Trends in Demographic and Health Indicators in Jordan

Data from the 1990-2012 Jordan Population and Family Health Surveys

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Trends in Demographic and Health Indicators in Jordan: Data from the 1990-2012 Jordan Population and Family Health Surveys

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Abstract

Data from the six Jordan Population and Family Health Surveys (JPFHS) carried out in 1990, 1997, 2002, 2007, 2009 and 2012 were used to describe trends in Jordan over an interval of more than 20 years. Trends are presented for demographic, social and household indicators; fertility rates and fertility intentions; family planning; maternal and adult health; and child health. Tests of statistical significance were applied to the observed differences between the surveys for each indicator. Many indicators appeared to be changing significantly in the direction of improvements, such as household density, education level of ever-married women, fertility rates, number of ante-natal care visits, premarital exams, and child immunization. Some indicators showed no significant change between the most recent surveys—for example, the interval between births, use of modern contraception, unmet need for limiting births, anemia in children, child mortality, and stunting). Some indicators are moving significantly in a contrary direction, particularly between the most recent surveys—for example, delivery by C-section, anemia in women, obesity, smoking by women, underweight and wasting in children.

1. Introduction

The Jordan Population and Family Health Survey (JPFHS) has been carried out six times in a 22-year period from 1990 to 2012. These surveys have provided data and reliable estimates of indicators in the areas of demography, fertility, family planning, maternal health, child health and nutrition. However, there has been no report to date which compares all six surveys and especially one which indicates whether any observed changes in the estimates between the survey years are statistically significant. The purpose of this report is therefore not only to describe the trends in selected indicators, but also to demonstrate using statistical tests whether these changes are significant. This information can be vital for policymakers and planners, as it can identify progress across the years as well as indicate which areas need further attention or may be lagging behind.

The indicators chosen for this trend analysis report are not comprehensive, but are considered to be those of greatest relevance to Jordan and the Jordanian context. The report covers a selection of demographic, social and household indicators; fertility rates and fertility intention indicators; family planning indicators; maternal and adult health indicators; and child health indicators. Each of these areas is presented in a separate chapter of the report from chapter 2 to chapter 6 with a summary at the end of each chapter.

1.1. Data Sources

The data used for analysis in this report are from the Jordan Population and Family Health Surveys (JPFHS) carried out in 1990, 1997, 2002, 2009 and 2012 by the Jordanian Department of Statistics (DOS). The 2009 JPFHS was an interim survey which did not include all questions normally found in the JPFHS. The six surveys collected data with nationally representative samples selected from appropriate sampling frames. For the 2007, 2009 and 2012 JPFHS surveys, the 2004 Jordan Population and Housing Census was used as a sampling frame, while in 2002 and 1997 the 1994 Census sampling frame was used. The sampling frame for the 1990 JPFHS was obtained from an updated listing of housing units in 1989 and 1990 for major cities, as well as from population projections for localities in the remaining parts of the country. The numbers of interviewed households and ever-married women are summarized in Table 1.

Table 1. Number of interviewed households and ever-married women in each survey, with the sampling frame used in each survey

	1990	1997	2002	2007	2009	2012
Households interviewed	16,296	7,335	7,825	14,564	13,577	15,190
Ever-married women interviewed	6,461	5,548	6,006	10,876	10,109	11,352
Sampling frame used	1989 and 1990 updated listings	1994 Census	1994 Census	2004 Census	2004 Census	2004 Census

1.2. Methodology

The estimates and statistical tests produced in this report account for the multistage stratified, clustered sample design and sampling weights. For the 2012 JPFHS the stratification was by the governorates, urban and rural areas, Badia areas, and refugee camps. In the 2002, 2007, and 2009 surveys, stratification

was by governorates and urban and rural areas. For the 1990 and 1997 surveys, stratification was by urban and rural locality, and region (North, Central, and South). The 12 governorates of Jordan are Amman, Balqa, Zarqa, Madaba, Irbid, Mafraq, Jarash, Ajloun, Karak, Tafiela, Ma'an, and Aqaba.

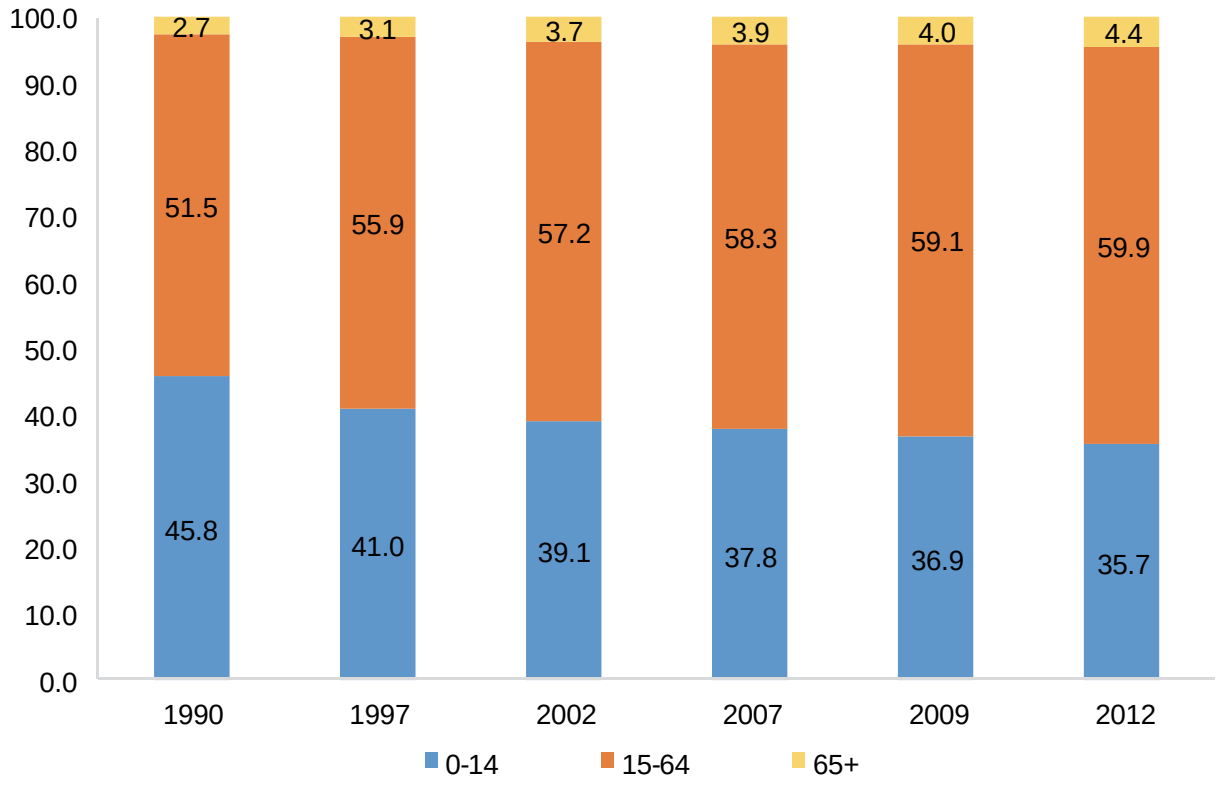
For each indicator, the estimated sampling errors were used to produce 95% confidence intervals and to test for significant change between consecutive survey years. The statistical test used is a z-test and the p-values reported are one-tailed. The hypothesis being tested is whether the indicator changed in the desired direction, compared with the previous survey. The null hypothesis is that there is no change between the consecutive years being tested.

2. Demographic, Social and Household Indicators

2.1. Population Age Distribution

Figure 1 shows the percent distribution of the de facto (or slept last night) population by age groups 0-14, 15-64, and 65 and over. As can be seen in the figure the percent of the population below age 15 remains relatively high at more than a third of the population, as a consequence of a history of high fertility in Jordan. However, as can be seen in Table 2, this percentage has been decreasing significantly across the years, from 45.8% in 1990 to 35.7% in 2012. Another indicator of interest is the percentage of the population age 15-64 as this affects the dependency ratio in Jordan. Figure 1 shows that the percentage of the population in the 15-64 age group has increased across the years from 51.5% in 1990 to 59.9% in 2012. However, this increase was only significant between the consecutive years from 1990 up to the period from 2002-2007 and was not significant afterwards (see Table 2). Finally, the percentage of the population 65 years and over only significantly increased between 1990-1997 and 1997-2002, and has remained unchanged since 2002 at approximately 4% of the population.

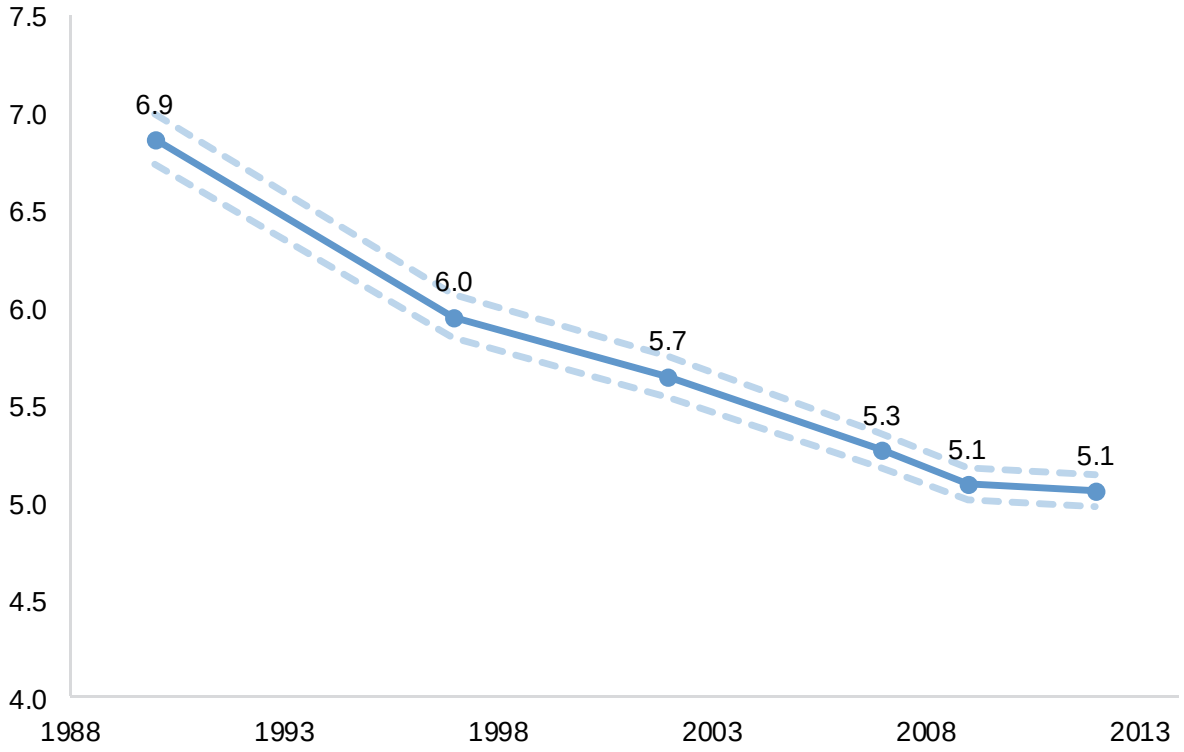
Figure 1. Distribution of the de facto population by major age groups



2.2. Household Characteristics

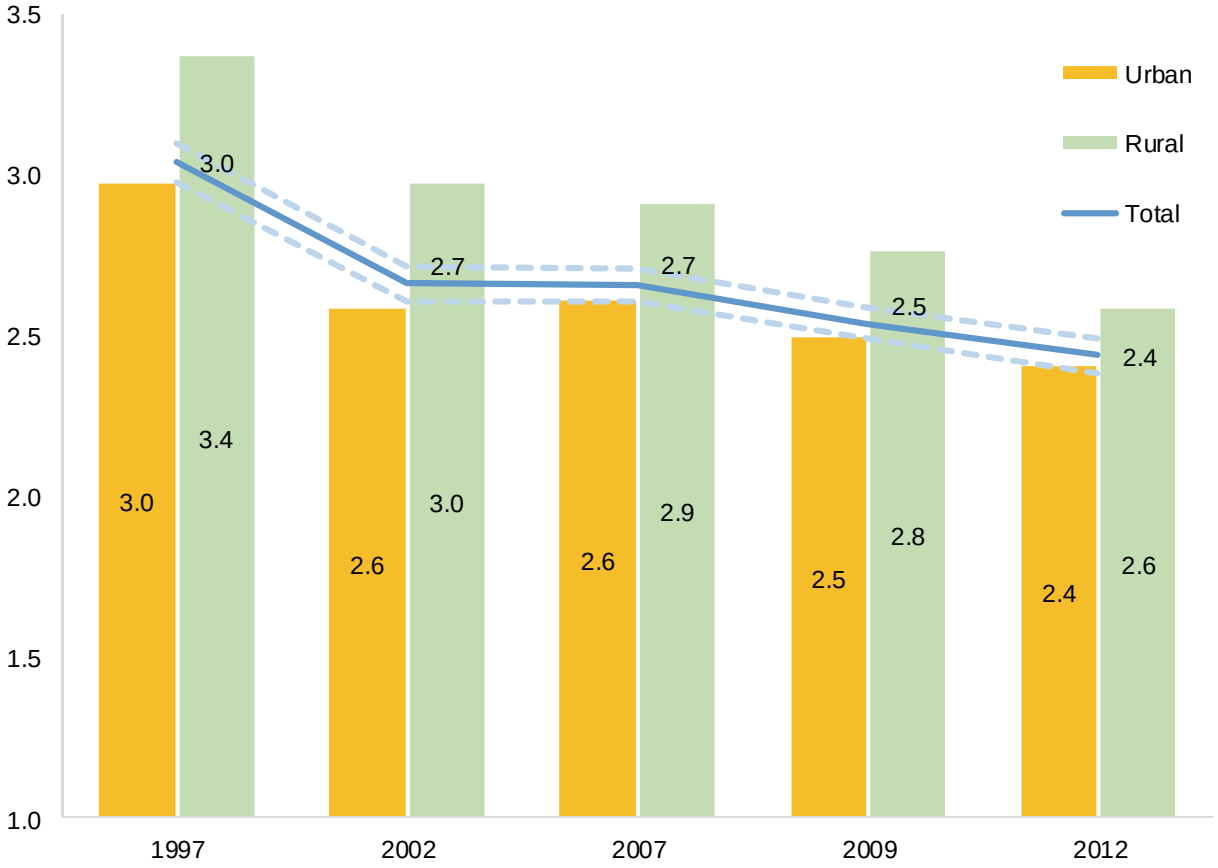
The household characteristics presented are important for assessing the household standard of living. A large number of people sharing the same household may lead to overcrowding and unfavorable health conditions. Figure 2 shows that the mean de jure (or usual resident) household size significantly decreased from 6.9 in 1990 to 5.1 in 2009, but remained unchanged between 2009 and 2012 (see Table 2).

Figure 2. De jure mean household size for the survey years 1990, 1997, 2002, 2007, 2009, and 2012, with 95% confidence intervals



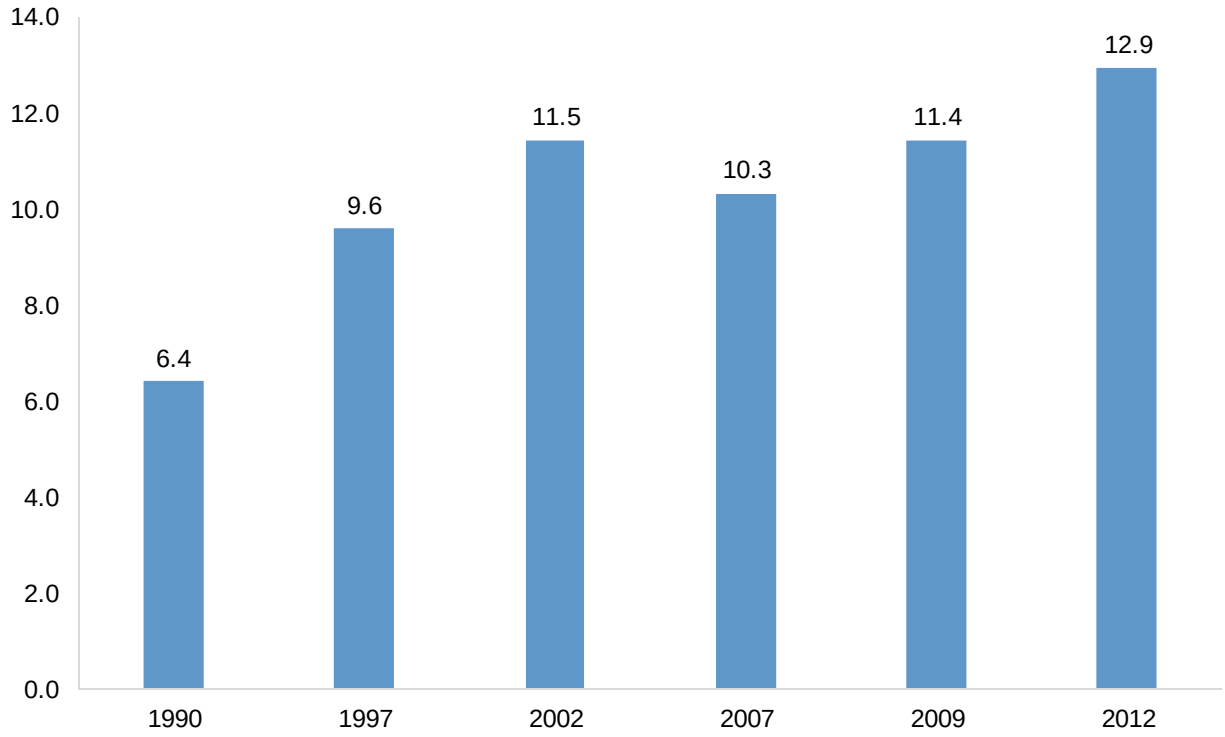
The mean number of person per sleeping room is another indicator of crowding. Data on the number of sleeping rooms was not available for the 1990 survey and therefore this year is not represented in Figure 3 or Table 2. Figure 3 shows that except for the period between 2002 and 2007, the mean number of persons per sleeping room has significantly decreased from 3.0 in 1997 to 2.4 in 2012 (see Table 2). The figure also shows the mean number of persons per sleeping room separately for urban and rural areas. The means are always higher in the rural areas compared to the urban areas although this difference was only 0.2 in 2012, a decrease from the 0.4 difference in 1990 and 1997. The trends and significant changes between the years for urban and rural crowding are the same as those for the total mean as shown in Table 2.

Figure 3. Mean number of de jure household members per sleeping room, by urban and rural place of residence, with the total plotted with 95% confidence intervals



Households that are headed by females are usually associated with limited financial means. Figure 4 shows that the percent of female headed households significantly increased in the intervals 1990-2002 and 2007-2012 (see Table 2). The percentage was 6.4% in 1990 which more than doubled to reach 12.9% in 2012. In the period between 2002 and 2007, the percentage significantly decreased by 1.1 percentage points before increasing again in 2009 (see Table 2).

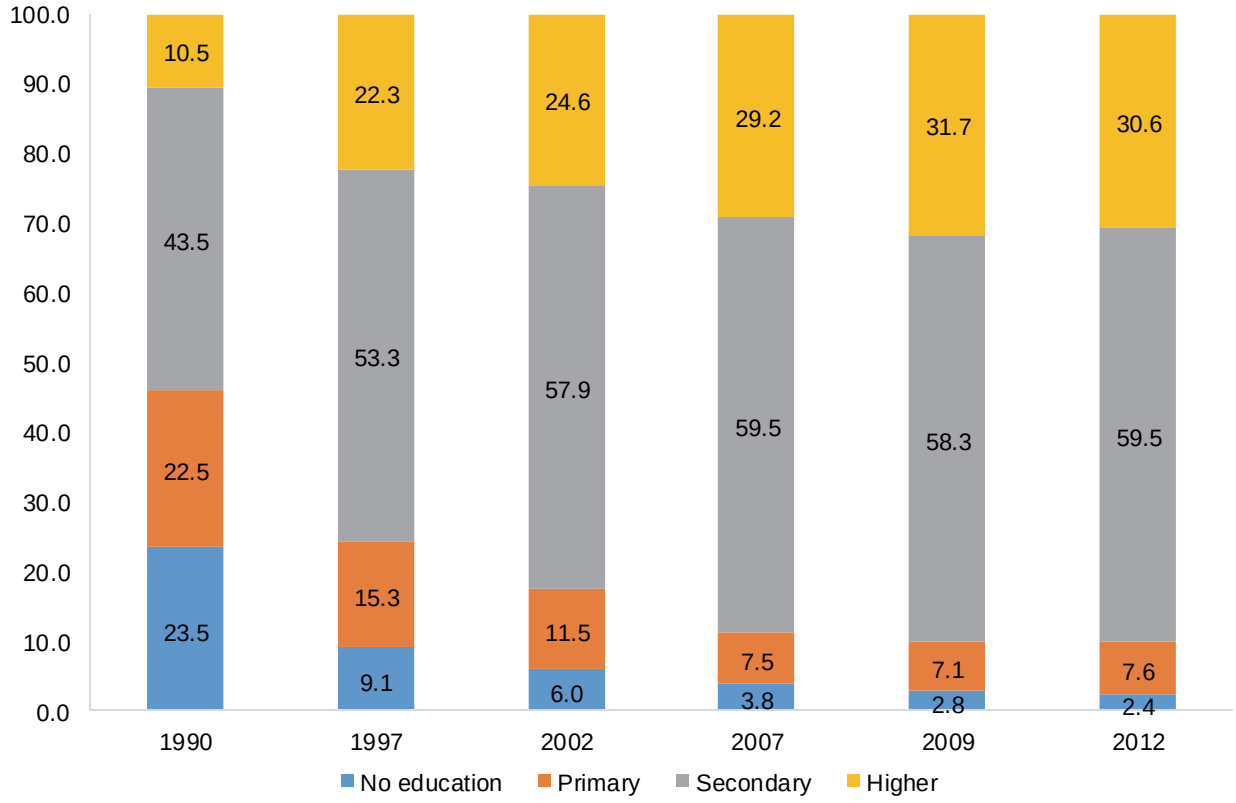
Figure 4. Percentage of households with a female head



2.3. Educational Attainment

Educational status is an important socioeconomic indicator; the education of ever-married women is an especially important indicator as it is usually associated with fertility, contraceptive use and the health of the mother and child. Figure 5 shows that except for 1990, more than half of ever-married women age 15-49 in each survey year had secondary level education. In general, the education level of women is improving, as is shown by the increase in higher education and secondary education and the decrease in primary and no education categories. For the highest level of education the increase was from 10.5% in 1990 to nearly a third of the ever-married women, 30.6%, in 2012. However, this increase was not always significant, as shown in Table 2. The percentage remained statistically unchanged in the intervals 1997-2002 and 2009-2012.

Figure 5. Percentage distribution of highest educational level achieved for ever-married women age 15-49



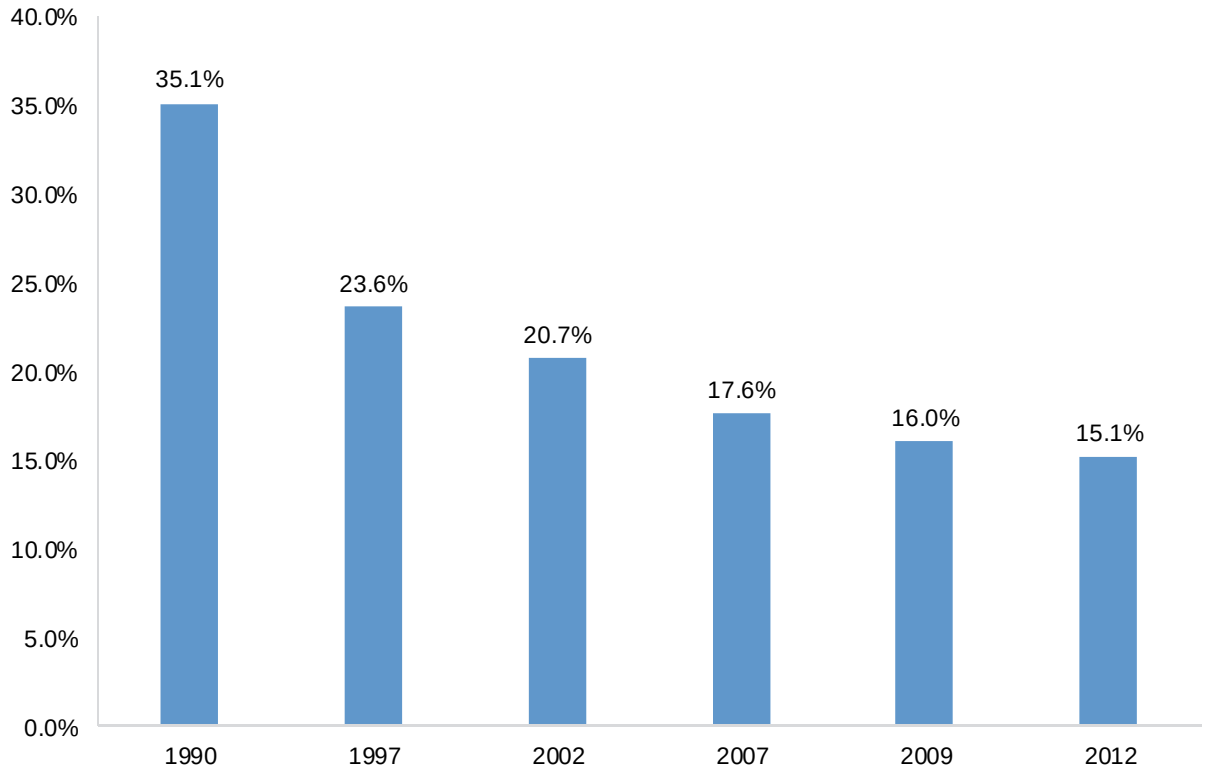
2.4. Marriage

The age at which women marry generally has a strong influence on fertility levels. The younger the age at marriage, the higher the exposure to the risk of pregnancy during the reproductive years and therefore the higher the fertility. Teenage marriages, which lead to teenage pregnancies, can have additional health implications for the mother and child, with increased risk of adverse morbidity and as well as mortality outcomes. Teenage marriages are also associated with lower education levels for girls.

Teenage marriages

The legal age of marriage in Jordan is 18 years, but there are some younger marriages, especially in the earlier surveys, as shown in Figure 6. It is important to note that this indicator is derived from a question which asks all ever-married women the age at which they married their first husband. The indicator is then weighted by an all-women factor to obtain the proportion of teenage marriages in the female population of Jordan, and only women above the age of 24 were selected for the calculation of this indicator. This indicator does not necessarily indicate the current prevalence of teenage marriages in Jordan, but it can still be used as an indicator of teenage marriages among the female population over the age of 24 years. Figure 6 shows that teenage marriages decreased significantly from 35.1% in 1990 to 15.1% in 2012. The decreases were all significant as shown in Table 2 except for the period between 2009 and 2012 where the decrease is not significant.

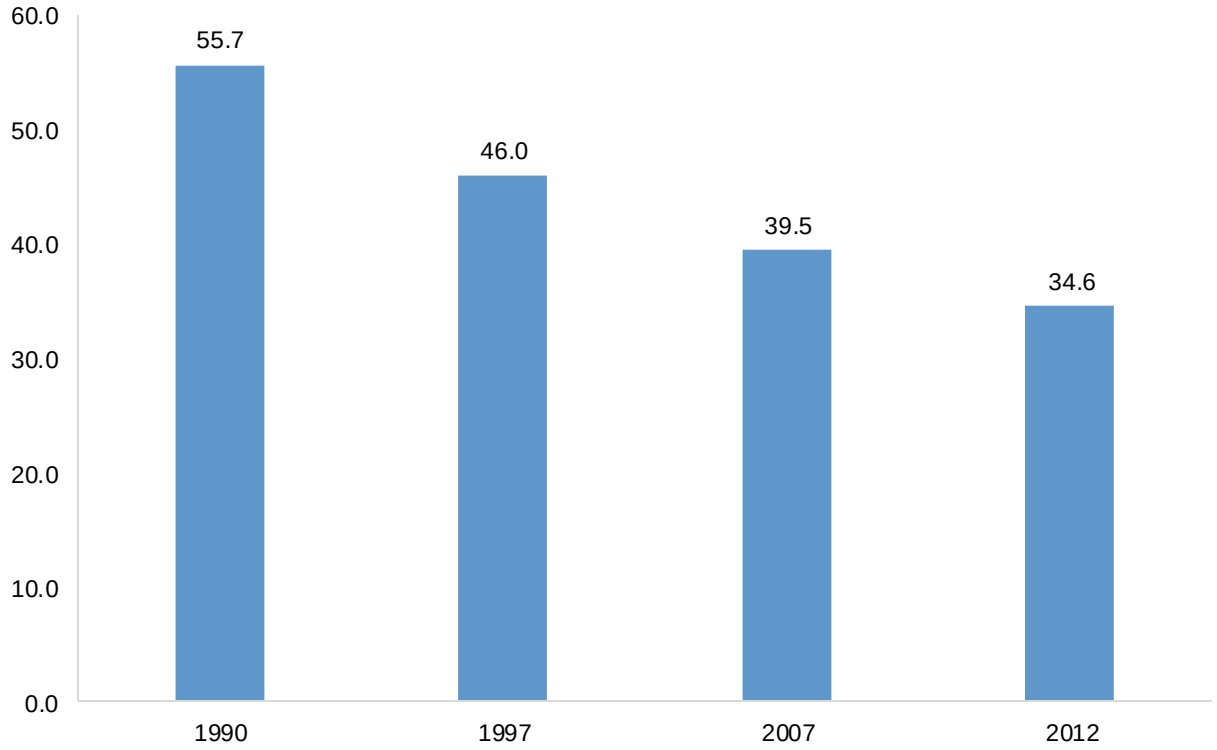
Figure 6. Percentage of women age 25-49 who were married before the age of 18



Consanguinity

Marriage between relatives can result in adverse health outcomes for the child due to increased risk of genetic disorders. It can also be associated with increased risk of spontaneous abortions and still- births. Consanguinity is very common in the Middle East, especially marriages between first cousins. In 1990, more than half (55.7%) of Jordanian ever-married women were married to a relative. However, consanguinity decreased significantly between 1990 and 2012 (see Figure 7 and Table 3). In 2012, it is estimated that about a third (34.6%) of the ever-married women had a consanguineous first marriage.

Figure 7. Percentage of ever-married women age 15-49 whose first husband is a relative



2.5. Summary

Most changes in the demographic, social, and household indicators are in the direction of improvements. The percent of the population aged 0-14 years is significantly decreasing, as a consequence of the decreasing fertility rates in Jordan. Crowding in households has also declined, in both urban and rural areas. The percentage of women with higher education (more than secondary) has increased significantly, reaching an estimated third of the population of ever-married women age 15-49. Teenage marriages are also declining significantly, although this decline has stalled in the most recent surveys. Of concern is the increase in the percentage of households with a female head. Further study is required to understand why this increase is occurring.

Table 2. Estimates for demographic, social and household indicators, with tests of significant differences between consecutive years

	1990 R (C.I.)	1997 R (C.I.)	Diff. 1997-1990	2002 R (C.I.)	Diff. 2002-1997	2007 R (C.I.)	Diff. 2007-2002	2009 R (C.I.)	Diff. 2009-2007	2012 R (C.I.)	Diff. 2012-2009
Percent population 0-14 (de facto)	45.8 (45.1-46.6)	41.0 (40.2-41.9)	-4.8***	39.1 (38.3-39.8)	-1.9***	37.8 (37.0-38.6)	-1.3*	36.9 (36.0-37.7)	-1.0*	35.7 (34.7-36.6)	-1.2*
Percent population 15-64 (de facto)	51.5 (50.8-52.2)	55.9 (55.1-56.7)	4.4***	57.2 (56.5-57.9)	1.3**	58.3 (57.5-59.0)	1.1*	59.1 (58.4-59.9)	0.9	59.9 (59.1-60.8)	0.8
Percent population 65+ (de facto)	2.7 (2.5-2.8)	3.1 (2.9-3.3)	0.4**	3.7 (3.4-4.0)	0.6***	3.9 (3.6-4.2)	0.2	4.0 (3.7-4.4)	0.1	4.4 (4.0-4.8)	0.4
Mean household size (de jure)	6.9 (6.7-7.0)	6.0 (5.8-6.1)	-0.9***	5.7 (5.5-5.8)	-0.3***	5.3 (5.2-5.3)	-0.4***	5.1 (5.0-5.2)	-0.2**	5.1 (5.0-5.1)	-0.0
Total mean number of people/ sleeping room (de jure)	NA[(b)]	3.0 (3.0-3.1)	NA[(b)]	2.7 (2.6-2.7)	-0.4***	2.7 (2.6-2.7)	-0.005	2.5 (2.5-2.6)	-0.1***	2.4 (2.4-2.5)	-0.1**
Urban mean number of people/ sleeping room (de jure)	NA[(b)]	3.0 (2.9-3.0)	NA[(b)]	2.6 (2.5-2.6)	-0.4***	2.6 (2.5-2.7)	0.02	2.5 (2.4-2.5)	-0.1**	2.4 (2.3-2.5)	-0.1*
Rural mean number of people/ sleeping room (de jure)	NA[(b)]	3.4 (3.2-3.5)	NA[(b)]	3.0 (2.9-3.0)	-0.4***	2.9 (2.8-3.0)	-0.1	2.8 (2.7-2.8)	-0.1***	2.6 (2.5-2.6)	-0.2***
Percent female headed households(a)	6.4 (5.7-7.1)	9.6 (8.8-10.4)	3.2***	11.5 (10.5-12.4)	1.9**	10.3 (9.5-11.1)	-1.1*	11.4 (10.5-12.4)	1.1*	12.9 (12.0-13.9)	1.5*
Percent of ever-married women age 15-49 with higher education	10.5 (9.4-11.5)	22.3 (20.4-24.2)	11.8***	24.6 (22.6-26.6)	2.3	29.2 (27.4-31.1)	4.6***	31.7 (29.8-33.7)	2.5*	30.6 (28.6-32.6)	-1.1
Percent of all women >24 years that were married before the age of 18	35.1 (33.5-36.6)	23.6 (22.2-25.0)	-11.5***	20.7 (19.5-21.9)	-2.9***	17.6 (16.4-18.8)	-3.1***	16.0 (14.7-17.3)	-1.6*	15.2 (14.0-16.3)	-0.9

Notes: R represents the percentage or mean estimates. (a) For 1990 no information was present on the sex of the household head, assumed the first respondent to the questionnaire was the household head. (b) In 1990, there was no data available on the number of sleeping rooms. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

Table 3. Proportion of ever-married women age 15-49 whose first husband is a relative, with tests of significant differences between consecutive years

	1990 % (C.I.)	1997 % (C.I.)	Diff. 1997-1990	2007 % (C.I.)	Diff. 2007-1997	2012 % (C.I.)	Diff. 2012-2007
First husband is a relative	55.7 (54.1-57.2)	46.0 (44.3-47.8)	-9.6***	39.5 (37.6-41.3)	-6.6***	34.6 (32.9-36.3)	-4.9***

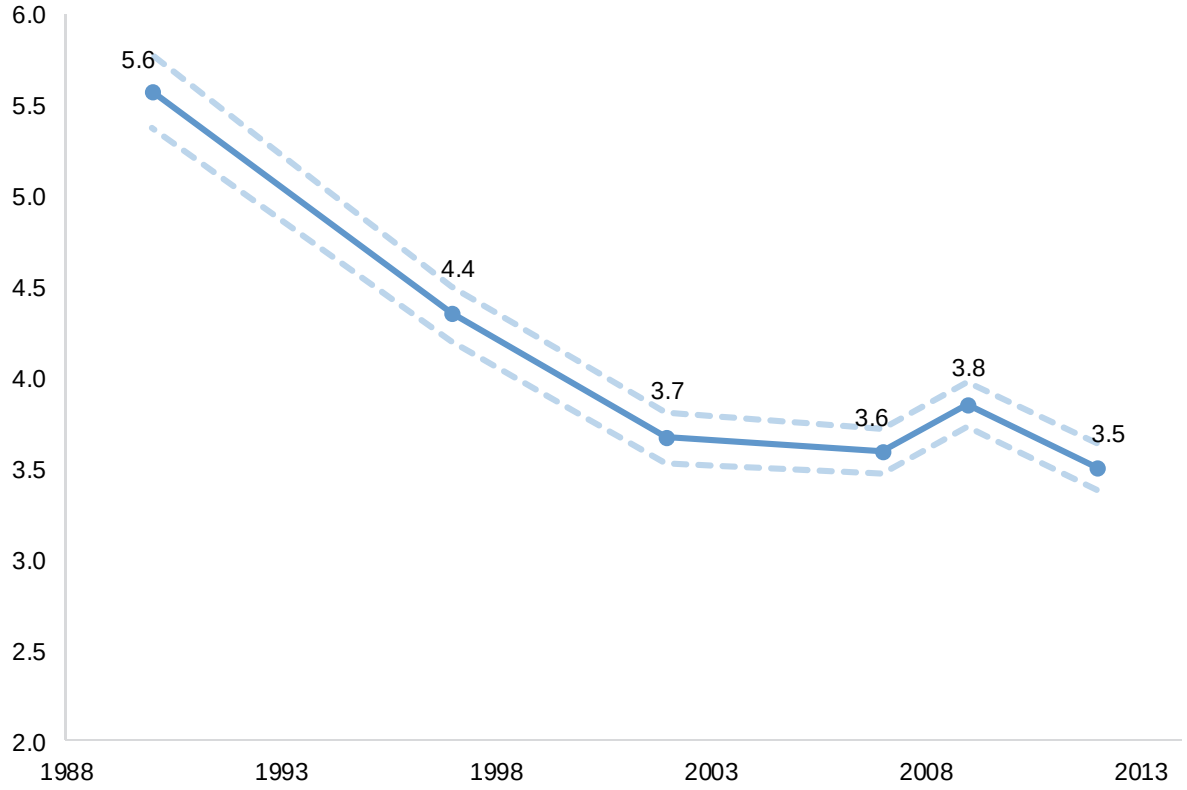
Notes: Data not available for 2002 and 2009. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

3. Fertility Rates and Fertility Preferences

3.1. Total Fertility Rate

The total fertility rate (TFR) is a measure of the average number of births a woman would have at the end of her reproductive years if she experienced the current age-specific fertility rates. The TFR reported here represents the 3-year period preceding the survey. As shown in Figure 8, the TFR in Jordan significantly decreased from 5.6 births per woman in 1990 to 3.5 births per woman in 2012, although the decrease between 2002 and 2007 was not significant as shown in Table 4. There was also a slight but significant increase between 2007 and 2009 before decreasing again in 2012. Although the TFR overall is decreasing, this decrease is not as rapid as the earlier years; the TFR actually increased in 2009, and it had a relatively high level of 3.5 births per woman by 2012. Having a high fertility rate not only can impact the health of the mother and child, but also has implications for the sustainable development of a country.

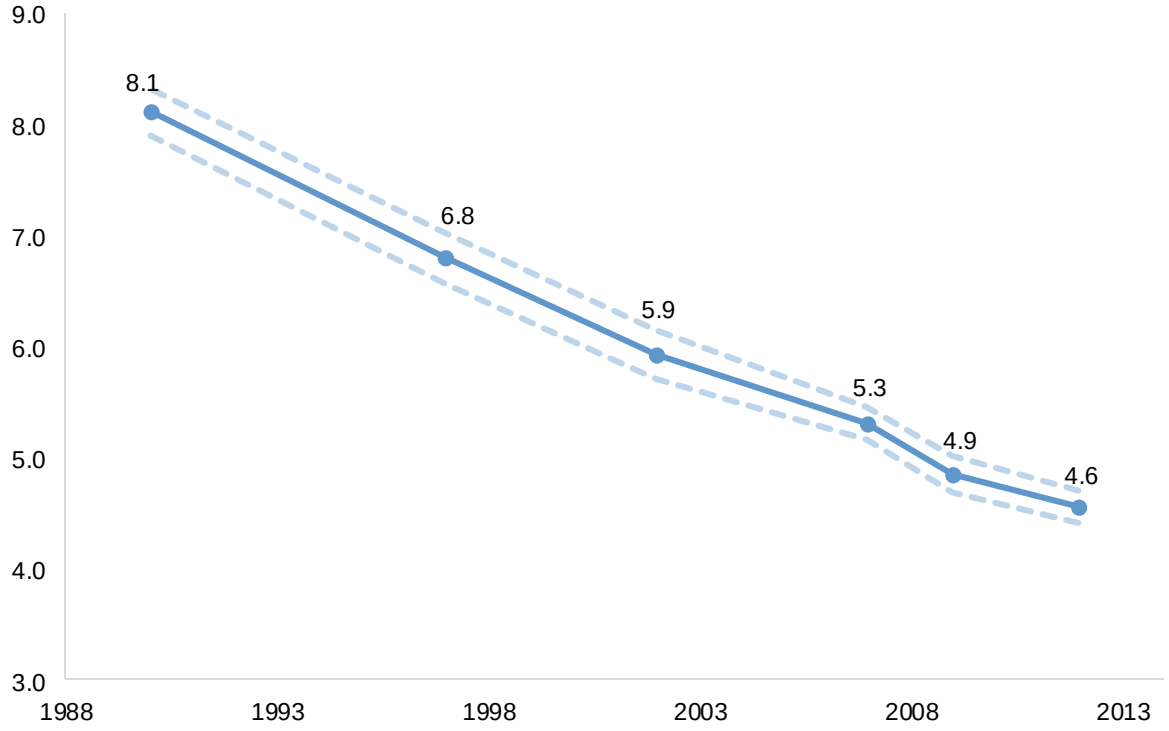
Figure 8. Total fertility rate in the 3-year period preceding the surveys for the survey years 1990, 1997, 2002, 2007, 2009, and 2012, with 95% confidence intervals



3.2. Completed Fertility Rate

The completed fertility rate represents the fertility of women over 40 years when they are less likely to have any more children. This indicator, calculated as the mean number of children ever born to women age 40-49, includes an all-women factor to calculate the indicator for all women, not just the ever-married women in the surveys. Figure 9 shows a significant decrease over the years from a mean of 8.1 births per woman in 1990 to 4.6 births per woman in 2012. The decrease was significant between each of the consecutive surveys as shown in Table 4. A higher completed fertility rate than total fertility rate, as can be seen when comparing these two indicators for each year, is further evidence of declining fertility in Jordan. However, as mentioned with the TFR, the completed fertility rate still remains relatively high in 2012 at 4.6 births per woman.

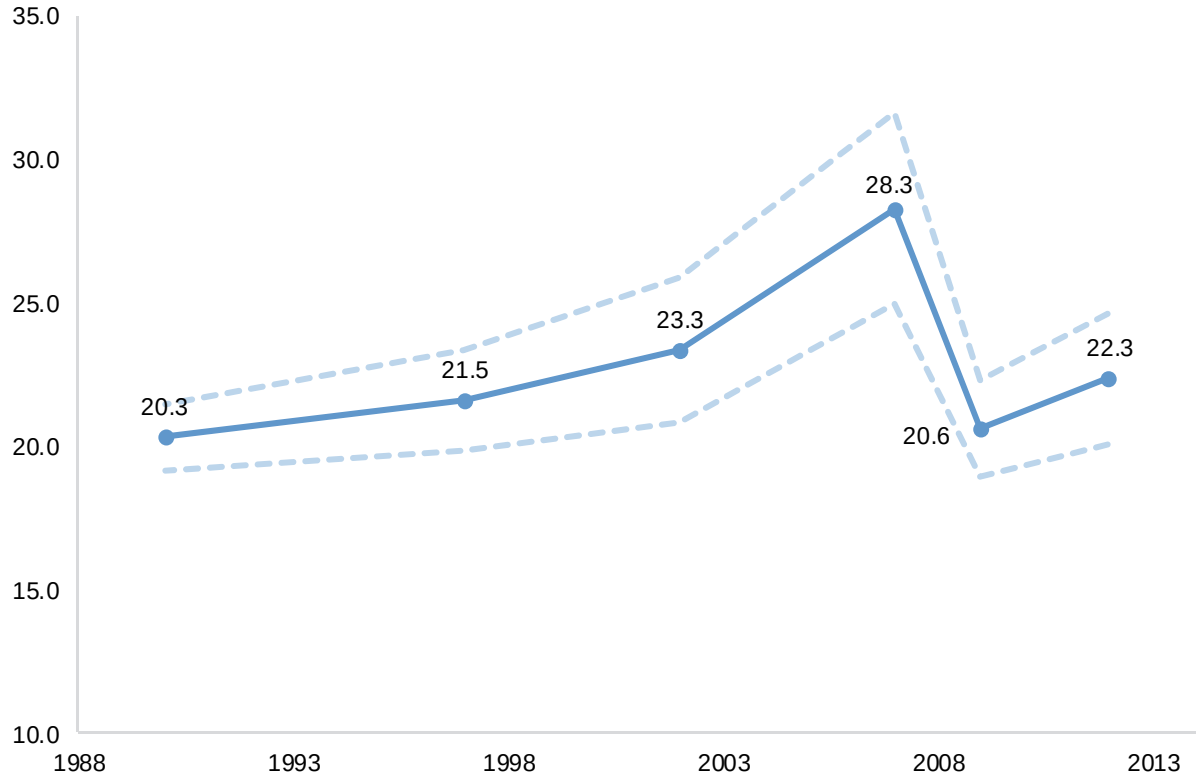
Figure 9. Completed fertility rate for all women age 40-49 for the survey years 1990, 1997, 2002, 2007, 2009, and 2012, with 95% confidence intervals



3.3. Time between Marriage and First Birth

Figure 10 shows the mean interval in months between marriage and the first birth for ever-married women age 15-49. As shown in the figure, except for a significant jump in 2007 to a mean of 28.3 months, this mean has remained relatively unchanged, in a range from 20.3 to 23.3 months. The increase between 2009 and 2012 is not significant, as is shown in Table 4. A longer interval is recommended as newly married couples require time to adapt to marital life and learn more about fertility, contraception, and child rearing skills. An increase in this interval can also have a direct influence on decreasing fertility rates.

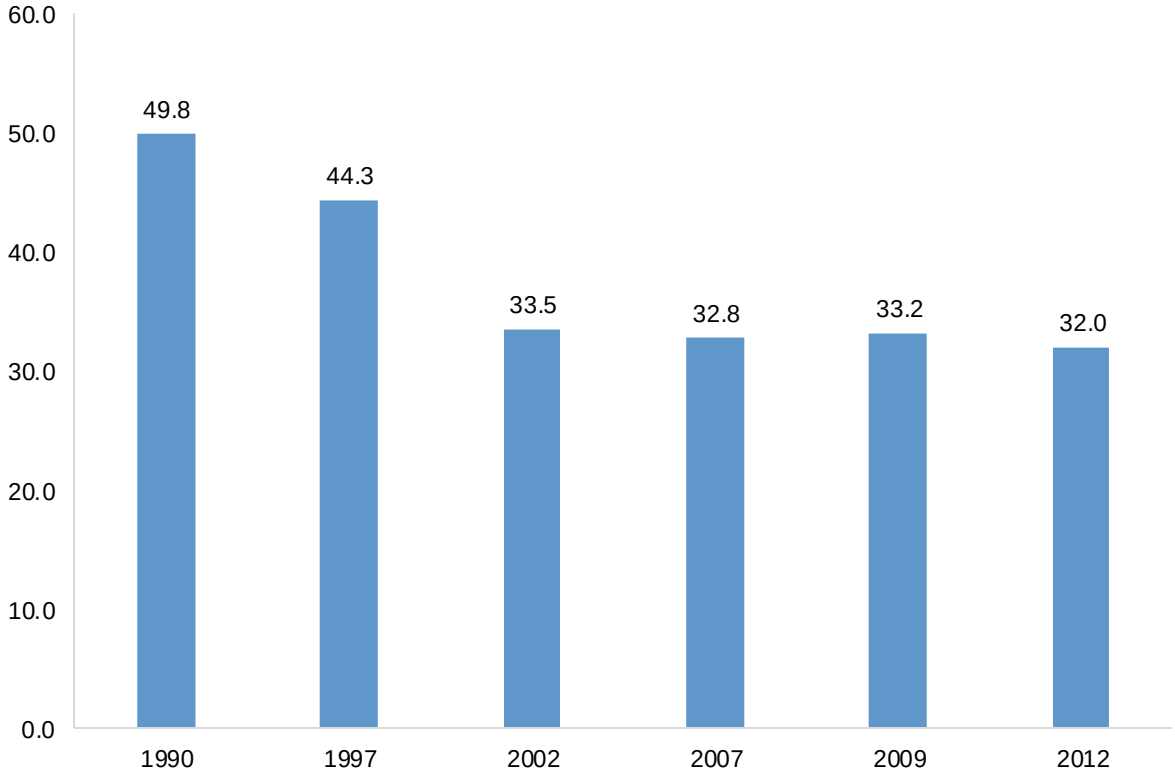
Figure 10. Mean number of months between marriage and first birth for ever-married women age 15-49 for the survey years 1990, 1997, 2002, 2007, 2009, and 2012, with 95% confidence intervals



3.4. Birth Interval

The birth interval, or the period of time between two live births, can have a large impact on the health of the mother and child as well as have an impact on fertility rates. It is recommended that women wait at least two years between consecutive births to allow the mother to recover fully from her pervious child birth. Other recommendations suggest an even longer birth interval of 3-5 years for better health of the mother and child. Figure 11 shows the percentage of non-first births, in the five years preceding the survey, which occurred less than the minimum recommended 24-month interval since the preceding birth. Although there was a significant decrease in closely spaced births between 1990 and 2002, this percentage has remaining relatively unchanged in the following years as shown in Table 4. From 2002 to 2012 almost one-third of births occurred less than 24 months after the preceding birth.

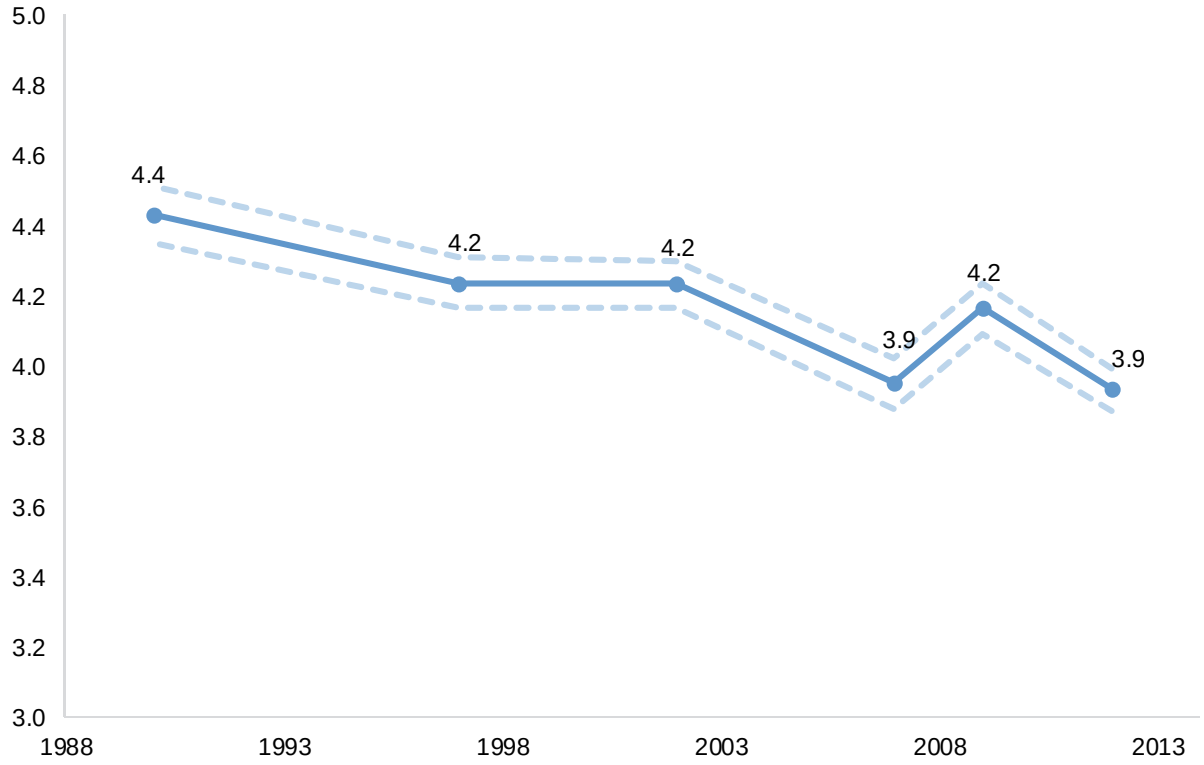
Figure 11. Percentage of non-first births in the five years preceding the survey that are less than 24 months after the preceding birth



3.5. Ideal Number of Children

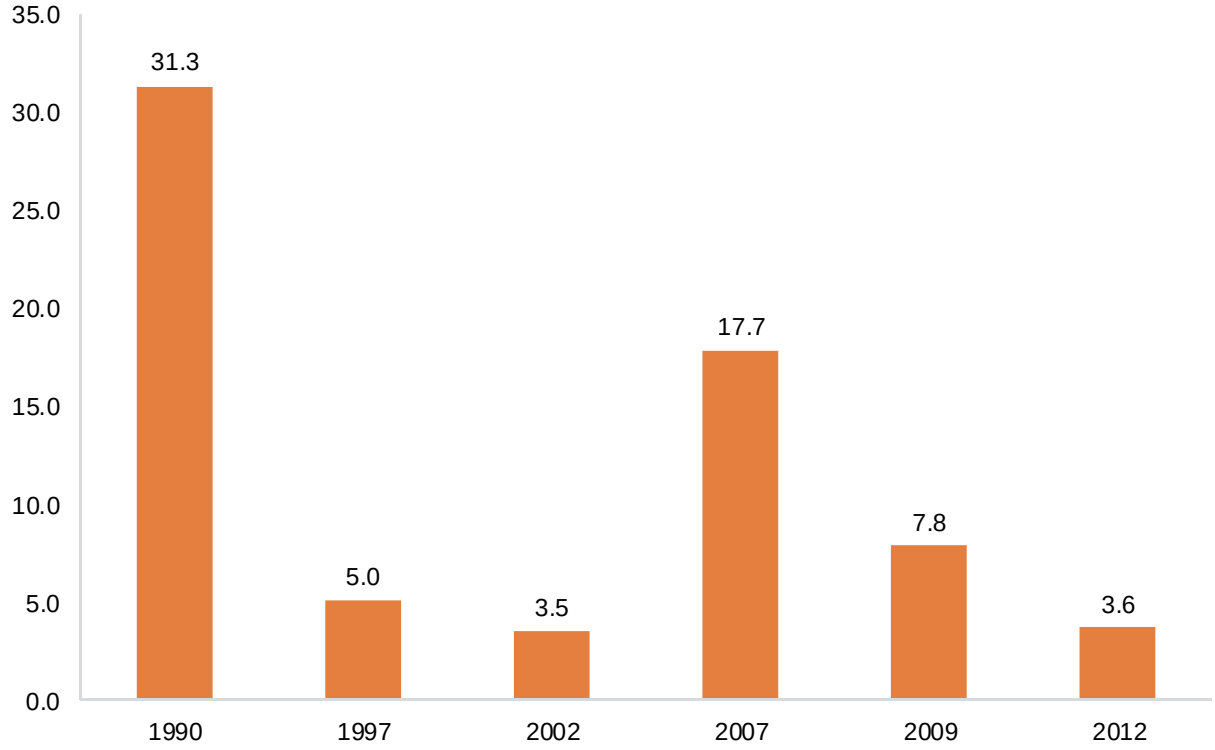
This indicator is derived from a question in which ever-married women age 15-49 are asked to consider, independently of their actual family size, how many children they would choose to have if they could start childbearing again. Women who provided a non-numeric answer, as described below, were excluded from the calculation of this indicator. Figure 12 shows that the ideal number has remained at approximately four children. There has been a slight decrease in the ideal number across the full interval of time except for an increase between 2007 and 2009. These changes, although small, are all significant except for no significant change between 1997 and 2002 as shown in Table 4.

Figure 12. Mean ideal number of children for ever-married women age 15-49 for the survey years 1990, 1997, 2002, 2007, 2009, and 2012, with 95% confidence intervals



Many women who are asked about their ideal number of children provided a non-numeric response such as “Fate” or “Depends on God”. The percentage of ever-married women who provided a non-numeric answer can be used as an indicator to show the level that women are aware of their fertility intentions. It can also reflect the willingness of the interviewer to probe for a numeric answer. Figure 13 shows a large decrease in this percentage after 1990 but with a significant increase in 2007. The changes in the percentages are all significant as shown in Table 4 and in the most recent survey only 3.6% of women provided a non-numeric response.

Figure 13. Percentage of ever-women age 15-49 who gave a non-numeric response for ideal number of children



3.6. Summary

While fertility rates have decreased significantly during the full range of these surveys, the decrease in the recent surveys has not been as rapid as in the earlier surveys. This relative slowing down of the fertility decline may be related to the other indicators reported in this chapter. The mean interval between marriage and first birth has remained less than 24 months for all the surveys. The mean interval between successive live births remained unchanged in the 10 year period from 2002 to 2012, with approximately a third of the births occurring within 24 months after the preceding birth. The ideal number of children, while significantly decreasing, continues to be close to an average of 4 children.

Table 4. Estimates for fertility rates and fertility intention indicators with tests of significant differences between consecutive years

	1990 R (C.I.)	1997 R (C.I.)	Diff. 1997-1990	2002 R (C.I.)	Diff. 2002-1997	2007 R (C.I.)	Diff. 2007-2002	2009 R (C.I.)	Diff. 2009-2007	2012 R (C.I.)	Diff. 2012-2009
Total Fertility Rate (rate)	5.6 (5.4-5.8)	4.4 (4.2-4.5)	-1.2***	3.7 (3.5-3.8)	-0.7***	3.6 (3.5-3.7)	-0.1	3.8 (3.7-4.0)	0.2**	3.5 (3.4-3.6)	-0.3***
Completed Fertility Rate (mean)	8.1 (7.9-8.3)	6.8 (6.6-7.0)	-1.3***	5.9 (5.7-6.2)	-0.9***	5.3 (5.2-5.5)	-0.6***	4.8 (4.7-5.0)	-0.5***	4.6 (4.4-4.7)	-0.3**
Time between marriage and first birth (mean)	20.3 (19.1-21.4)	21.5 (19.8-23.3)	1.3	23.3 (20.8-25.8)	1.8	28.3 (24.9-31.6)	5.0*	20.6 (18.9-22.3)	-7.7***	22.3 (20.0-24.6)	1.7
Birth interval <24 months (percent)	49.8 (48.2-51.5)	44.3 (42.6-46.0)	-5.5***	33.5 (31.8-35.2)	-10.8***	32.8 (31.0-34.5)	-0.7	33.2 (31.3-35.0)	0.4	32.0 (30.2-33.8)	-1.2
Ideal number of children (mean)	4.4 (4.3-4.5)	4.2 (4.2-4.3)	-0.2***	4.2 (4.2-4.3)	-0.004	3.9 (3.9-4.0)	-0.3***	4.1 (4.1-4.2)	0.2***	3.9 (3.9-4.0)	-0.2***
Non-numeric response to ideal number of children (percent)	31.3 (29.5-33.1)	5.0 (4.3-5.7)	-26.2***	3.5 (2.9-4.1)	-1.6***	17.7 (16.5-19.0)	14.3***	7.8 (6.7-8.9)	-9.9***	3.6 (2.8-4.4)	-4.2***

Notes: R represents the rate, percent, or mean estimates. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

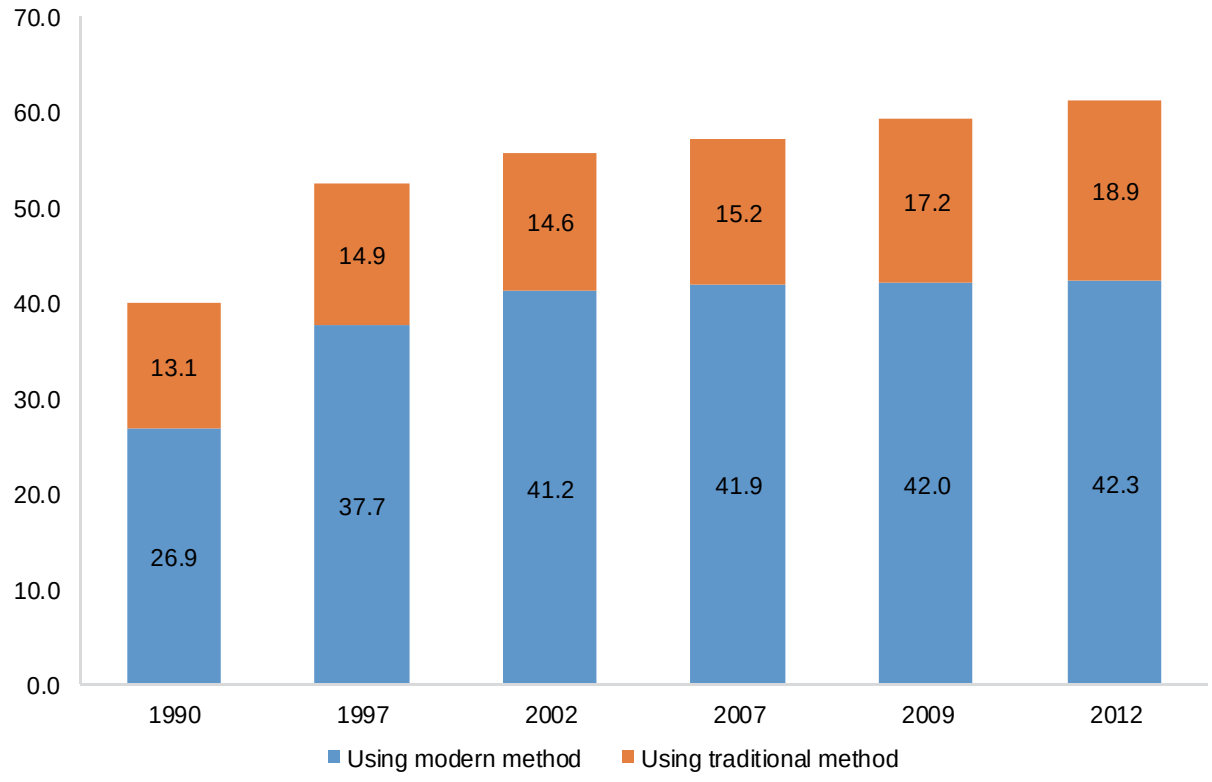
4. Family Planning

Since knowledge of contraceptive methods is very high in Jordan (almost 100% for all six surveys), this was not seen as an important indicator to examine. In this chapter, trends in current use of family planning and unmet need are described.

4.1. Current Use of Family Planning

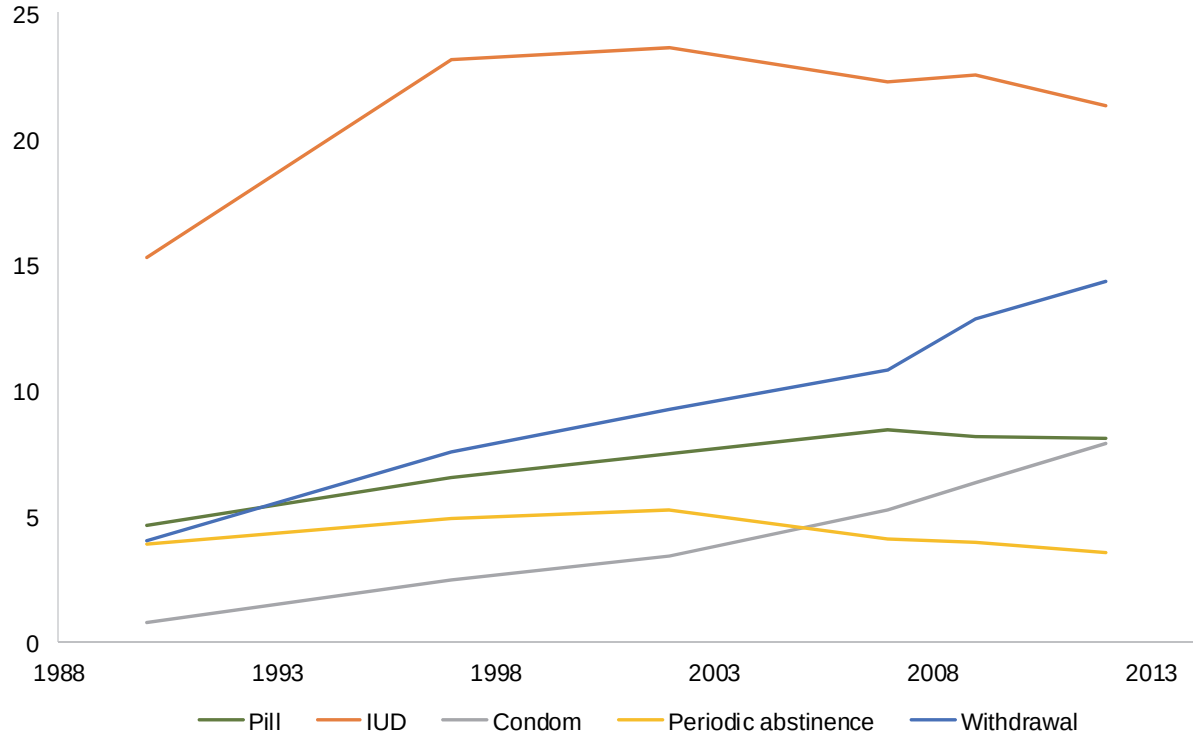
Current use of family planning measures the use of family planning methods at the time of the survey. Figure 14 shows the percentage of current use of contraceptive methods, modern or traditional, among currently married women. Overall, as indicated in Table 5, current contraceptive use has significantly increased from 40.0% in 1990 to 61.2% in 2012, except for no significant change between 2002 and 2007. The percentage of women using modern methods is higher than those using traditional methods in each year. For modern method use, the percentage increased significantly from 1990 to 1997 and from 1997 to 2002; however, it has remained unchanged at approximately 42% since 2002 (see Table 5). For traditional method use, the percentage also increased significantly between 1990 and 1997 but then remained unchanged until 2009. Since 2009, the percentage of currently married women using traditional methods increased significantly from 15.2% in 2007 to 18.9% in 2012. Between the last two surveys the increase in current contraceptive use appears to be primarily due to a significant increase in traditional methods, as the use of modern methods did not change significantly in this interval.

Figure 14. Percentage of current use of contraception among currently married women age 15-49



The most common contraceptive methods, both modern and traditional, are examined in Figure 15. As can be seen in the figure as well as in Table 5, use of IUD remains the most used contraceptive method. The use of this method increased significantly between 1990 and 1997; however, there was no significant change after 1997. The most important changes in contraceptive use can be mostly attributed to condom use as a modern method and withdrawal as a traditional method. Condom use increased from 0.8% in 1990 to 7.9% in 2012, and withdrawal increased from 4.0% in 1990 to 14.3% in 2012, and the increases have been significant across the full interval of time. The use of pills and periodic abstinence have not changed as rapidly, and have remained relatively stable especially in the recent surveys.

Figure 15. Percentage of current use of the most common modern and traditional methods among currently married women age 15-49 for the survey years 1990, 1997, 2002, 2007, 2009, and 2012



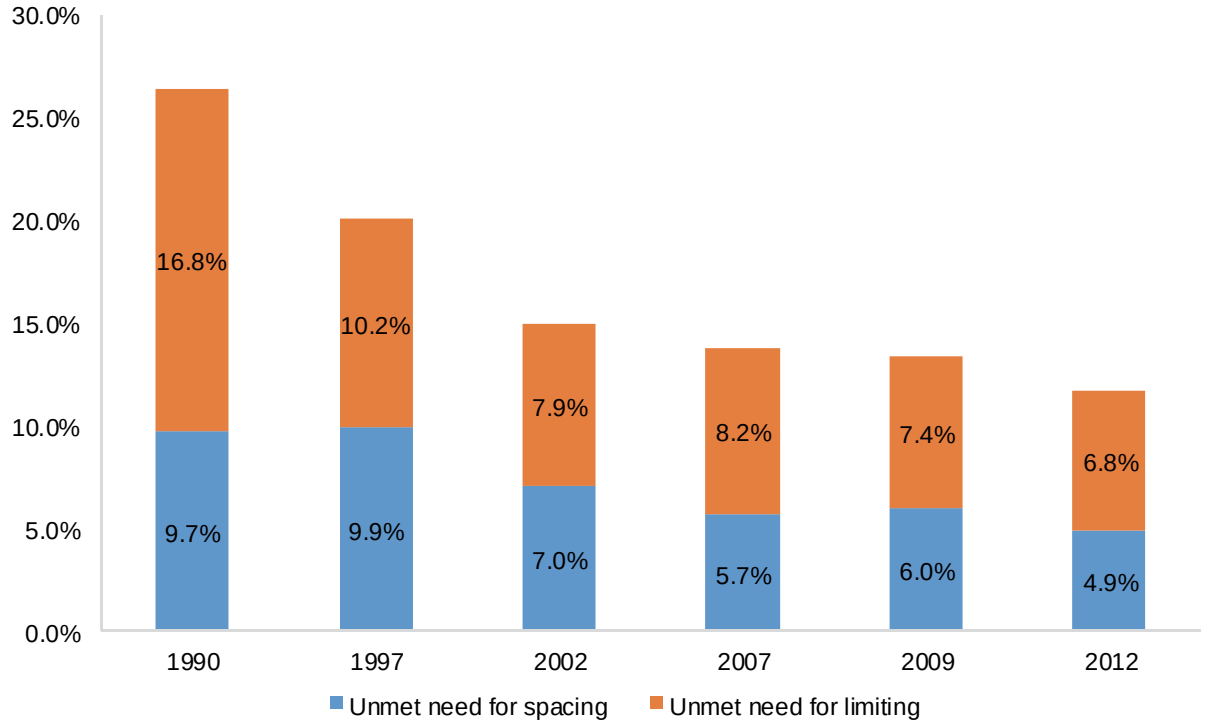
4.2. Unmet Need for Family Planning

Unmet need refers to women who are not using contraception but who still wish to postpone the next birth (unmet need for spacing) or to stop having children completely (unmet need for limiting). This indicator was calculated differently in the years preceding 2012 using information from the contraceptive calendar and questions not used in every survey. Currently, the revised definition of unmet need uses information that was collected in every survey. The percentages reported here consistently use the more recent definition. Therefore the percentages before 2012 will not be the same as those reported in the final reports of the JPFHS surveys from 1990-2009.

As shown in Table 5, the total unmet need for currently married women decreased from 26.5% in 1990 to 11.7% in 2012. This decrease was not always significant; with no significant change between 2002-2007 and 2007-2009. Figure 16 shows that unmet need for both limiting and spacing among currently married

women appears to be decreasing, but again the decrease is not always significant. There was no significant change in unmet need for spacing between 1990 and 1997. After 1997 the unmet need for spacing decreased significantly from 9.9% in 1997 to 5.7% in 2007. It then remained unchanged before significantly decreasing again to 4.9% in 2012. Unmet need for limiting also decreased significantly from 16.8% in 1990 to 7.9% in 2002, but it remained unchanged afterwards with no significant increase or decrease between the consecutive surveys from 2002 and 2012. In 2012 the unmet need for limiting was 6.8%.

Figure 16. Percentage of currently married women age 15-49 with unmet need for family planning



4.3. Summary

Current use of family planning for currently married women age 15-49 has generally increased across the full range of surveys. However, the percent of currently married women using a modern method remained unchanged between 2002 and 2012. While the use of condoms has increased significantly, the use of the most common modern contraceptive methods, IUDs and pills, has remained relatively unchanged since 1997. The use of traditional methods for family planning, on the other hand, has increased in recent years, mostly due to the increase in withdrawal. Total unmet need has decreased significantly and was found to be 11.7% in 2012. The changes in unmet need for spacing and for limiting were different. Unmet need for spacing had a significant decrease between the recent surveys of 2009 and 2012, but unmet need for limiting did not change significantly after the 2002 survey. This stalling of the decrease in unmet need for limiting as well as the recent lack of change in modern contraceptive use requires further study and analysis.

Table 5. Percentage of current use contraception and unmet need for family planning among currently married women age 15-49, with tests of significant differences between consecutive years

	1990 % (C.I.)	1997 % (C.I.)	Diff. 1997-1990	2002 % (C.I.)	Diff. 2002-1997	2007 % (C.I.)	Diff. 2007-2002	2009 % (C.I.)	Diff. 2009-2007	2012 % (C.I.)	Diff. 2012-2009
Contraceptive use											
Any method	40.0 (38.3-41.6)	52.6 (51.0-54.2)	12.6***	55.8 (54.0-57.6)	3.2**	57.1 (55.5-58.7)	1.3	59.3 (57.8-60.7)	2.2*	61.2 (59.7 – 62.6)	1.9*
Modern method	26.9 (25.4-28.3)	37.7 (36.2-39.2)	10.8***	41.2 (39.5-43.0)	3.5**	41.9 (40.4-43.5)	0.7	42.0 (40.4-43.7)	0.1	42.3 (40.9-43.8)	0.3
Traditional method	13.1 (12.1-14.0)	14.9 (13.8-16.0)	1.8**	14.6 (13.4-15.7)	-0.3	15.2 (14.2-16.2)	0.6	17.2 (15.9-18.6)	2.1*	18.9 (17.8-19.9)	1.6*
Pill	4.6 (3.9-5.3)	6.5 (5.8-7.3)	1.9***	7.5 (6.6-8.3)	0.9	8.5 (7.6-9.3)	1.0	8.2 (7.3-9.0)	-0.3	8.1 (7.2-9.1)	-0.1
IUD	15.3 (14.1-16.5)	23.1 (21.9-24.4)	7.9***	23.6 (21.8-25.4)	0.5	22.3 (21.0-23.5)	-1.4	22.6 (21.1-24.1)	0.3	21.3 (19.8-22.8)	-1.3
Condom	0.8 (0.5-1.0)	2.4 (2.0-2.9)	1.7***	3.4 (2.8-3.9)	1.0 **	5.3 (4.5-6.0)	1.9***	6.3 (5.5-7.1)	1.1*	7.9 (7.0-8.8)	1.5**
Periodic Abstinence	3.9 (3.3-4.4)	4.9 (4.2-5.6)	1.1*	5.2 (4.5-6.0)	0.3	4.1 (3.5-4.7)	-1.1*	4.0 (3.2-4.7)	-0.1	3.5 (2.9-4.2)	-0.4
Withdrawal	4.0 (3.4-4.6)	7.6 (6.8-8.3)	3.6***	9.3 (8.4-10.2)	1.7**	10.8 (9.9-11.7)	1.5**	12.8 (11.7-14.0)	2.0**	14.3 (13.3-15.3)	1.5*
Unmet need											
Total unmet need	26.5 (25.3-27.7)	20.1 (18.9-21.2)	-6.4***	14.9 (13.8-16.0)	-5.2***	13.8 (12.7-15.0)	-1.1	13.4 (12.3-14.5)	-0.4	11.7 (10.6-12.9)	-1.7*
Unmet need for spacing	9.7 (8.8-10.6)	9.9 (9.0-10.8)	0.2	7.0 (6.3-7.8)	-2.9***	5.7 (5.0-6.4)	-1.4**	6.0 (5.2-6.7)	0.3	4.9 (4.2-5.6)	-1.1*
Unmet need for limiting	16.8 (15.8-17.7)	10.2 (9.3-11.0)	-6.6***	7.9 (7.1-8.7)	- 2.3***	8.2 (7.3-9.0)	0.3	7.4 (6.5-8.3)	-0.7	6.8 (5.8-7.8)	-0.6

Notes: 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

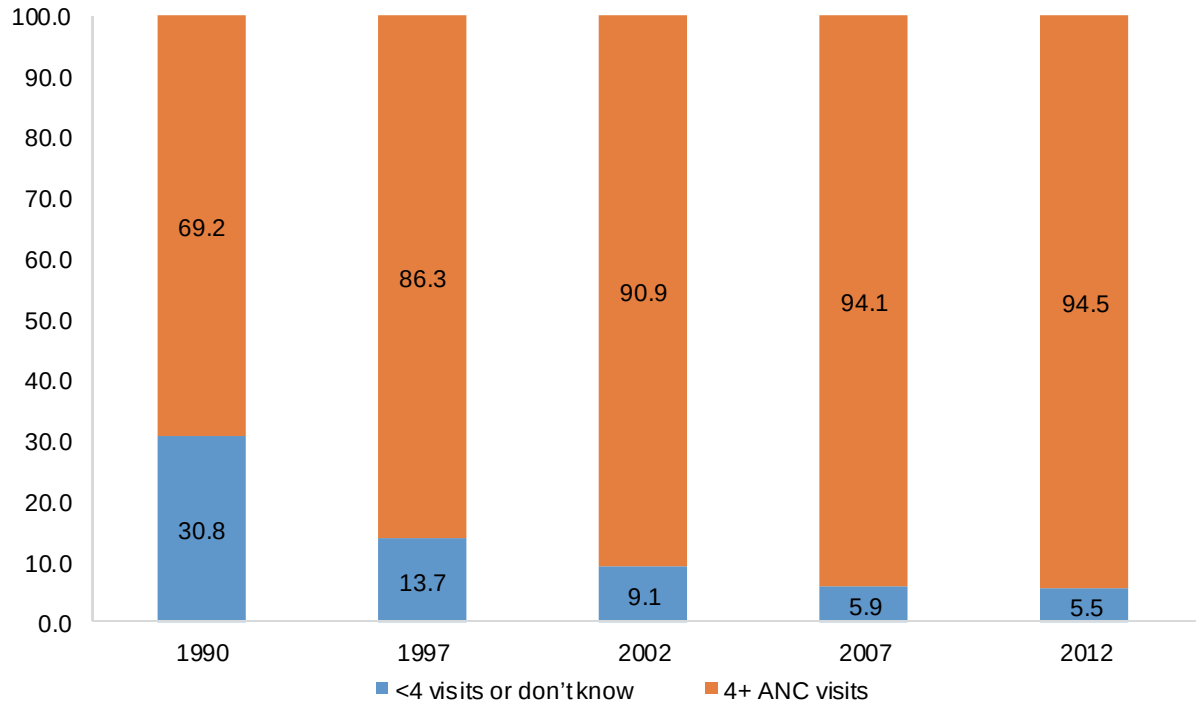
5. Maternal and Adult Health

5.1. Antenatal care

The health care the mother receives during her pregnancy can have a direct impact on her health and also on the health of her child. In each survey, ever-married women who had a live birth in the five years preceding the survey were asked the number of antenatal care (ANC) visits they received for the most recent birth. The indicator was then recoded to identify those who had less than four ANC visits (or did not know the number), and those who had four or more ANC visits. The World Health Organization (WHO) recommends that women have a four or more ANC visits for each pregnancy. No data on ANC visits was available for the 2009 survey.

As shown in Figure 17, the percentage of women having less than four ANC visits decreased from 30.8% in 1990 to 5.5% in 2012. The decrease was significant between the consecutive survey years, as shown in Table 6, except for no significant change between 2007 and 2012.

Figure 17. Percentage distribution of ever-married women age 15-49 who had a live birth in the five years preceding the survey, by having <4 or 4+ ANC visits for most recent birth



5.2. Caesarean Section Deliveries

Caesarean section (C-section) delivery is an indicator used to measure access to obstetric care. The WHO has determined that C-sections should constitute between 5 to 15% of all deliveries in a population. A percentage over 15% indicates that C-sections are being overused and that women are being exposed to unnecessary risks associated with this surgical procedure. Figure 18 shows that the percentage of births delivered by C-section increased significantly from 5.6% in 1990 to 28.0% in 2012. Since 2002 the percentage of C-section deliveries has exceeded the WHO recommendation, suggesting that many of these C-sections may not be medically indicated.

Figure 18. Percentage of live births in the five years preceding the survey delivered by caesarean section

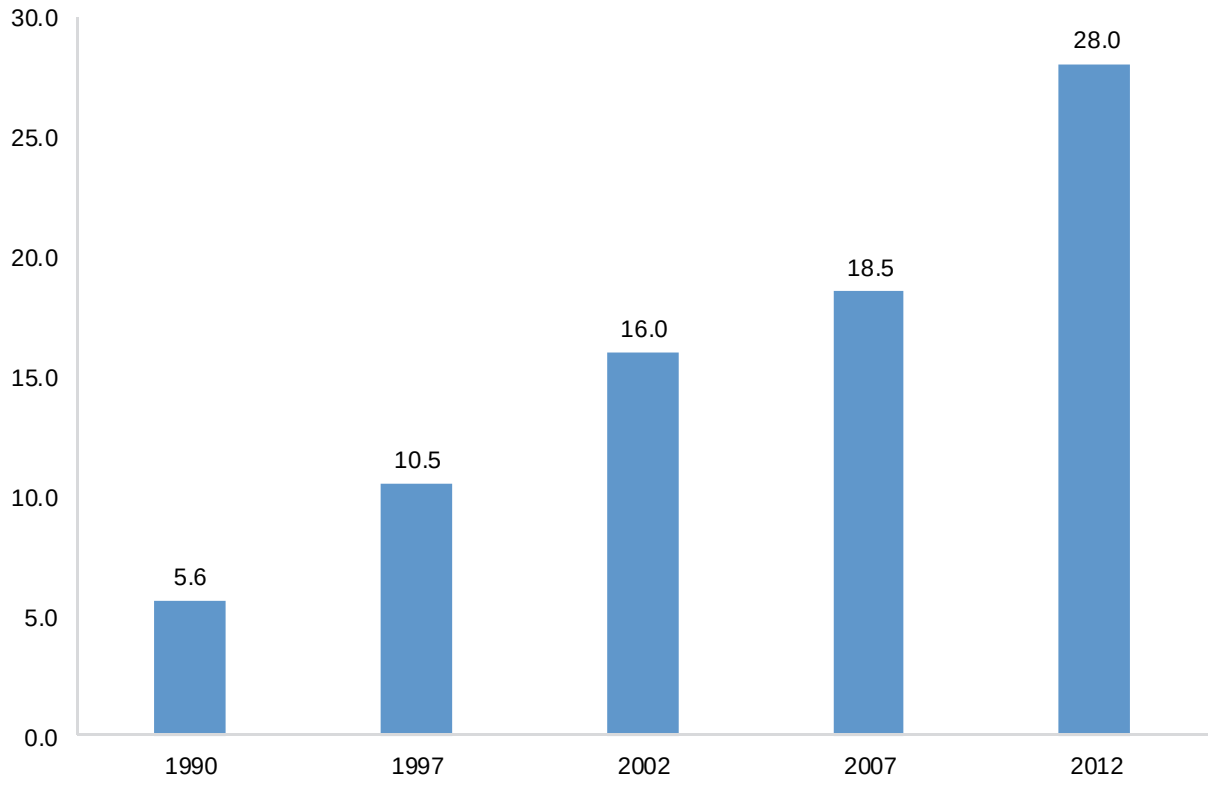


Table 6. Percentage of ever-married women age 15-49 with less than four antenatal care visits for the most recent birth, and percentage of births with C-section deliveries with tests of significant differences between consecutive years

	1990 % (C.I.)	1997 % (C.I.)	Diff. 1997-1990	2002 % (C.I.)	Diff. 2002-1997	2007 % (C.I.)	Diff. 2007-2002	2012 % (C.I.)	Diff. 2012-2007
Less than 4 ANC visits	30.8 (28.9-32.6)	13.7 (12.4-15.0)	-17.1***	9.1 (8.1-10.2)	-4.6***	5.9 (5.1-6.7)	-3.2***	5.5 (4.6-6.4)	-0.4
C-section deliveries	5.6 (4.9-6.4)	10.5 (9.5-11.5)	4.9***	16.0 (14.4-17.6)	5.4***	18.5 (17.0-20.0)	2.6*	28.0 (26.2-29.9)	9.5***

Notes: Data not available for 2009. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

5.3. Nutritional Status of Women

Women's nutritional status can be assessed by their body mass index (BMI), that is, weight in kilograms divided by the height in meters squared (kg/m^2). A BMI less than 18.5 indicates underweight; from 18.5-24.9 indicates normal weight; from 25-29.9 indicates overweight; and 30 or over indicates obesity. BMI is not calculated for women who are pregnant or one month postpartum. Weight and height measurements required to calculate the BMI in the DHS surveys are usually taken from women in the household. However, in 1997 these measurements were taken only from interviewed mothers. Therefore, in order to be able to compare this indicator across the years, the BMI categories discussed in this report are only for ever-married women age 15-49 and not all women in the household sample. In addition, while in 1997 all interviewed mothers were selected for weight and height measurements and in 2002 all women in the household were selected, in the remaining years only a subsample of women in the household were selected for measurement. In 2007 and 2009 this subsample was half of the households; in 2012 the subsample was two-thirds of the households. Weight and height measurements of women were not taken in the 1990 survey.

Figure 19 shows the distribution of ever-married women age 15-49 according to the four weight categories (underweight, normal, overweight, and obese). A very small percentage of ever-married women are underweight-- 2.3% in 1990 and 1.7% in 2012. The percentage of underweight ever-married women has not changed significantly between the consecutive years (see Table 7).

Of more concern, almost two thirds of the ever-married women in each of the surveys are overweight or obese. The percentage of overweight women has remained relatively unchanged at about a third of the sample except for a significant increase from 32.7% in 2002 to 36.3% in 2007 (see Table 7). Obesity, however, has increased significantly from 28.3% in 1997 to 38.9% in 2009. This period includes a significant decrease in obesity between 2002 and 2007 of 6.7 percentage points. From 2009 to 2012 the percentage of obese ever-married women did not change significantly and by 2012 38.6% of ever-married women were obese. The increasing percentage of overweight or obese women are important issues for public health since obesity is linked to various chronic diseases.

Figure 19. Percentage of ever-married women age 15-49 by weight categories

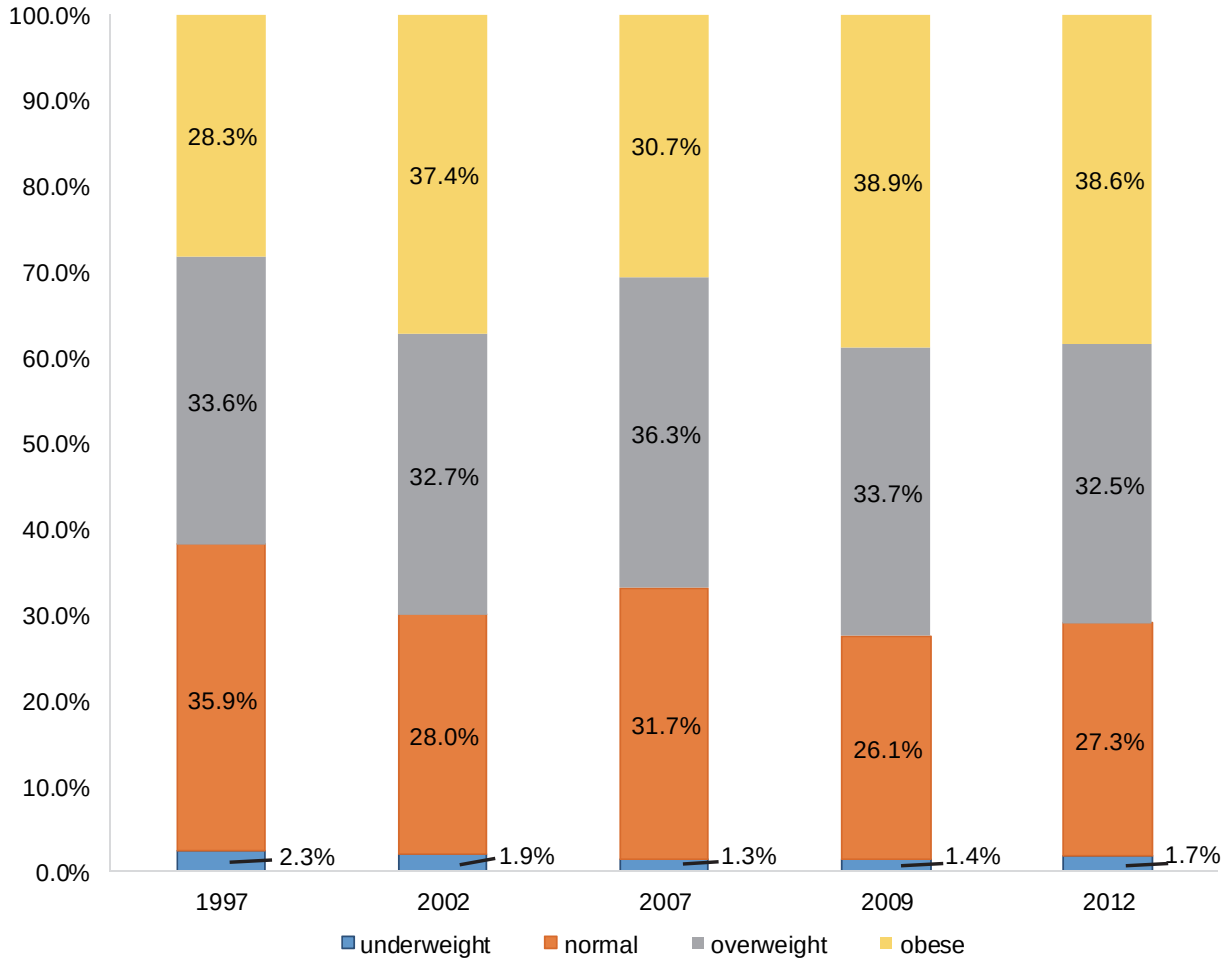


Table 7. Percentage distributions of weight categories for ever married women age 15-49, with tests of significant differences between consecutive years

	1997 % (C.I.)	2002 % (C.I.)	Diff. 2002-1997	2007 % (C.I.)	Diff. 2007-2002	2009 % (C.I.)	Diff. 2009-2007	2012 % (C.I.)	Diff. 2012-2009
Obese	28.3 (26.4-30.1)	37.4 (35.6-39.1)	9.1***	30.7 (28.4-32.9)	-6.7***	38.9 (36.5-41.3)	8.2***	38.6 (36.5-40.7)	-0.3
Overweight	33.6 (31.8-35.4)	32.7 (31.2-34.2)	-0.9	36.3 (33.9-38.6)	3.6**	33.7 (31.1-36.2)	-2.6	32.5 (30.5-34.4)	-1.2
Normal	35.9 (33.8-37.9)	28.0 (26.3-29.8)	-7.8***	31.7 (29.6-33.9)	3.7**	26.1 (23.9-28.3)	-5.6***	27.3 (25.4-29.2)	1.2
Underweight	2.3 (1.7-2.9)	1.9 (1.5-2.3)	-0.4	1.3 (0.8-1.9)	-0.5	1.4 (0.8-2.0)	0.1	1.7 (1.1-2.3)	0.3

Notes: Data not available for 1990. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

5.4. Anemia in Women

Anemia in women was derived from measurements of hemoglobin levels for a subsample of women age 15-49 in the household. In the 2002 JPFHS survey, one-fourth of all the households were chosen for hemoglobin testing (both women and children). In the 2009 JPFHS the subsample was 50% of the households, and in 2012 the subsample was two-thirds of the selected households. While women were also tested in 2007, the results were found to be unreliable and are therefore not reported. A woman with a hemoglobin level of 12 g/dl and above was considered non-anemic if she was not pregnant. If the woman was pregnant, then a hemoglobin level between 10.9-11.9 g/dl was also considered to be non-anemic. Hemoglobin measurements were only available for three survey years: 2002, 2009, and 2012.

Despite the high rates of overweight and obesity, one-third of women in 2012 were anemic. This indicates that women may not be receiving the right kind of nutrition particularly foods that increase iron intake. The percentage of women with anemia decreased from 2002 to 2009, as shown in Figure 20, but this decrease was not significant, as indicated in Table 8. Of greater concern is the significant increase of anemia in women from 25.4% in 2009 to 33.3% in 2012.

Figure 20. Percentage of all women age 15-49 with anemia

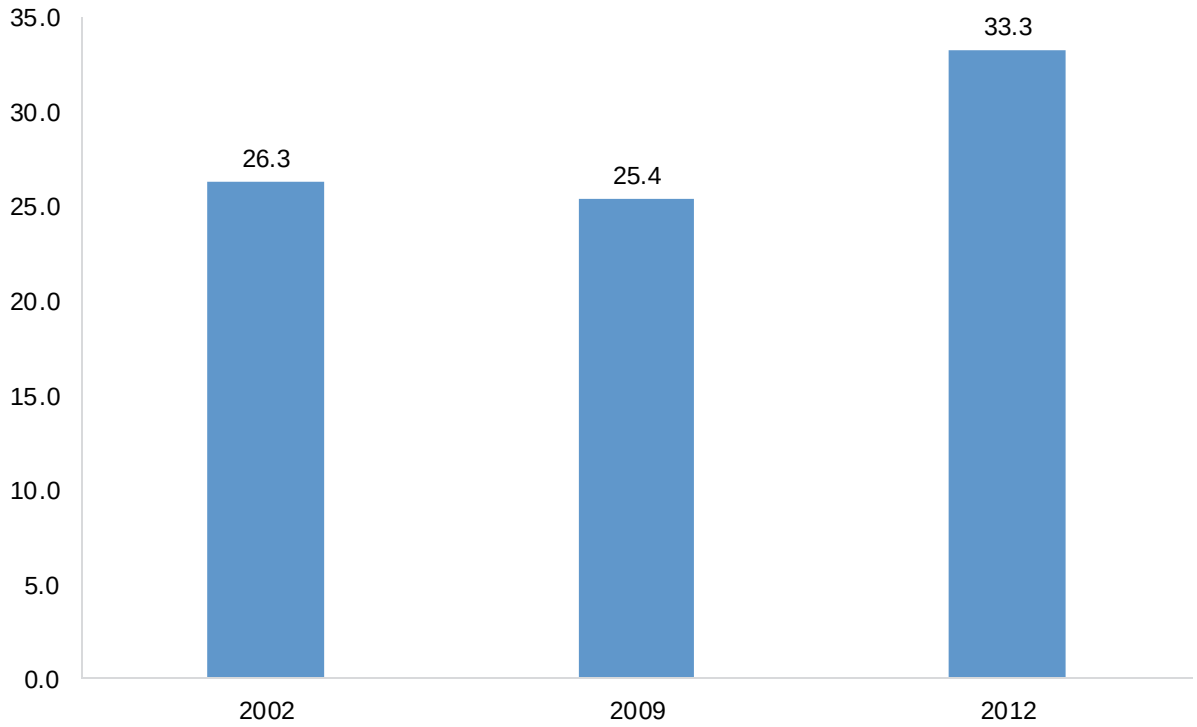


Table 8. Percentage of all women age 15-49 with anemia, with tests of significant differences between consecutive years

	2002 % (C.I.)	2009 % (C.I.)	Diff. 2009-2002	2012 % (C.I.)	Diff. 2012-2009
Women with anemia	26.3 (23.9-28.7)	25.4 (23.4-27.4)	-0.9	33.3 (31.6-34.9)	7.9***

Notes: Data not available for 1990 and 1997. In 2007 data was not reliable and are not reported. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

5.5. Premarital Health Exam

Due to the high rate of consanguinity in Jordan, premarital examinations are seen as an important requirement for marital unions mainly to allow genetic testing. Closely related parents can have an increased risk of passing on certain genetically related diseases to their children, compared with unrelated parents. Since 2004, this premarital exam has been required by law for all marriages. Data on the premarital exam were only available for the 2002, 2007 and 2012 surveys.

As can be seen in Figure 21, the percentage of ever-married women age 15-49 who have had a premarital exam increased significantly from 5.6% in 2002 to 39.8% in 2012. This percentage cannot inform us of the present situation as it asks ever-married women of all ages if they had had the premarital exam before they got married. To understand the indicator further, we can look at the percentages of women who have had the premarital exam by age groups, as shown in Figure 22. Here we can see that the percentages of those who had a premarital exam are lower in 2002 compared to the other two years for all age groups combined, but the percentages are higher in the younger age groups in each successive survey year. The highest percentages having a premarital exam was found for ever-married women less than 20 years of age. In 2007, 86.7% of ever-married women less than 20 years old had had a premarital exam; in 2012 95.7% of women in the same age group had the exam. The increase reflects the relatively recent legal requirement that this exam be given before marriage. The increases in percentages of women who have had a premarital exam for each age group across the survey years were all significant, as shown in Table 9.

Figure 21. Percentage of ever-married women age 15-49 who had a premarital exam

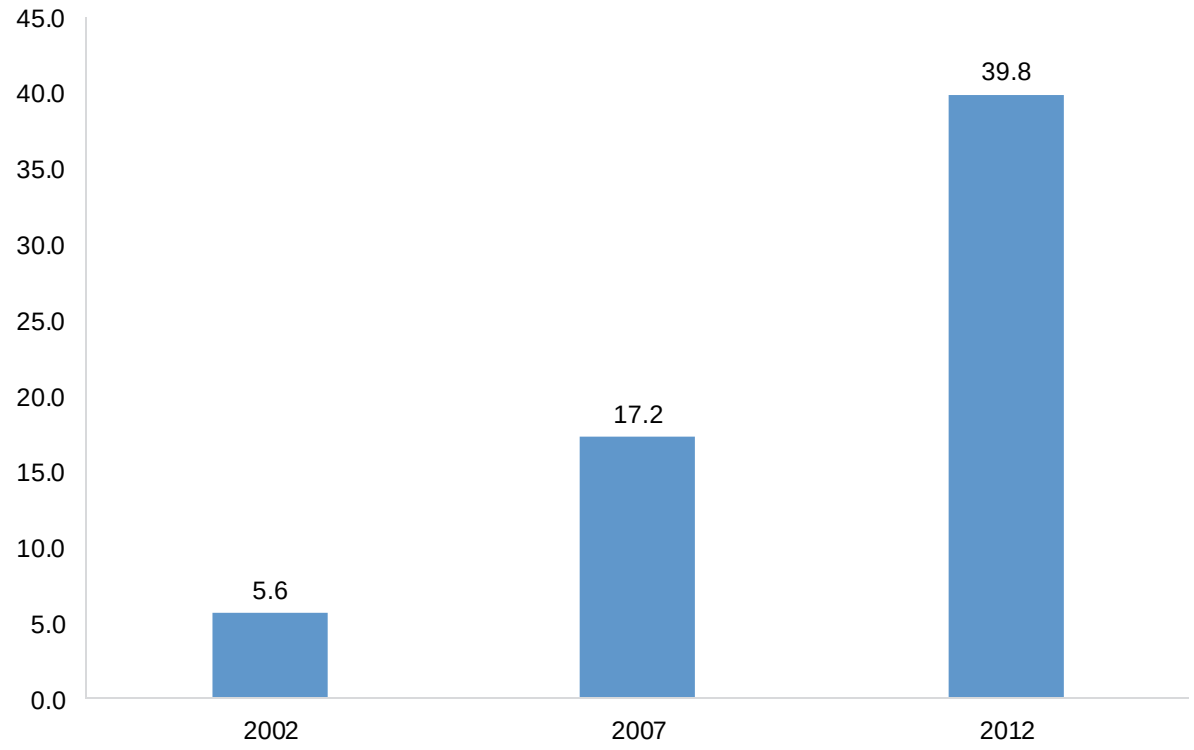
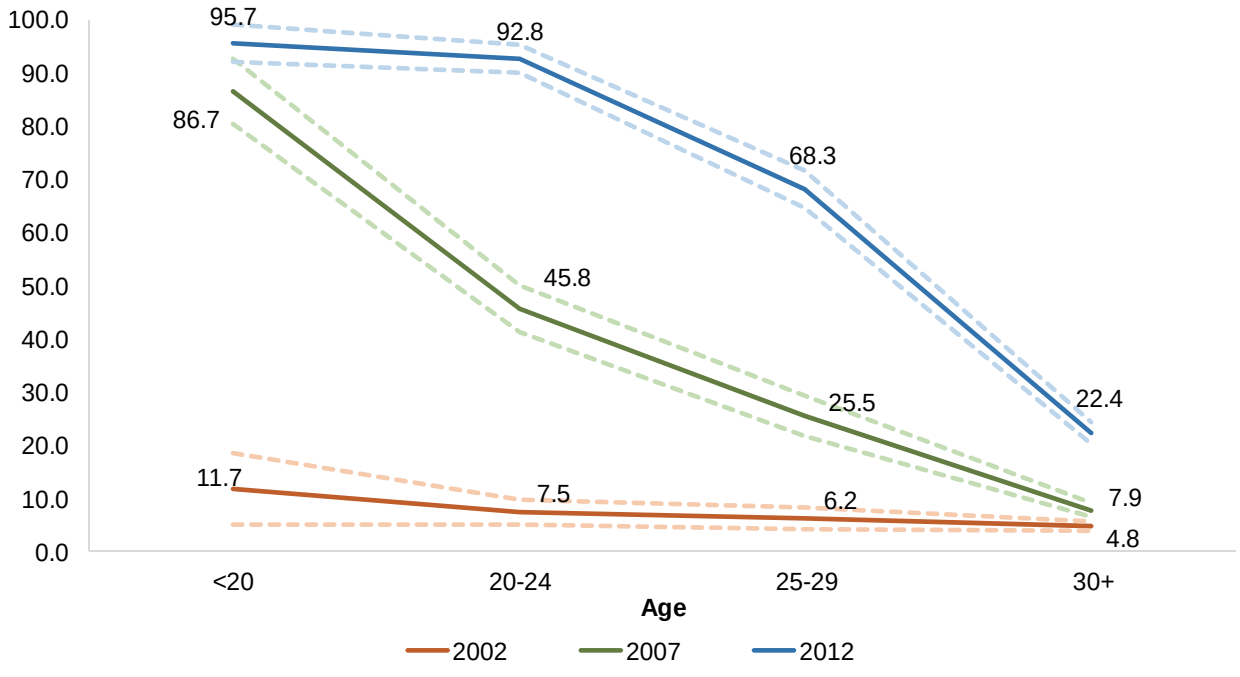


Figure 22. Percentage of ever-married women age 15-49 who had a premarital health exam, by age groups



The percentage of ever-married women who have had a premarital exam by age at first marriage was also examined. As shown in Figure 23, women whose age at first marriage was below 20 had the lowest percentages with a premarital exam in all three survey years. This early age at marriage is more likely for women who are now in the older age categories. The older the age at first marriage for women, the higher the percentage who had a premarital exam. For ever-married women whose age at first marriage was above 30 years, the percentage who had a premarital health exam was 10.1% in 2002, 28.6% in 2007, and 68.8% in 2012. The increases in these percentages for each age at first marriage group across the survey years were all significant, as shown in Table 9.

Figure 23. Percentage of ever-married women age 15-49 who have had a premarital health exam, by age at first marriage groups

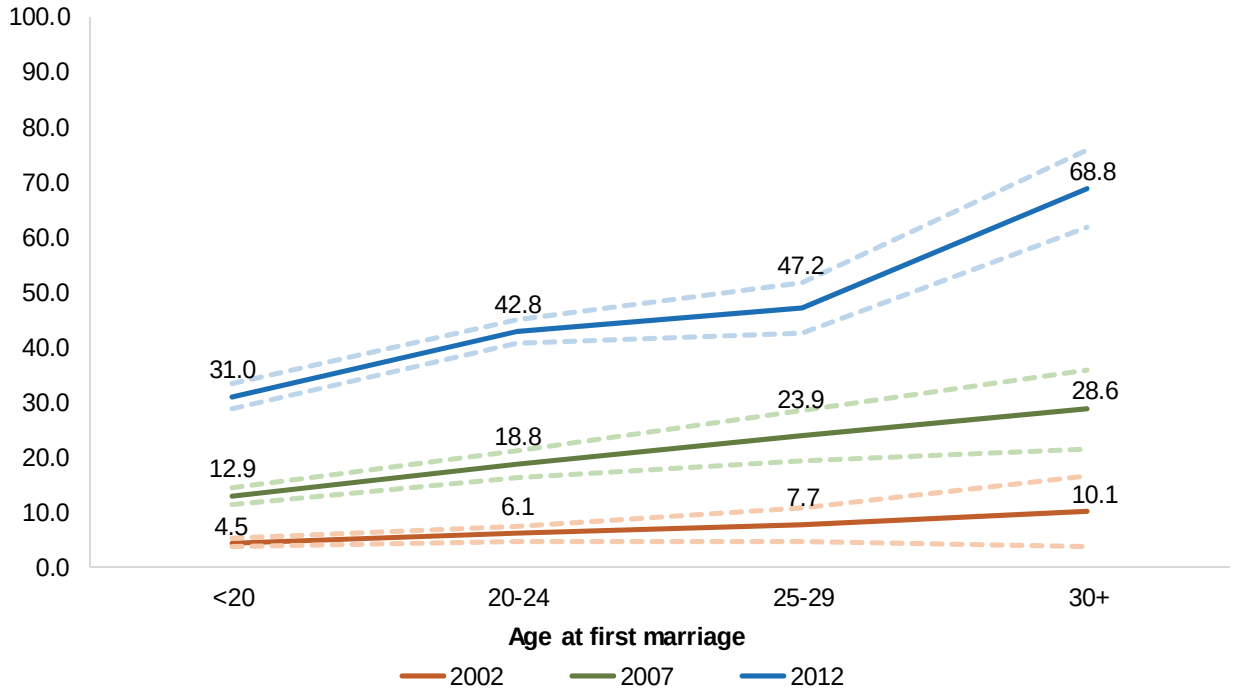


Table 9. Percentage of ever married women age 15-49 who have had a premarital exam, by current age and age at first marriage, with tests of significant differences between consecutive years

	2002 % (C.I.)	2007 % (C.I.)	Diff. 2007-2002	2012 % (C.I.)	Diff. 2012-2007
Current age					
<20 years	11.7 (5.0-18.4)	86.7 (80.4-92.9)	75.0***	95.7 (92.1-99.2)	9.0***
20-25 years	7.5 (5.2-9.8)	45.8 (41.4-50.2)	38.3***	92.8 (90.1-95.4)	47.0***
25-29 years	6.2 (4.2-8.3)	25.5 21.7-29.2)	19.2***	68.3 (64.8-71.9)	42.9***
30+ years	4.8 (4.0-5.6)	7.9 (6.4-9.3)	3.1***	22.4 (20.4-24.4)	14.5***
Age at first marriage					
<20 years	4.5 (3.6-5.3)	12.9 (11.3-14.5)	8.5***	31.0 (28.7-33.3)	18.1***
20-25 years	6.1 (4.8-7.4)	18.8 (16.4-21.2)	12.7***	42.8 (40.6-45.1)	24.0***
25-29 years	7.7 (4.7-10.6)	23.9 (19.3-28.6)	16.3***	47.2 (42.7-51.7)	23.2***
30+ years	10.1 (3.8-16.4)	28.6 (21.5-35.8)	18.5***	68.8 (61.9-75.7)	40.2***
Total	5.6 (4.9-6.3)	17.2 (15.9-18.6)	11.6***	39.8 (38.1-41.5)	22.6***

Notes: Data not available for 2009, 1997, and 1990. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.00

5.6. Smoking

Smoking tobacco is associated with many non-communicable diseases and increased risk of premature deaths. In Jordan, in addition to smoking cigarettes, the water pipe (*nargila*) is also prominent. Data on smoking tobacco was only available for the last four surveys (2002-2012).

Figure 24 shows a small but significant increase in cigarette smoking from 8.7% 2009 to 10.8% in 2012 in ever-married women age 15-49. For *nargila*, the increase was from 5.5% in 2009 to 10.3% in 2012, almost doubling and highly significant (see Table 10). Tobacco smoking, both in the form of cigarettes and *nargila*, can have very large health implications.

Figure 24. Percentage of ever-married women age 15-49 who smoke cigarettes or nargila for the survey years 2002, 2007, 2009, 2012, with 95% confidence intervals

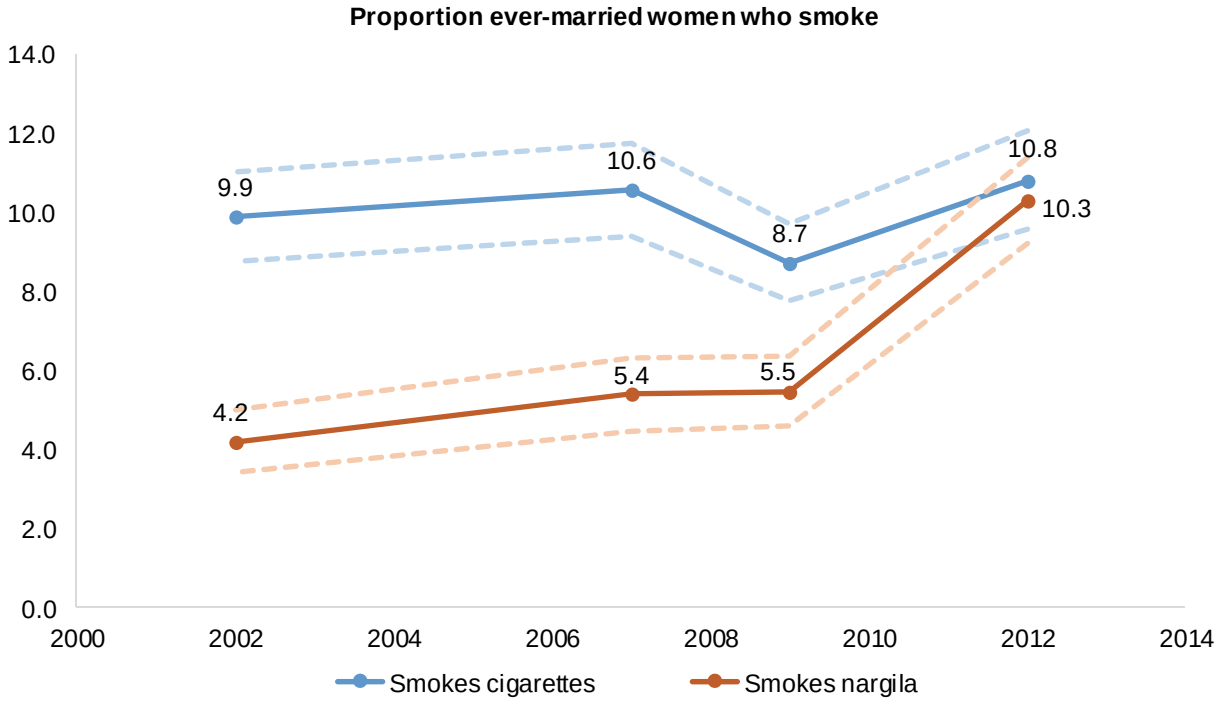


Table 10. Proportion ever-married women age 15-49 who smoke, with tests of significant differences between consecutive years

	2002 % (C.I.)	2007 % (C.I.)	Diff. 2007-2002	2009 % (C.I.)	Diff. 2009-2007	2012 % (C.I.)	Diff. 2012-2009
Smokes cigarettes	9.9 (8.8-11.0)	10.6 (9.4-11.7)	0.7	8.7 (7.7-9.7)	-1.9**	10.8 (9.5-12.0)	2.1**
Smokes nargile	4.2 (3.4-5.0)	5.4 (4.5-6.3)	1.2*	5.5 (4.6-6.3)	0.1	10.3 (9.2-11.4)	4.8***

Notes: Data not available for 1997, and 1990. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.00

5.7. Summary

Some of the maternal and adult health indicators improved across the full range of surveys. The percent of ever-married women age 15-49 with less than four ANC visits for the most recent birth has decreased significantly, and the percent of ever-married women age 15-49 who have had a premarital exam has increased significantly. However, many indicators in this chapter have not improved. The percentage of births delivered by C-section significantly increased and has been above the WHO recommendation of 15% of births since 2002. The percentage of obese ever-married women also increased and was at a high of 38.6% of ever-married women age 15-49 in 2012. There was also an increase in the percent of anemic women; in 2012 a third of all women age 15-49 were found to be anemic. Finally, smoking practices increased both in the form of cigarettes and the water pipe, with most of the increase occurring in the recent surveys.

6. Child Health

6.1. Early Childhood Mortality

Childhood mortality rates are important indicators than can be used to assess a country's socioeconomic situation and quality of life. They are also important measures of the quality of health programs in the country and are considered useful indicators for creating new polices. Figure 25 shows neonatal, postneonatal, infant, child, and under five mortality rates. In this discussion, dates such as 1990 refer to the survey years. The rates are calculated for the five years before each survey, and therefore refer to time intervals that are centered 2.5 years before the surveys.

Neonatal mortality rates, or deaths in the first month of life appear to follow a U shaped trend, decreasing until 2007 and then increasing again. However, the changes between consecutive years were not significant, as shown in Table 11. The overall decrease of neonatal mortality from 21.4 deaths per 1,000 live births in 1990 to 13.7 deaths in 2012 is highly statistically with a p-value <0.001 (results not shown in table). That is, the neonatal mortality rate decreased significantly between 1990 and 2012.

Postneonatal mortality rates, or deaths in the first year of life, but after the first month, exhibited a non-significant changes between the consecutive years from 1990 to 2009 but then decreased significantly from 7.7 deaths per 1,000 live births in 2009 to 3.5 deaths in 2012. The overall decrease from 12.4 postneonatal deaths in 1990 to 3.5 deaths in 2012 was also found to be significant.

For infant mortality rates, or deaths before the first birthday, the decrease in the rates between the consecutive years from 1997 to 2002 was significant, but the changes following 2002 were not found to be significant. Overall, the decrease from 33.8 infant deaths per 1,000 live births in 1990 to 17.2 deaths in 2012 was significant.

Child mortality rates, or deaths between the first and fifth birthday, remained unchanged between the consecutive years except for a significant decline between 2002 and 2007. Unlike the findings for the other mortality indicators, the decrease from 5.1 child deaths per 1,000 live births in 1990 to 3.8 deaths in 2012 was not significant.

Under-five mortality rates, based on deaths before the fifth birthday, combine the infant and child mortality rates. These rates significantly decreased in the periods from 1997 to 2002, 2007 to 2009, and 2009 to 2012 (see Table 11). Overall, the decrease from 38.8 under-five deaths per 1,000 live births in 1990 to 21.0 deaths in 2012 was substantial and highly significant. The decline was primarily due to reductions in infant mortality.

Figure 25. Childhood mortality rates for children exposed to the risk of mortality

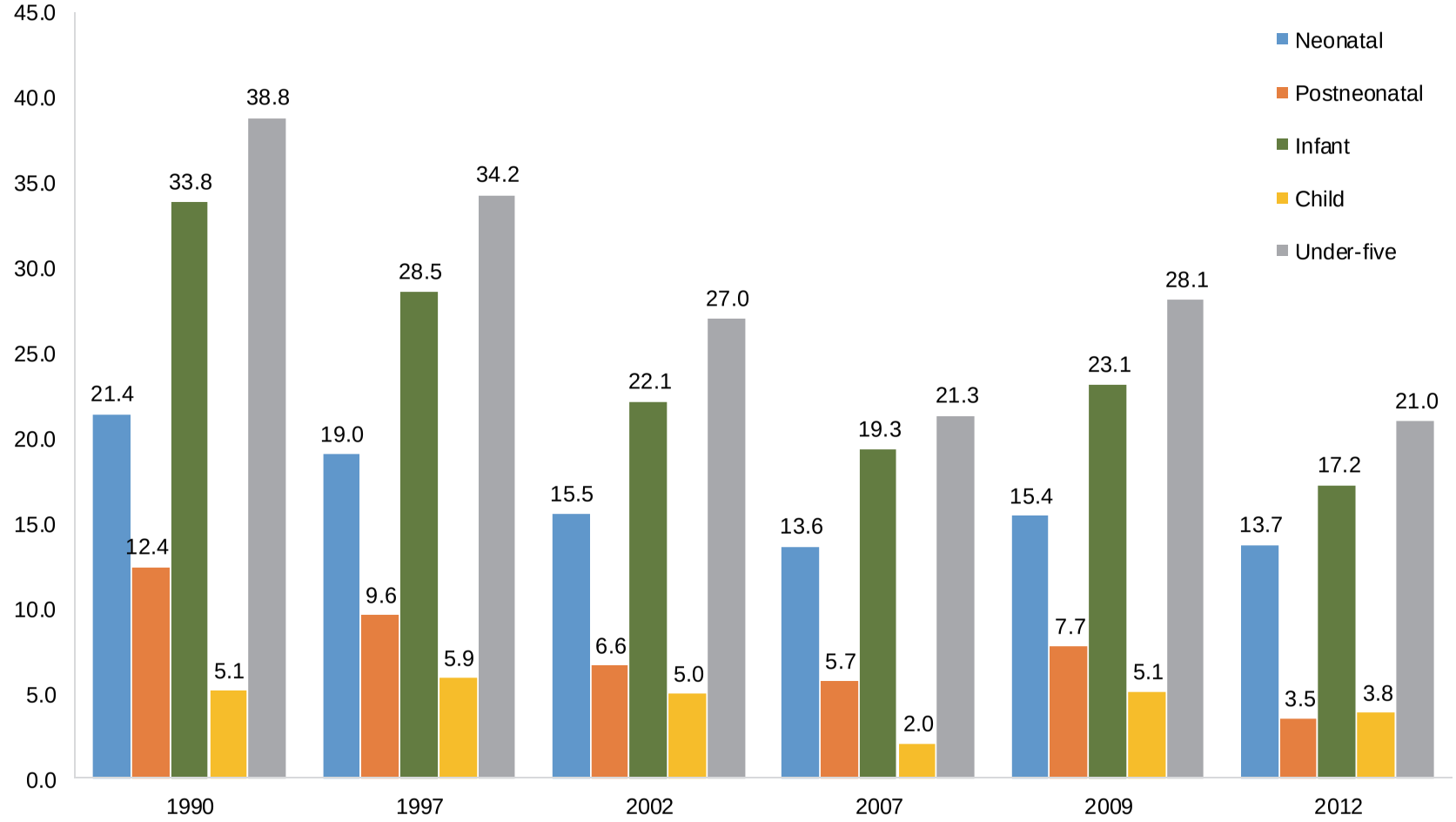


Table 11. Child mortality rate estimates with tests of significant differences between consecutive years

	1990 R (C.I.)	1997 R (C.I.)	Diff. 1997-1990	2002 R (C.I.)	Diff. 2002-1997	2007 R (C.I.)	Diff. 2007-2002	2009 R (C.I.)	Diff. 2009-2007	2012 R (C.I.)	Diff. 2012-2009
Neonatal	21.4 (16.9-25.7)	19.0 (14.8-23.2)	-2.4	15.5 (11.0-20.0)	-3.5	13.6 (9.2-18.0)	-1.9	15.4 (10.5-20.3)	1.8	13.7 (9.5-17.9)	-1.7
Postneonatal	12.4 (9.8-15.0)	9.6 (6.9-12.2)	-2.9	6.6 (4.2-9.0)	-3.0	5.7 (3.3-8.1)	-0.9	7.7 (4.9-10.6)	2.0	3.5 (1.9-5.1)	-4.2**
Infant	33.8 (29.3-38.3)	28.5 (23.6-33.5)	-5.3	22.1 (16.9-27.3)	-6.4*	19.3 (14.5-24.2)	-2.8	23.1 (17.7-28.6)	3.8	17.2 (12.4-22.0)	-5.9
Child	5.1 (3.4-6.9)	5.9 (3.8-8.0)	0.7	5.0 (3.1-6.8)	-0.9	2.0 (0.9-3.2)	-3.0**	5.1 (2.3-7.8)	3.0	3.8 (1.6-6.0)	-1.3
Under-five	38.8 (34.0-43.5)	34.2 (29.0-39.5)	-4.5	27.0 (21.2-32.7)	-7.3*	21.3 (16.2-26.4)	-5.7	28.1 (22.4-33.8)	6.8*	21.0 (15.9-26.0)	-7.1*

Notes: R represents the estimated mortality rates. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

6.2. Child Immunization

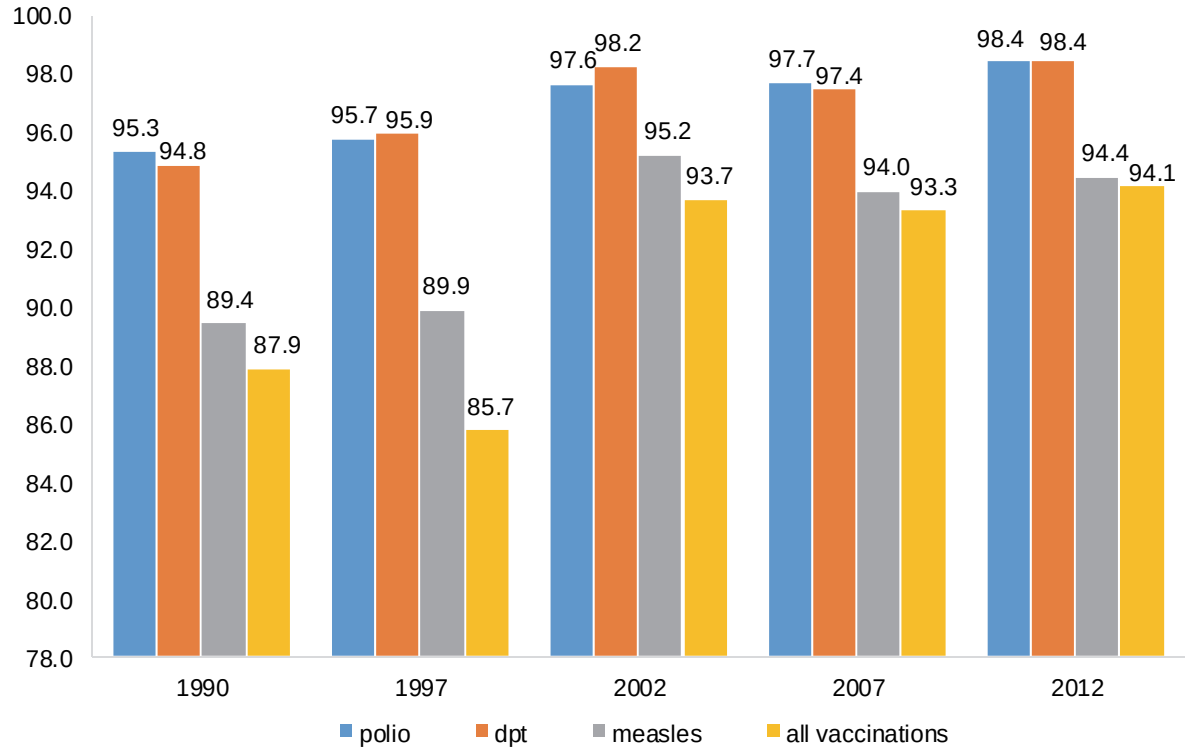
Universal immunization of children from six vaccine-preventable diseases (tuberculosis, diphtheria, whooping cough, tetanus, polio, and measles) is crucial in reducing childhood mortality. In Jordan, vaccination against tuberculosis (BCG) was not a requirement until recently. In the DHS surveys, information on child immunization is only available for surviving children of interviewed mothers. No data was collected on immunization in the 2009 survey.

Figure 26 indicates that vaccination rates of children aged 12-23 months for polio and DPT (three doses) remain in the 95-98% range. There were no significant changes in the consecutive years for these two vaccinations except for the period between 1997 and 2002 where the increase was significant (see Table 12).

For measles, the percentages were somewhat lower at 89.4% in 1990 and 89.9% in 1997. However, there was a significant increase again in the period between 1997 and 2002, which pushed the measles vaccination percentages above 90% in the remaining years.

Total vaccinations also went up significantly between 1997 and 2002 and reached 94.1% in 2012. This total does not include the BCG vaccine which is described separately in Figure 27.

Figure 26. Percent of children age 12-23 months who received vaccinations



Note: Polio and DPT (diphtheria, pertussis and tetanus) are for all 3 doses. BCG not included in total vaccinations.

BCG (tuberculosis) vaccination rates were examined separately as shown in Figure 27. The figure shows that since 2007 the BCG vaccination rates have increased markedly to above 90%. This is due to the inclusion of BCG as part of the national vaccination program after the 2002 survey. These increases have been significant across the years as shown in Table 12.

Figure 27. Percentage of children age 12-23 months who received BCG vaccinations

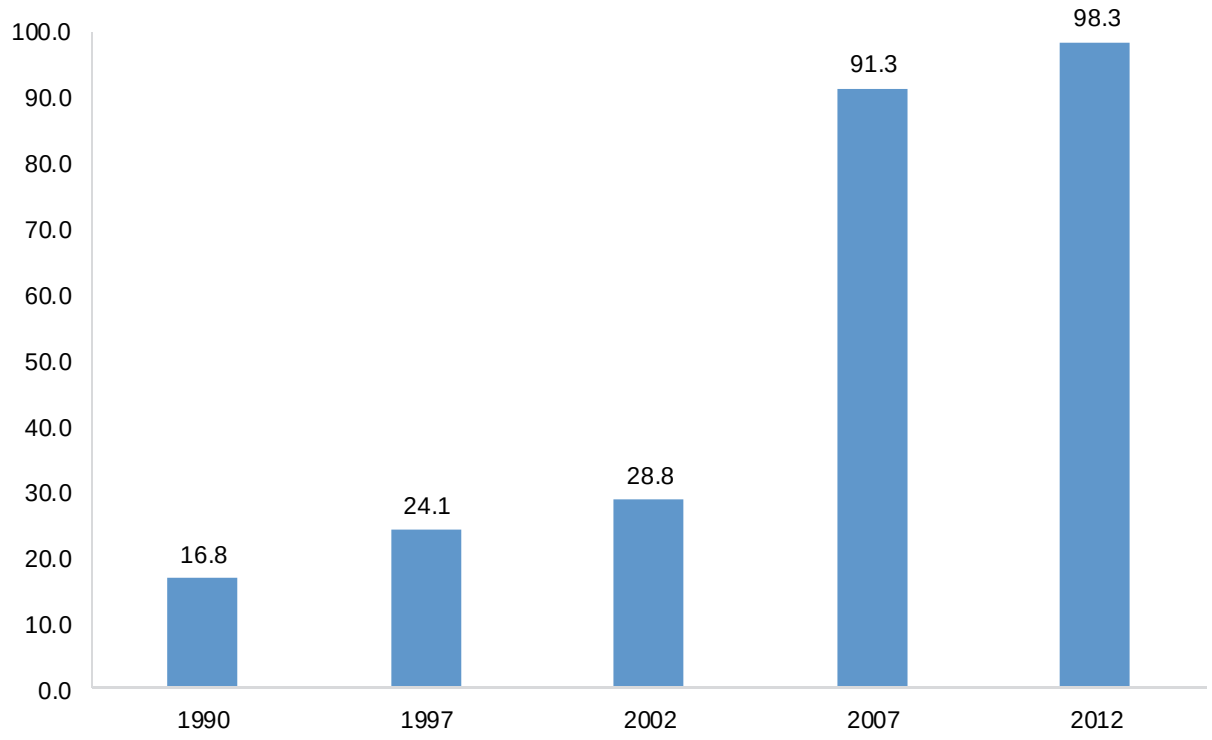


Table 12. Percent children age 12-23 months who received vaccinations, with tests of significant differences between consecutive years

	1990 % (C.I.)	1997 % (C.I.)	Diff. 1997-1990	2002 % (C.I.)	Diff. 2002-1997	2007 % (C.I.)	Diff. 2007-2002	2012 % (C.I.)	Diff. 2012-2007
Polio (3 doses)	95.3 (94.0-96.6)	95.7 (94.4-97.0)	0.4	97.6 (96.6-98.6)	1.9*	97.7 (96.6-98.7)	0.1	98.4 (97.7-99.1)	0.7
DPT (3 doses)	94.8 (93.5-96.2)	95.9 (94.6-97.2)	1.1	98.2 (97.3-99.0)	2.3**	97.4 (96.3-98.6)	-0.8	98.4 (97.7-99.1)	1.0
Measles	89.4 (87.7-91.1)	89.8 (88.1-91.6)	0.5	95.2 (93.7-96.7)	5.3***	94.0 (92.5-95.4)	-1.2	94.4 (92.6-96.3)	0.4
Received all Vaccinations (polio, DPT, measles)	87.9 (86.0-89.7)	85.7 (83.5-88.0)	-2.1	93.7 (92.0-95.3)	7.9***	93.3 (91.7-94.8)	-0.4	94.1 (92.2-96.0)	0.8
BCG	16.8 (13.8-19.7)	24.1 (20.6-27.6)	7.3***	28.8 (24.6-32.9)	4.7*	91.3 (89.5-93.1)	62.5***	98.3 (96.6-100.0)	7.0***

Notes: Data not available for 2009. Percent who received all vaccinations does not include BCG. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

6.3. Nutritional Status of Children

Children's nutritional status is an important indicator of children's overall health and well-being. Undernourished children not only have greater risk of morbidity and mortality than well-nourished children, but they can also have worse cognitive development. Height and weight measurements are used to calculate three indices of nutritional status: short height-for-age, or stunting, measures chronic malnourishment; low weight-for-height, or wasting, measures acute malnourishment; and low weight-for-age, or underweight, is a composite index of acute and chronic malnourishment. The measurements of children under five years are compared to WHO Child Growth Standards to obtain a z-score for that child. Each child found to fall below two standard deviations from the reference score (-2 SD) for each index is considered to be stunted, or wasted, or underweight. In the 1990, 1997 and 2002 surveys, the child growth standards used were based on the U. S. National Center for Health Statistics (NCHS). However, new z-scores have been calculated using the new WHO standard for children in these years. In the earlier surveys, the height and weight measurements were only taken from the children of interviewed mothers; more recently, they are taken during the household interview for all children in the household. In order to compare across the years, the three anthropometric indices have been calculated for the children of interviewed mothers using the new WHO standard.

As with the height and weight measurements of women, not all children were selected for these measurements in all the surveys. In 1997 all children of interviewed mothers were selected, and in 2002 all children in all households were selected for measurement. However, in 2009 a subsample of half of the households were selected for height and weight measurements, and in 2012, two-thirds of the households were selected. In 2007, as well, half of the households were selected for measurement, but the data collected in this survey have provided unreliable results for children's nutritional status and are therefore not reported here.

Figure 28 shows the percentage of children under 5 who are stunted, underweight, or wasted in each of the survey years except for 2007. As shown, the percentage of stunted children decreased from 19.6% in 1990 to 7.7% in 2012. However, as shown in Table 13, this decrease was only significant from 1990 to 1997 and from 2002 to 2009. In fact, from 1997 to 2002, there was a slight (but non-significant) increase. There was also a decrease in the percentage of underweight children but only up to 2009. The decrease was from 4.7% in 1990 to 1.8% in 2009, with the decline being significant in the periods between 1990-1997 and 2002-2009, as with stunting. The most recent change, from 2009 to 2012, was a significant increase in underweight, from 1.8% to 3.0%. The percentage of wasted children show a similar pattern as with underweight, with the decrease being significant in the intervals from 1990 to 1997 and 2002 to 2009 and a significant increase in the most recent surveys. The percent of wasted children decreased from 3.9% in 1990 to 1.5% in 2009, but then increased to 2.4% in 2012.

Figure 28. Percentage of measured children of interviewed mothers under 5 years who are stunted, underweight, or wasted, according to the WHO standard

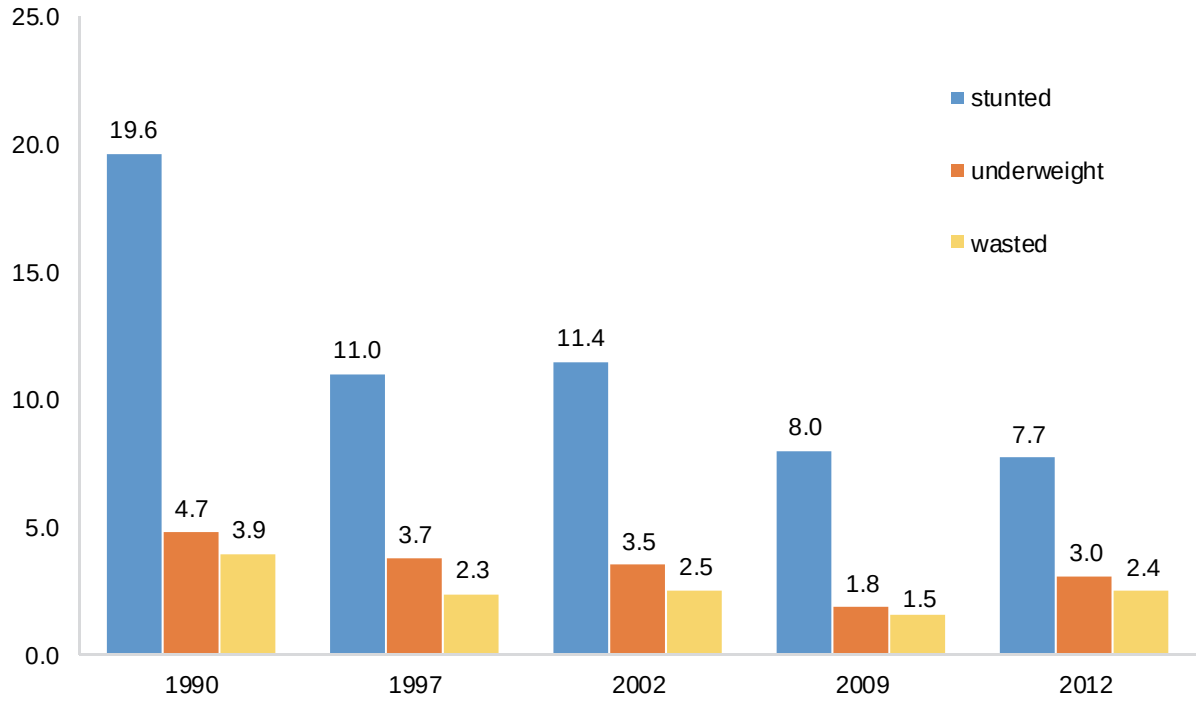


Table 13. Percentage of measured children of interviewed mothers under 5 years who are stunted, underweight, or wasted, according to the WHO standard, with tests of significant differences between consecutive years

	1990 % (C.I.)	1997 % (C.I.)	Diff. 1997-1990	2002 % (C.I.)	Diff. 2002-1997	2009 % (C.I.)	Diff. 2009-2002	2012 % (C.I.)	Diff. 2012-2009
Stunted	19.6 (18.2-21.0)	11.0 (9.9-12.0)	-8.6***	11.4 (10.3-12.6)	0.4	8.0 (6.6-9.4)	-3.5***	7.7 (6.4-8.9)	-0.3
Underweight	4.7 (4.0-5.4)	3.7 (3.2-4.3)	-1.0*	3.5 (2.9-4.1)	-0.3	1.8 (1.3-2.4)	-1.6***	3.0 (2.2-3.9)	1.2*
Wasted	3.9 (3.3-4.5)	2.3 (1.9-2.8)	-1.6***	2.5 (1.8-3.2)	0.1	1.5 (0.9-2.1)	-1.0*	2.4 (1.8-3.1)	0.9*

Notes: In 2007 data was not reliable and are not reported. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

6.4. Anemia among Children

Children under age five were tested for anemia. The children selected for testing were from the same subsamples of households used for testing women for anemia described earlier. Anemia testing was not conducted in 1990 and 1997, and in 2007 the data was not reliable and therefore are not reported. Any child found to have a hemoglobin level below 11 g/dl was considered to have anemia.

In Figure 29 there appears to be a slight decrease in the percentage of anemia in de facto children 6-59 months from 2002 to 2012. However, as shown in Table 14, this decrease was not significant and in fact the percentage of anemia has stayed stable at approximately one-third of the children aged 6-59 months in the 10-year period from 2002-2012. Rates of anemia are not decreasing. This indicates that children in Jordan are not receiving proper nutrition. This matches the finding for ever-married women.

Figure 29. Percentage of de facto children of interviewed mothers age 6-59 months with anemia

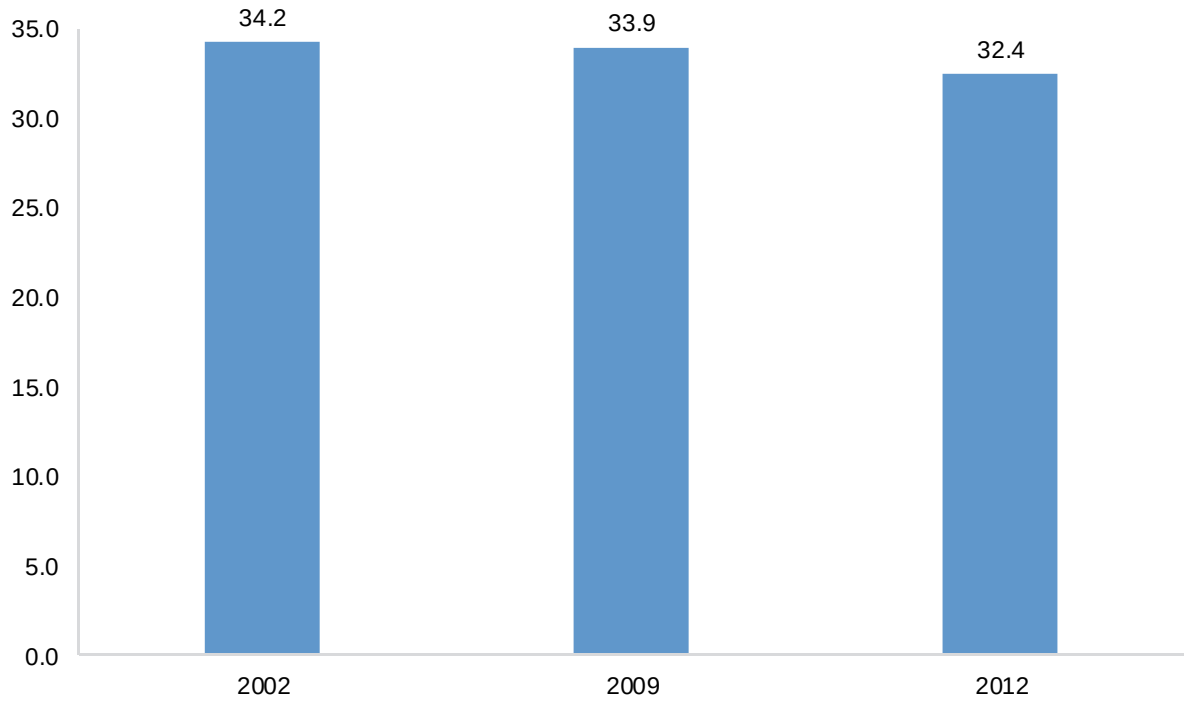


Table 14. Percentage of de facto children age 6-59 months with anemia with tests of significant differences between consecutive years

	2002 % (C.I.)	2009 % (C.I.)	Diff. 2009-2002	2012 % (C.I.)	Diff. 2012-2009
Children with anemia	34.2 (31.1-37.3)	33.9 (31.0-36.8)	-0.3	32.4 (30.0-34.8)	-1.5

Notes: Data not available for 1990 and 1997. In 2007 data was not reliable and are not reported. 95% C.I. P-values are one-tailed, * p-value <0.05, **<0.01, ***<0.001

6.5. Summary

Overall, mortality rates declined from 1990 to 2012, but there was little change from 2007 to 2012, and there is evidence of a temporary increase in the 2009 survey. There is a general improvement in the vaccination levels for children age 12-23 months, with 94.1% of children having all vaccinations in 2012. In addition, BCG was recently added as part of the Jordanian vaccination program and by 2012 98.3% of children age 12-23 months had received the BCG vaccine. The percent of children under five who are stunted, underweight, or wasted has generally decreased. However, the results show that there were slight increases in wasted and underweight children between 2009 and 2012, as well as a stalling of the decrease in stunting in this same period. Finally, anemia in children remained unchanged between 2002 and 2012, with approximately a third of children age 6-59 months found to be anemic.

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