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Trends of Parity Progression Ratio in young Iranian women 2006-2016

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Abstract

In recent years, fertility developments have led to the announcement of population policies. The purpose of this study is to investigate the fertility trend in the censuses of the last three periods based on the Parity progression ratios. Parity progression ratios is actually the proportion of women of a given parity who go to have another child. The findings show that the PPR in young women in the age group of 20 to 35 years is lower than that of women in the age group of 35 to 49 years. Women's fertility reaches a significant percentage when they reach the reproductive age. The first and second ranks are significant, it respects the limit of succession, but it decreases in the fifth ranks and later, and in fact, this is the reason for the decrease in childbearing. As a result, the fertility of married women is also in an acceptable situation, but demographic policies based on strengthening the economic and welfare infrastructure will increase marriage, which will ultimately boost childbearing.

Keywords: Parity progression ratio, Birth order, Population policy, Total fertility rate, Marital fertility.

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1. Introduction

In recent years, significant population events have occurred in Iran. Fertility and childbearing have been one of the most important changes in Iran in the last 40 years. Fertility has initially increased and has started to decrease since about 1989, To the extent that it has fallen below the replacement level in the last 5 years. The importance of fertility changes led to the announcement of general population policies in 2014. General population policies emphasize on the role of all government parts in solving fertility problems (Abbasi-Shavazi, McDonald & Hosseini-Chavoshi, 2009).

Examining the age pyramids of the country's population from 1956 to 1986 shows that during the years under discussion, the country's population has always been increasing without control. From 1996 onwards, the base of the Sunni pyramids is gathering, which shows the effectiveness of population control policies in the country after the years of Iraq's imposed war against Iran. In the age pyramid of 2011, the extraordinary increase in the population of the age groups of 20-24 and 25-29 (the generation born after the revolution) is clearly visible, which caused the country to face the phenomenon of "youth inflation". The increase in population in these ages had its effect on the number of births in recent years, which is known as the "demographic torque effect". In the age pyramid of Iran in 2016, the extraordinary increase of the population aged 25-34 (the generation born after the revolution) is clearly visible. This situation has caused the country to go through the phenomenon of "youth inflation" and gradually increase the size of the adult population (Fathi and others, 2019).

In fertility analysis, total fertility is often used and the level of subsistent can be estimated by this method. In this method, periodic fertility is calculated and therefore influenced by timing effects. In addition, the total fertility rate because the cumulative mode has age-specific fertility rates, Therefore, the total fertility rate does not show the parity progression ratio and only in general can it state what the fertility process is like (Weeks, 2020).

Another way to analyze fertility is birth ranking with parity progression ratio (PPR)1. The importance of the birth rank arises from the fact that, first, it

[1] parity progression ratio

indicates the desired number of children for the family and the mother and second, it shows changes in reproductive behavior in terms of age and time of birth of the child, and these effects reflect an increase or decrease in social awareness. These calculations can also be used to predict fertility (Graff, 1979), (Mason, 1997)

The main purpose of this study is to identify the trend of parity progression ratio in recent years and during the census of 2006 to 2016. In other words, based on parity progression ratio in the first, second and ... ranks, we find the fertility trend and the rate of fertility decline in Iran.

In the future, the problem of our society will be fertility, and therefore the right actions can help solve the problem.

The necessity of conducting this research and the main question here is whether the Iranian society does not have the capacity of surrogacy and fertility at the surrogacy level? Is there a problem of having children in married Iranian women? What answer do the data have for us in this field? If the problem is not in married women, then where is the problem of reducing the fertility rate below the replacement level and what solutions are there to solve the problem?

As it was said before, this research aims to determine the level of childbearing in Iran, and then to provide appropriate and applicable solutions for population policies, and to reject popular discourse with inappropriate goals and to promote it. The quantity and quality of the country's population and the improvement of the level of welfare and development will help.

Finally, the necessity of conducting this research is to provide the most appropriate solution and the best method to increase the fertility rate at the replacement level in the macro level of the country.

To achieve this goal and to know the real situation of fertility and childbearing, we have used the method of parity progression ratio. Parity progression ratio will show us the situation of our 15- to 49-year-old women and the completed reproductive age groups from 45 to 64 in the field of childbearing, and what changes the age groups have in this regard.

2. Review of Literature

In 2007, Thomas Frejka and Sardon conducted research titled Child adoption and childbearing rate in European countries. His research has been investigated separately in three parts of Western, Eastern and Southern Europe. First of all, this research states that in most European countries, childbearing has greatly decreased, and the number of women of reproductive age is greater than the number of their children, and the rate of childbearing in Western European countries is higher than in other European countries. These researchers state that in the coming years, postponing fertility in Western Europe may end (Frejka and Sardon, 2007).

Christoph Zeman and his colleagues conducted research titled "Generational Fertility Reduction in Countries with Low Fertility", which was done by the method of women's fertility ranking. This research has been done in European countries, North America, Australia and East Asia. The target of attention in this research was the countries whose fertility was less than 1.75 children per woman. The findings of this research show that women who were born between 1940 and 1955 experienced a sharp decrease in fertility in their third and older children, and women who were born between 1955 and 1970 had a different regional pattern, so that In Eastern and Central Europe, the desire to have two children is more, and in German-speaking countries, Eastern Europe and East Asia, the decrease in first children has played the main role (Zeman et al, 2018).

Bhardwaj et al., in research titled "Analysis of Childbearing Rank" conducted in the city of Delhi, India, investigated the rank of childbearing among women living in the city. This research was done in 2010. The researchers in this research state that probabilistic models in fertility, especially in the level of having children, have created a different method in fertility analysis and these methods can play an important role in the analysis. In this research, mothers in Fertility age group has been used for analysis and review. The results of the research show that the fertility rate is different from other researches. Also, this research shows that the fertility rate from the first to the second place is 54%, from the second to the third place to children is 34.5%, from the third to the fourth place is 27%. It was a percentage. Comparing this

research with other researches that have been done shows that fertility behavior in different regions can be affected by different behavioral factors (Bhardwaj and others, 2010).

3. Methodology

Most fertility research and findings are based on total fertility rate (TFR)1 While this method is strongly influenced by the timing effect. One of the methods of fertility analysis is childbearing rank and parity progression ratio. In this method, the number of live births of women is used for analysis. In this study, Parity progression ratio method (PPR) used to assess fertility in the country. This method is one of the most suitable, widely used and expressive methods in fertility analysis (Hinde, 1998), (Moultrie et al., 2013). In this study, all data of 2% of the sample population in 2006, 2011 and 2016 were collected and analyzed. To analyze the data of this research, the secondary analysis method was used, which is a generational method and the effects of tempo and quantum are not seen.

Parity progression ratio is Proportion of women who have already had a certain number of children and go on to have another child (Siegel and Swanson, 2004), (Spoorenberg, 2015).

Parity progression ratio Shows with an, which is obtained from the following relation:

$$an = \frac{\text{Number of women who have a (n+1) child}}{\text{Number of women who have a (n) child}}$$

Using this method, it is possible to calculate the probability of mothers having a certain number of children. At this stage, the parity progression ratio is obtained and it is determined that what percentage of mothers who have had a child have a second child in the following years, and in the same way, the second child is examined to the third, and so on. This study will show us whether during the different censuses from 2006 to 2016, there was a difference in the parity progression ratio in the first and second children and children of several ranks or not.

1.Total fertility rate

To reach the index of childbearing rank in Iran, the statistical population includes all married women aged 15-49 and completed reproductive ages in Iran in the 2006, 2011 to 2016 censuses, which used 2% of the sample data. The number of married women samples aged 15-49 in the country during the three censuses was 322693, 315733 and 344574, respectively, and a total of 983000 people. In addition, the completed fertility age groups of married women from 45 to 64 years were also analyzed.

4. Findings

This table shows the frequency and percentage of parity of married women. The data in this table show that the percentage without children did not change significantly between 2006 and 2016, but parity increased slightly in the first rank. The rank of the first child in 2006 was equal to 18.81 and in 2011 it reached 20.41 and in 2016 it reached 20.89. But in the second rank births, this increase is very significant, so that in 2006, the value was 18.07, and in 2011, it reached 21.87, and in 2016, it reached 27.71.

Table1. Frequency distribution and percentage of parity. 2% census data in the age group of married women 15-49 years, 2006-2016

country	census		Parity						Total
			0	1	2	3	4	5+	
Iran	2006	Frequency	37935	45504	43723	29940	22254	62584	241940
		percentage	15.68	18.81	18.07	12.37	9.20	25.87	100
	2011	Frequency	40566	54488	58377	36156	23967	53412	266966
		percentage	15.20	20.41	21.87	13.54	8.98	20.01	100
	2016	Frequency	44778	67046	88928	47714	26155	46352	320973
		percentage	13.95	20.89	27.71	14.87	8.15	14.44	100

In fact, childbearing had the second highest percentage in 2016. In the third rank of births, we also see an increase in 2006-2016, so that 12.37 were in the third rank, and in 2011 it was equal to 13.54, and in 2016 has reached 14.87. From the third rank, we see a significant decrease in births in the fourth rank especially in the fifth rank and above. For example, in 2006, 25.87 had 5 or more children, and in 2011 was 20.01%. But in 2016, only 14.44 were in the fifth place and above. In fact, childbearing has dropped sharply from the fourth place onwards. This table shows well that the reason for the decrease in childbearing in recent years has been in the higher ranks of children, and in the

first, second and even third ranks of childbearing, there is even an increase in percentage.

Table 2. Parity progression ratio (in percent), 2% census data in the age group of married women 20-34 years, 2006-2016

PPR	2006			2011			2016		
	20-24	25-29	30-34	20-24	25-29	30-34	20-24	25-29	30-34
0	0.60	0.82	0.93	0.55	0.77	0.91	0.56	0.75	0.87
1	0.24	0.51	0.79	0.24	0.43	0.68	0.26	0.44	0.62
2	0.20	0.29	0.50	0.21	0.24	0.36	0.16	0.20	0.28
3	0.34	0.33	0.44	0.34	0.31	0.36	0.20	0.25	0.27
4	0.46	0.38	0.43	0.40	0.36	0.39	0.31	0.32	0.34
5	0.54	0.39	0.44	0.61	0.44	0.41	0.19	0.38	0.38

Table 2 shows the status of childbearing and PPR among young women during the last three censuses. This table shows, for example, 82% of women aged 25 to 29 who have not had a child are giving birth to their first child, and 51% of Women of the same age group who have one child give birth to a second child, so in general, we observe how the process of having children was according to different ranks, but the comparison of fertility in these young women shows that all of the age groups As we move lower towards higher age groups, it will increase somewhat with the completion of reproductive age groups. The incidence is high in the first and second children and is decreasing in the fourth and fifth children.

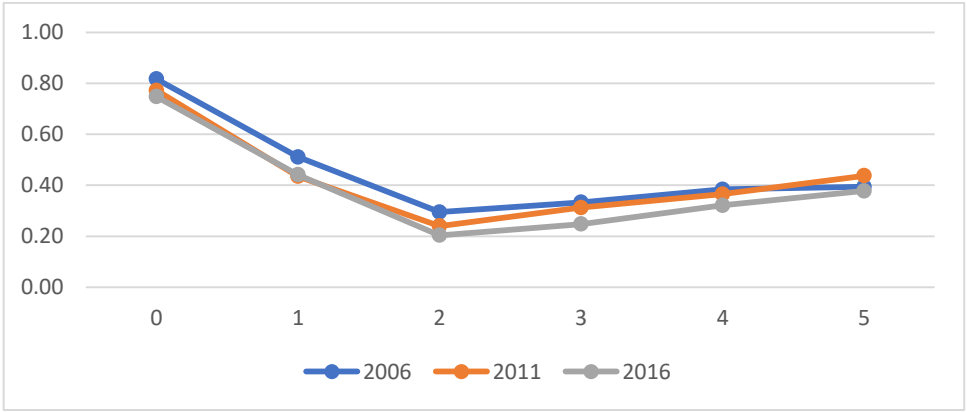

Figure 1. Parity progression ratio, married women aged 25-29 years, 2006-2016

Table 3. Parity progression ratio (in percent), 2% census data in the age group of married women 35-49 years, 2006-2016

PPR	2006			2011			2016		
	35-39	40-44	45-49	35-39	40-44	45-49	35-39	40-44	45-49
0	0.96	0.97	0.97	0.95	0.97	0.97	0.94	0.95	0.96
1	0.92	0.96	0.97	0.87	0.93	0.96	0.79	0.88	0.92
2	0.71	0.84	0.91	0.54	0.70	0.82	0.40	0.53	0.66
3	0.60	0.74	0.84	0.44	0.58	0.72	0.34	0.42	0.54
4	0.54	0.67	0.78	0.44	0.53	0.64	0.39	0.42	0.51
5	0.52	0.62	0.73	0.49	0.52	0.60	0.45	0.47	0.49

This table shows how the process of having children has been based on the past censuses. As seen in table two, the rate of having children in young age groups is decreasing with the rate of having children in the age groups of women who are older. For example, in the age group of 40 to 44 years, 96% of mothers who have their second child also give birth, but only 62% of women in the same age group who have five children give birth to their next child, and this decline in women Younger was also evident. But the rate of having children in older age groups has a high percentage.

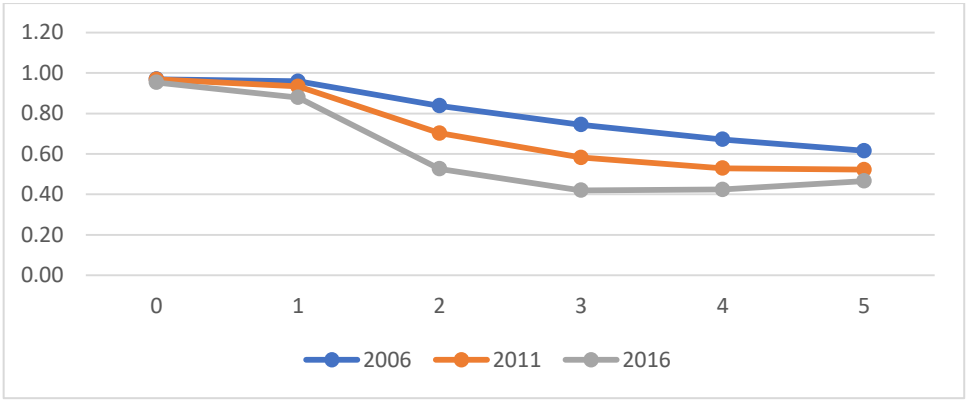

Figure 2. Parity progression ratio, married women aged 40-44 years, 2006-2016

5. Conclusion

The findings of this study showed that the percentage of viability in the first, second and even third childbearing ranks did not change significantly during the censuses and childbearing in these ranks is almost constant and even slightly increases, but in the fourth place, and especially in the fifth place and above, we see a very significant decrease, and this decrease in the number of children in a family has led to a decrease in total fertility. Therefore, the majority of families keep two children, which is in the range of replacement level, but they do not consider fertility in a higher number desirable. However, having two children is expected to decrease significantly in the last 5 years.

The findings of this research show that the percentage parity in the second and third children and in the census the highest percentage of the ranking of the children was in the second and third children and the reason for the decrease in the fertility rates was in the fifth children and later, this issue can be seen in all three censuses. This finding was seen in other researches (McDonald, Hosseini-Chavoshi, Abbasi-Shavazi, & Rashidian, 2015).

Also, the rate of PPR among young women in the age group of 20 to 34 years was lower than the rate of PPR among women with older age groups and in the age group of 35 to 49 years. But favorable fertility and childbearing that includes the limit of succession is evident in older age groups. On the other hand, the findings of this research show that the reduction of childbearing in the ranks of fourth children and later and in all age, groups show itself, in fact, in older age groups, the replacement limit is observed, and in young age groups and in young women. Childbearing of married women is increasing until the end of reproductive age, and after that it is complete, but the parity progression ratio is decreasing, and the best PPR is seen in the second and third children, and in the ranks of the fourth, fifth and above children, we wish it would decrease.

This finding means that the decrease in childbearing and PPR in our country occurs in the fourth, fifth and older children, but married women in their reproductive age meet the limit for replacement, although this percentage is decreasing, but it is at the replacement limit such as research of frejka (Frejka & Sardon, 2007).

Global findings and researches in Iran show that the infertility rate in Iran is about 10 to 15%. By considering this amount, we can explain the zero fertility of a child, which was 85%. Therefore, childbearing in married women in Iran is in a good process and the remaining percentage can be sought in other causes (McDonald, Hosseini-Chavoshi, Abbasi-Shavazi, & Rashidian, 2015), (Zeman, Beaujouan, Brzozowska, & Sobotka, 2018).

Findings from the census tables show that fertility in Iran is not a problem for married women and these women have had fertility in different years. In the completed fertility age groups, it was clearly observed that women complete their maximum fertility by the end of the reproductive ages and fertility in a good ratio in the first, second and third ranks and fertility declines appear to be higher ranks in married women, However, the main cause of fertility decline in recent years in Iran can be considered as the marriage squeeze and reduced marriage of age groups. This group of women can have a great impact on the fertility of the country. Due to the declining fertility trend, it is necessary to formulate suitable and balanced incentive policies with the economic, social and cultural situation. Incentive policies will be realized in the context of the economic situation and the level of welfare and development. We all know that the economic situation, which is also part of the background variables It is not in a good condition, and adaptive policies should also be on the agenda. Policies such as social security and creating better conditions for families can provide the conditions for having children. Also, considering that we are in the demographic window situation, creating stable and appropriate employment, reducing inflation, reducing unemployment, and providing suitable housing can provide the conditions for having children, especially for young people, and provide the conditions for marriage.

Among the other issues that should be considered in this category are the basic measures to reduce infertility, in which good progress has been made, as well as dealing with the topic of abortion and preventing illegal and dangerous abortions should be taken more seriously with stronger laws. Creating suitable conditions for housewives and financing them and paying attention to the roles of parents in raising children should also be considered. Incentive policies for working women should also be significant and accessible.

In conclusion, it can be said that unfortunately, the executives and policymakers in the field of population have not implemented the policies announced by the leadership in May 2014. While other clauses of the communication policy refer to the creation of correct and appropriate infrastructure, which can make the implementation of childbearing policy easier and more appropriate. Failure to address issues such as welfare, reducing unemployment, reducing inflation, increasing the level of development and solving the problem of housing and marriage are among the issues that can be seen in population policies but it can be said that almost no suitable strategy has been implemented for it. As research data show, the problem is not in married people and it is necessary to create a suitable marriage context for young people so that having children will be in a more appropriate situation.

Interventions to increase childbearing in recent years have been mainly interventions and punitive policies. While incentive policies such as maternity leave have not changed significantly, and most importantly, fundamental changes in the economic context have not only not taken place, but economic pressure has increased. Comparative policies have not changed much at this stage. Given that the country is still in the population window and there is a great opportunity for economic development in terms of manpower, therefore, economic development can be expanded with proper planning and action.

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