Fertility Decline in Egypt:
Current Status, Future Prospects

John B. Casterline * and Laila O. El-Zeini **

16 March 2005

* Professor of Sociology and Demography, Pennsylvania State University, University Park, Pennsylvania, 16802.
jcasterline@pop.psu.edu

** Associate Professor, Department of Statistics, Cairo University and Social Research Center, American University in Cairo
lelzeini@aucegypt.edu

Paper for presentation at the annual meeting of the Population Association of America, Philadelphia, 31 March - 2 April 2005. This research received support from the Office of Population and Reproductive Health, Bureau for Global Health, U.S. Agency for International Development, under the terms of Award No. HRN-A-00-99-00010. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development. Support was also provided by grants from the Hewlett Foundation and the Mellon Foundation to the Policy Research Division of the Population Council (New York) and by a grant from the Mellon Foundation to the Social Research Center of the American University in Cairo. Some of the work on this paper by the first author was carried while he was Senior Associate in the Policy Research Division, Population Council, New York.

ABSTRACT

While the sustained decline in fertility in Egypt began in the 1960s, four decades later the total fertility rate [TFR] remains above three births per woman. In this paper we assess the current status of the Egyptian fertility decline and prospects for further decline. In order to speak to national policy priorities, our main concern is the gap between the current level of fertility (TFR=3.2) and replacement-level fertility (TFR=2.1): sources of this gap, and mechanisms by which it might be reduced or eliminated. The paper draws primarily on data from the national Egypt Demographic and Health Surveys [EDHS], especially the most recent survey (2003), as well as data from a 2004 re-interview with a sub-sample of the 2003 respondents. Key conclusions from this analysis are as follows. First, the Egyptian fertility decline has proceeded somewhat more slowly than others in the Arab region but at about the same pace as fertility declines in countries such as India and Bangladesh. The Egyptian decline appears to have decelerated during the 1990s but has picked up speed again during the present decade. Achievement of replacement-level fertility will require roughly equal reductions in planned and unplanned fertility, both on the order of one-half birth. With respect to unplanned fertility, the key is improving contraceptive continuation (as against reducing unmet need or use-failure); TFR simulations indicate that substantial improvement in contraceptive continuation has the potential to reduce fertility by one-third birth. With respect to planned fertility, there is almost unanimous acknowledgment by Egyptians of the benefits of a two-child family. Yet a substantial fraction regard three (or more) children as ideal, and the data reveal widespread indifference between the ideals of two and three children and a corresponding weak attachment to the two-child norm. These characterizations apply even to the younger cohorts of women and men just beginning their childbearing careers. For the gap between current and replacement-level fertility to be closed, a stronger commitment to limiting family size to two children must be established, and disciplined practice of contraception that implements this goal must become more prevalent. We suggest that these two changes reinforce each other and must go hand-in-hand.

I. Introduction

In Egypt a sustained decline in fertility began in the 1960s, yet four decades later the total fertility rate [TFR] remains above three births per woman. After a rapid decline during the 1980s and during the first half of the 1990s, in the second half of the 1990s the pace of decline appeared to slow or even come to a halt (Eltigani 2003). This apparent stalling of the Egyptian fertility decline prompted intense anxiety and doubt about whether the national policy goal of reaching replacement-level fertility by the year 2017 would be achieved. Highly visible pronouncements about the importance of sustaining the fertility decline through to replacement-level have been issued at the presidential and ministerial level.

It is in this context that we assess the current status of the Egyptian fertility decline and prospects for further decline. In order to speak to national policy priorities, our main concern is the gap between the current level of fertility and replacement-level fertility: sources of this gap, and mechanisms by which it might be reduced or eliminated. Our assessment relies primarily on data from the national Egypt Demographic and Health Surveys [EDHS], and especially the most recent survey, the 2003 Egypt Interim Demographic and Health Survey [EIDHS]. A sub-sample of the respondents from the EIDHS was re-interviewed in 2004, in a collaboration between the Population Council (Cairo) and the Cairo Demographic Center. The re-interview focused on childbearing attitudes and values and in particular the acceptability of the two-child family. These data are analyzed in Section V of this paper.

The paper contains five further sections after this Introduction. In the second section, we provide a brief portrait of the Egyptian fertility decline to date and compare it to fertility declines in other Arab and non-Arab countries. In Section III, we consider the important question of the extent to which the gap between observed fertility and replacement-level fertility ("excess fertility") can be attributed to wanted or unwanted fertility. The subsequent two sections investigate, respectively, the sources of unwanted and wanted fertility. Section VI provides a synthesis of the main findings of the analysis and discusses the prospects for achieving replacement-level fertility in Egypt under the current conditions and potential policies.

II. Fertility Decline in Egypt: A Brief Sketch

The trend in fertility in Egypt, as indicated by the TFR, is shown in Table 1. The left-hand column presents United Nations Population Division estimates for the period from 1950-54 through 2000-2004, and the right-hand column presents estimates from six national surveys conducted from 1980 through 2003. If one considers the twenty-five-year period covered by both pairs of estimates (1975-79 – 2000-04), the starting and ending levels of fertility are almost

identical: both sources show the TFR declining by slightly more than two births, from a level roughly mid-way between five and six births per woman in the late 1970s to slightly over three births per woman in the first half of the present decade. While in this respect the two pairs of estimates are in agreement, the two trajectories of decline differ in a manner that is directly relevant to the concern noted above about a stalling of the Egyptian fertility decline in the late 1990s. As compared to the direct survey estimates, the UN shows somewhat higher fertility during the 1980s and early 1990s, and, accordingly, a steady decline through the 1990s into the first part of the present decade, i.e. no stalling. The survey estimates, in contrast, show relatively rapid decline during the 1980s and early 1990s and a subsequent leveling out during the late 1990s. Whereas the UN estimates show a decline in the TFR of over one birth during the 1990s, according to EDHS estimates fertility declined by little more than one-half birth during the 1990s.

While it was understandable that the time-series of TFRs – 3.9, 3.6, 3.5 – from the three EDHS surveys that encompassed the 1990s caused alarm, we think the more important facts about the Egyptian fertility at this juncture are: first, the decline over the past twenty-five years has been substantial (over two births per woman); and, second, the TFR remains over three births per woman, i.e. more than one birth in excess of replacement-level fertility.[1] This latter point – the gap between actual and replacement-level fertility -- will be the focus of most of the remainder of this paper.

As a back-drop to this discussion, we can ask how the Egyptian fertility decline to date compares with declines in other Arab and non-Arab countries. This analysis is presented in Table 2, which shows a few summary indicators of the onset and pace of decline. For comparison we examine other populous Arab countries (Morocco, Algeria, Tunisia, Syria, Iraq, Saudi Arabia) and ten purposively selected populous non-Arab countries, two of which are neighboring (Turkey, Iran), four elsewhere in Asia (India, Bangladesh, Indonesia, China), one in Africa (Kenya), and three in Latin America (Brazil, Mexico, Peru). Regional averages for the Arab region are also shown.

Considering onset, fertility decline began relatively early in Egypt (1960-64) as compared to the regional average (1965-69) and the dates for the specific countries listed in Table 2. Among early-onset Arab countries, the Egyptian and Tunisian declines began at roughly the same time and only slightly later than Lebanon (not shown in Table 2). Looking outside the region, the onset of the Egyptian decline is roughly contemporaneous with the onsets in India, Brazil and Peru but pre-dates onset of decline in Iran, Bangladesh, Indonesia, China, and Mexico. Only the Turkish decline clearly pre-dates the Egyptian decline among the ten non-Arab countries

[1] Throughout this paper, we will assume that replacement-level fertility is a TFR of 2.1. This assumes some further decline in mortality rates.

listed. As for the level of fertility at onset, the TFR is slightly above seven throughout the Arab region, which is higher than the TFR in the non-Arab countries listed in Table 2, with the exception of Kenya. Indeed, most demographers agree that pre-transition fertility in the Arab region (TFR=7.2 at onset) was high as compared to other regions.

More germane to this paper is the pace of fertility decline since onset. Judging from Table 2, Egypt can hardly be viewed as distinctive in its pace of decline. Among Arab countries, the Egyptian decline was relatively rapid during its first decade but relatively slow during its second and third decades (with the exception of Iraq). The pace of decline in Egypt compares more favorably with the selected non-Arab countries: much slower than the extraordinarily swift declines in Iran, China, and Mexico; slightly slower than the declines in Indonesia, Brazil, and Kenya; and on a par with the pace of decline in Turkey, India, Bangladesh, and Peru.

A final issue considered in Table 2 is the level of fertility after three decades of decline (for Egypt the early 1990s). At this point the TFR in Egypt was 4.0 according to the United Nations (somewhat lower according to EDHS estimates). This is a full birth higher than the TFR in the three Magreb countries (Morocco, Algeria, Tunisia) after three decades of decline, and in all likelihood substantially higher than will be observed in Syria after three decades of decline (in 2005-09). China's fertility fell below replacement after three decades of decline, and Iran appears to be on a path to the same (in 2010-14). In Indonesia, Brazil, and Mexico, the TFR was under 3.0 after three decades of decline, resembling the declines in the Magreb countries at the same stage and a full birth lower than in Egypt. On the other hand, in India, Bangladesh, and Peru the TFR was roughly four births per woman after three decades of decline. (In the case of Bangladesh, however, some scholars would dispute whether the fertility decline began as early as 1965-69 and whether the TFR was as high as 4.0 in the late 1990s.) In short, the progress to date in the decline of fertility in Egypt falls short of the experience of some countries in the region (the Magreb countries, Syria, Iran) and outside the region (Indonesia, Brazil, Mexico) but matches the experience of some other populous countries where fertility reduction has also been a national priority (India, Bangladesh).

III. Excess Fertility: Wanted or Unwanted?

We will use the term "unplanned" for births that are either unwanted or mistimed (occur sooner than intended). The distinction between planned and unplanned fertility is fundamental to any analysis of reproductive dynamics, and it is also essential to the formulation of policy initiatives and program modifications designed to reduce fertility. If Egyptian women and men of reproductive age on average desire more than two births, then replacement-level fertility will only be achieved if there is a change in childbearing norms or if the required fraction of women and

men fall short of their childbearing goals (i.e. because of insufficient years in marital unions and/or infertility problems within marital unions). Reducing the rate of unplanned births, in contrast, is typically regarded as an easier task, a matter of strengthening motivation and providing couples with more reliable means of pregnancy prevention. If the gap between current levels of fertility in Egypt and replacement fertility can be largely attributed to unplanned fertility, then there are grounds for optimism that replacement-level fertility can be achieved in the near future. This is not to imply that wanted fertility is highly resistant to change: in recent decades there are numerous instances of countries experiencing marked declines in normative family size, as a natural outgrowth of other concomitant economic, social and cultural changes.

We begin by distinguishing wanted and unwanted fertility, with wanted births comprised of births that are wanted and "on time" as well as births that are wanted but mistimed. The analysis in the next section of this paper will group mistimed births together with unwanted births in the more inclusive category of unplanned births. The wanted-unwanted distinction is simpler, and arguably more consequential, than planned-unplanned. With EDHS data, several procedures are available for identifying unwanted births. Women are asked, with reference to recent births (typically births during the five years preceding the interview): "At the time you became pregnant with <name>, did you want to become pregnant then, did you want to wait until later, or did not want (more) children at all?" Responses to this question are known to be biased by women's reluctance to report a child as unwanted (or mistimed). One indication of this bias in EDHS data is the lower estimates of unwanted fertility derived from these responses as compared to the second method. This second method for identifying unwanted births – the method currently employed by DHS – is to compare the respondent's ideal number of children with the number of living children at the time of conception; if the ideal number equals or falls short of the number of living children at conception, the birth eventuating from that conception is classified as unwanted. This method is hampered by women's tendency to report an ideal number of children at least equal to their number of living children at the interview, and by non-numeric responses to the ideal number of children item ("not stated" or "up to God"). The latter is a significant issue in EDHS data, with non-numeric responses constituting 10%-20% of responses in the EDHS during the past decade. Recognizing these serious limitations in existing methods for estimating unwanted fertility – limitations which can be expected to yield downwardly biased estimates -- we are developing a new method that should suffer from less bias (Casterline and el-Zeini 2005). For the present analysis, however, we shall rely on estimates of wanted-unwanted fertility calculated by the method that has been applied to all DHS survey data for the past 15+ years.

Estimates of wanted and unwanted TFRs for Egypt from 1989-92 to 2000-03 are presented in Table 3. Wanted fertility has been between 2.5 and 2.9 since the early 1990s. In the same period, the unwanted TFR declined by one-half birth, accounting for virtually the entire decline in

fertility during this period. In the most recent period (2001-03), the wanted TFR is estimated as 2.5. Hence, according to the estimates in Table 3, roughly one-third of the gap between the observed TFR of 3.2 births per woman and replacement-level fertility (TFR = 2.1) can be attributed to wanted fertility and about two-thirds to unwanted fertility.

By this accounting, addressing unwanted fertility is of higher priority than addressing wanted fertility. However, we believe it is unrealistic to posit total elimination of unwanted fertility, especially in Egypt where neither contraceptive sterilization nor induced abortion are readily available as means of birth control. If the achievable floor in the unwanted TFR is assumed to be 0.1 or 0.2 births per woman[2], then an equivalent additional reduction in wanted fertility will be required to offset this lingering unwanted fertility. From this we conclude that the most plausible path to replacement-level fertility in Egypt at this historical juncture would entail roughly equal declines in wanted and unwanted fertility.[3] Furthermore, almost certainly observed wanted fertility falls short of desired fertility, due to lack of marital exposure (never marriage, marital dissolution) and infertility. Such a shortfall may well be inevitable, but one can expect individuals to strive to fulfill their childbearing aspirations, and ideally they would be successful in doing so. This is a further reason why must be more attention to fertility desires (and their expression in wanted fertility) than the figures in Table 3 might suggest.

The decomposition of fertility in the recent period into wanted and unwanted components can be extended to the sub-national level for the most recent period (Table 4). In the Urban Governorates, wanted fertility is 0.3 births below replacement-level fertility; overall fertility in these metropolitan areas is slightly above replacement-level (TFR = 2.3) only because women average 0.5 unwanted births (the lowest unwanted TFR among the five regions). Elsewhere, wanted fertility is slightly above replacement-level, ranging between 2.2 (Lower Urban) and 2.5 (Lower Rural), with the exception of Upper Rural where wanted fertility is estimated as 3.4 births per woman, more than one birth above replacement. This latter figure suggests that the reproductive regime in rural areas of Upper Egypt is fundamentally different from the other major regions of the country -- three to four births per woman are still preferred in rural Upper Egypt. Turning to unwanted fertility, the unwanted TFR is 0.7 births per woman in Egypt as a whole, and none of the regional unwanted TFRs diverge from this figure by more than 0.2 births. The relative uniformity of unwanted fertility among the regions is striking. We suspect this regional uniformity can be attributed to the relatively more effective fertility control where wanted fertility is low (urban areas, Lower Egypt) and, where fertility control is less effective, the lower risk of unwanted fertility because family-size desires are high (rural areas, Upper Egypt). In any case, it is clear

[2] Equivalent to one-tenth or one-fifth of women having an unwanted birth during their childbearing careers.

[3] This assessment presumes the validity of the wanted-unwanted decomposition of Table 3. However, as noted above, there is good reason to believe that unwanted fertility is under-estimated in Table 3. We are attempting to correct this bias in our ongoing research.

from Table 4 that regional variation in the overall TFR is due primarily to regional variation in wanted fertility.

If, as argued above, some continuing unwanted fertility must be expected, it follows from the regional patterns in Table 4 that achieving replacement-level fertility will require reductions in both wanted and unwanted fertility in all regions except the Urban Governorates, where wanted fertility is already sufficiently low. The same logic applied to Table 4 leads to the conclusion that reductions in unwanted fertility must be larger than reductions in wanted fertility in all regions except rural Upper Egypt, where substantial reductions in desired fertility are required. Apart from this demographic logic that suggests greater priority be given to unwanted fertility, one might argue that reducing unwanted fertility is a more legitimate governmental activity than attempting to modify family-size desires. Accordingly, in the next section of this paper we undertake an in-depth analysis of the sources of unplanned (unwanted + mistimed) fertility and the potential fertility impact of eliminating one or more of these sources. Note, however, that the figures in Tables 3 and 4 demonstrate that further declines in wanted fertility are also necessary if fertility is to decline to replacement level in Egypt. And we note again that wanted fertility in all likelihood falls somewhat short of desired fertility. Hence in Section V we return to the issue of wanted fertility and fertility desires, analyzing recent survey data that suggest that the commitment to the two-child norm remains weak. We hypothesize that this weak commitment accounts in part for a tolerance of unwanted fertility rates that have the effect of elevating overall fertility to the present level of over three births per woman.

IV. Unplanned Fertility: What is the Potential Fertility Impact of Reductions?

IV.a. Methodology: assessing the fertility impact of reducing unplanned births

What is the potential impact on fertility of successful efforts to reduce unplanned fertility? As posed, this question might seem quite straightforward to answer, provided trustworthy estimates of the "planned TFR" were available. The "planned TFR" would be the TFR calculated from planned births only (i.e. births that are wanted and on time). Comparison of the planned TFR and the actual TFR would reveal the amount of fertility reduction that would follow from eliminating unplanned births, and this could be regarded as the maximum impact of efforts to reduced unplanned fertility.

Tables 3 and 4 show the "wanted TFR" that the DHS routinely presents in the main survey report. This TFR is calculated using births that are classified as wanted (as judged by the respondent's stated ideal number of children). This measure is insufficient for the task of assessing the impact of reducing unplanned births, for two reasons. First, the wanted TFR includes mistimed births. Many births are wanted but mistimed, i.e. occurring sooner than desired; if

fertility regulation were more effective, these births would occur at a later time. Since TFR is a period measure, it is affected by the timing of births in addition to the ultimate level of cohort completed fertility. The potential for reducing fertility through the reduction of mistimed births cannot be assessed on the basis of the conventional "wanted TFR".

A second and more significant limitation of an assessment that relies on the wanted TFR alone is that such an approach offers no insights about the relative payoffs from the various pathways (reducing unmet need vs. increasing use-effectiveness vs. reducing use-failure) through which a reduction in unplanned fertility could be achieved. The individual net impact of each of the pathways cannot be assessed using an overall wanted fertility measure. Hence analysis for policy and program purposes based on this overall measure necessarily has a "black box" character, with the mechanisms through which the hypothetical reduction might be achieved left vague. Competing policy/program alternatives are intrinsically more effective at tackling different sources of unplanned fertility.

Given these limitations, we adopt a different analytical approach for assessing the potential impacts on the TFR of alternative strategies for reducing unplanned births. We begin by identifying a set of mutually exclusive sources of unplanned births. Using the 2003 EIDHS (birth history and calendar data), we then calculate hypothetical TFRs – "simulated TFRs" – under the assumption that births attributable to each of these sources were sharply reduced. By distinguishing different sources of unplanned births, this approach offers more useful insight for policy development and evaluation. Note that this approach considers reductions in both mistimed births and unwanted births. Improved birth-spacing has in recent years become a program priority in Egypt.

The methodology of the TFR simulation is described in detail in Appendix A. In brief, key features of this methodology are as follows. First, unplanned births are assumed to originate from one, and only one, of three mutually exclusive reproductive processes: (i) contraceptive use failure; (ii) contraceptive use discontinuation; and (iii) unmet need for family planning. There is conceptual ambiguity in the distinction between use discontinuation and unmet need; we assume that births following discontinuation can be attributed to discontinuation for the first twelve months of nonuse, after which they are attributed to unmet need. There is measurement ambiguity in the distinction between use failure and use discontinuation; we classify as contraceptive failures pregnancies that immediately follow (i.e. next month) the termination of a contraceptive episode, whether or not the woman reports the episode as ending because she became pregnant.

Second, the methodology takes into account two pairs of competing risks: between nonuse and use failure (nonusers who adopt contraception become subject to the risk of

contraceptive failure), and between unmet need and discontinuation (women with unmet need who start using become subject to the risk of use discontinuation).

Third, the methodology is not plagued by the cross-sectional nature of conventional unmet need measures which hinders analysis of the fertility impact of reducing unmet need. This gain comes at a steep price, however: we rely on retrospective declarations about the planning status of births that are known to give downwardly biased estimates of the prevalence of unplanned fertility (due to women's reluctance to admit that children were unwanted or mistimed).

Fourth, in calculating the fertility impact of reducing unplanned births, we adjust for the fact that with more perfect fertility control mistimed births would not be altogether eliminated but rather would occur sometime later.

Finally, recognizing that total elimination of unplanned births is unrealistic, we generate "simulated TFRs" under the assumption that ninety percent of unplanned fertility is eliminated. Our analysis does not assume that unplanned births can be eliminated altogether -- we believe this is unrealistic, in most societies and especially in Egypt, where contraceptive sterilization and induced abortion are relatively unavailable means of birth control. Indeed one could argue that ninety percent reduction is too ambitious; if so, this portion of our analysis over-estimates the achievable gain from reducing unwanted births. But in other respects this analysis is biased in the other direction – most importantly, as just noted the analysis relies on retrospective reports of unplanned births that are known to be downwardly biased. We will proceed with the assumption that these opposing biases are roughly offsetting.

IV.b. Results: potential reductions in the TFR due to reductions in unplanned births

Table 5 presents simulated TFRs calculated by applying the procedures sketched above (and described in detail in Appendix A) to the 2003 EIDHS.

A summary of the findings in Table 5 is as follows:

Source of unplanned	**Percent decline in TFR to 90% elimination:**	**Fraction of fertility above replacement TFR (2.1)**
Use-failure:	5 %	15 %
Use-discontinuation	9	26
Unmet need	3	9
Overall	17 %	50 %

The combined impact of reducing all three sources of unplanned fertility is a 17 percent reduction in the TFR, from the observed estimate of 3.2 to a simulated figure of 2.6. That is, a TFR that would be one-half birth above replacement-level (TFR=2.1) could be attained without reductions in planned fertility. Strikingly, and consistent with Table 4, Table 5 indicates that in the most developed region of the country -- urban governorates -- replacement-level fertility can be achieved solely through elimination of unplanned births.

In all regions, use-discontinuation is the primary source of unplanned fertility. Marked reductions in use-discontinuation that occurs for reasons other than method failure or wanting another child would reduce the TFR by 9 percent. In contrast, reductions in both use-failure and unmet need would have similarly minor impacts on fertility (TFR reductions of 5 percent and 3 percent, respectively).

It bears repeating that women's reluctance to retrospectively report births as unplanned leads to an upward bias in the simulated TFRs presented in Table 5. For this reason, this analysis can be regarded as offering conservative estimates of the potential TFR reduction through sharp reductions (90%) in unplanned births.

A comparable estimate of the potential impact on fertility of eliminating contraceptive discontinuation is provided by Blanc *et al*. (2002). Using data from the 1995 EDHS and assuming the complete elimination of births following episodes of use that ended within two years prior to the birth (excepting births following use-discontinuation for the purpose of becoming pregnant), the authors calculate a simulated TFR of 2.36 (Table 2, p. 131). By design the methodology of Blanc *et al*. should produce a larger potential fertility impact of improved contraceptive practice than the present analysis because: (1) it ignores women's reports about the planning status of births, and hence hypothetically averts many births women report as wanted; (2) it attributes to use-discontinuation conceptions that occur following as much as 15 months of nonuse (as against 12 months in this study), thereby attributing to the elimination of use-discontinuation some of the fertility impact credited here to reduction in unmet need; and, (3) it assumes the *complete* elimination of births attributable to discontinuation. Given these differences in methodology, it is not surprising that Blanc *et al*. project roughly four times as much TFR reduction from improved contraceptive continuation as in this analysis (1.2 births vs. 0.3 births). Accordingly, the simulated TFRs under the scenario of improved use-continuation differ by about one-half birth: 2.4 in the analysis of Blanc *et al.* and 2.9 in this analysis. While we believe our estimates may be conservative, for reasons given above, we also believe that Blanc *et al*. exaggerate the potential fertility reduction from higher contraceptive continuation rates in Egypt.

Blanc *et al.* (2002) also consider the impact on fertility of eliminating contraceptive failures. Their estimate of the reduction in the TFR is 0.31 births, as against 0.16 births in the

present analysis. Note that Blanc *et al.* hypothesize elimination of all births following contraceptive failure, whereas we eliminate only those declared unplanned (and, further, count one-half of mistimed births). Even so, the discrepancy between the findings from the two exercises is small, and the overall conclusion is the same: more effective practice of contraception (i.e. less use-failure) would lead to relatively minor reductions in fertility in Egypt. Improved contraceptive continuation has far more potential fertility impact.

Considering the assumptions of the analysis summarized in Table 5, the likely defects in the data, and the differences with the findings of Blanc *et al.*, we think it is fair to regard the findings in Table 5 as an under-estimate of the potential impact on Egyptian fertility of reducing unplanned births. Even so, such reductions would close one-half of the gap between current fertility levels and replacement-level fertility.

V. Wanted Fertility: Is Replacement-Level Fertility Acceptable?

As noted above when discussing Table 3, the most recent estimate (2003 EIDHS) of the wanted TFR for Egypt as a whole is 2.5, about one-half child above replacement level. Moreover, there has been almost no downward movement in the wanted TFR since the early 1990s. Achievement of replacement-level fertility will require a wanted TFR of about 2.0 or even lower, if hoped-for progress in reducing unplanned fertility does not materialize. Furthermore, if the gap between the wanted TFR and fertility desires were to narrow – it is likely that wanted fertility falls short of desired fertility -- this would place upward pressure on the wanted TFR and increase the need to reduce desired family size.

One might surmise that a wanted TFR of 2.5 reflects a roughly even division among Egyptian women between those desiring two and those desiring three children, and this is essentially what the survey data reveal. A standard question put to women in the EDHS is, "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" A summary of the distribution of responses is provided in Table 6. Considering the responses for all women (bottom row), the fraction of women mentioning two children or less (39%) is roughly equal to the fraction mentioning a number exceeding two (42%). A majority of the women who mention more than two children choose three, but a substantial fraction of these women – and about one-sixth of all women – indicate that four or more children would be ideal. Almost all women who mention two children or less as ideal choose two; there is virtually no support for a one-child family. The mean ideal number of children among those women providing a numeric response is 2.8, i.e. much closer to three than two children. Also note that a relatively high fraction of women (19%) fails to mention any number at all.

It is likely that these responses to the ideal family size item shown in Table 6 are affected by *ex post* rationalization, i.e. an aversion to choosing an ideal number less than the woman's current number of living children. This will upwardly bias measurement of family size ideals. Certainly rationalization may account for some of the stated ideals of four or more children; as is evident in Table 6, these responses are provided disproportionately by women who already have four or more children. Of course this same pattern would be observed if women were, in fact, fulfilling their childbearing ideals.

Of more immediate concern for our assessment of the prospects for replacement-level fertility in Egypt are the ideals and preferences of women with two or fewer living children. Table 6 shows that among women with two living children, only 55 percent consider a number less than three children as ideal, and the mean ideal number of children is 2.5. The corresponding figures for women with less than two living children are 57 percent (ideal number less than three) and 2.4 (mean ideal number). The data on fertility preferences in the right-hand column are consistent in showing that support for the two-child family is far from complete. Among women with two living children, 60 percent indicate a desire to have no further children; i.e., 40 percent either wish to have another child or are uncertain. Even among women with three living children, 14 percent (about one out of seven) wish to have another child or are uncertain. These figures indicate that the two-child norm is not yet firmly established in Egyptian society.

Recognition that lack of firm attachment to the two-child ideal is an important obstacle to attainment of replacement-level fertility in Egypt was the primary motivation for the "Stalled Fertility Transition" [SFT] project, conducted in 2003-05 by the Population Council (Cairo) and the Cairo Demographic Center, with financial support from USAID. In the SFT, a sub-sample (n=3286) of 2003 EIDHS respondents were re-interviewed roughly eleven months after the EIDHS interview. In addition, fresh samples of young (ages 18-29) unmarried women (n=917) and men (n=945) were also interviewed. All three samples were asked at length about childbearing attitudes and perceived costs/benefits of childbearing, with particular attention to views about the two-child family. In the remainder of this section, we make use of the SFT data to explore further the acceptability of replacement-level fertility and the degree of individual-level commitment to this goal.

V.a. Acceptance of the Two-Child Norm

SFT respondents were read 15 statements that describe reasons couples might want to have many children. None of the statements garnered agreement from as many as one-half of the women, and agreement was below 25 percent for 11 of the statements. Indeed, 21 percent of the women agreed with none of these stated advantages of having many children, and less than 1

percent agreed with all of them. The respondents were also asked two sets of questions on the critical issue of whether childbearing should be limited to two children. One set asked about the advantages, and the second set about the disadvantages, of having only two children. Nine possible advantages were read to the women, and eight possible disadvantages. Women's responses were decisive and unambiguous, as summarized in Table 7: about ninety percent agreed with all nine advantages, and seventy percent disagreed with all eight disadvantages. That is, only ten percent of the women dissented from any one of the proposed advantages of having only two children, and only thirty percent concurred with any one of the proposed disadvantages. This is the outcome after both spontaneous mention in response to an open-ended question and item-by-item probing. It is of some interest to note that more than two-thirds of the married women spontaneously mentioned having a better living standard and better prospects for proper childrearing and schooling as advantages of having only two children. Similar views are expressed by unmarried men and women. One could hardly expect a more ringing endorsement of the desirability of the two-child family.

And yet other information collected in the SFT casts doubt on the extent to which two children has been accepted as the most desirable childbearing outcome. In a further effort to assess childbearing norms, the respondents were asked their views about what would be desirable for other persons: "a couple in Egypt these days", and their daughter or son. The distributions of responses to these items are presented in Tables 8. With respect to "a couple in Egypt these days", the respondents were asked what they considered to be the maximum desirable number of children (" . . the number of children after which you would advice them not to have more") and the number that would be "too few". The modal maximum number is three, volunteered by almost one-half of the women. Only one-fifth regards two children as a maximum. At the other extreme, there is substantial agreement (three-quarters of women) that one child is "too few", but a further 22 percent consider two children "too few" for a typical couple. From these two sets of responses, a strong aversion to having just one child is apparent, while an equally large majority of women regard three children as acceptable. When asked about their own daughter or son, in contrast, "two children" emerges as the modal response (Table 8, right-hand column). Even so, 23 percent consider three or more children as ideal for their own son or daughter, and 42 percent choose three or more or another type of response (such as "depends").

The SFT posed all the same items to the young (ages 18-29) unmarried women and women. To our knowledge, the childbearing attitudes and desires of young unmarrieds have not heretofore been investigated so thoroughly in a national population-based survey. One might hypothesize that the younger cohorts would be more uniformly attached to the two-child norm, especially the unmarrieds in these cohorts (assuming selectivity of marriage on pro-natalism). In the event, we find little difference between the married and unmarried of the same age, and we

find far less than unanimous support for two children as a childbearing goal. It is the case that, when asked for their ideal number of children, the majority of young unmarried women and men choose two children, 58 percent and 51 percent, respectively. At the same time, 39 percent of women and 43 percent of men indicate that three or more children is their ideal number. These are the ideals of the younger cohorts who are just about to embark on their childbearing careers.

The inference from these responses to various SFT items, presumably free from the effect of *ex post* rationalization, is not categorically different from the one reached through answers to the ideal family size question. There is no mass aversion to the two-child family, but nor is there anything approaching consensus that two children is the optimal outcome. A significant fraction, even among the young unmarrieds, regards three (or more) children as ideal.

V.b. Indifference between Two and Three children

From the evidence discussed in Section V.a., one could infer that Egyptians are largely indifferent between having two and three children. We examined this indifference directly in the SFT, via two questions asking women how they would feel about having one child more or less than their ideal. The responses to these two items are shown in Table 9 for those women whose ideal is two and three living children, critical groups for evaluating the commitment to the two-child goal. The key figures are in bold. On the one hand, about three-quarters (73%) of women for whom three children is the ideal are largely indifferent between two and three children; this suggests little resistance to a downward shift in childbearing ideals. On the other hand, about one-half (49%) of those for two children is the ideal express no concern at having three children instead of two, and only one-third (35%) indicate that the additional child would matter "a great deal". Even among those whose ideal is three children, less than one-half (40%) indicate that an additional child would matter "a great deal". It is worth noting that the tolerance of three children as an ideal family size is consistent with population campaigns in Egypt during the past two decades, in which typically a "large family" has been a family having four children or more.

Roughly the same amount of indifference is expressed by the young unmarried women and men. Specifically, among those who consider two children ideal, 42 percent of both samples indicate that it would matter "not at all" if they had three children. At the same time, among those who consider three children ideal, 80 percent and 69 percent of young unmarried women and men, respectively, indicate it would matter "not at all" if they had two children.

In the SFT data, one finds receptivity to small-family outcomes mixed with acceptance of other outcomes (i.e. three or more children). For example, in contrast to the evidence cited above that leads to some pessimism about the existing attachment to the two-child norm, if one compares in Table 9 those for whom two and three children is ideal, it appears there is somewhat

more indifference about falling short of a three-child ideal than exceeding a two-child ideal. (Falling short would matter "a great deal" for 27 percent, as against 35 percent for whom over-shooting by one child would matter "a great deal".) And, similarly, if one examines only women for whom two children is the ideal, falling short of this ideal appears to be more acceptable than exceeding it. From these sorts of comparisons, one might conclude that the DHS data on ideal family size, if taken at face value, if anything give an upwardly biased impression of desired fertility in Egypt. But, equally, one could not conclude from these SFT data that a consensus has emerged among Egyptians that two children is the desirable goal and strenuous efforts should be made to achieve it.

V.c. Desired Fertility and Son Preference

One factor that may contribute to the observed uncertainty and indifference is preferences concerning the sex of children. When asked about the desired sex-composition of their children, most Egyptian women indicate a desire for at least one boy and one girl. A strong attachment to such ideal balanced composition represents a strong obstacle to achieving replacement fertility, since only one-half of couples with two children will achieve this balance. In order to investigate the attachment of Egyptian women to the ideal of balanced sex composition, Table 10 presents EIDHS and SFT estimates of the percentage of currently married women who want to have a third child according to different sex compositions of their two living children. Table 10 reveals a preference for a balanced sex composition – those with one boy and one girl are most likely to want to stop childbearing. There is an additional preference for sons over daughters – those with two sons are more willing to stop than those with two daughters (by 10-15 percentage points, a marked differential). At the same time, from Table 10 one would not conclude that son preference is an overwhelming obstacle to accepting a two-child family. 40 percent (EIDHS) or 50 percent (SFT) of women with two daughters indicate a desire to stop childbearing. To be sure, this fraction is substantially less than the fraction wanting to stop (65-67%) among women with one boy and one girl, but it is an impressive fraction nevertheless.

Our conclusion is that son preference is not in itself a prohibitive factor in the progression of Egyptian fertility to replacement level. But it must be counted among a number of factors (some as yet unclear) that undermine couples' degree of commitment to the two-child norm.

Taking stock of the various pieces of evidence reviewed in this section (and presented in Tables 6-10), one senses enormous uncertainty and ambiguity about fertility aspirations in contemporary Egyptian society. More to the point, how can we reconcile the lack of support for large families and the almost unaminous endorsement of the advantages of having two children (Table 7) with the evidence that many women either desire to have more than two children (Table

6) or appear to regard such an outcome as perfectly acceptable (Tables 8 and 9)? This is the puzzle of current attitudes towards childbearing in Egypt. There seems to be an intellectual assent to the notion that two children is the optimal childbearing outcome. What is lacking is a corresponding commitment to two children as each couple's own childbearing goal, a lack of commitment revealed by women's expressed fertility desires and their apparent willingness to accept having more than two children. Perhaps women perceive that most of the recognized advantages of having only two children, and the very few recognized disadvantages, apply equally well to having three children. That is, perhaps the distinction between two and three children is inconsequential in women's minds. This may well be a valid view for individuals; but in the aggregate, this distinction implies sharply different long-range population growth rates for Egypt.

A further relevant piece of information from the SFT is the prevalence of a belief that childbearing cannot be fully controlled by a husband and wife and that actual reproductive outcomes are unpredictable. These attitudes, we believe, readily accommodates the occurrence of unwanted births (i.e., births in excess of the couple's desired number).

Furthermore, suppose we posit full implementation of current fertility desires. Under that scenario, further declines in the level of fertility in Egypt would occur, but fertility would not decline to replacement-level (unless this scenario includes a non-trivial fraction falling short of childbearing ideals). This point is underscored by the SFT data on young adults who have yet to marry and start childbearing. A substantial minority of these women and men feel that three (or more) children is the ideal outcome. Judging from these data, replacement-level fertility in Egypt will not occur automatically through generational succession, i.e. the replacement of older cohorts by younger (and, it is often assumed, more "progressive") cohorts. Generational succession is not a secure pathway to replacement-level fertility. If Egypt is to achieve replacement-level fertility during the next few decades, these younger cohorts must become more fully committed to the two-child norm.

VI. Summary and Concluding Remarks

We organize our summary and concluding remarks around four sets of questions that are commonly posed about the Egyptian fertility transition.

Has fertility declined relatively slowly in Egypt? And did the decline stall during the past decade?

The answer to both questions is a qualified "Yes" – qualified in the sense that we believe it is a mistake to make too much of the affirmative answers to these questions.

As compared to the majority of Arab countries, fertility has indeed declined slowly in Egypt. But the inter-country differences in pace of decline are not large. In addition, the Egyptian

decline began early by Arab standards, and there tends to be an inverse relationship between date of onset and pace of decline. Moreover, the Egyptian decline has proceeded at roughly the same pace as declines in other populous countries outside the Arab region, including India and Bangladesh. Perhaps the pace of decline in these countries as well should raise alarms. But when the trajectory of decline in Egypt resembles what is observed in many other countries, both inside and outside the Arab region, discussions that implicitly or explicitly suggest an exceptional character to the Egyptian decline seem out of line. There is an unfortunate tendency to select extreme cases (e.g. Iran) as the standard for comparison.

As for the stall in Egyptian fertility decline during the 1990s, the time-series of EDHS estimates certainly suggest a deceleration of the decline during that decade. But the 2003 EIDHS shows a renewal in the decline in the TFR in the present decade. At this juncture, in our view of much greater significance are two inter-related questions: first, can the pace of decline be quickened? and, second, are there obstacles to replacement-level fertility in the near future (i.e. within 10-20 years)?

In attempting to close the gap between current levels of fertility and replacement-level fertility, what relative weights should be placed on wanted and unwanted fertility?

The short answer to this question is, equal weights: if one assumes that unwanted fertility will be difficult to eliminate entirely, then the assumed achievable decline in unwanted fertility must be matched by a roughly equivalent decline in wanted fertility. Under this formula, both would decline by about one-half birth.

This answer, however, applies to the country as a whole. If current fertility is dissected by region, the answer varies considerably: in the Urban Governorates, reduction of unwanted fertility is the exclusive requirement for the achievement of replacement-level fertility; in most regions, greater weight should be given to reducing unwanted fertility than reducing wanted fertility (the weights for unwanted and wanted fertility would be roughly two-thirds and one-third, respectively); and in rural Upper Egypt, substantial declines in wanted fertility – more than one child – are required.

This weighting is based on demographic analysis alone. Obviously policy priorities and program initiatives must also take into account feasibility, i.e. the likely returns to investments. In this regard, we note that unwanted fertility has been on the decline during the past 10-15 years, whereas wanted fertility has hardly changed.

Is it plausible that <u>further</u> reductions in unplanned fertility could contribute meaningfully to the achievement of replacement-level fertility? And, if so, what sources of unplanned fertility should be of highest priority?

To some extent, our affirmative answer to the first of these two questions follows automatically from our answers to the previous question above. But this issue is of such importance and subject to such intense debate that our conclusions deserve further emphasis and elaboration. The fact that wanted fertility is distinctly above replacement-level (wanted TFR = 2.6 according to the 2003 EIDHS) and has been relatively stable over the past 10-15 years has led some to single out fertility desires as the main obstacle to further fertility decline in Egypt. But simulations of the fertility impact of reducing specific sources of unplanned (unwanted + mistimed) births clearly show how much such reductions could contribute towards closing the gap between current fertility and replacement-level fertility. The simulations indicate that one-half of the remaining gap could be resolved through 90% success in reducing unplanned births. The simulations also demonstrate that among the three sources of unplanned births – contraceptive failure, contraceptive discontinuation, and unmet need – the largest potential for fertility reduction resides in improved contraceptive continuation.

Is the two-child norm taking hold in Egypt? Can this be expected to translate into wanted fertility rates near, or below, replacement-level before too long?

The empirical evidence on these two inter-related questions is mixed; this in itself may imply negative answers to both questions. There is ample evidence from the SFT of Egyptians recognition of the many benefits and few attendant costs of limiting childbearing to two children. But women's fertility ideals remain roughly evenly divided between two and three (or more) children. Even among young unmarried adults – both women and men – forty percent profess an ideal of three or more children. (A clear conclusion from this analysis is that generational succession *per se* will not establish the two-child family as the consensus norm in Egypt.) Various other pieces of information suggest indifference between two and three children as childbearing outcomes. On the one hand, these data can be viewed as indicative of little resistance to a societal transition to a two-child norm. On the other hand, they are also indicative of a lack of firm widespread attachment to such a norm at the present time.

A further relevant point is that observed wanted fertility (e.g. the wanted TFR) typically is lower than average fertility desires. On the one hand, this gives some breathing room – fertility desires do not have to fall to two children (on average) for wanted fertility to fall to this level. On the other hand, one should expect that individuals will strive to achieve their fertility desires (e.g. seeking treatment for infertility), and greater success in doing so would reduce the gap between wanted fertility and fertility desires. A policy principle, especially post-ICPD, is that individuals should be assisted in achieving their personal reproductive aspirations.

How robust is the current gap between actual and replacement-level fertility in Egypt? Our response to this over-arching question is as uncertain as, we believe, the current reproductive

situation in Egypt. Achievement of replacement-level fertility in one decade may not be the long-shot that a casual assessment might suggest: while three (or more) children remains the ideal for many Egyptians (including younger cohorts just entering the childbearing years), further probing reveals little opposition to the ideal of a two-child family; and there would appear to be scope for considerable reduction in fertility via reductions in unplanned fertility, in particular improved contraceptive practice among those who already have experience with contraception.

But how soon will a commitment to a two-child norm firm up and become close to universal? And how soon will Egyptians adopt the necessary behaviors to avoid unplanned pregnancies? We suspect that these two developments must go hand-in-hand; at this juncture, treating planned and unplanned fertility as independent and alternative policy and program targets may be counter-productive. That is, stronger motivation to limit childbearing to two births, along with a subsiding of the current indifference about childbearing outcomes, is probably a prerequisite for improvements in contraceptive practice. And, similarly, a reduction in unplanned pregnancy, and the accompanying diffusion of a realization that fertility can be carefully regulated, may be a precondition of more widespread commitment to the two-child norm. Policies and programs that achieve one goal will facilitate achievement of the other; and failure in one arena will hinder the prospects for success in the other.

Because of these positive synergisms, it is hazardous to project the pace of fertility decline in Egypt during the next decade. Certainly there are ample reasons to expect that fertility will continue its downward trajectory. How rapid the pace of decline will be and whether the eventual floor will be replacement-level (as against, for example, a TFR in the range 2.3 - 2.5) are much more difficult to determine because, judging by the available empirical data, the current fertility regime in Egypt is clouded by considerable uncertainty and ambiguity.

REFERENCES

Blanc, A.K., Curtis, S.L., and Croft, T.N. 2002. 'Monitoring contraceptive continuation: links to fertility outcomes and quality of care.' *Studies in Family Planning* 33(2): 127-140.

Casterline, John B. 2001. "The pace of fertility transition: national patterns in the second half of the twentieth century." Pp. 17-52 in R. Bulatao and J. Casterline (eds) Global Fertility Transition. Supplement to Volume 27 of *Population and Development Review.*

Casterline, J.B., El-Zanaty, F., and El-Zeini, L.O. 2001. 'The interplay of fertility preferences and contraceptive use: longitudinal evidence from Egypt.' Paper presented at the Annual Meetings of the Population Association of America, Washington D.C., 29-31 March.

Casterline, J.B., El-Zanaty, F. and El-Zeini, L.O. 2003. 'Unmet need and unintended fertility: longitudinal evidence from Upper Egypt.' *International Family Planning Perspectives* 29(4): 158-166.

Casterline, J.B. and L.O. el-Zeini. 2005. "The estimation of unwanted fertility." Paper presented at the Annual Meetings of the Population Association of America, Philadelphia, 31 March – 2 April.

Eltigani, E.E. 2003. 'Stalled fertility in Egypt, why?' *Population and Environment* 25(1): xx – xx.

El-Zanaty, F., Hussein, E., Shawky, G., Way, A. and Kishor, S. 1996. Egypt Demographic and Health Survey 1995**.** Calverton, Maryland, USA: National Population Council and Macro International Inc.

El-Zanaty, F., Sayed, H., Zaky, H., and Way, A. 1993. Egypt Demographic and Health Survey 1992. Calverton, Maryland, USA: National Population Council and Macro International Inc.

El-Zanaty, F. and Way, A. 2001. ***Egypt*** Demographic and Health Survey 2000. Calverton, Maryland, USA: Ministry of Health and Population, National Population Council, and ORC Macro.

El-Zanaty, F. and Way, A. 2004. Egypt Interim Demographic and Health Survey 2003. Cairo, Egypt: Ministry of Health and Population, National Population Council, El-Zanaty and Associates, and ORC Macro.

El-Zanaty, F., Way, A.A., Kishor, S., and Casterline, J. 1999. Egypt Indepth Study on the Reasons for Nonuse of Family Planning: Results of a Panel Survey in Upper Egypt. Calverton, MD, USA: National Population Council , and Macro .International Inc.

Jain, A. 1999. 'Should eliminating unmet need for contraception continue to be a program priority?' *International Family Planning Perspectives* 25(Supp.): S39-S43.

Rafalimanana, H. and Westoff, C.F. 2001. "Gap between Preferred and Actual Birth Intervals in Sub-Saharan Africa: Implications for Fertility and Child Health." DHS Analytical Studies No. 2, ORC Macro, Calverton, Maryland USA.

Sayed, H.A., Osman, M., El-Zanaty, F. and Way, A. 1989. Egypt Demographic and Health Survey 1988. Columbia, Maryland: Egypt National Population Council and Institute for Resource Development/Macro Systems, Inc.

Westoff, C. and Bankole, A. 1996. 'The potential demographic significance of unmet need.' *International Family Planning Perspectives* 22(1): 16-20.

APPENDIX A

Estimating the Fertility Impact of Reducing Unplanned Births

The aim is to assess the expected impact on the level of fertility were the rate of unplanned births to be sharply reduced. For this purpose, simulated TFRs are calculated in which, alternatively, births are eliminated that can be attributed to one of three mutually exclusive reproductive processes: (i) contraceptive use failure; (ii) contraceptive use discontinuation; and (iii) unmet need for family planning.

A.1. The method of TFR simulation

The simulated TFRs, each pertaining to a different scenario, are computed using the conventional method of computing the TFR from DHS birth history data. Age-specific fertility rates for the three year period before survey are computed by dividing the number of births, classified by maternal age-group at the time of birth, by the total number of women-years lived in that age group. Because the sample for Egypt DHS is restricted to ever-married women, the denominator is calculated by dividing the total number of women-years lived by the sampled women by the, age-specific proportion of ever-married women. The TFR is then obtained by summing the age-specific fertility rates and multiplying by 5. Simulated TFR under different scenarios are computed by excluding births that satisfy specific conditions, as described below.

Since it is implausible to assume that unplanned births could be entirely eliminated, a "virtual elimination" scenario is used under which ninety percent of unplanned births are eliminated.

The decomposition of reduction in the TFR into three components is not perfectly additive. This is because the effects of reducing each component (90% of adjusted differences) are calculated for age-specific fertility rates, which are then summed into TFRs.

A distinction between unwanted births and mistimed births is in order: preventing a mistimed birth has a lower impact on TFR than preventing an unwanted birth, because it is assumed that postponed wanted births will eventually occur. Under simple assumptions about the relationship between birth interval length and the TFR, it can be shown that an increase in birth interval length will result in a proportional decline in TFR (Rafalimanana and Westoff 2001). Using information from the 2003 EIDHS on the average length of birth intervals preceding births reported as mistimed and on the average preferred waiting times reported by mothers, we estimate that the average observed interval is around half the length of the preferred interval. Therefore, mistimed births are discounted by a factor of 0.5 when computing simulated TFR under "virtual elimination" of unplanned births. As it happens, the results are not sensitive to this parameter – the simulated TFR changes by a maximum of 0.2 births (higher or lower) if a different discounting factor is used.

A.2. Classifying unplanned births by source

The TFR simulation consists of calculating TFRs assuming the elimination of births attributed to one of three mutually exclusive reproductive processes: (i) contraceptive use failure; (ii) contraceptive use discontinuation; and (iii) unmet need for family planning. On conceptual grounds, the first two -- use failure (i.e. becoming pregnant while using) and discontinuation of use before getting pregnant -- are mutually exclusive. Distinguishing the two empirically is not so clear-cut, as discussed in the next paragraph. Discontinuation of use and unmet need, in contrast, are not conceptually distinct; we take up this issue below.

We consider first the identification of births attributable to contraceptive use failure. In the 2003 Egypt Interim DHS, women are asked for the reason for the termination of each episode of

contraceptive use that ended within the five-year period preceding survey, with failure ("became pregnant while using") as one of the pre-coded reasons. An examination of these data reveals that all women who report failure as the reason for stopping contraceptive use are recorded as pregnant in the month succeeding the last month of use. The reverse, however, is not always the case: some women who are shown as pregnant in the month following the last month of a contraceptive episode are reported as stopping for reasons other than failure. We believe that reports of pregnancy status are less likely to suffer from reporting bias than reports of reasons for discontinuation, and hence we classify as due to use-failure all live births from pregnancy episodes that begin in the month following the last month of a contraceptive-use episode. (This procedure implicitly assumes that conception occurs in the month prior to the first gestational month recorded in the calendar.) The results should not be sensitive to this decision, for two reasons: first, pregnancy follows immediately after only eight percent of contraceptive episodes in the 2003 EIDHS, and more than half such pregnancies are explicitly reported as use-failures; second, in the simulation exercise (see below), we eliminate births attributable to use-failure only if women report the births as unplanned.

Turning to the task of distinguishing births due to use-discontinuation from those due to unmet need, this is of some importance if, as some have argued (Jain 1999), policy emphases and program directions for addressing discontinuation are categorically different from those for tackling unmet need. To make this distinction, a conceptual ambiguity must be resolved. By definition, unmet need implies nonuse of family planning: setting aside discontinuations due to failure (including, as discussed in the previous paragraph, discontinuation followed immediately by pregnancy), all pregnancies leading to live births must be preceded by one or more months of nonuse. Which subset of these pregnancies should be attributed to use-discontinuation and which to unmet need? A rule is required. Note that never users do not present a problem -- all their unplanned births can be attributed to unmet need. The task, then, is to separate unplanned births to ever users into those due to use-discontinuation and those due to unmet need, and the most straightforward basis for doing so is the elapsed period of nonuse prior to conception. We adopt a twelve-month rule, under the assumption that a twelve-month period of nonuse is sufficiently long for ever-users to be regarded as detached from family planning practice. Following this rule, unplanned births are attributed to discontinuation if they are preceded by contraceptive use within 2-12 months before conception, and they are attributed to unmet need if no contraceptive use episode occurred during the 12 months preceding conception. Obviously more or less permissive rules could be adopted. For example Blanc *et al*. (2002) attribute births to use-discontinuation if the discontinuation occurred within two years prior to the birth (equivalent to 15 months prior to conception). Some experimentation with the EIDHS data indicates that the results of the simulation exercise are relatively insensitive to modest variations in the attribution rule.

A.3. Adjusting for competing risks

Failure and nonuse are competing risks: when nonusers (whether they are recent users, distant users, or never users) become users, they are subject to the risk of use-failure. Therefore, in order to preserve the additive character of the decomposition of unplanned births into three sources, the probability of use-failure should be taken into account when simulating the TFR impact of reducing unplanned births attributable to either discontinuation or unmet need. The 2000 EDHS shows a 12-month failure rate of 0.03 (El-Zanaty and Way 2001, Table 7.1). We use this figure to adjust downward the impact of reducing births attributable to discontinuation and unmet need.

Discontinuation and unmet need are also competing risks: when women with unmet need become users, they are subject to the risk of use-discontinuation. According to the 2000 EDHS, the 12-month discontinuation rate in Egypt, for reasons other than failure and desire to become pregnant, is 22 percent (El-Zanaty and Way 2001, Table 7.1). Hence, to take the risk of discontinuation into account, the estimated decline in TFR attributable to reduction in unmet need is discounted by a factor of 0.78.

A.4. Measurement of unmet need

It should be noted that the procedure used here for studying the impact of reducing unmet need does not use the conventional DHS measure of unmet need. This unmet need measure is a current status indicator, pertaining to status at the interview. A proper assessment of the fertility implications of unmet need as gauged by the conventional DHS measure should be based on a prospective study that follows women and records their births after their classification according to unmet need status (e.g. Casterline *et al*. 2003). To be sure, one can derive such an assessment from cross-sectional data using a regression model (Westoff and Bankole 1996) or a proximate determinant framework, but these approaches have two serious limitations. First, estimates of unmet need refer to the time at survey while TFR estimates refer to a period preceding the survey (typically three years). Second, and more importantly, these approaches necessarily assume that a reduction in unmet need translates into an equivalent increase in contraceptive use which, in turn, leads to a reduction in fertility. But this presumes that the intrinsic impact of contraceptive use on fertility is the same among users and nonusers. In most settings, however, contraceptive use is selective on higher fecundability. Dealing with such unmeasured heterogeneity has long been recognized as a fundamental challenge in fertility research.

The procedure adopted in this analysis avoids these two limitations by using actual fertility experiences of nonusers, i.e. their actual live births within the three-year period before survey. Unfortunately, there is a price to pay for this decision. Unlike the conventional DHS measure of unmet need that depends in part on answers to questions about future childbearing preferences, our approach relies entirely on retrospective declarations about the planning status of births. These retrospective reports are known to give downwardly biased estimates of the prevalence of unplanned fertility because women are reluctant to admit that a child was unwanted or mistimed. In prospective data from Upper Egypt, roughly 60 percent of births prospectively identified as mistimed and 26 percent of births prospectively identified as unwanted were retrospectively reported as being on time (Casterline *et al*. 2001). Accordingly, simulated TFR values presented in this paper should be considered as conservative estimates of the potential impact of “virtual elimination” of unplanned births.

Table 1. Trend in Fertility in Egypt

Total Fertility Rate (TFR) according to UN estimates and according to demographic surveys.

UN Estimates		Demographic Surveys	
Period	**TFR**	**Period** [a]	**TFR**
1950-54	6.6		
1955-60	7.0		
1960-64	7.1		
1965-69	6.6		
1970-74	5.7		
1975-79	5.5	**1975-80**	5.3
1980-84	5.3	**1983-88**	4.7
1985-89	4.8	**1989-92**	3.9
1990-94	4.0	**1992-95**	3.6
1995-99	3.5	**1997-2000**	3.5
2000-04	3.3	**2000-2003**	3.2

Sources:

UN Estimates: United Nations. 2003. World Population Prospects: the 2002 Revision. New York: United Nations.

Demographic surveys:

1975-80:	1980 EFS:	
1983-88:	1988 EDHS:	Sayed et al. (1989), Table 7.11
1989-92:	1992 EDHS:	El-Zanaty et al. (1993), Table 8.8
1992-95:	1995 EDHS:	El-Zanaty et al. (1996), Table 7.11
1997-2000:	2000 EDHS:	El-Zanaty and Way (2001), Table 9.11
2000-03:	2003 EIDHS:	El-Zanaty and Way (2004), Table 2.13

[a]. Estimates refer to the 60 months (1988) or 36 months (other surveys) preceding the survey.

Table 2. Fertility Decline in Egypt and Selected Other Arab and non-Arab Countries

Date of onset of fertility decline [a], TFR at onset, percentage decline over selected periods, and TFR after 30 years of decline

Country	Date of Onset of Decline [a]	TFR at Onset	Percent Decline First 10 Years	Percent Decline First 20 Years	Percent Decline First 30 Years	TFR after 30 Years of Decline
Egypt	1960-64	7.1	19	25	43	4.0
Arab region (average)[b]	1965-69	7.2	14	33	50	3.6
Other Arab countries						
Morocco	1965-69	7.1	17	36	58	3.0
Algeria	1970-74	7.4	14	44	62	2.8
Tunisia	1960-64	7.2	14	32	57	3.1
Syria	1975-79	7.4	17	49	-	-
Iraq	1970-74	7.1	11	20	33	4.8
Saudi Arabia	1980-84	7.2	20	37	-	-
Non-Arab countries						
Turkey	1950-54	6.9	10	25	40	4.2
Iran	1980-84	6.6	35	65	-	-
India	1960-64	5.8	6	23	35	3.8
Bangladesh	1965-69	6.6	15	28	40	4.0
Indonesia	1965-69	5.6	15	37	53	2.6
China	1965-69	6.1	45	59	70	1.8
Kenya	1970-74	8.1	8	34	51	-
Brazil	1960-64	6.2	23	39	58	2.6
Mexico	1965-69	6.8	22	47	60	2.8
Peru	1960-64	6.8	12	32	46	3.7

Source: United Nations. 2003. World Population Prospects: the 2002 Revision. New York: United Nations.

[a] Onset determined according to method of Casterline (2001).
[b] Median date of onset, otherwise mean. Sample of countries for means is restricted to those who have experienced sufficient years since onset of decline.

Table 3. Trends in Wanted and Unwanted Fertility

Percent of births unwanted and total fertility rates (unwanted, wanted, total)

Period	Percent Births Unwanted [a]	Total Fertility Rates		
		Unwanted	Wanted	Total
1989-92	27	1.2	2.7	3.9
1992-95	25	1.0	2.6	3.6
1997-2000	16	0.6	2.9	3.5
2000-03	17	0.7	2.5	3.2

Source: EDHS surveys: 1988, 1992, 1995, 2000, 2003 (EIDHS)

Table 4. Wanted and Unwanted Fertility by Place of Residence: 2000-2003

Percent of births unwanted and total fertility rates (unwanted, wanted, total) by type of place of residence (urban and rural) and by region (Lower and Upper)

Place of Residence	Percent Births Unwanted [a]	Total Fertility Rates		
		Unwanted	Wanted	Total
Urban Gov.	18	0.5	1.8	2.3
Lower Urban	18	0.6	2.2	2.8
Lower Rural	18	0.7	2.5	3.2
Upper Urban	17	0.6	2.3	2.9
Upper Rural	17	0.8	3.4	4.2
Total	17	0.7	2.5	3.2

Source: 2003 EIDHS

Table 5. Impact on Fertility of Reducing Unplanned Births

Simulated values of the TFR[a] assuming 90% reduction in unplanned births, by source of unplanned births and by region, Egypt EIDHS 2003

Region	Source of Unplanned Births			Total [e]	Actual TFR
	Use Failure [b]	Use Discon-tinuation [c]	Unmet Need [d]		
Urban Governorates	2.10	2.04	2.23	1.84	2.26
Urban Lower Egypt	2.65	2.56	2.75	2.30	2.83
Rural Lower Egypt	2.94	2.82	3.08	2.49	3.18
Urban Upper Egypt	2.85	2.72	2.85	2.55	2.93
Rural Upper Egypt	4.12	3.91	4.08	3.61	4.25
Total Egypt	3.02	2.89	3.08	2.62	3.18

[a] Simulated TFR is computed by subtracting 90% of adjusted differences from observed TFR. Adjusted differences are the differences between observed TFR and estimate of TFR after eliminating births reported as unplanned, classified according to the mother's pre-pregnancy status as users (failure), recent users (discontinuation), or distant users or nonusers (unmet need), adjusted as follows: (1) differences due to excluding births reported as mistimed are discounted by a factor of 0.5, (2) differences due to discontinuation or unmet need are discounted by 0.97 to account for contraceptive failure, and (3) differences due to unmet need are discounted by 0.7 to account for discontinuation. See Appendix A.

[b] Excluding unplanned births whose mothers were using contraceptives the month prior to conception.

[c] Excluding unplanned births whose mothers were using contraceptives within the 12-month period prior to conception but were not using during the month prior to conception.

[d] Excluding unplanned births whose mothers were not using contraceptives during the 12-month period prior to conception.

[e] Excluding all three categories of unplanned births.

Table 6: Ideal Number of Children and Fertility Preferences

Percentage distribution of ideal number of children, mean ideal number of children, and percent wanting no more children at the survey, by number of living children, 2003 EIDHS

Number of Living Children	Ideal Number of Children					Fertility Preferences[b]	
	Percentage responding:				Mean of Numeric Responses[a]	Percent Wanting No More Children	*n women*[c]
	1-2 children	3 children	4+ children	Non-numeric			
0-1	57	22	9	12	2.4	10	3589
2	55	26	9	10	2.5	60	2247
3	31	40	14	16	2.9	86	1609
4+	22	16	32	31	3.4	97	1714
Total	39	24	18	19	2.8	69	9159

[a] Calculated for those women providing numeric response.
[b] Currently married women.
[c] Weighted.

Table 7: Advantages and Disadvantages of Having Only Two Children

Summary percentages of currently married women agreeing with items on the advantages and disadvantages of having only two children, 2004 SFT

	Percent
Advantages[a]	
Percent disagreeing with all 9 advantages	0
Percent agreeing with at least 5 advantages	99
Percent agreeing with all 9 advantages	91
Disadvantages[a]	
Percent disagreeing with all 8 disadvantages	70
Percent agreeing with at least 4 disadvantages	4
Percent agreeing with all 8 disadvantages	1

a. The advantages and disadvantages presented to the respondents were as follows:

Advantages	**Disadvantages**
A less crowded household	Less help from children in household work
A better living standard	Less contribution to household income
Children raised more properly	Insufficient support in old age
Children can have more schooling	Feeling of a strong family is lost
Children are healthier	Husband less tied to family
Less stressful to woman's health	Family name is weakened
Easier for woman to work and enjoy herself	Risk of shortage of sons or daughters
Reduce population explosion in Egypt	Risk of not enough children surviving to adulthood
Household is happier	

Table 8: Fertility Ideals

Percent distribution of ideal number of children, for Egyptian couples and for respondent's children

Ideal number of children	Egyptian couple: maximum desirable number of children[a]	Egyptian couple: number that is "too few" children[b]	Ideal number for daughter or son
0	-	1	-
1	0	74	1
2	20	22	57
3	45	3[c]	19
4	22	-	4[d]
5+	13	-	-
Depends	-	-	15
Other, not stated	0	-	4
Total	100	100	100
Number of Women[e]	*3286*	*3286*	*3286*

[a] The questionnaire item is: "For a couple these days in Egypt, what is the number of children after which you would advice them not to have more?"
[b] The questionnaire item is: "For a couple these days in Egypt, what is the number of children you would consider too few for them?"
[c] 3 or more children.
[d] 4 or more children.
[e] Weighted.

Table 9: Attachment to Stated Ideal Number of Children

Percentage distribution of currently married women according to feelings about having one child more or one child less than ideal, women whose ideal number is two or three children, Egypt SFT 2004

	Ideal number of children	
	Two children	**Three children**
How much would it matter if you had one child more than ideal?		
A great deal	35	40
Little	16	13
Not at all	**49**	47
Total	100	100
How much would it matter if you had one child less than ideal?		
A great deal	27	12
Little	14	15
Not at all	59	**73**
Total	100	100
n women[a]	*1479*	*945*

[a] Weighted.

Table 10: Son Preference in Fertility Preferences

Percentage not wanting another child among currently married non-pregnant women with two living children, according to the sex composition of living children, EIDHS 2003 and SFT 2004

Sex composition	**EIDHS**		**SFT**	
	Percent Not Wanting Another Child[a]	**Sample Distribution**	**Percent Not Wanting Another Child**[a]	**Sample Distribution**
Two sons	57	17	60	17
One son and one daughter	67	56	65	56
Two daughters	41	27	50	27
Total	58	100	61	100
n women[b]		*1535*		*646*

[a] Includes women contraceptively sterilized and declared infecund.
[b] Weighted.