The second pregnancy interval and it's determinants in Tehran city: Results from the 2017 Iran Fertility Transition Survey

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Abstract

Delay in the second child's birth can have a significant tempo effect on fertility. The main purpose of this study is to examine the spacing between first birth and second pregnancy and determine the probability of second pregnancy.

This study uses data from the 2017 Iran Fertility Transition Survey. The sample comprise of 363 married women aged 15-49 years old who had one child at the time of the survey in Tehran city. The Kaplan-Meier test was used to determine the birth interval and the gamma regression analysis was used to identify the determinants of the likelihood of a second birth. The Akaike information criterion (AIC) was considered as a criterion to select the best model (s).

Kaplan-Meier test showed that the median time of birth of first child to second pregnancy was 65 months (95% CI; 57.67-72.32 & SE 3.73). After 120 months (10 years) of the first birth, 75% of women reach a second pregnancy. Living in urban areas, college education, and delayed first births increase the survival time of a single child and reduce the likelihood of a next pregnancy. Increasing the ideal number of children increases the likelihood of a next pregnancy.

Given the high correlation between low fertility, and increasing marriage age, in line with recent pronatalist population policies, it is suggested the reduction of the gap between first birth and second pregnancy would lead to higher fertility.

Key Words: Second pregnancy, birth Interval, low fertility, postponement, survival analysis, Tehran.

Introduction

Iran has experienced a dramatic fertility decline in recent decades. The total fertility rate decreased from 7.7 in 1966 to around 6.0 by the mid-1970s, rose slightly during the late 1970s and early 1980s, and fell sharply during the 1990s. The own- children estimates of fertility for Iran based on the 2006 Census show that the TFR had reached replacement-level (2.1) in 2000 and further declined to 1.9 by 2006. Total fertility rate declined to 1.8 in 2011 but then rose to around 2.1 by 2016. Provincial levels of fertility indicate that most provinces of Iran waare experiencing below replacement level fertility. One of the features of below replacement fertility level is increasing birth interval.

In studies which investigate fertility reduction, usually, two influential dimensions of fertility including tempo (childbearing time) and quantum (number of children) are considered. When the aim of the study is to investigate delayed fertility, tempo is a suitable index. If the first child was born at young ages of mother and a short interval after her marriage, achieving next pregnancies may occur faster. On the other hand, by increasing mother's age and the interval between first birth and second birth, in addition to a reduction in TFR, completed dimension of her family is also reduced. Thus, in the society with a low fertility rate, a delayed childbearing may cause a low fertility pattern. The main purpose of this study is to determine the space between first child and second pregnancy and to determine the probability of second pregnancy.

Understanding the factors affecting the birth interval is of particular importance for health planners and families. Although studies in this area are numerous in other countries, there are few studies on the gap between births in Iran (Zare and et al 2015). Therefore, the main objective of this study is to determine the distance between first birth and second pregnancy and the determinants of our second pregnancy. Since the main variable under study is the distance between the first birth and second pregnancies, survival analysis is appropriate. In studies conducted in the country in statistical analyzes, successive correlations between distances are less considered and few studies are found to use fragility analysis to account for birth and correlation between them (14: 1145). Therefore, in this study, we tried to use fragility models to consider this dependence on survival times.

In recent years, policies and programs have been proposed to increase fertility in Iran, and overall population policies have focused on preventing population decline and increasing fertility rates. The results of this study could be useful in assessing future fertility levels and provide incremental policies and programs in relation to determinants of postponement of second pregnancy.

Data and method

The paper uses a sub-sample of data from the 2017 Iran Fertility Transition Survey comprising 363 married women aged 15-49 years old and having one child in Tehran city.

The dependent variable is distance between first birth and second pregnancy. This indicator shows the time interval between the first birth to the second pregnancy and is calculated through questions about

the month and year of first birth and the month and year of the second pregnancy. In the present study, the distance was calculated in months.

Second pregnancy experience: For those who experienced a second pregnancy, code 1 and those who had not yet experienced a second pregnancy were assigned code 0.

Independent variables comprised of age, level of education, education, number of siblings time of first birth, ideal number of children, place of residence up to 14 years, employment statues.

The Kaplan-Meier test was used to determine the second pregnancy interval and the gamma regression analysis was used to identify the determinants of the likelihood of a second pregnancy. The Akaike information criterion (AIC) was considered as a criterion to select the best model (s).

Results

KM survival estimates are computed for second pregnancy intervals and their survival curve is shown in Figure 1. Kaplan-Meier test showed that the median time of birth of the first birth to the second pregnancy was 65 months (95% CI; 57.67-72.32 & SE 3.73). After 120 months (10 years) of the first birth, 75% of women reach a second pregnancy.

Figure 1. Kaplan-Meier Survival Curve of second pregnancy Interval, Tehran city, the 2017 Iran Fertility Transition Survey

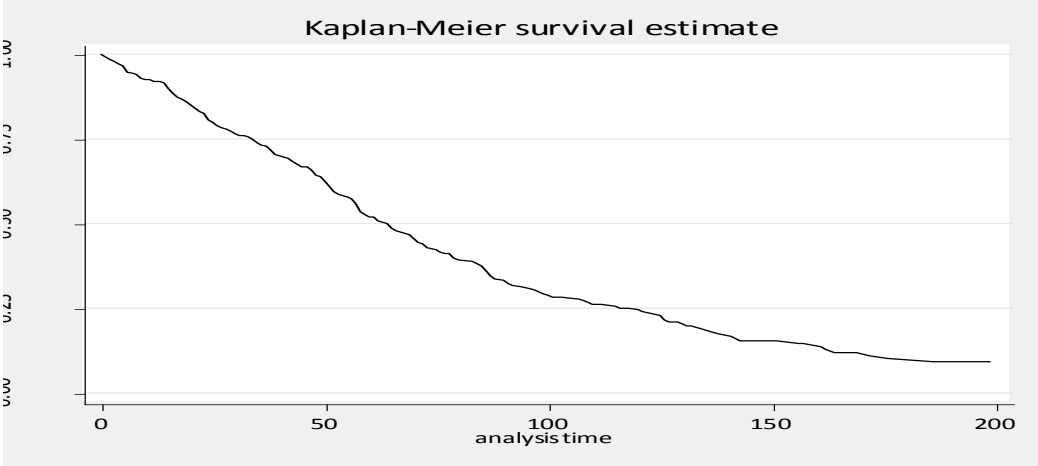
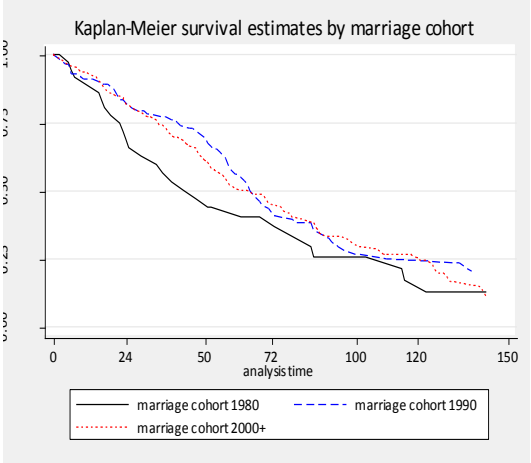
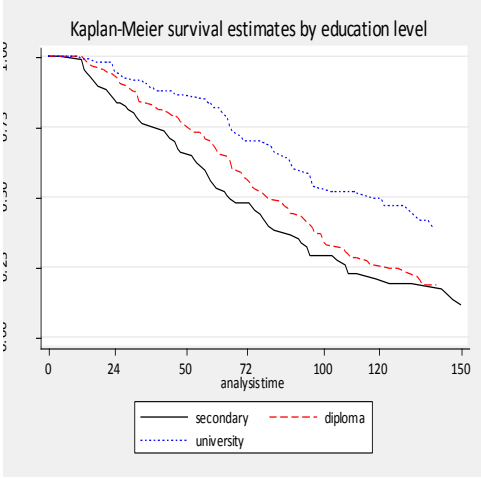


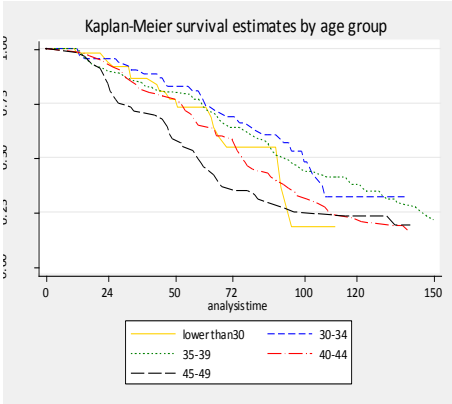
Figure 2 displays the survival curves of the second pregnancy interval, by socio demographic covariates.The pattern of the survival curves for the educational levels showed that by increasing women's educational level, the second pregnancy also increased. These variations were also proved by significant Log-Rank test ($P < 0.01$).

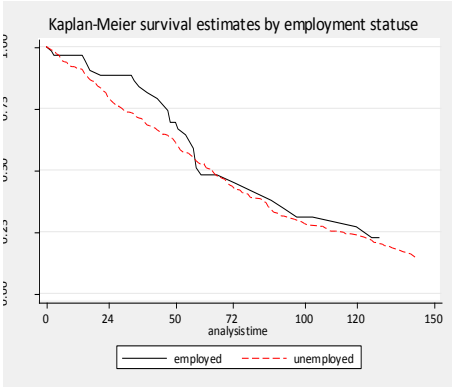
In sum, based on Kaplan-Meier test results and logarithmic rank test, it is concluded that university educated women, women who married after 2000 and employed women had longest second birth interval compared to the other women

Figure 2. Kaplan-Meier Survival Curves of Women's Second pregnancy Interval by Significant Covariates.









In order to determine the factors affecting the interval between first birth and second pregnancy in a multivariate model, it was tried to use parametric survival analysis methods such as Weibull, logistic log, normal log and gamma and finally select and analyze the best model. The values of exponential ratio and chi 2 LR and Akaike criterion showed that the lowest value was related to the gamma model. Therefore, the gamma model was identified as the most efficient model.

The results of generalized gamma AFT regression are presented in Table 1. The variables included in this model are marriage cohort, literacy level, employment status, and place of residence up to 14 years, birth time of first child, number of ideal children.

The result show the coefficient of effect of education less than diploma is -.3201902 (-.0197282 and -6206521) and indicates that not having a college education reduces the time of second pregnancy. In contrast, with the increase in first birth interval, the time of second pregnancy increases.

The findings confirmed the significant impact of the first birth time on the time of second pregnancy. With the increase in the distance between marriage and the first birth, the delay in second pregnancies increases. This finding is consistent with the study by Singh et al. (34). Previous studies of the marriage distance to first birth have shown that as the age of marriage increases, the distance between marriage to the first child decreases and individuals attempt to compensate for the delay effect giving birth to a

shorter first child. However, the results of multivariate analysis showed that with increasing distance from marriage to first birth, second pregnancy intention also increased. This finding may be due to decreased fertility and fear of pregnancy at an older age. The effect of delayed marriage and first birth on reducing the probability of subsequent pregnancies and total fertility rates has been confirmed in various studies.

Also, increasing the ideal number of children at the time of marriage reduces the time of second birth. Significance of fragility also indicates that the correlation between the interval between birth and pregnancy of each individual and individual difference is an important factor in modeling.

Table 1. AFT Gamma Regression Analysis of Determinants of the Probability of Second pregnancy in Tehran, 2016

Variable		Coef	. Std. Err.	z	P>z	[95% Conf. Interval]	
Birth place	urban	-.648407	.56292	1.15	0.249	-1.75171	.4548959
	Rural (ref)						
Education level	secondary	-.3201902	.1532997	2.09	0.037	-.6206521	-.0197282
	diploma	-.3137286	.1324821	2.37	0.018	-.5733886	-.0540685
	University (ref)						
Marriage cohort	1980	-.1656745	.1582773	1.05	0.295	-.4758923	.1445432
	1990	-.0040629	.1131533	0.04	0.971	-.2258393	.2177135
	2000+ (ref)						
Employment status	employed	.0391577	.1536982	0.25	0.799	-.2620852	.3404006
	Unemployed (ref)						
Number of brother &sister		-.000789	.024037	0.03	0.974	-.0479007	.0463226
Ideal fertility		-.192699	.0678763	2.84	0.005	-.3257341	-.059664
		0.00262	0.00817	3.21	0.001	0.0010 و	0.00422
Time of first birth		.002621	.0072397	3.14	0.043	.009707	.0042287
_cons		5.732163	.5854796	9.79	0.000	4.584644	6.879681
/lnsigma		-.2498623	.0664057	3.76	0.000	-.3800151	-.1197095
/kappa		.4414741	.1815796	2.43	0.015	.0855846	.7973636
sigma		.778908	.0517239			.6838511	.8871781

LR chi2= 27.44 Prob>chi2= 0.001 Log Likelihood= -340.7511 AIC= 667.5216

The results of this study showed that women currently undergoing delayed pregnancy in a low fertility setting in Tehran may have a negative impact on women's completed fertility. Delay in the birth of the second child, in addition to leading to a gap between the number of ideal children and the number of children available, provides further fertility reduction. This finding is in line with the study of Falahzadeh et al In Yazd (1999). In their study, those with a tendency to have two or fewer children had a mean birth interval of 51.77 months compared to 47.52 months for those who preferred more than two children.

References

Will be added