Abortion and Contraceptive Use in Turkey

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Abstract

The abortion rate in Turkey declined from a peak of 4.5 abortions per 100 women in 1988 to 2.4 in 1998. This paper examines the extent to which the decline in abortion in Turkey can be attributed to increased use of modern contraception. Trends in abortion ratios and rates and in contraceptive use are examined among subgroups of Turkish women. The study then examines changes in the contraceptive behavior associated with abortion, changes in fertility preferences and demand for contraception, and changes in the propensity to abort unwanted pregnancies. Finally, the analysis includes a number of simulations that examine what abortion levels might be under different contraceptive use scenarios. Results indicate that the decline in abortion is associated with a decline in traditional method failure. The decline in traditional method failure is related to three factors: a shift from traditional method use to modern method use, a decline in the traditional method failure rate, and a decline in the proportion of traditional method failures that are aborted.

Introduction

The relationship between contraceptive use and abortion is a long-debated and difficult one. The difficulty of the question arises from the complex interaction of several interrelated determinants, which affect both contraceptive use and abortion. These factors range from social, cultural, religious, and economic influences, which determine ideal family size and the demand for abortion and contraception, to a totally different set of variables related to the quality of family planning services which affect use of family planning and abortion services, contraceptive discontinuation, and contraceptive failure.

The abortion rate and ratio in Turkey are relatively high but have been declining over the last decade. While overall contraceptive use has been stagnant over the same period, there has been a gradual shift from traditional contraceptive use to modern contraceptive use. The purpose of this study is to analyze the factors associated with the recent reduction in the abortion rate in Turkey, with particular emphasis on the role of increasing modern contraceptive use. The study also examines the potential contributions of other related factors, specifically changes in fertility preferences and demand for family planning, changes in contraceptive discontinuation and contraceptive failure rates, and changes in the propensity to abort unwanted pregnancies.

The study uses national data primarily from the 1993 and 1998 Turkish Demographic and Health Surveys (TDHS), supported by earlier national data from the 1978, 1983 and 1988 Turkey Population and Health Surveys (TPHS). The study begins with an analysis of recent trends in abortion and contraceptive practice. This is followed by an examination of trends in fertility preferences and demand for contraception. The next section focuses on trends in contraceptive practice prior to abortion, and contraceptive failure and discontinuation rates. The analysis

continues with an examination of the percentage of unintended pregnancies aborted according to contraceptive behavior prior to the pregnancy. The final piece of the study draws together these factors in a simulation analysis that separates the contribution of the different factors to the overall decline in abortion between 1993 and 1998.

Background

Socio-demographic and family planning context

Turkey's current population of 65 million is projected to reach 88 million by the year 2025 (Population Reference Bureau, 2000). The country is undergoing rapid urbanization, fueled by internal migration, with some cities growing at a rate of 4% per year (State Institute of Statistics, 1997). Since the 1980s Turkey has made great strides in liberalizing its economy; annual per capita income is over $3000, placing it in the class of middle-income economies. However, life expectancy still hovers around 68, which, like many other social development and health indicators, lags behind that of comparable economies (OECD, 1999).

The Turkish family planning program, initiated in 1964, is one of the oldest in the developing world. In 1983, a liberal population law was passed, helping the program to diversify and expand. The new law legalized sterilization services and authorized non-physicians to deliver family planning services. The 1983 law also legalized abortion up to 10 weeks of pregnancy. The total fertility rate has dropped from 4.3 in 1978, to 2.6 in 1998. The most rapid decline happened between 1983 and 1993, when fertility declined from 4.1 to 2.7 over the ten-year period (Hacettepe University Institute of Population Studies, 1987; Hacettepe University Institute

of Population Studies, 1989; Ministry of Health [Turkey], Hacettepe University Institute of Population Studies and Macro International Inc., 1994).

Unusually high reliance on traditional methods, particularly withdrawal, is a unique feature of the contraceptive use pattern in Turkey. In 1978, withdrawal use comprised half of all contraceptive use. In spite of a gradual shift from traditional to modern methods, withdrawal is still the most commonly used contraceptive method. In 1998, 24% of all currently married couples used withdrawal, followed by IUDs, at 20% (Hacettepe University, Institute of Population Studies and Macro International Inc., 1999).

Even before its legalization in 1983, abortion was a common practice in Turkey. Particularly before the inception of the family planning program in 1964, the lack of modern contraception resulted in widespread use of abortion. Throughout the 1960s and 1970s, when the availability of family planning services remained limited, abortion rates steadily increased. In the 1970s, it was estimated that one-third of all women had undergone at least one abortion. Once abortion was legalized in 1983, the abortion rate increased over a five-year period, and then began to decrease after 1988 (Hacettepe University Institute of Population Studies, 1987; Hacettepe University Institute of Population Studies, 1989; Ministry of Health [Turkey], Hacettepe University Institute of Population Studies and Macro International Inc., 1994).

Relationship between contraceptive use and abortion

Figure 1 shows the trends in the abortion rate and the contraceptive prevalence rate in Turkey since 1983. The initial increase in abortion in 1983-1988 following legalization was accompanied by an increase in both modern and traditional method use. However, the decline in

abortion in Turkey since 1988 is associated with an increase in modern contraceptive use accompanied by a decline in traditional method use, while overall contraceptive use has remained fairly stable.

Figure 1 here

The relationship between trends in abortion and trends in contraceptive use has been analyzed in several other countries. In some Eastern European countries, such as Hungary, increases in the availability of contraceptives in the mid-1960s led to immediate declines in abortion rates (Rolston and Eggert, 1994). However, the trends in contraceptive use and abortion have been different in other countries. For example, in Korea, the abortion rate and contraceptive prevalence rate (CPR) rose simultaneously during the 1960s, due to increasing demand for smaller families. The abortion rate then declined in the following decades, while contraceptive use among married women tripled from 24% to 77%. However, the abortion rate eventually stabilized and did not decline further, primarily due to a large percentage of women who relied on less effective traditional methods (Noble and Potts, 1996).

Trends in the United States have been similar to those in Korea and Turkey. In the United States, the legalization of abortion in 1973 led to a brief period of increase in the abortion rate. The abortion rate then began a gradual decline, accompanied by an increase in contraceptive use. This occurred as women shifted to using more effective contraceptive methods, and to using them better (Jones, 1989).

A comprehensive study in three Central Asian countries showed that increased use of family planning led to a corresponding decline in abortion rates in all three countries (Westoff et al.,

1998). In Kazakhstan, Uzbekistan, and the Kyrgyz Republic, having an abortion was associated with age, number of children, wanting no more children, and particularly with using contraception. The study also conducted a simulation analysis to estimate future abortion rates by making different assumptions about contraceptive use, propensity to abort, and contraceptive failure rates. The simulation analysis suggests that the abortion rate will be reduced by 25 to 30 percent over the next five years in these countries, based on plausible continued increases in contraceptive use and corresponding reductions in unmet need for contraception.

Another study on trends in abortion and in contraceptive use and fertility in Brazil, Columbia and Mexico provides descriptive data on relationships among these trends over time. (Singh and Sedgh, 1997) The study concludes that due to increasing demand for limiting fertility, abortion rates may continue to rise even while family planning use rises, but that they will ultimately stabilize and decline.

This brief review of the literature demonstrates that, while it seems intuitive that increases in contraceptive use lead to decreases in abortion, a clear cause and effect relationship has not been established conclusively. The problem in establishing causality stems from the fact that abortion rates and contraceptive use often rise simultaneously because they are affected by the same underlying social and demographic factors. Similarly, women who use contraception are often those who are more likely to have abortions, again due to common causality. In these situations, increases in contraceptive use may reduce reliance on abortion by keeping abortion rates stable or by preventing an even more rapid increase in abortion rates. However, such effects are difficult to demonstrate empirically, especially given the typically poor quality of data on abortion.

Data and Methods

The data used in this analysis come primarily from the 1993 and 1998 TDHS. The 1993 TDHS was conducted between August and October 1993. A nationally representative sample of 6,519 ever-married women age 15-49 was interviewed. The 1998 TDHS was conducted between August and November 1998, and covered a nationally representative sample of 8,576 women age 15-49 (including never-married women). Husbands of selected currently married women were also interviewed in half the households.

In both surveys, data on abortion were collected in the reproduction and calendar sections of the questionnaires. After the standard DHS birth history, respondents were asked a series of questions to determine how many miscarriages, induced abortions, and stillbirths they had had during their life. They were also asked additional questions on their most recent non-live birth, including the date the pregnancy ended, type of outcome (miscarriage, stillbirth, induced abortion), and the main reason for having an induced abortion if it was an induced abortion. In addition, both surveys included the DHS calendar. The calendar consists of a matrix of rows and columns and is used to record (among other things) monthly contraceptive and pregnancy histories for the five years before the survey. Each row of the calendar corresponds to a particular calendar month and the columns are used to record different types of events. The dates, durations, and outcomes of all pregnancies in the five years preceding the survey were recorded in the first column of the calendar. A distinction was made between live births, miscarriages, stillbirths, and induced abortions. In the 1993 TDHS, the abortion provider was recorded for each induced abortion in column two of the calendar. In the 1998 TDHS, the place where the induced abortion took place, rather than the provider of the abortion, was recorded in column two of the calendar. The data used in this study come primarily from the pregnancy

history collected in the calendar rather than from the general questions in the reproduction section.

Basic data on knowledge, ever use, and current use of contraception were collected in the contraception section of the questionnaires. In addition, monthly contraceptive histories for the five years preceding each survey were collected in the calendar. Monthly contraceptive status (by method) was recorded in column one of the calendar, along with the pregnancy histories. Each time a contraceptive method was discontinued, the reason for discontinuation was recorded in column two. Contraceptive discontinuation and failure rates can be calculated from these data, and contraceptive behavior preceding each recent abortion can be determined.

In addition to the data on abortion and contraceptive use, this study also uses data on fertility preferences, the wanted status of live births in the preceding five years, and on the background characteristics of women collected elsewhere in the questionnaires. The study also draws on data from the 1978, 1983, and 1988 TPHS surveys to examine long-term trends whenever possible. All three surveys covered nationally representative samples of ever-married women under age 50 and provide data on abortion and contraceptive use. However, the questions on abortion and contraceptive use were asked differently in these surveys than they were in the two DHS surveys. For example, data on abortion were collected through a complete pregnancy history. This approach provides more complete data than the DHS approach in that the pregnancy history covers the woman's entire reproductive life rather than only the five years before the survey. While the basic data on contraceptive knowledge, ever use and current use were collected in a similar way to the DHS surveys, the TPHS surveys did not include a calendar

and did not collect the five year contraceptive histories collected in the DHS surveys.[1] Since many of the analyses presented below rely on the contraceptive history data, they are restricted to the 1993 and 1998 surveys. In addition, since we did not have access to the raw data from 1978 and 1983, we had to use published figures from these surveys. We were only able to use published figures that were comparable to the figures calculated from the 1988, 1993, and 1998 surveys. We also did not have access to the raw pregnancy history data from the 1988 TPHS, so published abortion data are also used for 1988.

Data quality

Good quality data on abortion are notoriously difficult to collect. Abortions are typically under-reported because many women wish to conceal the fact that they have had an abortion either because in many countries abortions are illegal, or because of the social stigma associated with abortion in many societies. Because abortion is legal and is relatively acceptable in Turkey, the social and legal context is conducive to better quality reporting of abortion. Nevertheless, under-reporting of abortion is a concern.

Figure 2 presents estimated annual abortion ratios per 100 pregnancies and annual abortion rates per 100 ever-married women age 15-44 for 1982-1997 by source. The most striking feature of this figure is the disjuncture between the series from each source. Typically, the latest figure for a given survey is much higher than the earliest figure from the next survey, even though the two

[1] The 1988 TPHS included a partial contraceptive history for the five years before the survey, similar to the one used in DHS-I surveys. Specifically, structured questions were used to determine the last contraceptive method used in each pregnancy interval in the preceding five years, length of use of that method, and the reason for discontinuation (including failure). However, these data were not used in this analysis because they were collected in a different way to the way they were collected in 1993 and 1998. Studies have shown that the calendar approach provides data of much higher quality than the structured

figures are only a year apart. For example, the abortion ratio for 1992 estimated from the 1993 TDHS is 17.8 compared to 13.4 for 1994 estimated from the 1998 TDHS. In addition, the abortion ratios and rates from a given survey tend to increase closer to the survey date. These patterns suggest omission of abortions further back in time, or possibly misplacement of abortions in time to a date closer to the survey than they actually occurred. Therefore, it appears that the quality of the data deteriorates the further back from the survey one goes. Given these patterns, we decided to restrict most of the following analyses to three years before each survey. This analysis period provides sufficient cases for detailed analysis, while excluding the most suspect data from four and five years before the survey.[2] For some analyses, the three months immediately before the survey are excluded to allow for under-reporting of first trimester pregnancies and censoring of the outcome of recent pregnancies.[3] In a few tables a one- or five-year analysis period is used instead of a three-year period because it was more appropriate in that specific case.

Figure 2 here.

Data on contraceptive use are generally much more reliable than data on abortion. Reporting of traditional method use can be sensitive to the way questions are asked but since virtually the same question format was used in all the surveys used in this analysis, and since withdrawal is a widely recognized and widely used method in Turkey, the reporting of traditional method use should be reasonably good in these surveys. A lot of the data on contraceptive use used in this

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questions used in the 1988 TPHS (Goldman, Moreno, and Westoff, 1989; Westoff, Goldman, and Moreno, 1990).

[2] Several of the tables were run for both three- and five-year analysis periods and the general results were found to be robust to the choice of analysis period.

[3] Most abortions in Turkey occur in the first ten weeks of pregnancy when they are still legal. Therefore, most pregnancies that occurred more than three months before the survey will have been aborted by the time of the survey if an induced abortion is the outcome.

analysis are obtained from the calendar. The calendar requires women to recall detailed information on their contraceptive behavior for a five-year period and relies heavily on the ability of respondents to recall these events. Several analyses of the quality of DHS calendar data on contraceptive use suggest that these data are of reasonably good quality in terms of completeness and internal consistency (Goldman, Moreno, and Westoff, 1989; Westoff, Goldman, and Moreno, 1990; Curtis and Blanc, 1997). The main problem identified lies in the reliability of reporting of the main reason for contraceptive discontinuation (Curtis and Blanc, 1997; Strickler et al., 1997). In addition, Strickler et al. (1997) found considerable unreliability in the reporting of individual women's contraceptive histories in Morocco, particularly for complex histories, although aggregate level indicators were generally robust to this unreliability.

A previous analysis of the quality of the 1993 TDHS calendar data on contraceptive use found some evidence of under-reporting of condom use and traditional methods other than withdrawal in the earliest part of the calendar, but found no other serious data quality problems (Enünlü and Doğan, 1996). One area of concern, however, is that there has been an increase in the amount of missing information on reason for discontinuation in the 1998 TDHS compared to the 1993 TDHS. In the 1993 TDHS, 6% of completed episodes of contraceptive use in the calendar had a missing reason for discontinuation (Ministry of Health [Turkey], Hacettepe University Institute of Population Studies, and Macro International Inc., 1993). This figure increased to 13% in the 1998 TDHS (Hacettepe University Institute of Population Studies and Macro International Inc., 1999).

Results

Abortion Trends

Table 1 shows trends in the abortion ratio per 100 pregnancies and per 100 live births, and in the abortion rate per 100 ever-married women age 15-49 for the period 1982-1998. The abortion rate and ratio sharply increased between 1983 and 1988, following the legalization of abortion in 1983. Since 1988, the abortion rate and ratio have been declining slowly but steadily.

Table 1: Trends in abortion rates and ratios

Number of abortions per 100 pregnancies, per 100 ever-married women age 15-49, and per 100 live births in the year before the survey and standard errors). Turkey, 1982-1998.

	Abortions		
Year & Source	Per 100 pregnancies	Per 100 women	Per 100 live births
1983 TPHS[1]	12.1 (na)	2.8 (na)	15.4 (na)
1988 TPHS[1]	23.6 (na)	4.5 (na)	35.1 (na)
1993 TDHS	18.0 (1.3)	3.1 (0.2)	26.0 (2.3)
1998 TDHS	15.7 (1.4)	2.5 (0.2)	20.9 (2.3)

na – not available.

[1] Published figures. *Sources*: Hacettepe University Institute of Population Studies, 1987; Hacettepe University Institute of Population Studies, 1989.

Figure 3 shows trends in the age-specific abortion rates and ratios for 1988-1998. The abortion rate has declined in all age groups except for the youngest (15-19) and the oldest (45-49), while the abortion ratio has declined among women age 20-39. The declines are most pronounced in the peak reproductive ages of 25-39. Since the majority of unwanted pregnancies occur in these peak reproductive years, a decline in the abortion rates at these ages leads to a substantial drop in the total number of abortions. Between 1993 and 1998, the Total Abortion Rate, which represents the number of abortions a woman is expected to have during her life given current age-specific abortion rates, declined from 0.74 to 0.59 (significant at the 10% level).

Figure 3 here

The abortion ratio has increased slightly at the extremes of the age distribution while the abortion rate has remained fairly constant in these age groups. This pattern suggests that women over 40 and, to a lesser extent, women under 20 are less likely to get pregnant but are more likely to have an abortion if a pregnancy occurs.

Table 2 shows trends in abortion rates and ratios between 1983 and 1998 by selected background characteristics. The western portion of the country is considerably more developed than the east. In general, the declines in abortion are most pronounced among women living in more developed areas (urban, west, central) and among more educated women, especially between 1993 and 1998. The abortion rate and ratio have not changed much between 1993 and 1998 among rural women, among women in the southern region, and among the least educated women. In the east the abortion rate and ratio dropped sharply in 1993, followed by a slight increase in 1998. In 1993, health care services were largely interrupted in the area due to political unrest, which may have led to impaired access to services.

Table 2: Trends in abortion rates and ratios by background characteristics

Number of abortions per 100 pregnancies and per 100 ever-married women age 15-49 for the three years before the survey, by area of residence, region, and education. Turkey, 1982-1998.

	Abortions							
	Per 100 pregnancies				Per 100 ever-married women (15-49)			
Characteristic	1983[1]	1988[1]	1993	1998	1983[1]	1988[1]	1993	1998
Residence								
Urban	18.1	28.6	21.3	16.8	3.7	5.3	3.6	2.5
Rural	7.0	17.4	12.4	12.2	1.8	3.4	2.2	2.2
Region								
West	19.2	28.5	25.7	18.5	3.4	4.7	3.8	2.5
South	9.6	13.8	15.5	15.1	2.4	3.1	2.5	2.4
Central	12.1	31.4	19.7	16.6	2.8	5.6	3.3	2.6
North	13.2	18.0	17.9	17.0	3.0	2.8	3.3	2.7
East	5.3	18.2	7.7	8.7	1.6	4.6	1.7	2.1
Education								
None/Some primary	na	na	13.6	13.2	na	na	2.3	2.1
Primary/ Some. secondary	na	na	13.6	13.2	na	na	2.3	2.1
Secondary +	na	na	23.1	16.4	na	na	3.9	2.3
Total	12.1	23.6	18.0	15.2	2.8	4.5	3.1	2.4

[1] based on published figures for one year before the survey. *Sources:* Hacettepe University Institute of Population Studies, 1987; Hacettepe University Institute of Population Studies, 1989.

Na – not available

Trends in contraceptive use

Figure 4 here

Figure 4 presents the percentage of currently married women age 15-49 currently using contraception for the period 1978-1998. Overall contraceptive use among married women has increased sharply from 38% to 63% between 1978 and 1988. Since 1988, total contraceptive use has leveled off at around 63%. In the period 1988-1998, there has been a significant shift away from traditional methods in favor of modern methods. The use of traditional methods has declined significantly, while use of modern methods has continued to increase. Despite the decline in use of traditional methods, withdrawal remains the most commonly used contraceptive method, used by almost one-fourth of all couples in 1998 (data not shown). Between 1988 and 1998, use of intrauterine devices and sterilization has increased steadily. Pill and condom use have not changed much, however.

Figure 5 shows trends in modern and traditional method contraceptive prevalence among married women by age. Modern contraceptive use has increased in all age groups since 1988, with the most pronounced increases occurring among women age 30-44 and 15-19. At the same time, traditional method use has decreased in all age groups except for the youngest age group, with the most pronounced decreases among women age 25-44. Overall contraceptive use has increased only in the oldest (40-49) and youngest groups (15-19), and there has been a slight (but statistically insignificant) decrease in contraceptive use among women age 25-34. These findings suggest that the recent shift from traditional methods to modern methods seen in Figure 4 is most pronounced in the peak reproductive age groups. The decline in abortions is also most pronounced in these same age groups (Figure 3).

Figure 5 here

Table 3: Trends in contraceptive use by background characteristics

Percentage of currently married women age 15-49 currently using a method of contraception, by area of residence, region, education, and type of method. Turkey, 1988-1998.

	Year and Source								
	TPHS-88			TDHS-93			TDHS-98		
Character-istic	Mod-ern	Trad-itional[a]	Total	Mod-ern	Trad-itional[a]	Total	Mod-ern	Trad-itional[a]	Total
Residence									
Urban	36.0	33.2	69.2	38.9	27.3	66.2	40.8	25.9	66.7
Rural	24.6	31.1	55.8	26.8	29.3	56.1	31.4	26.7	58.1
Region									
West	34.9	34.9	69.7	37.3	34.2	71.5	40.5	30.0	70.5
South	28.0	24.7	52.7	36.7	26.0	62.8	35.1	25.3	60.3
Central	33.3	34.9	68.2	36.6	26.1	62.7	42.8	25.5	68.3
North	25.4	39.1	64.5	29.8	34.4	64.2	35.2	31.8	67.0
East	26.1	24.8	50.8	26.3	16.0	42.3	26.7	15.3	42.0
Education									
None/some primary	22.8	30.5	53.2	25.6	24.8	50.4	27.9	22.4	50.4
Primary/ some sec.	34.1	33.9	68.0	35.9	31.5	67.4	38.6	28.5	67.1
secondary+	46.7	31.1	77.7	49.7	23.3	73.0	52.7	22.5	75.3
Total	31.1	32.3	63.4	34.5	28.1	62.6	37.7	26.1	63.9

[a] traditional methods includes folkloric methods.

Table 3 shows trends in contraceptive prevalence among married women by selected background characteristics. Modern method use has increased and traditional method use has decreased between 1988 and 1998 in all subgroups of women (except women in the south, among whom traditional method use has remained fairly constant while modern method use has increased). Overall contraceptive prevalence has increased modestly among rural women and among women in the south and north, but has stayed fairly constant or has decreased slightly among other women. In particular, contraceptive use has declined in the east of Turkey, particularly between 1988 and 1993 due primarily to a decline in traditional method use accompanied by virtually no increase in use of modern methods. The declines in abortion were most pronounced among women in urban areas, women in the west and central regions, and among the most educated women, but in general these subgroups do not stand out as exhibiting trends in contraceptive use that are markedly different from those of other women. However, the overall level of contraceptive use is somewhat higher in these groups than in other subgroups.

Table 4. Trends in fertility preferences by background characteristics.

Percentage of currently married women age 15-49 who want no more children, and who want to wait at least two years until their next child by background characteristics. Turkey 1988, 1993, and 1998.

	Year and Source					
	TPHS-88		TDHS-93		TDHS-98	
Characteristic	% want no more	% want >2 years	% want no more	% want >2 years	% want no more	% want >2 years
Age						
15-19	14.7	NA	15.1	50.2	15.1	47.3
20-24	39.9	NA	34.6	40.3	32.3	41.3
25-29	65.3	NA	64.9	18.0	56.8	19.7
30-34	83.8	NA	83.6	4.6	77.8	5.4
35-39	85.8	NA	89.7	1.6	87.8	0.4
40-44	76.7	NA	89.2	0.3	86.7	0.2
45-49	47.6	NA	79.7	0.0	75.4	0.1
Residence						
Urban	65.4	NA	68.8	14.4	65.8	13.8
Rural	64.9	NA	71.6	13.0	67.5	13.4
Region						
West	65.4	NA	70.6	13.1	65.2	13.4
South	60.7	NA	68.5	13.9	63.9	12.9
Central	67.2	NA	71.5	13.1	69.7	14.3
North	63.6	NA	67.8	15.4	69.8	9.9
East	66.4	NA	68.1	15.6	64.5	15.8
Education						
None/Some primary	69.0	NA	78.5	6.8	74.5	6.4
Primary/Some secondary	64.2	NA	66.5	16.6	64.9	15.2
Secondary+	55.3	NA	61.6	20.1	57.2	20.7
Total	65.2	NA	69.8	13.9	66.3	13.6

NA – Not available

Fertility preferences and unmet need for contraception

While it is clear that trends in abortion in Turkey are linked to trends in contraceptive use, the exact dynamic of this link is less clear. The first step in examining the link in more detail is to examine fertility preferences and unmet need for contraception. Changes in fertility preferences will affect both abortion and contraceptive behavior. For example, shifts toward more pronatalist fertility preferences could lead to declines in unmet need for contraception which in turn could lead to reductions in abortion if contraceptive use is maintained at previous levels.

Table 4 examines recent trends in preferences for spacing and limiting births among married women by background characteristics. There was an increase in the percentage of married women reporting that they want no more children between 1988 and 1993, but between 1993 and 1998, the percentage of married women who want no more children has declined. Although these changes are relatively small they are statistically significant. In contrast, there has been no change in the percentage of married women reporting that they want to wait more than two years until their next child. There has been no change in fertility preferences among the youngest married women (15-19) but among married women age 20-34 there has been a consistent decline in the percentage who want no more children, accompanied by only a very small (and insignificant) increase in the percentage who want to wait at least two years until their next birth. Because both age at first marriage and age at first birth have been increasing in Turkey (Hacetteppe University Institute of Population Studies and Macro International Inc., 1999), it is possible that the recent declines in the proportion of younger women who want no more children are associated with delays in marriage and childbearing that have resulted in a shift in the age at which women reach their ideal family size. Very few women over age 35 want to space births. The percentage of these women wanting to stop childbearing has decreased slightly between

1993 and 1998 after increasing substantially between 1988 and 1993. Trends in fertility preferences by the other background characteristics largely reflect the trends seen among all married women, although the percentage of married women wishing to space births has declined in the north.

How do these patterns affect unmet need and demand for contraception? Table 5 presents differentials in unmet need and demand for family planning among currently married women age 15-49 for 1993 and 1998.[4] In general, unmet need and demand for contraception have not changed substantially in any subgroup between 1993 and 1998. There is some evidence of decreased demand for contraception among women age 25-39, consistent with the patterns seen for fertility preferences in Table 4, and some evidence of increased demand among women age 15-19 and 40-44. This demand has been met by increased modern method use in these age groups, as indicated by the increase in met need, so unmet need has remained stable or declined slightly.

The fact that unmet need has not changed substantially is consistent with the fact that much of the recent change in contraceptive use has been a shift from traditional to modern methods rather than an increase in overall contraceptive use, and with the relatively small changes in fertility preferences discussed above. Because both traditional and modern method use are met need, a shift from traditional to modern method use is not reflected in unmet need and demand figures. This means that very little of the recent decline in abortion in Turkey is likely to be linked to declines in unmet need for contraception associated with changes in fertility preferences.

[4] Unmet need cannot be calculated in a comparable way for 1988 because some of the necessary data were not collected. The DHS-III definition of unmet need is used here (Westoff and Bankole, 1995) so the unmet need figures for 1993 do not match exactly those published in the 1993 TDHS report, which were based on an earlier definition.

Table 5: Differentials in trends in unmet need and demand for family planning

Percentage of currently married women with unmet need, met need, and total demand for family planning by age, place and region of residence and education. Turkey 1993 and 1998.

	Year and Source					
	TDHS-93			TDHS-98		
Background characteristics	Unmet need	Met need	Total demand	Unmet need	Met need	Total demand
Age						
15-19	20.2	24.1	46.5	20.0	33.6	57.7
20-24	16.4	51.1	70.6	16.0	52.9	72.5
25-29	10.5	68.0	82.0	10.5	67.0	79.8
30-34	10.3	76.5	88.4	9.6	74.3	85.3
35-39	9.2	76.8	86.7	6.6	76.3	83.5
40-44	10.8	61.0	71.9	7.2	70.0	77.4
45-49	5.3	41.7	47.0	7.3	41.4	48.8
Residence						
Urban	8.9	66.2	76.9	8.5	66.7	76.7
Rural	15.3	56.1	73.1	13.5	58.1	73.5
Region						
West	5.4	71.5	78.1	5.7	70.5	77.4
South	9.8	62.8	74.6	10.0	60.3	72.2
Central	9.9	62.7	74.5	9.2	68.3	79.0
North	9.9	64.2	76.6	8.4	67.0	77.3
East	27.5	42.3	71.8	23.8	42.0	68.1
Education						
None/Some primary	18.8	50.4	70.9	15.7	50.4	67.0
Primary/Some secondary	8.1	67.5	77.2	8.7	67.1	77.7
Secondary+	4.9	73.0	80.3	6.1	75.3	82.9
Total	11.2	62.6	75.5	10.1	63.9	75.6

Contraceptive behavior prior to abortion

The next stage of the analysis examines contraceptive behavior prior to abortion in order to gain a more complete understanding of the dynamics of contraceptive use that result in abortion, and to determine whether these dynamics have changed recently. Since the analyses in this section rely on the contraceptive histories collected in the DHS calendar, they are restricted to 1993 and 1998.

Table 6 presents the distribution of abortions in the three years before each survey by the most recent contraceptive behavior in the pregnancy interval preceding the abortion[5]. The majority of abortions are preceded by contraceptive use. In 1998, 46% of all recent abortions were preceded by use of a traditional contraceptive method, particularly the withdrawal method. An additional 32% of abortions were preceded by the use of a modern contraceptive.

[5] Contraceptive behavior is defined for each pregnancy interval prior to an abortion based on the last contraceptive event recorded for that pregnancy interval in the calendar. For example, if a woman did not use any contraception in the pregnancy interval prior to the abortion, the abortion will be classified as associated with non-use, even if the woman had used contraception in an earlier pregnancy interval. Similarly, if a woman used a modern method, switched to a traditional method, and then discontinued the traditional method during the pregnancy interval, the resulting abortion will be classified as associated with a traditional method discontinuation. A contraceptive discontinuation is defined as a contraceptive failure if the woman reported that she became pregnant while using the method. For some abortions, the pregnancy preceding the abortion occurred before the start of the calendar. For these abortions, if there is no contraceptive use between the start of the calendar and the aborted pregnancy, contraceptive behavior is uncertain because we do not know whether or not there was any contraceptive use between the last pregnancy and the start of the calendar.

Table 6: Distribution of abortions by contraceptive behavior prior to the abortion

Percentage distribution of abortions in the three years before the survey by most recent contraceptive behavior in the pregnancy interval preceding the abortion. Turkey 1993 and 1998.

	Year	
Contraceptive behavior	1993	1998
Modern method failure	16.0	15.2
Traditional method failure	46.2	36.1
Modern method discontinuation	15.2	16.8
Traditional method discontinuation	4.3	9.8
No method used	13.1	17.5
Uncertain	5.2	4.5
Total	100.0	100.0
Number of abortions	567	426

There has been a decline in the proportion of abortions due to contraceptive failure. This decline is particularly notable for abortions resulting from traditional method failures. In 1993, traditional method failure accounted for 46% of all abortions. In 1998 this figure decreased to 36%. The proportion of abortions resulting from modern method failures decreased slightly from 16% to 15%. Modern method failure has remained relatively low due to the prominent use of the IUD. There has been little change in the proportion of abortions resulting from modern method discontinuation and a modest increase in the proportion resulting from traditional method discontinuation and from non-use.

Figure 6 here

Figure 6 shows the abortion rate per 100 ever-married women for the three years prior to the survey broken down by contraceptive behavior prior to the abortion. The abortion rate associated with traditional method failure decreased between 1993 and 1998, while the abortion rate associated with traditional method discontinuation increased slightly. Abortion rates associated with other types of contraceptive behavior show little change, except for a small decline in the abortion rate associated with modern method failure. Thus is appears that most of the recent decline in the abortion rate is related to a decline in abortion associated with traditional method failures. The decline in abortions associated with traditional method failures could be due to the shift from traditional methods to more effective modern methods described above, since this shift will lead to fewer women exposed to the risk of traditional method failure, which in turn will lead to fewer traditional method failures and fewer abortions.

Another possible explanation for the decline in abortions associated with traditional method failures is that traditional method failure rates may themselves have declined. Table 7 presents

trends in contraceptive failure rates between 1993 and 1998.[6] Between 1993 and 1998, both modern and traditional failure rates decreased. While the decline in the traditional method failure rate is significant, the decline in the modern method failure rate is not. Thus it appears that at least part of the decline in abortions associated with traditional method failures is due to a decline in traditional method failure rates. The decline in traditional method failure rates may reflect improved use of traditional methods among users, but it could also reflect selective switching to modern methods if traditional method users who are most at risk of a contraceptive failure (e.g., younger women, women who have previously experienced a contraceptive failure) are the ones who are most likely to switch to modern methods. In this case, the increase in use of modern methods associated with the shift from traditional methods could also be contributing to the decline in traditional method failure rates.[7]

[6] The failure rates are calculated using multiple decrement life table methods and are based on episodes of contraceptive use obtained from the calendar. For the rate for all methods, an episode of contraceptive use is defined as a period of continuous use of any contraceptive method. For the failure rate for modern methods, an episode of use is defined as a period of continuous use of any modern method (including sterilization). For the failure rate for traditional methods, an episode of use is defined as a period of continuous use of any traditional method.

[7] Data quality could be another factor in the observed decline in traditional method failure rates. As mentioned in the section on data quality above, there was an increase between 1993 and 1998 in the percentage of discontinuations for which the reason for discontinuation was missing. If some of these missing reasons for discontinuation are actually contraceptive failures, the traditional method failure rate will be under-estimated (and the discontinuation rate for other reasons over-estimated). While this is likely to be true in some cases, we do not think that the under-estimate of the failure rate is sufficient to account for much of the decline in the failure rate.

Table 7: Trends in contraceptive failure rates

12-month net failure rates and standard errors for modern and traditional contraceptive methods. Turkey 1993 and 1998.

Year and method	12-month failure rate	Standard error	No. of episodes
Modern methods			
1993	5.2	0.9	2,484
1998	4.2	0.9	2,303
Traditional methods			
1993	15.9	0.9	2,369
1998	11.8	1.0	2,171
All methods			
1993	10.4	0.6	3,939
1998	8.2	0.6	3,665

Propensity to abort unwanted pregnancies

A final possible explanation for the recent decline in abortion is that women are becoming less likely to abort an unwanted pregnancy when it occurs, particularly if the pregnancy was a traditional method failure. Table 8 presents recent trends in the percentage of unwanted /mistimed pregnancies that were aborted between 1993 and 1998.[8]

Table 8. Percentage of unwanted/mistimed pregnancies aborted

Percentage of unwanted/mistimed pregnancies in the three years before the survey that were aborted (and standard errors) by contraceptive behavior prior to the pregnancy. Turkey, 1993 and 1998.

	Year			
	1993		1998	
Contraceptive behavior	%	Number	%	Number
Modern failure	48.6	183	38.1	161
Traditional failure	45.9	525	35.2	382
Modern discontinuation	87.9	13	66.8	52
Traditional discontinuation	58.9	30	49.4	69
No method	33.9	488	34.5	361
Total[1]	42.3	1,240	38.0	1,029

[1] Includes a few pregnancies that were preceded by non-use that extends back to the start of the calendar. It is not known whether there was any contraceptive use in the pregnancy interval prior to the start of the calendar and therefore we cannot be sure whether the pregnancy followed a contraceptive discontinuation or period of non-use.

[8] Unwanted/mistimed pregnancies are defined as all live births that were reported as wanted later or not wanted in the health section of the DHS, plus all induced abortions. The DHS did not collect information on the wanted status of spontaneous abortions and stillbirths, so we assume that these birth were wanted. In addition, the reporting of the wanted status of live births is subject to post-event rationalization that increases with the time since the birth (Westoff and Bankole, 1998), so the number of unwanted/mistimed live births is likely to be underestimated.

Between 1993 and 1998, the propensity to abort unintended pregnancies declined for all categories of contraceptive behavior, except for non-use. The decline in the propensity to abort unwanted pregnancies does not seem to be stronger for traditional method failures than for unwanted pregnancies resulting from contraceptive discontinuation or modern method failure.

Simulations

The analysis so far suggests that the recent decline in abortion is primarily associated with a decline in abortions associated with traditional method failures. The decline in abortions associated with traditional method failures in turn seems to be associated with a decline in traditional method use as women switch to modern methods, a decline in traditional method failure rates, and a decline in the proportion of women who experience a traditional method failure who elect to have an abortion. The final stage of the analysis investigates the relative contribution of these factors to the decline in abortion between 1993 and 1998 through a series of simple simulations.

The simulations essentially use a direct standardization approach. The observed distribution of ever-married women age 15-49 by exposure status, the observed pregnancy/failure rate in each exposure group, and the observed proportion of pregnancies aborted in each exposure group are used to estimate an abortion rate among ever-married women for 1993 and 1998. The 1998 method mix, traditional method failure rates, and traditional method abortion ratios are then applied in turn to the 1993 data to estimate what the abortion rate would have been in 1998 if (1) only the method mix had changed, (2) only the traditional method failure rates had changed, and (3) only the traditional method abortion ratios had changed. The effect of changing all of these factors is then examined. Further details are given in the Appendix.

Figure 7 here

Figure 7 summarizes the results of the simulations. The simulated abortion rate per 100 ever-married women in 1993 is 2.95 while the simulated abortion rate for 1998 is 2.26.[9] If only the method mix is changed from the 1993 mix to the 1998 mix (i.e. same overall level of use, but a greater proportion of modern method use), the simulated abortion rate declines from 2.95 to 2.85. This decline represents 14.4% of the total simulated change between 1993 and 1998. If only the traditional method failure rate is changed from 1993 to 1998 levels, the simulated abortion rate declines from 2.95 to 2.67. This represents 40.6% of the total simulated change between 1993 and 1998. If only the abortion ratios among traditional method users are changed from 1993 to 1998 levels, the simulated abortion rate changes from 2.95 to 2.61, representing 49.3% of the total simulated change. If both the abortion ratios and the failure rates among traditional method users are changed from 1993 to 1998 levels, the simulated abortion rate declines from 2.95 to 2.40 (79.7% of the simulated change). Finally, if the method mix, traditional method failure rates, and the traditional method abortion ratios are all changed from 1993 to 1998 levels, the abortion rate declines from 2.95 to 2.35. This decline represents 87.0% of the total simulated change between 1993 and 1998. The remainder of the decline in abortion can be attributed to a decline in the propensity to abort modern method failures and a slight decline in modern method failure rates, offset to some extent by a slight increase in the propensity to abort pregnancies among non-users.

[9] The simulated abortion rates among ever-married women are slightly lower than the observed rates for three years before the surveys in Table 2 (3.1 for 1993 and 2.4 for 1998). These small differences are due to rounding errors and other small differences in the way that the figures were calculated and are not significant.

Discussion and Conclusions

Analysis of Findings

This paper demonstrates that the recent decline in abortion in Turkey has been accompanied by an increase in modern contraceptive use, and by a corresponding decrease in traditional method use, while overall contraceptive use has remained fairly stable. The shift from traditional to modern methods has been most pronounced in the peak reproductive ages (25-39), where the decline in abortion also has been most pronounced.

A more detailed analysis reveals that the decline in abortion is largely associated with a decline in traditional method failure. The decline in abortion associated with traditional method failure in turn is associated with three factors: a shift from traditional method use to modern method use, a significant decline in the traditional method failure rate, and a decline in the proportion of traditional method failures that are aborted. A simulation analysis showed that the most important of these three factors is the decline in the propensity to abort traditional method failures, followed closely by the decline in the traditional method failure rate. The shift in the method mix toward modern methods also contributed to the decline but to a lesser extent. These three factors together accounted for 87% of the decline in the abortion rate among ever-married women between 1993 and 1998. The remainder of the decline is associated with a decline in the propensity to abort modern method failures and a slight decline in the modern method failure rate.

The study did not analyze the reasons for the decline in the traditional method failure rate or the decline in the propensity to abort traditional method failures. It is possible that use of traditional methods has improved among all (or most) traditional method users. Another possible

explanation is that the traditional method users who are most at risk of experiencing a failure are the ones who are most likely to switch to using modern methods (e.g., younger women and those who have experienced a contraceptive failure). The decline in the propensity to abort traditional method failures could be part of a general move away from abortion among contraceptive users, but could also be related to trends in contraceptive method choice and failure. For example, the women who are most highly motivated to avoid an unintended pregnancy could be the ones who are most likely to switch from traditional to modern methods. In this case, the propensity to abort a traditional method failure could also decline, since the women who have continued using traditional methods may be less motivated to abort an unintended pregnancy if it occurs. Therefore, while the direct contribution of the increased use of modern contraceptive methods to the decline in abortion is modest according to the simulations, it may contribute indirectly to both the decline in the traditional method failure rate and to the decline in the propensity to abort traditional method failures. A more detailed analysis of the dynamics of the shift from traditional to modern contraceptive use might illuminate this issue further, but is unfortunately beyond the scope of this paper.

Programmatic Implications

The analysis conducted in Turkey is an interesting addition to the broader literature on the relationship between contraceptive use and abortion. In many countries studied previously, such as those in Eastern Europe and the former Soviet Republics, contraception has replaced abortion as contraceptive methods have become more widely available. In contrast, Latin American countries have undergone rapid increases in demand for fertility regulation, leading to simultaneous increases in both abortion and contraceptive use. The trend in Turkey represents another situation, where, after initial increases in the use of both abortion and contraception, both demand for contraception and overall use of contraception remained fairly constant for many

years. However, marked reductions in abortion have been achieved in Turkey through improved contraceptive use rather than increased contraceptive use.

Throughout the 1990s, the Turkish national reproductive health program focused on improving clients' use of contraceptives by improving the training of providers, the knowledge of clients, and the overall quality of services. This was accomplished with the support of several international agencies. Particular emphasis has been placed on the provision of family planning counseling and services to clients who have undergone abortions (Senlet et al, 2000). These efforts may be related to the improved use of family planning methods and the subsequent reduction in abortion. Programs providing quality family planning services improve clients' correct use of contraceptive methods, encourage continuity of method use, and promote informed choice of the most appropriate method for the client. Continued improvements in the quality of family planning services have the potential to improve method use and consequently to further reduce abortion rates.

The findings presented here have important program implications for the delivery of family planning services in Turkey. This analysis demonstrates that shifts in the method mix toward more effective methods and more effective use of methods has considerable potential to reduce abortion levels, even in the absence of increased use. Given the relatively low level of unmet need for family planning (around 10%) and the relatively low abortion rate associated with non-use of contraception (0.4), efforts to improve the existing use of contraception rather than increase the overall use of contraception are likely to be most effective in reducing abortion. Traditional methods still account for 41% of all contraceptive use and 46% of abortions are preceded either by traditional method failure or discontinuation of a traditional method.

Therefore, abortion could be reduced further through additional shifts toward more effective modern methods and through more effective use of traditional methods.

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Appendix

Simulated abortion rates for 1993 and 1998.

Table A1 shows the raw data on which the simulations presented in Figure 7 are based. Three exposure groups are defined: modern method users, traditional method users, and non-users.[10] For each exposure group, the proportion of the population of ever-married women age 15-49 in the exposure group is multiplied by the pregnancy rate (per woman) for that group and the proportion of pregnancies aborted to get the number of abortions per woman in that exposure group. These numbers are then summed across all exposure groups and multiplied by 100 to get the simulated abortion rate per 100 ever-married women for 1993 and 1998.

[10] We experimented with a more detailed classification of exposure among non-users but found that the simpler definition required fewer assumptions in calculating the pregnancy and abortion ratios, which in turn resulted in simulated abortion rates that were close to those observed. In addition, the more complex definition of exposure was not necessary for the simulations we wished to do.

Table A1. Distribution of ever-married women age 15-49, annual pregnancy rate, and percentage of pregnancies aborted by exposure group, TDHS 1993 and 1998.

	1993				1998			
Exposure status	% women	Preg. Rate (%)	% aborted	Abortion rate	% women	Preg. Rate (%)	% aborted	Abortion rate
Modern user	33.2	3.3	48.6	0.54	36.1	2.8	38.1	0.39
Traditional user	27.0	11.7	45.9	1.45	25.0	9.5	35.2	0.84
Non-user[1]	39.8	28.4	8.5	0.96	38.9	28.2	9.4	1.03
Total	100.0			2.95	100.0			2.26

[1] Includes pregnant women.

The pregnancy/failure rates are Pearl pregnancy rates among users of modern methods, users of traditional methods, and non-users. For example, for modern method users, the number of modern method failures in the period 3-35 months before the survey is divided by the number of months of modern method use in the same period to get a monthly failure rate. The monthly failure rate is then multiplied by 1200 to get the annual failure rate per 100 women.

The percentage of pregnancies aborted is the percentage of pregnancies that occurred in the period 3-35 months before the survey that were aborted for each exposure group. For modern method users, this is the percentage of modern method failures in the period that were aborted, and similarly for traditional method users. For non-users, this is the percentage of all pregnancies in the period that were not contraceptive failures that were aborted.

To estimate the effect of changes in the contraceptive method mix, changes in traditional method failure rates, and changes in the propensity to abort traditional method failures, the simulated abortion rates are recalculated changing each of these factors from 1993 levels to 1998 levels in turn. When simulating the effect of changing the method mix, the overall level of contraceptive use is held at 1993 levels, but the distribution of use across modern and traditional methods is changed to that observed in 1998. The effect of the slight increase in overall contraceptive use between 1993 and 1998 is not included in these simulations. Table A2 summarizes the simulations.

Table A2. Summary of simulations

Simulation	Description
1. Effect of changing method mix	1998 method mix, 1993 distribution of non-users (i.e % modern users = 35.5, % traditional users = 24.6, % non-users = 39.8; 1993 pregnancy rates and abortion ratios.
2. Effect of changing traditional method failure rate	1998 traditional method failure rate; 1993 distribution of women, modern method failure rate, pregnancy rate among non-users, and abortion ratios.
3. Effect of changing propensity to abort traditional method failures	1998 abortion ratio for traditional method users; 1993 distribution of women, pregnancy/failure rates, and abortion ratios for modern method users and non-users.
4. Effect of changing propensity to abort traditional method failures and traditional method failure rate.	1998 abortion ratio for traditional method users and traditional method failure rate; 1993 distribution of women, modern method failure rate, pregnancy rate for non-users, and abortion ratios for modern method users and non-users.
5. Effect of changing method mix, propensity to abort traditional method failures, and traditional method failure rate.	1998 method mix, abortion ratio for traditional method users and traditional method failure rate; 1993 distribution of non-users, modern method failure rate, pregnancy rate for non-users, and abortion ratios for modern method users and non-users.

Figure1. Trends in abortion rates and contraceptive prevalence 1983-1998

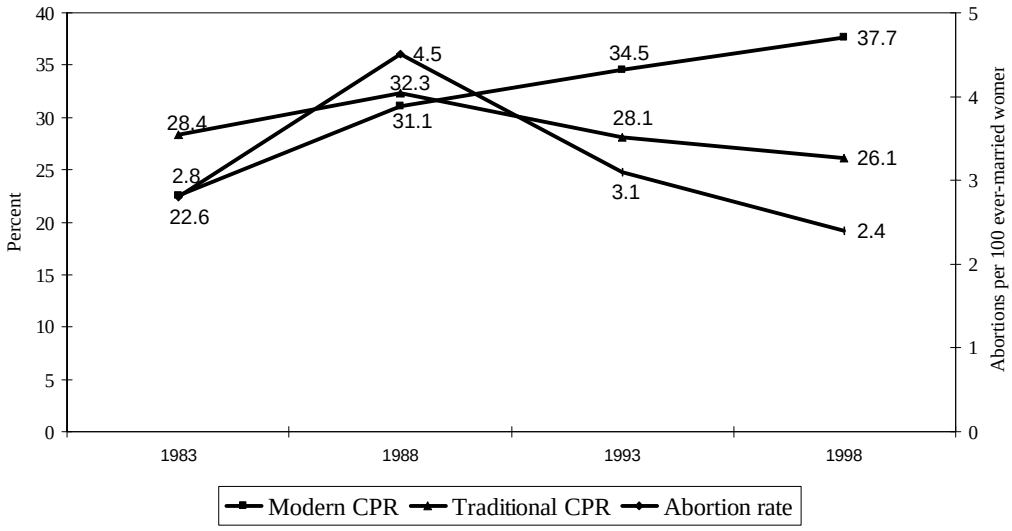
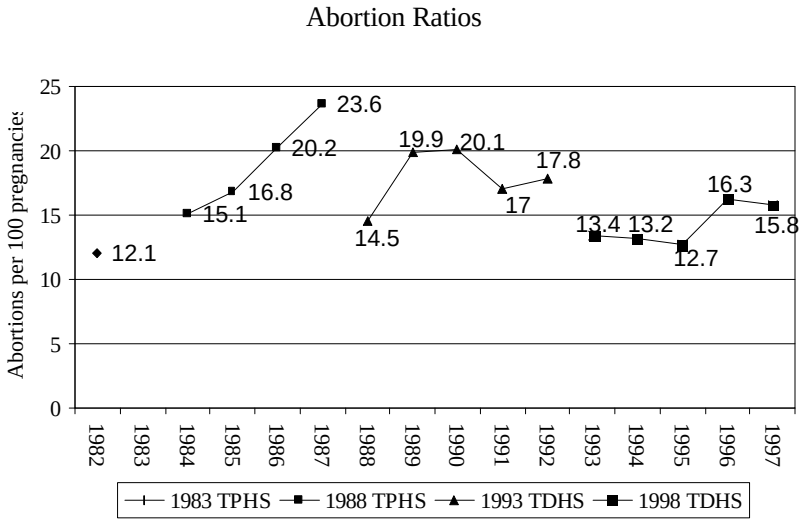
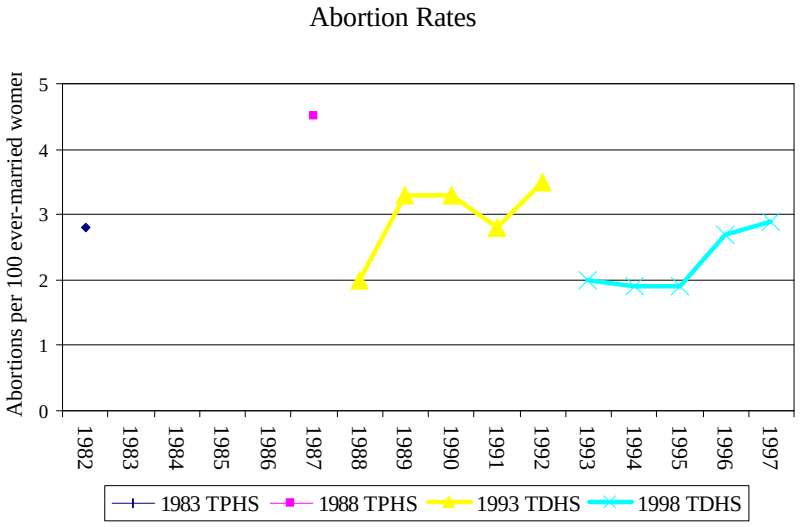


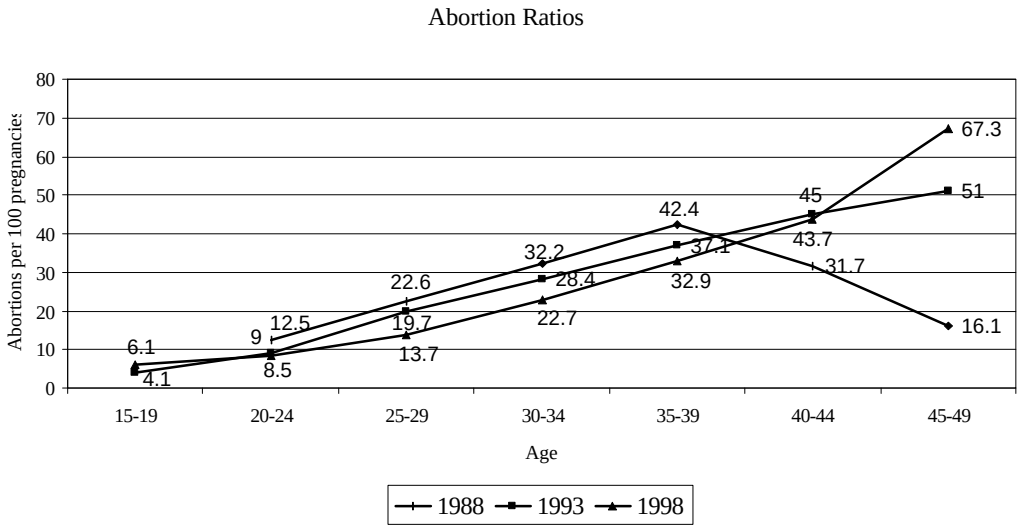
Figure 2. Annual abortion rates and ratios for 1982-1997 by source.

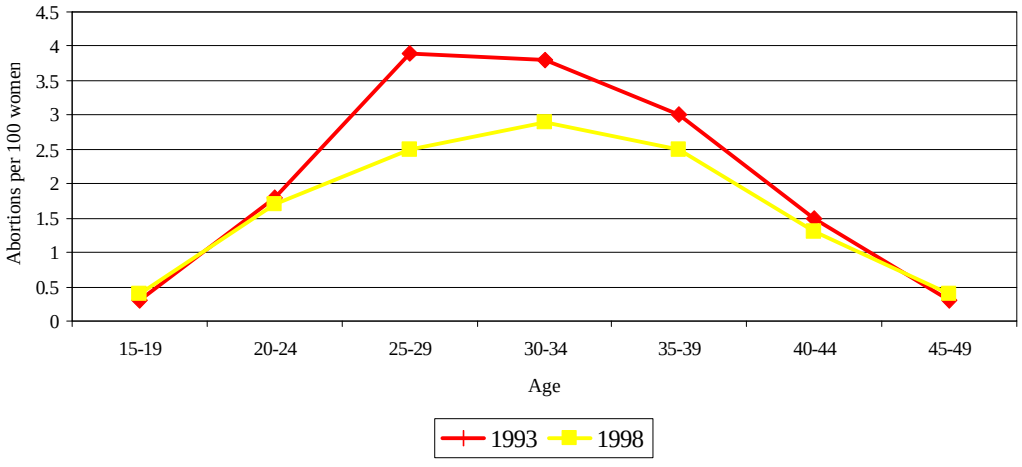




Source for 1983 and 1988 TPHS: Hacettepe University Institute of Population Studies, 1989.

Figure 3. Trends in age-specific abortion rates and ratios

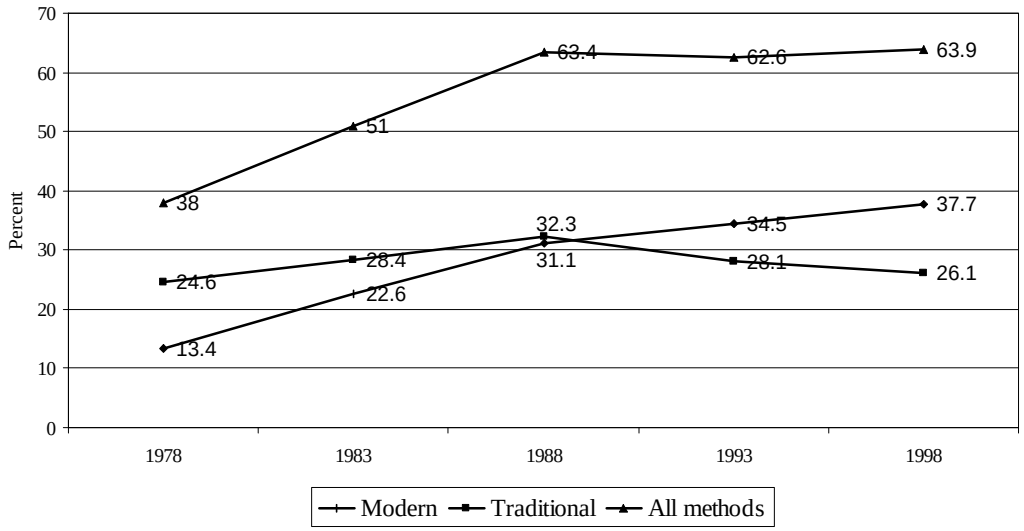




Notes: abortion rates and ratios are calculated for three years before each survey, except for 1988, where published data based on a one-year period prior to the survey are used. Source: Hacettepe University Institute of Population Studies, 1989.

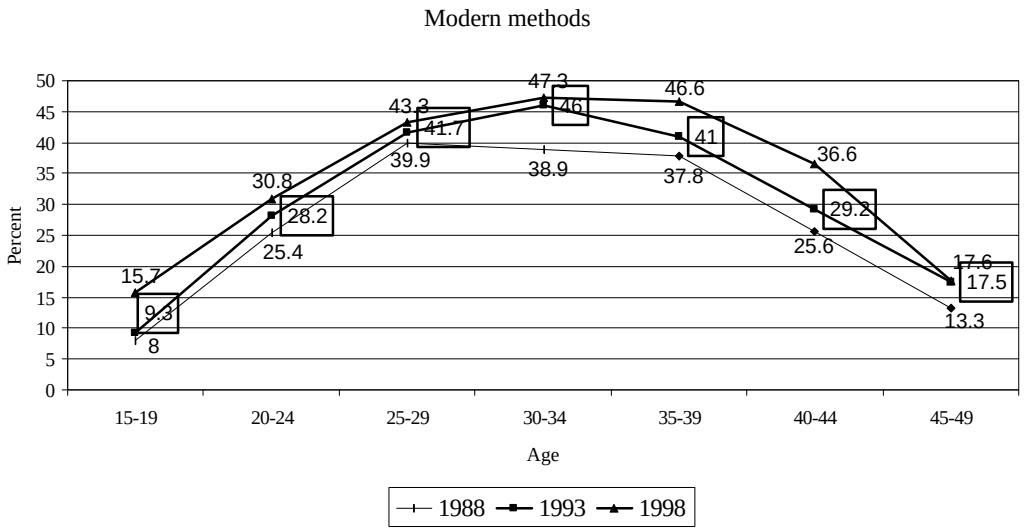
The abortion rates refer to all women age 15-49. Data for all women were not available for 1988.

Figure 4. Contraceptive prevalence among married women, 1978-1998



Source for 1978-1983: Hancioglu, 1997.

Figure 5. Contraceptive prevalence among married women by age, 1988-1998



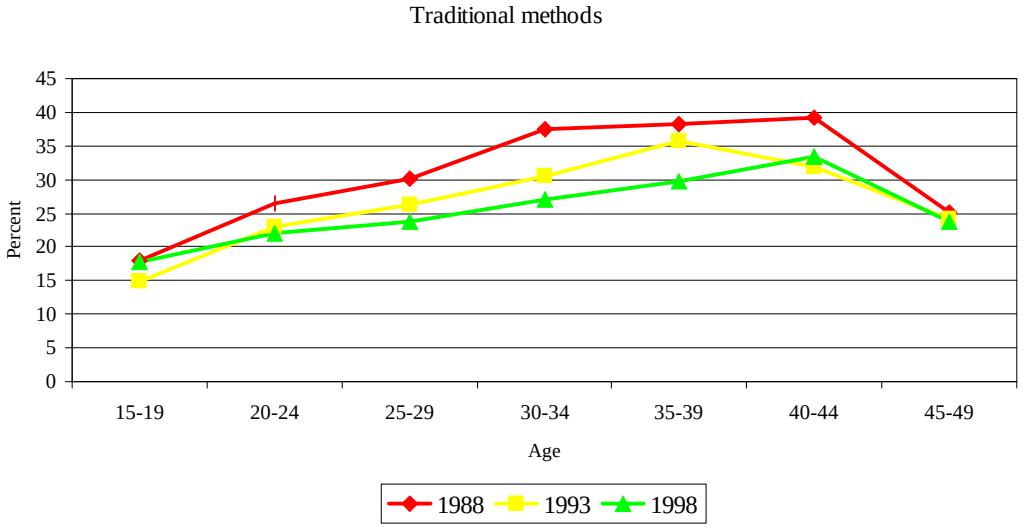
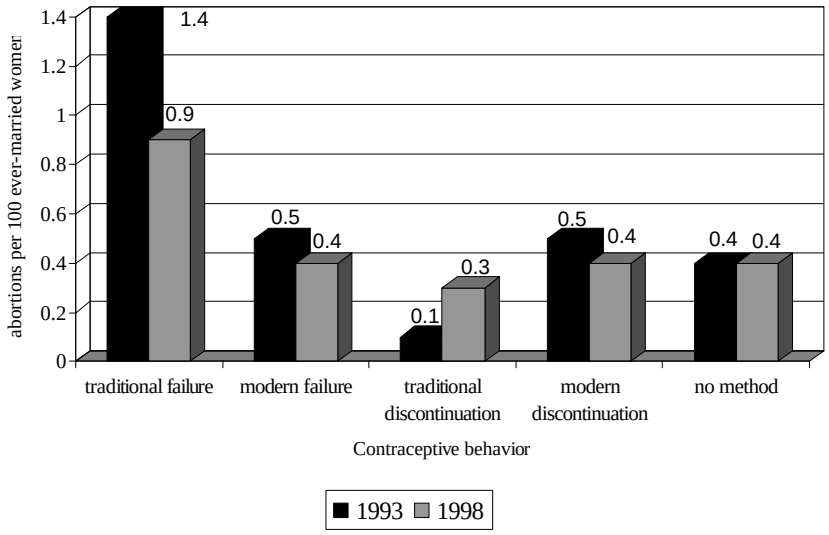


Figure 6. Abortion rates by contraceptive behavior prior to the abortion



Note: abortion rates refer to the three years prior to the survey and are for ever-married women.

Figure 7. Simulated abortion rates among ever-married women