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# **The Determinants of the Decision of Having Children Among Young families: Application to Armenia**

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**DISCLAIMER:** The views expressed in this research paper are those of the authors and do not represent any position of any agency of the RA government or MSRF Panel.

## **ABSTRACT**

The study examines the demographic, socioeconomic and psychosocial determinants of young couples' decision to have children across various sub-groups in rural and urban areas of Armenia using the Armenia Demographic and Health Survey. Modeling the variables on the number of living children, the findings imply differences in the determinants among the couples in the rural and urban areas suggesting the need for designing area specific policies. The findings indicate that the number of household members, wealth categorization, women's employment and fertility preferences, among others, are the determinants of young families' decision to have a child.

Keywords: *Number of living children, fertility decision, young family, Armenia*

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## **1 - Introduction**

The demography of Armenia is characterized by a decreasing fertility rate and postponement of childbearing. The issue of decreasing total fertility rate is particularly acute for Armenia, given that the population is projected to decrease by nearly 20 percent by 2050 and by 31 percent by 2075 from the previous population level of 3,538,171 in 1990<sup>1</sup> (United Nations, 2019).

The rapid decline in the crude birth rates<sup>2</sup>, evident especially after the independence in 1991 is another feature of the declining population of Armenia. In the first decade of post-independence, the crude birth rate plummeted from 21 to 13 in 1000 people slowly recovering until 2010 before decreasing again to 13.99 in 2018 (Guilmoto, 2013). The trend of the rapid fall in crude birth rate results from the fertility rate transformations in the same period. The total fertility rate (TFR hereafter) experienced a sharp decline from 2.48 in 1991 to 1.63 in 2001 and increased moderately to the level of 1.755 in 2018 (United Nations, 2019). The difference in the TFR between urban and rural areas in favor of rural areas has disappeared by 2016 (SCRA, 2017). However, in Armenia, the TFR is below the population replacement level of 2.12 - a rate indicating that couples are producing just enough children to replace themselves (ibid). Further, the rate is below the average fertility rate for other upper-middle-income countries and the lowest in the region<sup>3</sup>.

The findings of Armenia Demographic and Health Survey (ADHS hereinafter) (2017) indicate that childbearing among women in Armenia begins relatively late with the most childbearing occurring below the age of 30 with a peak in the 20 to 24 age group. Moreover, the mean age of childbearing increased over the last two decades indicating that women in Armenia are more often postponing childbearing to later ages. In 2000, 60 percent of childbearing cases of

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<sup>1</sup> The World Bank. Population, total - Armenia. (2020). Retrieved from <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=AM>

<sup>2</sup> Crude birth rate is the number of live births occurring during the year, per 1,000 population estimated at midyear (The World Bank).

<sup>3</sup> The World Bank. Fertility rate, total (births per woman). (2020). Retrieved from <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?end=2018>

ADHS were concentrated among women aged 15-24 (SCRA, 2000; SCRA, 2017). The trend reversed in 2015-2016, when only a little more than 40 percent of childbearing took place in those age groups (SCRA, 2017). The trend of late childbearing stems from the parallel increase in the mean female age of marriage (Guilmoto, 2013).

The fertility preferences of men and women in Armenia are similar with slight differences in proportion: roughly half of men and women in Armenia did not want to have another child, as well as both men and women want the same number of children in general (SCRA, 2017). The mean ideal number of children observed among all men and women were 2.7 and 2.6 respectively, and has been relatively constant in preceding surveys (SCRA, 2017). There is a gap between the ideal number of children and the actual fertility rate among all women in Armenia, indicating that there are latent reasons behind the decision of women to have children, meaning that almost all women want to have some number of children (SCRA, 2017).

Contrary to Axinn and Barber (2001), the decline of TFR in Armenia is not associated with an increase in women's education. Adult female literacy rate in Armenia, although exhibiting a moderate increasing trend in the last decade, has changed only moderately since 1990 being the second highest in the region in 2018<sup>4</sup>. Yet, female labour force participation demonstrated an increasing trend in the last two decades with infrequent fluctuations, which indicates a general improvement in female economic independence<sup>5</sup>.

The present study is a quantitative and economic analysis of the determinants of individual fertility among young married couples in Armenia, and is of particular importance due to the limited availability of prior research on reproductive behaviour in Armenia. The study uses data on Armenian young couples from ADHS 2015-16, and measures the impact of demographic and socioeconomic characteristics on the number of living children among young households in Armenia. Considering the fact that people's characteristics vary between

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<sup>4</sup> The World Bank. Literacy rate, adult female (% of females ages 15 and above). (2020). Retrieved from <https://data.worldbank.org/indicator/SE.ADT.LITR.FE.ZS?end=2017>

<sup>5</sup> The World Bank. Labor force participation rate, female (% of female population ages 15+) (national estimate). (2020). Retrieved from <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.NE.ZS?end=2018>

regions, the estimation is conducted based on the type of place of residence, that is, separate for Yerevan, other urban areas, rural areas, as well as for Armenia. The ultimate goal of this research is to provide the main determinants of fertility decision of young families as a solid base for the future policies directed to increase the fertility rate in Armenia and increase the “affordability” and willingness of childbearing.

The rest of the paper is organized as follows. Section 2 describes the related literature, Section 3 describes the data used for the analysis and the methodology for conducting the ordered logit regression, and Section 4 discusses the results of the empirical analysis. Recommendations are provided in Section 5. Section 6 reports the concluding remarks and gives further recommendations for possible implications.

## **2 - Literature Review**

The existing literature provides different approaches and methodologies for assessing the determinants of individual fertility. One approach uses microeconomic characteristics behind the fertility choice providing the possibility to assess the effect of one variable, such as income or education on fertility. In the meantime, another approach concentrates on the psychosocial aspects of fertility and fertility behaviour with an emphasis on fertility preference, demand for contraceptive use and accessibility of family planning information. The process of individual and parental decision-making follows because the decision-making power underlying in household or other related issues is one of the salient characteristics of individual fertility decision-making.

Socioeconomic development demonstrated by improvements in income, women’s employment status and education are among the main determinants of fertility decline (Simon, 1974; Graff, 1979; Standing, 1978). The expected negative relationship between women’s employment and fertility is derived from the rationale that women’s participation in the economic market competes with their family obligations (Beguy, 2009). The author confirms that the attainment of higher education, as well as paid-employment, reduces a woman’s

chance of increasing her family size (ibid). Kolllehlon (1984), on the contrary, did not observe a statistical difference between the fertility levels of working and non-working women in Liberia. Similarly, Drenovsky (1994) explains that the increase in the status, rather than women's work, reduces the fertility of women. If the work women perform does not produce a status for women, which was observed in developing countries, women will unlikely limit their childbearing as they consider the latter a source for women's status (ibid).

Bongaarts (2010) provides evidence that the education level of women is negatively related to the number of children and the desired family size and positively related to contraceptive use. The author further notes that as education rises among women, more educated women tend to marry and bear a child later or not at all (ibid). Other studies failed to confirm the initial hypothesis that the increased levels of women's education and household income adversely affect fertility (Simon, 1974; Graff, 1979).

Another strand of literature uses a psychosocial approach to establish a relation between the knowledge of family planning, attitudes towards contraceptive use, fertility preferences to fertility. Williamson (1970) related social variables, such as the radio and newspaper exposure, and level of information to the use of birth control and fertility in five developing countries. The study observed the relation of the variables along with education, income, marital status, and age (ibid).

In many fertility studies, the decisions of fertility are linked to implicit decision-making processes at the household level. Female autonomy, measured by the involvement of women in the decision-making of household-related issues, is used to predict the usage of modern contraception (Hindin, 2010). Even though involvement in decision-making is inversely related to fertility, the author suggests that the decision-making process is multi-dimensional and each component of the process has different implications for fertility behaviour.

The successive fertility studies have borrowed from the prior literature and examined the relation of fertility to socioeconomic, psychosocial as well as variables on household decision-making (Zhang, 1990; Ying, 1992; Klomegah, 1999; Indongo and Pazvakawambwa, 2012; Nguyen-Dinh, 1997). Using results from the Country Demographic and Health Surveys,

studies have analyzed household, women's, as well as husband characteristics on the number of children ever born (Zhang, 1990; Indongo and Pazvakawambwa, 2012; Nguyen-Dinh, 1997). Zhang (1990) found that the wife's education, but not the husband's education is a significant factor for fertility in China. On the contrary to the previous studies, the author finds the husband's occupation rather than the wife's occupation to have a significant negative effect for the number of children ever born (ibid). Klomegah (1999), however, supports that uneducated women have reported the highest number of children in Ghana. Both studies further note the difference in fertility observed in the place of residence with women in rural areas having more children compared to women living in urban areas (ibid).

Indongo and Pazvakawambwa (2012) using similar analysis on the number of children ever born for three consecutive DHS surveys predict that the rural areas will experience decline in fertility in Namibia. The authors observed the negative relation of the desire for more children to the actual fertility with those women who desire to have more children sometime have on average less children than those who desire no more (ibid). The fertility was negatively related to the age married and was observed to increase with the age of women and (ibid).

Nguyen-Dinh (1997) includes variables describing awareness of family planning, such as knowledge of contraceptive methods and reports negative relation to fertility. Ying (1992) also observed the significance of the knowledge and accessibility of family planning related to decreases in fertility among Malays.

The present paper aims to analyze the determinants of individual fertility of young families in Armenia with respect to demographic, socioeconomic, psychosocial variables, as well as decision-making characteristics. It contributes to the present body of literature by employing a quantitative analysis of DHS in Armenia following other studies conducted on similar data in Namibia and Vietnam (Nguyen-Dinh, 1997; Indongo and Pazvakawambwa, 2012).

### **3 - Data**

This study documents the fertility decision of young families, that is, the probability of having another child, based on the microdata accessed from Armenia Demographic and Health Survey (ADHS) of 2015-16. The survey was carried out by the Statistical Committee and the Ministry of Health of the Republic Armenia, in the scope of worldwide Demographic Health Surveys (DHS) programs. The present paper concentrates on the couple's data (aka couple's recode) of ADHS which implies married couples or the ones living together, where the unit of analysis is the couple including both partners between ages 15-49<sup>6</sup>. An ordered-response model is developed to assess the probability of young families to be in the higher categories of the dependent variable - maximum number of children - depending on various exogenous factors. The paper reports marginal contributions of those exogenous variables, since the simple ordered logit model has a difficulty in the interpretation of coefficients.

#### ***Sample Selection***

The sample includes around 1500 couples, however, we limit our analysis to 1015 couples, as the current study concentrates on young families only. While in most contexts a young family is defined as a family where the total age of a couple does not exceed 70 years, in the present paper, the upper total age is extended to 77 years. This recognizes the fact that the sample is characterized by postponement behavior resulting in marriage in older ages as well as late childbearing.

Since the focus of this study is to measure the decision of having children as if it is a possible option, the women who have been declared infecund were excluded from the sample.

A summary of statistics for 1015 couples is given in Table 1. The data in the sample is well distributed, representative and parallel with our population.

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<sup>6</sup> The couple recode of ADHS is a survey done by two partners separately and then gathered into one dataset where each observation is one couple.

**Table 1. Summary Statistics on ADHS Couple data**

	Yerevan		Other urban		Rural		Armenia	
	mean	sd	mean	sd	mean	sd	mean	sd
Number of living children (grouped)	1.59	0.87	1.61	0.82	1.79	0.89	1.69	0.87
Age	30.06	4.57	29.3	4.64	28.58	4.88	29.09	4.76
Age at first cohabitation	21.98	3.34	21.07	3.12	20.11	3.04	20.78	3.18
Number of household members (listed)	5.07	1.61	5.05	1.51	5.83	1.6	5.4	1.61
Home ownership	0.32	0.47	0.45	0.5	0.44	0.5	0.42	0.49
Wealth index combined	4.04	1.36	3.13	1.5	2.35	0.89	2.92	1.37
Woman's educational level	1.68	0.51	1.55	0.55	1.25	0.61	1.44	0.6
Husband's educational level	1.58	0.57	1.33	0.64	1.01	0.64	1.23	0.66
Woman currently working	1.3	0.46	1.29	0.46	1.2	0.4	1.25	0.43
Husband currently working	1.82	0.39	1.78	0.42	1.67	0.47	1.73	0.44
Fertility Preference	1.25	0.73	1.09	0.74	1.15	0.77	1.14	0.75
Heard Family Planning	0.27	0.44	0.34	0.47	0.26	0.44	0.29	0.46
Knowledge on Fertile Period	1.69	0.56	1.45	0.75	1.35	0.77	1.44	0.74
Frequency of Using Internet	1.5	0.83	1.55	0.92	2.15	1.17	1.81	1.07
Decision maker on Health Care	0.56	0.5	0.78	0.42	0.79	0.41	0.75	0.43
Decision maker on HH Purchases	0.64	0.48	0.65	0.48	0.61	0.49	0.63	0.48
Decision maker on Family Visits	0.81	0.4	0.85	0.36	0.82	0.38	0.83	0.38
Observations	154		410		451		1015	

Source: Authors' elaboration based on ADHS 2016

### *The variables*

The dependent variable is the number of living children grouped in categories 0, 1, 2, and 3 or more. This represents the actual childbearing decision of the family. As mentioned earlier, the ideal number of children of couples is approximately three children, this we take the highest category as having three children or more. The explanatory variables presented in Table 1 include demographic, socioeconomic, physiological characteristics of the female respondents and control variables relating to their husbands. The full definitions of 15 variables are given in Appendices Table 1A.

The number of living children among all regions is concentrated around two, and there are rarely families that have more than three children. Regions where families have more than three children are Ararat, Armavir, and Tavush, the regions with the highest TFR in 2016 (SCRA, 2017). On average, the number of children grouped is 1.69 consistent with the TFR of Armenia. The distribution of the number of living children by the wealth index reconfirms that more families regardless their wealth groups are more concentrated around having two children. (See Figure 2A for the distribution of wealth distribution by the number of children)

Concerning the decision making factors displayed in table 1, we can see that in the case of decision making, most couples make decisions jointly. Most men's work type can be classified

as manual, while most women in the sample were not working. Most couples were also unsure of their fertility preference, 417 out of 1015, while others either certainly wanted or didn't want additional child/children. In the case of the type of residence and region, the sample is very well distributed among the regions with an equal share of urban and rural families allowing to separate different policies targeted to different regions. Most women respondents answered that they were not using the internet, which might uncover some general problem about literacy and information access. The latter mentioned problem is reconfirmed in the answers to questions about fertility, which indicates that most women have incorrect knowledge about fertility.

#### **4 - Results**

Table 2 displays the results of the ordered-logit regression analysis showing the marginal effect for each exogenous variable on the number of children grouped. The same set of demographic, socioeconomic factors for men and women are estimated for Yerevan, other urban areas and rural samples of young families in Armenia to provide the possibility for comparing the impact between different types of place of residences.

**Table 2. Estimated marginal effects of socioeconomic variables and proximate factors on the decision of having children among young families, DHS, Armenia**

Dependent variable (number of living children) = 0, 1, 2, 3+				
	Yerevan	Other Urban	Rural	Armenia
				-0.088**
Age	-0.068*** (0.025)	-0.081*** (0.018)	-0.089*** (0.015)	*
Age squared	0.001** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Age at first cohabitation	0.024*** (0.004)	0.021*** (0.003)	0.019*** (0.003)	0.021*** (0.002)
Type of place of residence				
Rural				reference
Urban				-0.003 (0.012)
				-0.033**
Number of household members (listed)	-0.036*** (0.006)	-0.038*** (0.005)	-0.030*** (0.004)	*
Home ownership				
Does not own	reference	reference	reference	reference
Own house alone or jointly	-0.009 (0.023)	0.004 (0.014)	-0.01 (0.011)	-0.009 (0.008)
Wealth index combined				
Poorest	reference	reference	reference	reference
Poorer	-0.138*** (0.041)	-0.063*** (0.024)	-0.004 (0.016)	-0.023 (0.014)
Middle	-0.097 (0.066)	0.048 (0.036)	-0.026 (0.016)	-0.030** (0.015)
Richer	-0.043 (0.033)	-0.025 (0.020)	-0.032 (0.032)	-0.022 (0.014)
Richest	-0.124*** (0.029)	-0.022 (0.024)	0.056 (0.045)	-0.036** (0.014)
<b>Woman's educational level</b>				
Primary or less	reference	reference	reference	reference
Secondary	0.078 (0.053)	0.031 (0.042)	0.006 (0.022)	0.008 (0.020)
Higher	0.035 (0.047)	0.046 (0.042)	0.014 (0.024)	0.013 (0.021)
<b>Husband's educational level</b>				
Primary or less	reference	reference	reference	reference
Secondary	0.036* (0.044)	0.013 (0.022)	0.017 (0.015)	0.019* (0.013)
Higher	0.046** (0.044)	0.028* (0.024)	0.017 (0.018)	0.023* (0.014)
<b>Woman's current working status</b>				
Does not work	reference	reference	reference	reference
Currently working	0.079*** (0.026)	0.005 (0.016)	0.015 (0.016)	0.021** (0.010)

<b>Husband current working status</b>				
Does not work	reference	reference	reference	reference
Currently working	-0.038 (0.027)	-0.039* (0.020)	-0.004 (0.011)	-0.020** (0.010)
<b>Fertility Preference</b>				
No more	reference	reference	reference	reference
Have another	0.089*** (0.031)	0.070*** (0.017)	0.061*** (0.013)	0.067*** (0.010)
Undecided	-0.054** (0.023)	-0.039*** (0.013)	-0.028*** (0.009)	-0.037** *
<b>Heard family planning</b>				
No	reference	reference	reference	reference
Yes	0.021 (0.027)	0.013 (0.015)	0.0001 (0.012)	0.007 (0.009)
Knowledge on fertile period				
Don't know	reference	reference	reference	reference
Incorrect knowledge	-0.021 (0.056)	-0.006 (0.023)	0.011 (0.017)	-0.001 (0.014)
Correct knowledge	0.04 (0.056)	-0.007 (0.021)	0.001 (0.016)	0.001 (0.012)
<b>Frequency of using internet last month</b>				
Never	reference	reference	reference	reference
Less than once a week	-0.056** (0.022)	-0.034** (0.017)	0.007 (0.015)	-0.01 (0.010)
At least once a week	0.003 (0.043)	-0.025 (0.039)	-0.011 (0.016)	-0.021 (0.014)
Almost every day	-0.028 (0.057)	-0.033 (0.027)	-0.031** (0.015)	* (0.012)
<b>Decision maker on health care</b>				
Separate decision	reference	reference	reference	reference
Joint decision	-0.016 (0.020)	-0.013 (0.017)	0.021 (0.013)	0.003 (0.010)
<b>Decision maker on hh purchases</b>				
Separate decision	reference	reference	reference	reference
joint decision	0.008 (0.021)	-0.023 (0.015)	-0.005 (0.013)	-0.006 (0.009)
<b>Decision maker on family visits</b>				
Separate decision	reference	reference	reference	reference
Joint decision	-0.087*** (0.025)	-0.005 (0.020)	0.007 (0.015)	-0.009 (0.012)
Observations	154	409	446	1,009
McFadden R-squared	0.527	0.4293	0.4419	0.4181
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1				
Source: Authors' calculations based on ADHS data 2015-16				

The signs of the variables are overall consistent with the reviewed literature with few exceptions believed to be specific to the context of Armenia. The age of the wife has an observed negative impact on the number of living children for each four samples, however, the impact is getting weaker by age, for example, the probability that the woman will have more children increases until a certain age and after that, it decreases. According to ADHS, women aged 20-24 have the highest fertility, that is, 124 children per 1000 women, compared to the other age groups, confirming the result that younger women have higher probability of having more children compared to older aged women. Age at first cohabitation with the current partner, on the contrary, is positively associated with the number of living children with a one year increase in the age of cohabitation increasing the order of the number of children by 2.1 percent for Armenia. In general, the age at first cohabitation equals the age of marriage of the couple, and consistent with the literature (De Tray, 1977), the age union which in our case is the age at cohabitation has a significant impact on fertility. Even though the literature suggests that later age of marital union would lead to lower fertility, our estimation shows that an increase in the order of the number of children is associated with later age of cohabitation.

Considering the fact that in the last decade, the decrease in crude birth rate in rural areas has been much greater than in urban areas, we exhibit the differences in variable magnitudes, signs, and significance in the sub-samples as a present a background for policy implications targeted toward different regions. The number of listed household members is negatively associated with the number of children for each sub-sample with the highest impact observed in the other urban areas rather than in Yerevan. All other factors equal, an increase in household members by one is predicted to decrease the order of number of children by 3.8 percent. For the rural areas, the impact is relatively moderate with an increase in each additional member resulting in 3 percent probability to have lower order of number of children. The result confirms the association of space availability with fertility decisions, such that in the rural areas in Armenia are characterized with single-story houses and abundant land as compared with multi-story apartment buildings in urban areas, sharing a house with additional family members is more acute for the cities.

A negative relationship is observed between wealth index groups (a substitute to income groups) and the number of children. Particularly in Yerevan, the poorer families have 13.8 percent less probability and the richest families have 12.4 percent less probability to have a higher order number of children compared to the poorest families. The latter indicates that in the context of Armenia, the poorest families are predicted to have the highest number of children compared with families in other wealth groups. However, the middle wealth group in the other urban sample, as well as the richest families in rural samples show the opposite pattern. It is predicted that in rural areas, or in urban areas other than Yerevan, the richest and middle classes respectively, have a 5 percent chance to have a higher order of number of children compared to the poorest wealth class. coefficients of the highest wealth group stem from the higher awareness and abilities to purchase modern contraception among young men and women in the upper wealth groups as compared to the lower groups. This shows that in these regions the middle class or richest class are characterized differently, meaning that the barriers to fertility are lower for them, and education and income enable the reproduction decision of young families.

A woman's educational level is positively related to the number of children, indicating that women with secondary or higher education have higher probability to have another child as compared to women with primary or less education. The pattern is consistent for all samples except for Yerevan, which exhibits higher coefficients for secondary education. It is important to notice that in Yerevan, women with secondary education are more than twice likely to have a higher order of number of children than those with higher education, which shows that even though education positively affects the fertility decision, its magnitude is much lower for more educated women in the capital city. Contrary to Zhang (1990), the husband's education rather than wife's education is significant for Yerevan, other urban areas and Armenia in total. The women in Armenia whose husbands have completed higher education have 2.3 percent, and those who completed secondary education have 1.9 percent higher probability to have more children. The pattern of significant education is observable for all sub-samples, but the magnitude of the coefficients is higher for the capital sample.

It is observed that in all subsamples, the current working status of women affects the number of children positively, while that of men affects the number of children negatively. In Yerevan, a couple with a working woman is approximately 8 percent more likely to have a higher number of children rather than if the women did not work. Whilst the couple with a working husband is 4 percent less likely to have more children than those with not working husbands. The difference in the influences of men's and women's work status on the number of children has a direct connection with men's and women's roles in the household. The pattern confirms that in Armenia, men are the main income earners, and their employment causes time scarcity which stands a barrier in the fertility decision of the couple. However, the women's work is more of a complementary good in the household, which is less associated with time scarcity and more associated with additional income, which in turn, increases the probability of having more children.

In line with the ADHS report (2017) our sample is consistent with the fact that the more children in the house the less people want to have another child, adversely, the more children in the household the more people are undecided to have a child (see Appendix Table 3A). The findings further confirm that women in Yerevan with a preference for an additional child have 8.9 percent more probability to have a higher order number of children as compared to women who do not want additional children. Whilst, women who were undecided in regards to their fertility preference had 5.4 percent less probability to have an additional child in Yerevan. The pattern was uniform for other urban areas, rural and the total sample with the highest magnitude observed in Yerevan.

Concerning the variable of awareness on family planning and general knowledge on fertile periods, the higher level of awareness among women is positively associated with young couple's fertility decisions. In Yerevan, women who heard about family planning have 2.1 percent more probability of having more children compared to women who did not hear, while the magnitude of hearing about family planning is low in the rural sample. The prior positive relationship indicates the need to transfer the practice of educating about family planning to

the rural areas. The correct knowledge of the fertile period increases by 4 percent, while the incorrect knowledge adversely affects the couple's fertility decision.

The decision-making characteristics were taken as proxies to characterize autonomy in the household and to see whether equal decision-making is related to the higher number of children. The joint decision making for family visits is statistically significant and couples that make joint decisions have 8.7 percent higher probability to have a higher order number of children as compared to couples who make separate decisions. The variable is to a lesser extent negative for other urban and Armenia samples confirming the prior studies' findings of a relation between the decision-making autonomy of couples and the usage of contraception (Hindin, 2010).

Regression analysis uncovered various interesting results both in terms of existing and already observed patterns in the other countries as well as some not repeating patterns which are Armenia specific. The combination of the following results as well as foreign practices similar to the case of Armenia will maximize the likelihood of creating a policy that might increase the fertility rate among young families.

## **5 - Summary and Recommendations**

Using Armenia Demographic Health Survey data of 2015-16 an ordered-logit model was employed to estimate the effects of socioeconomic and demographic variables on the fertility decision of young families based on the survey data conducted on the married and cohabiting couples in Armenia. An estimation was conducted on rural and urban subsamples to reveal region-specific determinants of fertility decision to suggest policies tailored for regions including Yerevan.

The findings indicated the couple's decision to have children is dependent on demographic variables such as age and age at first cohabitation; socioeconomic variables such as the number of household members, home ownership, wealth index, women's and husband's educational attainment, and their current employment status; psychosocial variables such as

fertility preferences, fertility-related knowledge, internet usage as well as variables regarding the involvement in decision-making processes. The differences in the magnitude of those variables between the different samples highlight the policy focus points for urban and rural areas.

The wealth index, as a determinant of the decision of having children, suggests that enhancing living standards in rural and urban areas other than Yerevan, would increase fertility, having more couples wanting to have another child.

As the regression results suggest, the poorest income families are inclined to have more children than any other group, as well as, the richest are the least likely to have more children. In this context, the wealth index is associated with the income of the family (used as substitute to income in ADHS). The tendency of having more children among poorest families may be incentivized by the lump-sum benefit system. On the other hand, the less number of children in rich households may be associated with lack of time for childbearing. Thus, investing in child care facilities rather than providing monetary benefits for each additional child may be more advantageous for the representatives of all income groups.

The estimations confirmed that there is a higher probability of couples to have more children in case the woman has higher education as compared to the couples with women having primary education. With more women educated in rural areas that will later occupy good paying jobs, the reliance of women on men as breadwinners in the family will decrease contributing to the improvement in women's status. This may further add to the higher involvement of women in family and fertility related decision-making.

According to our model, couples, whose women are in current employment, have a higher likelihood of having a higher order of number of children than those couples whose women do not work. The former families are characterized by unequal distribution of family responsibilities, with women doing unpaid domestic work. Also, the fact that husband's current employment negatively affects the number of children, confirms that in the families where the husband is the main or only income earner the likelihood of having another child decreases. The results affirm the need for policies contributing to the equal share of family

and household responsibilities. A particular policy concentration is needed towards elimination of the social norms that disable women to work, thus, decreasing their chances of having more children.

The findings showed that increasing the awareness on family planning, in terms of providing information about family planning on different platforms, increases the fertility likelihood of the young couples. Given that psychosocial variables, such as correct knowledge of the fertile period and awareness of family planning positively impact women's decision to have an additional child in Yerevan, educational programs in schools for young females as well as seminars for older women on fertility-related issues may improve young women's confidence and drive more informed fertility decision-making process. As educating women on fertility related issues is important, such opportunities should not be limited to Yerevan but made accessible to everyone even in the remotest areas of Armenia.

Overall, based on the findings of this study, the following policies are recommended to address the residence specific fertility needs of young couples of rural and urban areas of Armenia.

- investment in child care facilities rather than payment for each additional child;
- implementation of programs aimed at increasing equality in household responsibilities among men and women;
- promoting attainment of higher education among women in rural areas;
- conducting educational programs promoting correct knowledge of fertility related issues among young females in schools, as well as seminars for adult females.

## References

- Axinn, W., & Barber, J. (2001). Mass Education and Fertility Transition. *American Sociological Review*, 66(4), 481-505.
- Beets, G. (2008). An introduction: Late fertility and determinants of postponement behaviour. *Genus*, 64(3/4), 17-31.
- Beguy, D. (2009). The impact of female employment on fertility in Dakar (Senegal) and Lomé (Togo). *Demographic Research*, 20, 97-128.
- Bongaarts, J. (2010). The causes of educational differences in fertility in Sub-Saharan Africa. *Vienna Yearbook of Population Research*, 8, 31-50.
- De Tray, D. (1977). Age of Marriage and Fertility: A Policy Review. *The Pakistan Development Review*, 16(1), 89-100.
- Drenovsky, C. (1994). The effects of mass education and labor on fertility in developing countries. *International Review of Modern Sociology*, 24(2), 1-16.
- Guilmoto, C. Z. (2013). Sex imbalances at birth in Armenia: Demographic Evidence and Analysis. United Nations Populations Fund Armenia.
- Hindin, M. (2000). Women's Autonomy, Women's Status and Fertility-Related Behavior in Zimbabwe. *Population Research and Policy Review*, 19(3), 255-282.
- Indongo, N., & Pazvakawambwa, L. (2012). Determinants of fertility in Namibia. *African Journal of Reproductive Health*, 16(4), 50-57.
- Klomegah, R. (1999). Socioeconomic Factors Relating To Fertility: A Ghanaian Level Test Of The Contextual Theory Of Fertility. *International Review of Modern Sociology*, 29(1), 17-33.
- Kollehlon, K. (1984). Women's Work Role and Fertility in Liberia. *Africa: Journal of the International African Institute*, 54(4), 31-45.
- Mason, K. (1987). The Impact of Women's Social Position on Fertility in Developing Countries. *Sociological Forum*, 2(4), 718-745.
- Statistical Committee of Armenia, Ministry of Health, Armenia, and ORC Macro. 2000. Armenia Demographic and Health Survey 2000. Calverton, Maryland, USA: NSS, MOH, and ORC Macro.
- Statistical Committee of Armenia, Ministry of Health, Armenia, and ICF. 2017. Armenia Demographic and Health Survey 2015-16. Rockville, Maryland, USA: NSS, MOH, and ICF.
- Nguyen-Dinh, H. (1997). A Socioeconomic Analysis of the Determinants of Fertility: The Case of Vietnam. *Journal of Population Economics*, 10(3), 251-271.

Standing, G. (1983). Women's work activity and fertility.

United Nations, Department of Economic and Social Affairs, Population Division. (2019). World Population Prospects 2019, Volume II: Demographic Profiles (ST/ESA/SER.A/427).

Williamson, J. (1970). Subjective Efficacy and Ideal Family Size as Predictors of Favorability Toward Birth Control. *Demography*, 7(3), 329-339.

Ying, S. (1992). Determinants of Fertility in Malaysia: How Much Do We Know? *Journal of Southeast Asian Studies*, 23(1), 112-132.

Zhang, J. (1990). Socioeconomic Determinants of Fertility in China a Microeconomic Analysis. *Journal of Population Economics*, 3(2), 105-123.

## Appendices

**Table 1A. Variable Definitions**

Variable	Definition
<i>Response variable</i>	
Number of children (grouped)	has four categories; takes 0 in case of maximum of zero children in the household, 1 if one child, 2 if two children, 3 if the household has three or more children with a maximum of 6 children
<i>Explanatory Variables</i>	
Age	the respondents' age (woman's) in years
Age at first cohabitation	the respondents' age (woman's) at first cohabitation in years
Number of household members (listed)	Number of listed household members varies from 2-11
House ownership	takes 0 if the couple does not own a house, and 1 if the couple owns a house either jointly or alone
Wealth index combined	composite measure of a household's cumulative living standard, used as a substitute to the variable income; wealth index is group in five categories; 0 - poorest, 1 - poorer, 2 - middle 3 - richer, 4 - richest
Woman's Educational Level	the variable is grouped in three categories; 0 - primary or less, 2 - secondary, 3 - higher
Husband's Educational Level	the variable is grouped in three categories; 0 - primary or less, 2 - secondary, 3 - higher
Woman Currently Working	takes 0 if does not work, 1 if works
Husband Currently Working	takes 0 if does not work, 1 if works
Fertility Preference	Fertility preference of the woman grouped in three categories; 0 if wants no more, 1 if undecided, 2 if wants more
Heard Family Planning	Heard family planning by text messages on mobile phone, TV, radio newspaper/magazine last few months; takes 0 if no, 1 if yes
Knowledge on fertile period	Knowledge of ovulatory cycle grouped in three categories; 0 if don't know, 1 if knows incorrect, 2 if knows correct
Frequency of using internet last month	Woman's frequency of using internet is grouped in four categories; 0 - not at all, 1 - less than once a week, 2 - at least once a week, 3 - almost every day
Decision maker on health care	Person who usually decides on women's health care; 0 - separate decision or decided someone else, 1 - joint decision of the couple
Decision maker on hh purchases	Person who usually decides on large household purchases; 0 - separate decision or decided someone else, 1 - joint decision of the couple
Decision maker on family visits	Person who usually decides on visits to family or relatives; 0 - separate decision or decided someone else, 1 - joint decision of the couple

Source: Authors' elaboration on ADHS 2015-16

**Table 2A. Distribution, frequencies of categorical variables**

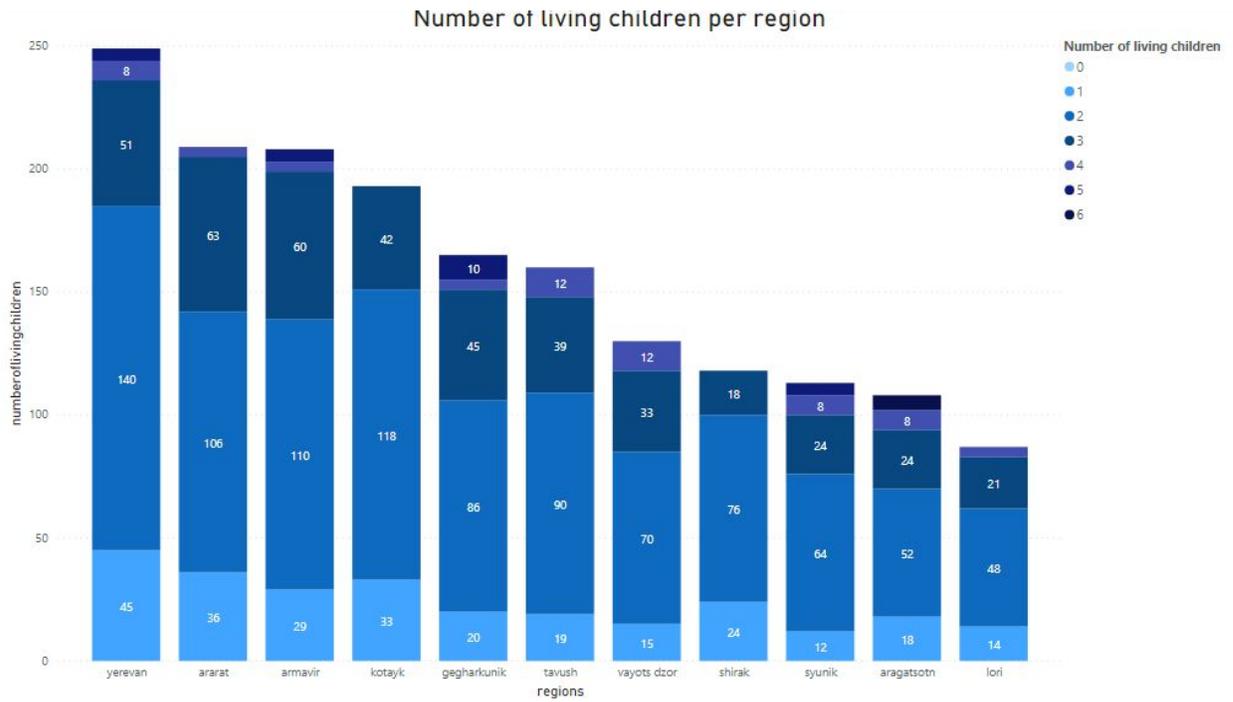
Variable Name	Observations	Unique	Top	Freq.
Type of residence	1015	2	Urban	564
Region	1015	11	Yerevan	154
Women's education	1015	3	Secondary	498
Women's working status	1015	2	Not working	760
Women's occupation	1015	7	Not working	689
Husband's education	1015	3	Primary or less	516
Husband's working status	1015	2	Working	745
Husband's occupation	1015	7	Manual	324
Fertility Preference	1015	4	Uncertain	417
Heard about family planning	1015	2	No	716
Knowledge about fertility	1015	3	Incorrect knowledge	600
Decision making about health care	1015	2	Joint decision	763
Decision making about household purchases	1015	2	Joint decision	639
Decision making about family visits	1015	3	Joint decision	839
Frequency of using internet	1015	4	Not at all	563
Ownership of the house	1015	2	Does not own	584

**Table 3A. Fertility preference of the respondent (woman) by the number of living children**

Fertility Preference	Number of living children				Total
	0	1	2	3	
no more	12	44	146	25	227
have another	96	203	112	6	417
undecided	0	15	221	131	367
Total	108	262	479	162	1,011

Source: Authors' calculation based on ADHS 2015-16

**Figure 1A. Number of living children by the region**



**Figure 2A. Number of living children by the wealth groups**

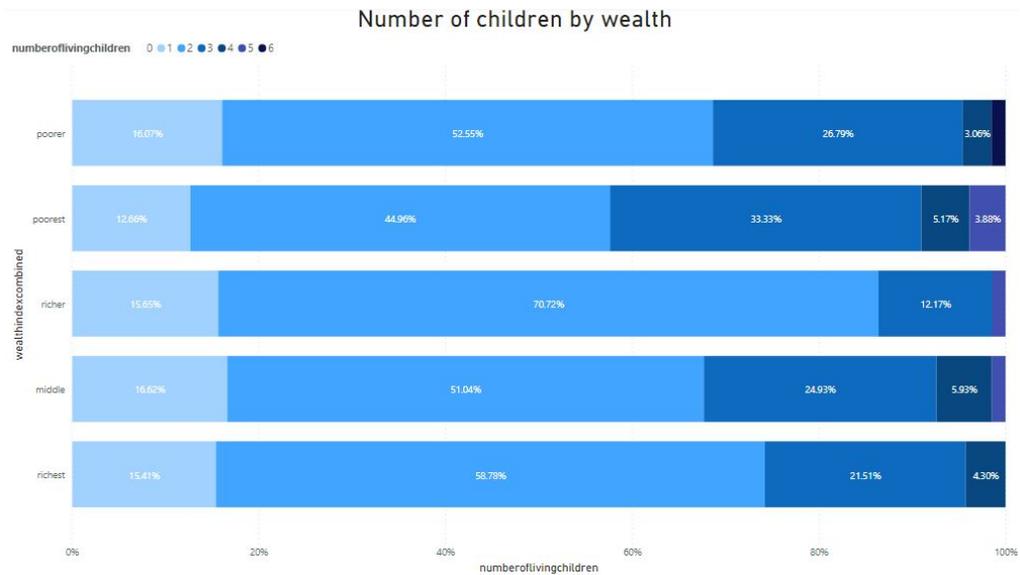


Figure 3A. Number of living children by the women's education

