Fertility Decline in Egypt:
Current Status, Future Prospects

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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. Wanted fertility is already at replacement level in Egypt, according to revised estimates presented in this paper, and therefore achievement of replacement-level fertility mainly requires reductions in unwanted fertility. For the latter, of highest priority is improving contraceptive continuation (as against reducing use-failure or unmet need); discontinuation accounts for about one-half of unwanted fertility. With respect to wanted 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. The data on fertility attitudes suggest that much of the "unwanted" fertility is not deeply unwanted, instead is relatively easily accepted. 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. Some information from these data are analyzed in Section IV 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 inter-relations between wanted and unwanted fertility and the sources of unwanted fertility. Section VI considers the potential impact of nuptiality change. Section VII 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 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[1], 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 roughly half that amount 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.[2] 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 calculated from UN estimates (United Nations 2003). 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,

[1] A new set of estimates and projections – the 2004 Revision – were released by the United Nations Population Division several months ago. To date these have not yet been distributed in a convenient electronic format, hence this paper analyzes estimates contained in the 2002 Revision. It is quite unlikely the new estimates will change the picture in Table 1 and 2 to any marked extent.

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

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. Among the ten non-Arab countries listed, only the Turkish decline clearly pre-dates the Egyptian decline. 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 this respect. Among Arab countries, the Egyptian decline was relatively rapid during its first decade but relatively slow during its second and third decades (except as compared to Iraq). The pace of decline in Egypt is also not especially slow in comparison to the selected non-Arab countries, with a few exceptions: Iran, China, and Mexico, all three of which experienced extraordinarily rapid declines. Otherwise, the Egyptian decline has been slightly slower than the declines in Indonesia, Brazil, and Kenya, and on a par with the pace of the declines 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.[3] 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

[3] 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.

experience of some other populous countries where fertility reduction has also been a national priority (India, Bangladesh).

III. Excess Fertility: Wanted or Unwanted?

The distinction between wanted and unwanted 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 unwanted 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 unwanted 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

Given the importance of the wanted-unwanted distinction, it is frustrating that the distinction is difficult to operationalize in empirical research. This difficulty in turn reflects both the ambiguity of concept and the sensitivity of the topic of unwanted childbearing, in Egyptian society as most everywhere. As a practical matter, in research that aspires to adopt a historical perspective and to compare major strata of the population, heavily reliance must be placed on Demographic and Health Survey data, i.e. the time-series of Egypt DHS. 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 <u>then</u>, did you want to wait until <u>later</u>, or did not want (<u>more</u>) 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 estimate 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 have developed a new method that, we are persuaded, offers a more valid breakdown of fertility into wanted and unwanted components (Casterline and el-Zeini 2005a). Our method relies on the fertility attitudinal item that is generally agreed to have the highest validity and reliability: the prospective preferences question, "Would you like to have (a/another) child or would you prefer not to have any (more) children?" The present analysis is a first application of this alternative method for estimating unwanted fertility. As it turns out, the choice of estimator is highly consequential: the rates of wanted and unwanted fertility according to this new method depart substantially from the rates derived from EDHS data using the conventional method, as will be shown below. The result is a starkly different understanding of the evolution of fertility in Egypt during the past twenty years and its current status. Indeed, our own assessment of the Egyptian fertility decline just three months ago told a very different story (Casterline and el-Zeini 2005b).

Estimates of wanted and unwanted TFRs for Egypt from 1986-89 through 2000-03 are presented in Table 3. Considering first the revised estimates in the top panel (Table 3a), wanted fertility has declined from 2.6 births per woman to 2.1 births per woman since the late 1980s. Most of this decline occurred, it appears, prior to 1990: as of 1989-92, the wanted TFR was already near replacement level, at 2.2 births per woman, and it has remained near this level since. Unwanted fertility, in contrast, has steadily declined since the late 1980s, from nearly two births per woman to a level of one birth per woman in 2000-03. Note that from 1990 to the present, the Egyptian fertility decline can be attributed almost entirely to a decline in unwanted fertility.[4] The historical trends in the revised estimates of wanted and unwanted fertility closely resemble the existing estimates (compare Table 3a and 3b). The two sets of estimates differ markedly, however, in the relative levels of wanted and unwanted fertility: according to the revised estimates, unwanted fertility is about one-half birth per woman higher than has been believed, and wanted fertility corresponding one-half birth lower. Indeed, as already noted, the wanted TFR is only slightly above two births per woman. If replacement-level fertility is taken as 2.1 births per woman, then as of 2000-03 the entire gap between the observed TFR and replacement-level fertility can be attributed to unwanted fertility.

[4] During the same period, unmet need for contraception has plummeted, from over one-fifth of currently married women to less than one-tenth, corroborating evidence of a steep decline in unwanted fertility.

By this accounting, eliminating unwanted fertility – a desirable policy objective on several grounds – will be sufficient to achieve the national target of replacement-level fertility by 2017. However, this conclusion must be qualified, for three reasons. First, it is unrealistic to posit total elimination of unwanted fertility, especially in Egypt where the average age at first marriage is relatively young (early 20s), leaving women with many years of risk of unwanted births, and neither contraceptive sterilization nor induced abortion are readily available as means of birth control (nor likely to become so in the near future). If the achievable floor in the unwanted TFR is assumed to be 0.1 or 0.2 births per woman[5], then an equivalent additional reduction in wanted fertility will be required to offset this lingering unwanted fertility. Secondly, 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. Ideally they would be successful, and it can be argued that reproductive health services should assist them in doing so (consistent with the ICPD Programme of Action). Thirdly, as will be argued at more length in Section IV of this paper, there are reasons to raise questions about the meaning of unwanted fertility in Egypt; the wanted-unwanted distinction is not clean and sharp, and indeed we believe that some portion of unwanted fertility should not be considered "unwanted". For these three reasons, we conclude that achievement of replacement-level fertility in Egypt will require further transformation of fertility desires and further declines in wanted fertility.

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 over 0.4 births below replacement-level fertility; overall fertility in these metropolitan areas is slightly above replacement-level (TFR = 2.3) only because women average 0.6 unwanted births (but the lowest unwanted TFR among the five regions). Elsewhere, wanted fertility is also below replacement level in the urban areas of Lower and Upper Egypt (about 1.9 in both areas), and at replacement level in the rural areas of the delta. Only in the rural areas of Upper Egypt is wanted fertility estimated to be above replacement level, at 2.6 births per woman. The regional comparison suggests that the reproductive regime in rural areas of Upper Egypt is fundamentally different from the other major regions of the country – well over two births per woman are still wanted in rural Upper Egypt. Even so, the overall TFR in excess of four births per woman in rural Upper Egypt can be attributed mainly to high unwanted fertility, estimated here at 1.6 births per woman, more than one-half birth above the national average of about one unwanted birth per woman. It is striking how much unwanted fertility differs among the five regions, from 0.6 births per woman (Urban Governorates) to 1.6 births per woman (rural Upper Egypt). While wanted fertility also varies among the five regions, from Table 4 one must

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

conclude that regional variation in the overall TFR is due primarily to regional variation in unwanted fertility.[6]

We argued above that some continuing unwanted fertility must be expected, and therefore achieving replacement-level fertility will require reductions in both wanted and unwanted fertility in Egypt as a whole and, specifically, in the rural areas. Nevertheless, the decisive and unavoidable conclusion from the analysis in Tables 3 and 4 is that far higher priority should be given to unwanted fertility. Furthermore, one might argue that reducing unwanted fertility is a more legitimate governmental activity than attempting to modify family-size desires.

IV. Wanted and Unwanted Fertility: What Does the Distinction Signify?

The analysis in Tables 3 and 4 relies on women's responses to the prospective fertility preferences item: "Would you like to have (a/another) child or would you prefer not to have any (more) children?" Numerous studies have shown that this item possesses relatively high validity and reliability (see review of evidence in Casterline and el-Zeini 2005a). We believe this item provides an entirely defensible basis for distinguishing wanted and unwanted fertility and, more generally, for assessing fertility desires. A wanted TFR of 2.1 births per woman is, in our view, a valid characterization of recent fertility in Egypt. Having said this, it is important to recognize that fertility desires cannot be reduced to the simple wanted-unwanted distinction. Multiple pieces of information demonstrate that, while wanted fertility may be close to two births per woman in Egypt at present, larger family sizes are readily accepted and perhaps even considered desirable. Put otherwise, these other pieces of data raise questions about what it means for a birth to be "unwanted" if it occurs to a woman who has stated a desire to have no further births.

Consider, for example, fertility ideals. 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 5. 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 among Egyptian women. 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

[6] This is a reversal of our earlier conclusion from analysis of existing DHS estimates of wanted and unwanted fertility (Casterline and el-Zeini 2005b).

fraction of women (19%) fails to mention any number at all. These responses suggest that desired fertility is certainly in excess of two children per woman, undoubtedly a significant fact when one is contemplating prospects for further fertility decline in Egypt, as also argued by Eltigani (2003).

It is likely that the responses of some women to the ideal family size item 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 5, 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 5 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. Note that the data in Table 5 on fertility preferences are the same data used to generate the estimates of wanted and unwanted fertility in Tables 3 and 4. A wanted TFR of 2.1 is consistent with substantial fractions of women desiring more than two children (as reflected in their responses to the prospective preferences item) and having an ideal number of children that exceeds two. (One reason this is possible -- explored further in Section VI of this paper -- is nuptiality: a significant proportion of the reproductive years are spent outside marriage, on average, and therefore without risk of pregnancy, since extra-marital sex appears to be quite rare in Egypt.)

A more in-depth exploration of fertility desires in Egypt is provided by survey data collected under 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-03 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. (For a description of the project design and extensive descriptive analysis, see Casterline and Roushdy (forthcoming).)

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: 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. 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 6. 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 6, 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 men 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.

From this evidence, one might infer that Egyptians are largely indifferent between having two and three children. This indifference was pursued 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 7 for those women whose ideal is two and three living children, critical groups for evaluating the commitment to the two-child goal. A complex picture emerges, and the data are subject to varying interpretations with different emphases. 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".[7] These additional children – a third child beyond two or a fourth child beyond three – are classified as "unwanted" according to prospective fertility preferences, but many respondents reveal little resistance to the additional "unwanted" child. Nevertheless, it is also the case in Table 7 that there is more acceptance of falling short of three children than exceeding two children, and this may be critical to the transition to replacement-level fertility. As already noted, substantially more women care "not at all" about falling short of an ideal of three than care "not at all" about exceeding an ideal of two (73% and 49%, respectively). And, similarly, for women whose ideal is two children, 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".

[7] Acceptance 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 SFT samples of 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.

Further insight into the significance of the wanted-unwanted distinction is provided by Table 8. This table is restricted to women who indicate that they want no further children. Table 8 shows the fraction of such women whose ideal number of children exceeds their current number of living children and the fraction who provide a non-numeric response ("up to God") to the ideal number of children item. Of special interest are women with two or three living children. A relatively small proportion of these women (less than ten percent) choose an ideal number of children greater than their current number, but a further proportion provide a non-numeric response, resulting in fifteen to twenty percent whose response to the ideal number of children item raises some doubts about the strength of their attachment to stopping childbearing at their current number.

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).

Taking stock of all the empirical evidence in Tables 5-8, it is clear that while a majority of women may indeed wish to stop at two children -- as reflected in the wanted TFR of 2.1 – this is mixed with feelings that three children is more "ideal" and with an indifference (or acceptance) about having a third child. One senses enormous uncertainty and ambivalence about fertility aspirations in contemporary Egyptian society. It seems overly simplistic to classify births to women who profess a desire to stop as "unwanted" when in many cases these births bring women closer to their ideal number of children or when they indicate some indifference about having the further child.

In short, we believe that the unwanted TFR in Egypt of 1.0 births per woman is composed of some fertility that is truly unwanted and some fertility about which women have feelings that are not so simply classified. This fact is of considerable relevance when considering the potential for reducing unwanted fertility and the interventions that might advance this aim.

V. Unwanted Fertility: What is the Relative Importance of Each Source?

Although unwanted fertility is composed of some portions that are likely to be difficult to eliminate, because they reflect weak commitment to expressed fertility preferences, other portions are likely to be more responsive to policy and program initiatives. In this section, we consider sources of unwanted fertility in Egypt, under the assumption that policy and program initiatives will be more effective to the extent they are informed by a good understanding of the relative importance of various sources of unwanted fertility and how these vary among major sub-groups of the population.

V.a. Methodology: assessing the fertility impact of reducing unwanted births

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

Tables 3 and 4 show the "wanted TFR" according to the method proposed by Casterline and el-Zeini (2005a). This TFR is calculated applying estimates of the proportion unwanted by birth cohort (age-group at beginning of reference period) to the estimated cohort-specific fertility rates. This measure is insufficient for the task of assessing the potential impact of reducing unwanted births, for two reasons. First, it is unrealistic to assume that all unwanted fertility can be eliminated. A proportion that might be realistic to eliminate must be selected. This in itself is a difficult analytical exercise that, ideally, should make use of demographic analysis of the nature of wanted and unwanted fertility, analysis of deficiencies in the provision of family planning services and the feasibility of overcoming these deficiencies, and rich social science analysis of the character of unwanted fertility in any particular setting. This is a tall order, and we made just a limited effort in this direction in Section IV.

A second 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-continuation vs. reducing use-failure) through which a reduction in unwanted 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

unwanted fertility. It is this limitation of relying on the wanted TFR alone that we address in this section.

We do so by identifying a set of mutually exclusive sources of unwanted births. Using the EIDHS-03 (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 unwanted births, this approach offers more useful insight for policy development and evaluation. This exercise makes use of the retrospective direct reports on the wantedness of births at the time of conception. As indicated in Section III, we do not believe that these reports give a complete accounting of unwanted births: according to these retrospective reports, 11 percent of births in the three years preceding the 2003 EIDHS were unwanted, as against 28 percent according to our method which, we are convinced, yields far more valid estimates. There is, however, a good argument for focusing on the births that are declared "unwanted" in retrospective reports. One can hypothesize that, among all births that might validly be classified as "unwanted", this sub-set is more strongly and deeply unwanted – these constitute the unaccepted fraction of the "unwanted" births (consistent with our argument in Section IV that a substantial fraction of unwanted fertility in Egypt is readily accepted). Accordingly, it seems likely that this subset of unwanted births is more susceptible to elimination via appropriate policy and program initiatives.

However, because the retrospectively declared unwanted births are a fraction of all unwanted fertility, we do not present the simulated TFRs (in contrast to our earlier analysis in Casterline and el-Zeini (2005b)[8]), rather we calculate the percentage of the estimated reduction in fertility that can be attributed to each source. This is equivalent to presenting the percentage of unwanted births due to each source, weighted by the observed age-specific fertility rates. Note that this assumes, implicitly, that the unwanted fertility unaccounted for by the retrospective direct reports (i.e. the difference between 28 percent unwanted and 11 percent unwanted) is distributed by source in the same manner as the directly reported unwanted births -- admittedly an heroic assumption.

The methodology of this exercise is described in detail in Appendix A. In brief, key features of this methodology are as follows. First, unwanted 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

[8] Our earlier analysis also took into account births reported as mistimed as well as births reported as unwanted. In this paper we have shifted to an analysis of unwanted fertility only: this presents fewer conceptual and analytical challenges and, furthermore, it seems likely that unwanted fertility is more easily reduced than mistimed fertility.

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: as already conceded, we rely on retrospective declarations about the planning status of births that are known to give downwardly biased estimates of the prevalence of unwanted fertility (due to women's reluctance to admit that children were unwanted or mistimed) and, therefore, may also give a skewed impression of the distribution of the sources of unwanted fertility.

Fourth, because the method produces "simulated TFRs", the conclusions about the sources of unwanted fertility are, in effect, weighted by TFR impact.

V.b. Results: potential reductions in the TFR due to reductions in unwanted births

Table 9 shows the percentage distribution of sources of unwanted births (weighted by TFR impact) for Egypt – entire country and by major region -- from applying the procedures sketched above (and described in detail in Appendix A) to the 2003 EIDHS. For the entire country, the result is as follows:

Source of Unwanted Births	Percentage of Unwanted Fertility due to this Source
Use-failure	31 %
Use-discontinuation	53 %
Unmet need	16 %
Total	100 %

There is a clear ordering of the sources of unwanted fertility: roughly one-half from use-continuation, roughly one-third from use-failure, and the remaining one-sixth from unmet need. The small contribution of unmet need is striking and consistent with Jain's (1999) argument that

unmet need is becoming less of a priority in societies such as Egypt where contraceptive use is well-established and highly prevalent.

Considering the region-specific distributions in Table 9, predominance of use-discontinuation as a source of unwanted fertility characterizes all regions, varying only between 51 percent and 58 percent. This consistency of the contribution of use-discontinuation, despite the highly variable levels of unwanted fertility among the regions evident in Table 4, is something of a surprise. Interestingly, in the Urban governorates (the metropolitan areas, chiefly Cairo and Alexandria), while use-discontinuation retains the top position use-failure is not far behind as a source of unwanted fertility, whereas unmet need is of no consequence. It is the contribution of unmet need that varies most among regions, from 3 percent in the Urban governorates to 26 percent in rural Upper Egypt. This clearly suggests that different programmatic strategies apply in different regions, at least when it comes to the issue of targeting women with unmet need (Casterline *et al.* 2003).[9]

VI. Nuptiality

Nuptiality patterns can have an enormous impact on levels and trends in fertility. They do not figure heavily in most discussions of fertility trends in Egypt nor in discussions of future prospects. Undoubtedly one reason for this neglect is that nuptiality change has had less impact on fertility decline in Egypt than in many other developing countries (in the Arab region and outside the Arab region). A second reason is that a deliberate policy to discourage marriage, as a fertility reduction tool, is not conceivable any time soon in Egypt. Nevertheless, a demographic analysis of fertility in Egypt is incomplete without some attention to nuptiality.

Our analysis in this paper is brief. Data on nuptiality trends are presented in Tables 10 and 11 – measures of birth cohort and period (i.e. marriage cohort), respectively. A first point is that

[9] A comparable effort to evaluate the potential impact on fertility in Egypt of eliminating contraceptive discontinuation and contraceptive failure is provided by Blanc *et al*. (2002) using the 1995 EDHS. These authors also employ the method of TFR simulation. Unlike the present analysis, they present their results in terms of TFR impact. There are numerous differences in the particulars of their analytical approach as contrasted with ours, as detailed in Casterline and el-Zeini (2005b). Certainly their simulated TFRs should show 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. Despite these differences in methodology, the overall conclusions from the two analytical exercises with respect to the relative contribution to TFR reduction of the different sources of unwanted fertility are the same: more effective practice of contraception (i.e. less use-failure) would lead to much less fertility reduction than improved contraceptive continuation. (Blanc *et al*. do not consider reduction of unmet need.)

marriage occurs relatively early in Egypt. Even among birth cohorts coming of age in the 1990s (women born after 1975), more than one-third are married by age 20 and one-half by age 22 (Table 10). Similarly, the median age at first marriage for women marrying in the period from the late 1980s to the present has ranged between 20.0 and 21.0 and shows only the slightest trend upwards (Table 11). Even in the Urban Governorates, the median age is 22.4 years in the most recent period. This contrasts with medians that exceed 25.0 in urban populations in many other Arab and non-Arab countries.

A second point, which gets slighted in the emphasis on the relatively young age at first marriage in Egypt, is that there have been noticeable trends in nuptiality over the past three decades. In particular, the fraction of women marrying before age 18 – whether assessed on a birth cohort or marriage cohort basis – has declined by more than one-half (although still constituting about one-fifth of all marriages) (Tables 10 and 11). Considering other indicators of trend: whereas more than one-half of women in the birth cohort of 1955-59 married before age 20, this figure is about one-third in the birth cohort of 1980-83 (Table 10); and the median age at marriage for marriage cohorts has increased from 18.6 to 20.7 from 1975-80 to 1998-2003, with the increase being of roughly the same magnitude in all regions (and, in fact, somewhat larger in magnitude in Upper Egypt) (Table 11).

It is critical to take into account the nuptiality factor – loss of exposure to childbearing due to time spent outside marriage during the reproductive years – when assessing the current status of fertility in Egypt and prospects for further decline. As already noted, nuptiality is one reason (but not the sole reason) for the apparent discrepancy between fertility attitudes (ideals, preferences) and the wanted TFR: a wanted TFR of 2.1 is possible despite the prevalence of desires for three (or more) children because a fraction of women are non-married. And looking forward, increases in the proportion of the reproductive years spent non-married would further offset persistent desires on the part of some women for three (or more) children. We believe that further nuptiality change – later age at first marriage, and more women never marrying – is to be expected, even if Egypt remains more pro-nuptial than most Arab societies. (We take a more positive view of the potential fertility-reducing impact of future nuptiality change than Eltigani (2003).) Among other consequences, later entry to marriage will reduce the number of years that women are at risk of unwanted births, thereby contributing to the reduction of the unwanted TFR from its current level of one birth per woman.

VII. 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, two inter-related questions are of much greater significance, in our view: 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 answer to this question is that much more weight should be placed on unwanted fertility. We estimate a wanted TFR of 2.1 births per woman and an unwanted TFR of 1.0 births per woman for the most recent period (2000-2003). Elimination of unwanted fertility would, therefore, bring fertility down to replacement level. This is an unreachable goal, in our view, given the relative unavailability of sterilization and induced abortion as means of birth control. A lingering unwanted TFR of 0.2 per woman, for example, would require an equal amount of reduction in the wanted TFR (i.e. to 1.9 births per woman). By this reasoning, one might achieve

replacement-level fertility through twenty percent and eighty percent reductions in wanted and unwanted fertility, respectively.[10]

This answer applies to the country as a whole. When current fertility is dissected by region, the relative weights vary: in the Urban Governorates, rather slight reductions of unwanted fertility (one-third reduction) is the exclusive requirement for the achievement of replacement-level fertility; in the urban areas of Lower and Urban Egypt as well less than complete elimination of unwanted fertility will suffice. At the other extreme, in rural Upper Egypt wanted fertility is almost one-half child above replacement, and therefore substantial reductions in wanted fertility are required if replacement-level fertility is to be achieved.

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.

How firm is the attachment to two children? How do these desires convert into observed fertility rates?

The evidence on the attachment to the two-child norm is distinctly mixed. Judging by the information collected under the SFT project, women recognize 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 widespread firm attachment to such a norm at the present time. Here we concur with Eltigani (2003) – desired family size remains an obstacle to the achievement of replacement level fertility in Egypt.

This empirical evidence adds meaning and context to the unwanted TFR of 1.0. The survey data suggest that much of this fertility is not deeply unwanted, rather is readily accepted, and indeed brings women's childbearing experience more in line with some of their ideals. We suspect that more in-depth qualitative probing would reveal that Egyptian women's fertility desires are pulled in opposing directions by family ideals (including ideal number of children), on the one hand, and economic/social constraints, on the other. These contending forces leave many women

[10] We note again that this is a major revision of our earlier view, in which roughly equal weights were placed on reductions in wanted and unwanted fertility (Casterline and el-Zeini 2005b).

with considerable ambivalence about the two-child norm and weak attachment to the goal of stopping at two children (although when interviewed they may truthfully express a desire to have no more children after two). This in turn helps explain the relatively high unwanted TFR, itself predominantly the consequence of use-discontinuation – further indication of equivocal commitment to the two-child goal.

A further relevant point is that observed wanted fertility (e.g. the wanted TFR) typically is lower than average fertility desires. An important reason this is the case is nuptiality – late marriage and never marriage subtract from exposure to the risk of pregnancy. 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.

If further reductions in unwanted fertility are essential to the achievement of replacement-level fertility, what sources of unwanted fertility should be of highest priority?

Three sources of unwanted fertility can be distinguished: contraceptive failure, contraceptive discontinuation, and unmet need. Simulations that use retrospective data on the wantedness of recent births and contraceptive use (monthly calendar) indicate that among the three, the largest potential for fertility reduction resides in improved contraceptive continuation (accounting for roughly one-half of unwanted births). This is followed by contraceptive failure (accounting for roughly one-third of unwanted births) and, thirdly, unmet need (accounting for roughly one-sixth of unwanted births). There are important variations by region that imply different program priorities: while unmet need is the source of less than ten percent of unwanted births in the Urban Governorates, it is the source of one-quarter of unwanted births in rural Upper Egypt.

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: there would appear to be scope for considerable reduction in fertility via reductions in unwanted fertility, in particular improved contraceptive practice among those who already have experience with contraception; and 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.

But how soon will Egyptians adopt the necessary behaviors to avoid unwanted pregnancies? And how soon will a commitment to a two-child norm firm up and become close to universal? Our view is that these two developments must go hand-in-hand; at this juncture, treating wanted and unwanted 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 unwanted 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, especially if recent nuptiality trends continue. 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.

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APPENDIX A

Evaluating the Relative Fertility Impact of Reducing Different Sources of Unwanted Births

The aim is to assess the relative gain from targeting three mutually exclusive causes of unwanted births, namely: (i) contraceptive use failure; (ii) contraceptive use discontinuation; and (iii) unmet need for family planning. To achieve this end, simulated TFRs are calculated in which, alternatively, births are eliminated that can be attributed to each of these three sources of unwanted births. This exercise makes use of the retrospective direct reports on the wantedness of births at the time of conception. However, we do not believe that these reports give a complete accounting of unwanted births: according to these reports, 11 percent of births in the three years preceding the 2003 EIDHS were unwanted, as against the estimate using our method (Casterline and el-Zeini 2005a) of 28 percent. Hence, we do not present the simulated TFRs, rather calculate the percentage of the estimated reduction in fertility that can be attributed to each source. This is equivalent to presenting the percentage of unwanted births due to each source, weighted by the observed age-specific fertility rates.

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 EIDHS-03 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 EIDHS 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.

A.2. Classifying unwanted 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 EIDHS-03, 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, provided that the woman declares the birth unwanted. (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 EIDHS-03, and more than half such pregnancies are explicitly reported as use-failures; second, as already noted, we eliminate births attributable to use-failure only if women report the births as unwanted.

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 unwanted births can be attributed to unmet need. The task, then, is to separate unwanted 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, unwanted 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-03 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 unwanted births into three sources, the probability of use-failure should be taken into account when simulating the TFR impact of reducing unwanted 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. The DHS 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 determinants 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. As already noted, these retrospective reports are known to give downwardly biased estimates of the prevalence of unwanted fertility because women are reluctant to admit that a child was unwanted. In prospective data from Upper Egypt, 26 percent of births prospectively identified as unwanted were retrospectively reported as wanted and "on time" (Casterline *et al*. 2001).

Table 1. Trend in Fertility in Egypt

Total Fertility Rate (TFR), according to UN estimates and according to national 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]. The 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 3a. Trends in Wanted and Unwanted Fertility: Revised Estimates [a]

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

Period [b]	Percent Births Unwanted [a]	Total Fertility Rates [c]		
		Unwanted	Wanted	Total
1985-1988	37	1.87	2.59	4.46
1989-1992	37	1.65	2.22	3.87
1992-1995	35	1.44	2.14	3.58
1997-2000	31	1.27	2.23	3.50
2000-2003	28	1.04	2.12	3.16

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

a. Unwanted fertility – percent of births unwanted and the unwanted TFR – is calculated using the method of Casterline and el-Zeini (2005a).
b. The reference period is the 30 months leading up to the mid-point of the survey fieldwork.
c. Cohort-period fertility rates. The rates are calculated for cohorts defined by age at beginning of reference period. TFRs are then obtained by summing over these cohort-period-specific rates

Table 3b. Trends in Wanted and Unwanted Fertility: Existing Estimates [a]

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

Period [b]	Percent Births Unwanted [a]	Total Fertility Rates [c]		
		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)

a. Unwanted births are ascertained by comparing ideal family size with the number of living children at conception (the "Lightbourne method"). See EDHS reports.
b. The reference period is the 36 months prior to interview.
c. Age-period fertility rates.

Table 4. Wanted and Unwanted Fertility[a] by Place of Residence: 2000-2003 [b]

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 [c]		
		Unwanted	Wanted	Total
Urban Gov.	27	0.64	1.65	2.29
Lower Urban	28	0.85	1.94	2.79
Lower Rural	29	1.07	2.10	3.17
Upper Urban	27	0.92	1.92	2.84
Upper Rural	30	1.62	2.57	4.19
Total	28	1.04	2.12	3.16

Source: 2003 Egypt Interim DHS

a. Unwanted fertility – percent of births unwanted and the unwanted TFR – is calculated using the method of Casterline and el-Zeini (2005a).

b. The reference period is the 30 months leading up to the mid-point of the fieldwork period.

c. Cohort-period fertility rates. The rates are calculated for cohorts defined by age at beginning of the reference period. TFRs are then obtained by summing over these cohort-period-specific rates

Table 5: 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*

Source: Egypt Interim DHS, 2003

a Calculated for those women providing numeric response.

b Currently married women.

c Weighted.

Table 6: 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*

Source: SFT Survey, 2004

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 7: 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
Number of women[a]	*1479*	*945*

Source: SFT Survey, 2004

a Weighted.

Table 8. Consistency between Fertility Preferences and Fertility Ideals

Percentage of currently married women whose ideal number of children exceeds their current number, among women who do not want another child, by number of living children, 2000 EDHS and 2003 EIDHS

Number of Living Children	2000 EDHS				2003 EIDHS			
	Percent Ideal > Living	Percent Non-Numeric	Sum	*N Women*[a]	Percent Ideal > Living	Percent Non-Numeric	Sum	*N Women*[a]
1	46	13	59	*152*	43	11	53	*96*
2	7	8	16	*1720*	8	6	15	*1040*
3	7	15	22	*2327*	6	13	19	*1513*
4	3	26	29	*1856*	2	22	24	*1084*
5	3	32	35	*1290*	1	30	31	*675*
6+	2	39	42	*1677*	3	37	40	*775*

Source: Egypt DHS, 2000; Egypt Interim DHS, 2003

a Women who indicate a desire not to have another child. Weighted.

Table 9. Sources of Impact on Fertility of Reducing Unwanted Births

Percentage of reduction in fertility due to elimination of unwanted birth attributed to each source of unwanted births[a], by place of residence, EIDHS 2003

Place of Residence	Source of Unwanted Birth			Total [e]
	Use Failure [b]	Use Discon-tinuation [c]	Unmet Need [d]	
Urban Governorates	45	52	3	100
Urban Lower Egypt	33	51	16	100
Rural Lower Egypt	37	52	11	100
Urban Upper Egypt	26	58	16	100
Rural Upper Egypt	22	52	26	100
Total Egypt	31	53	16	100

Source: Calculated using Egypt Interim DHS, 2003.

a Births are eliminated from calculation of age-specific fertility rates if they are retrospectively reported as unwanted. The births are classified according to the mother's pre-pregnancy status as users (failure), recent users (discontinuation), or distant users or nonusers (unmet need), with adjustments as follows: (1) differences due to discontinuation or unmet need are discounted by 0.97 to account for contraceptive failure, and (2) differences due to unmet need are discounted by 0.7 to account for discontinuation. See Appendix A.

b Excluding unwanted births whose mothers were using contraceptives the month prior to conception.

c Excluding unwanted 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 unwanted births whose mothers were not using contraceptives during the 12-month period prior to conception.

e Excluding all three categories of unwanted births.

Table 10. Trends in Birth Cohort Nuptiality

Percentage ever-married by exact ages 18, 20, 22, and 25, by birth cohort

Age	Birth Cohort					
	1955-59	**1960-64**	**1965-69**	**1970-74**	**1975-79**	**1980-83**
18	42	38	34	26	20	18
20	57	52	50	43	36	35
22	69	65	63	59	50	
25	82	77	81	77	75	

Sources:
1955-59 & 1960-64: 1988 EDHS
1965-69: 1995 EDHS
1970-74 & 1975-79: 2000 EDHS (age 25 in 1975-79: 2003 EIDHS)
1980-83: 2003 EIDHS

Table 11. Trends in Period Nuptiality

Median age at first marriage, and percentage marrying before exact age 18 and after exact age 25, by survey and place of residence: first marriages during five years preceding survey

Measure and Place of Residence [a]	Survey					
	1980 EFS	1988 EDHS	1992 EDHS	1995 EDHS	2000 EDHS	2003 EIDHS
Median Age						
Total Egypt	18.6	19.8	20.3	20.3	20.5	20.7
Urban Governorates	20.9	22.7	22.8	22.3	22.4	22.4
Urban Lower	20.7	22.2	21.8	22.7	21.8	22.4
Rural Lower	18.4	19.4	19.3	20.3	20.0	20.3
Urban Upper	18.3	21.0	21.4	20.6	22.0	20.9
Rural Upper	16.8	17.3	17.6	17.9	19.0	19.4
Percent Marry Before Age 18						
Total Egypt	44	30	26	26	22	20
Urban Governorates	25	10	11	16	11	11
Urban Lower	28	14	11	9	12	9
Rural Lower	44	31	28	24	23	21
Urban Upper	48	23	18	22	17	18
Rural Upper	70	60	53	51	36	32
Percent Marry After Age 24						
Total Egypt	10	15	16	15	14	16
Urban Governorates	18	29	29	25	24	30
Urban Lower	18	23	21	29	19	21
Rural Lower	5	5	10	9	10	10
Urban Upper	12	23	24	16	21	18
Rural Upper	3	6	5	4	7	10

Source: Egypt national surveys, as indicated.

a. Place of residence at interview, not at marriage.