging from 1 per cent in Benin and Senegal to 0.6 per

Figure II. Fertility trends in French-speaking sub-Saharan Africa, 1980-1999
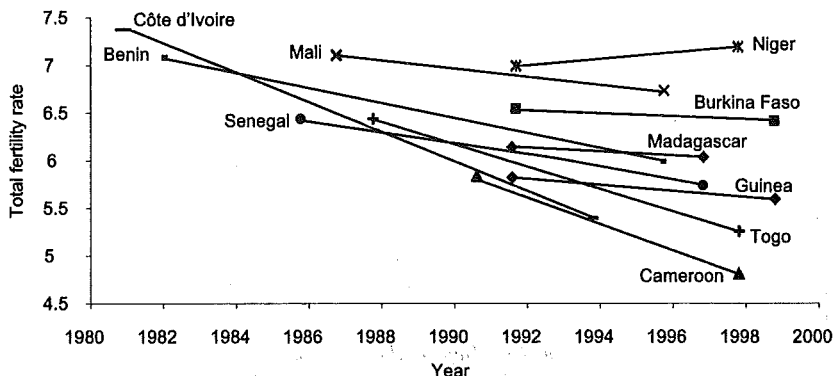
cent in Mali. The trend in these countries is comparable to that in Uganda (1 per cent) in the same period, but well below that in the United Republic of Tanzania (1.6 per cent) or Zambia (1.5 per cent);

Category III. Slow transition countries: Burkina Faso, Guinea, Madagascar and Niger. In these countries, the decline in fertility has been very modest, estimated at 0.2 per cent in Burkina Faso, 0.3 per cent in Madagascar and 0.5 per cent in Guinea. Although it is classified as a slow transition country, the Niger has actually shown an annual relative increase of 0.5 per cent in its total fertility rate. For the period 1980-1999, no English-speaking country had an annual relative change in fertility comparable to that of the countries in this category.

These above trends show that the fertility decline in French-speaking Africa is slower than in English-speaking Africa. A look at contraceptive prevalence and median age at first marriage should help to explain the rates and trends observed.

Fertility trends in rural areas, an important factor in the transition process

Although a demographic transition is under way in most French-speaking African countries despite the persistence of high fertility rates, it must be recognized that large disparities exist between urban and rural areas when it comes to reproductive behaviour (table 2). Fertility is declining relatively slowly in rural areas in slow and moderate transition countries, whereas in rapid transition countries (Cameroon, Côte d'Ivoire and Togo) reproductive behaviour is changing in both urban and rural areas. By comparing the differences observed in the three categories of countries, it can be seen that the gap between urban and rural areas narrows steadily as the transition process advances. It should also be mentioned that the improvement in pregnancy and childbirth conditions brought about by the implementation of reproductive health programmes, in a context of low contraceptive prevalence, seems to have contributed to a maintenance of and even an increase in fertility rates in slow transition countries such as Guinea, Madagascar and the Niger.

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(Percentages)

Country (survey year)	Area of residence		
	All	Urban	Rural
Category I. Forerunners			
Cameroon (1991-1998)	–2.5	–3.8	–2.0
Côte d'Ivoire (1981-1994)	–2.2	–2.6	–1.5
Togo (1988-1998)	–1.9	–3.5	–1.4
Category II. Moderate transition countries			
Senegal (1986-1999)	–1.0	–1.9	–0.5
Benin (1982-1996)	–1.0	–1.5	–0.7
Mali (1987-1996)	–0.6	–1.6	–0.2
Category III. Slow transition countries			
Guinea (1992-1999)	–0.5	–2.0	0.5
Madagascar (1992-1997)	–0.3	–2.1	0.0
Burkina Faso (1992-1999)	–0.2	–2.2	–0.2
Niger (1992-1998)	+0.5	–2.1	1.2

Source: Demographic and Health Surveys and World Fertility Surveys.

To sum up, comparative analysis of fertility decline according to area of residence shows that the decline is heavily influenced by trends in rural areas. The case of the slow transition countries is quite enlightening in this regard. While the annual relative decline in fertility in urban areas is greater in those countries than in moderate transition countries, overall their fertility has changed the least (table 2). In other words, the delay in the transition process in slow transition countries is attributable to the resistance to demographic change in rural areas.

D. FERTILITY DECLINE IN FRENCH-SPEAKING AFRICA: RELATIVE CON-TRIBUTION OF AGE AT FIRST MARRIAGE AND CONTRACEPTIVE PREVA-LENCE

Since they are the two most important proximate determinants of fertility, age at first marriage and contraceptive prevalence are used to examine the factors associated with fertility decline in sub-Saharan Africa (annex table A.1). In most countries of the subregion, marriage remains the major unit within which reproduction takes place. Botswana and Namibia, where the linkage between marriage and reproduction is gradually disappearing, are exceptions (annex table A.2).

To evaluate the relative contribution of each of these two explanatory variables, we postulate a simple linear model linking total fertility rate (*TFR*) to median age at first marriage (*MAR*) and contraceptive prevalence (*CP*) as follows:

$$TFR = \alpha \ (year) + \beta \ (MAR) + \chi \ (CP) + I_0$$

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where β and χ represent respectively the effects that a one-year increase in median age at first marriage (MAR) and a 1 per cent increase in contraceptive prevalence (CP) would have on TFR. Since we are interested in fertility transition, it is important to introduce a time variable ($year$). The coefficient a gives us the percentage decline in fertility from one year to the next. The last term, I_0, represents the constant of the model.

It should be noted that the above model only partly explains changes in TFR from one year to another or over a given period. It would be interesting, for example, to include an index for the abortion rate. Unfortunately, this is not possible because reliable data on abortion are very limited. Moreover, the model does not control for differences attributable to socio-economic factors such as gross national product, religion, rate of economic activity or rate of female school attendance. However, these factors are in fact endogenous to age at first marriage and contraceptive prevalence and should not, strictly speaking, be included in the linear formulation of the model.

The simple linear model shown above was applied to the French-speaking countries of sub-Saharan Africa (table 3). For purposes of comparison, the results obtained by applying the same model to the English-speaking countries are also given.

With the exception of rural areas, the explanatory value of the proposed model is relatively high for both the French-speaking and the English-speaking countries. This seems to confirm the hypothesis that contraceptive prevalence and median age at first marriage are the main proximate determinants of fertility. As mentioned earlier, the pace of change in rural areas is still relatively slow, which explains why the model has limited explanatory value for those areas. It should be noted, however, that disparities in fertility levels and trends according to area of residence are less marked in the English-speaking countries than in the French-speaking countries. Fertility decline in rural areas in the English-speaking countries is statistically significant at the 10 per cent level.

Moreover, all things being equal, fertility decline is more marked in the English-speaking countries than in the French-speaking countries of sub-Saharan Africa. The annual rate of fertility decline is 6 per cent in the French-speaking countries and 10 per cent in the English-speaking countries. In urban areas, where the change is relatively greater, the rates are 7 per cent and 13 per cent, respectively.

In the French-speaking countries, fertility transition is a purely urban phenomenon essentially attributable to the increase in age at first marriage. For now, contraceptive use is not a significant factor in the process of demographic change, even in urban areas.

In the English-speaking countries, on the other hand, the decline in fertility is quite different: it is both an urban and a rural phenomenon. However, in rural areas it is attributable solely to the increase in age at first marriage, with contraceptive prevalence playing a negligible role.

These findings show that the impact of the family planning programmes being implemented in French-speaking sub-Saharan countries is relatively limited, especially in rural areas. What can be expected to happen between now and 2010?

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TABLE 3. EFFECTS OF SELECTED VARIABLES ON THE TOTAL FERTILITY RATE, FRENCH-SPEAKING AND ENGLISH-SPEAKING COUNTRIES OF SUB-SAHARAN AFRICA, 1980-1999 (LINEAR REGRESSION)

| | French-speaking countries | | | | | |
| | All | | Urban areas | | Rural areas | |
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Year	−0.064**	0.022	−0.069**	0.025	−0.034	0.039
Urban area (ref: rural)	−1.176**	0.267				
Age at first marriage	−0.309**	0.066	−0.424**	0.068	−0.098	0.124
Contraceptive prevalence	−0.023	0.025	−0.007	0.021	−0.110	0.076
Constant	139.78**	44.61	150.25**	49.12	76.31	77.53
N	44		22		22	
R^2	0.8075		0.7793		0.3485	

| | English-speaking countries | | | | | |
| | All | | Urban areas | | Rural areas | |
Variables	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Year	−0.098**	0.025	−0.127**	0.029	−0.074*	0.039
Urban area (ref: rural)	−0.892**	0.231				
Age at first marriage	−0.488**	0.124	−0.734**	0.149	−0.389*	0.194
Contraceptive prevalence	−0.196**	0.009	−0.022**	0.008	−0.011	0.017
Constant	211.17**	50.64	272.32**	57.59	160.53*	78.15
N	42		21		21	
R^2	0.8121		0.8213		0.4591	

NOTES: **Coefficient significant at the 5 per cent level.
*Coefficient significant at the 10 per cent level.

Future fertility decline was estimated on the basis of simple hypotheses for each country. Projections of future fertility trends are often made on the basis of hypothetical trends in contraceptive prevalence (United Nations, 1999; Ross and Willard, 1999). Bongaarts (2000) reviewed the methodological problems associated with such an approach. The present analysis simply uses the rates of annual relative variation in fertility in each country to extrapolate future trends. These extrapolations cover the period 2000 to 2010 and incorporate the official context represented by population policy (table 4).

Towards the end of the 1990s, almost all the French-speaking countries covered by this study had a fertility policy aimed at slowing the rate of population growth. Togo and Côte d'Ivoire are exceptions, however, in that their official positions were respectively that fertility should be maintained and that it should be increased, while Benin did not as yet have a population policy. Judging from recent population efforts in those countries, fertility control is now a major concern for them, as it is for the other countries of sub-Saharan Africa.

To project fertility up to the year 2010 in the French-speaking countries of sub-Saharan Africa, two alternative hypotheses will be employed:

Hypothesis 1 (H1) assumes that the trends observed over the past two decades in countries of the subregion will be maintained up to 2010. This hypothesis is debatable, especially for countries classed as "forerunners" (Cameroon, Côte d'Ivoire, Togo) where fertility transition is taking place fairly rapidly, with fertility levels of around 5 children per woman. The rates of fertility decline in those countries might, according to the theory of demographic transition (Chesnais, 1992), steadily slow down as the transition process advances. Likewise, fertility might begin to decline more sharply in slow and moderate transition countries before 2010. These variants are taken into account in hypothesis 2;

Hypothesis 2 (H2) postulates a change in current trends between now and 2010. In countries classified as "forerunners", the rate of fertility decline will slow to levels similar to those observed in moderate transition countries in the 1990s (-1 per cent per year). Conversely, in moderate and slow transition countries, fertility will decline more rapidly between now and 2010. In moderate transition countries, the rates of annual relative change in fertility will approach those observed in the "forerunners" in the 1990s (-2 per cent), while in slow transition countries the rates will be similar to those observed in the moderate transition countries in the 1990s (-1 per cent).

According to hypothesis 1, all slow and moderate transition countries will have a total fertility rate of over 5 children per woman by 2010 (table 4). In Burkina Faso, Mali and the Niger, the fertility rate will be over 6 children per woman in 2010. In the "forerunners", on the other hand, the total fertility rate will decline on average from 5.1 children per woman in the 1990s to 3.6 in 2010.

According to hypothesis 2, the demographic changes taking place between now and 2010 will be more significant. Only Burkina Faso, Madagascar

TABLE 4. SCENARIOS OF FERTILITY DECLINE IN THE FRENCH-SPEAKING COUNTRIES OF SUB-SAHARAN AFRICA BY 2010, ACCORDING TO TWO HYPOTHESES (H1 AND H2)

Country	Population policies (1996)		Observed TFR (1990s)	Observed annual change in TFR (1980-1999)	Annual change in TFR up to 2010		Projected TFR for 2010	
	Considers fertility levels	Policy towards fertility levels			H1	H2	H1	H2
Category I. Forerunners								
Cameroon	Too high	Lower	4.8	−2.46	−2.46	−1.0	3.4	4.2
Togo	Satisfactory	Maintain	5.2	−1.88	−1.88	−1.0	4.0	4.6
Côte d'Ivoire	Satisfactory	Raise	5.3	−2.11	−2.11	−1.0	3.5	4.5
Category II. Moderate transition countries								
Mali	Too high	Lower	6.7	−0.63	−0.63	−2.0	6.1	4.8
Senegal	Too high	Lower	5.7	−0.99	−0.99	−2.0	5.0	4.2
Benin	Satisfactory	No intervention	6.0	−1.11	−1.11	−2.0	5.1	4.3
Category III. Slow transition countries								
Guinea	Too high	Lower	5.5	−0.50	−0.50	−1.0	5.2	4.9
Madagascar	Too high	Lower	6.0	−0.33	−0.33	−1.0	5.7	5.2
Burkina Faso	Too high	Lower	6.4	−0.22	−0.22	−1.0	6.1	5.2
Niger	Too high	Lower	7.2	0.48	0.48	−1.0	7.0	6.3

Source: United Nations (1999).

NOTE: TFR = total fertility rate.

and the Niger will have a total fertility rate of over 5 children per woman, and fertility rates in moderate transition countries will be close to those in the "forerunners".

To sum up, regardless of the scenario, fertility levels in French-speaking Africa will still be high in 2010. Under hypothesis 1, seven of the 10 countries covered by the study will have a fertility rate of over 5 children per woman (table 4). Even under hypothesis 2, which postulates a more sustained decline in fertility for moderate and slow transition countries, the total fertility rate in French-speaking sub-Saharan countries will be over 4 children per woman. It should be noted that with either hypothesis the Niger's projected total fertility rate for 2010 is still over 6 children per woman.

F. CONCLUSION

Fertility rates remain high in French-speaking sub-Saharan Africa, while mortality rates have declined sharply over the past decade. The result is a high rate of population growth that, given the lack of demographic change and the weak economies of countries in the subregion, poses two problems: delayed population stabilization and worsening quality of life. Analysis of fertility trends in French-speaking sub-Saharan Africa in the 1990s reveals that, although fertility has declined in the subregion, it is still relatively high. Seven, or half, of the 14 countries in the subregion (Benin, Burkina Faso, Chad, Madagascar, Mali, the Niger and Rwanda) have a fertility rate of at least 6 children per woman. Cameroon and the Comoros, with a fertility rate of under 5 children per woman, are the French-speaking sub-Saharan countries where fertility transition is most advanced. The Central African Republic, Côte d'Ivoire, Guinea, Senegal and Togo, classified as intermediate fertility countries, have a total fertility rate of between 5 and 6 children per woman.

The study of recent fertility trends shows that transition processes in the subregion vary and that the French-speaking countries of sub-Saharan Africa can be classified according to their rate of fertility decline. While Cameroon, Côte d'Ivoire and Togo are rapid transition countries (with an average relative decline of 2 per cent per year), Benin, Mali and Senegal are moderate transition countries, and Burkina Faso, Guinea, Madagascar and the Niger are slow transition countries.

Fertility decline in the French-speaking sub-Saharan countries is a purely urban phenomenon largely attributable to the increase in age at first marriage. In the English-speaking countries, on the other hand, the transition process is more advanced and fertility decline is both an urban and a rural phenomenon. This demographic change is attributable to both the increase in age at marriage and contraceptive use.

Thus, in the French-speaking countries of sub-Saharan Africa, fertility decline seems to be attributable to the impact of modernization and the economic crisis on matrimonial behaviour, in a context in which marriage remains the frame of reference for reproduction. These trends approximate the demographic transition model observed in the North African countries during the Malthusian phase of the fertility transition process (Pison and others, 1997).

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Comparing the French-speaking countries with the English-speaking countries nevertheless shows that contraceptive prevalence will have to increase dramatically in both urban and rural areas if there is to be a significant decline in fertility. The fact that the 1920 French law banning contraceptive advertising was in force in the French-speaking countries until only recently might go some way towards explaining why those countries are latecomers to the fertility transition process.

The results of the projections show that by 2010 fertility levels will still be relatively high (over 4 children per woman) in French-speaking sub-Saharan Africa. This is a measure of the challenges that will have to be met in the areas of population and reproductive health. The increase in age at first marriage is beginning to lose its impact as a mechanism of fertility decline (Pison and others, 1997), pointing to the need to emphasize the use of modern contraception. According to Vallin (1992), it is couple choice rather than technology that drives fertility control, which is why population awareness-raising and education are so important, so that the people of French-speaking sub-Saharan Africa, once they are aware of the population stakes, can exercise freely their right to reproduce.

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ANNEX

TABLE A.1. TRENDS IN TOTAL FERTILITY RATE, AGE AT FIRST MARRIAGE AND USE OF MODERN CONTRACEPTION IN THE FRENCH-SPEAKING AND ENGLISH-SPEAKING COUNTRIES OF SUB-SAHARAN AFRICA, BY TYPE OF PLACE OF RESIDENCE

Country, survey year	Total fertility rate			Age at first marriage			Prevalence of modern methods of contraception (percentage)		
	Urban	Rural	All	Urban	Rural	All	Urban	Rural	All
French-speaking countries									
Burundi, 1987	5.1	7.0	6.9	19.1	19.8	19.8	14.0	0.8	1.2
Comoros, 1996	3.8	5.0	4.6	..	18.8	19.2	14.7	10.3	11.4
Madagascar, 1992	3.8	6.7	6.1	..	18.1	18.5	15.8	2.9	5.1
Madagascar, 1997	4.2	6.7	6.0	..	18.1	18.6	17.6	7.1	9.7
Rwanda, 1992	4.5	6.3	6.2	..	..	..	19.7	12.6	12.9
Burkina Faso, 1992	4.6	7.0	6.5	18.0	17.4	17.5	17.1	1.5	4.2
Burkina Faso, 1999	3.9	6.9	6.4	19.1	17.5	17.6	20.1	2.6	4.8
Benin, 1996	4.9	6.7	6.0	19.4	18.0	18.5	5.8	2.1	3.4
Central African Republic, 1994	4.9	5.2	5.1	17.1	17.5	17.4	6.4	1.4	3.2
Côte d'Ivoire, 1994	4.4	6.0	5.3	19.2	17.7	18.3	8.0	2.2	4.3
Cameroon, 1991	5.2	6.3	5.8	17.6	16.2	16.7	7.1	2.5	4.3
Cameroon, 1998	3.8	5.4	4.8	18.9	17.1	17.7	13.1	4.5	7.1
Guinea, 1999	4.4	6.1	5.5	17.6	16.0	16.5	9.5	2.3	4.2
Mali, 1987	6.3	7.4	7.1	15.9	15.7	15.7	4.9	0.1	1.3
Mali, 1996	5.4	7.3	6.7	17.1	15.8	16.0	11.6	1.9	4.5
Niger, 1992	6.4	7.1	7.0	15.6	14.8	14.9	11.5	0.7	2.3
Niger, 1998	5.6	7.6	7.2	16.4	15.1	15.2	18.6	2.1	4.6
Senegal, 1986	5.4	7.1	6.4	18.1	16.0	16.6	6.7	0.3	2.4
Senegal, 1993	5.1	6.7	6.0	19.0	15.8	16.6	11.9	1.4	4.8
Senegal, 1997	4.3	6.7	5.7	..	16.6	18.0	19.3	2.1	8.1
Chad, 1997	5.9	6.5	6.4	16.2	15.9	15.9	4.2	0.3	1.2
Togo, 1988	4.9	7.3	6.4	19.7	17.9	18.4	6.5	1.7	3.1
Togo, 1998	3.2	6.3	5.2	..	18.5	19.1	10.3	5.5	7.0

English-speaking countries

Eritrea, 1995	4.2	7.0	6.1	18.7	16.3	16.9	14.5	0.9	4.0
Kenya, 1989	4.5	7.1	6.7	19.8	18.3	18.5	25.5	16.4	17.9
Kenya, 1993	3.4	5.8	5.4	..	18.9	19.2	37.9	25.4	27.3
Kenya, 1998	3.1	5.2	4.7	..	19.1	19.5	41.0	29.0	31.5
Malawi, 1992	5.5	6.9	6.7	18.5	17.6	17.7	17.2	6.0	7.4
Sudan, 1990	3.9	5.3	4.7	..	18.0	18.9	11.3	2.2	5.5
United Republic of Tanzania, 1992	5.1	6.6	6.2	19.0	18.1	18.3	14.0	4.5	6.6
United Republic of Tanzania, 1996	4.1	6.3	5.8	19.1	18.3	18.4	26.6	9.8	13.3
Uganda, 1988	5.7	7.6	7.4	19.0	17.1	17.2	12.2	1.5	2.5
Uganda, 1995	5.0	7.2	6.9	18.9	17.3	17.5	28.0	5.1	7.8
Botswana, 1988	3.8	5.3	4.9	..	..	..	40.8	27.5	31.7
Mozambique, 1997	4.6	5.3	5.2	18.2	16.9	17.2	16.6	2.3	5.1
Namibia, 1992	4.0	6.3	5.4	..	..	..	46.6	13.0	26.0
Zambia, 1992	5.8	7.1	6.5	18.0	17.4	17.7	15.3	3.2	8.9
Zambia, 1996	5.1	6.9	6.1	18.7	17.5	18.0	23.6	8.2	14.4
Zimbabwe, 1988	3.8	6.2	5.4	19.6	18.6	18.9	48.7	30.8	36.1
Zimbabwe, 1994	3.1	4.9	4.3	20.0	18.8	19.2	53.9	37.3	42.2
Ghana, 1988	5.3	7.0	6.4	18.7	18.1	18.3	6.6	3.1	4.2
Ghana, 1993	3.7	6.0	5.2	19.8	18.5	18.9	15.8	7.4	10.1
Ghana, 1998	3.0	5.3	4.4	19.9	18.8	19.1	17.4	11.4	13.3
Liberia, 1986	6.0	7.1	6.7	18.5	16.8	17.5	9.7	3.1	5.5
Nigeria, 1990	5.0	6.3	6.0	19.4	16.4	17.1	9.6	1.9	3.5
Nigeria (Ondo state), 1986	5.9	5.8	5.9	..	19.7	19.9	5.3	2.8	3.8

Source: Demographic and Health Surveys.

Country, survey year	Age at birth of first child	Age at first marriage
French-speaking countries		
Burundi, 1987	21.0	19.5
Comoros, 1996	21.0	18.5
Rwanda, 1992	21.5	20.0
Central African Republic, 1994	19.4	17.3
Côte d'Ivoire, 1994	18.8	18.1
Cameroon, 1991	18.7	16.5
Guinea, 1999	18.8	16.4
Mali, 1987	19.0	15.7
Mali, 1996	18.8	16.0
Niger, 1992	18.1	14.9
Niger, 1998	17.8	15.1
Senegal, 1986	18.9	16.4
Senegal, 1992	19.2	16.2
Senegal, 1997	19.8	17.4
Chad, 1997	18.3	15.8
Togo, 1988	19.2	18.3
Togo, 1998	20.1	18.8
English-speaking countries		
Eritrea, 1995	21.4	16.7
Kenya, 1989	18.6	18.1
Kenya, 1993	19.1	18.8
Kenya, 1998	19.4	19.2
Malawi, 1992	19.0	17.8
Sudan, 1990	20.5	17.8
United Republic of Tanzania, 1992	18.8	17.9
United Republic of Tanzania, 1996	19.1	18.2
Uganda, 1988	18.2	17.0
Uganda, 1995	18.6	17.4
Botswana, 1988	19.6	24.0
Mozambique, 1997	19.2	17.1
Namibia, 1992	21.0	24.8
Zambia, 1992	18.5	17.4
Zambia, 1996	18.6	17.7
Zimbabwe, 1988	19.5	18.6
Zimbabwe, 1994	19.6	18.9
Ghana, 1988	19.5	18.1
Ghana, 1993	20.2	18.8
Ghana, 1998	20.3	19.1
Liberia, 1986	19.4	17.2
Nigeria, 1990	19.7	16.9
Nigeria (Ondo state), 1986	20.6	19.7

Source: Demographic and Health Surveys.

LEVELS AND TRENDS OF FERTILITY IN OMAN AND YEMEN[1]

*Eltigani E. Eltigani**

A. INTRODUCTION

Oman and Yemen are neighbouring countries occupying the southern part of the Arabian peninsula. The first demographic census of Oman, which was conducted in December 1993, estimated the population size at 2 million, of which 27 per cent were non-Omanis. Estimates for 1998 put the population size at 2.3 million (Sulaiman, Al-Riyami and Farid, 2000). In Yemen, the 1994 demographic census (the first count after unification in 1990) estimated the population at 15.8 million, of whom 14.9 million were residents (Central Statistical Organization, 1998).

The populations of Oman and Yemen are growing at a rapid pace (3.6 per cent and 3.4 per cent per annum, respectively). The rapid growth rates are a result of a considerable decline in mortality and continued high fertility. Estimates for 1998 indicated that in Oman the crude birth rate was 40 per thousand persons and the crude death rate was 4 per thousand (Sulaiman, Al-Riyami and Farid, 2000), while in Yemen estimates for 1996 reported the crude birth rate at 45 per thousand and the crude death rate at 11 per thousand (Central Statistical Organization, 1998).

The absence of reliable demographic information in the past has hampered analyses of the population dynamics in the two countries. This task became feasible with the availability of nationally representative demographic data that were collected by a series of household surveys (1991/92 and 1997 surveys of Yemen; and 1988/89, 1995 and 2000 surveys of Oman). However, conclusions regarding estimates of fertility levels and trends should be treated with considerable caution, upon subjecting the data to careful scrutiny. For example, an assessment of data quality for the 1991/92 Yemen Demographic and Maternal and Child Health Survey showed that the degree of completeness of reporting of events is consistently low (Eltigani, 2001).

The present paper utilizes the data reported by various surveys to study the levels and trends of fertility in Oman and Yemen. The paper will attempt to identify the proximate determinants of fertility trends, as well as the role played by a set of underlying contextual factors on the observed trends in each of the two countries.

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Age-specific fertility rates and total fertility rates estimated for the three-year period preceding each of the surveys of Oman and Yemen are reported in table 1. Given the age-specific fertility rates that were prevailing during the late 1980s, Omani women were estimated to bear 8.6 children by the end of their reproductive careers; their Yemeni counterparts were estimated to bear 7.7 lifetime children. Previous study has shown a number of reasons for the TFR of 7.7 live births in Yemen. Yemeni women begin childbearing at a relatively early age; a large proportion of women reach high parity; and this occurs at a relatively fast pace (Eltigani, 2001). It is plausible to assume that these same factors were contributing to the very high fertility rate in Oman at that time.

By the mid-1990s, fertility is estimated to have declined by some 1.5 live births per woman in Oman, and by 1.2 live births in Yemen, leading to an esti-mated TFR of 7.1 and 6.5 in the two countries respectively. The rapid decline

TABLE 1.   AGE-SPECIFIC FERTILITY RATES (ASFR) AND TOTAL FERTILITY RATE (TFR) AMONG WOMEN AGED 15-49, OMAN AND YEMEN, VARIOUS SURVEY ESTIMATES

	Oman				
	ASFR per 1,000 women			Inter-survey change	
Age group	1988/1989[a]	1995[b]	2000[c]	1988/1989-1995	1995-2000
15-19	220	86	14	−134	−72
20-24	383	270	102	−113	−168
25-29	382	332	272	−50	−60
30-34	323	300	230	−23	−70
35-39	251	222	213	−29	−9
40-44	117	114	136	−3	22
45-49	43	86	43	43	−43
TFR	8.60	7.05	5.05	−1.55	−2.0

	Yemen			
	ASFR per 1,000 women		Inter-survey change	
Age group	1991/1992[d]	1997[e]	1991/1992-1997	
15-19	102	105	..	3	..
20-24	283	279	..	−4	..
25-29	315	301	..	−14	..
30-34	284	258	..	−26	..
35-39	258	196	..	−62	..
40-44	172	105	..	−67	..
45-49	120	54	..	−66	..
TFR	7.67	6.48	..	−1.19	..

Sources: [a] M. Sulaiman, A. Al-Ghassany and S. Farid (1992), table 11.13.

[b] M. Sulaiman, A. Al-Riyami and S. Farid (2000), table 8.14.

[c] Oman Comprehensive Health Survey for Evaluation and Reproductive Health, 2000, special tabulation.

[d] Central Statistical Organization (1994), table 3.1.

[e] Central Statistical Organization (1998), table 3.3.

NOTES: TFR = total fertility rate

ASFR = age-specific fertility rate

in TFR in Oman continued through the end of the 1990s. It is estimated that between 1995 and the year 2000, the TFR declined by 2.0 live births, reaching an eventual level of 5.1 live births. This means that during a period of slightly more than one decade, the TFR in Oman declined by 3.5 live births.

The decline in the TFR in each of the two countries was associated with changes in the age pattern of fertility. The data displayed in table 1 show that during the period between the late 1980s and mid-1990s, and despite the fact that Omani women of all ages (with the exception of those in the group 45-49 years) have experienced at least some decline in fertility, the extent of the decline was considerably larger among younger women (those in the age groups 15-19 through 25-29). By the late 1990s, this pattern of rapid fertility decline extended to include women in the age group 30-34. On the other hand, in Yemen the groups of women that had experienced a relatively large decline in fertility were concentrated mostly among those 35 years and older.

The difference in the age pattern of fertility associated with fertility decline in the two countries indicates that the proximate determinants of fertility are exerting a differential impact in each. Thus, in Oman the decline in fertility during the period between the late 1980s and mid-1990s is mostly a product of marriage delay among younger cohorts of women. During the period between the middle and late 1990s, marriage delay continued to exert its fertility-inhibiting effect among younger women, while the large decline in fertility among women aged 25 to 29 and 30 to 34 is related to a decline of marital fertility. On the other hand, in Yemen the fertility decline seems to be more a product of the decline of fertility within marriage.

The following section briefly discusses changes in the proximate determinants (marriage patterns, breastfeeding practices, and use of family planning methods), leading to the observed decline in fertility in the two countries.

C. Proximate Determinants

1. *Marriage*

As is well known, marriage patterns—the proportion of women of reproductive age who are married, age at first marriage and marriage stability—determine the extent and duration of exposure to conception and childbearing. In both Oman and Yemen, marriage and childbearing are viewed as interrelated social and demographic processes and as sequential phases in the life cycle of women. Thus, upward shifts in age at first marriage assume special demographic significance. Table 2 shows the proportion of women who remain single and the median age at first marriage, as reported in various surveys in each of the two countries.

It is clear from the table that in both societies increases occurred in the proportion of women in their childbearing years that are single, albeit at significantly different magnitudes. Between 1988/89 and 1995, the proportion of single females doubled in Oman (from 18 per cent to 36 per cent). By the year 2000, this proportion reached 44 per cent. In Yemen the increase in the proportion of single females was far less spectacular (from 24 per cent to 28 per cent between 1991/92 and 1997).

	Oman				Yemen		
	Percentage never married			Median age at first marriage[b]	Percentage never married		Median age at first marriage[e]
Age group	1988/1989[a]	1995[b]	2000[c]		1991/1992[d]	1997[e]	
15-19	62.8	84.5	90.4	*	75.3	73.2	*
20-24	12.9	38.7	50.8	19.9	28.2	27.2	18.2
25-29	5.9	9.7	18.8	16.9	9.1	9.5	16.6
30-34	2.7	2.5	5.1	14.8	2.5	3.9	16.9
35-39	1.4	0.7	2.3	14.3	1.0	2.1	15.9
40-44	0.3	0.8	0.9	14.6	0.2	1.5	15.8
45-49	0.1	0.5	0.8	14.1	0.0	0.8	15.7
TOTAL	**17.8**	**35.6**	**44.4**		**23.9**	**28.3**	

Sources: [a] M. Sulaiman, A. Al-Ghassany and S. Farid (1992), table 10.1.

[b] M. Sulaiman, A. Al-Riyami and S. Farid (2000), tables 7.1 and 7.5.

[c] Oman Comprehensive Health Survey for Evaluation and Reproductive Health, 2000, special tabulations.

[d] Central Statistical Organization (1994), table 5.3.

[e] Central Statistical Organization (1998), table 5.5.

NOTE: * = less than 50 per cent of respondents were first married by age 15.

Most of the overall increase in the percentage of single females in Oman is due to increases among younger cohorts (particularly those in the age groups 15-19 through 25-29), indicating greater tendency toward marriage delay during recent years. In Yemen, there is almost no change in the proportion of single women among younger cohorts. Rather, slight increases are observed among those 30 years and older.

Estimates of the median age at first marriage shown in table 2 indicate that, in both countries, age at marriage was and continues to be low. A rise in age at first marriage among younger cohorts is also clear, in particular among those aged 20 to 24 and 25 to 29 in Oman and those 20 to 24 years in Yemen. The extent of the trend is greater in Oman where, for example, the median age at first marriage is 4.7 years higher among women aged 20 to 24 compared to those aged 30 to 34. In Yemen, the difference between the same two cohorts is 1.3 years. This confirms the earlier observation that the impact of marriage delay on fertility decline is more important in Oman than in Yemen.

2. *Prevalence and duration of breastfeeding*

Among the elements influencing marital fertility is the duration of post-partum amenorrhoea, which in turn is associated with the intensity and duration of breastfeeding. Survey data indicate that breastfeeding is almost universal in both countries: 99 per cent of children born in the three years preceding the 1995 Oman survey and 97 per cent of children born in the five years preceding the 1997 Yemen survey were breastfed (Sulaiman, al-Riyami and Farid, 2000; Central Statistical Organization, 1998). The data also point to an increase in the mean duration of breastfeeding, from 16 to 19 months between 1988/89 and 1995 in Oman, and from 17 to 18 months between 1991/92 and 1997 in Yemen.

The increase in the duration of breastfeeding in Oman might be a result of efforts promoting this practice by health-care authorities. Almost 90 per cent of births occur in health facilities, where before leaving mothers receive counselling on childcare practices, including information on the benefits of prolonged breastfeeding. Health promotion is also carried out by community volunteers who visit the homes of new mothers to discuss health-related issues such as breastfeeding, children's immunizations and proper hygienic practices (Elbahi, 2001). Meanwhile, the increase in duration of breastfeeding in Yemen has been attributed to increases in the cost of infant formula (Central Statistical Organization, 1998).

3. Use of contraceptive methods

Marital fertility can be lowered through the use of family planning methods, which represent a deliberate and conscious effort to space or limit childbearing. Reports on the practice of family planning in the two countries indicate that by the mid-1990s more than one third of ever-married women (35 per cent in Oman and 38 per cent in Yemen) had ever used a family planning method. These percentages are considerably higher than those prevailing during the late 1980s (16 per cent in Oman and 20 per cent in Yemen). Moreover, between the late 1980s and the year 2000, the percentage of married Omani women who were currently practising family planning more than tripled (from 9 per cent to 32 per cent). In Yemen the percentage doubled between 1991/92 and 1997 (from 10 per cent to 21 per cent). The contraceptive method mix indicates that over three quarters (77 per cent) of married Omani women practising family planning selected a modern method (mostly injectables, female sterilization and the pill). In Yemen less than half (47 per cent) were using modern methods (mostly the pill and intrauterine device).

Data on contraceptive use among married women across different age groups reported in the surveys of Oman and Yemen are displayed in figure I. In the earlier surveys, contraceptive prevalence was highest among women in the age groups 25 to 29 through 35 to 39. While this pattern was maintained through the later survey periods in both countries, large percentage increases in prevalence were also revealed among both younger and older married Omani women and among older married Yemeni women.

In Oman and Yemen, the levels and trends of fertility and of the main proximate determinants are likely to have been influenced by a number of contextual factors exerting differential impacts in each of the two populations. The contextual factors that will be considered include political stability and economic development; expansion of educational opportunities (particularly for females); declines in childhood mortality; and population policy measures. The impact of each of these factors on fertility trends has been extensively reviewed in the literature (e.g., Mason, 1997; Hirschman, 1994; Hirschman and Young, 2000). It should be borne in mind that these factors are neither mutually exclusive nor independent, making the problem of strict causal attribution an arduous task.

Figure I. Percentage of married women (aged 15-49) currently using a family planning method according to age group, Oman and Yemen, various survey estimates

Oman

Yemen

OHCS 88/89   OFHS 95

YDMCHS 91/92   YDMCHS 97
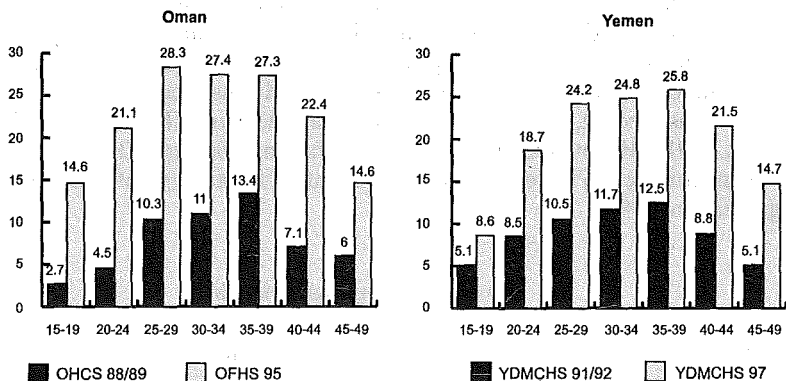
Sources: [a] Sulaiman, Al-Ghassany and Farid (1992), table 12.7.
[b] Sulaiman, Al-Riyami and Farid (2000), tables 7.1 and 9.7.
[c] Central Statistical Organization and Macro International (1994), table 4.6.
[d] Central Statistical Organization and Macro International (1998), table 4.6.
NOTES: OHCS 88/89=Oman Child Health Survey 1988/1989
OFHS 95=Oman Family Health Survey, 1995
YDMCHS 91/92=Yemen Demographic and Maternal and Child Health Survey, 1991/1992
YDMCHS 97=Yemen Demographic and Maternal and Child Health Survey, 1997

D. CONTEXTUAL FACTORS

1. *Political stability and economic development*

Until 1970 the main political concern in Oman was one of internal unity, given the historical split between coast and interior that continued through the second half of the nineteenth century and into the first part of the twentieth. In the mid-1970s, the Government began to implement a massive economic and social development programme. Prior to the commercial exploitation of oil, the economy consisted of subsistence agriculture and fishing. Social and economic infrastructure was almost non-existent. For example, in the 1960s Oman had only two hospitals, three schools, and ten kilometres of paved roads. Aided by oil export revenues, by the late 1980s there were 47 modern hospitals, 710 schools, and more than 3,000 kilometres of paved roads (Sulaiman, Al-Ghassany and Farid, 1992). The standard of living has improved enormously since the mid-1970s. Oman entered the development process as one of the poorest Arab countries, with a per capita income of $360 in 1970 (Metz, 1993). In the 1980s per capita income had risen to $3,140, finally reaching $6,211 in 1998 (Sulaiman, Al-Riyami and Farid, 2000).

The two States forming the current State of Yemen emerged in 1962 (North Yemen) and 1963 (South Yemen). In May 1990, although some differences remained in their policies, the two parts were unified, forming the Republic of Yemen. The attainment of unification fostered high expectations for

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economic and social development. However, as a result of economic, politi-cal and military difficulties at the national and regional levels, the anticipated progress did not materialize. It was estimated that between 1990 and 1995, per capita income declined at a rate of 9.8 per cent per annum, such that the level observed in 1995 ($270) was equal to 38 per cent of that recorded five years prior (Mut'har and others, 1996).

The political stabiliy enjoyed by Oman over the past 25 years has enabled the Government of that country to concentrate on designing and implementing a successful and wide-ranging modernization proramme that has touched all aspects of Omani life. In contrast, Yemen, without the same level of stability, is still striving to address the complex problems of development, including the question of high fertility.

2. *Expansion of educational opportunities*

It was estimated that during the mid-1970s only five per cent of Omani girls aged 6 to 11 were enrolled in school (Zurayk, 1979). As part of its mod-ernization drive, the Government of Oman has put much emphasis on ex-pansion of educational opportunities for both males and females. By the late 1980s, considerable increases had occurred in enrolment rates among boys and girls of all age groups. For example, according to 1988/89 survey data, 87 per cent of males and 81 per cent of females aged 6 to 10 were enrolled in school (table 3). By the mid-1990s the proportions enrolled had reached 94 per cent and 92 per cent, respectively. The rapid expansion in school enrolment among females has led to a narrowing of the gender gap in education at both the pri-mary and secondary levels.

In Yemen, World Bank estimates for 1965 (see Boxberger, 1998) indicated that 23 per cent of South Yemeni children were enrolled in primary school (10 per cent of girls). Among youth of the secondary school age group, 11 per cent were enrolled (5 per cent of girls). For North Yemen, 9 per cent of children were enrolled in primary school, with just one per cent of girls. Female enrol-ment among those in the secondary age group was nil.

TABLE 3. PERCENTAGE OF CHILDREN AND ADOLESCENTS ENROLLED IN SCHOOL AT THE TIME OF SURVEY ACCORDING TO AGE GROUP AND SEX, OMAN AND YEMEN, VARIOUS SURVEY ESTIMATES

	Oman				Yemen			
	Male		Female		Male		Female	
Age group	1988/1989[a]	1995[b]	1988/1989[a]	1995[b]	1991/1992[c]	1997[d]	1991/1992[c]	1997[d]
6-10	87.0	93.8	81.1	91.8	71.6	67.1	34.5	41.2
11-15	93.8	97.2	80.9	93.5	90.2	83.6	33.0	38.4
6-15	95.7	95.5	81.0	92.6	79.4	74.5	33.9	39.9
16-20	61.1	63.8	43.5	58.4	60.7	52.7	14.0	17.2

Sources: [a] M. Sulaiman, A. Al-Ghassany and S. Farid (1992), special tabulations.
[b] M. Sulaiman, A. Al-Riyami and S. Farid (2000), special tabulations.
[c] Central Statistical Organization (1994), table 2.7.
[d] Central Statistical Organization (1994), table 3.1.

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Successive Governments of Yemen (the two former States and the eventual unified nation) made appreciable efforts to expand access to education. The data in table 3 show that during the early 1990s, 72 per cent of boys aged 6 to 10 were enrolled in school. However, the enrolment rate of girls (35 per cent) was less than one half that of boys. The disparity was even more striking among males and females in the age group 16 to 20 (61 per cent and 14 per cent, respectively). Recent survey findings suggest that by 1997, the enrolment rate of males actually declined across age groups, while that of females increased. For example, among boys aged 6 to 10, enrolment had declined to 67 per cent, while that of females increased to 41 per cent. The decline in male school enrolment during recent years might be related to worsening economic conditions, which have forced some parents to send their boys to work to help support the family. Furthermore, the diminishing prospects of securing a job after finishing school have created a disincentive for obtaining an education.

Efforts to expand school enrolment rates in Yemen have been frustrated by high dropout rates. A study covering the period 1987-1994 estimated that 41 per cent of first graders (35 per cent of males and 56 per cent of females) will have dropped out of school before reaching the seventh grade (Mut'har and others, 1996). Numerous social and economic factors contribute to the high dropout rates of girls. Among the social factors is the perception that a better education may limit a girl's marriage prospects, especially in rural areas where the educational levels of men are also low. Primary schools may be co-educational in sparsely populated areas; as girls reach puberty they may drop out as it becomes unacceptable to be among unrelated males. Furthermore, the fact that very limited employment opportunities exist for educated women outside major urban areas makes girls' domestic labour more valuable than formal schooling (Boxberger, 1998). Thus, the wide gender gap in education in Yemen is a product of continued low initial enrolment and high dropout rates among young girls.

The divergent experiences of Oman and Yemen in the area of female schooling are reflected in the educational profile of ever-married women. As seen in table 4, during the late 1990s the percentage of women with no schooling was over two and a half times as high in Yemen as in Oman (84 per cent and 31 per cent, respectively). On the other hand, the percentage of ever-married Yemeni women having attended at least some preparatory school was less than one seventh of their Omani counterparts (4 per cent versus 30 per cent).

Such data on women's education signal more rapid improvements in the status of women in Oman than in Yemen. The impressive expansion of educational opportunities for females in Oman, particularly for preparatory and secondary school, can be linked to the observed increases in age at first marriage and in contraceptive prevalence among ever-married women during recent years.

TABLE 4. PERCENTAGE DISTRIBUTION OF EVER-MARRIED WOMEN (AGED 15-49) ACCORDING
TO HIGHEST LEVEL OF EDUCATION ACHIEVED, OMAN AND YEMEN, VARIOUS SURVEY
ESTIMATES

Year	No schooling	Primary education	Preparatory or higher
	Oman		
1988/1989[a]	67.8	19.0	13.2
1995[b]	49.7	26.9	23.4
2000[c]	31.4	38.3	30.3
	Yemen		
1991/1992[d]	89.2	6.7	4.1
1997[e]	84.2	11.6	4.2

Sources: [a] M. Sulaiman, A. Al-Ghassany and S. Farid (1992), table 3.9.

[b] M. Sulaiman, A. Al-Riyami and S. Farid (2000), table 3.9.

[c] Oman Comprehensive Health Survey for Evaluation and Reproductive Health 2000, special tabulation.

[d] Central Statistical Organization (1994), table 2.9.

[e] Central Statistical Organization (1998), table 2.10.

3. Declines in infant and child mortality

During the 1970s, estimates of infant and child mortality were high in both countries. In Oman, during the period 1969 to 1973, out of every 1,000 live births, about 140 died before reaching their first birthday. For every 1,000 infants surviving their first year, 98 did not reach the fifth birthday (Sulaiman, Al-Ghassany and Farid, 1992). In Yemen, infant and child mortality was even higher. In the period 1973 to 1977, infant mortality was estimated at 157 deaths per 1,000 live births and child mortality at 127 per 1,000 (Central Statistical Organization, 1994).

By the mid-1990s infant and child mortality had declined considerably in both countries. Figure II shows that the pace of childhood mortality decline was steeper in Oman than in Yemen. Over a period of two decades, Oman has experienced a 90 per cent reduction in infant mortality and a 94 per cent reduction in child mortality. In Yemen, infant mortality has declined by 52 per cent and child mortality by 75 per cent. However, despite such considerable declines, childhood mortality rates in Yemen continue to be the highest among Arab countries, with the exception of Iraq in recent years (Population Reference Bureau, 2000).

Rapid declines in childhood mortality in Oman are related to rapid improvements in the standard of living, levels of education (particularly among females) and coverage of health and sanitation services. In 1995, it was estimated that 82 per cent of the population had access to a safe water supply, 96 per cent had access to health services and 78 per cent to sanitation services (United Nations Development Programme, 1998). The same factors that contributed to childhood mortality decline in Oman were playing a positive role in Yemen, though on a lesser scale. For example, coverage of health services improved reaching 45 per cent of the population by 1997 (Central Statistical Organization, 1998). Furthermore, despite a certain amount of decline in fertility, the persistence of reproductive behaviours conducive to higher fertility (early childbearing, closely spaced births and high parity) are likewise contributing factors to the relatively high infant and child mortality rates in Yemen.

Figure II. Trends in infant and child mortality in Oman and Yemen

Oman

Yemen
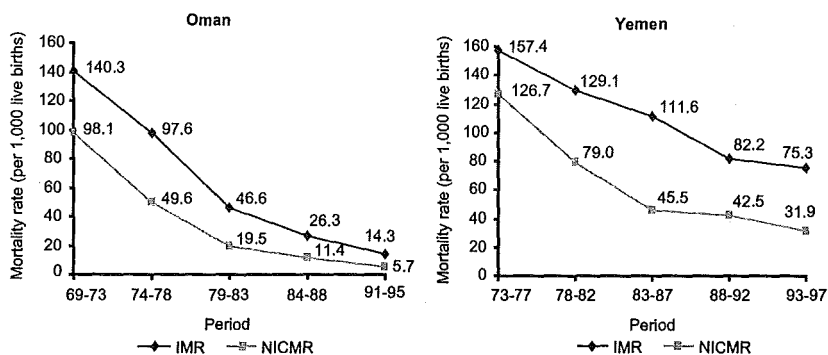
Sources: [a]Sulaiman, Al-Ghassany and Farid (1992), table 4.5.
[b]Sulaiman, Al-Riyami and Farid (2000), tables 7.1 and 13.4.
[c]Central Statistical Organization (1994), table 12.3.
[d]Central Statistical Organization (1998), table 7.2.
NOTES: IMR = infant mortality rate
    NICMR = child mortality

4. Population policy

The Government of Oman considers the current crude birth rate of 40 per 1,000 persons as high, but would like to see it maintained (Sulaiman, Al-Riyami and Farid, 2000). The country has no official population policy. However, Oman is the only country among the Gulf States that has announced a family planning programme (Al-Riyami, 1998). In October 1994, the birth spacing services programme was initiated as an integral component of the Maternal and Child Health (MCH) Care Programme in the Ministry of Health. The Programme provides information about contraceptives through counselling in MCH clinics. Contraceptives are available and may be obtained for free at all Ministry of Health centres and also through commercial outlets (Sulaiman, Al-Riyami and Farid, 2000).

The authorities in Yemen have come to realize that the rapid population growth rate (estimated at 2.4 per cent in 1975, 3.1 per cent in 1986 and 3.6 per cent in 2000) is imposing itself as one of the major national challenges, hampering efforts towards development and stability and requiring immediate policy and practical measures (Central Statistical Organization, 1992). The Government drafted a population strategy for the period 1990-2000, which was endorsed by the Council of Ministers and adopted as a national policy at the National Population Conference in 1991. Following the conference, a national population council was created to oversee implementation of the policy. A number of objectives were set, including the following:

- To reduce the infant mortality rate to 60 per 1,000 and the maternal mortality rate by half;
- To reduce the total fertility rate to 6 births per woman by the year 2000;

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- To raise the level of contraceptive use among married women to 35 per cent and expand family planning services to men;
- To expand basic education to reach an enrolment ratio of 85 per cent or more among the school-age population;
- To reduce adult illiteracy to less than 30 per cent among males and less than 50 per cent among females;
- To raise primary health-care coverage to 90 per cent;
- To achieve a population distribution between urban and rural areas that corresponds to the prevailing environmental, economic and production requirements;
- To protect and improve the environment.

Family planning services were offered through maternal and child health and family planning programmes of the Ministry of Public Health and Population, the private sector (pharmacies) and the Yemen Family Care Association. The number of family planning service outlets assisted by the Association grew steadily, from 75 centres in 1991 to 126 in 1992, reaching 231 centres in 1995 (Abdel Ghani, Bahebeishi and Abdalla, 1996). However, in general, by 1995, little progress in achieving the overall goals had been made. The strategy was not translated into detailed programmes within the national plans of governmental institutions, and the financial and human resources necessary for implementation were not available. The result was that either most of the planned programmes were not implemented or the implementation was not adequate (Mut'har and others, 1996). A national conference on population policy was held in October 1996 with the aim of evaluating and assessing progress in implementation of the 1990-2000 population strategy, as well as revising the work plan on population in the light of international, regional and local events (Central Statistical Organization, 1998).

E. CONCLUSIONS

The paper has shown that Oman and Yemen, countries that recorded the highest fertility rates during the late 1980s, have experienced appreciable declines in fertility during recent years. Fertility decline in Oman has been brought about by the rising age at first marriage and a decline in marital fertility among younger cohorts of women. In contrast, fertility decline in Yemen is essentially a result of decline in marital fertility. A distinguishing feature of the fertility declines in each of the two countries is the age patterns: in Oman fertility transition has been initiated by the younger cohorts of women, while in Yemen it was led by women aged 35 years and older. This indicates that in Oman a delay in childbearing and the spacing of births among younger women are the principal factors behind the observed fertility decline. It is plausible to expect a sustained decline in Omani fertility in the future, mainly as a result of the interplay of tempo of childbearing and the factors that limit it. The tempo factors are associated with the expected continued rise in age at first marriage (and age at first birth) among younger women, while the limiting factors are associated with the expected rapid increase in use of family planning methods

among older married women. In Yemen, family size limitation among older women is the main factor behind the fertility decline. Future declines in that country could be accelerated with a delay in childbearing among younger cohorts of women.

The study has also suggested that the underlying contextual factors behind fertility decline in each of the two countries differ. In Oman, political stability over the past two and a half decades facilitated the implementation of a successful and wide-ranging socio-economic development effort. This lead to a rapid rise in the standard of living, substantial improvement in educational attainment and a rapid decline in childhood mortality rates. These developments provided the necessary and sufficient conditions for the observed substantial declines in fertility during recent years and set the stage for further fertility decline in the future. In Yemen, it can be inferred that improvements in the survival chances of children, and perhaps psychological reactions to the worsening economic conditions, prompted the observed fertility decline during recent years.

The prospects of future fertility decline are embedded in the present realities in the two countries. In Oman, continued expansion in school enrolment, particularly among females of secondary and college age, is expected to lead to a further rise in age at first marriage. Not only do increased educational opportunities lengthen the time girls spend in school, but they also foster change in social norms regarding proper age of marriage and in attitudes towards family size (Al-Riyami, 1998).

It has been argued that the provision of free medical care, social services, and education by the Government of Oman encourages families to continue to have a large number of children, since the monetary cost of raising children will be low (Eickelman, 1993). Fertility trends since the late 1980s have shown that this argument is not entirely correct. Rapid socio-economic development and increased exposure to the outside (particularly the Western) world have created new aspirations and promoted the diffusion of new ideas about lifestyles. Many young couples consider a large family as costly and contrary to the image of a modern lifestyle (Al-Riyami, 1998). The availability of modern family planning methods at both government health facilities and private sector outlets—and the promotion of information, education and communication (IEC) messages to use these methods—will definitely enable couples to achieve their desire for better spacing of births and smaller families, leading to rapid future declines in the total fertility rate.

In Yemen, fertility is also expected to continue its downward trend. However, the decline is not expected to be rapid. Worsening economic conditions alone cannot produce a long-lasting transformation in reproductive behaviour. Changes in reproductive behaviour among Yemeni women can be effected through improvements in their status, particularly among rural residents (through expanded schooling and paid employment opportunities). Improved coverage of health services, leading to continued decline in childhood mortality and in turn reduced desire for a larger number of children, is also essential for any future rapid fertility decline. Lower family-size desire among married women (from an average of 5.4 children in 1991/92 to 4.5 children in 1997)

indicates a potential demand for family planning services that needs to be met. The ability of the family planning programme in Yemen to meet current and future demand for contraceptive methods could be enhanced through technical and financial support by international donors. As previously noted, non-availability of funding and non-integration of population programmes within the activities of Government institutions led to the poor performance of the national population strategy in its initial five years.

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TRENDS IN ANGOLA'S FERTILITY

Victor Agadjanian and Ndola Prata***

A. INTRODUCTION

The present study attempts to assess fertility trends and prospects in Angola. In particular, it seeks to detect any possible impact on the country's fertility of the civil war that has ravaged Angola for almost three decades. Such an enterprise would be difficult enough for countries with better demographic data. In the case of a country like Angola, with little systematic and reliable demographic data available, it is inevitably reduced to a general exploration. To highlight the possible effects of war and to situate Angola's reproductive trends in a broader picture of regional reproductive dynamics, comparisons are drawn, where data allow, with other more peaceful sub-Saharan countries of Africa.

War can be expected to depress fertility, mainly through marital disruption and deliberate postponement of births; following this logic, fertility should rebound once normal life is restored. However, the effect of war on childhood mortality can also create an incentive to continue childbearing; under such conditions parents would try to produce replacements for children who died or whom they perceive at a high risk of dying. Reflecting this conceptual complexity, the literature on the impact of war on fertility is inconclusive. Some studies, especially those focusing on twentieth-century western societies, have documented sharp declines of fertility during war years with a rebound in post-war periods (Hobcraft, 1996, for England and Wales; Rindfuss and Sweet, 1977, for the United States; Schwartz, 1997, for Germany). Other studies, especially those dealing with developing countries in early stages of the fertility transition, have offered less clear evidence. For example, the civil war in Lebanon did not seem to have any significant influence on that country's fertility (Khlat, Deeb and Courbage, 1997; Kulczycki and Saxena, 2000). The Iran-Iraq war of the 1980s did not show any effect on Iranian fertility, either (Ladier-Fouladi and Hourcade, 1997). However, in the only recent study dealing with sub-Saharan Africa, Lindstrom and Berhanu (1999) did detect some short-term fluctuations in Ethiopian fertility associated with politico-military instability and famine, even though the available data did not allow the authors to assess the long-term impact of war.

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Although many sub-Saharan nations have lived through spells of political and military instability, the Angolan case is among the particularly tragic ones. As early as 1961, long before Angola's independence from Portugal, the Movimento Popular para a Libertaço de Angola, a nationalist group known as the MPLA, launched its first initiative against the Portuguese military. Soon after the MPLA uprising, other nationalist groups joined in the anticolonial struggle. After the Portuguese colonial regime collapsed and Angola became independent in 1975, the war continued as a civil conflict between the then-"Marxist" MPLA Government, strongly supported by the Union of Soviet Socialist Republics and Cuba, and the opposition, União Nacional para a Independência Total de Angola (UNITA), backed by the United States and South Africa. Although the political labels and alliances have changed radically since the early independent years, the civil war in Angola has raged on with few pauses. A ceasefire brokered by the United Nations in 1991 was shattered a year later when UNITA contested the results of the first multiparty presidential and parliamentary election held in September 1992. After a bloody outbreak of violence that followed, a shaky peace was re-established in November 1994 with the signing of the Lusaka accord, only to degenerate into an all-out (and still continuing) war at the end of 1998 (Pycroft, 1994; Spears, 1999).

The war has taken an enormous toll on the Angolan people and their economy. Hundreds of thousands have been uprooted and forced to flee the fighting. The public health system has been all but paralysed in much of Angola, and the population of many parts of the country has come to rely heavily on domestic and especially international non-governmental organizations for the supply of basic food and medical care (Médecins sans frontières, 2000). High levels of child malnutrition and low levels of immunization, even by unenviable sub-Saharan standards, attest to the state of public health in Angola (Agadjanian and Prata, 2000).

The magnitude of human and socio-economic destruction caused directly and indirectly by the civil war looks particularly staggering if we take into account the high agricultural potential of Angola and its unusual mineral wealth—especially in oil and diamonds. From a net exporter of agricultural products, Angola turned into a country surviving on food imports and donations. Diamond mining has been largely controlled by the UNITA opposition, which has used the proceeds to purchase weapons (Sherman, 2000). Only the revenues from offshore oil production, controlled by the Government and generally shielded from any direct disruption by the hostilities, have saved the country from a complete economic collapse (*The Economist*, 2000). Paradoxically, Angola, richly endowed with natural resources and one of the region's biggest oil producers, remains among the poorest sub-Saharan nations, with a gross national product most recently estimated at $220 per capita (World Bank, 2001).

Angola's protracted civil war, endemic poverty and erratic politics have crippled researchers' attempts to study the country's sociodemographic

dynamics and problems. The overwhelming majority of scholarly publications on contemporary Angola have dealt with the war, but with an almost exclusive focus on its political and military aspects. The investigation of social, and especially sociodemographic, aspects of the war has been sketchy and largely limited to Portuguese-language reports that have rarely reached a wider international audience. Yet even before independence, the anticolonial war was claimed to have a profound impact on the demographics of at least some parts of Angola, primarily through mass displacements and killings of the civilian population (Pelissier, 1974). This impact could only widen as the anticolonial struggle gave place to generalized civil war after independence.

C. A GENERAL SOCIODEMOGRAPHIC PROFILE OF ANGOLA

Angola's population is currently estimated at about 13.1 million (World Bank, 2001). The country is sparsely populated: its population density is just under 10 people per square kilometre, compared to an average of about 27 for sub-Saharan Africa as a whole. The average population density figure, however, conceals the distortion produced by the civil war, especially disproportionately rapid growth in population of its capital Luanda (which may now shelter over one fifth of the country's population), and to a lesser extent other cities that have been absorbing masses of people displaced by fighting. The United Nations currently estimates Angola's annual population growth rate at 2.9 per cent, above the sub-Saharan average (2.4 per cent), although the Angolan figure is likely to be a crude extrapolation of much earlier data. Angola's life expectancy, undermined by war and poverty, is estimated at 45 years. However, no other demographic measure better reflects Angola's war-induced devastation than its infant and childhood (under-five) mortality rates—127 and 208 deaths per thousand, respectively—that are far above the subcontinent's average. No wonder, then, that Angola recently earned the grim distinction of the worst country in which to be a child in *The Progress of Nations 1999*, the United Nations Children's Fund report (UNICEF, 1999).

D. DEMOGRAPHIC DATA

The available demographic statistics in most sub-Saharan countries are limited in coverage and questionable in quality; this problem, like many others, is magnified in Angola. The colonial-era census and civil registration data are notoriously flawed (Da Costa Carvalho, 1979). Even though it is impossible to establish fully the type and degree of bias, there are reasons to suspect that the fertility of the black population was systematically underreported, especially in earlier censuses (Heisel, 1968). In the quarter-century of Angola's independent existence, only one national census has taken place; even that census, conducted in 1983/84, was limited to accessible government-controlled areas (provinces of Luanda, Cabinda, Zaire and Namibe, and cities of Lubango, Uige and Negage). A demographic and socio-economic survey was carried out in 1988 in the relatively safe southern and south-western parts of Angola, but the survey's demographic module focused mainly on mortality (Instituto Nacional de Estatística, 1990).

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The four-year stretch of relative peace after the signing of the Lusaka Agreement in 1994 generated a lot of optimism and some demographic studies. Two of those studies produced especially valuable data that are used in this analysis: the Living Standards Measurement Survey (LSMS), a World Bank standard priority model survey conducted in 1995 (see Sousa, Grave and Ceita, 1996, for a description of the methodology), and the 1996 Multiple Indicators Cluster Survey (MICS), commissioned by UNICEF (Instituto Nacional de Estatística and UNICEF, 1998). With a sample size of about 5,000 households, the LSMS covered mainly urban areas in five provinces. In contrast, the MICS was a nationally representative survey of nearly 4,500 households for which 4,890 women aged 14 to 49 were interviewed. Both surveys lacked the breadth and depth of information that a complete fertility analysis would require. Neither collected nuptiality information; women's birth history is available only in the MICS and only for the last three births preceding the survey. The MICS did not cover camps for displaced people, a regrettable omission, though at the time it was conducted the population of those camps was relatively small. Nonetheless, these survey data allow for important insights into the dynamics of Angolan fertility, and they are used in combination with available census data.

To achieve a better understanding of Angola's fertility, the 1996 MICS data are compared with contemporary estimates from the Demographic and Health Surveys (DHS) conducted in five other sub-Saharan countries: Benin, Ghana, Kenya, Mozambique and Zimbabwe. The countries are at different stages of fertility transition: whereas Kenya and Zimbabwe are at the forefront of fertility decline in the subcontinent, Ghana is somewhat behind, and Mozambique and Benin are considered to be among the slowest (Cohen, 1998; Kirk and Pillet, 1998). All these countries have been relatively peaceful except Mozambique, another former Portuguese colony, convulsed by a brutal civil war from the late 1970s until 1992.

E.   TRENDS IN AGE-SPECIFIC FERTILITY

Figure I displays changes in age-specific fertility rates in Angola between 1940 and 1996.[1] The data point to a considerable rise in Angolan fertility between 1960 and the mid-1980s. Although a pre-transition rise of fertility has been a common occurrence historically (Dyson and Murphy, 1985), and some increase in fertility was probably taking place after the Second World War in several sub-Saharan societies (Foote, Hill and Martin, 1993; Romaniuk, 1980), the apparent jump in Angolan fertility seems too large to be attributed to improved nutrition and reproductive health, a gradual erosion of traditional methods of fertility regulation and improved data collection. It is likely inflated owing to the already mentioned underreporting of blacks' fertility in colonial censuses; it may also reflect to some extent the selective coverage of the 1983/84 census. In any case, even though the increase in childbearing can be seen across all ages (with the exception of the latest stages of women's reproductive span), the overall pattern has not changed much: in the mid-1990s, as in 1940, fertility peaked in the age range 20 to 29 years. The data also suggest that little change occurred between the early/mid-1980s and the mid-1990s, as age-specific fertility remained well above the colonial period levels for all but the youngest and oldest age groups. Nevertheless, an overall shift of reproductive activity to older ages is evident, and especially an appreciable decline of fertility levels in the two youngest age groups.

Considering the limited coverage of the 1983/84 census, it is difficult to ascertain whether the recent trends presented in figure I are a sign (or at least a precursor) of a sustained reduction of fertility in Angola or a reflection of the politico-military experience of the nation. When the MICS estimates are compared with findings from the five cross-national Demographic and Health Surveys (figure II), the shapes of the age-specific fertility rates distributions are generally similar. However, the high levels of Angolan fertility, especially in the peak reproductive ages of 20 to 29, stand out in comparison not only with forerunners of fertility transition but even with such generally pre-transitional societies as Benin and Mozambique. Assuming that the MICS data do not grossly overestimate the country's fertility, no indication is found that war may have lastingly depressed fertility. On the contrary, figure II implies that war may have been a deterrent to any fertility reduction.

F. TOTAL FERTILITY

Figure III compares recent trends in total fertility rates in Angola and the other five countries. The TFR is calculated as the sum of the age-specific fertility rates through all ages of the reproductive span, and indicates the total number of children a woman would have during her reproductive life if she were to follow the current age-specific schedule of childbearing. Although the TFR, like the age-specific rates from which it is computed, is a period (or synthetic cohort) measure that does allow one to follow the fertility of real age cohorts, a comparison of TFRs for different societies at different points in time may shed some light on the dynamics of reproductive changes.

Angola's total fertility remains the highest among the countries compared. It has been on the decline in recent years, following the trend observed in all the other countries (except an inexplicable, even if moderate, increase in Benin

Figure I.   Trends in age-specific fertility rates, Angola, 1940-1996
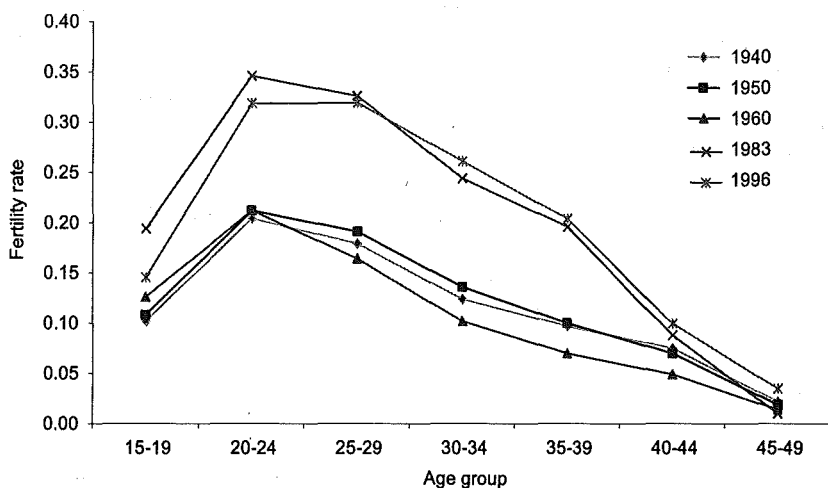
Sources: N. López-Escartín (1992); Instituto Nacional de Estadística/UNICEF (1998).
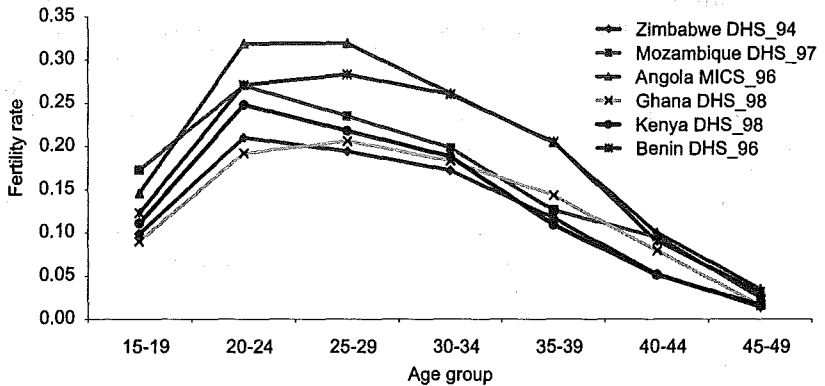
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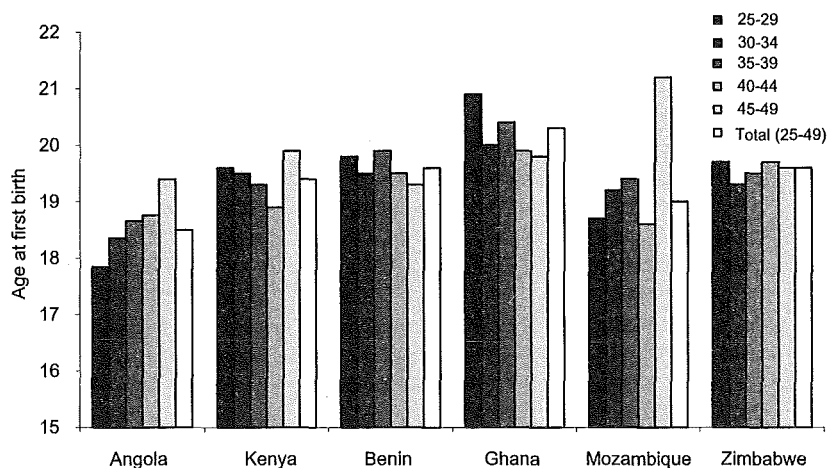Figure II.   Age-specific fertility rates for selected countries

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

in the mid-1990s). The Angolan data suggest that the country's TFR peaked in the mid-1980s, when the war was in a medium-intensity guerrilla stage, and then declined in the mid-1990s to a level still slightly higher than early 1970s levels. Although these trends seem generally plausible, the reservations about the exact magnitudes of total fertility caused by the quality and limitations of Angolan data remain.

Even in countries that have not fully embarked on the path of fertility transition, fertility levels tend to vary across major sociodemographic categories. Table 1 summarizes the differences in total fertility by women's average educational level and area of residence, computed from the Multiple Indicators Cluster Survey in Angola and the Demographic and Health Surveys of other selected sub-Saharan countries. In general, one would expect a strong negative correlation between schooling and fertility: at each higher level of education fertility should be lower. Such a strong correlation is present in all countries but Angola. Although Angolan women with secondary or higher levels of education have the lowest total fertility, the TFR for women with primary education is in fact higher than that for women with no education at all. This pattern is not uncommon in developing countries, especially in sub-Saharan Africa (Jejeebhoy, 1995), and reflects the very early stage of fertility transition, when the erosion of traditional child spacing practices (such as prolonged post-partum abstinence and prolonged breastfeeding) associated with education is not adequately compensated for by contraceptive use. Even though the fertility differentials between uneducated women and those with secondary or higher levels of education are nearly universal, the gap between the two groups is noticeably smaller in Angola than in any other country on our list, underscoring again the largely pre-transitional nature of Angolan society. The urban versus rural comparison invites the same conclusion, as urban and rural areas in Angola display very similar levels of fertility, unlike the pronounced urban-rural differentials in the other countries. Thus, at the aggregate level there is no evidence in Angola

Figure III.   Trends in total fertility rates for selected countries, 1960-1998
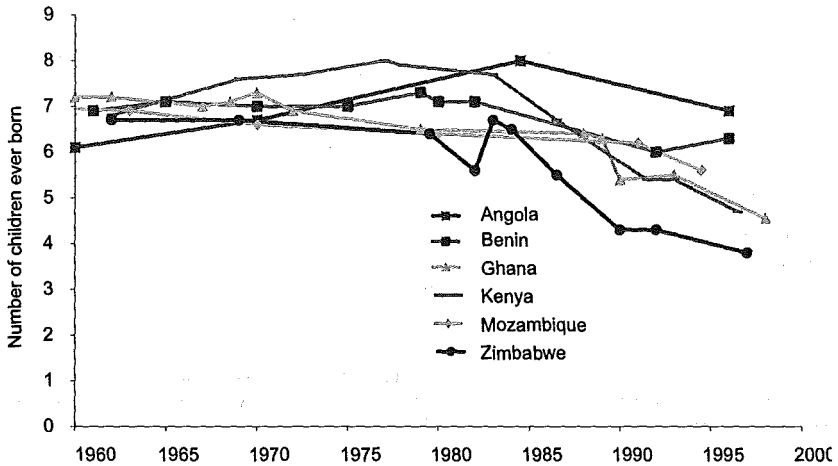
that urban conditions, no matter how severe (increased overcrowding, mass un-employment, dilapidated and insufficient housing and chronic shortages of food and other consumer items), have pushed urban fertility down.

G.   AGE AT START OF CHILDBEARING AND ADOLESCENT FERTILITY

One feature typical of fertility transition is postponement of childbearing. Figure IV depicts median ages at first birth in Angola and in the comparison countries, for all women and for specific age cohorts, obtained from the most recent surveys. Despite what had previously appeared to be fertility decline among the youngest women between the mid-1980s and mid-1990s (figure I), Angolan women still tend to start childbearing earlier than women of any other of the countries included. This holds for all age cohorts with the exception of the oldest cohort (over 40 years old). Even for the latter group of women, the Angolan average is among the lowest. Notably, age at first birth in Angola de-creases consistently from the older age groups to the younger ones. This is also generally the case for Mozambique, but in the other four countries age at first birth tends to rise, especially in the youngest cohort, which is congruent with the notion of fertility transition. Hence on this indicator too Angola shows no sign of a fertility decline: in fact, the Angolan trend contradicts an expectation that war might have hastened fertility reduction through a later start of child-bearing. The war may have had exactly the opposite impact: although quantifi-able data are lacking, there is abundant evidence of widespread rape and sexual enslavement of young girls (Human Rights Watch, 1999). It is also plausible to suggest that owing to war-induced hardships families may try to marry off girls earlier in order to alleviate the household's economic burden.

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	Angola (1996)	Benin (1996)	Ghana (1998)	Kenya (1998)	Mozambique (1997)	Zimbabwe (1994)
Education						
None	6.9	7.0	5.8	5.8	5.8	5.2
Primary	7.3	5.0	4.9	5.2	5.7	4.7
Secondary and higher	5.8	3.2	2.8	3.5	3.7	3.3
Residence						
Urban	6.8	5.2	3.0	3.1	5.1	3.1
Rural	7.0	7.0	5.4	5.2	5.8	4.9
TOTAL	**6.9**	**6.3**	**4.6**	**4.7**	**5.6**	**4.3**

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

The trends highlighted in figure IV further suggest a high level of adolescent childbearing in Angola today. Indeed, as table 2 shows, Angola—along with Mozambique—has the highest levels of adolescent fertility. The pressure on women to start childbearing early is traditionally common in sub-Saharan societies (Bledsoe and Cohen, 1993), and the Angolan data provide no hint that this pressure is easing. Remarkably, Angola is the only country in the sample where the levels of adolescent fertility are slightly higher in urban areas than in rural areas; in all other countries the reverse is true, usually with a wide gap. The case of Angola is incompatible with the "normal" expectation that urban young women are more likely to postpone childbearing (mainly through contraception and abortion) than their rural counterparts. Unfortunately, because recent Angolan data are lacking on age at entry into first marital union, it is not possible to assess the magnitude of out-of-wedlock adolescent fertility, which has been seen as a growing problem in various parts of sub-Saharan Africa (e.g., Garenne, Tollman and Kahn, 2000).

H. FERTILITY INTENTIONS

Although fertility intentions stated in a survey should not be seen as accurate predictors of reproductive outcomes, such statements can serve as approximate gauges of a society's reproductive climate and of its future fertility course. The intention to have no more children is arguably the least biased measure of desired fertility (though even this measure is imperfect). Table 3 presents a profile of women's intention to cease childbearing for Angola and the other countries by area of residence and by number of living children. The proportion of women who said that they did not want to have more children overall places Angola in the middle of the list, but much closer to countries where fertility changes have been less advanced. Less than a quarter of Angolan women wanted to stop childbearing—considerably fewer than in Kenya, Zimbabwe and Ghana, as many as in Benin and somewhat more than in

**Figure IV. Median age at first birth by women's age group
at the time of the survey, selected countries**

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

TABLE 2. PERCENTAGE OF ADOLESCENT WOMEN (15-19 YEARS) WHO HAD BEGUN CHILD-BEARING AT THE TIME OF THE SURVEY, BY AGE AND AREA OF RESIDENCE, SELECTED COUNTRIES, 1994-1998

	Angola (1996)	Benin (1996)	Ghana (1998)	Kenya (1998)	Mozambique (1997)	Zimbabwe (1994)
Age						
15	8.0	2.7	1.6	3.3	7.5	2.9
16	20.7	7.4	5.8	6.0	19.6	9.7
17	30.6	22.4	13.9	19.6	43.5	16.2
18	39.7	35.3	21.1	30.1	63.0	31.1
19	62.9	56.1	31.7	44.9	66.7	44.1
Residence						
Urban	33.9	18.7	8.5	17.5	30.6	15.2
Rural	32.8	32.5	17.4	21.8	43.6	21.6
TOTAL	**33.3**	**26.0**	**14.1**	**20.9**	**40.0**	**19.7**

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

TABLE 3.   PERCENTAGE OF WOMEN WHO REPORTED WANTING NO MORE CHILDREN, BY NUMBER OF LIVING CHILDREN
AND AREA OF RESIDENCE, SELECTED COUNTRIES

	Number of living children							Area of residence		
	0	1	2	3	4	5	6+	Urban	Rural	Total
Angola (1996)	7.7	9.3	14.1	20.0	38.9	60.9	77.3	24.2	22.0	23.2
Benin (1996)	1.0	1.3	5.3	14.5	25.1	38.5	58.6	27.1	20.8	23.0
Ghana (1998)	0.8	2.3	16.1	36.1	53.2	64.3	78.4	36.8	34.2	35.0
Kenya (1998)	1.7	8.1	33.9	51.8	72.2	78.4	88.8	49.0	54.4	53.3
Mozambique (1997)	1.0	2.1	6.7	14.7	19.9	38.3	55.5	24.3	15.1	16.9
Zimbabwe (1994)	2.5	5.5	19.5	31.4	50.8	61.4	80.3	39.9	37.3	38.0

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

Mozambique. As in the majority of countries included in the comparison, Angolan urban women are somewhat more likely to want to end procreation than rural women, but the urban-rural difference is very small. When broken down by the number of living children, the pattern becomes more complex. Angolan women with no children or one child display an unusually high proclivity towards wanting no more children. The share of childless women intending not to have children is particularly suspect and may be an artefact of the data collection process.[2] As in all countries, in Angola the share of potential stoppers rises with each additional child. However, the Angolan pattern of fertility intentions, especially among higher-parity women, is more similar to that in the three more transitionally advanced countries than to that in Benin and Mozambique (where fertility levels are actually close to Angola's).[3] Yet, given the nature of the variable, such patterns alone are not sufficient to claim that the war has precipitated the disinclination to have more children.

I. CONTRACEPTIVE USE

Fertility decline is usually associated with contraceptive uptake. The use of modern contraception is particularly indicative of reproductive changes underway in a society. While sub-Saharan Africa trails most other parts of the world in contraceptive use, in some countries (such as Kenya and Zimbabwe) contraceptive prevalence has reached fairly high levels, contributing to notable fertility decline (Cohen, 1998). In Angola the national family planning programme started as part of the maternal and child health services package in the mid-1980s, with the main objective of improving the health and well-being of mothers and infants through birth spacing (Carvalho and others, 1996). Since the programme's inception, family planning services have been offered free of charge through State-run clinics. The programme has been plagued by shortages of properly trained health workers, limited choice of available contraceptives, and frequent interruptions in contraceptive supply. The Ministry of Health's family planning education programmes usually target only women who seek the services, leaving the general public largely uninformed about benefits and potential side effects of contraceptives. Private alternatives to State clinic–based family planning services are limited and expensive. However, because of the weakness of the State-run family planning system and the absence of a community-based distribution network, users increasingly have to rely on private providers whose services are poorly regulated and whose prices are often exorbitant.

Reflecting the state of the national family planning system, Angola's levels of contraceptive use are among the lowest in sub-Saharan Africa, especially in comparison with such contraceptive leaders as Kenya and Zimbabwe (table 4). At the same time, Angola's modern contraceptive prevalence does not differ much from that in Benin and Mozambique. As in all the countries included, Angolan women's educational level displays an unequivocal positive association with contraceptive use; and as in most countries, the gap in contraceptive prevalence is particularly large between women with a primary education only and those with a secondary or higher educational level.

	Angola (1996)	Benin (1996)	Ghana (1998)	Kenya (1998)	Mozambique (1997)	Zimbabwe (1994)
All methods	8.2	16.4	22.0	39.0	5.6	48.1
Urban	13.4	19.0	30.4	49.6	17.7	57.6
Rural	4.2	15.0	18.1	36.2	2.7	44.2
Modern methods	4.2	3.4	13.3	31.5	5.1	42.2
Urban	15.0	5.8	17.4	41.0	16.6	53.9
Rural	1.9	2.1	11.4	29.0	2.3	37.3
No education	2.3	2.1	8.9	16.1	2.5	25.9
Primary	7.2	7.0	12.9	21.8	6.3	38.9
Secondary and higher	28.5	11.1	20.3	46.3	27.1	54.7
Capital/largest city						
All methods	33.0	27.6	32.2	56.3	30.3	61.6
Modern methods	27.5	4.9	17.4	46.8	28.5	57.7

Sources: Benin Demographic and Health Survey, 1996; Ghana Demographic and Health Survey, 1998; Angola Multiple Indicators Cluster Survey, 1996; Kenya Demographic and Health Survey, 1998; Mozambique Demographic and Health Survey, 1997; Zimbabwe Demographic and Health Survey, 1994.

As is generally the case, contraceptive prevalence is higher in urban areas than in rural ones. Of the group of countries, the urban-rural gap is the second widest in Angola, after Mozambique. In both lusophone nations, urban-rural differences are inflated by the high contraceptive prevalence in their respective capital cities. Although this pattern is not atypical across sub-Saharan Africa, in Mozambique and especially in Angola it also reflects the war-induced distortion of the health and family planning systems in favour of capital cities with safer and better infrastructure. However, the urban-rural differences in contraceptive use stand in sharp contrast with the proximity of urban and rural fertility levels (table 1). This discrepancy is puzzling and may have to do with the recency of mass contraceptive adoption in urban areas, and the recent influx of women migrants caused by the war from the rural to urban areas, which places their rural fertility experience in the urban context, narrowing the urban-rural gap in fertility levels. It has been observed that in early stages of contraceptive uptake, the number of unwanted and mistimed pregnancies may not decline and in fact may rise partially as a result of contraceptive failure (Bongaarts, 1997). The Angolan situation probably represents a case for which the obvious but recent contraceptive advantage of urban areas, and the capital in particular, has yet to translate into tangible fertility differences.

J. WAR-RELATED VARIATIONS IN ANGOLAN FERTILITY

When attempting to assess the links between war and fertility in Angola, it is necessary to take account of the unevenness of the war impact in both time and space. Despite the long stretches of fighting that have marked the last several decades of Angolan history, some periods have seen more intensive hostilities than others. Likewise, not all the areas of the country have suffered

in the same way or to the same extent. Rural areas, especially in the central, south-eastern and eastern parts of the country, have been affected most often and most directly. The majority of urban areas as well as some parts of the countryside in relatively stable areas of the south and south-west, areas around the capital Luanda and those along the coast have experienced profound yet mainly indirect consequences of the war. Even during the most engulfing spell of warfare from 1992 to 1994, some parts of the country—both urban and rural—saw greater devastation than others.

Below, the fertility and reproductive health characteristics of women in the parts of the country where the impact of war, especially from 1992 to 1994, has been stronger and more direct are compared with the characteristics of women in the parts where this impact has been relatively weaker and more indirect. The greater-impact zones include Angola's northern region (provinces of Uíge, Zaire and Malanje), eastern region (Lunda Norte, Lunda Sul and Moxico) and centre-south region (Huambo, Bíe and Cuando-Cubango). The lesser-impact zones are the capital region (provinces of Luanda, Bengo, Cwanza Norte and Cabinda), the southern region (Huíla, Namibe and Cunene) and the western region (Benguela and Cuanza Sul).[4] Although this simple classification does not fully reflect the complexity and the scale of the impact of war on Angolan society, it is sufficient to illustrate the main points. Table 5 displays some of the fertility-related characteristics obtained from the 1996 MICS by region of war impact and by urban and rural areas within each region. The differences both across and within these regions are instructive.

To highlight changes in fertility over time, the predicted probabilities of a woman's giving birth during the period September 1993 to August 1994, when the fertility effects of the fighting that flared up after the announcement of the 1992 election results should have been particularly strong, are compared with those during the period September 1995 to August 1996, at least a year after the hostilities ceased. In both regions, the probabilities rose between the periods 1993 to 1994 and 1995 to 1996 (table 5), conforming to the notion of post-war fertility rebound discussed earlier. The increase was somewhat more pronounced in greater-impact regions, where both urban and rural areas displayed higher peacetime probabilities than in lesser-impact zones. The spike was highest in the rural areas of more affected regions: those areas were generally worst hit by the fighting, which noticeably depressed the wartime birth probabilities, at least relative to less affected rural areas.

Another study (Agadjanian and Prata, 2001) found that the temporal variations in fertility were largely concentrated among certain socio-economic segments of the Angolan population. More educated and more affluent people were more likely to regulate (and presumably more capable of regulating) their fertility in response to war's ebb and flow, regardless of the part of the country where they lived. Agadjanian and Prata also discovered that, irrespective of educational level or material status, the probabilities of giving birth among Luanda residents—the most modernized segment of Angolan society—were consistently lower than elsewhere. Yet at the same time, in Luanda, where the presence of war was perhaps the least direct, fertility oscillated almost as much as in the most directly and heavily affected parts of the country.

	Regions of greater war impact			Regions of lesser war impact		
	Total	Urban	Rural	Total	Urban	Rural
Predicted probability of a woman giving birth by period (percentage)						
Between 9/93 and 8/94	39.0	34.3	40.9	44.0	40.0	48.0
Between 9/95 and 8/96	52.2	49.6	53.5	48.3	45.7	50.9
Children ever born						
Average number of children ever born	3.6	3.8	3.6	3.6	3.5	3.6
Fertility intentions						
Percentage of women who want to get pregnant in the next twelve months[a]	25.2	27.3	24.2	23.7	16.0	32.5
Percentage who want no more children[b]	28.1	31.9	26.5	30.1	34.1	25.5
Family planning						
Percentage of women using contraception	4.4	6.2	3.6	11.0	16.5	4.9

Source: 1996 Angola MICS Survey.
[a]Non-pregnant women with at least one living child.
[b]Women with at least one living child.

Table 5 also shows no regional variation in lifetime fertility (with the exception of somewhat lower parity in lesser-impact urban areas that include the capital Luanda), indirectly suggesting that war had no lasting effect on fertility trends. Another possible indication is the rather uniform pattern of fertility intentions: both regions had very similar percentages of women who wanted to have another child in the next 12 months and those who wanted no more children.[5] In addition, the urban-rural differences with each region conformed to the universal expectation of lower fertility in urban areas. (The large urban-rural difference in less affected regions was due mainly to the peculiarity of Luanda.) Although contraceptive use was low in both regions, it was more than twice as high in the less affected regions as in the more affected regions, or 11 per cent as compared with 4 per cent. The gap between urban areas of both regions was considerable, especially in the lesser-impact regions, because of much higher contraceptive prevalence in the capital, Luanda.

K.   CONCLUSION: PROSPECTS FOR FERTILITY DECLINE IN ANGOLA

Despite the paucity of data, the available demographic information on Angola paints a picture of a largely pre-transitional society. Recent data allude to a possibility of some fertility decrease and a shift of reproduction to older ages, which commonly characterizes fertility decline, but the limitations of these data, especially of the 1983/84 census, cast doubts on any affirmation. The available data offer no evidence that war might have accelerated fertility decline. In fact, it seems more plausible to argue that war has slowed down and even halted long-term fertility changes in Angola—by keeping childhood mortality high, crippling the Government's efforts to expand family planning

and maternal and child health care, restricting couples' access to contraceptive information and services and disrupting marital unions, and by causing large-scale social disruptions that hinder school enrolment and attendance that, in turn, might lead to an earlier start of childbearing.

In the last part of the analysis, comparison was made of Angolan fertility at different stages of the war and in regions more and less affected by hostilities. The findings point to considerable temporal and regional variations in birth probabilities, but also to little difference across regions in lifetime fertility and fertility intentions. Yet the war-induced or magnified regional and area differences in fertility may have a lasting effect on future trends. Specifically, the residents of the capital Luanda, an indirectly yet very profoundly affected segment of Angola's population, have displayed the lowest fertility and the highest contraceptive prevalence. Although capital cities are known to be in the forefront of fertility transition (Shapiro and Tambashe, forthcoming), and Luanda's distinctiveness cannot be linked to the influence of war, it can at least be speculated that war may have amplified internal differences in fertility by stalling fertility changes in some segments of society and stimulating them in others.

The above suggestion, however inconclusive, has an important analytical and policy implication. As demographers are often tempted to focus narrowly on how marital, sexual and reproductive behaviour may change in direct response to societal crisis, including warfare, they tend to overlook the indirect effects that war exerts on people's demographic behaviour. War imperils human well-being in a multitude of ways: by distorting the social and demographic fabric of society; by drastically curtailing economic prospects for the overwhelming majority of citizens; by undermining their health and restricting their access to health care; by perpetuating government corruption and ineffectiveness; and by magnifying social and economic injustices. These effects are unevenly spread in the affected societies. Childbearing is intricately, even if indirectly, predicated on these complex and uneven effects, and both demographic research and population policies should take them into account.

NOTES

[1] Age-specific fertility rates according to the 1940, 1950 and 1960 censuses were computed using Brass multipliers, and for the 1983/84 census using P/F ratios. For 1996, ASFRs were computed from the MICS data by dividing the number of live births in the 12 months preceding the survey by the number of women in each age group.

[2] It is likely, for example, that many of the respondents, particularly unmarried adolescents, misunderstood the question on lifelong reproductive plans as referring to short-term fertility intentions.

[3] Owing to a lower proportion of higher-parity women in the MICS, the overall share of potential stoppers in Angola is closer to that in the Benin and Mozambique DHS.

[4] The definition of regions is constrained by the regional classification employed in the MICS.

[5] The indicator for assessing timing of future fertility preferences is limited to non-pregnant women with at least one living child; for assessing desires to limit childbearing, the denominator excludes childless women.

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FERTILITY LEVELS AND DIFFERENTIALS IN THE UNITED REPUBLIC OF TANZANIA[1]

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A. INTRODUCTION

Fertility rates are higher in sub-Saharan Africa than in other major regions of the world. Analyses of Demographic and Health Survey (DHS) data collected during the period 1990 to 1995 suggest that most of the countries in sub-Saharan Africa have a total fertility rate (TFR) of more than 6 children per woman, with only Botswana, Kenya, Lesotho, South Africa and Zimbabwe having TFRs below 5 children (Mboup and Saha, 1998). Despite these high rates, fertility declines have recently been documented for several countries (Cohen, 1993; Cleland, Onuoha and Timaeus, 1994). In their recent review of fertility trends in sub-Saharan Africa, Kirk and Pillet (1998) characterized the United Republic of Tanzania as a country with high fertility levels but with a regular trend showing modest fertility decline during recent years.

The first objective of the present paper is to assess fertility levels and trends in the United Republic of Tanzania during the period 1967 to 1999. Two sets of data sources are used for this purpose: the three post-independence population censuses conducted in 1967, 1978 and 1988; and the four national demographic surveys conducted in 1991/92, 1994, 1996 and 1999. The second objective is to identify the major determinants of fertility change in the United Republic of Tanzania and to consider the implications of changes in these determinants (both proximate and distant) on fertility. Third, the paper will consider the prospects for further fertility decline in the near future.

B. COUNTRY PROFILE OF THE UNITED REPUBLIC OF TANZANIA

The United Republic of Tanzania is located in eastern Africa and consists of the union of the mainland (formerly Tanganyika) and the island of Zanzibar. It is one of the largest countries in sub-Saharan Africa, covering approximately 940,000 square kilometres. Administratively, the mainland is divided into 20 regions, and Zanzibar is divided into 5 regions. The national language of the United Republic of Tanzania is Kiswahili, which is spoken by the majority of the people. There are, however, more than a hundred local tribal languages. The United Republic of Tanzania is a poor country with a mixed economy

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in which agriculture plays a key role. The most recent population census was conducted in 1988 (although the National Bureau of Statistics is now in the advanced stages of conducting another census), and it enumerated 23.1 million people. The United Nations (1999) estimated the population of the country at 32.1 million in 1998. These two figures imply an annual growth rate between 1988 and 1998 of 3.3 per cent.

Four out of five Tanzanians live in rural areas (National Bureau of Statistics and Macro International, Inc., 2000), and almost half (49 per cent) are illiterate (Komba and others, 1991). Mortality rates are still high, although a declining trend has been observed (Mturi and Hinde, 1995). The infant mortality rate was estimated at 155 infant deaths per 1,000 live births in 1967 and by 1996 had declined to 88 deaths per 1,000 live births (Bureau of Statistics and Macro International, Inc., 1997; National Bureau of Statistics and Macro International, Inc., 2000).

C. FERTILITY TRENDS IN THE UNITED REPUBLIC OF TANZANIA

The three population censuses of 1967, 1978 and 1988 collected two types of data that can be used for fertility estimation. First, women were asked questions regarding the number of children they had ever borne (that is, about their lifetime fertility); and second, they were asked how many children they had borne in the 12 months prior to the census (the answer to which provided data on current fertility).

An assessment of census data on fertility revealed the usual problems of fertility information from censuses conducted in Africa (Mturi, 1996). These include underreporting of births in the year prior to the census and omission of children ever born for women in their late thirties and forties (United Nations, 1983). A variety of indirect methods have been applied to data from all three censuses in order to overcome these problems. Mturi and Hinde (1994) present various estimates of the TFR and argue in favour of a series of estimates made from each census using the same P/F ratio method (United Nations, 1983). Their preferred estimates are 6.9 in 1967; 7.2 in 1978; and 6.5 in 1988. This series appears to indicate that fertility peaked sometime around the late 1970s and that a modest decline set in during the 1980s.

The Demographic Health Survey programme helped the Government of the United Republic of Tanzania to conduct four national surveys during the 1990s: the 1991/92 and 1996 Tanzania Demographic and Health Surveys; the 1994 Tanzania Knowledge, Attitudes and Practices Survey; and the 1999 Tanzania Reproductive and Child Health Survey. One objective of the surveys was to obtain data from which levels and trends of fertility could be estimated. In three of the surveys (the exception being the 1994 Tanzania Knowledge, Attitudes and Practices Survey), information on the birth histories of women aged between 15 and 49 years at the time of the interview was collected, including the birth dates of each child, sex, survival status, and so on. That information can be used to estimate TFRs for periods close to the survey dates, consider-

ing first the estimates for the three years just prior to each survey. The 1991/92 Tanzania Demographic and Health Survey, based on a sample of 9,238 women, reported a TFR of 6.3 for the period 1989 to 1992 (Ngallaba and others, 1993). According to the 1996 survey, for which 8,120 women were interviewed, the total fertility rate fell to 5.8 for the period 1993 to 1996 (Bureau of Statistics and Macro International, 1997). The 1999 Tanzania Reproductive and Child Health Survey interviewed a smaller sample of 4,029 women. It reported a TFR for the period 1996 to 1999 of 5.6 (National Bureau of Statistics and Macro International, Inc., 2000).

The above estimates are all "current", in that they are made using data for the period immediately prior to the surveys. However, the birth history data in the surveys can also be used to estimate the TFR with reasonable accuracy for earlier periods. Moving further back from the survey date, the fertility of a gradually widening group of older women is unobservable, as these women were aged over 49 years by the time the survey was conducted. However, since the fertility of women in their forties is a relatively small proportion of total fertility, reasonably good "historical" estimates of the total fertility rate for periods up to about 10 years prior to each survey can be obtained by substituting estimates of the fertility of women aged 40 to 44 and 45 to 49 years from more recent periods for the unobserved values. Figure I displays TFRs estimated from the population censuses, and both "current" and "historical" estimates from the 1991/92, 1996 and 1999 surveys. The consistency shown by the estimates from different sources is reassuring. It seems fairly clear that there was no decline in Tanzanian fertility prior to the early 1980s, but that since then there has been a modest decline, especially during the 1990s.

Figure I. Trends in the total fertility rate, United Republic of Tanzania, 1965-1999
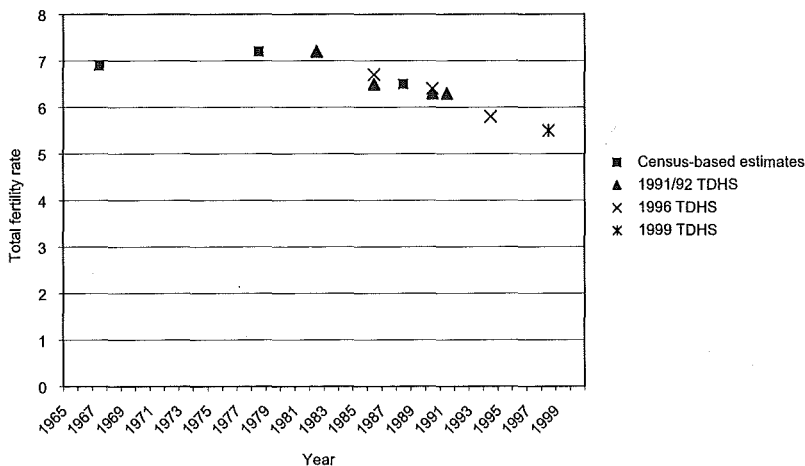
Sources: 1967, 1978 and 1988 population censuses of the United Republic of Tanzania; 1991/92 and 1996 Tanzania Demographic and Health Surveys; 1999 Tanzania Reproductive and Child Health Survey.

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Figure II shows age-specific fertility rates derived from the three surveys. A clear decline in fertility at all ages is evident from the period 1977 to 1980 onwards. The decline was initiated by a particularly pronounced drop among all age groups that took place between 1977 to 1980 and 1981 to 1984. Since the period 1981 to 1984, there have been some age-specific differences in the pattern: the decline has been sustained at ages 25 and over, but has rather slowed down at ages 20 to 24 years and has stopped altogether at ages 15 to 19 years.

The pattern of decline may also be examined in a parity-specific way. Hinde and Mturi (2000) examined parity progression ratios derived from the Tanzania Demographic and Health Surveys. Those ratios are less prone to error in the reporting of dates of birth than are age-specific fertility rates (Brass and others, 1997). More specifically, Hinde and Mturi (2000) used life-table methods to calculate the proportion of women having had a birth of order j who go on to have a birth of order $j + 1$ within 5 years, or 60 months (defined in Brass, 1996, as B_{60}). The authors adjusted for truncation effects using the approach of Brass and Juarez (1983). By calculating sets of B_{60} for different birth cohorts, an indication of temporal trends in fertility during the 25 to 30 years before the survey can be obtained (table). Hinde and Mturi (2000) did not consider progression to the first birth, as the complexity of the African marriage process meant that establishing a suitable reference point for the period of 60 months was problematic (Brass and others, 1997).

Brass, Juarez and Scott (1997) suggested that if the birth intervals were assumed at about 30 months, the set of B_{60} could be located in time by supposing that women aged 20 to 24 at the time of the survey were making the transition to their second birth at that time. From this, it follows that women aged 25 to 29 years at the time of the survey were currently making the transition to their fourth birth, and had made the transition to their second birth five years before the survey (on average). This reasoning permitted the construction of a

Figure II. Age-specific fertility rates, United Republic of Tanzania, 1973-1999
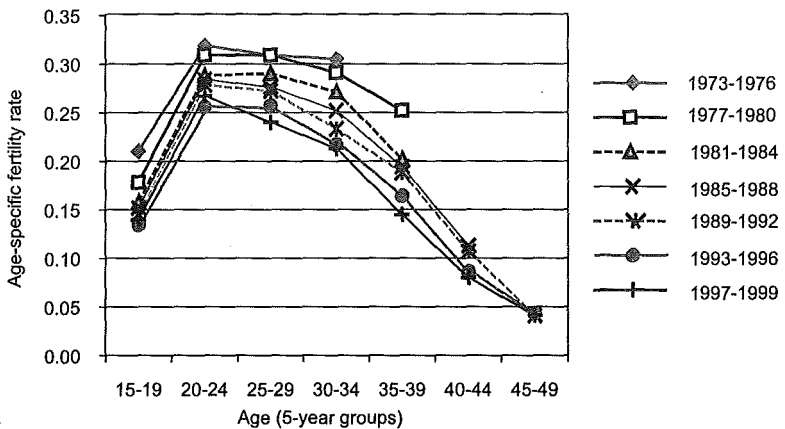
Sources: 1991/92 and 1996 Tanzania Demographic and Health Surveys; 1999 Tanzania Reproductive and Child Health Survey.

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TABLE. TRENDS IN ADJUSTED B_{60} BY TIME PERIOD, UNITED REPUBLIC OF TANZANIA, 1971-1996

Progression	1996		1991		1986		1981		1976		1971
1-2	0.79	0.82	0.84	0.84	0.84	0.85	0.87	0.88	0.89	0.89	0.89
2-3	0.77	0.80	0.82	0.84	0.85	0.86	0.87	0.87	0.88	0.88	0.88
3-4	0.77	0.78	0.79	0.81	0.82	0.84	0.86	0.87	0.88	0.87	0.84
4-5	0.79	0.80	0.80	0.79	0.81	0.83	0.85	0.87	0.85	0.84	
5-6	0.74	0.76	0.77	0.78	0.79	0.81	0.82	0.82	0.83		
6-7	0.70	0.67	0.70	0.73	0.77	0.82	0.82	0.81			
7-8	0.67	0.69	0.71	0.71	0.72	0.73	0.75				
8-9	0.64	0.64	0.68	0.71	0.69	0.68					

Source: Hinde and Mturi (2000), p. 185.

NOTE: The time locations are only approximate and depend on the assumption that the average birth interval is 30 months. For the United Republic of Tanzania this is a slight underestimate.

table, in which the average PPRs from the 1991/92 and 1996 Tanzania Demographic and Health Surveys were used for periods when both were available. The pattern revealed is of a slow decline in fertility at all parities from two to nine. The start of the decline may be dated roughly from the late 1970s. Although the magnitude of the decline is relatively small, the consistency of the trends across parities suggests it is real. The timing of the decline suggested by the B_{60}s is consistent with that suggested by the total fertility rates in figure I and the age-specific fertility rates in figure II.

D. DETERMINANTS OF FERTILITY

1. Use of contraception

Use of contraception has been described as the most important proximate determinant of fertility (Sherris and others, 1985). Some studies have indicated that differences in levels of use of contraception explain 92 per cent of the variation in fertility across societies (Robey and others, 1992). This implies that where use of contraception is widespread, fertility is low. It is therefore unsurprising that a major cause of the declining fertility in the United Republic of Tanzania during the 1990s is thought to have been the slow but steady increase in the use of contraceptives. This was demonstrated by Larsen (1997), who showed, using data from the 1991/92 Tanzania Demographic and Health Survey, that women who had ever used contraception had longer waiting times to conception (median 22 months) than other women (median 15 months). Only 23 per cent of all women aged 15-49, however, had ever used a method of family planning, and only 9.5 per cent of them were using a contraceptive method at the time of the 1991/92 survey (Ngallaba and others, 1993). Current use of any method among all women aged 15 to 49 more than doubled to 22 per cent by the time of the Tanzania Reproductive and Child Health Survey in 1999 (National Bureau of Statistics and Macro International, 2000). The use of modern methods increased from 6 to 16 per cent for all women aged 15 to 49 during the same period. The pill injectables and the (male) condom are the main modern methods used by Tanzanian couples.

Historically, contraception was first formally provided in Dar es Salaam in 1959 by the Family Planning Association of Tanzania (UMATI). However, it was initially available only in a few urban centres. The Government became actively involved in providing contraception following the launch of the integrated maternal and child health programme in 1974. But the Association continued to coordinate all family planning activities until 1989, when the Government established the National Family Planning Programme in the Ministry of Health. Along with the coordination of family planning activities, NFPP is also responsible for management and distribution of contraceptives to all service delivery points. The Programme has benefited from a special project, funded by the United States Agency for International Development and the United Nations Population Fund, concerned with the management and distribution of contraceptive supplies. It is believed that most of the family planning services are offered through the project. There are other government departments, non-governmental organizations and international non-governmental organizations assisting the Programme in providing the services (Mturi, 1996). Since the mid-1990s, Population Services International has operated a social marketing programme in the United Republic of Tanzania (National Bureau of Statistics and Macro International, Inc., 2000). Those services include social marketing of "Salama" male condoms and "Care" female condoms, as well as mosquito bednets and insecticide. In addition, the Ministry of Health has established the National AIDS Control Programme aimed at controlling the spread of HIV/AIDS. The joint effort of these initiatives has contributed positively to raising awareness of and promoting the use of contraception.

Evidence from the 1996 Tanzania Demographic and Health Survey indicates that contraception is being used both to space births and to "stop" having children. Birth intervals at all parities up to seven are longer for Tanzanian women who use contraception than for those who are non-contraceptors. In addition, evidence exists of stopping behaviour at parities above three.

2. *Nuptiality patterns*

Postponement of first marriage and marital dissolution through divorce or widowhood accompanied by low remarriage rates are associated with low levels of fertility. There is some evidence that the age at marriage in sub-Saharan Africa is increasing as the education of women becomes widespread. This is likely to reduce fertility, and in some countries (for example, the Sudan) postponement of first marriage has been outlined as the main determinant of observed fertility decline (Cleland, Onuoha and Timaeus, 1994). However, evaluating the impact of changes in nuptiality on fertility in sub-Saharan Africa is complicated. First, in some parts of Africa marriage tends to be a process rather than a single event; and, secondly, the fertility of never-married women is by no means negligible.

Hinde and Mturi (2000) have shown an increase of more than two years in the median age at marriage between women born in the 1940s compared with women born in the 1970s (figure III). Therefore, it is possible that changes in nuptiality are implicated to some degree in the decline of fertility in the United Republic of Tanzania during the 1990s. Harwood-Lejeune (forthcoming) has

Figure III. Median age at first marriage and first birth, United Republic of Tanzania
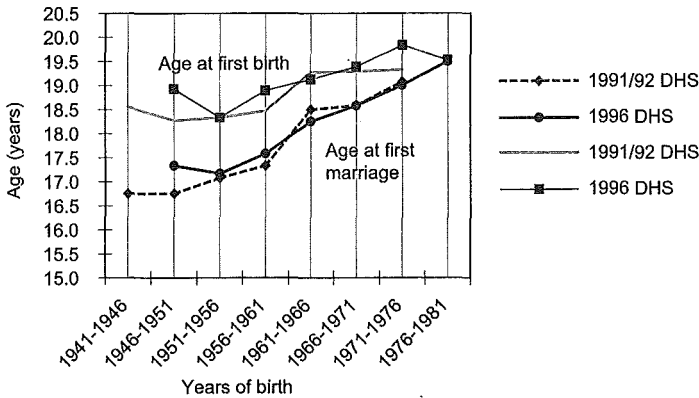
estimated that, once changes in both pre-marital and marital age-specific fertility rates are taken into account, about one sixth of the decline in Tanzanian fertility between 1984 and 1996 is due to changes in nuptiality. One reason why the rise in the average age at marriage has not had more of an effect may be that the age at first birth has not been increasing as fast as the age at first marriage (figure III).

3. *Other proximate determinants*

Apart from nuptiality and contraception, variations in fertility are due mainly to induced abortion; the length of the period of post-partum non-susceptibility, principally a result of breastfeeding; and variations in the extent of infertility and subfertility.

Breastfeeding in the United Republic of Tanzania is almost universal, and the median duration according to both the 1991/92 and the 1996 Tanzania Demographic and Health Surveys is just over 21 months (Ngallaba and others, 1993; Bureau of Statistics and Macro International, Inc., 1997). Hinde and Mturi (1996) showed that breastfeeding durations, to the extent that there was a trend, leaned towards slightly shorter durations among more recent cohorts, but that the magnitude of the trend was small. An increase in the duration of post-partum non-susceptibility is, therefore, not likely to be responsible for the fertility decline.

Unfortunately, nationally representative data on abortion are not available in the United Republic of Tanzania and so an evaluation of the importance of abortion to the fertility decline cannot be made. This problem may be quite serious. Induced abortion is not permitted unless it is intended to save the mother's life. However, a study involving 300 women with early pregnancy loss who were admitted to Muhimbili Medical Centre in Dar es Salaam showed that nearly a third of them (most of whom were young and unmarried) had had

an illegally induced abortion (Justesen and others, 1992). In a similar study that covered four public hospitals in Dar es Salaam, Mpangile, Leshabari and Kihwele (1993) observed that 455 out of 965 women screened (47 per cent) were found to have had an induced abortion. It is important, therefore, to keep in mind that abortion might have a significant fertility-inhibiting effect in the country and have played a part in the recent fertility decline.

Larsen (1997) has argued that subfertility is prevalent in the United Republic of Tanzania and that the prevalence of infertility is relatively high as compared with neighbouring countries. It seems that most of this subfertility and infertility take the form of secondary sterility, as only 2 per cent of women aged 40 to 49 in 1996 had borne no children (Bureau of Statistics and Macro International, 1997). There is some evidence that infertility varies regionally within the country: the southern regions of Lindi and (especially) Mtwara, for example, have the lowest fertility rates in the country outside Dar es Salaam, despite not having the highest rates of contraceptive use. They do, however, have high rates of self-reporting of sexually transmitted diseases among men.

4. Socio-economic determinants

Large family size desires are sometimes identified as being with high fertility in sub-Saharan Africa. Some writers have suggested that Africans invoke "the will of God" when they report their desired number of children (Caldwell and Caldwell, 1987). This implies that a woman will have as many children as she is biologically capable of bearing. With regard to the United Republic of Tanzania, the 1991/92 TDHS showed that only 14 per cent of women gave a non-numeric response such as "up to God" or "as many as possible". The figure was 7 per cent in the 1994 TKAPS, 8 per cent in the 1996 TDHS and just 3 per cent in the 1999 TRCHS. It seems, therefore, that the proportion of women giving a non-numerical response is low and that it is declining. However, on average, Tanzanian women would ideally like to have five children (National Bureau of Statistics and Macro International, Inc., 2000). This indicates that the large family norm is prevalent in the country and is likely to influence actual fertility levels.

Caldwell (1977) argued that high fertility is economically rational in traditional African economies where land is held by lineage and increasing numbers provide the best form of investment available to control the land and its products. The tendency of most young people to take non-agricultural jobs, not only because of modernization, but also because of a reduction in the size of landholding with time owing to scarcity of land, would appear to contradict this argument. For instance, the increasing scarcity of land in the northern part of the United Republic of Tanzania meant that landholdings were broken down so that most sons could inherit land; in consequence, land litigation among kinsmen increased, and the value of land in the highlands rose by 700 per cent (Maro, 1974). However, Caldwell (1977) makes the point that even when children take jobs in non-agricultural sectors, family ties lead them to remit money to their families. Indeed, having many children increases the chance that one will do well in the non-agricultural sectors and help support the family.

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The cultural set-up of the family structure that gives husbands the power of reproductive decision-making while placing most of the economic burden for raising children on mothers (Caldwell and Caldwell, 1987), together with responsibility for agricultural production (Boserup, 1985), has been outlined as the major factor influencing high fertility in sub-Saharan Africa. The argument is that, since husbands receive the advantages of status and prestige from paternity as heads of household while not having to bear any economic burdens, they are encouraged to opt for large families. It can be concluded therefore that the family structure, its consequences for power and decision-making and the fact that children provide old-age security for their parents are the major sociocultural factors causing high fertility in sub-Saharan Africa. However, the magnitude of these factors and how they change with time in a specific setting are not easily quantified.

Another recent factor affecting fertility is economic hardship. A number of authors have invoked economic hardship as contributing to fertility decline in other sub-Saharan African countries (see, for example, Rutenberg and Diamond, 1993). It is possible that economic hardship was important in initiating fertility decline in the United Republic of Tanzania. Tanzanians experienced increasingly severe economic difficulties during the late 1970s and early 1980s. Already feeling the pinch of the increase in oil prices in the mid-1970s, the economy was subjected to further strain in 1978 by the conflict beween the United Republic of Tanzania and Uganda, which cost about $500 million and disrupted trade. Foreign aid (especially from the World Bank and the International Monetary Fund) was frozen. Since around 80 per cent of the Government budget depended on foreign aid, the importation of many goods became impossible, and the shops were empty. It is widely believed in the country that economic hardship resulted in couples attempting to postpone or prevent further childbearing, especially at parities above three or four. It is possible that economic difficulties have also contributed to the rising age at marriage.

The spread of education and literacy among women is believed to be fundamental to changes in reproductive behaviour. While analysing the relationship between fertility and level of education in sub-Saharan Africa, Cohen (1993) has shown that fertility is either curvilinearly or negatively related to education but does not appear very responsive to a small amount of education. A more recent comparative study has shown that higher education of women is consistently associated with lower fertility (Martin, 1995). The mechanisms through which education affects fertility include postponement of age at first marriage, reduction of family size preference, and a rise in contraceptive use. Martin (1995) also argues that education enhances women's ability to make reproductive choices. In the United Republic of Tanzania, 40 per cent of the women and 31 per cent of the men have never been to school; only 4 per cent of the women and 5 per cent of the men have attended at least some secondary school or higher. Not surprisingly, there are differentials in Tanzanian fertility by women's level of education. The 1999 TRCHS, for example, shows that women with no education had a TFR of 6.5, whereas those who completed primary education had a TFR of 4.9. Any effort geared towards educating women, especially completion of primary schooling, can have a significant effect in reducing fertility.

5. *The impact of the HIV/AIDS epidemic*

The United Republic of Tanzania is one of the countries most seriously affected by the HIV/AIDS epidemic. The adult prevalence rate was estimated to be 8.1 per cent at the end of 1999 (UNAIDS, 2000). Some analysts argue that an HIV epidemic is likely to exert downward pressure on fertility (Gregson, 1994). The HIV/AIDS epidemic may affect fertility in several ways. First, men and women with HIV/AIDS may have reduced fecundity for a variety of reasons (including reduced coital frequency). Second, age-selective AIDS mortality may reduce the population at risk of giving birth, since most deaths from AIDS occur in the childbearing ages. Third, the HIV/AIDS epidemic is giving rise to greater use of contraceptives (especially condoms), which may lead to reduced fertility. Finally, changes in social attitudes (including reduction of desired family size and changed attitudes towards gender roles) and in behaviour to avoid HIV/AIDS may have indirect fertility-reducing effects.

Baschieri (2000) has tried to assess the effect of HIV/AIDS on fertility in the United Republic of Tanzania. Since both fertility and HIV prevalence vary regionally within the country, the author first estimated district-specific HIV prevalence rates. Those were then used, together with the district-specific general fertility rates (GFRs, or annual numbers of births per 1,000 women of reproductive age), to estimate what the gross fertility rate of HIV-negative women in each district would have been in the absence of HIV/AIDS. A weighted average of these rates, where the weights are the proportions of women of reproductive age living in each district, provides the national level of fertility in a non-HIV/AIDS scenario. The overall impact of HIV/AIDS is obtained by comparing the gross fertility rate of non-HIV/AIDS scenario with the current gross fertility rate of all women. Baschieri evaluated the impact of HIV/AIDS in the United Republic of Tanzania at the national level and, using a similar procedure, in four zones (classified on the basis of HIV prevalence) using the 1996 TDHS data. She concluded that the impact of HIV/AIDS on fertility in the higher prevalence zones was between 3 and 5 per cent (fertility was 3 to 5 per cent lower than it would have been in the absence of HIV). In the lower prevalence zones, its impact was less than 2 per cent. Therefore, although further investigation is necessary into the effect of HIV/AIDS on fertility, Baschieri's study suggests that only a small proportion of the observed decline in fertility in the United Republic of Tanzania is likely to be due to HIV/AIDS.

E. FUTURE PROSPECTS FOR FERTILITY DECLINE

It is not easy to speculate about the future trends in Tanzanian fertility. However, based on the observations above, the decline of fertility can be attributed to a number of factors. It can be argued that the spread of family planning services will perhaps dictate the trend in fertility. Contraceptive prevalence is still very low in the United Republic of Tanzania and there is a lot of room to improve the situation. Unmet need for family planning is quite high, indicating that there is already a demand that needs to be realized.

The 1996 TDHS data showed that 18 per cent of all women were in need of family planning services but were not using any. The proportion declined only slightly to 17 per cent according to the 1999 TRCHS. In other words, if all women who said they wanted to space or limit their children were to use methods, the overall contraceptive prevalence could be increased from 22 to 40 per cent (National Bureau of Statistics and Macro International, 2000). This has many implications for the level and trend of fertility. It can be concluded that the National Family Planning Programme has a key role to play in the campaign to reduce fertility levels in the United Republic of Tanzania.

The spread of the education of women is another factor that can play a significant role in reducing fertility. As indicated earlier, educated women tend to postpone their first marriage, prefer smaller family sizes, be aware of and use contraception and have greater negotiation skills on reproductive matters. A further decline of fertility in the United Republic of Tanzania will therefore depend on the Government's success in the campaign for gender equity and equality. This can go hand in hand with programmes geared at empowering women. A closer look at the existing gender policy, and how to implement it, is a necessary condition in a campaign to lower fertility in the country.

Couples should be encouraged to have smaller family sizes. The ideal family size of about five children is quite high. However, the 1996 TDHS has shown that there is a (slow) move towards smaller ideal family sizes in the United Republic of Tanzania and provides evidence that "wanted" fertility is now close to, or lower than, current levels of achieved fertility. A number of factors can be linked to this trend in smaller family size, including economic hardship; people looking at children in terms of quality and not quantity; and the HIV/AIDS epidemic. The change of government policies has also played a role in making couples cautious about the number of children they have. During the 1970s and early 1980s, primary and secondary school education and health-care facilities were free in the United Republic of Tanzania. Nowadays people have to pay for these services; consequently, the larger the family size, the more financial resources needed.

In conclusion, a further decline in Tanzanian fertility will depend on the performance of the National Family Planning Programme in terms of raising the contraceptive prevalence rate. The first step is therefore to make sure that the existing demand for family planning services is met. Advocating gender equity and equality, empowering women and making fathers take responsibility for raising children will go a long way in reducing fertility in the United Republic of Tanzania.

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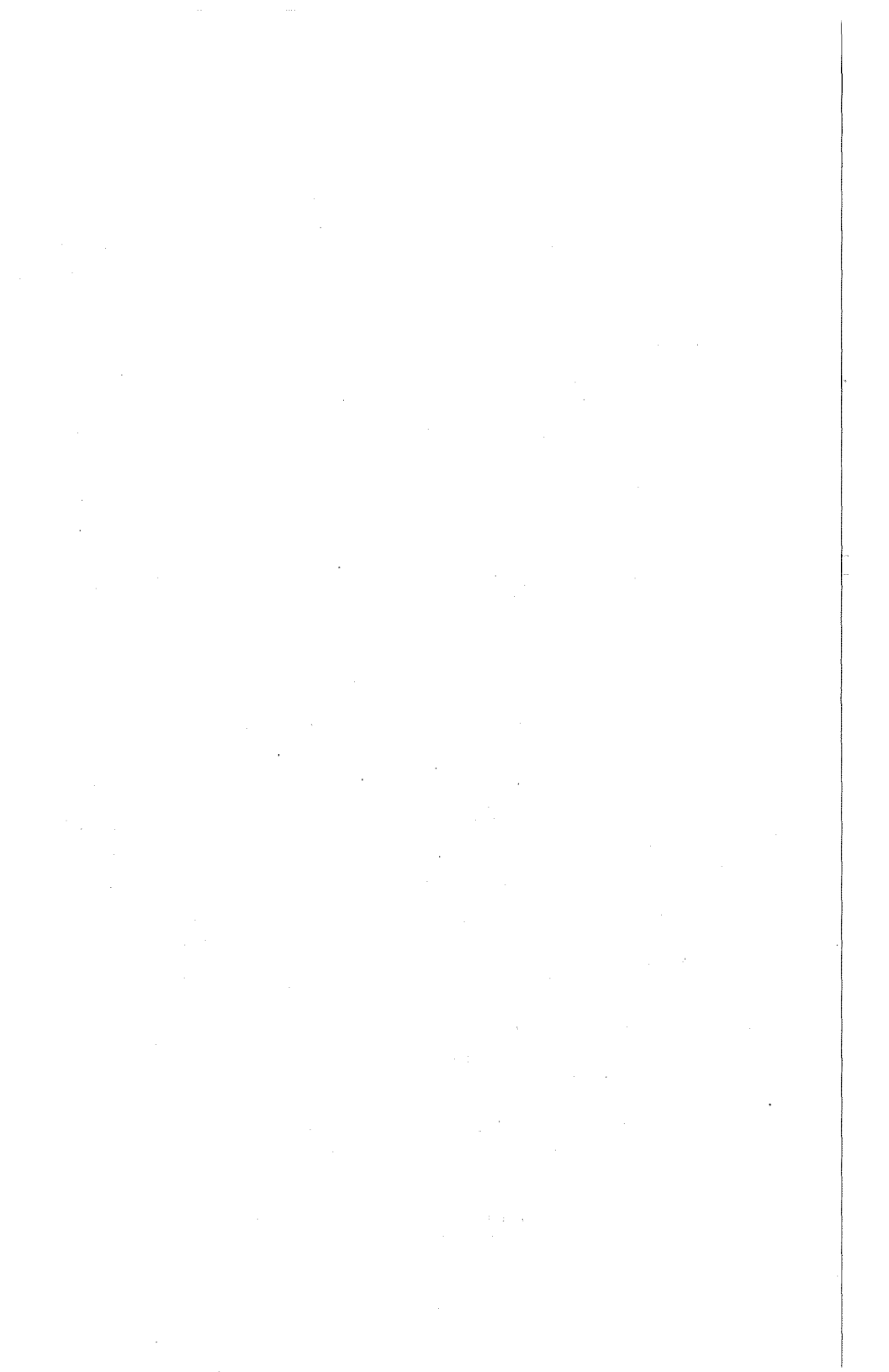
PROSPECTS FOR FERTILITY DECLINE IN THE FACE OF HIV/AIDS IN UGANDA

James P. M. Ntozi* and Fred E. Ahimbisibwe*

A. INTRODUCTION

In the last half-century, most of the developing world has experienced fertility decline. Although Africa is the last region to witness fertility decline, the downward trend has already started in several countries. For instance, in Botswana, the total fertility rate (TFR) dropped from 6.4 children per woman in 1981 to 5.7 in 1988 and to 5.1 in 1996 (Gaisie, 1998; Udjo, 1996). The TFR decreased dramatically in Kenya, from 8.1 in 1975-1978 to 4.7 in 1995-1998 (National Council for Population and Development and others, 1999), and in Zimbabwe from 5.5 in 1984-1988 to 4.0 in 1996-1999 (Zimbabwe Central Statistics Office, 2000). Similar fertility decline has occurred in Ghana, Senegal and South Africa. Factors responsible for the decline have included increased use of modern contraceptives and a combination of economic, social, political, cultural and infrastructural reasons (Ramasundaram, 1995; Zimbabwe Central Statistics Office, 2000; Gaisie, 1998). HIV/AIDS has also been mentioned as one of the factors contributing to fertility change in sub-Saharan Africa (United States Bureau of the Census, 1995; Haub, 1997).

Complex factors influence the decisions of HIV-positive women about their fertility, including demographic and situational variables, psychological problems, counselling techniques, access to care, attitudes of health-care providers and infection with other sexually transmitted diseases (Williams, Watkins and Risby, 1996; Johannisson, 1996). Kumar and others (1995; and 1997) claimed that a combination of these factors results in poor pregnancy outcomes. For instance, AIDS has an adverse effect on the health of a foetus, and pregnancy may accelerate disease progression through immunological deterioration.

Sexually transmitted diseases, which are closely associated with AIDS, have serious short- and long-term health consequences. Johannisson (1996) observed that gonorrhoea can lead to pelvic inflammation resulting in future ectopic pregnancy or infertility, while syphilis can increase the risk of spontaneous abortion and stillbirth, all of which reduce fertility. Studies in sub-Saharan Africa show that HIV seropositive women frequently experience spontaneous abortions, stillbirths, premature births and miscarriages (De Cock and others, 1994; Tammerman and others, 1994). Using data from an Australian study, Thackway and others (1997) observed that HIV-infected women had

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a higher risk of pregnancy termination and consequently lower fertility than the general female population.

Women often have psychological problems owing to AIDS (Dhoundiyal and Shah, 1996). Psychological problems arising out of fear of HIV/AIDS have created a risk of marital instability, separation or divorce when women refuse sexual advances of regular partners, including husbands. A study in Nigeria found that Yoruba women broke off marriages, refused sex or insisted on condom use with seropositive husbands (Orubuloye, Caldwell and Caldwell, 1992).

For economic reasons, some women living with HIV/AIDS have decided to have fewer children. Barnett and Blaikie (1992) claimed that in Africa HIV-positive women were worried about leaving behind many children as orphans who would suffer economically. Even in the United States, Levine (1995) found that AIDS orphans had a lot of unmet needs, especially economic ones. A review of the care of AIDS orphans in Africa found that the orphans were not receiving enough care and attention from providers. Although the extended family may provide a lot of assistance, rampant poverty in the African region does not allow relatives to satisfy the economic needs of orphans. In addition, couples looking after AIDS orphans of deceased relatives may limit their own family sizes to be able to manage the extended household economically.

Behavioural changes due to the HIV/AIDS epidemic may exert a downward pressure on fertility. Gregson and others (1998) claimed that positive changes in sexual behaviour owing to the epidemic in Zimbabwe were expected to reduce fertility further through delayed onset of sexual relations, increased condom use and widespread monogamy. Zaba and Gregson (1998) analysed data from controlled studies in Africa and concluded that the fertility of HIV-positive women was lower than that of HIV-negative women in all but the youngest age group, with the differential increasing with the age of the women and duration of the epidemic. In addition, Gregson (1994) developed a demographic model of fertility based on proximate determinants, which postulated that severe HIV/AIDS epidemics would cause the total fertility rate to fall by 27.9 per cent in Uganda, 29.6 per cent in Nigeria and 30 per cent in Zimbabwe, with a corresponding absolute decline of 2.01, 1.72 and 1.58 children respectively. The author went further to claim that despite increased mortality, the long-awaited fertility transition in Africa would be brought about by the HIV/AIDS epidemic.

Nevertheless, it is possible for fertility to increase in the face of the HIV/AIDS epidemic. For example, Setel (1995) argues that the high rates of stillbirths, spontaneous abortion, and infant and neonatal mortality may reduce culturally prescribed periods of abstinence among HIV-infected women in sub-Saharan Africa who are trying to have children, thereby increasing fertility. In addition, by drastically increasing infant and childhood mortality, HIV/AIDS may increase fertility in endemic areas if couples decide to replace their dead children or deceased close relatives. Moreover, some HIV-infected women with unmet reproductive goals may be tempted to accomplish them with the hope that some children may be born free of HIV (De Cock and others, 1994; Datta and others, 1994).

B. THE HIV/AIDS EPIDEMIC IN UGANDA

Uganda has experienced HIV/AIDS for about two decades now. In Africa, AIDS was first identified in Uganda in 1982 (Serwadda and others, 1985), and since then the disease has spread all over the country. A recent report on HIV/AIDS surveillance by the Ministry of Health (2000) estimated that 1.4 million people were infected with HIV by the end of 1999. Of those, 1.3 million (90 per cent) were adults and 144,000 (10 per cent) were children aged 12 years and younger. Of the total estimated adults living with HIV/AIDS, 761,000 (59 per cent) were women and 533,000 (41 per cent) were men. The average prevalence rate for adults was estimated to be 8.3 per cent. As table 1 shows, HIV/AIDS prevalence levels peaked at around 30 per cent at the antenatal sentinel sites in 1992 and then declined, but are still above 10 per cent at most sites. At the country's main referral hospital, Mulago, patients with HIV/AIDS represented over 44 per cent of all patients with sexually transmitted diseases in the late 1980s and early 1990s.

AIDS is the fourth leading cause of death among children under 5 years of age in Uganda. It is suspected that the epidemic has reversed gains made in infant and under-five mortality. The infant and child mortality rates increased from 118 and 198 deaths per 1,000 to 122 and 203 deaths per 1,000 between the 1969 and 1991 censuses respectively. Despite some subsequent improvement, more recent findings from the Uganda Demographic and Health Survey of 1995 and that of 2000/01 showed another deterioration of mortality rates among infants and children under five, from 81 and 147 to 88 and 152 per 1,000 respectively (Uganda Bureau of Statistics, 2001). In addition, with an estimated 1.7 million orphans, mostly caused by AIDS, Uganda has one of the highest proportions of AIDS orphans in the world.

The epidemic has affected women more than men because they are biologically, socially and economically disadvantaged compared to men. Women are more at risk of receiving contaminated blood and blood products during pregnancy and childbirth owing to limited blood testing facilities in the country. Women are more exposed to risky situations as a result of their dependency on men for socio-economic survival and limited formal education and information on HIV/AIDS. Traditionally, women bear the burden of caring for the sick and the affected and often forgo productive activities to fulfil such duties.

Since the primary route of HIV transmission in Africa is through heterosexual intercourse, it is not surprising that the highest rates of infection in Uganda are among the most sexually active persons, especially young women. Studies have found that prevalence rates are highest in ages 20 to 34 years (over 35 per cent in the early 1990s). Moreover, adolescent girls aged 15 to 19 are 6 times more likely to be HIV-infected than boys of the same age group (Uganda AIDS Commission, 2000). According to a Kyamulibwa cohort study in 1993, the HIV incidence rate reached 12 per 1,000 person-years among females.

C. HIGH FERTILITY IN UGANDA

Uganda is one of 14 countries in sub-Saharan Africa that have sustained high fertility in the recent past (United Nations, 2001). As table 2 shows,

TABLE 1. PERCENTAGE OF PREGNANT WOMEN FOUND HIV-INFECTED IN ANTENATAL SENTINEL SITES, UGANDA, 1989-1999

Site/Hospital	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Nsambya	24.5	25.0	27.8	29.5	26.6	21.8	16.8	15.4	14.6	13.4	12.3
Rubaga	..	..	27.4	29.4	24.4	16.5	20.2	15.1	14.8	14.2	10.5
Mbarara	21.8	23.8	24.3	30.2	18.1	17.3	16.6	15.0	14.5	10.9	11.3
Jinja	24.9	15.8	22.0	19.8	16.7	16.3	13.2	14.8	11.0	10.5	10.8
Tororo	..	4.1	12.8	13.2	11.3	10.2	12.5	8.2	9.5	10.5	4.5
Mbale	12.8	11.0	12.1	14.8	8.7	10.2	7.8	8.4	6.9	6.3	5.7

Source: Ministry of Health (2000).

TABLE 2. AGE-SPECIFIC FERTILITY RATES (PER 1,000 WOMEN) AND TOTAL FERTILITY RATE (CHILDREN PER WOMAN), UGANDA, VARIOUS SOURCES, 1968-2000

Age group	Time period				
	1968-1969	1984-1988	1990	1992-1995	1996-2000
15-19	198	187	152	204	178
20-24	341	327	329	319	338
25-29	322	319	324	309	298
30-34	253	273	275	244	259
35-39	189	224	207	177	187
40-44	87	96	95	89	76
45-49	35	36	32	29	40
TFR	**7.1**	**7.3**	**7.1**	**6.9**	**6.9**

Sources: 1969 and 1991 censuses of Uganda; 1988/89, 1995 and 2000/01 Uganda Demographic and Health Surveys.

according to census and survey data, the total fertility rate in Uganda was reported at 7.1 children per woman in 1968/69 and again in 1990, and then experienced a slight shift before stabilizing at 6.9 in 1992-1995 and 1996-2000. Many reasons have been advanced for the constant high fertility in the country. Unlike many African societies where women practice extended periods of abstinence after child delivery, most of the ethnic groups in Uganda do not observe this practice for long. The 1995 Uganda Demographic and Health Survey found that the median length of post-partum abstinence was only 2.2 months, which is too short to reduce fertility (Uganda Department of Statistics and Macro International, Inc., 1996). This period does not vary much by women's age, education, rural-urban residence or subnational region. In fact, Ntozi (1995) found that couples in some ethnic groups in the western part of the country resume sex within a week after childbirth in observance of a cultural ritual.

Owing to strong pro-marriage traditions, the institution of marriage is held in high regard and encouraged among all Ugandans. For instance, among certain rural and uneducated populations in Uganda, a woman who dies unmarried embarrasses the family, thus putting pressure on women in rural areas to marry as soon as suitors are available. Parents try to marry off their daughters as early as possible to avoid such calamities and also to get bride wealth, which could then be used by sons in marriage. Until recently, many girls were forced to drop out of school early to get married. These practices have tended to suppress the age at first marriage for a long time. Both the 1991 census and the 1995 Survey show that the median age at first union was below 17.6 years. Since marriage is traditionally closely associated with procreation in Ugandan societies, early marriage means early age at first birth (65.9 per cent of women were mothers by age 20) and many subsequent births.

Further, the marriage traditions have sustained high proportions of married women in Uganda. The 1969 and 1991 censuses showed that the percentage of women who had ever married or were living in union by age 45 years were 94 per cent and 97 per cent respectively, an overwhelming majority; and according to the 1995 Survey, this proportion increased to 98.6 per cent. Furthermore, the proportion of women who were widows and divorcees in the prime reproductive ages of 20 to 34 was low, implying minimal effect on fertility. In any case, remarriages of widows and divorcees were encouraged through levirate practice until recently, when the risks of HIV infection due to widow inheritance became too high to ignore.

The Ugandan societies attach high values on children. Like other groups in many developing countries, various ethnic groups in Uganda look at children as sources of labour, prestige, power, security, insurance and continuing lineage. Uganda is predominantly agricultural, and children contribute a lot to the subsistence living of their families in the form of labour for producing food and cash crops and looking after domestic animals. Producing many children, including sons, is a great source of happiness and physical security and an indicator of high status and power in the society. Future economic insurance in old age is measured by the family's number of children. Ntozi (1995) observed that assistance in meeting emergencies such as funerals, sick-

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ness, payment of school fees and in organizing wedding parties was obtained from a range of relatives and largely depended on the size of the nuclear and extended family.

Most families in Uganda still highly value producing several sons to continue the lineage. Hence, the search for sons makes many couples, including highly educated ones, end up with larger families than initially desired. Even highly educated men take second wives or mistresses in order to produce several sons (Ntozi, 1993). The 1995 Survey found a strong desire to have children and a preference for large families in Uganda. Married men were found to be more pronatalist than married women, with a much larger percentage wanting to continue procreation after producing 6 living children (48 per cent of the men and 18 per cent of the women) (Uganda Department of Statistics and Macro International, Inc., 1996).

Another reason for sustained high fertility is the limited use of modern contraceptives. Modern contraception can drastically reduce fertility levels in even a short time (Bongaarts, 1978; Bongaarts and Potter, 1983). In the case of Uganda, current use of modern contraceptives is still too low to make an impact on fertility. In the 1988/1989 Survey, contraceptive prevalence among currently married women was estimated at 4.9 per cent. The rate rose to only 8.9 per cent in 1995 and 18 per cent in 2000/2001. This occurred despite high and still increasing levels of awareness, from 77.9 per cent of women with knowledge of modern methods in 1988/1989, to 91.6 per cent in 1995 and 98.7 per cent in 2000/2001. It is important to note that a large proportion of currently married women (37 per cent in the 1995 Survey) explained the wide difference between their knowledge and use of methods in terms of reproductive desires. The desire for a large number of children is very strong, and over a quarter of women with 6 living children did not want to limit their childbearing. Other reasons for non-use of contraceptives were self-reported subfecundity or infecundity (by 12.4 per cent of women in 1995), knowing no method (8.3 per cent), having reached menopause (7.2 per cent), partner opposition to family planning (6.6 per cent), respondent opposition (5.6 per cent), knowing no source of methods (5.6 per cent), fear of side effects (4.5 per cent) and religious beliefs (3.1 per cent). At the same time, unmet need for contraception remained high, at 29 per cent according to the 1995 Survey findings.

Frequent sexual activity exposes women to a high risk of pregnancy. In the absence of effective contraception, the risk of pregnancy is greatly influenced by the frequency of sexual intercourse among Ugandan women. Findings from the 1995 Survey reveal that a high proportion of women of reproductive age (60 per cent) were sexually active in the four-week period before the survey. The likelihood of women being sexually active was highest in age groups 25 to 29 (70.2 per cent), 30 to 34 (69.2 per cent), 35 to 39 (66.9 per cent) and 20 to 24 (65.5 per cent), as well as among the uneducated (64.5 per cent) and rural residents (61.3 per cent). However, sexual activity was high even among adolescents (40.9 per cent), urban women (52.9 per cent) and the most educated (48.3 per cent). In a 1985 survey of women in south-western Uganda, women's mean frequency of sexual intercourse was estimated at 3.5 times per week (Ntozi, 1995).

In the absence of sexual abstinence, short durations of breastfeeding contribute to high fertility. Owing to various cultural practices, including early supplemental feeding, periods of exclusive breastfeeding do not exceed 3 months on average. The short periods of breastfeeding among Ugandan women were found to lead to a fairly short interval of post-partum amenorrhoea (interval before resumption of menstrual periods) with a median duration of 12.6 months (Uganda Department of Statistics and Macro International, Inc., 1996). This period varies somewhat by age (from 11 to 16 months between women under 30 years and older women), residence (7 to 13 months between urban and rural women) and education (6 to 15 months between the uneducated and highly educated). Combining post-partum amenorrhoea with abstinence leads to an overall median length of post-partum insusceptibility of 13.4 months, as reported in the 1995 Uganda Demographic and Health Survey, a period which is considered rather short.

High infant and child mortality levels may have contributed to sustained high fertility in Uganda. The prevalence of killer diseases of children, notably malaria and diarrhoea, remains high in the country (Uganda Department of Statistics and Macro International, Inc., 1996). For instance, among infants aged 6 to 11 months at the time of the 2000/01 Survey, 38 per cent had suffered from diarrhoea in the two weeks before the survey (Uganda Bureau of Statistics, 2001). As mentioned above, census data indicated that infant and under-five mortality rose between 1969 and 1991. Although the 1995 Survey showed dramatic improvement in survival, the 2000/01 Survey reported some lost ground, with infant and under-five mortality reaching 88 and 152 deaths per 1,000, respectively. It is likely that couples are reacting to the worsening mortality situation by having additional children so that some of them will survive. The levels of mortality are not yet low enough for couples to feel confident in having only their desired number of children.

The lack of a large urban and fairly educated population in the country has hindered fertility decline. Urban and better-educated women generally have lower fertility than those who live in rural areas and are less educated. For two decades—the 1970s and 1980s, when other African countries were educating their populations and building their industrial and urban sectors (e.g., Botswana, Kenya and Zimbabwe)—Uganda was trapped in civil wars that stagnated the economy and inhibited any progress towards achieving a highly educated population. By 1991, only 11.3 per cent of the country was urban, with the rest in rural areas with a mostly agricultural subsistence economy. Forty-six per cent of the female population aged 6 and over had never been to school; only 7 per cent had attained at least some secondary education (Uganda Department of Statistics, 1995). The low proportion of women educated to the secondary school level has meant little progress towards fertility decline.

D.   HIV/AIDS AND FERTILITY DECLINE

Although so far fertility in Uganda has been sustained at high levels, available evidence shows that fertility has declined in the areas and households

most severely affected by HIV/AIDS. A cross-sectional prospective study in Rakai, the district where the first case of HIV was diagnosed in 1982 and which has been severely affected by the epidemic, showed substantial reduction in pregnancy prevalence of women infected with HIV (Gray and others, 1998). It was observed that the likelihood of pregnancy among HIV-positive women compared to seronegative women was less than half (odds ratio of 0.45 according to regression analysis). Similarly, the pregnancy rate among HIV-positive women was much lower than that of HIV-negative women (23.5 versus 30.1 per hundred woman-years), with a reverse pattern for the levels of pregnancy loss (18.5 per cent compared to 12.2 per cent respectively). In a separate study, Donovan (1998) concluded that HIV-infected women in Rakai were 55 per cent less likely to be pregnant, while HIV-symptomatic women were 77 per cent less likely to be pregnant; moreover, pregnancies among HIV-positive women were 50 per cent more likely to end in miscarriage or stillbirth.

A longitudinal study by Carpenter and others (1997) of 3,684 women of reproductive age in Masaka, another severely affected district of Uganda, showed results corroborating the findings in Rakai. Over a six-year period of follow-up, from 1989/90 to 1995/96, total fertility rates declined from 7.0 to 6.1 children per woman. The general fertility rate among HIV-positive women was considerably lower than the rate for seronegative women (192 versus 212 births per 1,000). In almost every age group (except 15-19 years), fertility levels were lower among the seropositive. Overall, HIV-infected women were found to have 20 per cent lower fertility than their uninfected counterparts. This decline in fertility is explained in part as a result of co-infection with other sexually transmitted diseases, such as syphilis and gonorrhoea, resulting in lower fecundability.

Between 1992 and 1997, three cross-sectional surveys covering a total of nine districts were conducted to study the impact of AIDS on a number of demographic variables including fertility. The first two surveys were done in six districts in east, west and central parts of Uganda in 1992 and 1995, while the third was carried out in three districts in northern Uganda in 1997. Similar questionnaires were used to gather data on fertility among women of reproductive age, and a verbal autopsy method was used to probe for information on persons in the household living with HIV/AIDS or having died of the disease. The sample sizes were 1,797 households in 1992, 2,352 in 1995 and 1,206 in 1997.

The findings are displayed in table 3. Households were categorized into two types: AIDS-affected households where member(s) died of AIDS and/or suffered from it at the time of the study; and non-AIDS households that had not experienced any AIDS-related death. The table shows that between the 1992 and 1995 surveys fertility declined in the six districts, from 7.3 to 6.0 children per woman. A comparison of the two types of households shows that AIDS-affected households maintained lower fertility (TFR of 6.8 in 1992 and 5.3 in 1995) than the non-AIDS households (8.0 in 1992 and 6.3 in 1995). This pattern is also true for three northern Uganda districts, which reported a total fertility rate of 5.6 in AIDS-affected households versus 7.2 in non-AIDS households.

Table 4 presents results derived from the 1991 census and the 1995 Survey for the same sampled districts. It can be seen in the table that over the four-year period, the TFR decreased from 7.4 to 6.2 in the six districts (that is, those

TABLE 3.   AGE-SPECIFIC FERTILITY RATES (PER 1,000 WOMEN) AND TOTAL FERTILITY RATE (CHILDREN PER WOMAN)
IN AIDS-AFFECTED HOUSEHOLDS AND NON-AIDS-AFFECTED HOUSEHOLDS, SELECTED DISTRICTS OF UGANDA, 1992-1997

Age group	1992 survey, 6 districts			1995 survey, 6 districts			1997 survey, 3 districts		
	AHH	NAHH	All	AHH	NAHH	All	AHH	NAHH	All
15-19	284	408	337	372	286	318	286	240	265
20-24	314	414	363	228	296	271	256	348	324
25-29	320	280	301	194	299	261	191	279	257
30-34	199	204	201	133	197	172	213	236	232
35-39	115	175	140	89	116	105	79	210	173
40-44	83	94	88	53	48	51	67	87	82
45-49	38	21	30	0	27	12	20	35	29
TFR	6.8	8.0	7.3	5.3	6.3	6.0	5.6	7.2	6.8

Sources: 1992, 1995 and 1997 household surveillance surveys.
NOTES: AHH=AIDS-affected households; NAHH=non-AIDS-affected households.

TABLE 4.   AGE-SPECIFIC FERTILITY RATES (PER 1,000 WOMEN) AND TOTAL FERTILITY RATE (CHILDREN PER WOMAN) DERIVED FROM THE 1991 CENSUS
AND 1995 UDHS, FOR THE SAME SETS OF DISTRICTS SURVEYED IN 1991 AND 1995

Age group	Same 6 districts surveyed in 1991 and 1995		Same 3 districts surveyed in 1991 and 1995	
	1991 census	1995 UDHS	1991 census	1995 UDHS
15-19	173	174	175	163
20-24	341	340	325	345
25-29	333	290	311	275
30-34	286	204	253	272
35-39	218	142	176	184
40-44	97	73	69	140
45-49	31	19	12	0
TFR	7.4	6.2	6.6	6.9

Sources: 1991 census of Uganda; 1995 Uganda Demographic and Health Survey.

covered in the 1992 and 1995 surveys). This finding confirms the fertility trend presented above linking the decline to the HIV/AIDS epidemic.

Nonetheless, fertility levels are seen to have increased in the three northern districts, from 6.6 to 6.9, between the 1991 census and the 1995 Uganda Demographic and Health Survey (table 4). This can perhaps be attributed to a more recent incidence of the epidemic in the northern districts as compared with the first six districts. Another possible reason is the civil war in northern Uganda, which could have contributed to higher fertility to replace the deceased. However, it is also possible that the census estimate is an underestimate, since it was based on a household account of births in the past year.

Preventive HIV/AIDS education and information programmes have emphasized and promoted change of sexual behaviour and use of condoms as strategies for reducing HIV infection rates. Recent studies by the STD/AIDS Control Programme (Ministry of Health, 2000) have indicated that condom accessibility and use increased in the 1990s. For example, in Mpigi district in 1996, 66.2 per cent of adolescents aged 15 to 19 years had acquired condoms, and current condom use with non-regular sexual partners was a high 54.8 per cent. In addition, studies by Ntozi and others (2001) on high risk groups in Uganda—such as commercial sex workers, barmaids, long-haul truck drivers, street children and adolescents—have shown that condom use has increased dramatically since the epidemic started. Increase in condom use among those groups, who are mostly at the younger ages, may continue in the future and have an inhibiting effect on fertility.

Campaigns against HIV infection have included advice to unmarried persons to abstain from sex, which may reduce exposure to pregnancy risks among the young, divorced, separated and widowed. Owing to fear of HIV infection, widows and widowers find it harder than before to remarry.

E. PROSPECTS FOR FERTILITY DECLINE

Recent evidence showing declines in fertility among some groups of the population suggests that fertility decline will occur sooner rather than later. According to the results of recent censuses and demographic and health surveys, women living in urban centres have reduced their fertility. The 1988/89 Uganda Demographic and Health Survey reported a national total fertility rate of 5.7 children per woman in urban areas, which decreased to 5.0, according to the 1995 Survey. The fall in fertility in urban centres was perhaps mostly a response to increased use of modern contraceptives among currently married women; prevalence rose from 12.2 per cent in 1988/89 to 28.1 per cent in 1995 (more than double in 6 years). Since then, prevalence has increased to 41.6 per cent in 2000/01, implying a further decline in the fertility of urban women.

Another factor that may be favourable to reducing fertility in the country is education. Women with post-primary education are more engaged in the monetary economy as employees or petty traders in the informal sector. This development has increased competition between childbearing and income-generating activities for women (Mulindwa, 1999). The TFR of women with post-primary education declined gradually from 6.0 in 1968/69 to 5.2 in 1995.

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This fertility decline was most likely associated with a rise in the contraceptive prevalence of this group, from around 10 per cent in 1988/89 to 25.5 per cent in 1995 (an increase of about two and half times over a short period of time). Since contraceptive prevalence among the highly educated increased sharply to 42.2 per cent in 2000/01, the prospects for further fertility decline in that population category are high.

Moreover, the Government recently began implementing its universal primary education policy, which has dramatically increased primary enrolment (from 3 million to over 6 million), and is focusing on promoting girls' education. However, in addition to bearing the cost of education for every child, parents are experiencing a reduction in the benefits they previously expected from their children, since children who are in school most of the day cannot help with farming activities. The new developments are expected to reduce the desired number of children and, consequently, bring about fertility decline. The Government also intends to extend this policy to the secondary education level, which should greatly increase the number of women in the population with post-primary schooling and suppress fertility further in the near future. Even when the HIV epidemic subsides, it is likely that the use of contraception, and the open approach to sex education that it has engendered, will continue and thus suppress fertility further.

F. CONCLUSIONS AND RECOMMENDATION

Uganda has sustained high fertility in the past owing to a number of sociocultural, demographic and economic factors. It is expected that some of those factors will change in the future, in a way such that fertility will decline. Fertility decline has already occurred in some parts of the country, albeit in response to the HIV/AIDS epidemic. To accelerate fertility decline, government policy for universal education, especially post-primary education for girls, should be promoted and supported by development partners.

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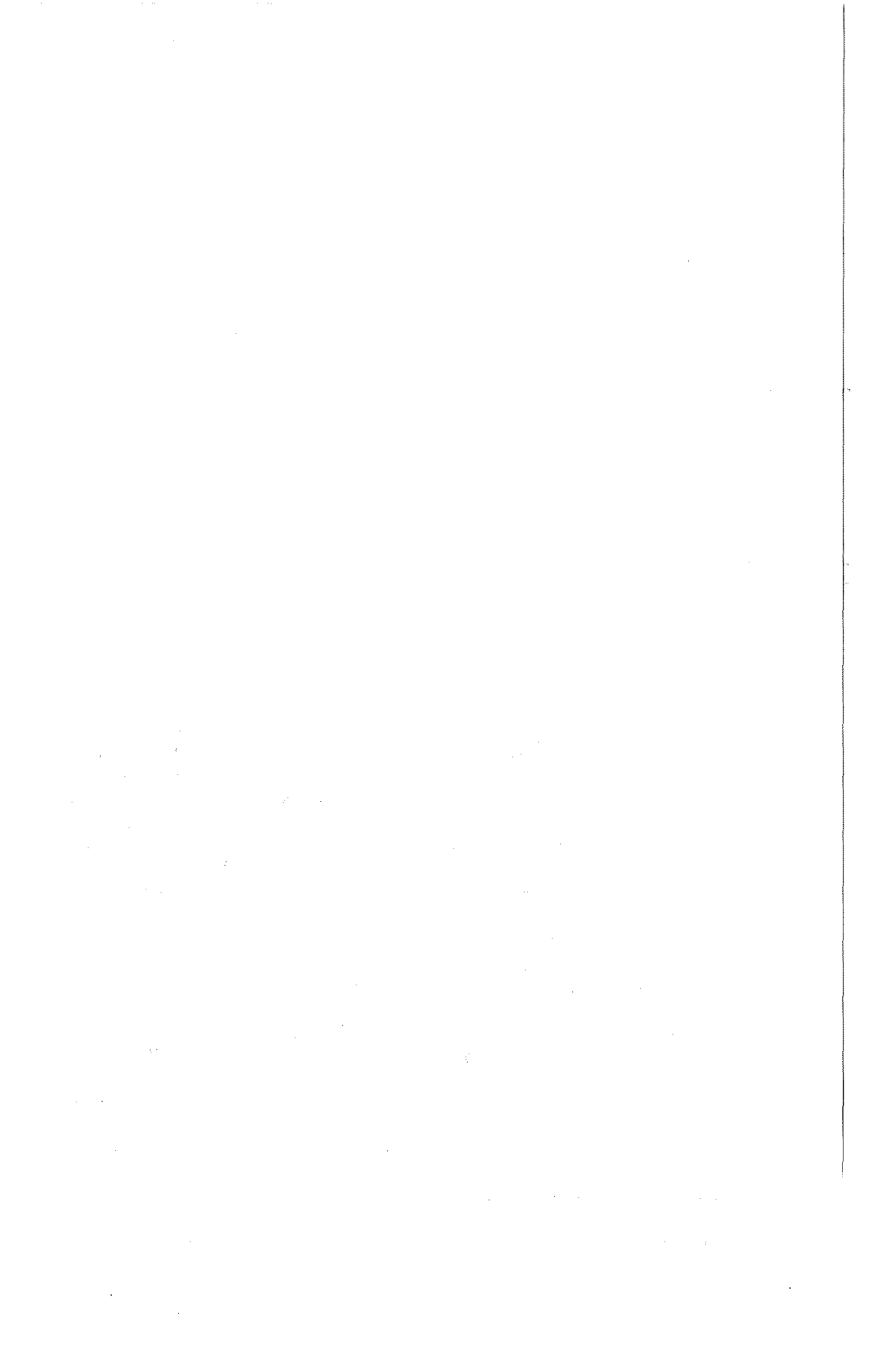
PROSPECTS FOR FERTILITY DECLINE IN NIGERIA: COMPARATIVE ANALYSIS OF THE 1990 AND 1999 NIGERIA DEMOGRAPHIC AND HEALTH SURVEY DATA

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A. INTRODUCTION

Nigeria's population is one of the fastest growing in the world and was ranked the tenth largest in 2000. The population is currently estimated between 111 million and 115 million (National Population Commission, 2000; United Nations, 1999). The annual rate of natural increase is estimated to be between 2.6 and 2.9 per cent (National Population Commission, 2000; United Nations, 2001). Nigeria has the growth potential to become the fifth largest country in terms of population size (at some 303 million) by 2050 (United States Bureau of Census, 2001). Although recent statistics suggest signs of a decline in fertility (National Population Commission, 2000; United Nations, 2001), this decline is at best slow if not uncertain (Caldwell, Orubuloye and Caldwell, 1992).

Rapid population growth is of concern to the Government of Nigeria, international organizations and non-governmental organizations. The prosperity of the 1970s and early 1980s gave way to gloom and despair in the 1990s. In response, the Nigerian Government inaugurated the national population policy in 1998 to stem the adverse effects that the high population growth rate was having on national development and welfare (Federal Ministry of Health, 1988). Key points of the policy are to improve standards of living; to prevent premature deaths among high risk groups; to reduce birth rates through voluntary fertility regulation methods; and to promote an even urban-rural population distribution. At its inauguration the population policy was internationally commended as comprehensive and multisectoral, but its implementation has been inconsistent and not well coordinated (National Population Commission, 2000).

Decision makers, researchers and other concerned groups are interested in learning (1) whether fertility will consistently decrease in Nigeria; and (2) what factors are necessary to make the transition to low fertility. Those two topics are the subject of the present paper, which also outlines the theoretical arguments on fertility decline. The paper describes trends in the indicators of fertility since the 1960s. Data from the Nigeria Demographic and Health Survey (NDHS) of 1990 and that of 1999 are used to examine the prospects of a future fertility decline. Three fertility indicators (use of contraception, percentage of women who gave birth during the five years preceding the surveys and desire

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for children) are used to evaluate the prospects for future fertility decline. If the trends in any of the fertility indicators shifted in a fertility-inhibiting direction between 1990 and 1999, then it can be concluded that the prospects for future fertility decline are bright.

The survey data sets collected information from nationally representative samples of women, using similar sampling designs in the 1990 and 1999 rounds. Questions on the comparability of the two data sets were addressed in the 1999 Survey (National Population Commission, 2000), which examined similarities and inconsistencies in the age and sex distribution, completeness of information on births and deaths and the proximate determinants of fertility. The report concluded that, although the 1999 Survey somewhat underestimated current births, it is comparable with the 1990 Survey for periods in the past.

B.   THEORETICAL ARGUMENTS

1.   *Sociocultural considerations*

The link between the belief in life after death, or ancestral descent, and fertility is well documented in the literature (Caldwell and Caldwell, 1987). This belief, entrenched in traditional religion, is part of the psyche of many Nigerians. It is unknown to what extent westernization has changed this belief. Disproportional gender relations favouring males are another aspect of the cultural system that is said to promote high fertility in Nigeria. Recently, much attention has been paid to the role that men play in reproduction and family planning. Evidence suggests that men in most societies in Nigeria (and elsewhere in sub-Saharan Africa) are often pronatalists who use their power to ensure their own reproductive goals, to the detriment of women.

2.   *Economic considerations*

The framework proposed by Easterlin and Crimmins (1985) is often used to explain fertility levels in developing countries. Unlike other theories on population that draw solely from economics, this framework is strengthened by its combination of the demand concept from economics and the supply concept on population from sociology (Macunovich, 2000). The argument is that declining infant mortality leads to an excess supply of children, thus decreasing the demand for children and motivating fertility regulation. This is relevant in Nigeria because infant mortality and other indicators of socio-economic development have made little progress since the late 1980s. Caldwell's (1982) wealth flow theory of the expected social and economic returns to parents from their investment in children seems close to the current economic realities in Nigeria. The high cost of schooling, dwindling financial support from the Government and increasing unemployment, especially of university graduates, may have created the context for the reversal of the wealth flow (National Research Council, 1993; Makinwa-Adebusoye and Feyisetan, 1994).

3. *Political and economic instability*

Political turmoil and economic crises are said to lead to low aspirations and crisis-led fertility transition (Lesthaeghe, 1989; National Research Council, 1993). In some countries, war has led to famine, nutritional deficiency, psychological stress and a lack of motivation by the population to reproduce (Lindstom and Berhanu, 1999). Nigeria's recent political turmoil appears to have led to anxiety and uncertainty about the future; a long tradition of poor resource management has led to increased hardship. The relevance of crisis-led fertility transition in Nigeria was vividly articulated by the National Research Council (1993), which argued that the introduction of the structural adjustment programme (SAP) made Nigerians reconsider the cost of raising children as a component of their cost of living.

4. *Cohort and social change*

The factors affecting social change vary across cohorts (Macunovich, 2000). Each birth cohort has unique features based on the changing context of education, peer socialization, linguistic dynamics and historical experience. Experience may be a combination of political, economic and cultural factors, some of which were presented above. Cohort identity is evident in the Nigerian social organizations traditionally marked by rites of passage and the initiation into adulthood (Lesthaeghe, 1989). The civil war, the economic boom of the 1970s and subsequent bust since the 1980s, the military interregnums and the continued process of westernization may be important factors affecting cohorts and may have implications for future fertility. The present paper borrows from the cohort and social change approach in examining changes in fertility indicators and their determinants across age groups with the objective of providing insight on future fertility in Nigeria.

C. PAST AND PRESENT DEMOGRAPHIC TRENDS

A review of trends in some indicators of fertility suggests a gradual decline in the last few years. National statistics suggest declines in the total fertility rate, from 6.3 children per woman in the early 1980s to 5.9 in 1991, 5.4 in 1994 and 5.2 in 1999 (National Population Commission, 2000). Using the data from the 1990 Demographic and Health Survey, Makinwa-Adebusoye and Feyisetan (1994) provided evidence that fertility decline started around 1986. The authors examined, among other things, factors influencing women's fertility, contraceptive use and reproductive preferences, concluding that the economic crisis that started in the early 1980s and the postponement of births, mostly by high parity women (those who had four or more children), explained the observed fertility decline. If the observed trends are real, are trends in factors influencing fertility telling the same story?

Trends in the indicators of knowledge and attitudes that influence fertility are examined below. The analysis controls for residence, level of education, religion and work location. The results (table 1) show that the proportion of women with knowledge of any method of contraception and knowledge of

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TABLE 1. TRENDS IN INFLUENTIAL FACTORS AND INDICATORS OF FERTILITY AMONG CURRENTLY MARRIED WOMEN,[a] BY AGE GROUP, NIGERIA, 1990 AND 1999 DEMOGRAPHIC AND HEALTH SURVEYS

(Adjusted percentages)[b]

	Total			Age group 24 and under			25-29			30-34			35 and older		
Percentage of women	*1990*	*1999*	*Sig.*[c]	*1990*	*1999*	*Sig.*[c]	*1990*	*1999*	*Sig.*[c]	*1990*	*1999*	*Sig.*[c]	*1990*	*1999*	*Sig.*[c]
Explanatory factors															
Heard family planning message on the radio	30	34	***	28	28	Θ	32	37	**	32	39	***	29	35	***
Knows any method of contraception	49	63	***	42	54	***	55	67	***	52	68	***	49	65	***
Knows modern method of contraception	47	60	***	40	53	***	53	65	***	50	99	***	46	61	***
Respondent approves of family planning	54	39	***	47	30	***	57	41	***	58	45	***	55	40	***
Husband approves of family planning	33	29	***	28	21	***	36	30	**	37	36	Θ	33	30	*
Discussed family planning with spouse	28	31	***	22	22	Θ	30	32	Θ	33	38	**	30	32	Θ
Discussed family planning with spouse, has secondary level education	9	13	***	9	10	Θ	13	17	***	10	19	***	6	11	***
Indicators of fertility															
Currently using any method of contraception ...	8	15	***	5	7	**	8	13	***	11	19	***	12	18	***
Currently using modern contraceptive method ..	5	8	***	3	2	Θ	4	7	**	7	12	***	8	12	***
Had birth(s) in the last five years	70	66	***	73	75	Θ	84	81	*	79	77	Θ	51	45	***
Wants same number of children as husband (or husband wants fewer)	31	36	***	29	34	**	32	37	**	32	40	***	33	36	Θ
Husband wants more children	19	28	***	20	28	***	18	26	***	20	27	***	20	30	***
Does not know husband's desire for children ...	49	36	***	51	39	***	49	36	***	48	33	***	47	34	***

Sources: Nigeria Demographic and Health Survey (NDHS) (1990 and 1999).

[a] "Married women" includes those in formal marriages as well as consensual unions with a partner.

[b] Analysis based on combined 1990 and 1999 NDHS data sets; total number of cases = 12,711. Percentages are adjusted for sample differences in residence, level of education, religion and work location.

[c] Sig. = significance level: *** $p<0.001$, ** $p<0.01$, * $p<0.05$ and Θ = not significant at 5 per cent level.

modern methods of contraception increased by at least 10 percentage points for all age groups between 1990 and 1999. The data also suggest a decline in the approval of family planning among both respondents and their spouses. The reason for this trend is not clear from the data.

Spousal communication about family planning often leads to a discussion about family size, a necessary step for fertility regulation. Spousal discussion significantly improved overall; the proportion of women having discussed family planning with their spouses increased from 28 to 31 per cent (although after controlling for age, the change was only significant among women 30 to 34 years). Gender equity was measured by a dummy variable for spousal discussion about family planning among women with a secondary level education. The results suggest a small but consistent trend towards increased gender equity overall regarding family planning discussion, increasing from 9 to 13 per cent, and across most age groups (except for women younger than 25).

The percentage of women who gave birth in the five years preceding the survey is an important indicator of the recent level of fertility. As seen in table 1, the proportion of women who gave birth in the last five years declined across surveys (70 to 66 per cent), with important declines among women aged 25 to 29 (84 to 81 per cent) and especially among those aged 35 or older (55 to 45 per cent). The findings reflect positive trends in the percentage of all women currently using any contraceptive method (8 to 15 per cent) and those currently using modern methods (5 to 8 per cent).

Couples' desire for children is an important determinant of future fertility in most of sub-Saharan Africa. The literature suggests that when husbands and wives have similar desires for children, or husbands want fewer children, fertility may decline since women's family size desires are usually lower. There are two measures of the desire for children used in this paper: (1) the couple wants the same number of children or the husband wants fewer; and (2) the wife does not know her husband's desire for children. Results in table 1 show some positive trends between 1990 and 1999. The proportion of women who wanted the same number of children as their husbands, or whose husbands wanted fewer, increased overall (31 to 36 per cent) and for most specific age groups (except those aged 35 or older). At the same time, the proportion of married women who did not know their husband's desire for children decreased. This suggests improved spousal relations and increased knowledge among wives about their spouse's family size ideals. However, findings also suggest an increased trend in husbands' desire for more children.

D. PROSPECTS FOR FUTURE FERTILITY DECLINE

The use of contraception, recent levels of fertility and desire for more children are used to evaluate prospects for future fertility decline in Nigeria. The hypothesis is that if contraceptive use increased or the other two indicators decreased between 1990 and 1999, fertility decline is likely in the future. Using pooled data from the 1990 and 1999 Surveys, logistic regressions are used to examine the likelihood of currently married women in the 1999 Survey, as compared with those in the 1990 Survey, of using contraceptives, having more

or fewer births and desiring more or fewer children. The results, which also show the effects of demographic and socio-economic variables on contraceptive use, fertility levels and desire for more children, are presented in tables 2 and 3.

1. Use of contraception

The findings in table 2 show a significant positive trend in the use of any method of contraception between 1990 and 1999. Married women of all ages were about twice as likely to use contraceptives in 1999 than in 1990. The effect of age at first marriage on use of contraception is not as expected. Women who delay getting married are expected to have higher levels of contraceptive use, since later marriage—a proximate determinant of fertility (Bongaarts, 1978)—suggests the intention not to have children at early ages. However, the results show that women who first married after 25 years of age are around half as likely to use contraceptives as their counterparts who married before 20 years (among women currently aged 25-29 and 30-34 at the time of the survey). In each age group except 25 to 29 years, urban women are significantly more likely to use a method of contraception than rural women. Education is largely associated with contraceptive use, at least among women aged 25 or over. Women who have some primary education, and especially some secondary level schooling, are more likely to use a method of contraception than those not educated. Moreover, religion appears to remain a strong influence as women who are Roman Catholic or Protestant are generally found more likely to use contraception than those who are Muslim.

Other determinants having a positive effect on the use of contraception are spousal communication and respondent or husband's approval of family planning. Women's employment exercises some influence, at least among younger women, as those under age 30 who work away from home are more likely to use a method of contraception than those not working. The findings of the effect of household material possessions as an indicator of socio-economic status were not consistent; only women in the youngest and oldest age groups (younger than 25, and 35 or older) who had a greater number of material possessions were more likely to use a method of contraception.

2. Births in the last five years

After controlling for other factors, there was little difference in women's likelihood of having given birth in the five-year period preceding the 1990 Survey as compared with the 1999 Survey, except for the oldest age group (35 or older), which experienced a significant decline. The effect of age at first marriage on reported recent fertility differed by age group. While younger women (currently aged under 25) who first married at age 20 or later were less likely to have given birth in the last five years as compared with those who married as teens (age 19 or younger), the opposite was true for women in the age groups 30 years and over. This suggests a marital duration effect. Among younger women, those who married early had a longer period of exposure to conception than those who married later. Among older women, those who mar-

ried later were likely to have had more births in a prior period exceeding five years before the survey.

The findings in table 2 suggest differences in recent fertility by women's employment status, but the differences vary by age group. Older women (35 years or older) who worked, either at home or away, were significantly less likely to have given birth in the last five years; curiously, the reverse trend was seen for younger women (under 25 years). The role of religion was less appreciable as compared with the trend seen for contraceptive use, with only Roman Catholic women in two age groups (25-29 and 35 or over) less likely to have had births in the last five years. The effects of knowledge of modern methods of contraception, husband's approval of family planning and spousal discussion of family planning on recent fertility were generally in the expected direction. However, the degree of the effect varied across age groups.

3. *Desire for children*

The findings reveal that younger married women (under 25 years) in the 1999 Survey were about one and a half times as likely to want the same (or greater) number of children as their spouses, as compared with those in the 1990 Survey; women in the middle of their reproductive years (25-29 and 30-34 years) were about 1.3 times as likely (table 3). This suggests that younger women were more likely to prefer smaller family sizes. Older women who first married between the ages of 20 and 24 were more likely to want the same/greater number of children as their husbands, as compared with their counterparts who married in adolescence. Women working away from home were more likely than women not working to have the same desired number of children as their husbands. Compared to women with no more than one material possession, women aged 25 years and above who had more material possessions had a desired family size similar to that of their husbands.

Education, religion, type of marriage, attitudes toward family planning and spousal discussion of family planning all had effects on the likelihood of women wanting the same number of children as their husbands or on the husbands wanting fewer, with the effects being significant across age groups. Women in the youngest age group whose husbands approved of family planning were 1.6 times more likely to desire the same number of children as their husbands, as compared with those whose husbands disapproved. However, the trend was reversed for women in the oldest age group.

The findings further reveal that women across all age groups were consistently less than half (0.4 times) as likely to say they did not know their husband's desire for children in 1999 as in 1990. In general, women seem to have moved from a lack of information or interest about their partner's reproductive goals to some knowledge—either perceived (through non-verbal communications) or through discussion—in the later survey period. Knowledge about a partner's reproductive goals may lead to discussion about a potential discrepancy between partners. Discussion may be helpful in terms of covert contraceptive use (women's use without the husband's consent).

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TABLE 2. RELATIVE ODDS FROM THE LOGISTIC REGRESSION MODELS ASSESSING EFFECTS ON USE OF CONTRACEPTION AND RECENT FERTILITY AMONG CURRENTLY MARRIED WOMEN,[a] BY AGE GROUP, NIGERIA, 1990 AND 1999 DEMOGRAPHIC AND HEALTH SURVEYS[b]

Correlates	Current use of any method of contraception, by age group				Had birth(s) in the last five years, by age group			
	<25	25-29	30-34	35+	<25	25-29	30-34	35+
Survey year								
1990 (r)[c]								
1999	2.1***	1.9***	2.1***	2.5***	1.2	0.8	0.9	0.7***
Age at first marriage								
Less than 20 (r)								
20-24	0.8	0.8	0.8	1.0	0.5***	1.1	1.8***	1.4***
25 + ...	..	0.4**	0.6*	0.8	..	0.3***	1.3	2.0***
Residence								
Rural (r)								
Urban	1.8**	1.2	1.9***	1.5**	0.9	0.8	0.9	0.7***
Level of education								
No education (r)								
Primary	0.7	1.7*	1.3	1.9***	1.0	1.4	1.5*	1.0
Secondary or higher	1.5	3.0***	1.9*	2.7***	0.7*	0.7	0.7	0.9
Religion								
Islam (r)								
Protestantism/others	1.8*	1.6*	1.4	1.4*	1.0	0.9	0.8	1.0
Catholicism	1.8*	2.0**	2.2***	1.9***	0.9	0.5***	0.9	0.8*
Type of marriage								
Polygamous (r)								
Monogamous	1.0	1.0	1.2	1.2	0.9	1.1	1.1	1.1

Location of work							
Not working (r)							
At home	1.0	1.7*	1.2	1.5*	1.6***	0.9	1.0	0.8**
Away	1.9**	1.8**	1.2	1.4	1.7***	1.1	0.9	0.6***
Material possessions							
At most one (r)							
Two or three	1.0	0.9	1.1	1.3*	0.9	1.1	0.9	1.1
Four or higher	1.9*	1.1	1.5	1.6**	1.3	1.2	0.6*	0.8*
Heard FP message on radio[d]							
No (r)							
Yes	1.0	1.2	1.3	1.2	1.0	0.8	1.0	0.9
Knows a modern method							
No (r)							
Yes	..	..	..	..	1.7***	1.2	1.6**	1.6***
Respondent's attitude re FP							
Disapproves (r)							
Approves	1.5	2.1**	1.7*	1.9***	1.3	1.0	1.2	0.8*
Does not know	0.4*	0.7	0.5*	0.8	0.8	1.2	1.3*	1.1
Husband's attitude re FP							
Disapproves (r)							
Approves	3.7***	2.8***	3.6***	4.7***	1.1	1.7***	1.9***	1.3*
Does not know	0.9	2.6*	1.3	1.6	1.1	1.4	1.2	1.2
Discussed FP with husband							
No (r)							
Yes	3.5***	2.2***	2.9***	2.7***	1.2	1.6**	1.2	1.5***

Sources: Nigeria Demographic and Health Survey (1990 and 1999).

[a]"Married women" includes those in formal marriages as well as consensual unions with a partner.

[b]Analysis based on combined 1990 and 1999 NDHS data sets.

[c](r)=reference category, *** p<0.001,** p<0.01 and * p<0.05

[d]FP=family planning

TABLE 3. RELATIVE ODDS FROM THE LOGISTIC REGRESSION MODELS ASSESSING EFFECTS ON SPOUSAL AGREEMENT IN DESIRED NUMBER OF CHILDREN AMONG CURRENTLY MARRIED WOMEN,[a] BY AGE GROUP, NIGERIA, 1990 AND 1999 DEMOGRAPHIC AND HEALTH SURVEYS[b]

Correlates	Wants same number of children as husband/Husband wants fewer, by age group				Does not know husband's desire for children, by age group			
	<25	25-29	30-34	35+	<25	25-29	30-34	35+
Survey year								
1990 (r)[c]								
1999	1.5***	1.3*	1.3*	1.1	0.4***	0.4***	0.4***	0.4***
Age at first marriage								
Less than 20 (r)								
20-24	1.3	1.2	1.6***	1.2*	1.0	1.1	0.9	1.0
25+	..	1.4	1.3	1.3		1.2	1.0	1.0
Residence								
Rural (r)								
Urban	1.1	1.0	1.0	1.1	1.1	1.2	0.9	1.1
Level of education								
No education (r)								
Primary	1.3	1.4*	1.1	1.3*	0.9	0.7	1.1	1.0
Secondary or higher	1.7***	1.8***	1.7**	1.6***	0.8	0.5**	0.8	0.6***
Religion								
Islam (r)								
Protestantism/others	1.5***	1.6***	1.5**	1.4**	0.9	0.8	0.6***	0.9
Catholicism	2.1***	1.5*	1.5*	1.6***	0.6***	0.8	0.6**	0.7*
Type of marriage								
Polygamous (r)								
Monogamous.................	1.3*	1.4***	1.7***	1.6***	1.2	1.1	0.9	1.0

| Location of work								
Not working (r)								
At home	1.1	1.3	1.2	1.1	0.8*	0.8	0.8	0.7***
Away	1.3*	1.3	1.1	1.1	0.9	0.8	0.9	0.8*
Material possessions								
At most one (r)								
Two or three	1.1	1.2	1.3	1.2*	0.9	0.9	0.8	1.0
Four or higher	1.0	1.4*	1.1	1.4*	1.3	0.7*	0.8	1.0
Heard FP message on radio[d]								
No (r)								
Yes	1.2	1.3*	1.3	1.3*	0.8**	0.6***	0.8	0.8*
Knows a modern method								
No (r)								
Yes	1.1	1.1	1.1	1.2	0.7***	1.0	1.0	0.7***
Respondent's attitude re FP								
Disapproves (r)								
Approves	1.6***	2.3***	2.3***	2.8***	0.8	0.6***	0.8	0.8*
Does not know	0.5***	0.6***	0.5***	0.6***	3.9***	4.0***	5.3***	4.0***
Husband's attitude re FP								
Disapproves (r)								
Approves	1.5**	0.8	1.0	0.7**	0.7**	0.9	0.7*	0.8
Does not know	1.4	0.9	1.3	1.2	0.9	1.0	0.7	0.9
Discussed FP with husband								
No (r)								
Yes	1.6***	1.9***	1.3*	1.5***	..	..	..	..

Sources: Nigeria Demographic and Health Survey (1990 and 1999).

[a]"Married women" includes those in formal marriages as well as consensual unions with a partner.

[b]Analysis based on combined 1990 and 1999 NDHS data sets.

[c](r)=reference category, *** $p < 0.001$, ** $p < 0.01$ and * $p < 0.05$

[d]FP=family planning

Women's attitude towards family planning was significantly associated with knowledge of the husband's desire for children. In particular, women of all ages who did not have any opinion about family planning were about four times more likely not to know their husband's desired family size when compared with those who disapproved of family planning. Women in the former category were likely to have unwanted births and high fertility since they were less likely to have reproductive goals or control over their fertility. Secondary education, work, exposure to family planning messages on the radio and knowledge of modern contraception all had an effect on reducing the likelihood of a woman's having no knowledge of her husband's desire for children, although the effects were not significant at all ages.

E. CONCLUSIONS

The above findings suggest that the prospects for fertility decline in Nigeria are bright. Use of contraceptives among married women increased between 1990 and 1999. Recent fertility, as measured by the proportion of women who had given birth in the five years before the survey, declined somewhat (at least among older women). More women think that they have the same reproductive goals as their husband. These are favourable indicators for future fertility decline. In addition, young women who worked away from home were found to be more likely to use contraception and to share their husband's desire for children. Finally, young women who delayed getting married were found less likely to have had recent births.

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ANNEX

RELATIVE ODDS FROM THE LOGISTIC REGRESSION MODELS ASSESSING EFFECTS ON CONTRACEPTIVE USE, RECENT FERTILITY AND DESIRE FOR CHILDREN AMONG CURRENTLY MARRIED WOMEN,[a] ALL AGES COMBINED, NIGERIA, 1990 AND 1999 DEMOGRAPHIC AND HEALTH SURVEYS[b]

Correlates	Current use of contraception	Had birth(s) in last five years	Shares family size desire/ husband wants fewer	Does not know husband's desire for children
Survey year				
1990 (r)				
1999	2.3***	0.7***	1.3***	0.4***
Age at first marriage				
Less than 20 (r)[c]				
20-24	0.9	1.0	1.3***	1.0
25+	0.8	0.8	1.3*	1.0
Residence				
Rural (r)				
Urban	1.6***	0.8***	1.1	1.1
Level of education				
No education (r)				
Primary	1.3**	1.4***	1.3***	0.9
Secondary or higher	1.7***	1.2***	1.7***	0.7***
Religion				
Islam (r)				
Protestantism/others	1.6***	0.8***	1.5***	0.8***
Catholicism	2.1***	0.7***	1.7***	0.7***
Type of marriage				
Polygamous (r)				
Monogamous	1.0	1.1**	1.5***	1.0

Location of work				
Not working (r)				
At home	1.7***	0.9	1.2*	0.8***
Away	1.9***	0.8***	1.2**	0.8***
Material possessions				
At most one (r)				
Two or three	1.1	1.0	1.2***	0.9*
Four or higher	1.4**	0.8**	1.2*	0.9
Heard FP message on radio[d]				
No (r)				
Yes	1.2*	0.9	1.2***	0.8***
Knows a modern method				
No (r)				
Yes	..	1.5***	1.1*	0.8***
Respondent's attitude re FP				
Disapproves (r)				
Approves	1.8***	1.0	2.2***	0.7***
Does not know	0.7**	1.0	0.5***	4.1***
Husband's attitude re FP				
Disapproves (r)				
Approves	3.7***	1.3***	0.9	0.8***
Does not know	1.6*	1.2*	1.2*	0.9
Discussed FP with husband				
No (r)				
Yes	2.9***	1.3***	1.6***	..

Sources: Nigeria Demographic and Health Survey (1990 and 1999).

[a]"Married women" includes those in formal marriages as well as consensual unions with a partner.

[b]Analysis based on combined 1990 and 1999 NDHS data sets.

[c](r)=reference category, *** $p < 0.001$, ** $p < 0.01$ and * $p < 0.05$

[d]FP=family planning
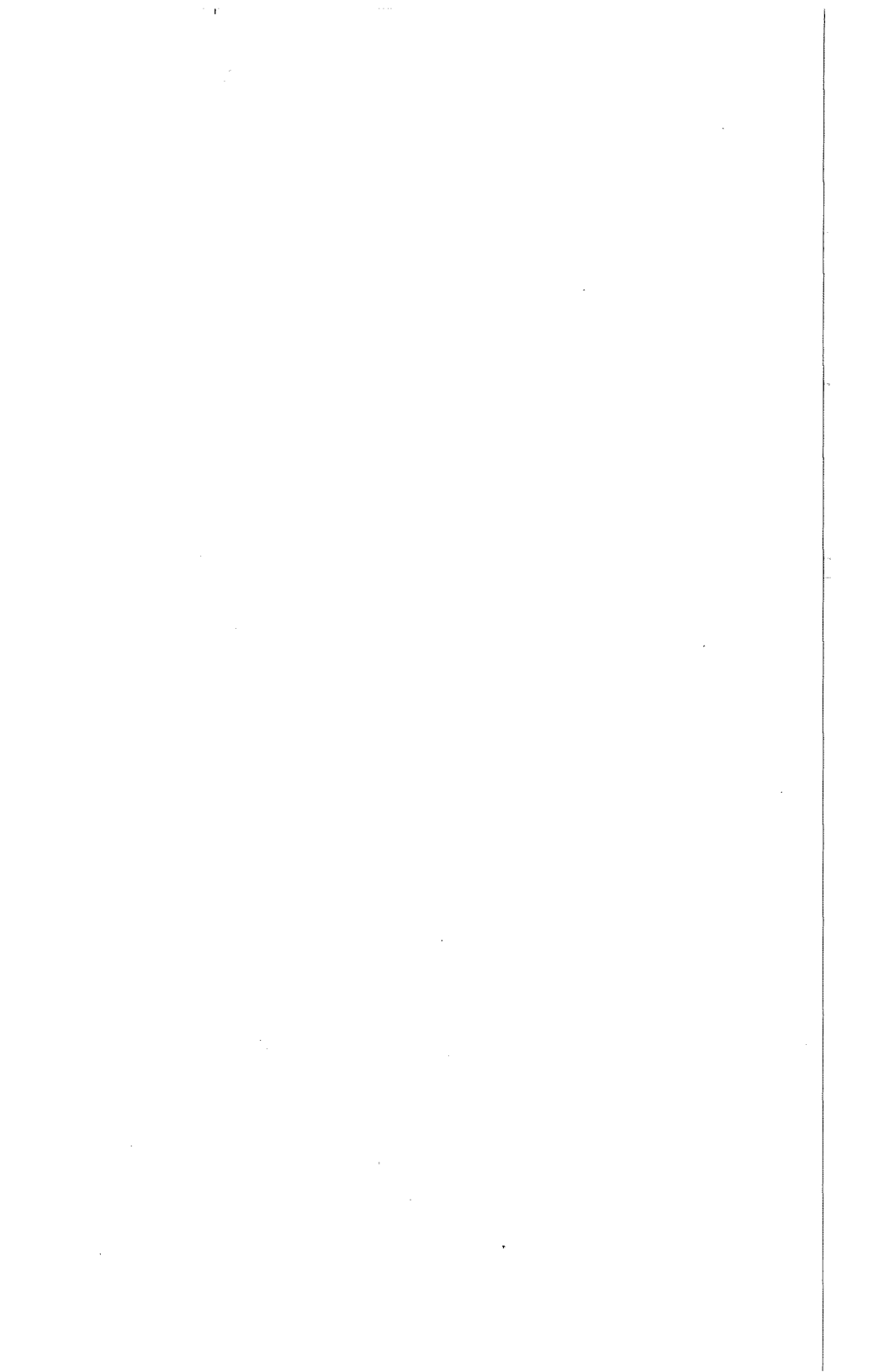
FERTILITY IN THE DEMOCRATIC REPUBLIC OF THE CONGO[1]

David Shapiro and B. Oleko Tambashe***

A. INTRODUCTION

The task of assessing the general level of fertility in the Democratic Republic of the Congo is rendered difficult by the absence of reliable recent national data. Only two large-scale national data collection efforts have been carried out in the country: one was a massive survey in the mid-1950s by the Belgian colonial administration, and the other was a national census by the National Statistical Institute in 1984. Further, as can be seen below, there is good reason to believe that the estimates of fertility provided in conjunction with the 1984 census as well as subsequent estimates are flawed.

The first section of the paper reviews the estimates of fertility and mortality in the Democratic Republic of the Congo, covering the second half of the twentieth century. The most recent estimates provided by the United Nations (2001) are compared with those from the 1950s survey, the 1984 census, another large-scale survey carried out in the western part of the country in the mid-1970s, and a more modest national survey carried out in 1995. Additional evidence is examined, leading to the conclusion that the fertility estimates from the 1984 census and from the 1995 survey are too high. Insofar as the census estimates were the basis for upward revisions to the United Nations fertility estimates undertaken in the mid-1990s, it is likely that the current United Nations estimates of fertility in the country are too high.

The second section of the paper explores a variety of factors that are likely to influence fertility in the Democratic Republic of the Congo, as is the status of those factors with a view to estimating what the level of fertility in the country might in fact be. Mortality, women's education, socio-economic development, civil war and economic crisis are all considered in that context. On balance, these different factors appear to exert downward pressure on fertility. The conclusion of the paper speculates briefly on the prospects for fertility transition in the Democratic Republic of the Congo.

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B. ESTIMATED FERTILITY AND MORTALITY IN THE DEMOCRATIC REPUBLIC OF THE CONGO

Although the focus of the present paper is on fertility, knowledge of mortality levels and trends is very important for understanding changes in fertility behaviour (Easterlin, 1996; Easterlin and Crimmins, 1985). The first part of this section therefore looks at levels and trends in mortality beginning with the early 1950s, as reflected in estimates from different data sources, followed by an overview and more detailed discussion of estimated levels and trends in fertility.

Data sources, in addition to United Nations estimates, consist of the two large-scale national data collection efforts previously mentioned, carried out from 1955 to 1957 and in 1984. In addition, data from the Etude démographique de l'ouest du Zaïre (EDOZA), a large-scale demographic household survey carried out in the western part of the country from 1974 to 1977, and limited estimates from the 1995 survey, Enquête nationale sur la situation des enfants et des femmes (ENSEF), are used.[2]

1. Estimates of mortality

Estimates of mortality in the Democratic Republic of the Congo are shown in table 1. Owing to concerns about possible misreporting of mortality, the estimates were generated by indirect methods. The United Nations estimates are part of broader population estimates and projections that attempt to take into consideration demographic estimates from national data sources.

During the period 1950 to 1995, national sources and United Nations estimates remain fairly close through the mid-1970s but diverge afterwards. In particular, the national sources tend to show higher mortality in the 1980s and 1990s, with mortality rising, while the United Nations estimates show mortality falling during the 1980s and 1990s. The higher and increasing mortality

TABLE 1.   MORTALITY ESTIMATES FOR THE DEMOCRATIC REPUBLIC OF THE CONGO,
1950-1995

Year	Crude death rate (per 1,000 population)	Infant mortality rate (per 1,000 live births)	Life expectancy at birth (years)
1955-1957	26	165	39.5
1950-1955	25.6	166	39.1
1974-1977[a]	17.0	..	46.4
1970-1975	18.9	127	46.1
1984	16.8	137	47
1980-1985	16.4	109	49.6
1995	..	148	45.4
1990-1995	14.7	93	51.7

Sources: 1954-1957: Romaniuk, 1968; 1950-1955: United Nations, 2001; 1974-1977: République du Zaïre, 1978b, table 7.2.2; 1970-1975: United Nations, 2001; 1984: Institut national de la statistique, 1991b; 1980-1985: United Nations, 2001; 1995: République du Zaïre, 1996, table 4.17; 1990-1995: United Nations, 2001.

[a] Data refer to results from the 1974-1977 surveys of the west of the country and pertain to the three provinces of Bas-Congo, Bandundu and Kasai Occidental, a portion of Equateur province, and Kinshasa.

depicted by the national sources is attributed to the deterioration in the overall socio-economic situation of the country, especially in rural areas, during the period between 1984 and 1995 (République du Zaïre, 1996).

Overall, the United Nations figures suggest that during the period covered, both the estimated crude death rate and infant mortality rate fell by more than 40 per cent, while life expectancy at birth rose by over 30 per cent. However, owing to the deterioration in the mortality situation, which is reflected in the national sources for the period after the onset of the first chronic economic crisis in the mid-1970s and then in the acute economic crisis in the early 1990s, the national sources indicate a much smaller improvement in mortality. That improvement is approximately 10 per cent in infant mortality and 15 per cent in life expectancy. Further, at the end of the period the national source estimate of infant mortality is almost 60 per cent higher than the corresponding United Nations estimate, and life expectancy in the national source is at only 88 per cent of the value of the United Nations estimate.

Since the onset of the civil war, especially since 1998, mortality has increased sharply, especially in the eastern part of the country. The International Rescue Committee estimate, as of May 2000, of 1.7 million or more excess deaths due to war during a 22-month period implies a crude death rate nationally that is in the mid-30s per 1,000—twice as high or more than the estimated rate in the 1980s (International Rescue Committee, 2000).[3] The civil war has also extensively disrupted life in much of the eastern part of the country, with likely implications for fertility (see below).

2. Estimates of fertility

Estimates of fertility in the Democratic Republic of the Congo are shown in table 2. During the period 1950 to 1995, there is an increase in estimated fertility. The total fertility rate increased by more than 10 per cent according to the United Nations estimates and by more than 20 per cent according to the national estimate for 1995. The estimated general fertility rate rose by more than 10 per cent between the mid-1950s and the mid-1980s, while the crude birth rate estimates show a distinctly smaller increase, on the order of 1 to 7 per cent. Further, prior to 1984 the estimated crude birth rates from the national sources are consistently lower than the United Nations estimates, while there is closer agreement between the different TFR estimates.

The relatively low fertility that prevailed in the 1950s reflected in part the presence of high levels of sterility and childlessness in certain northern parts of the country. Among women aged 35 to 44, for example, roughly 40 per cent of those in the Tshuapa and Equateur districts in Equateur province and almost 45 per cent of those in the Bas-Uélé and Haut-Uélé districts in Orientale province were childless. The corresponding figure for the entire country was 22 per cent (Romaniuk, 1968). The northern part of the country, with its low level of fertility and high proportion of childless women, was part of a broader "infertility belt" stretching from Cameroon to southern Chad, including the Central African Republic (Retel-Laurentin, 1974). The high levels of sterility among certain of the Democratic Republic of the Congo's ethnic groups were linked by Romaniuk (1961, 1967) to relatively high levels of venereal disease.

TABLE 2.   FERTILITY ESTIMATES FOR THE DEMOCRATIC REPUBLIC OF THE CONGO,
1950-1995

Year	Crude birth rate (per 1,000)	General fertility rate (per 1,000)	Total fertility rate (children per woman)
1955-1957	45.2	203	5.91
1950-1955	47.6	—	6.0
1974-1977ᵃ.............	44.6	218	6.3
1970-1975	47.7	—	6.3
1984	48.1	229	6.7
1980-1985	48.3	—	6.7
1995	—	—	7.3
1990-1995	48.2	—	6.7

Sources: 1955-1957: Romaniuk, 1968, table 6.48; 1950-1955: United Nations, 2001; 1974-1977: Tabutin, 1982, table 1; 1970-1975: United Nations, 2001; 1984: Institut national de la statistique, 1991b, p. 21 (crude birth rate) and p. 18 (total fertility rate); general fertility rate, estimated based on crude birth rate and the population of women aged 15-44, is given in Institut national de la statistique, 1991a, table 1; 1980-1985: United Nations, 2001; 1995: République du Zaïre, 1996, table 4.15; 1990-1995: United Nations, 2001.

ᵃData refer to results from the 1974-1977 surveys of the west of the country. In the 1950s, fertility in the west was slightly higher (by 3-5 per cent) than the corresponding national estimates, so these figures most likely slightly overstate fertility nationally in the mid-1970s. See in text for details.

By the mid-1970s, it appears that fertility had risen somewhat, at least as measured by the general fertility rate and the total fertility rate. As noted above, no national surveys were carried out during this period, but results from the EDOZA (République du Zaïre and others, 1977, 1978a, 1978b) provide a good indication of what was happening in a major part of the country. Those figures are reported for 1974 to 1977 in table 2.

In order to assess changes over time, Tabutin (1982) used Romaniuk's (1967) estimates and determined that in the west of the country, as of the mid-1950s, the crude birth rate was 46.4 per 1,000, the general fertility rate was 211 per 1,000, and the total fertility rate was 6.2 lifetime children per woman. Hence, in the 1950s fertility measures for the west of the country were slightly higher than the corresponding national figures, with the differences being about 3 to 5 per cent. Comparing the figures for the west from the 1950s with those from the 1970s makes it clear that overall there was a small increase in fertility (2-3 per cent), as measured by the general fertility rate and the total fertility rate. The increase presumably reflected reductions in sterility in the north-western part of the country associated with public health campaigns against venereal disease (Sala-Diakanda, 1980; Tabutin, 1982).

That trend may be assumed to characterize the trend at the national level: the west constituted a significant share of the total national population, and the lowered incidence of sterility should have had an impact in the north-east of the country as well as in the north-west. As noted earlier, the districts of Equateur and Tshuapa in north-western Equateur province had especially low levels of fertility in the 1950s, and the Bas-Uélé and Haut-Uélé districts of Orientale province in the north-eastern part of the country were also distinguished by very low fertility and an inordinately high incidence of sterility. Hence, reductions in sterility would lead to higher fertility in the north-east as well as in

the north-west of the country. Overall, these considerations from the EDOZA suggest that as of the mid-1970s the total fertility rate nationally was probably in the neighbourhood of 6.0 to 6.2.

The census data for 1984 suggest that fertility continued to increase after the 1970s, with all three measures of fertility increasing over a period of a decade or less by amounts of at least 5 to 8 per cent. Given that the estimates from the mid-1970s in table 1 probably overstate fertility in the entire country (since the west already had somewhat higher fertility than the rest of the country even in the 1950s), this implies that the apparent increase in fertility from the mid-1970s to the mid-1980s was even larger than 5 to 8 per cent. According to the ENSEF data from 1995, the total fertility rate continued to rise by almost another 10 per cent between the mid-1980s and mid-1990s.

As mentioned briefly above, the period from the mid-1970s until 1990 was one of chronic economic crisis in the Democratic Republic of the Congo, with stagnant or declining real incomes and inflation usually well into double digits and occasionally higher. Even more severe economic problems were experienced during the early 1990s, accompanied by civil disorder, a shrinking modern sector of the economy and accelerated inflation. An increase in fertility of almost 20 per cent during such a period seems unlikely.

It is most likely that the fertility estimates for 1984 and for 1995 are flawed. As indicated in multiple census reports by the National Statistical Institute (e.g., Institut national de la statistique, 1991b), those estimates were generated using the FERTCB procedure of *MortPak-Lite*, a United Nations demographic software package (United Nations, 1988). That procedure, which was also used to generate the fertility estimates from the 1995 ENSEF data, uses information from a single survey on the average number of children ever born to women by age group, employing a technique first suggested by Mortara (1949) for populations with constant fertility. The approach presupposes that fertility has remained stable in the recent past, however, and it is clear that applying the procedure when fertility has in fact been falling or rising will yield incorrect estimates.

Consider, for example, what happens when the procedure is used with data from different surveys done in Kenya, where fertility has fallen sharply since at least the latter part of the 1980s. Applying the procedure to data on children ever born from the 1978 Kenya Fertility Survey (part of the World Fertility Surveys programme) yields an estimated total fertility rate of 8.03, which is quite close to the survey estimate of 8.11 (African Population Policy Research Center, 1998). However, when applied to the 1989 Kenya Demographic and Health Survey (DHS) data, the procedure generates an estimated TFR of 8.06, well above the survey estimate of 6.7. Similarly, when applied to the 1993 Kenya DHS data, the children ever born method produces an estimate of the TFR of 7.68, substantially higher than the DHS estimate of 5.4. Note that as fertility transition in Kenya proceeds, the inaccuracy of the children ever born estimates of fertility grows.

Similarly, application of the single-survey children ever born procedure to data the authors collected in 1990 in the capital of the Democratic Republic of the Congo, Kinshasa, yields a TFR estimate of 8.9. This clearly is an extremely

high level of fertility, substantially higher than earlier estimates for 1975 of 7.2 to 7.5, and unprecedented for a large city. Indeed, as documented elsewhere (Shapiro, 1996; Shapiro and Tambashe, forthcoming), there is strong evidence of a decline in fertility in Kinshasa, to a level less than 5.7 as of 1990. **These results indicate that use of the children ever born method with data from a single survey when fertility has been falling will yield inaccurate, misleading and increasingly erroneous estimates of fertility.**

At the national level, the total fertility rate estimated from the 1984 census data was 6.7 children per woman (Institut national de la statistique, 1991b). This represents an increase of 13 per cent as compared with the level that prevailed in the mid-1950s and an increase of 8 to 12 per cent vis-à-vis the level of roughly 6.0 to 6.2 that may be presumed to have existed in the mid-1970s. Such an increase might reflect changes in the proximate determinants of fertility that have sometimes been observed in conjunction with some initial exposure to modernization or schooling, such as reduced durations of breast-feeding and post-partum abstinence. These changes shorten birth intervals and consequently increase fertility (Romaniuk, 1980; Lesthaeghe, 1989).

Alternatively, it is possible that, given the problems outlined above with the implementation of the children ever born procedure used to estimate fertility, the census estimates are incorrect and instead, nationally, fertility has been either stable or perhaps declining somewhat rather than increasing. This is the outcome the authors believe to be most plausible, as described in the following section. Such a scenario would help explain the sorts of anomalies noted in the ENSEF, which contrasted the estimated increased fertility between 1984 and 1995 with the fact (normally associated with reduced fertility) that both the mean age at first marriage and the mean age at childbirth had increased over the same period (République du Zaïre, 1996).

As recently as 1991, United Nations estimates for the country showed a total fertility rate of 6.09 for the first half of the 1980s. That estimated rate, comparable to the author's best estimate as of the mid-1970s, was reported stable for the period from 1970 through 1985 after having been just below 6.0 for most of the two decades prior to 1970 (United Nations, 1991). Following publication of the census estimates in 1991, however, the United Nations estimates were revised so as to be compatible with the census figures. Hence, more recent United Nations estimates show a TFR of 6.0 for the period from 1950 to 1965, with a small increase to 6.1 in the period 1965 to 1970, moving to 6.3 in the period 1970 to 1975, to 6.5 in 1975 to 1980, up to 6.7 in 1980 to 1985 and then holding steady at 6.7 for the period from 1985 to 1995 (United Nations, 2001).

In sum, while the possibility that the total fertility rate in the Democratic Republic of the Congo is as high as 6.7 cannot be ruled out, a strong case can be made for fertility being distinctly lower. A TFR of 6.7 would put the country at or near the top in terms of estimated fertility in Central Africa where the average (excluding the two smallest countries, Equatorial Guinea and Sao Tome and Principe, which are offshore and have relatively low fertility) was under 5.5 in 1995 according to the Population Reference Bureau (1995) and just over 6.0 for 1990-1995 according to the United Nations (2001). The following section considers some of the reasons underlying the authors' point of view.

C. WHITHER FERTILITY?

Between the mid-1950s and the mid-1970s, it appears that fertility in the Democratic Republic of the Congo increased somewhat, as a reflection of reductions in sterility and also possibly some changes in proximate determinants owing to the secular effects of modernization and urbanization. The question is, what happened to fertility after the mid-1970s? A number of factors are likely to be relevant in considering fertility behaviour. They include mortality, women's education, socio-economic development (or, in the case of the Democratic Republic of the Congo, the lack of such development), civil war and economic crisis.

As shown in the first part of this paper, it appears that until recently there has been a long-term downward trend in mortality in the Democratic Republic of the Congo. As Easterlin (1996) and Easterlin and Crimmins (1985) have argued, declining mortality should lead ultimately to lower fertility, as couples determine that fewer numbers of births are required to achieve any given number of desired children surviving to adulthood. Such an effect would clearly be more substantial if the United Nations mortality estimates, which show continued improved mortality during the 1990s, were accurate, rather than the national estimates. At the same time, however, knowledge of the state of the country's economy during the 1990s, as well as of the effects of civil war for most of the past five years, suggests that the more pessimistic estimates from national sources may well be more plausible. Indeed, estimates from the International Rescue Committee (2000) suggest that as a consequence of the ongoing civil war, recent mortality in the Democratic Republic of the Congo now exceeds the levels reported in table 1. This increased mortality, in turn, if it persists, might well contribute ultimately to higher fertility. In any case, longer-term trends in mortality seem likely to have contributed somewhat to fertility decline, but more recent mortality experience is unlikely to promote further declines in fertility.

In the case of women's education, the authors have shown elsewhere (Shapiro, 1996; Shapiro and Tambashe, 1997, 1998 and forthcoming) that in the capital, Kinshasa, women with a secondary education tend to have significantly lower fertility than those with primary or no schooling. The strong tendency for women with a secondary education to have distinctly lower fertility has been documented for a number of countries in sub-Saharan Africa (Ainsworth, Beegle and Nyamete, 1996; Jolly and Gribble, 1993; Muhuri, Blanc and Rutstein, 1994). To the extent that this phenomenon is pertinent in the Democratic Republic of the Congo outside of Kinshasa, the growth over time in the proportion of women with a secondary education should exert downward pressure on overall fertility.

To determine the relevance of this factor, the authors examined data collected in six smaller cities in the Democratic Republic of the Congo during the period from 1975 to 1977. The data collection was carried out in conjunction with the EDOZA and included the cities of Mbandaka, Bandundu, Kikwit, Kananga, Matadi and Bukavu.[4] Looking at the determinants of the number of children ever born among women in those six cities, the authors found that after controlling for age, fertility was highest among women with a primary

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education and that there was a clear pattern of declining fertility as education increased beyond the primary level. In fact, the fertility differentials by education among women in those smaller cities were similar to those among women in Kinshasa (Shapiro, 1996; Shapiro and Tambashe, 1998). Hence, the lower fertility of women with a secondary education that was apparent in Kinshasa in the 1970s was also evident among women in the smaller cities.

In the 1970s, the impact of such better-educated women on overall fertility was very slight, since they were only a minor component of the population of women of reproductive age. Even as of 1984, it is unlikely that this effect was very large, since only 16 per cent of the women aged 15 to 49 nationally had secondary schooling. However, with nearly 25 per cent of 15- to 24-year-olds and 17 per cent of 25- to 29-year-olds having reached the secondary level as of 1984, it seems likely that there was at least some effect.

More importantly, in the years since then, the educational profile of women of reproductive age has changed, with increasing numbers of women having been exposed to secondary schooling. According to the 1995 ENSEF, for example, more than 25 per cent of women aged 15 and over had attended secondary school, and in urban areas the figure exceeded 60 per cent (République du Zaïre, 1996). Given this increase in the proportion of women with secondary education, one would expect distinct downward pressure on fertility.

Socio-economic development in the Democratic Republic of the Congo has been slow since the early 1960s owing to political difficulties, policy concerns and, for much of the past five years, civil war. Fertility transition in much of the developed and developing world has been broadly associated with socio-economic development, presumably in part reflecting increased parental investment in the education of a relatively small number of children, as such investments bear the promise of potentially substantial returns (Becker, 1991; Easterlin and Crimmins, 1985). On that ground, then, the absence of development in the Democratic Republic of the Congo may be seen as a factor supportive of maintaining traditional high levels of fertility.

At the same time, the increased urbanization that has taken place is putting downward pressure on fertility. Urban places are clearly the loci for the beginning of fertility transition in sub-Saharan Africa (Shapiro and Tambashe, 2000). They are places where the economic benefits of children to parents are smaller than in rural areas, where living costs are higher and where opportunities for the education of children are also greater. All of these factors tend to promote smaller families. Hence, even in the absence of meaningful development, the trend towards increasing urbanization of the Congolese population most likely is exerting some downward pressure on fertility.

Some suggestions can be found in the literature about the possibility of crisis-led fertility transitions (Lesthaeghe, 1993), as well as evidence of economic crisis contributing to fertility decline (e.g., see Eloundou-Enyegue, Stokes and Cornwell, 2000; Foster, 1993). The Democratic Republic of the Congo has experienced a long-term economic crisis (from the mid-1970s until 1990), and then more severe economic dislocations since 1990, exacerbated by civil war for most of the period since 1996. It is likely that these dislocations have had some impact on fertility, both in urban and rural areas.

The acute economic crisis of the early 1990s (compare with Maton, Shoors and Van Banwel, 1999) is likely to have led to delays in marriage and in the onset of childbearing, especially in urban places (Foster, 1993). Crisis also appears to weaken solidarity networks whereby extended-family members often provide economic assistance to one another (Eloundou-Enyegue, 1992). Evidence from Kinshasa shows that much of the assistance from solidarity networks is focused on children's schooling and child fostering (Shapiro, Simmons and Tambashe, 1995). To the extent that this phenomenon prevails elsewhere in the country, particularly among urban-dwellers, the weakening of solidarity networks effectively raises the cost of children to parents and consequently puts downward pressure on family size. Rural areas have been doubly hit by economic crisis and by ongoing civil war. Both the outmigration of men to urban places in search of better economic opportunities and the evacuation of able-bodied men from villages in war zones are factors likely to result in lower fertility in rural areas.

Taking all of these factors together, it appears that there are several reasons why one might expect fertility over the past 25 years or so to have declined. Few immediate reasons support the notion that fertility has increased. The magnitude of the factors contributing to a likely decline in fertility is difficult to assess, but at the very minimum, at least a moderate impact seems likely. Hence, given that the total fertility rate in the Democratic Republic of the Congo was probably at a level of just above 6 in the mid-1970s, the TFR at present is probably in the neighbourhood of 5.5. The authors acknowledge, however, that this is speculative on their part. The desirability of having reliable and current information on fertility and mortality in sub-Saharan Africa's third most populous country should be evident.

What the future holds with respect to fertility remains to be seen. Using DHS data from 40 surveys in 25 countries, the authors have examined the unfolding fertility transition in sub-Saharan Africa (Shapiro and Tambashe, 2000). Their analyses indicate that fertility transition typically begins in the capital city, spreads first to other urban centres and then to rural areas. According to the authors, that scenario, undergirded both by increased women's education and by ongoing economic and political disruptions, probably characterizes the Democratic Republic of the Congo as well. The authors have documented declines in fertility in Kinshasa (Shapiro, 1996; Shapiro and Tambashe, forthcoming), and on the basis of the fertility differences by education that were apparent in smaller cities in the 1970s, it can be said that other urban places have also experienced fertility transition. Further, the social and economic dislocations caused by the economic crisis of the 1990s and the ongoing civil war appear to have created an environment where rural fertility is also very likely to have begun to fall. Topics that merit further research using more recent national data include determining by how much fertility has changed and at what pace fertility transition is occurring in the Democratic Republic of the Congo. At the same time, the persistence of economic crisis and civil war and their likely negative consequences for school enrolment, especially among girls, may slow down fertility transition, which the authors believe has already been set in motion in the country as a whole.

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[2] The specific sources used are Romaniuk (1967, 1968) for the 1950s survey; Institut national de la statistique (1991b) for the 1984 census; République du Zaïre and others (1978b) and Tabutin (1982) for the EDOZA and République du Zaïre (1996) for the ENSEF. The ENSEF was national in scope; it covered more than 4,500 households and in excess of 27,500 individuals.

[3] Estimates from UNAIDS and others (2000) suggest that AIDS plays only a relatively minor role in mortality in the Democratic Republic of the Congo, representing no more than 2 deaths per 1,000 population in 1999. However, it is very likely that the situation will change in the coming years. As a result of the civil war, Congolese in the east and north of the country have been under occupation for close to three years, with armed forces from Angola, Burundi, Rwanda, Uganda and Zimbabwe all present. With the exception of Angola, the soldiers all come from countries with high HIV prevalence. Since military populations often play an important role in the propagation of the AIDS epidemic, it is quite possible that with some lag the epidemic may soar sharply, especially among rural populations that have been ravaged by the war and are at the mercy of the armed forces.

[4] Data for these analyses were provided by Emile Berckmans of the Belgian Archives for the Social Sciences at the Catholic University of Louvain, Louvain-la-Neuve, Belgium.

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FERTILITY IN PAKISTAN: PAST, PRESENT AND FUTURE

*Zeba A. Sathar**

A. INTRODUCTION

Fertility in Pakistan has shown a widely acknowledged resistance to change. Owing to sharp declines in mortality after the Second World War, the population of Pakistan was growing at the rate of 2.7 per cent per annum around 1960. In response to concern about rapid growth, a national policy of slowing population growth was articulated in the 1960s, with a programme of family planning services as the main tool. During its first two decades, however, the programme appeared to have had hardly any impact on fertility: the total fertility rate (TFR) continued to hover between 6 and 7 births per woman throughout the 1970s and 1980s, and the population growth rate approached and possibly exceeded 3 per cent per annum.

Finally, at the turn of the century, there is definite evidence of fertility decline in Pakistan. Significantly, all estimates for the 1990s for the first time fall below 6 births per woman, to a little above 5. This is in contrast to numerous surveys that indicated that the TFR remained above 6 births per woman in the 1980s. Furthermore the latest census, held in 1998, with provisional results released in July 1998, indicates that the average population growth rate for the period 1981 to 1998 was 2.6 per cent per annum, a decline from previous intercensal rates and consistent with a decline in fertility in the 1990s. An inter-ministerial committee on the population growth rate reached a consensus that the growth rate for 1998 was 2.4 per cent, placing the current growth rate in 2001 at 2.2 or even less. The present paper intends to highlight the major trends in fertility and its proximate determinants, assess the role of supporting factors such as public policy and social and economic determinants and, lastly, assess prospects for further fertility change in Pakistan.

B. FERTILITY: PAST AND PRESENT TRENDS AND DETERMINANTS

With a population of 130.5 million in the 1998 population census, Pakistan is the world's seventh most populous country. According to United Nations projections, it will become the third most populous by the year 2050. As of 1998, it is one of only 10 countries with a population over 100 million in combination with a TFR in excess of five births per woman (United Nations, 1999). Pakistan stands apart from its populous neighbours in South Asia, all of which (with the exception of Nepal) experienced substantial declines in fertility prior to 1990 and therefore show markedly lower fertility in 2001.

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Intercensal growth rates between 1951 and 1981 indicated a rise in the population growth rate in the 1960s and 1970s (table 1), largely attributed to the sharp declines in mortality seen in the 1950s and 1960s, which were not followed by any decline in fertility in those decades. Intercensal growth rates peaked in the period 1961 to 1972 and continued at fairly high levels between 1972 and 1981, after which they began to decline. The period 1981 to 1998 recorded a decline to 2.6 per cent per annum, indicating that growth rates in the last few years of the intercensal period were probably lower. While the validity of the 1998 census has generally been endorsed, a post-enumeration survey was not carried out. A revised figure issued by the Population Census Organization placed Pakistan's population in 1998 at 131.6 million, and in 2001 this was likely to be closer to 140 million. Demographic surveys from the 1960s until the 1990s also indicate that growth rates peaked in the 1970s and 1980s and have come down quite sharply for the first time since then. The 1998 Pakistan Demographic Survey shows a rate of natural increase of 2.4 per cent, which is one of the lowest figures recorded since the 1960s.

The main contribution to rapid population growth in the recent past is definitely high fertility. Though accepted as high by any standards, internationally and within the country, demographers continue to struggle to establish the exact level of fertility in Pakistan. Whereas in the 1960s data from the Population Growth Surveys established fertility levels between 6 and 7 births per woman, the Pakistan Fertility Survey of 1975, with its full reproductive histories and relatively better data-collection procedures, placed fertility at 6.3 births per woman for the mid-1970s. For the 1970s and 1980s, four major surveys were used to establish the most recent trends in fertility. Those were the Population, Labour Force and Migration Survey of 1979, the Pakistan Contraceptive Prevalence Survey of 1984/1985, the Pakistan Demographic and Health Survey of

TABLE 1. TRENDS IN POPULATION GROWTH RATES IN PAKISTAN, VARIOUS SOURCES, 1901-1998

Census		Survey	
Census year	Intercensal growth rate (percentage)	Survey year(s)	Rate of natural increase (percentage)
1901		1962-1965 (PGE)[a]	2.6
1911	1.6	1968-1971 (PGS)[b]	2.4
1921	0.8	1976-1979 (PGS)[b]	3.1
1931	1.1	1984-1988 (PGS)[b]	3.2
1941	1.9	1989-1994 (PDS)[c]	2.9
1951	1.8	1995-1997 (PDS)[c]	2.6
1961	2.4	1998 (PDS)[c]	2.4
1972	3.6		
1981	3.0		
1998	2.6		

Sources: 1951, 1961, 1972, 1981 and 1998 population censuses of Pakistan.
[a] PGE = Population Growth Estimation Experiment
[b] PGS = Population Growth Surveys
[c] PDS = Pakistan Demographic Surveys

1990/1991 and the Pakistan Demographic Surveys of 1984-1990. As reflected in table 2, considerable divergence exists in the fertility rates presented by these various surveys: estimates for the late 1980s vary from 5.5 as reported by the Pakistan Demographic and Health Survey to 6.9 as reported by the 1988 Pakistan Demographic Survey. A more careful assessment of the latest Pakistan Demographic and Health Survey data, with scrutiny of its reproductive histories and adjustments for data errors, provides a fertility rate of 6.1 for the period 1986 to 1991 (Juarez and Sathar, 2001).

Data from the 1990s demonstrate a distinct decline in fertility levels. Collectively, recent estimates imply a modest decline of around one birth per woman between the 1980s and 1990s. The Pakistan Contraceptive Prevalence Survey, which did not collect birth histories, yielded an indirect estimate of the total fertility rate of 5.6 for 1994/1995, based on information about women's last birth. The Pakistan Fertility and Family Planning Survey of 1996/1997 provides a direct estimate of 5.4 for the period 1992 to 1996, which suggests a slightly more rapid decline during the 1990s than implied by the previous surveys (National Institute of Population Studies, 1998). The extrapolated total fertility rate in 2000 is around 4.8 births per woman or less. Finally, the Pakistan Integrated Household Survey of 1998 suggests that fertility in Pakistan may have fallen to levels below a TFR of 5.

Given the low levels of contraceptive use in the period 1975 to 1991 (table 3), marital fertility could not have declined by very much until the late 1980s, when the survey data indicate a modest decline. A rise in contraceptive prevalence from 5 per cent in 1975 to 9 per cent in 1985 and to 12 per cent in 1991 was hardly supportive of widespread fertility control within marriage. However, the 1990s were a period of distinct departure from that trend, with a sharp rise in contraceptive prevalence. The prevalence among currently married women rose to 18 per cent according to the Pakistan Contraceptive Prevalence Survey of 1994/1995, and to 24 per cent in the Pakistan Fertility and Family Survey of 1996/1997. Contraceptive prevalence is currently projected to be 30 per cent, rising at about 2 per cent a year. Thus, while earlier any change in fertility was attributed to factors other than contraceptive use, it is now a major contributor to the lower levels of fertility seen in the 1990s. It was estimated in 1997 that as many as 36 per cent of currently married women had ever used a contraceptive method.

Any hints of fertility transition from 1961 until 1991 appeared to be largely a result of rising age at marriage among women (table 4) and, as already pointed out, until recently of only a very moderate rise in contraceptive prevalence. Between 1981 and 1998, the proportion of women aged 15 to 19 who were never married increased from 70.6 to 79.4 per cent, while the singulate mean age at marriage increased from 20.2 to 21.7 years. While there was less of a change in marriage patterns among males, their singulate mean age at marriage also rose, from 25.1 to 25.8, thereby reducing the spousal age gap to 4.1 years. These changes in marriage patterns are fairly dramatic. Notably, the higher mean age at marriage in Pakistan (attributable mainly to the "marriage squeeze" and availability of partners) as compared with India and Bangladesh is incongruent with delayed fertility decline in Pakistan.

TABLE 2. TRENDS IN TOTAL FERTILITY RATE (TFR), PAKISTAN, VARIOUS SOURCES, 1962-1996

1960s		*1970s*		*1980s*		*1990s*	
Source	*TFR*	*Source*	*TFR*	*Source*	*TFR*	*Source*	*TFR*
PGE 1962-1965 (CD)[a]	7.95	PLM 1975-1979[e]	6.50	PCPS 1984/85[h]	6.0	PCPS 1994/95[l]	5.6
PGE 1962-1965 (LR)[b]	6.09	PLM 1970-1975[e]	7.10	PDS 1984-1988[i]	6.9	PFFPS 1992-1996[m]	5.4
NIS 1968/69[c]	5.02	PFS 1970-1974[f]	6.28	PDHS 1986-1991[j]	5.5	PIHS 1994-1996[n]	4.5
PGS 1968-1971[d]	6.04	PFS 1965-1969[f]	7.07	PIHS 1987-1991[k]	6.3		
		PGS 1976-1979[g]	6.90				
Average	6.3	Average	6.8	Average	6.2	Average	5.1

Sources: [a] PGE (1962-1965) CD: Population Growth Estimation Experiment Rates (adjusted by Chandra-Deeming formula).
[b] PGE (1962-1965) LR: Population Growth Estimation Experiment (based on longitudinal registration).
[c] NIS (1968/69): National Impact Survey.
[d] PGS (1968-1971): Population Growth Survey, 1968, 1969 and 1971.
[e] PLM (1970-1974 and 1975-1979): Population, Labour Force and Migration Survey, 1979.
[f] PFS (1965-1969 and 1970-1974): Pakistan Fertility Survey, 1975.
[g] PGS (1976-1979): Population Growth Survey, 1976, 1977, 1978 and 1979.
[h] PCPS (1984/85): Pakistan Contraceptive Prevalence Survey, 1984/85.
[i] PDS (1984-1988): Pakistan Demographic Surveys, 1984, 1985, 1986, 1987 and 1988.
[j] PDHS (1986-1991): Pakistan Demographic and Health Survey, 1990/91.
[k] PIHS (1987-1991): Pakistan Integrated Household Survey, 1991.
[l] PCPS (1994/95): Pakistan Contraceptive Prevalence Survey, 1994/95.
[m] PFFPS (1992-1996): Pakistan Fertility and Family Planning Survey, 1996/97.
[n] PIHS (1994-1996): Pakistan Integrated Household Survey, 1998.

	National Impact Survey, 1968/1969	Pakistan Fertility Survey, 1975	Population, Labour Force and Migration Survey, 1979	Pakistan Contraceptive Prevalence Survey, 1984/1985	Pakistan Demographic and Health Survey, 1990/1991	Pakistan Contraceptive Prevalence Survey, 1994/1995	Pakistan Fertility and Family Planning Survey, 1996/1997
Current use of contraception (percentage)	5.5	5.2	3.3	9.1	11.9	17.8	23.9
Ever use of contraception (percentage)	12.1	10.5	4.6	11.8	20.7	28.0	35.7

TABLE 4.   TRENDS IN MARRIAGE PATTERNS,
PAKISTAN, 1951-1998

	Singulate mean age at marriage			Proportion never married at 15-19, female
Census year	Male	Female	Male-Female	
1951	22.3	16.9	5.4	27.1
1961	23.3	16.7	6.6	25.4
1972	25.7	19.7	6.0	65.6
1981	25.1	20.2	4.9	70.6
1998	25.8	21.7	4.1	79.4

Sources: 1951, 1961, 1972, 1981 and 1998 population censuses of Pakistan.

Another interesting feature of Pakistan's demographic situation is the rapid rate of urbanization. In the 1981 census, 28 per cent of the population resided in urban areas. That proportion had risen to 32 per cent in the 1998 census. The increasing share of the urban population is largely a result of migration from rural to urban areas. However, to a large extent, urban fertility has continued to be high with hardly any differential between urban and rural areas (Yusuf and Retherford, 1981; Sathar, 1979). The pattern of urban-rural fertility differentials has been changing since around 1985 (table 5), when the 1984/1985 Pakistan Contraceptive Prevalence Survey found considerably lower fertility rates in the major urban areas of Karachi, Lahore and elsewhere (Population Welfare Division, 1986). Data from the 1980s showed the urban TFR to be between 0.7 and 1.2 points below rural levels (Juarez and Sathar, 2001). The rural-urban fertility differential seems to have widened since the 1980s. While fertility has begun to decline in rural areas, the change appears to be more gradual than in urban areas. For instance, according to the Pakistan Fertility and Family Planning Survey, the TFR in major cities is 3.9 as compared with 5.9 in rural areas. Interestingly, provincial fertility differentials have been small despite considerable differences in levels of development across the regions. The province of Sindh has the lowest fertility, but this is primarily due to the large population of Karachi.

Survey	Period	Urban	Rural
Pakistan Fertility Survey (1975)	1970-1974	6.2	6.4
Population, Labour Force and Migration Survey (1979) ...	1975-1979	6.2	6.6
Pakistan Contraceptive Prevalence Survey (1984/1985)	1984/1985	5.5/6.1[a]	6.2
Pakistan Demographic Survey (1992)	1992	6.2	7.3
Pakistan Demographic and Health Survey (1990/1991) ...	1986-1991	4.7/5.2[a]	5.6
Pakistan Contraceptive Prevalence Survey (1994/1995) ...	1994/1995	4.5	6.3
Pakistan Fertility and Family Planning Survey (1996/1997)	1996/1997	3.8	5.8

[a]The Pakistan Contraceptive Prevalence Survey and the Pakistan Demographic and Health Survey divided urban areas into major urban areas and "other" urban areas; TFRs were higher in the latter category.

Three of the fertility surveys also collected data on infant and child mortality. As with fertility, the mortality rates from different sources present a conflicting story, with considerably higher infant mortality from the Pakistan Demographic Survey than from the Pakistan Demographic and Health Survey. Not only are the levels different, but a downward trend appearing in the latter data is not seen in the former. A reinterview round of some of the Pakistan Demographic Health Survey respondents indicated considerable omission of infant deaths and cast doubt on that survey's estimates (Institute for Resource Development, 1994). Based on the reinterviews, the adjusted PDHS estimate of the infant mortality rate was 107 deaths per 1,000 live births for the nine-year period before the survey. Thus even with a downward trend in mortality, the infant mortality rate is likely to have been at least 100 deaths per 1,000 in 1990. Infant and under-five mortality rates of males exceed those of females by about 15 per cent and 10 per cent respectively. Recent surveys indicate a decline in infant mortality to a little less than 90 deaths per 1,000 at the turn of the century. However, those rates represent quite high and resilient levels of infant mortality.

Since mortality rates above these very young ages are largely unknown, mortality indicators such as life expectancy are usually derived from model life tables; such model life tables indicate that life expectancy at birth was around 59 years for both men and women in 1990 and had risen to 63 years by the late 1990s. This equalization of life expectancy by gender is a recent phenomenon. Until recently female life expectancy in Pakistan was lower than male life expectancy. This was largely due to higher female childhood mortality in the past and high mortality among women of reproductive ages. Estimates of the maternal mortality ratio, for instance, while covering a broad range from 227 to 756 maternal deaths per 100,000 live births, are among the highest in the world (Fikree, Jafarey and Pal, 1994).

C. THE ROLE OF PUBLIC POLICY

Pakistan recognized several decades ago that its population growth was extremely rapid and that it would soon be faced with a doubling and tripling of its population. The country has had an official antinatalist population policy since 1965. However, official efforts at reducing population growth have met with little success. This is in contrast with Bangladesh, which was a part of Pakistan until 1971 and has since managed to curb its rapid population growth rate much more effectively, despite its dire economic circumstances. India, too, has achieved relatively more success in recent years. Though not all success in bringing about fertility decline in India is due to public efforts, with the exception of four large states in northern India, fertility rates there have certainly experienced sharp declines.

As mentioned above, Pakistan has had an official policy to curb population growth from 1965 until the present day. The content of the population programme, which is almost the sole organ through which population policy is expressed and executed, has experienced a number of changes during this period. Several approaches have been utilized in efforts to extend service delivery. By and large the programme has only changed in the specifics about how it ought to deliver services, but it has remained focused on women and has been based on the model assuming that women themselves are expected to seek family planning services. The programme has lacked a firm political commitment to it; at many points it has lacked funds and it was even suspended under President Zia ul-Haq for two or three years. Its checkered history and rather fragile base have rendered it practically non-effective.

A distinct revival of interest in population policy occurred starting in the mid-1990s. The last two prime ministers both addressed the issue of population growth as a national priority in important public platforms. Former Prime Minister Benazir Bhutto attended the International Conference on Population and Development despite the fear of a religious backlash. However, more importantly, funding for the population programme has been rising, albeit slightly. In the 1980s the focus of the programme was on providing a multisectoral approach to family planning by combining it with other forms of information and advice through the 1,250 family welfare centres set up by the Government. Although these were to be supplemented by efforts of non-governmental organizations, by hospitals and clinic-based services, and through doctors and *hakeems*, the coverage remained very limited, especially in rural areas. In preparing for the Eighth Five-Year Development Plan (Ministry of Population Welfare, 1992), a new scheme was proposed for community-based delivery of family planning services and advice, under the aegis of the village-based family planning worker scheme. Several thousand such workers were to be recruited, trained and put in place to provide services in their own villages by the end of the Plan period in 1998. Health outlets were also asked to provide family planning services, and the Ministry of Health launched a scheme of its own to provide 40,000 female health workers.

If the services are effectively delivered to the doorsteps of women under these initiatives and are of acceptable quality, presumably a large proportion of women will begin to adopt contraception. That assumption is based on the large

unmet demand as expressed by women themselves. According to the 1990/1991 Pakistan Demographic and Health Survey, almost 40 per cent of currently married women aged 15 to 49 wanted no more children, and the estimated figure for those who experienced an unmet need for family planning services to space or curtail their families was 28 per cent (National Institute of Population Studies and Institute for Resource Development, 1992). Family planning awareness has increased substantially in recent years, and the majority of men and women of reproductive age know of some method for controlling fertility (though fewer know of a source for obtaining family planning services). Also encouraging is the acceptability of family planning in Pakistan: among currently married women who were not sterilized and who knew of a contraceptive method, 61.6 per cent approved of family planning. However, unmet need remains high even in the 1990s, at about 38 per cent (National Institute of Population Studies, 1998), indicating continuing large proportions of women who want to space or limit births but who face obstacles to adopting contraception.

While the shift in focus has been made to attempt to provide women who are especially secluded with family planning services through community-based delivery, up to now the majority of women who are using or have ever used contraception are located in urban areas, especially in large cities. They are also likely to be educated and working in the formal sector. Thus, the impact of population policies or related efforts to curb fertility that have met with any success is greatly influenced by women's place of residence and their individual characteristics.

The period following the International Conference on Population and Development marked an even greater active interest in population policies and issues of reproductive health. While reducing population growth rates remains the primary concern of the Government of Pakistan, there is greater emphasis on providing accessible and better-quality services to meet the needs of individuals. Furthermore, the need on the part of the Ministry of Population Welfare to collaborate with other public institutions as well as with the private sector and non-governmental organizations now appears in all documents, such as the Ninth Five-Year Plan (1998-2003), and the population and reproductive health policies formulated in 2000. In an atmosphere in which such major donors as the United States Agency for International Development are not operating in Pakistan, the Government is still committing scarce resources to family planning and reproductive health. The Ministry of Population Welfare and the Ministry of Health have jointly evolved a reproductive health package to be administered in public facilities. By the end of this year, the Ministry of Health will be taking over most of the service delivery functions in that area. Increasingly, the private sector is taking on responsibility for dispensing, advertising and training in reproductive health through social marketing programmes.

D.   THE ROLE OF SOCIOCULTURAL AND ECONOMIC FACTORS

Fertility transition has not occurred in Pakistan, probably as a result of the ineffectiveness of population policy and the failure of the State or the private

sector to absorb the demand for quality family planning services. Moreover, the sociocultural and economic conditions of Pakistan, which are quite distinct from its neighbours, have hindered fertility decline. Although the economy improved in the 1980s with acceptable rates of growth, in the 1990s Pakistan experienced a sharp deterioration in its economic growth rates and a rise in poverty levels. Those circumstances negated any efforts made to remedy the past record in social development.

The lack of progress in education and health has obvious direct implications for fertility. The majority of the population (above 70 per cent) is illiterate and resides in rural areas, where illiteracy is even more pronounced. Education has been a largely neglected sector in past decades, and few resources have been allocated to it until recently. The demand for schooling has also been weak in this largely uneducated, rural population engaged mostly in agriculture. Female education continues to be at a low level, with barely one woman in ten advancing beyond primary education. While the situation is improving and the Government is placing special emphasis on primary schooling for girls through the Social Action Programme, it will be several years before this affects cohorts of married women. Nonetheless, some slight change in this regard has been recorded: whereas only 10 per cent of married women aged 15 to 49 had any education in 1975, this proportion increased to 22 per cent in 1992 (National Institute of Population Studies and Institute for Resource Development, 1992). The 1998 census indicated a rise in literacy levels to 45 per cent overall and about 33 per cent for women. However, investment in the health sector and such related areas as the provision of sanitation and potable water continues to be very limited.

The cultural milieu has changed only slightly in the last two decades. In most respects, Pakistan remains a feudal and agricultural society with strong bonds of caste and family. In particular, the position of women has hardly changed in terms of opportunities for both education and remunerated work outside of the family farm or enterprise. In certain respects, particularly legal rights, their position may have even deteriorated. Thus, the combination of low educational expansion, lingeringly high infant mortality and weak women's power within households and society are all factors that would impede rapid changes in fertility desires and in women's ability to control their fertility.

The rapid rate of urbanization in recent decades must be singled out as an instance of social change of serious magnitude. As more and more Pakistanis move from rural bases to urban areas, even though many might move to squatter settlements and slums in the big cities, they are increasingly exposed to the "urban influence". This consists of greater exposure to the media and a modern way of life, greater non-agricultural work opportunities and a weakening of ties with rural roots. The proportion of the population living in urban areas rose from 18 per cent in 1951 to 28 per cent in 1981 and to 32 per cent in 1998. Unlike many other developing countries, urban fertility in Pakistan has only very recently been recorded as lower than rural fertility. That occurs because even when rural Pakistanis move to cities and towns, they may do so without their extended and even sometimes without their nuclear families. Ties with natal kinsmen and feudal linkages continue to extend their influence despite changes

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in residence. Social patronage and control continue to influence values and family size norms but to a much lesser extent. However, this may have begun changing in the 1990s with a rise in the proportion of nuclear families, now the category of almost half of all households.

The position and status of women have changed little, as already expressed through low female educational attainment, but also in their being largely confined to the sphere of the home. When women do engage in economic work, they do so much less than men, and are even less likely to be remunerated for it. Women's economic work is barely acknowledged in official statistics. Although an increasing proportion of women are entering the labour force, especially in the informal sector, it is questionable whether this is likely to lead to an improvement in their status within the household and society.

Research has shown strong linkages between lower fertility and post-primary education and formal sector employment (Sathar and Kazi, 1990). In rural areas the link is stronger between women's autonomy and paid employment outside the home than with educational attainment (Sathar and Kazi, 1997). However, the proportion of women who are educated and engaged in economic activity remains small, and therefore this is not likely to be an important influence on fertility change.

Another way in which the low status of women in Pakistan has a direct impact on fertility is through the strong preference for male progeny. It could be argued that in a low contraceptive use society, parents are not making choices about the number of children they want to have and therefore are unlikely to be vastly influenced by the gender of children in making reproductive decisions. However, the majority of current contraceptive users have two living sons, and the number of living sons is strongly positively associated with the desire not to have any more children (Ali, 1989). Thus, the strong preference for male children is likely to influence the adoption of fertility control and may become a more contentious factor as fertility begins to decline more notably and parents make more confined choices about numbers of children. This has been the case in other Asian societies with strong son preference, such as China, India and the Republic of Korea.

E. PROSPECTS FOR THE FUTURE

A considerable discrepancy exists in information drawn from various data sources and in the projections based on those sources. Population projections for the year 2020 vary from 244 million (medium variant) and 232 million (low variant) according to the United Nations (1999), to just over 200 million according to the Government of Pakistan (Ministry of Population Welfare, 1999). To some extent the differences in the projections are based on the method used by each of the agencies to date the beginning of fertility transition in Pakistan and subsequently the levels of fertility used for the projections. Undoubtedly, the most important factor in determining which trajectory of projections emerges as realistic for Pakistan will depend on the actual speed of fertility decline in the next two decades. Fertility decline from its current estimated level of 4.8 to about 4 children per woman in the near future will be possible

only when fertility transition diffuses to the rural areas. At the moment, fertility transition has hardly begun in rural areas, which is not surprising given the vast differences in service delivery and in social development between urban and rural areas.

Fertility transition will occur largely as a result of the crystallization of existing desires for smaller families along with a decline in family size desires and a reduction in the social, cultural and psychic costs of contraception (Sathar and Casterline, 1998). To the extent that a large proportion of fertility is unwanted even in the 1990s, reducing fertility in the immediate future will depend very much on meeting existing need for contraception, given the large percentage of currently married women who have unmet need. Unmet need remains high in both urban and rural areas (38 per cent in 1996/1997 as reported by the Pakistan Fertility and Family Planning Survey). Contraceptive uptake could be fairly rapid if the service delivery environment was to improve. That would require a spread of service delivery networks, such as sustaining and expanding the programme of community-based workers, as is currently planned. It would also require the private sector, which is currently concentrated in urban Pakistan, to penetrate into rural areas. However, one of the major reasons behind unmet need for family planning services goes beyond the availability and quality of services to the issue of women's subordinate status, which is an important obstacle to the adoption of family planning (Casterline and others, 2001). To overcome this obstacle and others, such as social disapproval of family planning, it is recommended—and the Government of Pakistan is proposing—to address men, religious leaders and political representatives through advocacy to enable women to overcome the strong resistance at the family and community levels that currently inhibits their adoption of contraception.

The Government's own objectives are for the total fertility rate to be about 4.0 in five years and to reach replacement levels by the year 2020. While those levels of fertility are certainly possible, the expected decline of two births per woman in a period of 15 years (2005-2020) is based on the assumption that women's desired family size will be much lower than the current and fairly consistent stated ideal of about 4 children. It is also based on the expectation that unmet demand for family planning will be bridged by the combined efforts of private and public sector initiatives to provide family planning services. However, if reproductive intentions remain stagnant, then family planning programmes can only reduce fertility to its current wanted levels of about 4 children. To expect fertility to decline much below 4 children would also require the demand for children to change. This change would not occur without more profound and rapid changes in Pakistani society, which clearly do not emerge from this appraisal of the current situation. An effort to reduce fertility preferences from their current levels requires strong investments in social and economic development (Bongaarts and Amin, 2001). The demand for radically smaller families requires parents voluntarily to want to make stronger investments in their children. A rapid increase in educational attainment rates, especially for girls, an induction of a huge proportion of women into the paid labour force and a rapid improvement in health seem unlikely, but such changes will need to occur to alter fertility behaviour in Pakistan. Those changes can

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occur, quite independently of public policy and deliberate efforts to control fertility. They can have an immense impact in a short period of time, as seen in the case of Bangladesh in recent years.

To some extent, the growing awareness that marital fertility can be controlled and the greater acceptability of contraception will act as a catalyst for an increasing number of couples to adopt a smaller family size. Coupled with this dynamic is the response to trends in economic aspirations and the increasing burden of costs in rearing children (particularly for schooling and health). The impact of the media, particularly electronic media, will be an important factor in this regard. Those factors will certainly ensure the continuation of fertility transition in Pakistan.

In conclusion, while most of South Asia had similarly high levels of mortality and fertility about four decades ago, few would have predicted the demographic diversity that ensued. Southern India and Sri Lanka led fertility transition, but most other areas followed with fertility declines by the 1980s especially, surprisingly, Bangladesh. Pakistan was the largest block in South Asia to begin its fertility transition as late as the 1990s. The burning question for Pakistan's demographic profile is whether it will converge rapidly to the lower fertility patterns of neighbouring South Asia or whether it will continue to lag behind by a couple of decades. For Pakistan to "catch up" it will have to experience a major departure from its previous and current trends of low school enrolments, low literacy, high infant mortality and weak autonomy of women, amounting to fairly major transitions in its social sector record and policies. Meeting these requirements will be fairly daunting. However, if this does not occur then it is very likely that fertility transition in Pakistan will continue to lag behind its South Asian neighbours.

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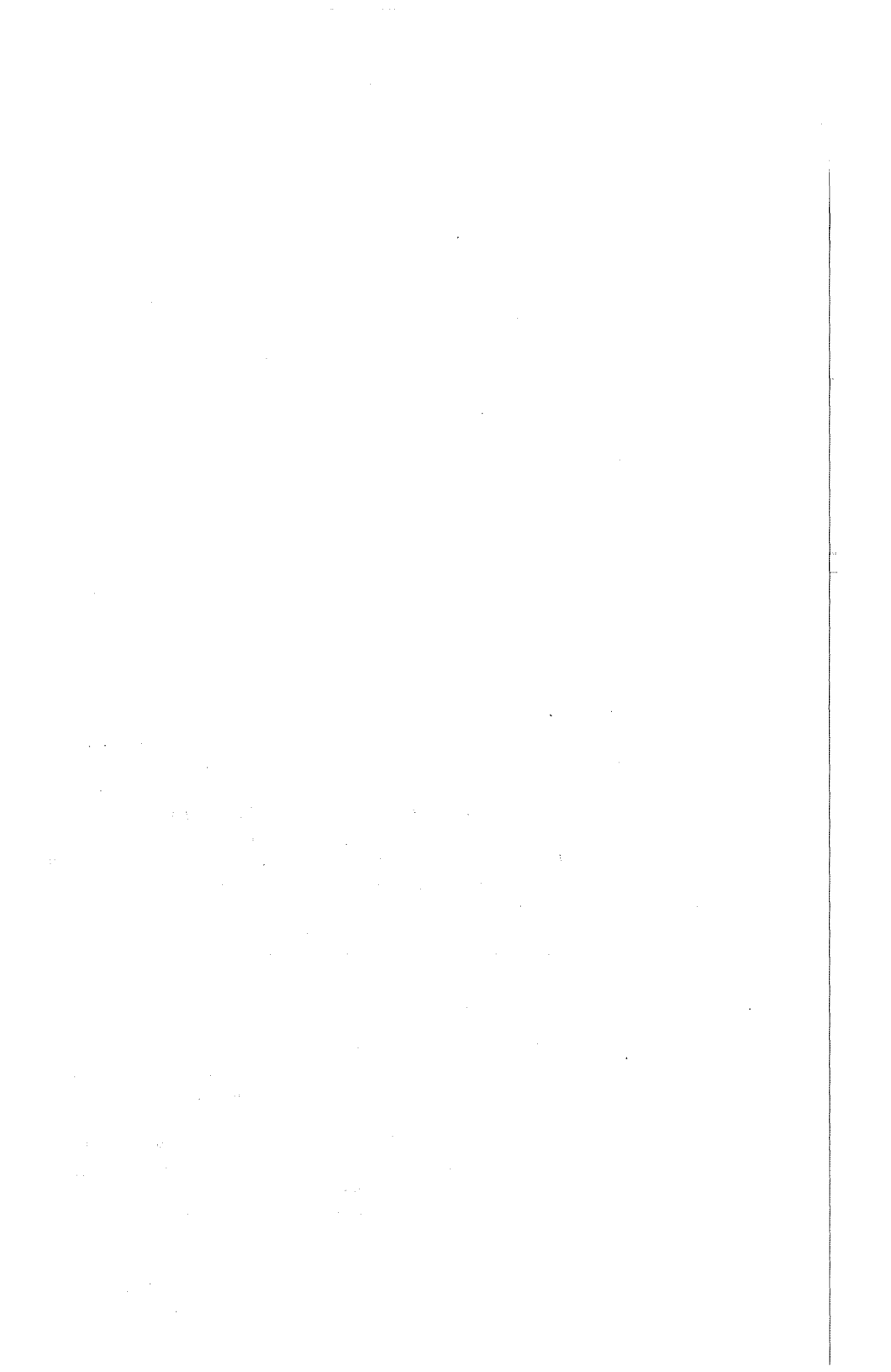
FERTILITY IN RURAL AFRICA: SOME INDICATORS FOR ANALYSIS OF DEMOGRAPHIC CHANGE AMONG THE MOSSI OF BURKINA FASO[1]

*Christine Ouedraogo**

A. INTRODUCTION

Africa is the last region in the world to enter fertility transition, and it is doing so at a different rate from other developing countries. This is puzzling and even worrying for demographers, especially since the population growth rate in sub-Saharan Africa is higher than elsewhere owing to the reduction in infant mortality. The questions that are on demographers' minds are how fast the fertility decline is going to progress in the countries where it has already begun and, above all, when it is going to begin in the rural areas of West African countries.

To answer these questions and to make population projections, demographers can draw on a large body of empirical data and an equally large number of theories about the determinants of fertility decline. Five theoretical approaches to explaining fertility transitions can be identified (Piché and Poirier, 1995a).

The first approach emphasizes the means of controlling fertility and the importance of access to contraception for initiating and spreading fertility decline. This approach presupposes the existence of a large, unexpressed demand for fertility control which can be uncovered and expressed by setting up family planning programmes. This pragmatic approach is linked to the view that population growth is an obstacle to economic development.

A second approach is based on Caldwell's work (1976, 1978). The theory of intergenerational wealth flows explains the transition from high fertility to low fertility by a change in the value placed on children. Where fertility is high, net wealth flows benefit older members of the family; where fertility is low, net flows benefit children. Fertility transition is thus defined by the inversion of wealth flows that results from the economic and emotional nuclearization of the family. The origin of this demographic transition is the dissemination of Western values through the school system and the mass media. Emotional nuclearization means that parents become less concerned about their older relatives and other members of the extended family and instead pay greater attention to their own children (Caldwell, 1976). The driving force behind fertility transition, according to this approach, is the transformation of economic and cultural values, particularly the value placed on children.

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A third, Marxist, approach focuses on the link between fertility and systems of production. It identifies several forms of transition, depending on the place occupied in the system of production. In Africa, the introduction of capitalism has radically altered the demographic strategies of the peasant classes. For those classes, the family is still the main place of subsistence production. Demographic reproduction must supply sufficient manpower for both agricultural production and migrant wage labour. As a result, rather than decreasing, the pressure in favour of high fertility may even increase in rural Africa. Children and young adults are a production value that is essential to the survival of domestic units.

A fourth approach sees the weight of institutions as explaining fertility. The work of Boserup (1985), McNicoll (1980), Cain (1983) and Lesthaege and Surkin (1988) reopened the debate on fertility transition theories by emphasizing the role of institutions. For them, fertility determinants fit into the broader context of the institutions of production and reproduction. These determinants must therefore be analysed with reference to the system of production and the organization that the social group adopts to ensure its reproduction. According to Lesthaege and Surkin (1988), it becomes essential to contextualize fertility decision-making mechanisms by analysing the interaction between the structures of material production and that of demographic reproduction.

A fifth approach based on a feminist viewpoint has allowed a fresh look at the mechanisms of demographic transition from the standpoint of the decline of the patriarchy. It is women who do the bulk of the work needed to produce human beings, but it is men who control the child labour force. The patriarchal system is based on men's domination of children and women. This male power is based on control of resources (land, capital etc.) and control of the institution of marriage. High fertility is thus explained by the material advantages that men derive from their dominant position and from their patriarchal control over the family's labour. In some cases, however, women may also benefit from high fertility, especially if they are economically dependent on their husbands. What is interesting about this theory is that it places fertility decline in the context of changes in the division of labour by sex in productive and reproductive activities. The author of the present paper subscribes to this approach, which draws on the institutional approach while taking account of gender relations within the family.

The purpose of the paper is to shed light on the obstacles to fertility decline in the rural areas of West Africa and to explore current changes that might lead to a reduction in fertility. Mossi society is used as a case study owing to the author's experience among the Mossi, where she has conducted a considerable amount of qualitative research concerning reproductive issues (Ouedraogo, 1997).

An introduction to conventional fertility-related indicators drawn from the two Demographic and Health Surveys conducted in Burkina Faso in 1993 and 1998 will be followed by a brief description of the traditional organization of Mossi society and an analysis of the place of women in that society and the factors conducive to high fertility. The paper then describes the changes taking place in those institutions and the factors that might lead to a reduction in fertility.

B. MAIN INDICATORS

Despite the changes affecting many areas of life, fertility remains high in rural areas of Burkina Faso. Many researchers have suggested that there are signs of the beginning of a demographic transition and fertility decline. However, if we look at the DHS data of 1993 and 1998 (see table), the indicators do not seem to suggest that a transition is under way in rural areas: the total fertility rate (TFR) stayed the same (7.3 children per woman). In urban areas, on the other hand, the data show that a transition is well under way and the indicators reflect a decline in fertility.

With regard to nuptiality, age at first marriage rose slightly in rural areas and the proportion of women married at ages 15 to 19 decreased from 44.6 per cent in 1993 to 34.8 per cent in 1998. The proportion of women in a monogamous marriage at ages 30 to 34 rose from 39.3 per cent in 1993 to 41.7 per cent in 1998, showing that monogamy is on the increase.

With regard to sexuality, the proportion of women in rural areas having had sexual relations for the first time at ages 15 to 19 increased from 17.1 per cent to 17.4 per cent between the two surveys, while age at first childbirth did not change.

The interval between pregnancies for women aged 24 to 35 years decreased in rural areas, but the duration of post-partum abstinence decreased only slightly. The proportion of women of childbearing age currently using a modern method of contraception increased from 1.5 per cent in 1993 to 2.6 per cent in 1998.

In Bazega province, close to the capital city, the total fertility rate declined from 6.7 children per woman in 1996 to 6.4 in 1998, according to surveys conducted by the Demographic Teaching and Research Unit (UERD) in the context of the Community Health Lab. Over the same period, the proportion of women currently using a modern method of contraception rose from 4.4 per cent to 5.4 per cent.

C. TRADITIONAL MOSSI SOCIETY

The Mossi are the largest ethnic group in Burkina Faso, accounting for over 60 per cent of the population in the 1996 census. They are concentrated on the central and north-west plateau, where population density was over 65 inhabitants per square kilometre at the 1996 census (compared with a national average of 39).

The following sections illustrate the organization of Mossi society, including such basic characteristics as the organization of power, family structures, the matrimonial system, the system of production and the division of labour by sex. For each of these, a description of the place occupied by women is provided. The information comes from studies conducted by ORSTOM in the 1970s (Capron and Kohler, 1975; Boutillier, Quesnel and Vaugelade, 1977).

TABLE. INDICATORS OF FERTILITY, NUPTIALITY, POST-PARTUM ABSTINENCE, BREASTFEEDING AND CONTRACEPTIVE USE IN BURKINA FASO, DEMOGRAPHIC AND HEALTH SURVEYS, 1993 AND 1998/99

Indicators	DHS 1993			DHS 1998/99		
	Rural	Total	Urban	Rural	Total	Urban
Fertility						
Total fertility rate (children per woman)	7.3		4.7	7.3	from 6.7 to 6.4 in Bazega	4.1
Median age at first childbirth	19.1		19.6	19.2		19.8
Nuptiality and sexual relations						
Proportion of women married at ages 15-19		44.6			34.8	
Median age at first marriage	17.4		18.0	17.6		18.9
Proportion of women having had sexual relations for the first time at ages 15-19		54.1			49.1	
Median age at first sexual relations	17.1		17.9	17.4		18.3
Type of marriage: percentage of women in a monogamous marriage at ages 30-34	39.3		67.6	41.7		75.0
Post-partum abstinence and breastfeeding						
Duration of post-partum abstinence (months)		19.8			20.1	
Duration of breastfeeding (months)		25.2			28.8	
Interval between pregnancies for women aged 24-35 years (months)	40.7		38.0	37.6		39.6
Contraception						
Proportion of married women using a modern method	1.5		19.9	2.6	from 4.4 to 5.4 in Bazega	20.1
Percentage of married women with an unmet need for family planning in order to space births	20.2		19.0	19.6		14.9

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1.   *Power*

Several types of authority are present among the Mossi. First, there is *naam*, which is the power to command men; it is political power, to which the Mossi ascribe a divine origin. Only members of the princely lines have *naam*, which they inherit as a kind of charisma.

Next, there is *tengdo*, which is the power to command the earth, at once a material and a symbolic substance that sustains all human activity and is the dwelling place of the dead and the living, the ancestors and all the invisible cosmogony that influences the life of the living. Fertility is the link between the different aspects of *tenga*. Whether it is the tamed earth, the subsoil or the bush, the purpose of all activity is fertility: fertility of agricultural land, fertility of the men living on it, fertility of the bush, fertility of the forge. The masters responsible for the symbolic management of the soil (*tengsoba*) and the bush (*bugo*) or the forge (*sogna*) are also the masters of fertility. Among the Mossi, if a couple has no children, it is the woman who is considered infertile and undergoes treatment. This requires the services of a *bugo* (master of the bush) or a *sogna* (blacksmith).

The different types of authority among the Mossi are codified in what the Mossi call the *rog n miki* (literally "what I find on coming into the world" or "tradition"). The *rog n miki* is a code of conduct to which reference is made in passing laws. It is supposed to define, for each type of social relation, the rights and duties of each party, the right way to be, to say or to do. It is at once the frame of reference for conduct and the code that characterizes and sanctions conduct either positively or negatively. The *rog n miki* is at the core of the socialization process and promotes social integration.

2.   *Family structures*

The family in Mossi society is organized on the basis of a highly central-ized and hierarchical patriarchal power. In the patriarchal system, older fam-ily members have authority over younger ones, and men have authority over women in all areas of social life. Access to land and to wives, for instance, is determined by the individual's position in the power structure, which depends on his birth rank: older brothers have more power and privileges than younger ones. Family ties and alliances play an important role in the hierarchy of the values ascribed to each member of the group.

The family lineage, or *buudu*, is the basic structure around which the social life of the community is organized. It is the family line that administers all activ-ities: land, alliances, justice. It is headed by the oldest member (*buud kasma*), who derives his authority from his age and his rank in the lineage (Gruenais, 1985).

Precedence is thus a hierarchical principle which functions between family lines and within the family. It is the basis of the rights of the first occupant (or indigenous occupant) over the one who comes later and also of the birthright.

The Mossi domestic unit is the *zaka*, commonly called the "concession". It is also a consumption unit. It is the residence unit of a family group made up of the head of the farm, his wives and unmarried children, his married children and their wives and children, his married and unmarried younger brothers and

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other individuals with some kind of family tie to the head of the farm. The size of the unit may vary from a few people to several dozens. The *zaka* may comprise more than one farm. The system governing residence of family members is patrilocal: a woman must live with her husband's family.

As in many African societies, the woman's social position is one of subordination. As a girl, she is viewed as a reprieved outsider in her own community. When she marries, she becomes a real outsider in her husband's community, to which she moves under the rule that the wife must join her husband. Her husband's position may add to her own position of inferiority; for instance, she may be the wife of a younger brother. The group of women in a household also functions according to a model of hierarchical authority in which younger women are subject to the authority of older women.

At the core of this organizational structure is the production of children to ensure the reproduction of the family lineage and the safeguarding of the family heritage. Moreover, the circulation of children makes it possible to strengthen ties among relatives of the same lineage, compensate for the acquisition of a wife by returning a child to the wife's original family and lend out children when a family is short of manpower (Guillaume and other, 1996; Lallemand, 1993).

3. The matrimonial system

A society's matrimonial system reveals the place accorded to reproduction within the group as well as the norms and principles governing that society. Marriage is not the product of obedience to an ideal rule; it is the culmination of a strategy that must ensure not only the reproduction of the family line but also the safeguarding of the family heritage. Chiefs accumulate wives and redistribute them in such a way as to maintain and reinforce their power. It is they and the older members of family lines who control the movement of women. Wives are acquired to produce children, and those who after a number of years prove "unproductive" are marginalized and sometimes sent back to their own families.

The production of children, which ensures the reproduction of the family lineage, is thus central to marriage. Wives are a priceless value in the trading and production of children.

Customary marriages take several forms. *Pug-siuure* marriages, or deferred-compensation marriages, involve returning the first daughter of the woman given in marriage to the man who gave her away. This type of marriage reinforces the authority of the older members of the family with regard to the movement of women, since each woman given in marriage confers new rights to a woman as yet unborn. Younger brothers have no rights over their own children and remain dependent on the older brothers who gave them their wives. Exogamy promotes the steady expansion of networks of alliance and the social integration of local groups and outsiders. Another form of traditional marriage is marriage by gift. The woman is given to a head of family, preferably a powerful, prosperous one, as a sign of friendship. The giver expects to receive other kinds of advantages (protection and support) in return. In these marriages, age differences are over 15 years.

Marriage by inheritance is a third form of traditional marriage. When a man dies, his relatives inherit his wife for she belongs by marriage to her husband's patrilineal family. Wives who are still fertile are rapidly returned to the matrimonial circuit: as soon as the funeral is over, they are distributed among the relatives entitled to inherit according to the customary laws in force. In theory, the woman can choose a spouse from among her husband's relatives. Most widows are given primarily to unmarried relatives. This is the principle of the levirate. In all these cases, matrimonial payments are deeply symbolic and cement the alliance between two family lines.

The forms of non-customary marriage are basically marriage by abduction and marriage by mutual consent. When the power of the older members of the family becomes unbearable, one way around it is to abduct the young woman: in so doing, young people manage to evade the authority of the older members. The abduction is often carried out with the complicity of the young woman's mother. The young man must then flee with his "stolen" bride and wait for the family's anger to subside. This type of marriage deprives the older family members of their principal means of controlling their dependants: they lose the benefit of the productivity of the dependants who escape them. It also undermines established alliances and prevents the older members of the family from carrying out their social strategies. Abduction and marriage by mutual consent are for them a real loss of authority and a serious threat to the traditional organization of society. When this type of marriage is ultimately endorsed by the family authorities, the object is to defuse tensions that might otherwise prompt more rebellious elements to refuse or fight against a marriage.

Marriages by mutual consent generally take place through the Roman Catholic church or Protestant church, with or without the consent of the families. The customary salutations preceding the marriage are exchanged between the priest or pastor and the young man's family if the young woman has refused to be given to a husband chosen by her family. Age differences between the spouses are far smaller in this kind of marriage—less than 10 years (Capron and Kohler, 1975).

4. *The system of production*

The Mossi plateau is situated in the Sudano-Sahelian area where rainfall is very irregular (between 400 and 800 millimetres a year). Periods of acute drought follow a four-year cycle (Marchal, 1985). There is a chronic deficit in grain production. The tropical ferruginous soil is put under severe strain by the combined impact of man and drought.

When they have a grain surplus, men invest in livestock, which provide a form of savings that is easy to mobilize in cases of urgent need. Children are responsible for herding the livestock.

In societies that live off grain production with little mechanization, man is the main factor of production. In this situation, women have considerable importance as both producers and reproducers, and children have an economic value. Women are responsible for 60 to 80 per cent of food production, 50 per cent of livestock production and 60 per cent of trade in essential goods, according to numerous surveys conducted by ORSTOM in the 1970s (Capron and Kohler, 1975; Ancey, 1975; Boutillier, Quesnel and Vaugelade, 1977).

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Few families manage to survive solely on farming, and migration plays an important role in the organization of Mossi society. It enables the Mossi to diversify their income-generating strategies at a time when harvests are poor. Some young men join the market economy by taking paid jobs on the plantations of Côte d'Ivoire or Ghana or in the city. Migration also helps to reduce the pressure on over-farmed, unproductive land. Young men also see it as an advantage, for it frees them from the domination of the older men in the family and enables them to save up to get married. Parents benefit considerably from the money earned by children who migrate, and mothers are proud to be able to say that it was their son who provided some of their resources.

The management of land ownership is well codified and is carried out by the *tengsoba*, who is often the senior member of the family line of the first occupants of the village. Each family line is entitled to take some of the land belonging to the village. Land management has three fundamental characteristics: (*a*) land is a community asset over which individuals have rights of usufruct; (*b*) land is an inalienable asset; and (*c*) no one has the right to refuse land to someone who needs it for his subsistence.

Since land is a community asset, well-being does not depend on the ownership of land but on the size of the family and, more particularly, on the manpower needed to farm it. Since land is distributed by order of arrival in the village, inequality exists in both the size of the piece of land and its quality. The husband's rank in the family hierarchy also affects the size of the piece of land, since older brothers have the best land; this, by extension, affects the wife.

The husband allocates a field or *beolga* to his wife, often several years after the marriage or after the birth of the first child. This field comes from part of the husband's field or the husband borrows land from more prosperous neighbours. The wife's situation is greatly dependent on that of her husband and on his position in the family (older or younger son) insofar as it determines his ability to obtain land. The wife may have several small fields close to home and a field in the bush where she grows food to meet her own and quite often the family's needs. The *beolga* is thus an invaluable asset: it is the wife's only personal property with which she can do what she likes. The harvest from the *beolga* is a source of savings that she uses in case of need, either by selling part of it or by making part of it available for family consumption. The more children a wife has to help her in this field, the bigger the field can be.

The reproductive strategy of each head of a farm is thus to increase the size of his family by accumulating wives and children in order to have the necessary agricultural labour force. The more children available to help with farm work, the easier it is to cope with the vicissitudes of climate: agricultural and pastoral activities are carried on in what is a perpetual race against time, where the slightest delay in the agricultural calendar may prove fatal for the family's survival (Poirier and Guiella, 1996).

Children also represent insurance and security for their parents in old age. Family solidarity ensures that parents are taken care of by their children when they grow up. As the proverb states, "It is so that her back can rest that the donkey gives birth" (*boâng dogda biiga ta poor na vuuse*).

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5. *Division of labour by sex*

The division of labour by sex occupies a special place in the system of production. It is based on rules specific to each social group and the roles of men and women are codified and regulated by rights, duties and prohibitions in the different spheres of life (domestic, productive and community). While behaviours and practices are not directly dictated by these rules, they do correspond to them.

In the domestic sphere, the woman is responsible for reproducing the labour force. She must ensure the production and upkeep of children. Since men do not take part in domestic work, the more help a woman has, the lighter her domestic burden. This help is provided by all the females at her disposal. From the age of five or six, girls help their mothers with housework. In polygamous households, the co-wives take turns preparing meals. The mother-in-law or the first wife is responsible for the overall supervision of household tasks and for the distribution of grain for making meals when the husband delegates this power to her. As soon as a woman has a daughter-in-law living with her in the courtyard, she is relieved of all household tasks. This hierarchy among older and younger women is based on the former's authority over the latter. The work to be done is so heavy and time-consuming that women do everything possible to acquire extra hands to share the burden. The production of children is central to this dynamic, and women need daughters or daughters-in-law to help them with housework.

The division by sex operates with regard to material resources. The husband must provide the grain and the wife all the ingredients needed to make the meal: condiments, water and wood. The husband is responsible for clothing his wife and she is responsible for clothing the children. He is in charge of health care, and he builds and repairs his wife's hut.

In the production sphere, the wife must cultivate the family field before going to her own field. She can work on her own field only when she has done her share on the family field. She must also produce the condiments needed for making meals. In addition, she tries to engage in some commercial activities in order to obtain the money necessary for day-to-day expenses. Such activities involve selling raw or processed produce. Here, too, it is in the woman's interest to have several daughters to help her with all this work and sons to provide her with daughters-in-law. Once she has daughters-in-law, she is no longer required to cultivate the family field. She can then devote herself to her own field and has time to conduct her business.

With regard to the means of production, women do not own farm implements; they borrow them from their husbands.

6. *Preliminary conclusion*

To ensure its survival and guarantee its functioning, the organizational structure outlined above requires the production of a large number of children. Children are a substantial labour force. They are a source of prestige and help to ensure ancestor worship. They provide insurance against old age and help to consolidate social networks.

The role of women is defined predominantly by reproduction: they produce children and provide labour, and men derive a twofold benefit from it. However, as many earlier studies have shown (Castle, 1993; Piron, 1990; Simard, 1993), women are not a homogeneous group and their situation varies according to their husband's position in the family line and their own position in the family and in the life cycle. There is, in fact, a hierarchy among women, and older women have a higher status than younger ones. Young wives newly arrived on the family concession are liable to be assigned chores ruthlessly. Under the authority of the mother-in-law or the first wife, the young bride remains subordinate to the older women until she gives birth to a child and has younger women under her responsibility with whom to share her chores.

The crowning moment of a mother's career is when she herself becomes a mother-in-law. The wife's position changes when she has a daughter-in-law to take on some of her chores. Not only does she have more time to devote to trading but, above all, she has authority over all the younger women on the concession.

Thus, to cope with their many constraints and obligations, women devise various strategies for performing their duties and acquiring power and authority. Producing children is one of the strategies that women use to gain authority, prestige and insurance against old age. In polygamous families, co-wives compete with each other to produce the most children, preferably of both sexes: boys to ensure the reproduction of the father's family line and to provide them with daughters-in-law, and girls to help them with household and production tasks and later to attract future alliances. It is the biological children, not the children of the co-wives, who are a source of power.

The interests of both men and women are served by having many children, but these interests differ. Men demonstrate their virility by the number of their offspring, whereas women demonstrate their ability to produce children. Moreover, in the division of labour by sex, men and women occupy very distinct places and have very precise functions and roles. Children help both of them fulfil their assigned roles more effectively.

D.   CHANGES TAKING PLACE

The traditional socio-economic structures that shape the lives of the Mossi and determine their fertility behaviour are described above. What follows is an analysis of the factors that are undergoing change.

It is not easy to move from an anecdotal explanation to a theory; nevertheless, the analysis seeks to pinpoint changes on the periphery that may contribute to fertility transition.

This part is drawn from the author's fieldwork in Bazega, which began five years ago and covered several research topics.

The data used in this analysis were collected in the course of four research projects on the following topics: fertility and family planning; women's education; women's status and reproductive strategies; and credit for women and its effect on their power. The data come from the following sources:

- Forty-two group interviews conducted in eight villages to gather opinions on reproduction. Participants were suggested by local leaders and selected to form groups that were homogeneous by sex and age group (Ouedraogo, 1997)[2]

- Six in-depth individual interviews on relations and communication between spouses conducted with married women chosen on the basis of familiarity (Ouedraogo and Ouedraogo, 1998)

- Ten semi-structured individual interviews (five women and their husbands) and nine group interviews conducted on the respective rights and duties of men and women. Participants were suggested by local leaders and selected to form groups that were homogeneous by sex and age group (Ouedraogo and Pictet, 1999)[3]

- Sixty-one semi-structured individual interviews (34 wives and 27 husbands) conducted on marriage, child care and schooling. Participants were chosen at random on the basis of a census conducted in a village (Ouedraogo and Pictet, 1999)

- Seventy women and their husbands, chosen at random from a list of married couples, who were questioned about their daily activities and the sharing of tasks between men and women using the Harvard grid (Ouedraogo and Pictet, 1999)

- Thirty-three in-depth interviews conducted with women on the use of loans (1999)[4]

- Four group interviews on success conducted with women grouped according to age (Ouedraogo, 2000)

- Forty-three in-depth interviews on the impact of credit on women's power conducted with women in one village who had received credit. The women were selected from several groups predetermined according to the wealth ranking method (Ouedraogo, 2000)[5]

The situation of Bazega province is interesting on more than one count. It is located in a Mossi rural area, but the research area is not very far from Ouagadougou (35 kilometres), and there is intensive trade between the city and the countryside. Fertility indicators are also slightly different from those for rural areas in general and reflect the influence of the city (see table on page 268).

1. *Power*

Traditional power is rapidly being eroded in Bazega province and probably in most Mossi areas. Traditional chiefs lost some of their functions and powers during President Thomas Sankara's term of office (1985-1987), and that greatly affected their influence. Even though they are one of the mainstays of the current Government, young chiefs without charisma are no longer able to mobilize their constituencies. This is true of many young chiefs in Bazega who have replaced their fathers but do not have their fathers' aura.

The power of the older members of Mossi society has also been eroded through the combined effects of several factors. They retain only fragments of authority over their traditional domain. Customary religion is no longer strictly observed, and while families continue to conduct funerals for their members, other customary ceremonies are far less frequent. Exogenous religions have helped to transform rites, and leaders of the new religions are gradually replacing the traditional religious authorities. The State administration has replaced the customary authorities. In order to facilitate the acceptance of a new type of power, the administrative representatives of villages are often chosen from among the chief's entourage.

2. *Family structures*

The family lineage is also undergoing change. It is becoming segmented and not all sons in a family stay on the same concession, even if they do not always move away. Scarcity of land is encouraging migration to areas where more fertile land is available, with many Mossi migrating to the west and south of the country. Family solidarity is changing under the impact of geographical separation.

Children who have been to school are also reluctant to return to the village, and they adopt what village residents call "white" lifestyles, meaning that they do not observe the forms of respect, solidarity and allegiance due to older family members. They have more independence than those who have stayed in the village, and the older villagers have no influence over them.

3. *The matrimonial system*

Forms of marriage are changing rapidly, helping to undermine the entire patriarchal system and the rules of alliance. *Pug-siuure* marriages, which involved giving a daughter in return for one given away previously, are becoming rare. Marriages by gift, although still the majority, are facing strong opposition. Parents are reluctant to risk a situation which might cause them shame. If a young woman refuses the husband to whom she has been given or runs away before the marriage is consummated, her family suffers serious moral injury and its honour is tarnished:

> "I'm not going to give my daughters in marriage any more. Nowadays, you can be shamed if your daughter refuses the husband you give her. She will choose her own husband" (old man from village B3).

The main changes observed among young people concern their choice of spouse. That the family's control over the choice of spouse and the movement of women is slipping is clear from the fact that older men say that young women refuse to marry them, adults admit they have no control over the young people who go to parties and escape their parents' supervision, and the young women themselves say that they no longer want to marry older men, even if the dominant practice is still to give daughters in marriage.

> "My daughters left the husbands to whom they had been given and went where they wanted. They're perfectly happy there now" (old woman from village B1).

The family code, adopted in 1990 and amended in 1996, protects women from "forced" marriages and affirms the right of individuals to choose their spouse. In the research area, several young women who were refusing to marry the husband whom the family had chosen for them fled to the prefecture for protection. A shelter run by nuns in Sapone also provides a refuge for women running away from the husband imposed by the family.

The research done by Laurent (1996) on the Mossi of Oubritenga province, near Bazega province, shows that marriage processes are changing under the pressure of monetization, the erosion of the power of the older members of the family and the emergence of a feeling of independence. Some churches have played a significant role in these changes.

This new type of marriage—by mutual consent—has several consequences. The first is an increase in the age at marriage (see table on page 268). According to custom, the marriage age for women was either 17 or 19. These young women had to be virgins on the day they entered their husband's hut. Since women want to marry a man of their choosing, the age of marriage is increasing (Rossier, 2001).

The second consequence is a slight increase in the age at which women have sexual relations for the first time. This age is not rising as much as age at marriage, indicating that more girls are having sexual relations before marriage (Rossier, 2001).

A third consequence may be an increase in pregnancies out of wedlock, according to our informants. It used to be customary to banish the woman from the paternal family, but given the scale of the phenomenon, exclusion from the paternal courtyard has become temporary, lasting for the duration of pregnancy and childbirth. After that, the woman can return if no man has acknowledged paternity of the child or if the man who got her pregnant is unable to care for the mother and child.

Delaunay (1994) has shown that pregnancy before marriage has become a marriage strategy for Serer women in rural Senegal. This strategy allows the rules on marriage payments to be relaxed and reduces the pressure from older family members.

As a result, age at marriage is no longer a reliable predictor of age at first pregnancy, since pregnancy may precede marriage.

> "If you give birth to a daughter, you hope that she won't have sex with a man until she's married. But, whatever you might want, you can't follow her everywhere. When she comes home, if you yell at her, she'll tell you she didn't do anything. The lucky ones make it through to marriage without a problem. The unlucky ones get pregnant and then people say they've not been brought up properly. But it's because the child didn't listen" (old woman from village K1).

Other factors influence sexual conduct. Sexuality develops as a result of dances on market day, video film showings on market day and erotic posters. All these elements are helping to disseminate new ideas about sexuality. Many parents, men as well as women, complain that they have no control over their children.

"Nowadays, it's the dances that are having a bad effect on children. It's become what they do: if it's not girls looking for boys, it's boys looking for girls" (old woman from B1).

If they find themselves pregnant out of wedlock and are afraid of being sent away from their father's courtyard, some women will try to have an abortion. Induced abortion, even though it still appears to be an isolated phenomenon because it is not reported, definitely exists in rural areas, as demonstrated by the work of Ouedraogo and Pictet (1999) and Rossier (2001). It is a widespread phenomenon, for the abortion rate is estimated at 12 per 1,000. It seems to be used mostly by young women and by wives facing closely spaced pregnancies.

Traditional birth-spacing practices were not only a means of controlling fertility but also of reinforcing the traditional authorities: physical separation of the husband and wife during the breastfeeding period not only guaranteed strict observance of the rules but also prevented a close emotional tie from developing between the spouses. The new monogamous couples formed by mutual consent adopt different modes of cohabitation from their parents: they no longer live in separate huts but under the same roof. As a result, they have sexual relations more often and run the risk of closely spaced pregnancies.

However, young women who have married by mutual consent are increasingly reluctant to remain in their mother-in-law's hut for a long time after childbirth. It is becoming increasingly difficult to enforce the period of at least two years' post-partum abstinence and, in the absence of contraception among monogamous couples, the interval between pregnancies is no more than 30 months (see table). These new couples say they want to space births more widely for health reasons.

It should be noted that women themselves want a long period of sexual abstinence, not only because they are worried about getting pregnant but also because they believe their milk could be contaminated by their husband's sperm and make their baby ill (Ouedraogo, 1997; Van de Walle and Van de Walle, 1998). Women have definite ideas about what constitutes normal birth spacing; it varies between two and three years, depending on their age and number of children. There is a special name for a baby born within an interval shorter than the norm, and the child is said to be an annoyance to its older sibling. The child's mother is accused of clinging to her husband and not being able to control herself. This is a subject of mockery and disapproval.

"When cotton comes close to the flame, it doesn't take long to catch fire" (old man from village B2).

4. The system of production

Changes are occurring in the system of production at a number of levels. Some are still small, others are bigger. The rules governing access to land are no longer being strictly observed. Competition for resources and the weakening of land management authorities and customary law are giving rise to strategies of widespread land-grabbing. The reasoning is that accessible land must

be occupied today because by tomorrow it may no longer be available and someone else may have appropriated it (Poirier and Guiella, 1996).

The agrarian and land reform begun in 1998 actually encourages the appropriation of land by private individuals who undertake to develop it. The best land and irrigated areas are seized by private developers—some local, some not—who have them demarcated and "make them profitable". To do so, they use more inputs and mechanization (chemical fertilizers, tractors) and market the output. They use local wage labour, thereby creating an agricultural working class. The living conditions of these rural wage earners change as they join the monetized economy. Their children become consumers, rather than producers, and a different value is placed on them. The cost of their schooling and care may induce parents engaged in the market economy to limit their number of children when it exceeds their capacity to maintain them.

Declining agricultural output and chronic drought are threatening the survival of rural domestic units. The growth of the labour market, especially in the cities, offers those families survival opportunities. This accelerates rural-urban migration, thereby contributing to the conversion of the rural population into a working class.

The reduction in monetary flows between areas of migration, the new laws and taxes imposed on long-term resident aliens and the land disputes in Côte d'Ivoire that have caused a mass return of migrants over the past two years all create possible new scenarios. They may well have an impact on migration as a strategy for income diversification, given the uncertainty that surrounds this type of investment.

Proximity to the city facilitates the trading and marketing of certain foodstuffs. Bazega province is a prime area for market gardening, with produce being sold in the city. Market gardening requires little manpower but a lot of input. The men who manage to engage in it, thanks to loans or subsidies for obtaining the input, constitute a new rural class which has considerable supplementary income, at least when there is sufficient rainfall. Their wives help with the watering. The income earned from the sale of produce facilitates access to new resources, such as a means of transport. It also makes it possible to send children to school. The education of children is a prime means of social advancement. This new way of looking at children—wanting to educate them and take good care of them—contributes to the desire to limit their number:

"In the past, you could have a dozen children and be able to take good care of them. Nowadays, there isn't enough to eat and medicine is expensive. It's difficult when there's a problem" (woman from village K1).

Many interviews show that children are no longer a source of security in old age. Some children, when they grow up, hardly care about their parents. If they leave for Côte d'Ivoire, they are never heard from again; if they stay with their parents, they become delinquents:

"If there are a lot of children, home becomes unbearable. You could die too soon because you're always unhappy. If you don't keep an eye on them, if they spend their time roaming around the village stealing things and don't pay attention to what you tell them, your reputation is ruined, their reputation is ruined; it's not a good situation" (man from B1).

The children's ingratitude and lack of respect are mentioned so often that what matters is no longer the quantity of children but their quality. Interviewees talk about the resources available to the family for raising these children. Childhood illnesses and mortality are no longer involved as a reason for having a lot of children. On the contrary, increasingly uncertain climatic and economic conditions are included as an argument for limiting family size in order to be able to provide for the children's needs. These critical needs include food and medicine, which are hard to get. Schooling is often mentioned as one of these needs. Parents also express doubts about their children's ability and willingness to take care of them when they get old.

"If you give birth to a lot of children, thinking that they will take care of you one day, you will find that they abandon you to poverty. They won't even grow food when you're no longer able to do it. Some might even steal the little you have for themselves" (old woman from B2).

These changes in the value placed on children will cause parents to rethink their reproductive strategies and limit the number of their children once it exceeds their capacities.

Women say that it is men who are reluctant to limit their number of children. Once they have five or six living children, women over 40 do not want to have any more. They look for ways to limit their number of children or even to stop having children altogether.

"If a woman asks her husband to go with her to the clinic so that, together, they can find a way to limit their children to five or six, some men may think that their wife is trying to tell them what to do. Some of them may even refuse outright. If the husband refuses, what is the wife to do? Yet if there are a lot of children, the husband may spend his time drinking and not take care of his family. That's why women are always prepared to limit the number of children they have" (woman from K3).

5. *Division of labour by sex*

Within the system of production, changes in the division of labour by sex seem particularly deserving of closer analysis. In the past, men and women alike needed a large number of children to help them with their many tasks, give them prestige and provide security for their old age. However, the situation of women is changing. Whereas previously they had no access to the means of production except through their husbands, now they can buy materials and capital goods through various channels. They can obtain carts and animals on credit. Many development projects have provided women with mechanical means for alleviating tasks and reducing the time they take (mills, *karité* presses etc.). Credit institutions encourage women to engage in income-generating activities, and obtaining money gives them a feeling of pride when they manage to make it yield a profit (Ouedraogo and Ouedraogo, 1998). These women have a means of transport and go from market to market in search of products on which to speculate. This kind of trade is often incompatible with having young or sickly children. Since they already have four or five children of both sexes, they will make sure that they no longer give birth so frequently.

This is the case for Fati, a woman from village K1. In 1996, when the author first met her, she was 32 years old and was the second wife. She had four children: two girls and two boys. She traded with Ouagadougou in grain, *karité* nuts and *néré* seeds. She was happy with her business, which had enabled her to buy a moped on which to get around. On one of her trips to the city, she had got a Norplant® "so as not to have to worry" for a few years. In 2001 when the author saw her again, she was near term, eager to give her husband another child. This woman's strategy was to play two hands at once: she did not want her business to be undermined by problems of pregnancy and childhood illness, so she stopped having children for a while, but when the time came to choose, she also wanted to please her husband by giving him another child.

Not all women have access to these new means and technologies, and the gap between those who do and those who do not is growing. Not all women have the money to grind grain at the mill or have access to credit, for instance. The stratification of women according to seniority and the marginalization of the poorest women helps to promote monetization, notably through access to credit from which the poorest women are excluded (Ouedraogo and Ouedraogo, 1998).

To make themselves stronger, women set up associations, formal or otherwise, on an economic, religious or neighbourhood basis. The creation of networks enables them to exchange ideas and advice. This brings them out of their isolation and enables them to meet regularly for one reason or another. Those associations encourage the dissemination of old and new ideas and give women courage and self-assurance. As Watkins observed (1991), through informal conversations, people learn about new techniques; they also learn what their friends and relatives think of the legitimacy of using these techniques to limit family size, or what they think is a desirable family size. Social intervention thus serves not only to spread information, but also to confirm or to alter more general conceptions of the family.

The leaders of the associations and groups are chosen according to their age and position of respect. They are able to mobilize women. This ability is a function of their own personal qualities but also of their husband's position in the neighbourhood or village.

Women thus have new prospects for income diversification. They make choices based on their situation and use both traditional sources of power, such as children, and non-traditional ones, such as credit and know-how, to reduce their inequality with men and gain recognition and respect. However, this new dynamic can cause conflict in women's relations with men or with each other.

In a context where women's subordination is associated with a lack of resources, better access to resources could bring about more changes in fertility than any other factor.

Frank and Locoh (1994) observed that research had ignored or neglected the very marked difference between female and male interests for too long, and that gender-based inequality of access to the means of production and family solidarity gives rise to individualized strategies in which husbands and wives each have economic and demographic objectives.

Future research might therefore take a closer look at the changes that are currently taking place in order to identify the strategies employed by men and women and determine their impact on fertility. According to Kabeer (1995), the most important forces for change in bringing about fertility decline in the different societies in which it is occurring are related to the general mode of production and the changing interactions this entails between people, their institutional environment and the choices they face. The effects of population pressure on limited resources, combined with the spread of market forces and the associated monetization of everyday life, have profoundly affected the fertility calculus for parents as they erode older forms of livelihoods and security and give rise to the desire for more "human-capital" intensive strategies.

E. CONCLUSION

The current pace of change in rural areas is slow and is limited by the lack of development of the means of production. The integration of rural areas into the market economy is limited by a lack of jobs and by the current difficulties in other countries, especially Côte d'Ivoire. Two changes that are taking place may have an impact on fertility in rural Bazega. First, there is the change in the matrimonial system, with new kinds of marriage by mutual consent that have the effect of raising the age of marriage and slightly reducing the interval between pregnancies. For now, this change does not seem to be having a significant impact on fertility. Secondly, women who have access to the means of production and to money are becoming less dependent on their husbands for their day-to-day and other expenses.

These changes in relations between men and women are encouraging women to speak up and dare to say that they want to limit their number of children to five or six. These women, aged around 40 and with enough daughters and sons already to help them with their various tasks, will seek to invest in other sources of power. These new sources of power are money, know-how and the development of social relations. When women obtain credit to enable them to engage in income-generating activities, this is an innovative source of power. Involvement in a social network is another means that women use to gain recognition and respect. These women will try to space their pregnancies or even stop procreating in order to engage in new commercial activities. However, while those changes are well under way in institutions and in male-female relations, fertility is not expected to decline in the short term.

Women aged around 40 who already have four or five children have a clearly expressed need for contraception. Given that the total fertility rate in rural Burkina Faso is 7.4 children, it can be projected that the final number of children per woman will decline by an average of two children, provided infant mortality does not increase.

It is difficult to predict whether the changes observed in the area of study will spread to all rural areas, since not all of them have the same opportunities to trade with the city. Nevertheless, Government-created development poles, such as provincial capitals, can be expected to undergo the same changes, thanks to new infrastructures and the creation of a public demand for basic services. In other words, it is not impossible that, under the influence of the

urbanization of secondary centres and the development of their markets, the surrounding populations will gradually join the market economy. Changes in living conditions seem to be the most important vector of changes in the value placed on children. The new monogamous couples have new aspirations for their children, notably schooling, and will need contraception in order to avoid closely spaced births. Another important factor is the way in which contraceptives are supplied. The experiment with community-based distribution, which was evaluated by the Demographic Teaching and Research Unit in 1998, provides a number of lessons for addressing and meeting contraceptive needs more effectively in rural areas. Contraceptive prevalence more than doubled in the experiment area between 1996 and 1998, increasing from 3.6 to 8 per cent ($p < 0.05$). This increase was probably due to the increased accessibility of contraception (Baya and others, 1998). Population policy makers should use the findings of this research to fine-tune their population activities.

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