The Status of Fertility Transition in Egypt and Morocco: Explaining the Differences

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ABSTRACT

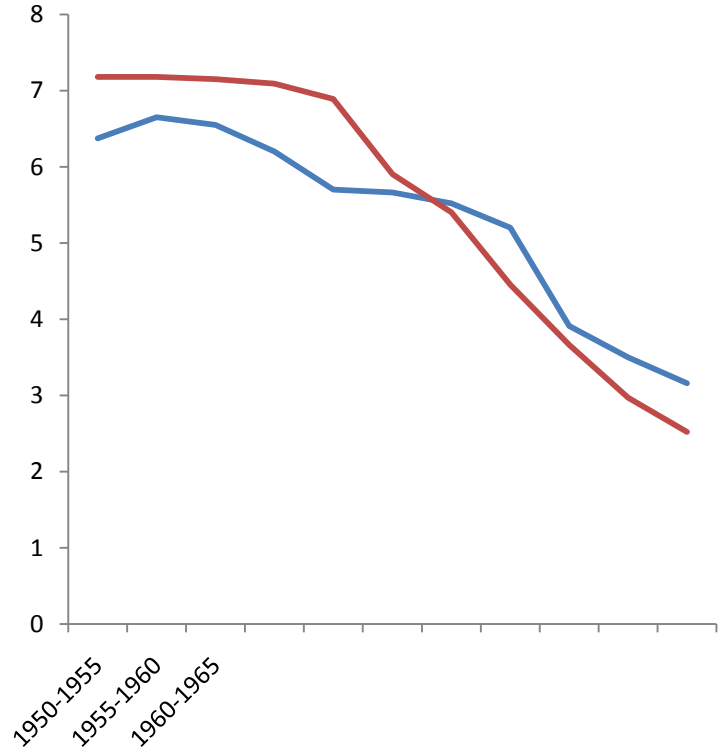
During the 1990s, fertility transition was going ahead in Morocco while slowing down in Egypt. This paper compares the status of the fertility transition in the two countries using DHS data. Findings indicate that the difference in the pace of fertility transition is attributable to changes in fertility preference. Unwanted fertility declined comparably in the two countries, but only Morocco witnessed a decline in wanted fertility. The decline in wanted marital fertility in Morocco was driven by the postponement of the second birth and by a decline in son preference. Decline in unmet need was the major factor in the decline of unwanted fertility in Morocco. In Egypt, the decline was equally attributable to declines in unmet need and discontinuation. While the difference in marriage patterns explains a large part of the difference between fertility levels in the two countries, it does not account for their differential pace of transition.

Concluding their overview of the demography of the Arab world and the Middle East, within *Population* chronicle on the demography of the world's regions, Tabutin and Schoumaker noted three fertility-related paradoxes: "how can we explain the rapid changes in Morocco, where access to education and social development have fallen far behind neighbouring countries such as Algeria and Tunisia? Conversely, how can we explain the persistence of high fertility in the Palestinian territories, where child mortality is low and nearly all children attend school? How can we explain the relative slippage of Egypt, whose government has been championing a firm Malthusian policy for the past 40 years?" (2005: 589-590) The second of these three questions, on close scrutiny, becomes less of a puzzle in light of the political conflict between Israel and Palestinians (Fargues 2000; Khawaja 2003). The paths of the fertility transition in Morocco and in Egypt, on the other hand, do seem paradoxical, especially when contrasted.

Figure 1 depicts the fertility transition paths in Egypt and Morocco during the last half century. Starting from a lower level of the total fertility rate (TFR), Egypt started its transition almost a decade before Morocco. The slope of the decline in Egypt, however, has never been steep, except for a brief period in the eighties. It has also experienced several periods of sluggish declines and plateaus. The decline in Morocco, on the other hand, has followed a nearly linear path.

By early 1990s Morocco was at least as far from replacement fertility as Egypt was (Sabagh 1993). Extrapolating from past trend of fertility, Mauldin and Ross (1994) predicted TFR in year 2015 to reach 2.79 in Egypt and 3.15 in Morocco. Adding indicators for program efforts and socioeconomic status to information on fertility levels and trend, they computed a composite index

Figure 1. Trend in total fertility rate (TFR) in Egypt and Morocco from 1950 to 2005



Source: United Nations (2009)

for the prospect of reaching replacement fertility by year 2015, with higher index indicating a higher prospect. The value for that composite index was higher in Egypt than in Morocco as a result of higher score for program effort, higher socioeconomic indicator, higher contraceptive rate, and larger decline in TFR between 1960-65 and 1980-85.

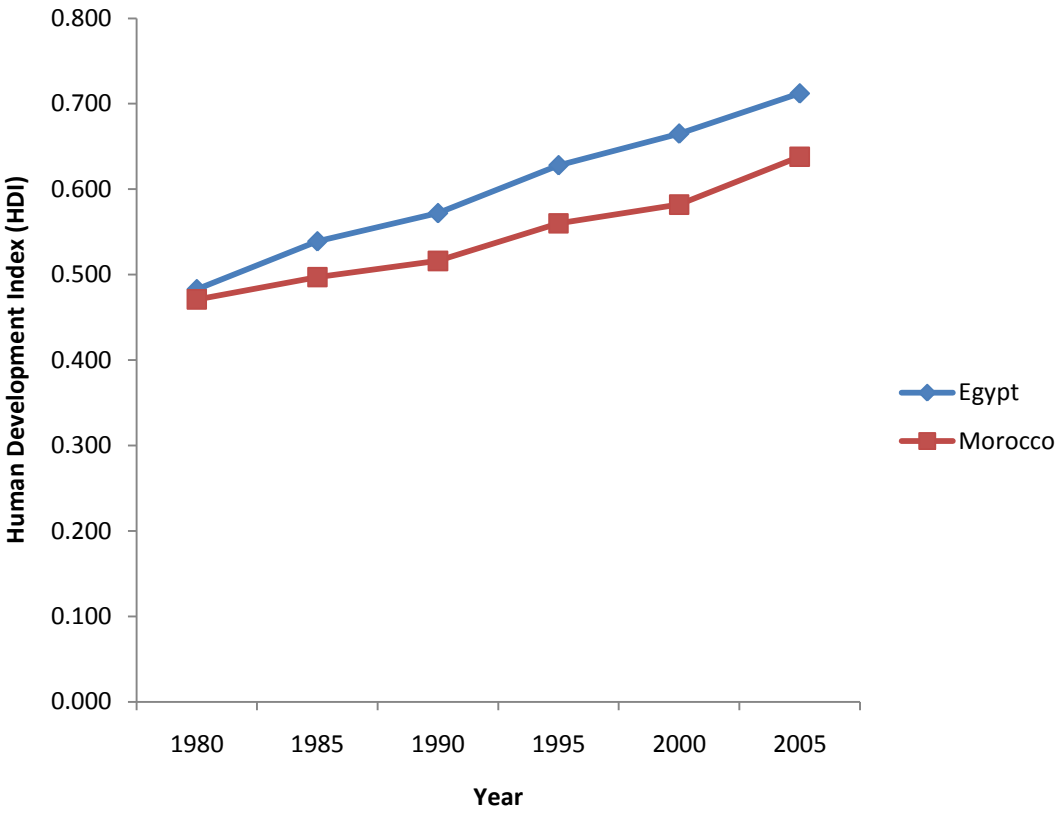
About twenty years earlier, Morocco was even less advanced in terms of its fertility transition than Egypt. While Mauldin and Ross (1994) put the two countries in the same group of "probable countries" in terms of reaching replacement fertility by 2015, Berelson (1978) put Egypt with the "possible" group of countries and Morocco within the "unlikely" group in terms of reaching a TFR of 2.5 children per woman in year 2000. As it turned out, Moroccan TFR has reached 2.5 during 2000-2005, while Egypt's was yet to fall below 3 children per woman. The latest available estimates show continuing divergence in the paths of the two countries. According to the 2008 Egypt Demographic and Health Survey (DHS), TFR is still standing at 3.0 children per woman (El-Zanaty and Way 2009). According to the latest United Nations medium variant projections, Egypt is to reach replacement fertility during the period 2030-2035, while Morocco is expected to reach it during the period 2015-2020 (United Nations 2009). These projections, however, probably reflect the recent past trend rather than a rigorous prediction of what is likely to occur in the future.

The difference in the fertility transition paths between Egypt and Morocco is noteworthy because of the little difference in the developmental status between the two countries. The two countries are classified by the World Bank in the lower middle income category. And if anything, the comparison here favours Egypt. Figure 2 shows the trend in the Human Development Index (HDI) in the two countries from 1980 to 2005. Starting from roughly the same level as Morocco, Egypt has progressed more steeply so that the gap between the two countries has increased until it reached a maximum by year 2000. Afterwards, the progress in Morocco started to pick speed and to parallel that of Egypt. The excess in HDI in Egypt compared to Morocco is due to higher educational attainment (adult literacy rate in 2006 was 71.4% in Egypt and 54.7% in Morocco; combined school enrolment ratio in 2006 was 76.4% in Egypt and 59.6% in Morocco), and higher per capita gross domestic product (GDP per capita based on purchasing power parity in US dollars in 2006 was 4,953 in Egypt and 3,915 in Morocco). In addition, human poverty index was lower in Egypt (20.0%) than in Morocco (31.8%). On the other hand, gender empowerment measure was lower in Egypt (0.238) than in Morocco (0.316). But this is mainly due to the lower proportion of seats in parliament held by women in Egypt[1]. Other components of the measure were almost equal in the two countries, or only slightly better in Morocco. (UNDP 2008)

The prospects of child survival, a main determinant of long-term changes in fertility (Cleland 2001), have also shown larger improvement in Egypt. The infant mortality rate during the 5-year period before DHS survey has declined in Egypt from 61.5 per thousand in 1992 to 33.2 in 2005 (46% decline), and the under five mortality rate from 84.9 to 41.0 (52% decline). In Morocco, infant mortality rate declined from 57.3 to 40.4 (29% decline) and under five mortality from 76.1 to 47.4 (38% decline). (Macro International Inc. 2009)

[1] This will soon change with the passing of a law in Egypt in 2009 that assigns 46 seats in the People Assembly to women starting from the coming election in 2010.

Figure 2. Trend in human development index (HDI) in Egypt and Morocco from 1980 to 2005



Source: UNDP (2008)

During the nineties, both countries have gone through structural adjustment and economic reforms under the guidance of the International Monetary Fund (IMF). Typically, these reforms resulted, at least initially, in increased levels of unemployment and income inequalities (Pfeifer 1999). Both countries also stood to benefit from, as well face risks associated with, the European Union's Association Agreements with countries in the Mediterranean region (Ghesquiere 1998). During the last decade, Egypt has experienced notable economic growth, but faced critical issues of fiscal deficit and inflation (IMF 2007). The macroeconomic situation in Morocco, on the other hand, has remained relatively stable with a low level of inflation and a declining debt, accompanied by weaker economic growth (IMF 2005). The rate of unemployment in 2000 was 9.0% in Egypt and 13.6% in Morocco (ILO 2009).

Against this backdrop of socioeconomic context that seems to favour Egypt, it is indeed surprising to see the divergence in the fertility transition paths. The main question addressed in this paper is: what accounts for the difference in the pace of fertility transition between Egypt and Morocco? This is of relevance, not just for pure scientific curiosity, but also because of the relevance to population policies in the two countries. Contrasting the two countries could shed more light on the factors responsible for the rapid change in Morocco. Of special interest is to find out whether they reflect structural social and cultural changes regarding childbearing norms, and can hence be expected to continue. Alternatively, they might have resulted from temporary circumstances that might change in the near future. On the other hand, the comparison could provide more insights into the slow pace of fertility decline in Egypt and suggest policy options to hasten the transition to replacement fertility.

Decomposing the Difference in the Pace of Fertility Transition

The main question of this study concerns differences in the pace of change rather than differences in the current level of fertility. Accordingly, there are two dimensions of comparison: across space between the two countries and across time between the early 1990s and the early 2000s. Egypt and Morocco are among a small minority of countries in the Arab region that have regular Demographic and Health Surveys. This is fortunate because it ensures reasonable comparability as well as data availability. Two surveys are chosen for each country. The earlier survey in both countries occurred in 1992. The later survey in Egypt is the 2005 DHS while in Morocco, it is the 2003/04 DHS. The choice is determined by survey availability as well as by closeness of implementation years.

During the inter-survey period, the total fertility rate has declined from 3.9 to 3.1 children per woman in Egypt, and from 4.0 to 2.5 children per woman in Morocco. The TFR is a composite measure, and changes in TFR reflect changes in its components. In the following sections we dissect the overall change in TFR into five main components: nuptiality patterns, fertility preference, family planning and unwanted fertility, birth postponement and spacing, and socioeconomic differentials. The findings are summarized and discussed, along with their implications, in the final part of the paper.

1) Nuptiality

Egypt's nuptiality pattern stands out among Arab countries, especially in North Africa, with its continuing spread of early and universal marriage (Rashad *et al*. 2005). Table 1 provides a comparison between Egypt and Morocco in several indicators of nuptiality pattern. The main observation in the table is the higher level of celibacy among women in Morocco. A significant proportion of women in the two countries marry at young ages. The difference, however, is that by age 35 almost all Egyptian women are already married. This is true both in 1992 and in 2005. In Morocco, on the other hand, an appreciable proportion of women who do not marry by early 20s remain single until the end of their reproductive life. This is becoming more evident with time. Table 1 also shows that age at first marriage is increasing in the two countries, especially in Morocco.

The question of relevance to our study is how much of the difference in the pace of fertility decline is attributable to the differential in the nuptiality pattern. The conventional demographic technique of rate standardization and decomposition is used to answer this question (Preston *et al*. 2001).

If Egypt and Morocco had the same nuptiality pattern in 1992 (chosen as the average of the two observed patterns), TFR would be 3.6 children per woman in Egypt and 4.4 in Morocco. The observed TFR were 3.9 in Egypt and 4.0 in Morocco. This means that the difference in the nuptiality pattern attenuated the difference in marital fertility, which was lower in Egypt in 1992. By mid 2005, the effect of the difference in the nuptiality pattern totally explained why TFR is lower in Morocco. If Egypt and Morocco had the same (average) nuptiality pattern, TFR would be 2.7 in Egypt and 2.9 in Morocco, instead of the observed 3.1 in Egypt and 2.5 in Morocco.

One way to look at these results is to say that the difference in nuptiality pattern explains all the recent difference in TFR between the two countries. But this conclusion is misleading because what we aim to explain is not the recent differential in the level but the differential trend. The right way to read the above figures is to say that if the two countries had the same nuptiality pattern and experienced the same change in that pattern, then the TFR would have been declined from 3.6 to 2.7 (a 25% decline) in Egypt and from 4.4 to 2.9 (a 34% decline) in Morocco. The observed decline in

Table 1. Some indicators of marriage patterns in Egypt and Morocco

Indicator	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Mean age at first marriage among women first married 0-4 years before survey	20.4	20.6	20.7	21.3
Median age at first marriage among women in the age group 25-29	19.9	19.4	21.3	23.9
% never married in the age group 15-19	86.1	87.5	87.5	89.0
% never married in the age group 20-24	43.4	56.0	48.9	61.7
% never married in the age group 25-29	13.4	34.3	18.7	40.7
% never married in the age group 30-34	4.9	13.9	6.0	26.9
% never married in the age group 35-39	2.5	6.7	3.6	16.3
% never married in the age group 40-44	2.3	2.6	2.5	11.3
% never married in the age group 45-49	0.9	0.4	1.7	4.6
% divorced, separated, or widowed in the age group 40-44	12.4	10.7	11.4	9.7

Sources: Mean age at marriage computed from DHS data files. Other indicators are from final DHS reports:

Egypt 1992: El-Zanaty *et al*. (1993): Table 9.1 & 9.3

Morocco 1992: Azelmat *et al*. (1993): Tables 5.1 & 5.5

Egypt 2005: El-Zanaty and Way (2006): Table 8.1 & 8.3

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Table 6.1 & 6.2

Egypt has been from 3.9 to 3.1 (a 20% decline) and in Morocco it has been from 4.0 to 2.5 (a 38% decline). This means that the differences in nuptiality pattern and trend between the two countries do exacerbate the difference in the pace of their fertility transition, but they hardly explain that difference.

A series of similar standardization exercises are carried out to detangle the impacts of differences and trends in fertility rates and in nuptiality patterns. The findings are summarized in Table 2. The trend in nuptiality patterns explains almost the same part of the trend in TFR in the two countries. Slightly less than one quarter of the decline in the total fertility rate in each of the two countries is attributable to the decline in the proportion married at different age groups (the top panel in Table 2). It should be noted, however, that the absolute effect of marriage in Morocco is double that of Egypt. This is because Morocco witnessed stronger changes in nuptiality pattern, as shown in Table 1. But it is clear that the changes in marital fertility rates are also stronger in Morocco than in Egypt. The decline in TFR due to the decline in age-specific marital fertility rates in Morocco is almost double that in Egypt.

In absolute terms, difference in marriage explains almost a constant amount of the difference in TFR between the two countries (the lower panel in Table 2). In early 1990s, the absolute impact of the higher marital fertility rates in Morocco more than offset the impact of marriage. A little more than a decade later, the difference in marital fertility rates has almost disappeared, and due to the difference in nuptiality pattern, Morocco's TFR has reached a lower level than Egypt's.

Table 2. Marriage contribution to differential in fertility level and trend between Egypt and Morocco using rate standardization and decomposition

	Change in total fertility rate	Change due to change in proportion married	Change due to change in fertility rates	% of change due to change in proportion married	% of change due to change in fertility rates
Egypt 92-05	0.80	0.19	0.61	23.7	76.3
Morocco 92- 04	1.56	0.38	1.17	24.5	75.5
	Difference in total fertility rate	Difference due to difference in proportion married	Difference due to difference in fertility rates	% of difference due to difference in proportion married	% of difference due to differences in fertility rates
Morocco 92 - Egypt 92	0.11	-0.77	0.87	-731.3	831.3
Morocco 04 - Egypt 05	-0.65	-0.79	0.03	121.4	-21.4

Source: Computed using data on age specific fertility rates and proportions currently married in different age groups available in country reports. In each decomposition, average rates and average composition (proportions married) are used as the standard population.

In conclusion, one can argue that the higher level of celibacy in Morocco puts a check on its fertility, compared to Egypt with its universal marriage. However, the contribution of marriage to the trend in the two countries is only moderate. The difference in the pace of the fertility transition between the two countries during the 1990s is mainly due to the faster decline in marital fertility rates in Morocco than in Egypt.

2) Fertility Preference

Since the differential in nuptiality pattern has not been the decisive factor in determining the differential pace of change in fertility between Egypt and Morocco, one should look for further explanations in factors operating on fertility within marriage. One such factor is fertility preference of married couples. Table 3 gives some indicators of fertility preference in the two countries in 1992 and about a decade later.

The stability in fertility preference of Egyptian women is the most striking feature in Table 3, with the exception of the noticeable decline in the proportion who want to bear a fourth child. In Morocco, on the other hand, most indicators of fertility preference have shown evidence of a trend towards lower fertility. It is worth noting, however, that the most recent evidence of a desire for large families is stronger in Morocco than in Egypt. We noted above that factoring out the differences in nuptiality pattern, Egypt would have only slightly lower fertility. Yet, the difference in fertility preference would make us predict a higher level of marital fertility rates in Morocco. This means that other factors operating in Morocco puts further checks on its current fertility. Birth postponement and spacing could be these other factors. We will return to this point below.

The contrast in the trend in fertility preference between stability in Egypt and clear decline in Morocco suggests that the decline in wanted fertility plays a major role in determining their differential pace of fertility transition. The last row in Table 3 indicates that the two countries had

Table 3. Some indicators of fertility preference in Egypt and Morocco

Indicator	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Mean ideal number of children for ever-married women aged 20-24	2.6	3.0	2.6	2.7
Mean ideal number of children for women having one living child	2.5	3.0	2.5	2.5
% of women with two living children [a] who want to bear a third child	35.5	66.1	32.1	50.0
% of women with three living children [a] who want to bear a fourth child	14.9	41.6	8.5	28.8
Total wanted fertility rate	2.7	2.7	2.3	1.8

[a] Includes current pregnancy

Sources: Final DHS reports:

Egypt 1992: El-Zanaty *et al*. (1993): Tables 8.1, 8.5, 8.6 & 8.8

Morocco 1992: Azelmat *et al*. (1993): Tables 6.1, 6.5, 6.6 & 6.8

Egypt 2005: El-Zanaty and Way (2006): Tables 9.1, 9.6, 9.7 & 9.10

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Tables 7.1, 7.4, 7.5 & 7.7

equal total wanted fertility rates in the early 90s. Little more than a decade later, total wanted fertility rate has declined by one third in Morocco and by only 15% in Egypt.

The total decline in TFR in each country can be decomposed to declines in wanted and unwanted components. Table 4 shows the results. In both countries the total decline is more or less equally attributable to declines in wanted and unwanted fertility. The share of wanted fertility in the

Table 4. Decomposition of changes and differences in TFR to wanted and unwanted TFR

	Change in total fertility rate	Change in wanted fertility	Change in unwanted fertility	% of change due to change in wanted fertility	% of change due to change in unwanted fertility
Egypt 92-04	0.80	0.39	0.41	48.6	51.4
Morocco 92-04	1.56	0.84	0.72	53.9	46.1
	Difference in total fertility rate	**Difference in wanted fertility**	**Difference in unwanted fertility**	**% of difference due to difference in wanted fertility**	**% of difference due to difference in unwanted fertility**
Morocco 92 - Egypt 92	0.11	-0.02	0.13	-20.8	120.8
Morocco 04 - Egypt 05	-0.65	-0.47	-0.18	72.8	27.2

Sources for wanted and unwanted total fertility rates:

Egypt 1992: El-Zanaty *et al*. (1993): Table 8.8

Morocco 1992: Azelmat *et al*. (1993): Table 6.8

Egypt 2005: El-Zanaty and Way (2006): Table 9.10

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Table 7.7

decline is higher in Morocco while the share of unwanted fertility is higher in Egypt. The magnitudes of the decline in both components are considerably larger in Morocco than in Egypt. At the earlier date, TFR was lower in Egypt due to its lower level of unwanted fertility. Recently, both wanted and unwanted TFR are higher in Egypt, but the excess of total fertility in Egypt is mainly due to its higher wanted fertility. Factors behind the trend in unwanted TFR in the two countries are discussed in the following section. We will focus in the rest of this section on an important factor related to the trend in wanted fertility in patriarchal societies, which is son preference.

Sex preference for children, especially son preference, is a main correlate of higher fertility desires (Obermeyer 1996; El-Zeini 2008). The effect of sex preference does not appear in indicators like ideal family size, and indeed this is one reason why wanted fertility measures based on ideal number of children could be downwardly biased (Bongaarts 1990). Sex preference can be studied using the prospective preference item and its relation to the actual sex composition of living children, as shown in Table 5. The desire to bear a third or a fourth child is strongly determined by the desire to have a son or a daughter, in both Egypt and Morocco. It appears, however, that the effect of sex composition on fertility desires has increased in Egypt, especially affecting the desire for a fourth child. This can be explained by a general avoidance of a fourth child that has recently appeared in Egypt, unless triggered by a desire to bear a son. The effect of sex preference in Morocco though was as strong as that in Egypt to start with, has declined during the study period, especially regarding the transition to the third child. Son preference, *vis-à-vis* preference for a balanced sex composition, seems to be increasing in Egypt while declining in Morocco.

Table 5. Sex composition of living children and the desire for an additional child

Sex composition of living children	% wanting to have an additional child			
	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Among women having 1 child				
One son	88.9	87.1	90.5	91.2
One daughter	88.6	87.1	88.7	88.1
Total [a]	87.7	87.1	89.5	89.5
Among women having 2 children				
No sons	48.0	81.3	47.8	75.9
No daughters	37.5	67.8	31.3	70.6
One son & one daughter	30.3	56.2	25.2	46.7
Total [a]	35.4	64.8	31.3	59.9
Among women having 3 children				
No sons	26.5	72.3	16.7	64.1
No daughters	17.7	38.5	8.3	43.9
At least one son & one daughter	12.1	37.8	7.3	35.0
Total [a]	14.1	41.6	8.3	40.1

[a] Pregnant women are excluded because the preference item for them refers to an additional birth after their current pregnancy
Source: Computed from DHS data files

3) Family Planning and Unwanted Fertility

As shown in Table 4, the larger decline in TFR in Morocco has resulted from larger declines in both wanted and unwanted fertility. In this section we focus on the factors related to the decline in unwanted fertility.

Since the 1960s, both countries have had strong programs for family planning, based at their respective ministries of health, that include direct support to guarantee accessibility to contraceptive methods (Eltigani 2001; United Nations 2007). Table 6 gives some indicators related to family planning practices in the two countries and how they changed around the turn of the century. The increase in the rate of contraceptive use has been larger in Morocco than in Egypt. The changes in the other indicators have been comparable. Unmet need has halved in the two countries, while the proportion of demand satisfied has increased. Use-discontinuation increased, but method failure became less prevalent.

One noteworthy observation in Table 6 is the higher dependence on traditional methods in Morocco compared to Egypt, which is likely to be the reason behind the higher rate of discontinuation and of failure in the former. This does not seem, however, to translate to higher fertility in Morocco, which suggests that some unwanted pregnancies are probably terminated by induced abortion. Abortion is illegal in the two countries, but the law seems to be more lenient in Morocco. While in Egypt abortion is only permitted to save the woman's life, it is permitted in Morocco to preserve her physical or mental health (Dabash and Roudi-Fahimi 2008). The addition of preserving woman's mental health to reasons permitting abortion in Morocco has been introduced during the period between the two surveys (United Nations 2007). Unfortunately there are no available estimates for the level of induced abortion in the two countries. Rough estimates can be derived, however, using a regression equation fitted based on available estimates in a number of developing countries (Westoff 2007). The estimating equation uses information on TFR and use of modern and traditional contraceptive methods. Applying this equation, it is estimated that the total abortion rate in Egypt was 0.9 in 1992 and 0.8 in 2005, while in Morocco it was 1.2 in 1992 and 1.1

Table 6. Some indicators related to family planning practices in Egypt and Morocco

Indicator	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Contraceptive prevalence rate (%)	47.1	41.5	59.2	63.0
% of users using modern methods	95.1	85.5	95.4	87.0
Discontinuation rate [a] (%)	29.0	38.7	31.8	43.2
Failure rate (%)	5.7	7.8	3.2	5.3
Unmet need for family planning (%)	20.1	19.3	10.3	10.0
% of demand satisfied	70.9	69.2	85.4	86.6

[a] For all reasons, including failure

Sources: Final DHS reports:

Egypt 1992: El-Zanaty *et al*. (1993): Tables 5.1, 7.1 & 8.4

Morocco 1992: Azelmat *et al*. (1993): Tables 4.5, 4.12 & 6.4

Egypt 2005: El-Zanaty and Way (2006): Tables 6.1, 7.1 & 9.4

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Tables 5.4, 5.12 & 7.3

in 2003/04. These estimates are very rough and subject to a large margin of error. However, they might indicate a slightly higher level of abortion in Morocco, and that abortion is not increasing in either country.

As mentioned before, the decline in unwanted fertility has been larger in Morocco than in Egypt. One reason could be that the ideal family size in Morocco in the later date far exceeds recognized wanted fertility (Table 3). In order to compare the changes in unwanted childbearing in the two countries, we can use another indicator which is the proportion of births unwanted among births occurring during the 36 months before each DHS survey. This proportion is estimated using the aggregate prospective estimator (Casterline and El-Zeini 2007). In Egypt, the proportion declined from 43.4% in 1992 to 30.8% in 2005, while in Morocco it declined from 38.2% in 1992 to 35.4% in 2003/04. In relative terms, the decline in Egypt is more than four times higher than that in Morocco. This striking comparison, especially in light of other contrasts that show little change in Egypt, deserves further probing.

The proportion of births unwanted can change due to a change in parity-specific fertility preference, i.e. the desire to have a child of a specific order, and/or a change in the composition of exposed women by parity. These two factors are not totally independent since a change in fertility preference would be manifested in a change in the composition by parity. The composition, however, is not totally determined by preference but is also affected by other factors such as marriage delays, birth spacing, and the implementation of better fertility controls.

Table 7 shows a simple decomposition of the change in the proportion of births unwanted to changes in the composition of total births by order and to order-specific rates of unwantedness. These rates, and the total proportion of births unwanted, are calculated using the aggregate prospective estimator proposed by Casterline and El-Zeini (2007), which depends on the prospective preference item. The results show that the large decline in Egypt is mainly due to the change in distribution of births by order. As discussed above, fertility preference in Egypt has been largely stable, and hence the order-specific rates of wantedness contributed very little to the change in the overall percentage of births unwanted. In Morocco, both factors have changed. Births of higher order became less wanted, but they also became less prevalent. The two factors almost cancelled each other and as a result the overall decline in the proportion of births unwanted became negligible.

The findings above indicate that women in both countries, especially Egypt, have become more capable of achieving their fertility preference. One relevant question is whether this higher capability has been achieved through more adoption of family planning, higher continuation rates or less method failure. In order to estimate the contribution of each of these three sources to the total decline in unwanted fertility, a simulation is carried out. The simulation could not use the aggregate prospective measure because it cannot be applied to individual births. Instead, births are classified as wanted or unwanted using the retrospective item that asks about the wantedness of each birth occurring during the period under analysis. The methodology of the simulation exercise and its underlying assumptions are presented in details someplace else (Casterline and El-Zeini 2005). A brief exposition is provided here.

Table 7. Decomposition of the percentage of births unwanted in Egypt and Morocco

	Change in percent of births unwanted	% of change due to change in order-specific wantedness	% of change due to change in distribution of births by order
Egypt 92-05	12.6	-17.9	117.9
Morocco 92-04	2.7	-410.8	510.8
	Difference in percent of births unwanted	% of difference due to difference in order-specific wantedness	% of change due to difference in distribution of births by order
Morocco 92 - Egypt 92	-5.2	203.5	-103.5
Morocco 04 - Egypt 05	4.7	-30.0	130.0

Source: Proportion of births unwanted, total and order-specific, are computed using the aggregate prospective estimator developed by Casterline and El-Zeini (2007). In each decomposition, average rates and average composition are used as the standard population.

Births declared as unwanted are assumed to originate from one, and only one, of three mutually exclusive sources: (i) contraceptive use failure; (ii) contraceptive use discontinuation; and (iii) unmet need for family planning. Births following discontinuation of contraceptive use are attributed to discontinuation for the first twelve months of non-use, after which they are attributed to unmet need. Births resulting from pregnancies that immediately follow (i.e. next month) the termination of a contraceptive episode are attributed to failure, whether or not the woman reports the episode as ending because she became pregnant. Two pairs of competing risks are accounted for: (1) between non-use and use failure (nonusers who adopt contraception become subject to the risk of contraceptive failure), and (2) between unmet need and discontinuation (women with unmet need who start using become subject to the risk of use discontinuation). The results are presented in Table 8.

The decline in unmet need has been the major factor in the decline of unwanted fertility in Morocco. In Egypt, the decline was equally attributable to declines in unmet need and in

Table 8. Sources of the changes/differences in unwanted fertility

	Contribution of unmet need to the change in unwanted fertility (%)	Contribution of discontinuation to the change in unwanted fertility (%)	Contribution of failure to the change in unwanted fertility (%)
Egypt 92-05	44.0	48.0	8.0
Morocco 92-04	70.8	38.1	-8.9
	Contribution of unmet need to the difference in unwanted fertility (%)	Contribution of discontinuation to the difference in unwanted fertility (%)	Contribution of failure to the difference in unwanted fertility (%)
Morocco 92 - Egypt 92	40.9	61.3	-2.2
Morocco 04 - Egypt 05	-103.6	52.7	150.9

Source: Based on TFR simulation, births are classified as wanted or unwanted using the retrospective item. Information on the simulation methodology is given in Casterline and El-Zeini (2005).

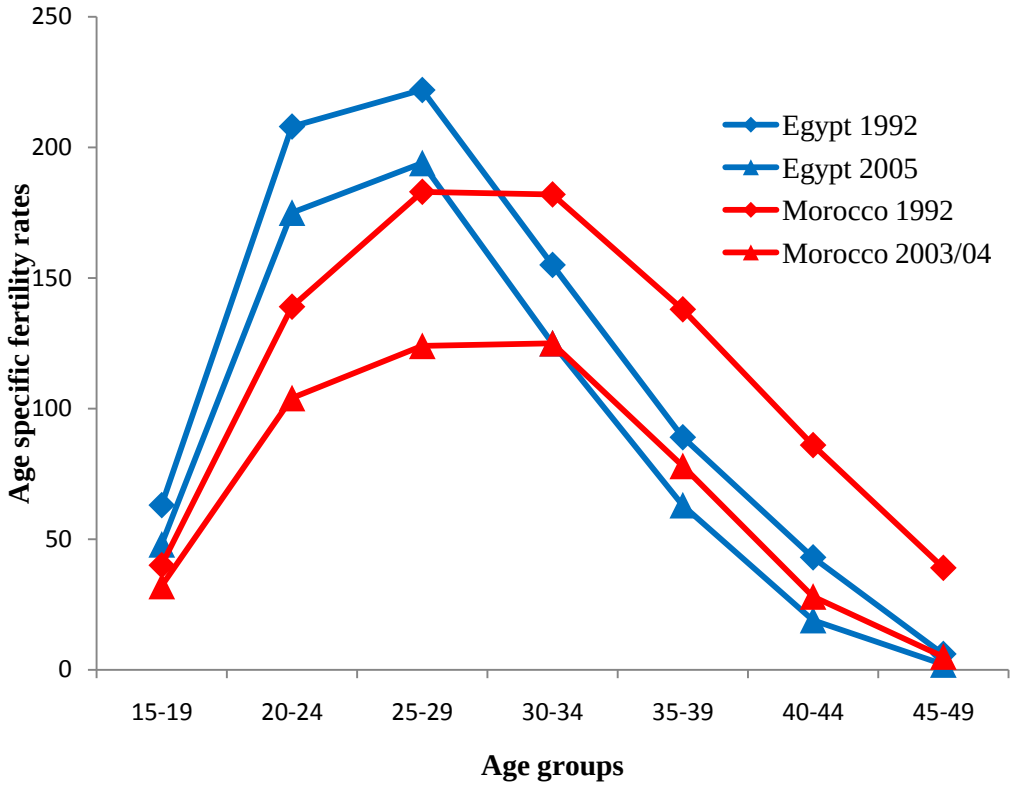
discontinuation. While unwanted fertility due to failure has slightly declined in Egypt, it increased in Morocco. These findings might be interpreted as indicators for more improvements in family planning practices in Egypt compared to Morocco.

4) Birth Postponement and Spacing

There is a noticeable difference in fertility pattern between Egypt and Morocco (Eltigani 2000). This is evident in Figure 3 that shows that Moroccan women bear children at older ages than Egyptian women. Differences in nuptiality patterns might explain a part of that difference. It could also result from differences in fertility tempo within marriage. The contribution of changes in marital fertility tempo to the decline in TFR in the two countries is investigated through the study of changes in age at childbearing of births of different orders (Bongaarts 1999). Table 9 shows these changes in age at childbearing based on the schedules of age-order-specific marital fertility rate, i.e. these changes in mean ages exclude the effects of marriage and age composition.

Married Moroccan women have their births at older ages than Egyptian women. This has been true in 1992 as well as in mid 2000s. The difference between the two countries seems to increase only with regard to the timing of having the second birth. On the other hand, the gap in the timing of birth of higher-order children is closing. We may conclude that postponement of the second child seems to be accounting for some of the differential pace of transition between Egypt and Morocco.

Figure 3. Age specific fertility rates in Egypt and Morocco



Source: El-Zanaty *et al*. (1993); Azelmat *et al*. (1993); El-Zanaty and Way (2006); and Ministère de la Santé [Maroc] *et al*. (2005)

Table 9. Mean age at childbearing, controlling for marriage and age distribution

	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
All Orders	24.9	27.5	24.3	25.9
First Order	19.9	20.7	20.2	21.0
Second Order	22.2	22.8	23.6	24.6
Third Order	24.9	27.0	26.9	28.4
Fourth Order	27.1	28.9	30.4	31.3

Source: Computed using DHS data from order-age-specific marital fertility rates

Further information on patterns of birth postponement and spacing are shown in Table 10. It is clear that Moroccan women, at the two time points, tend to postpone childbearing after marriage, and to use contraceptives for spacing purposes. Recently, more birth spacing is observed in Morocco. During the period under study, women in Egypt showed a trend towards postponing the second and third birth, but no evidence of postponing the first. Contraceptive use for spacing

Table 10. Some indicators related to birth postponement and spacing in Egypt and Morocco

Indicator	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
% of ever users who started using contraceptives before the first child	1.7	14.2	0.4	23.3
% of ever users who started using contraceptives between the first and the second child	37.0	31.3	62.8	53.1
% using contraceptives among women with no living children	0.5	5.6	0.5	11.0
% using contraceptives among women with one living child	31.6	39.1	46.0	57.6
% of currently married women using contraceptives for spacing	7.8	14.1	12.4	22.3
Contraceptive use for spacing as a percentage of total contraceptive use	16.5	34.0	20.9	35.4
Mean length of first birth interval (months)[a]	21.5	26.4	18.5	26.8
Mean length of second birth interval (months)[a]	29.9	34.3	33.0	45.3
Mean length of third birth interval (months)[a]	35.8	37.5	45.5	50.5

[a] For births occurring within the 5 years preceding the survey. Computed from DHS data files.

Sources: Final DHS reports (except for mean birth intervals):

Egypt 1992: El-Zanaty *et al*. (1993): Tables 4.6, 4.5 & 8.4

Morocco 1992: Azelmat *et al*. (1993): Tables 4.16, 5.2 & 8.4

Egypt 2005: El-Zanaty and Way (2006): Tables 5.8, 6.2 & 9.4

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Tables 5.7, 5.5 & 7.3

purposes has increased in the two countries. While the share of spacing in the overall rate of contraceptive use has experienced a higher relative increase in Egypt, it is still notably lower than the corresponding share in Morocco where more than a third of contraceptive use is for spacing purposes.

5) Differentials

Table 11 shows some main differentials in TFR. The main observation in the table is that differentials are stronger in Morocco than in Egypt. In both countries, the differences between groups with highest and lowest fertility are declining with time. The only exception to that general rule is the increase in the regional differential in Morocco, but this is mainly due to the very low TFR in Grand Casablanca region. In 1992 survey, Grand Casablanca was a part of the larger Centre region. The level of TFR in the other regions within the Centre and the Centre Sud regions has been 2.2 in Meknas-Tafillet, 2.3 in Tadla-Azilal and 2.7 in Chaouia–Ouradigha.

The decline in differentials with the advance of the fertility transition suggests what is called a leader-follower model (Bongaarts 2003). The higher differential in Morocco, under this model, indicates a stronger prospective for further declines. On the other hand, it seems that Egypt's fertility is converging at a higher fertility level. Eltigani (forthcoming) notes that the leading group in Egypt has not progressed to complete their fertility transition. Vignoli (2006) gives a similar explanation to the stagnation in fertility decline in Egypt during the 1990s. It should be noted, however, that defining the "leading group" in terms of education could be misleading because with the spread in

Table 11. Regional, educational, and socioeconomic differentials in fertility levels in Egypt and Morocco

	TFR			
Background variable	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Urban	2.9	2.5	2.7	2.1
Rural	4.9	5.5	3.4	3.0
Region with lowest total fertility rate	2.7 [a]	3.4 [c]	2.5 [a]	1.8 [e]
Region with highest total fertility rate	6.0 [b]	5.1 [d]	3.9 [b]	3.1 [f]
Secondary education or higher	2.9	2.0	3.0	1.8
No education	5.0	4.9	3.8	3.0
Highest wealth quintile			2.6	1.9
Lowest wealth quintile			3.5	3.3
Total	3.9	4.0	3.1	2.5

[a] Urban Governorates [b] Rural Upper Egypt
[c] Centre & Centre Sud [d] Tensift
[e] Grand Casablanca [f] Doukkala-Abda & Tanger-Tétouan

Sources: Final DHS reports:
Egypt 1992: El-Zanaty *et al*. (1993): Table 3.2
Morocco 1992: Azelmat *et al*. (1993): Table 3.2
Egypt 2005: El-Zanaty and Way (2006): Table 4.2
Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Table 4.2

school enrolment the more educated become a less select group. The lack of change in the preference and practice of the more educated women does not necessarily reflect a stability of the attitudes of a clearly defined group of women, the "leader" group. It could rather result from the inclusion in the category of more educated women of some who were recently mobilized in terms of education with no real changes in their norms and values from the older non-educated population.

In this respect, it is imperative to mention that school enrolment of Egyptian girls witnessed a notable increase during the study period. Among reproductive-age females (regardless of marital status), the proportion with at least secondary education has increased in Egypt from 38.9% in 1992 to 60.4% in 2005 (a 55% increase), while in Morocco it increased from 20.1% in 1992 to 27.8% in 2003/04 (a 38% increase). With a majority of reproductive-age women in Egypt becoming "highly educated", compared to slightly over a quarter of Moroccan women, it is clear that educated women in Egypt has become a less homogenous group than their Moroccan counterparts.

Taking the last point in consideration, the more striking feature of fertility differentials in Egypt is the change in the behaviour of the non-educated population. With the spread of education, this group becomes more selective towards the less privileged and the more conservative. The remarkable convergence of this group with the more educated in terms of fertility-related practices, as shown in Table 12, indicates the diffusion of moderate fertility attitudes in Egypt.

Conclusion: Summary of main Findings and their Implications

The set of analyses presented in the previous sections provides an insight into the differences between Egypt and Morocco in fertility components and how they changed since the early 1990s. The results can be summarized in the following points.

1) The nuptiality pattern of Moroccan women puts a strong check on their fertility level. In contrast, the Egyptian nuptiality pattern in favourable to high fertility. At any time point, differences in nuptiality explain a large part of the differences between fertility levels in the two countries. However, the trend in nuptiality does not explain the differences in the pace of fertility transition between the two countries. This is because the trend in nuptiality explains only a small part (around a quarter) of the recent decline in Moroccan fertility.

   It is important to stress the fact that celibacy, rather than a high age at marriage, seems to be the determining factor in the lower fertility in Morocco. This note is of special relevance when discussing future fertility prospects. Studies that explain the high celibacy in Morocco and other North African countries, other than Egypt, are much needed. In particular, there is a need for studies addressing the relationship between the prospects of marriage and emigration and also linking it to economic circumstances and aspirations. Social and economic implications of the increasing celibacy also need to be studied. The increase in celibacy that is not accompanied by a comparable increase in the age of marriage among those who eventually marry might imply inequality in the prospects of marriage that reflects an inequality in economic prospects (Weir 1984). It could also result from the existence of a subculture exhibiting different value systems, maybe due to European influences. The contrast between Egypt and Morocco might as well be attributable to differences in attitudes towards family formation, acceptable standards of living, and economic aspirations (Courbage 1984&1995; Schofield 1985). Without hard evidence and proper research, these remain mere speculations.

   In a context of low educational attainment and economic participation of women, the prevalence of celibacy raises serious questions regarding women's welfare and wellbeing. There is a need for studies addressing these issues in light of the characteristics of unmarried women. Another point that deserves further investigation is whether the increase in celibacy in Morocco

Table 12. Some indicators of fertility-related differences by education in Egypt and Morocco

Indicator	Egypt 1992	Morocco 1992	Egypt 2005	Morocco 2003-04
Median age at first marriage among women in the age group 25-29 for women with secondary or higher education	23.8	23.4	22.7	a
Median age at first marriage among women in the age group 25-29 for women with no education	17.5	18.7	18.8	21.3
% never married in the age group 30-34 for women with secondary or higher education	7.3	25.5	6.5	39.8
% never married in the age group 30-34 for women with no education	4.3	10.2	5.1	19.9
% using contraceptives among women with secondary or higher education	54.5	64.9	61.5	68.8
% using contraceptives among women with no education	36.0	35.7	54.8	61.2
% of women with two living children who do not want to get a third child among women with secondary or higher education	64.9	45.9	63.0	59.1
% of women with two living children who do not want to get a third child among women with no education	51.2	21.6	56.5	33.3
% of women with three living children who do not want to get a fourth child among women with secondary or higher education	86.0	86.9	89.0	80.7
% of women with three living children who do not want to get a fourth child among women with no education	74.0	41.9	82.8	57.7

[a] Median cannot be computed because less than 50% of females in this age group have been married.

Sources: Percentages never married are computed using DHS data files. Other indicators are from final DHS reports:

Egypt 1992: El-Zanaty *et al*. (1993): Table 5.2, 8.3 & 9.4

Morocco 1992: Azelmat *et al*. (1993): Tables 4.5, 5.6 & 6.3

Egypt 2005: El-Zanaty and Way (2006): Table 6.2, 8.4 & 9.3

Morocco 2003-04: Ministère de la Santé [Maroc] *et al*. (2005): Table 5.5, 6.4 & 7.2

reflects a permanent nuptial transition, responding to socio-cultural changes, or is merely a temporal response to economic hardship. The answer to this question is of special relevance in projecting the future path of Moroccan fertility. In addition, one should study the impact on nuptiality of the change in the family code in Morocco which granted equality to women in matters of marriage and divorce (UNIFEM 2008).

2) Postponement of childbearing after marriage and spacing of subsequent births put further checks on Moroccan fertility as compared to Egypt. The effect of spacing transcends the tempo effect in hastening the fertility transition. Spacing has the further advantage of controlling unwanted fertility. In Egypt, where the largest bulk of contraceptive use is for limiting purposes, use-discontinuation and failure typically result in unwanted births.

   As with the case of nuptiality, it requires further in-depth research to decide whether spacing practices in Morocco initiate from persistent or transient features of the family building attitudes.

3) The results indicate improvements in the use of effective family planning, especially in Egypt. With time, Egyptian women seem to assume better control over childbearing and to become more capable of realizing their fertility preferences. Population programs in Morocco, on the other hand, need to address issues of discontinuation and failure.

4) Preference for large family size is still prevalent in the two countries, although positive changes are evident in both. With the transition to lower fertility, it is expected to find stronger impact of son preference. This is evident in Egypt. On the other hand, son preference appears to be declining in Morocco. Further probes and interpretations are needed. The impact of son preference might increase in Morocco with the more adhering of less-privileged groups to lower family ideals.

5) Comparing the two countries might suggest that Moroccan transition follows a leader-follower model while Egypt's does not (D'Addato 2006; Vignolli 2006; Eltigani forthcoming). However, a better identification of a leader group is needed. In discussing prospects for transition, the implications of convergence of the fertility of the less advantaged groups in Egypt to the average level should not be dismissed.

The results presented above largely call for qualitative research that situates nuptiality and fertility practices in the two countries within the larger socio-cultural as well as economic context. Without such in-depth understanding, the current picture could invite a wide range of interpretations. On one extreme, Morocco could be portrayed as a country undergoing a fast process of modernization resulting from diffusion of new values favouring small families, while Egypt is facing stagnation and increasing conservatism. On the other extreme, one can contrast a fertility transition in Egypt that is slow but sure where education is spreading while the less educated are changing their attitudes, with a transition in Morocco that is fast but seems to be volatile and temporal. The truth is likely to be somewhere in the middle since the evidence presented in this paper reveals a picture of both changes and of continuities in each of the two countries.

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