The determinants of early marriage and under-five child mortality in Afghanistan

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The determinants of early marriage and under-five child mortality in Afghanistan

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Abstract

We use data from the Demographic and Health Survey of Afghanistan 2015 to conduct a study of determinants of early marriage and effect of early marriage on child mortality under five years. In order to conduct this study, binary logit, *probit* (Marginal effects) and OLS regression methods were used. The first step in this study was to find the determinants of early marriage and conduct binary logit analysis. According to the result, it was found that the main determinants of early marriage are the education of women, employment status, exposure to media, ethnicity, current age group, marital status, number of wives and unions, region, place of residence and age at first sexual activity. Education, ethnicity, age at first sexual activity significantly affect the likelihood of early marriage. Moreover, after finding the determinants of early marriage, we analyzed the effect of early marriage on child mortality under five years using *probit* (Marginal effects) and OLS regression methods. According to the results obtained after the analysis, it was found that early marriage increases the likelihood of child mortality by 17.57%, 17.54% and 14.28% among all children, sons and daughters, respectively. According to OLS estimates, early marriage increases child mortality by 0.04, 0.02, and 0.02 among all children, sons, and daughters, respectively. Moreover, it was found that number of wives, years since first cohabitation, contraceptive usage, age at first birth, place of residence, wealth index, number of family members, women and children under five years and ethnicity affect the likelihood and number of children mortality under five years. Also, we address endogeneity problem of origin household selection.

Keywords: *early marriage, children mortality, determinants of early marriage, Afghanistan*

1.   Introduction

In most countries of the world, the trend of early marriage prevails, that is, the age of women in most cases does not reach 18 years of marriage. This practice of early marriage is condemned by the UN, the convention of which says that "early and forced marriage" are a direct violation of human rights and freedom. According to the UN, early marriages are considered harmful practice, as they lead to the termination of education by a woman, and also inhibit the process of physical and emotional maturity, which is necessary to move to the stage of adulthood. Moreover, early marriage deprives a woman of the right to participate in family decisions, thereby restricting her freedom. According to an international agreement, a woman, like a man, "freely chose a spouse and to enter into marriage only with their free and full consent. " However, as practice in Afghanistan shows, the girl's parents try to marry her as soon as the she reaches the period of menarche in order to avoid an unwanted pregnancy, and this in turn violates the girl's right to freedom of choice of her future spouse. Despite the fact that the legal age for marriage is 18 years, as was said earlier, this indicator varies from 10 to 20 years in many countries. Thus, according to statistics, only 11 countries in the world adhere to the UN convention, 73 countries have a minimum age for marriage at 18, but make exceptions, and 102 countries do not have a law establishing a minimum age for marriage.

Studies in this area have shown a direct relationship between early marriage and the health of children and their mothers. The revealed relationship is negative and, moreover, affects not only the health of the child and mother, but also her role as woman in the family, the right to vote, freedom of movement, the right to employment and education. However, recent studies have shown that later marriages have a positive causal effect on the factors mentioned above (Field and Ambrus, 2008). A study in India found that children born in later marriages have higher arithmetic and reading rates than children born in early marriage (Sekhri and Debnath, 2014).

The age at which a woman marries is significant for a number of the following reasons:

Firstly, a girl who has married, in most cases, must stop her education, as the spouse's family does not give the girl the right to receive education. This factor entails the inability to develop as a person, which leads to a lack of knowledge and a gradual regression of the girl's personal growth. And this, in turn, leads to the fact that the girl does not have "authority" in the family, that is, a lack of voting rights in family decisions, as well as a negative effect on woman's bargaining power.

The Constitution of Afghanistan states that "Any discrimination and privileges are prohibited among citizens of Afghanistan. Afghan citizens, men and women, have equal rights and obligations before the law" (The Constitution of Afghanistan, 2004). However, this law only acts on paper, and reality is different. According to statistics, only one in five women in Afghanistan has a document confirming her identity. Most girls and women do not have the right to vote either in society or in the family, as a result of which the parents of each girl make an independent decision on her marriage. According to the law, Afghan girls can marry at 16 years old, under special circumstances at 15, while the minimum age for marriage in the world is 18 years. "My parents say they do not care if I'm

happy or not," she said. "They want me marry and that's it.", says one of the girls in Afghanistan (UNICEF, 2019). There are various reasons conducive to early marriage. One of them is the desire to strengthen ties between families to stop competition, blood feud, disputes and cover the debts of the girl's family. Moreover, poor families are trying to sell the girl, considering their daughter an economic burden, to a wealthy family, in order to secure a future life. Usually a large ransom is offered by rich man who are much older than girl, taking her as second wife. According to UNFPA, one in ten teenage girls between the ages of 15 and 19 gives birth almost every year, which leads to negative consequences for the health of the mother and her baby (UNFPA, no date). As a result of such physical exhaustion of the body, teenage girls die during pregnancy or after childbirth. The number of girls who die as a result of annual birth is 531 per 100,000 live births among adolescents 15-19 years old, but this figure is half that among girls 20-24 years old. Moreover, teenage girls have problems with the female organs as a result of repeated obstetric intervention, which leads to fistula[1]. Organizations such as the United Nations and its branches UNFPA, UN Women, UNICEF, UNAMA and UNDP are in close negotiations with the government, with its state and religious leaders, conduct lectures among the general public, in most cases of illiteracy people, about the negative consequences of early marriages, thereby encouraging girls' families not to marry their daughters in their teens, but primarily to try to educate their daughters.

Using Afghanistan's DHS data for 2015, first of all we try to find what are the determinants of early marriage. Further, using these determinants and the age of marriage as independent values, we try to look at their effect on child mortality under-five years, analyzing the overall effect, as well as separately on the child mortality of sons and daughters, while controlling for the age of the woman at the birth of her first child, her education, as well as the age interval between spouses and the education of a partner.

The rest of the paper is structured as follows. Section 2 introduces the empirical studies that were conducted in other countries. Section 3 involves dataset used and provides some summary statistics. Section 4 outlines the empirical strategy and reports the results. Section 5 consists of a discussion and conclusion. Section 6 concludes the entire empirical study by providing policy implications.

2.   Theoretical Framework: Empirical Studies from different parts of the world

The topic of teenage pregnancy and child mortality has previously been addressed in many empirical studies in various countries. In these research study, the econometric analyzes has been done to show the determinants of early marriage and the negative impact of adolescent motherhood on the lives of children under 5 years old.

According to Mim, early marriage negatively affects girl's education, as the girl cannot continue her studies after marriage, which leads to a decrease in the bargaining power of women in the family (2017). Assaad et al. conducted a study in the Middle East and North Africa using a multivariate setting and an instrumental variable to endogenize a marriage decision. The regression revealed that early marriage reduces the likelihood of

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[1]An obstetric fistula is a hole between the vagina and rectum/bladder that is caused by prolonged obstructed labour, leaving a woman incontinent of urine, faeces or both (UNICEF, 2019).

employment by 16% in Egypt, 33% in Tunisia and 47% in Jordan. Thus, marriage negatively affects a woman's work ability, thereby reducing her ability to have a paid job (2017). Family wealth index has a tangible impact on early marriage. It has been proven that the probability of getting married early is higher if family is from poorest wealth quintile and this probability becomes less and less as wealth index increases in the household in Democratic Republic of Congo (Mpilambo et al., 2017). Moreover, number of wives and number of unions effect the early marriage. According to Mpilambo et al., respondents who entered the union only once and those respondents who had monogamous type of union were less likely to be in the group of early-married women. Researchers also claimed that adolescence from rural place of residence had higher probability to be early-married (2017).

In an empirical study using the example of Izmir (Turkey), it was proved that in the neonatal period the risk of complications such as respiratory distress (2.3%), infection (0.9%), Rh immunization (1.8%), as well as postpartum traumatic stress (0.5%) is high (Keskinoglu, 2007). These complications can lead to neonatal mortality in newborns from teenage mothers. Thus, in the USA, as a result of a study conducted by Malabarey, et al., it was found that mortality in the neonatal period of infants in adolescent mothers under 15 years old is 0.86%, after 15 years-0.41%. Moreover, according to empirical analysis conducted in India, 5.1% of infants born from adolescents die in the period up to 48 hours, which is almost 4 times higher than in adult mothers (Mukhopadhyay, 2010). One of the main causes of neonatal mortality is the low weight of the adolescent during pregnancy, a deficiency of vitamins and nutrients entering the fetus during fetal development, which entails a slowdown in the process of weight gain in an unborn baby. The process of bonding of the mother and the child also affects the development of the baby. In view of the fact that the mother of the baby is a teenager, she is in a developmental stage, as a result of which she is not always able to establish an emotional connection with her child. This statement was reviewed and proven by Italian researchers Crugnola et al., where, for analysis, the relationship between a teenage mother and an infant was recorded and then encoded with a modified version of the Infant Caregiver Engagement Phases (2014). As a result, a teenage mother spends less time communicating with her child through the game, which entails a weak response from the child to the mother.

Breastfeeding and its duration have a significant impact on the height, weight, psychological development of the baby. In a study in Ohio, the United States, it was argued that the initiative to breastfeed a baby in a teenage mother (44%) was significantly lower than that of adult mothers (65%), the cause of which was adverse socioeconomic conditions and poor social support (Kyrus, Valentine, and DeFranco, 2013). Moreover, Oddy, et al. conducted a study in Australia, where 2,900 pregnant women were included into analysis and researchers were observing them and their children during 14 years. Thus, it was revealed that only 12.6% of mothers of adolescents breast-fed infants up to 6 months, and breastfeeding for more than 6 months amounted to 3.2% in teenage mothers. As a result, it was emphasized that short breastfeeding leads to a delayed development of the infant, namely, a lag in growth, weight and negatively affects the mental health of the baby (2010).

Marphatia et al. conducted research in traditional societies, which are often characterized by early marriages, which is associated with the mentalities of this societies (2017). An analysis of the impact of early motherhood on infant development covered countries such as Bangladesh, Nepal, India and Pakistan. Using an integrative perspective, factors such as socio-economic, bio-demographic, and physiological factors influenced the variable age of marriage. As a result of undernutrition, low living conditions, lack of education, low social status, the inability to receive the necessary medical services, as well as high morbidity and mortality, infants are lagging behind in the weight, growth and mental development (2017).

It is mothers who have a significant influence on the nutrition of their children, since nutrition which is deficient in vitamins, iron and folic acid affects the health of their children (Smith et al. 2003). The reasons for poor nutrition are the low level of material well-being of women, gender inequality, the right of women in the family to participate in decision-making process.

Chari et al. conducted household surveys in India, where it was found that the age of marriage and subsequent childbirth have a significant impact on the development of the baby (2017). Marriages at a more advanced age contribute to improving the health of children, as well as raising their educational level, since parents think more not about the quantity of children, but about the quality of each child (2017).

In addition to the negative impact of teenage pregnancy on the health and development of the infant, the health of the teenage mother is deteriorating during the first and subsequent births. As a result, in a study in Ghana, where teenage pregnancy is 30% of the total number of teenagers, teenage mothers under 19 years old are 80% more at risk for caesarean operation than pregnant women over 19 years old (Yussif et al., 2017). In addition, the risk of losing a child in the first 6 weeks of pregnancy in adolescents was 30% higher than in older women, while both age groups had the same socio-economic status.

Another study of the effects of adolescent motherhood on low weight and preterm birth is the analysis of pregnant women in sub-Saharan Africa (Mombo-Ngoma et al., 2016). An econometric analysis, where 24% of the total number of women studied were adolescents under the age of 19 years, revealed that in teenage mothers 10% of infants are born with low weight, and in 4% of adolescent women have a premature birth. Thus, early pregnancy is the main reason for the low level of weight in the newborn, as well as the increased chance of premature birth (2016).

As can be seen from the above, studies in the field of early motherhood and factors affecting the low level of development of the children and its lag have been conducted in many countries. However, a study addressing the issue of teenage pregnancy and its effect on the health of the child and mother has not been carried out for Afghanistan.

The objectives of this study are to find determinants of teenage pregnancy and its effect on child mortality under-five years.

Deducting the above, we would like to shed light on determinants of teenage pregnancy and its effect on child mortality under-five years based on a data from Afghanistan

Demographic and Health Survey 2017 (AfDHS). The sample size consists of 29 461 ever-married women out of which 1 911 respondents are women at the age of 15-19 years.

3. Empirical Investigation: Data and Methodology

For this analysis, data from Demographic and Health Survey (DHS) 2015 were used, where 25650 urban and rural households were interviewed in all 34 provinces of Afghanistan. Respondents were interviewed on issues related to their marriage and sexual activity, fertility, infant and child mortality, maternal and child health care, nutrition and women's empowerment.

Demographic and Health Survey 2015 also surveyed 29,461 ever married women aged 15 to 49 (they were either permanent residents of this households or visitors who stayed the night before the interview). In this analysis we included only 26,400 ever married women who gave a first birth before the age of 30. We made this decision because it is not common for women living in Afghanistan to give a first birth after the age 30 and such pregnancies can be risky for women's health.

3.1. Descriptive Statistics - Early-married women

Table 1 presents Descriptive Statistics of ever married women aged 8 to 24 years. We took this age interval because in this sample the earliest marriage age is 8 years old, and the age from 18 to 24 years is considered to be early adulthood. The Table presents 3 age groups of ever married women: less than 15 years old, 15-17, 18-24. The determinants shown in the Table were selected according to literature review, which, according to studies, are the most common indicators of early marriage among women.

The determinants are divided into two groups, such as 1) Socio-economic and cultural characteristics, 2) Demographic and behavioral characteristics. According to the first group of characteristics, girls who do not have an education marry before, on average, their age is 17.48 years, compared with girls with higher education, their marriage age is 18.49 years. Table 1 shows that the percentage of women married before the age of 18 is higher (51.34%) for those who do not work compared to girls who have paid work (49.25%). The next determinant is the impact of the media, according to which 53.79% of girls who do not have access to media are married before the age of 18, but the percentage of early married girls with media exposure is 49.59%. According to the table, the family wealth index does not affect marriage age, girls from the poorest and richest families marry at about the same age, 17.09 and 17.10 years, respectively. Ethnic characteristics also affect early marriages, so the percentage of women who are married before the age of 18 is the highest among the Baloch ethnic groups (68.14%) and the average marriage age is 16.11 years compared to the Turkmen ethnic group, where 37.88% of girls are married before 18 years old, and the average age of this group is 18.61 years. This may be due to the fact that the Baloch ethnic group is located on the borders of Afghanistan, while bordering with Pakistan; according to statistics, in these regions a high level of early marriage (UNPFA) is observed. Girls whose real age is 15-19 years are more likely to marry before the age of 18 (84.36%) compared with those whose real age is 20-24 years (49.88%).

Table 1. *Socio-economic and cultural characteristics and Demographic and behavioral characteristics*

Socio-economic and cultural characteristics	Less 15 N (%)	15-17 N (%)	18-24 N (%)	Total N (%)	Mean	(SD)
Educational level						
No education	3576	8749	11770	24095	17.48	(2.92)
	14,84%	36,31%	48,85%	100%		
Primary	310	753	847	1910	17.18	(2.82)
	16,23%	39,42%	44,35%	100%		
Secondary	203	670	854	1727	17.54	(2.70)
	11,75%	38,80%	49,45%	100%		
Higher	35	123	290	448	18.49	(2.80)
	7,81%	27,46%	64,73%	100%		
Total	4124	10295	13761	28180		
	14,63%	36,53%	48,83%	100%		
Employment status						
No	3725	9197	12246	25168	17.47	(2.90)
	14,80%	36,54%	48,66%	100%		
Yes	370	1066	1480	2916	17.63	(2.83)
	12,69%	36,56%	50,75%	100%		
Total	4095	10263	13726	28084		
	14,58%	36,54%	48,87%	100%		
Exposure to Medias						
No	1675	4028	4900	10603	17.33	(2.86)
	15,80%	37,99%	46,21%	100%		
Yes	2449	6263	8856	17568	17.58	(2.92)
	13,94%	35,65%	50,41%	100%		
Total	4124	10291	13756	28171		
	14,64%	36,53%	48,83%	100%		
Family Wealth Index						
Poorest	970	2146	2322	5438	17.09	(2.86)
	17,84%	39,46%	42,70%	100%		
Poorer	832	2356	3295	6483	17.63	(2.85)
	12,83%	36,34%	50,83%	100%		
Middle	671	2010	3366	6047	17.89	(2.85)
	11,10%	33,24%	55,66%	100%		
Richer	835	2190	2962	5987	17.55	(2.91)
	13,95%	36,58%	49,47%	100%		
Richest	816	1593	1816	4225	17.10	(2.99)
	19,31%	37,70%	42,98%	100%		
Total	4124	10295	13761	28180		
	14,63%	36,53%	48,83%	100%		
Ethnicity						
Pashtun	1487	4247	6224	11958	17.71	(2.83)
	12,44%	35,52%	52,05%	100%		
Tajik	1501	3269	3812	8582	17.20	(2.95)
	17,49%	38,09%	44,42%	100%		
Hazara	549	916	1139	2604	16.95	(3.12)
	21,08%	35,18%	43,74%	100%		
Uzbek	289	697	957	1943	17.56	(2.97)
	14,87%	35,87%	49,25%	100%		
Turkmen	47	167	351	565	18.61	(2.98)
	8,32%	29,56%	62,12%	100%		
Nuristani	40	497	696	1233	17.80	(2.06)
	3,24%	40,31%	56,45%	100%		
Baloch	109	122	108	339	16.11	(3.16)
	32,15%	35,99%	31,86%	100%		
Pashai	49	195	254	498	17.77	(2.67)
	9,84%	39,16%	51,00%	100%		
Other	50	164	195	409	17.55	(2.79)
	12,22%	40,10%	47,68%	100%		
Total	4121	10274	13736	28131		
	14,65%	36,52%	48,83%	100%		

Demographic and behavioral characteristics	Less 15 N (%)	15-17 N (%)	18-24 N (%)	Total N (%)	Mean	(SD)
Current age group						
15-19	324	1219	286	1829	15.95	
	17,71%	66,65%	15,64%	100%		
20-24	737	2297	3049	6083	17.38	
	12,12%	37,76%	50,12%	100%		
Total	1061	3516	3335	7912		
	13,41%	44,44%	42,15%	100%		
Marital status						
Married	3967	10043	6011	20021	17.49	(2.89)
	19,81%	50,16%	30,02%	100%		
Divorsed/Widowed/Separeted	157	252	72	481	17.18	(3.20)
	32,64%	52,39%	14,97%	100%		
Total	4124	10295	6083	20502		
	20,12%	50,21%	29,67%	100%		
Number of unions						
Once	3694	10036	13466	27196	17.50	(2.89)
	13,58%	36,90%	49,51%	100%		
More than once	95	123	126	344	16.56	(3.16)
	27,62%	35,76%	36,63%	100%		
Total	3789	10159	13592	27540		
	13,76%	36,89%	49,35%	100%		
Number of wives						
No other wives	3684	9415	12452	25551	17.48	(2.88)
	14,42%	36,85%	48,73%	100%		
One and plus	262	570	858	1690	17.60	(3.06)
	15,50%	33,73%	50,77%	100%		
Do not know	10	33	63	106	18.01	(2.99)
	9,43%	31,13%	59,43%	100%		
Total	3956	10018	13373	27347		
	14,47%	36,63%	48,90%	100%		
Province						
Kabul	125	240	331	696	17.34	(3.27)
	17,96%	34,48%	47,56%	100%		
Kapisa	134	317	380	831	17.18	(2.76)
	16,13%	38,15%	45,73%	100%		
Parwan	100	261	353	714	17.60	(3.08)
	14,01%	36,55%	49,44%	100%		
Wardak	78	205	516	799	18.41	(3.10)
	9,76%	25,66%	64,58%	100%		
Logar	23	170	671	864	19.38	(2.47)
	2,66%	19,68%	77,66%	100%		
Nangarhar	143	404	439	986	17.33	(2.75)
	14,50%	40,97%	44,52%	100%		
Laghman	96	277	385	758	17.69	(2.85)
	12,66%	36,54%	50,79%	100%		
Panjsher	102	209	329	640	17.50	(3.28)
	15,94%	32,66%	51,41%	100%		
Baghlan	181	230	279	690	16.63	(3.43)
	26,23%	33,33%	40,43%	100%		
Bamyan	123	240	266	629	17.05	(2.98)
	19,55%	38,16%	42,29%	100%		
Ghazni	162	279	625	1066	18.06	(3.32)
	15,20%	26,17%	58,63%	100%		
Paktika	8	46	1024	1078	19.93	(1.64)
	0,74%	4,27%	94,99%	100%		
Paktya	109	340	649	1098	18.19	(2.97)
	9,93%	30,97%	59,11%	100%		
Khost	106	590	597	1293	17.48	(2.44)
	8,20%	45,63%	46,17%	100%		
Kunarha	115	272	316	703	17.20	(2.74)
	16,36%	38,69%	44,95%	100%		
Nooristan	39	554	783	1376	18.04	(2.04)
	2,83%	40,26%	56,90%	100%		
Badakhshan	145	344	316	805	16.98	(2.72)
	18,01%	42,73%	39,25%	100%		
Takhar	167	318	307	792	16.91	(2.79)
	21,09%	40,15%	38,76%	100%		

Kunduz	121	269	412	802	17.59	(2.92)
	15,09%	33,54%	51,37%	100%		
Samangan	119	212	314	645	17.31	(3.14)
	18,45%	32,87%	48,68%	100%		
Balkh	122	314	418	854	17.57	(2.90)
	14,29%	36,77%	48,95%	100%		
Sar-E-Pul	74	309	385	768	17.75	(2.74)
	9,64%	40,23%	50,13%	100%		
Ghor	216	391	261	868	16.30	(2.69)
	24,88%	45,05%	30,07%	100%		
Daykundi	173	233	241	647	16.29	(2.96)
	26,74%	36,01%	37,25%	100%		
Urozgan	66	298	431	795	17.76	(2.37)
	8,30%	37,48%	54,21%	100%		
Zabul	14	69	78	161	17.80	(2.60)
	8,70%	42,86%	48,45%	100%		
Kandahar	135	417	367	919	17.09	(2.58)
	14,69%	45,38%	39,93%	100%		
Jawzjan	71	242	503	816	18.42	(2.88)
	8,70%	29,66%	61,64%	100%		
Faryab	100	245	333	678	17.59	(3.02)
	14,75%	36,14%	49,12%	100%		
Helmand	162	326	312	800	16.96	(2.93)
	20,25%	40,75%	39,00%	100%		
Badghis	262	353	236	851	16.08	(2.85)
	30,79%	41,48%	27,73%	100%		
Herat	112	455	405	972	17.09	(2.35)
	11,52%	46,81%	41,67%	100%		
Farah	173	599	350	1122	16.61	(2.24)
	15,42%	53,39%	31,19%	100%		
Nimroz	248	267	149	664	15.62	(2.95)
	37,35%	40,21%	22,44%	100%		
Total	4124	10295	13761	28180		
	14,63%	36,53%	48,83%	100%		
Place of residence						
Rural	2795	7776	10912	21483	17.62	(2.86)
	13,01%	36,20%	50,79%	100%		
Urban	1329	2519	2849	6697	17.04	(3.01)
	19,84%	37,61%	42,54%	100%		
Total	4124	10295	13761	28180		
	14,63%	36,53%	48,83%	100%		
Age at first sex						
Less than 16	3754	2275	82	6111	13.92	
	61,43%	37,23%	1,34%	100%		
Between 16 and 17	75	6779	241	7095	16.34	
	1,06%	95,55%	3,40%	100%		
Between 18 and 24	83	912	12872	13867	19.62	
	0,60%	6,58%	92,82%	100%		
Total	3912	9966	13195	27073		
	14,45%	36,81%	48,74%	100%		

According to Table 1, girls who have divorced, widowed or do not live with their partner married earlier than those who are still married, 17.18 and 17.49, respectively. Regarding the number of unions, 63.38% of girls married before 18 years old experienced more than one union and their average marriage age was 16.56 years, compared with 50.48% of girls married after 18 years old, whose average age at marriage was 17.50 years. The form of union between a man and a woman is also one of the determinants of early marriage; according to the Table, women living in polygamous families married on average at 17.60 years and their percentage is 49.23% compared with 51.27% of girls whose husbands have no other wives and their average marriage age was 17.48 years. Among the 34 provinces of Afghanistan, the earliest marriages were registered in the province of Nimroz, where 77.56% of girls were married before 18 years old and the average age of marriage in this

province was 15.62 years compared with Paktika province where only 5.01% of girls were married before 18 years and the average marriage age in this province is the highest, 19.93 years. This trend is observed because in the province of Nimroz, the majority of the population is the Baloch ethnic group, however, mostly Turkmens live in Paktika, where 37.88% of girls marry before the age of 18; this indicator is the lowest among all ethnic groups living in Afghanistan. According to the table, girls living in rural areas get married on average later in comparison with those who live in urban areas, 17.62 and 17.04 years, respectively. The last determinant in the table is the age at the first sex, according to which the earlier the girls begin their sexual life, the earlier they get married. 98.66% of girls who had their first sex before 16 years old got married on average at 13.92 years, compared with 7.18% of girls who had their first sex at 18-24, got married on average at 19.62 years. Thus, the later the girl begins a sexual life, the higher the expectancy is that she will marry after 18 years.

3.2.   Descriptive Statistics - Child mortality

In this study, we analyze such measurements of child mortality as a woman experienced at least one child death under 5 years and the total number of dead children under-five per woman up to 30 years old. According to the literature review, which was presented above, children mortality mainly occurs due to undernutrition, not receiving the required vaccinations by age, lack of intake of foods with vitamin A and iron.

Table 2 presents descriptive statistics for child mortality under-five per woman before 30 years.

Table 2. *Descriptive statistics for child mortality under-five per woman - Sample of ever-married mothers before the age of 30*

	Married before 18 (1)	Married 18-30 (2)
Percentage of dead children under-five years	38%	27%
Percentage of dead son under-five years	22,8%	15,6%
Percentage of dead daughter under-five years	18,4%	12,9%
Average number of dead children per woman	0,44	0,30
Average number of dead son per woman	0,24	0,16
Average number of dead daughter per woman	0,19	0,13
Observations	13 981	15 831

We consider the percentage of dead children under 5 years of age in two group categories: 1) women married before 18 years old, 2) women married after 18 years old. According to the table, 38% of all children born to women married before 18 years old died before the age of five, compared with 27% of dead children under 5 years old to

women married after 18 years. Regarding the sons' mortality, 22.8% of the sons died among mothers who were married before the age of 18, while 15.6% of the sons died whose mothers married after 18 years. According to statistics, the percentage of daughters' mortality of women of the first group is 18.4% compared with 12.9% of daughters' mortality of women who married after 18 years. The average number of dead children per woman in the first and second groups is 0.44 and 0.30, respectively. The average number of dead son per woman married before the age of 18 is 0.24, while this number is 0.16 per women of the second group. The average number of dead daughter per woman in the first and second groups is 0.19 and 0.13, respectively.

4.   Econometric Specification

First of all, we attempt to look at the effect of the determinants that are shown in Table 3 on the women's probability of getting married before the age of 18. To conduct this analysis, we use binary logistic regression, whereas the dependent value we used is the age of a women in her first marriage. In the AfDHS, we did not find this variable, so we equated the age of the girl in the first marriage to the age of cohabitation. Since the endogenous variable should have been represented as a dummy variable in the Binary logistic regression, we set the value "0" for those women who got married after 18 years while the value "1" was assigned to women who got married before 18 years old, inclusive. Independent variables include two groups, such as 1) Socio-economic and cultural characteristics, 2) Demographic and behavioral characteristics.

The first group of characteristics included the following variables: 1) the dummy variable of educational level, taking values from "0" to "4", where "4" means "higher", 2) the binary indicator of Employment status, 3) the binary indicator of media exposure, 4) ethnicity. The following variables were included in the second group of characteristics: 1) the binary indicator of current age group ("1" denotes for 15-19 age group, "0" denotes for 20-24 age group), 2) the binary indicator of marital status, 3) the binary indicator of number of unions, 4) the binary indicator of number of wives, 5) province, 6) the binary indicator of place of residence, taking value "0" for rural, "1" for urban, 7) age at first sex, taking the value "0" if the first sexual intercourse occurred between 18 and 24.

In the second part of our analysis, we try to determine the effect of early marriage on children mortality under five years old. To conduct it, we use a sample of early married women who gave a first birth before the age of 30. The econometric model that was used in this analysis is as follows:

$$\text{ChildMort}_{jhp} = \alpha + \beta \, \text{EarlyMarriage}_j + \gamma \, X_{jh} + \lambda_p + \varepsilon_{jhp} \qquad (1)$$

where endogenous variable ChildMort is a dummy variable that denotes dead child under-five of woman j who lives in household h which located in province p. This variable includes either at least one dead child of woman j or the total number of dead children under 5 years of woman j. The independent variable X_{jh} includes all the variables of socio-economic and cultural characteristics and demographic and behavioral characteristics of woman j in household h, which we use in the first stage of analysis (see Table 1). In the

econometric model we also include λ_p, which denotes for regional fixed effects since, as noted in the Descriptive Statistics - Early-married women section, the distribution of early married women differs depending on the province in which the woman j lives.

In the process of data analysis, it was noted that the number of dead sons and daughters differs, therefore the econometric model (1) was applied not only to all children, but also was tested separately among sons and daughters.

4.1.   Control for the effect of early marriage

According to the literature review that was carried out, we concluded that there are three main channels through which early marriage affect child mortality. Thus, in econometric model (1) we include several control variables, which were added in the following way:

1) According to a literature review, one of the channels through which early marriage affects child mortality is the average fertility interval. Data on previous fertility intervals were presented in the AfDHS. Therefore, to create this control variable, we found the difference between the current birth interval and the previous one, expressed in months. The average fertility interval and the number of children born to a woman are inversely proportional. It was proved that the smaller the interval between each birth, the more the woman's body wears out and leads to negative consequences for the health of the woman and her child. Moreover, a greater number of children born increases the competition between them, leading to the early marriage of teenage girls. As a result, we chose the average birth interval as a control variable to capture the effect of early marriage on child mortality.

2) The following control variable is the education of the woman, as it is one of the main determinants of early marriage and thus we can capture the effect of early marriage on child mortality. As noted above, the education variable is a dummy variable from "0" to "4", defining no education, primary education, secondary education and higher education.

3) The last control variables are part of the empowerment of women group. We control the effect of early marriage on child mortality using control variables such as spouses' age interval and husband's education.

In the second part of our analysis we conduct probit regression (marginal effects) and OLS regression analyses.

5.   Empirical Results

5.1.   Binary logistic estimation results

Table 3 presents the results of the binary logistic regression of the effect of determinants on early marriage. According to the table, women without education are 1.92 times more likely to marry before 18 years of age compared to girls with higher education, while girls with primary education are 2.30 times more likely to marry before 18 years of age compared to girls with higher education. Women who do not have a paid job are 1. 09 times more likely to get married before the age of 18 than women who are employed. Moreover, the inaccessibility media exposure increases the likelihood of a woman getting married before the age of 18 by 1.18 times. A woman whose family wealth index is the poorest is 1.01 times more likely to marry before the age of 18 compared with women from the richest families. Moreover, women from middle and wealthy families are 0.6 and 0.77 times less likely to get married before the age of 18 than women from richest families. Women who are from Pashtun and Pashai ethnic groups are 1.51 and 1.57 times, respectively, more likely to get married before the age of 18 than women who belong to the Turkmen ethnic group. The most likely to get married before the age of 18 is for women belonging to the Baloch ethnic group (3.51 times) compared with Turkmen women. According to the current age group, those women who are currently at 15-19 age group are 5.42 times more likely to get married before 18 compared to those in the 20-24 age group. Women who have experienced more than one union were 1.66 times more likely to marry before the age of 18 compared with those who have experienced one union. Also, a woman from a monogamous family is 1.08 times more likely to marry before the age of 18 than a woman from a polygamous family, however, these results were insignificant. According to the results, women living in Kabul are more likely to get married before 18 years compared with women living in Paktika province (20.91 times). Women who are living in the provinces of Badghis and Nimroz are most likely to get married before the age of 18, 49.42 and 65.54 times, respectively, more likely than women from Paktika. As for the place of residence, women from urban areas are 0.72 times less likely to get married before age 18 compared to women living in rural areas. The last independent variable is age at first sex, according to which a woman who began sexual activity before the age of 16 is 951.32 times more likely to marry before the age of 18 compared with women who first entered into sexual intercourse at 18-24. Similarly, women who started sexual activity at 16-17 years old are 367.92 times more likely to marry before 18 years old compared to women who started sexual activity at 18-24 years old.

Table 3. *The effect of determinants on early marriage*

Independent variables	Odds ratios (OR)	Independent variables	Odds ratios (OR)
Educational level		*Current age group*	
No education	**1.922*** (0.192)**	15-19	5.422*** (0.376)
Primary	**2.304*** (0.251)**	20-24	RC
Secondary	**1.876*** (0.206)**	*Marital status*	
Higher	RC	**Married**	**0.902 (0.0664)**
Employment status		Divorsed/Widowed/Separeted	RC
No	1.088** (0.0426)	*Number of unions*	
Yes	RC	Once	RC
Exposure to Medias		More than once	1.664*** (0.187)
No	1.183*** (0.0292)	*Number of wives*	
Yes	RC	No other wives	1.085 (0.0545)
Family Wealth Index		One and plus	RC
Poorest	1.012 (0.0419)	*Province*	
Poorer	0.729*** (0.0290)	Kabul	20.91*** (3.323)
Middle	0.600*** (0.0243)	Kapisa	22.51*** (3.512)
Richer	0.770*** (0.0311)	Parwan	19.39*** (3.072)
Richest	RC	Wardak	10.40*** (1.643)
Ethnicity		Logar	5.454*** (0.882)
Pashtun	1.511*** (0.134)	Nangarhar	23.63*** (3.630)
Tajik	2.052*** (0.184)	Laghman	18.37*** (2.892)
Hazara	2.110*** (0.201)	Panjsher	17.93*** (2.876)
Uzbek	1.690*** (0.165)	Baghlan	27.93*** (4.462)
Turkmen	RC	Bamyan	25.88*** (4.173)
Nuristani	1.265** (0.132)	Ghazni	13.38*** (2.045)
Baloch	3.508*** (0.510)	Paktika	RC
Pashai	1.576*** (0.197)	Paktya	13.12*** (2.001)
Other	1.800*** (0.237)	Khost	22.11*** (3.324)

Independent variables	Odds ratios (OR)	Independent variables	Odds ratios (OR)
Kunarha	23.22*** (3.690)	Between 16 and 17	367.9*** (26.98)
Nooristan	14.36*** (2.152)	Between 18 and 24	RC
Badakhshan	29.34*** (4.612)		
Takhar	29.96*** (4.719)		
Kunduz	17.95*** (2.809)		
Samangan	19.99*** (3.205)		
Balkh	19.78*** (3.076)		
Sar-E-Pul	18.86*** (2.965)		
Ghor	44.10*** (6.969)		
Daykundi	31.95*** (5.162)		
Urozgan	16.02*** (2.510)		
Zabul	20.18*** (4.250)		
Kandahar	28.52*** (4.421)		
Jawzjan	11.80*** (1.854)		
Faryab	19.65*** (3.131)		
Helmand	29.66*** (4.666)		
Badghis	49.42*** (7.869)		
Herat	26.55*** (4.089)		
Farah	41.83*** (6.432)		
Nimroz	65.54*** (11.00)		
Place of residence			
Rural	RC		
Urban	0.717*** (0.0203)		
Age at first sex			
Less than 16	951.3*** (110.3)		

5.2. Binary probit estimation results

Table 4 shows the results of probit regression with a marginal effect. The table is divided into 3 main groups, each of which is divided into 3 subgroups. The first main group represents the results of the effect of early marriages on the estimate of all children, the second group includes the children mortality rate of sons, while the third group represents the children mortality rate among daughters. Moreover, in columns (1), (1s), (1d)[2] we control the effect of early marriage on child mortality under five years through the psycho-physical channel (average birth rate interval); (2), (2c), (2d) - through the woman's education channel; (3), (3s), (3d) - through the channel of the age interval between spouses, as well as the education of the husband. According to the results, early marriages increase the probability of child mortality by 17.54% among all children, by 17.57% among sons and among daughters, the probability of child mortality increases by 14.28% if we control for average birth interval. When we control for the women education, the probability of child mortality increases, but not significantly, giving us results of 24.20%, 23.30%, 20.22% increase in the likelihood of child mortality among all children, sons and daughters, respectively. In the 3 Specification, when controlling for the age interval between spouses and the husband's education, early marriages increase the likelihood of child mortality among all children, sons and daughters almost as many times as in the 2 specification and the results are significant.

According to the table, if the family is polygamous, then the probability of child mortality among all children, sons and daughters increases in the Specifications 1 and 2, while having a percentage increase of approximately the same when controlling for psycho-physical channels and the education of a woman, 18.28%, 14.38%, 16.92% among all children, sons and daughters, respectively, however, when controlled for the spousal interval and the education of the husband, the likelihood of child mortality decreases, but these results are insignificant. Regarding the years since the first cohabitation in all three Specifications, the probability of child mortality increases by almost 5% for all groups. The use of contraceptives reduces the likelihood of child mortality by 18.62%, 15.53% and 13.77% among all children, sons and daughters, respectively, when controlling for the average fertility interval. In Specifications 2 and 3, this probability coefficient decreases and on average is equal to 3% for all types of groups in the table, however, the effects of contraceptive usage on children mortality are insignificant among daughters. The age at first birth and the likelihood of child mortality are negatively related, namely, the later the girl gives the first birth, the probability of child mortality decreases by 2.70%, 3.54% and 3.22% among all children under five years in Specifications 1, 2 and 3, respectively. Among children mortality among sons, the probability is reduced by an average of 3.50%, while among daughters one year a delay in first birth reduces child mortality by an average of 3% in all three Specifications. In Specification 1, the probability of child mortality increases by 20.49%, 16.24% and 18.66% among all children, sons and daughters, respectively, if the place of residence is rural. In Specifications 2 and 3, the probability of child mortality increases by an average of 10% and 15%, respectively, in rural areas.

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[2] (1) denotes for all children
(1s) denotes for sons
(1d) denotes for daughters

Table 4. *The effect of early marriage on children mortality under-five- Probit estimation (marginal effects)*

	All children			Sons			Daughters		
	(1)	(2)	(3)	(1s)	(2s)	(3s)	(1d)	(2d)	(3d)
Early marriage	0.175***	0.242***	0.216***	0.176***	0.233***	0.211***	0.143***	0.202***	0.181***
	(0.0182)	(0.0175)	(0.0180)	(0.0202)	(0.0195)	(0.0200)	(0.0212)	(0.0205)	(0.0210)
Number of wives	0.183***	0.0959***	-0.0239	0.144***	0.0724**	-0.0270	0.169***	0.0996***	-0.00981
	(0.0351)	(0.0331)	(0.0354)	(0.0383)	(0.0364)	(0.0390)	(0.0398)	(0.0379)	(0.0405)
Years since first cohabitation	0.0499***	0.0510***	0.0515***	0.0454***	0.0452***	0.0463***	0.0465***	0.0464***	0.0466***
	(0.00132)	(0.00103)	(0.00107)	(0.00143)	(0.00112)	(0.00117)	(0.00149)	(0.00119)	(0.00124)
Contraceptive usage	-0.186***	-0.0277	-0.0224	-0.155***	-0.0222	-0.0216	-0.138***	-0.00682	0.000600
	(0.0214)	(0.0211)	(0.0214)	(0.0236)	(0.0234)	(0.0237)	(0.0248)	(0.0245)	(0.0248)
Age at first birth	-0.0270***	-0.0354***	-0.0322***	-0.0295***	-0.0363***	-0.0336***	-0.0224***	-0.0298***	-0.0267***
	(0.00252)	(0.00249)	(0.00256)	(0.00280)	(0.00277)	(0.00284)	(0.00293)	(0.00290)	(0.00296)
Place of residence	-0.205***	-0.108***	-0.152***	-0.162***	-0.0795***	-0.117***	-0.187***	-0.104***	-0.145***
	(0.0207)	(0.0205)	(0.0210)	(0.0228)	(0.0227)	(0.0232)	(0.0243)	(0.0241)	(0.0248)
Wealth index	-0.106***	-0.0870***	-0.0842***	-0.0947***	-0.0792***	-0.0772***	-0.0902***	-0.0750***	-0.0756***
	(0.00646)	(0.00639)	(0.00663)	(0.00709)	(0.00706)	(0.00732)	(0.00745)	(0.00743)	(0.00771)
Number of women in household	-0.000632	-0.0759***	-0.0604***	0.00434	-0.0601***	-0.0473***	-0.00234	-0.0654***	-0.0521***
	(0.0103)	(0.00999)	(0.0103)	(0.0113)	(0.0110)	(0.0113)	(0.0120)	(0.0117)	(0.0121)
Number of children under-five years	-0.0449***	-0.0385***	-0.0277***	-0.0337***	-0.0289***	-0.0200***	-0.0513***	-0.0465***	-0.0372***
	(0.00538)	(0.00509)	(0.00522)	(0.00590)	(0.00561)	(0.00575)	(0.00639)	(0.00606)	(0.00622)
Number of members in household	-0.00561***	-0.00609***	0.000532	-0.00486**	-0.00542***	0.000711	-0.00529**	-0.00593***	-0.00143
	(0.00183)	(0.00176)	(0.00178)	(0.00202)	(0.00194)	(0.00197)	(0.00215)	(0.00206)	(0.00209)
Ethnicity	-0.282***	-0.359***	-0.289***	-0.206***	-0.278***	-0.223***	-0.269***	-0.339***	-0.271***
	(0.0178)	(0.0174)	(0.0177)	(0.0195)	(0.0192)	(0.0195)	(0.0208)	(0.0204)	(0.0208)
Observations	25 545	25 545	25 160	25 545	25 545	25 160	25 545	25 545	25 160

Robust standard error in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

According to the results, the higher the wealth index of the family, the probability of child mortality decreases by 10.57%, 9.46% and 9.01% among all children, sons and daughters, respectively, when controlling for the psycho-physical channel. Similarly, an increase in the wealth of the index reduces the likelihood of child mortality among all children, sons and daughters by 8.70%, 7.92% and 7.50%, respectively, when controlled for women education. In Specification 3, the results are similar to Specification 2 with minor changes. The effect of ethnicity, the number of all members, women and children under five on the probability of child mortality under five years in all 3 Specifications was also tested and can be observed in Table 4.

5.3. OLS estimation results

Table 5 shows OLS estimation results. According to Table 5, early marriages also negatively affect child mortality, as well as in *probit* results; early marriages increase the number of dead children by 0.04 when controlling for the average fertility interval, while the number of dead children increases by 0.02 and 0.017 in sons and daughters, respectively. In Specifications 2, 3, early marriages increase the number of child mortality by 0.028, 0.015 and 0.012 among all children, sons and daughters, respectively. The form of marriage also has a significant impact on child mortality. According to the results, in Specification 1, the polygamous form of marriage increases the number of child mortality by 0.07, 0.03 and 0.03 among all children, sons and daughters, respectively; these results are almost identical, with minor changes, when controlling for women education, the age intervals between spouses and husband's education. According to the table, the years since the first cohabitation increase the number of child mortality by 0.05, 0.03 and 0.03 in Specifications 1, 2 and 3, respectively, for all children. This indicator is slightly lower among the children mortality of sons and daughters, but the effect of the years since the first cohabitation is higher among the children mortality of sons - 0.02 for all three Specifications. The contraceptives usage reduces the number of child mortality; according to the results, the use of contraceptives reduces the number of child mortality by 0.09, 0.05 and 0.03 among all children, sons and daughters, respectively, when controlling for the average birth interval. Similarly, in Specifications 2 and 3, the contraceptives usage reduces child mortality by 0.10, 0.05 and 0.04 among all children, sons and daughters, respectively. Moreover, the age at the first birth rate also reduces the number of child mortality. According to the results, a one-year delay in the first birth reduces the number of child mortality among all children by 0.05, 0.04 and 0.04 in Specifications 1, 2 and 3, respectively. Similarly, a one-year delay in the first birth reduces the number of child mortality among sons by 0.03, 0.02 and 0.02 in Specifications 1, 2 and 3, respectively, while this indicator is the same among daughters and equals to 0.02 in all three Specifications. Rural place of residence increases child mortality. According to the table, when controlling for the average birth interval, rural place of residence increases child mortality by 0.02, 0.005 and 0.01 among all children, sons and daughters, respectively. In the remaining Specifications, this is exponentially approximately the same among all children, sons and daughters as in Specification 1, however, the influence of rural place of residence has almost no effect on children mortality among sons.

Table 5. *The effect of early marriage on children mortality under-five- OLS estimation*

	All children			Sons			Daughters		
	(1)	(2)	(3)	(1s)	(2s)	(3s)	(1d)	(2d)	(3d)
Early marriage	0.0394***	0.0276***	0.0280***	0.0212***	0.0150***	0.0154***	0.0173***	0.0124***	0.0123***
	(0.00256)	(0.00254)	(0.00257)	(0.00173)	(0.00170)	(0.00173)	(0.00154)	(0.00151)	(0.00154)
Number of wives	0.0694***	0.0675***	0.0524**	0.0272**	0.0261**	0.0218	0.0320***	0.0312***	0.0210*
	(0.0196)	(0.0198)	(0.0212)	(0.0132)	(0.0133)	(0.0142)	(0.0118)	(0.0118)	(0.0126)
Years since first cohabitation	0.0461***	0.0328***	0.0327***	0.0244***	0.0173***	0.0174***	0.0199***	0.0143***	0.0142***
	(0.000857)	(0.000658)	(0.000663)	(0.000577)	(0.000441)	(0.000444)	(0.000514)	(0.000393)	(0.000396)
Contraceptive usage	-0.0910***	-0.101***	-0.0999***	-0.0486***	-0.0535***	-0.0536***	-0.0368***	-0.0408***	-0.0403***
	(0.0113)	(0.0114)	(0.0115)	(0.00760)	(0.00765)	(0.00769)	(0.00677)	(0.00680)	(0.00685)
Age at first birth	-0.0531***	-0.0395***	-0.0395***	-0.0290***	-0.0218***	-0.0221***	-0.0225***	-0.0168***	-0.0165***
	(0.00251)	(0.00246)	(0.00250)	(0.00169)	(0.00165)	(0.00167)	(0.00150)	(0.00147)	(0.00149)
Place of residence	-0.0161	-0.0106	-0.0171	-0.00531	-0.00210	-0.00553	-0.0134*	-0.0110	-0.0143*
	(0.0131)	(0.0133)	(0.0134)	(0.00885)	(0.00895)	(0.00901)	(0.00788)	(0.00796)	(0.00802)
Wealth index	-0.0316***	-0.0303***	-0.0284***	-0.0167***	-0.0159***	-0.0150***	-0.0146***	-0.0140***	-0.0133***
	(0.00421)	(0.00430)	(0.00439)	(0.00284)	(0.00288)	(0.00295)	(0.00253)	(0.00257)	(0.00262)
Number of women in household	0.0511***	0.0763***	0.0749***	0.0301***	0.0434***	0.0420***	0.0181***	0.0287***	0.0283***
	(0.00898)	(0.00900)	(0.00907)	(0.00605)	(0.00604)	(0.00608)	(0.00538)	(0.00537)	(0.00541)
Number of children under-five years	0.0605***	0.0372***	0.0368***	0.0360***	0.0236***	0.0234***	0.0223***	0.0125***	0.0124***
	(0.00424)	(0.00418)	(0.00421)	(0.00286)	(0.00280)	(0.00283)	(0.00255)	(0.00249)	(0.00252)
Number of members in household	-0.0253***	-0.0229***	-0.0222***	-0.0147***	-0.0134***	-0.0130***	-0.00915***	-0.00812***	-0.00787***
	(0.00175)	(0.00176)	(0.00178)	(0.00118)	(0.00118)	(0.00120)	(0.00105)	(0.00105)	(0.00107)
Ethnicity	-0.129***	-0.126***	-0.119***	-0.0637***	-0.0628***	-0.0596***	-0.0642***	-0.0633***	-0.0595***
	(0.00968)	(0.00995)	(0.00992)	(0.00652)	(0.00667)	(0.00665)	(0.00581)	(0.00594)	(0.00592)
R-squared	0.1431	0.1264	0.1264	0.0921	0.0814	0.0817	0.0825	0.0738	0.0735
Observations	25 640	25 640	25 640	25 640	25 640	25 640	25 640	25 640	25 640

Standard error in parentheses
   *** p<0.01, ** p<0.05, * p<0.1

According to the result, the higher the family wealth index, the lower the child mortality rate; an increase in index wealth by one level reduces the number of child mortality by 0.03, 0.02 and 0.01 among all children, sons and daughters, respectively, in all three Specifications. An increase in the number of children under five in a family leads to an increase in the number of child mortality. According to the results, the more children under five ale living in the family, the number of child mortality increases by 0.06, 0.04 and 0.02 among all children, sons and daughters, respectively. When controlled for women education, the number of child deaths increases by 0.04, 0.02, and 0.01 among all children, sons, and daughters, respectively. Similarly, when controlling for the age interval between spouses and husband's education, this parameter increases by the same for all groups of children, as in Specification 2. Table 5 also shows the results of the influence of the number of women in the family, the total number of family members and ethnicity on the number of children mortality among all children, sons and daughters for all three Specifications.

6. Discussion and Conclusion

6.1 Discussion

As Table 3 shows, women's education has a significant effect on early marriage. Women without education, as a rule, do not have voting rights in the family, which entails the decision of the girl's parents to marry her daughter at an early age without her consent, in order to facilitate economic condition of the family, since the daughter in this case is considered as a financial burden for the family (UNFPA, no date). Education gives a young girl the opportunity to learn certain skills, master a certain profession, which can protect her from teenage marriage. Moreover, women who do not have paid work have a greater risk of being married before the age of 18. Education and employment are closely linked; getting an education allows a girl to find a job, which will reduce her risks of being married at an early age (Mpilambo, 2017). When a woman has education and paid work, she has the right to make decisions not only on the issue of marriage, but also in other aspects of life, which generally increases her bargaining power. Media exposure also affects early marriage. As it is well known, the influence of the media is an instrument of psychology, sociology, the theory of communication, with the help of which one can influence the behavior of people (Rogers, 1999). With the help of advertisements, documentaries, newspapers, it can increase the consciousness of girls and warn them about the negative consequences of early marriages by showing them clearly through sources of media exposure. Seeing, reading and having a general idea of the topic under discussion, girls will be more serious about the problem of early marriages, trying to study in order to avoid early marriages in adolescence. Moreover, as the results in Table 3 showed, girls from poorer families have a greater risk of getting married before the age of 18. As noted above, poor families try to marry their daughters as early as possible in order to secure for themselves a less financially difficult future. Poor families are ready to marry teenage girls for the large ransom offered by the groom. This tradition is widely practiced in Afghanistan, but this tradition is a relic of the past and leads to negative consequences for women. Families are ready to "sell" their daughters for ransom, thereby making life easier for themselves and their remaining children. When conducting an analysis among ethnic groups in Afghanistan, it was revealed that girls from the Baloch ethnic group have

the greatest risk of getting married before the age of 18. These results can be justified by the fact that girls living in border areas and in the south of the country are more likely to experience early marriages (UNFPA, no date). Baloch ethnic group lives in the south of the country and borders with Pakistan, where the occurrence of hostilities is high, therefore families living in such territories try to marry their daughters at an earlier age, since there is a risk that these girls may be raped during the hostilities. Also a high rate of early marriages is observed among the Pashtun and Pashai ethnic groups, as representatives of this ethnicity also live in the south of the country and partially border with Pakistan. Women who are currently in the 15-19 age group are more likely to get married before the age of 18; as was noted earlier, Afghanistan has a high level of early marriage, which entails a greater risk for girls to be married in adolescent period. Women who have experienced more than one union have married before the age of 18. This is due to the fact that as a result of early marriages, a woman can suffer from health problems, fertility, since her body was not ready for a married life at such a young age. In this regard, the husband can divorce his wife and marry again, as he is not satisfied with his current wife. According to Barikzai, "In practice, the first wife is often rejected when her husband remarries" (2017). Moreover, a man in Afghanistan can divorce his wife without any reason, thereby undermining the woman's reputation in society, because according to the Afghan mentality, a woman is always to blame for divorces (Habib, 2015). As noted earlier, girls living in such regions of Badghis and Nimroz are most prone to early marriages, as ethnic groups such as Baloch, Pashtun and Pashai, whose territories are located in the south of the border zones, live in these regions. Moreover, a high level of early marriages is observed in the province of Helmand, as this province is known for its long martial law, in the territory of which the war has been going on for more than 10 years. As a result of ongoing hostilities, family heads try to marry their daughters early in order to avoid rapes and unwanted pregnancies (Jones, 2019). Women in rural areas are more at risk of being married at an early age, as they are less likely to get an education and find work. Mostly people living in rural areas are engaged in agricultural activities and getting an education is not a priority. Women living in urban areas have a greater chance of getting an education and avoiding early marriage. In Afghanistan, the risk of rape is high. According to the results, the earlier the first sexual intercourse occurs, the earlier the girl gets married. In places where there is war, disorder reigns, which can lead to a high level of rape. According to TOLOnews, "... Taliban reportedly raped a number of girls who were there at the time", which proves a high risk of rape (2015).

Table 4 shows the effect of early marriage and its determinants on child mortality under five. According to the results, early marriage has a strong effect on children mortality. As it was mentioned in literature review, majority of women, who got married before the age of 18 undergo several problems, such as health issues, psychological pressure etc. The body of a teenager is not ready not only for sexual life, but also has difficulties to endure the process of pregnancy and childbirth, which subsequently leads to serious negative health consequences. In most cases, adolescent mothers give birth to newborns with underweight, with certain pathologies that lead to inhibition of the development of the child, his mental and physical activity. Moreover, due to the lack of knowledge of the mother, children may not receive the vitamins that they need at an early age. As a result of this, most children suffer from underweight, stunting, poor physical condition, which

lead to children mortality under five years, since at this age range, children are most vulnerable, during which vital changes occur in the baby's body. It has also been proven that polygamous families increase the incidence of child mortality. This may be due to the fact that a woman experiences some stress when her husband marries a second time and brings another wife to the house. In most cases, after re-marriage, the husband no longer has sexual intercourse with his first wife. Stress exerted on a woman leads to the loss of breast milk, as a result of which the child does not receive the necessary vitamins and suffers from malnutrition. Moreover, a husband can live separately from his first wife and provide her with financial inferiority. In this case, according to the law, a woman can file for divorce, since the husband must treat the wives equally, however, society will never be on the side of the woman and in the end she will be guilty. Therefore, often the first wives are left without financial support, which leads to malnutrition of the child and his poor health (Tayler, 2002). According to the following independent variable, more the years since first cohabitation, the higher the number of child mortality under five. This factor is equivalent to early marriage, meaning the more years since the first cohabitation, the earlier a woman got married. Similarly, the factors that cause chilren mortality in early marriage are identical to those in years with the first cohabitation. According to the results of Table 4, the use of contraceptives reduces the number of child mortality. This is due to the fact that a woman gives birth to fewer children throughout her life and devotes more attention and care to fewer children. As it is well known, more children require more costs, which cannot always be overcome by Afghan families due to financial problems. Family failure and poor childcare lead to poor health and death. Moreover, the less a woman gives birth, the less her body is depleted, which leads to the birth of healthier children. With the use of contraceptives, the fertility interval increases, which positively affects the woman's health, as the time increases during which the woman manages to recover. The good health of the woman during the next pregnancy increases the chance of having a healthier baby, thereby reducing the risk of children mortality. Thus, the contraceptives usage positively affects the health of women and reduces the number of child mortality under five (Chola et al., 2015). The age at first birth also reduces the number of child deaths. The later a woman gives birth, the higher the chance of having a physically healthy baby. The body of a teenage girl is not ready for pregnancy, since her body is still too young and often cannot handle such loads as childbirth. Early childbirth leads to serious health problems of a woman, which increases the risk of subsequent complications. The body women after 18 years is ready for pregnancy and childbirth and is stronger than adolescent girls' bodies, therefore, such women in most cases give birth to healthier children and reduce the number of child mortality. Moreover, adult women take their child's upbringing and feeding more seriously, as they understand to a large extent the responsibility that lies on their shoulders. They control for that the child receives the necessary vaccination, a sufficient amount of vitamins and nutrition. As a result of this, children grow up physically healthy and have a lower risk of dying before age five (UNICEF, 2019). Rural residence increases the number of child mortality under five years. This is due to the fact that rural residents have difficulties accessing health services (Malderen, 2019). Women living in rural areas in most cases rarely visit a doctor during pregnancy, however, this is very important for the health of the baby. A rare visit to a doctor during pregnancy and its non-control leads to the birth of a physically weak

newborn. Moreover, in most cases, due to the lack of health services in rural areas, children under 5 years old do not receive a certain amount of vaccinations, which are vital for the development of the child. Families living in urban areas are more economically wealthy and more likely to receive medical services. Thus, due to the lack of medical services in rural areas, as well as the poor financial security of families in rural areas, the number of child mortality under five increases (Malderen, 2019). The wealth index also affects child mortality. According to the results, the richer the family, the lower the number of child mortality. First of all, in most cases, women from poor families do not have education, since they do not have the opportunity to study (Biradar, Patel and Prasad, 2018). As noted earlier, a woman with no education is more likely to get married before the age of 18. Early marriages increase the number of child mortality, which means poor families also increase this parameter. Moreover, wealthy families have more access to health services, which increases the chance of having a healthy baby. Wealthy families, due to their financial capabilities, can provide their children with good nutrition with a large amount of vitamins necessary for the development of the child, and can pay for medical services and doctor's visits (Biradar, Patel and Prasad, 2018). These factors have a positive effect on the health of the child, as a result of which the number of child mortality decreases with increasing wealth index.

6.2. Solving for endogeneity issue: Endogeneity issue-selection of original household

As it was noted earlier, girls marry at an early age because either their family cannot financially provide all the children, and giving the daughter in marriage will ease the financial condition of the family or the girls are not given adequate time and preference is given to sons. In this regard, an endogeneity issue may arise since this characteristic may represent the economic situation of the family, as well as maternal care for the child. Moreover, if a girl does not receive proper attention and care in childhood, this can lead to the fact that she will also not look after her child well, resulting in an increased risk of child mortality under five years. The data that we use in this study does not have information about the girl's family before her marriage, about the conditions of life and wealth. In this regard, we decided to take the number of brothers and sisters of the respondent, as well as the number of dead brothers and sisters under five years. With the help of these variables, we will be able to control for child mortality in the respondent's mother, family wealth, number of children, gender discrimination, and maternal fertility. We add the above variables to Specifications 3 and carry out probit and OLS estimations. According to Table 6, where the results of the probit analysis are presented, the number of brothers and sisters who died under five years increase the likelihood of child mortality under five years by 0.38%, 0.21% and 0.25% among all children, sons and daughters, respectively.

According to Table 7, where the results of the OLS analysis are presented, the number of brothers and sisters who died before 5 years old increase the number of child mortality by 0.01, 0.007 and 0.009 among all children, sons and daughters, respectively. These results indicate that women repeat the attitude towards children from their origin household, which leads to the fact that children do not receive the necessary care, as a result of which they have health problems, which leads to child mortality under five years. Thus, the

connection between the robustness of results and endogeneity of origin household was confirmed.

Table 6. *Controlling for women's siblings' under*

	Controlling for women's siblings' under-five mortality-Probit estimations		
	All children	Sons	Daughters
Early marriage	0.212***	0.208***	0.177***
	(0.0180)	(0.0200)	(0.0210)
Number of siblings	0.0288***	0.0211***	0.0278***
	(0.00316)	(0.00348)	(0.00367)
Number of dead siblings<5	0.00275	0.00211*	0.00248*
	(0.00191)	(0.00118)	(0.00141)
Observations	28 076	28 076	28 076
Robust standard error in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Table 7. *Controlling for women's siblings' under*

	Controlling for women's siblings' under-five mortality-OLS estimations		
	All children	Sons	Daughters
Early marriage	0.0286***	0.0156***	0.0126***
	(0.00257)	(0.00173)	(0.00154)
Number of siblings	0.00139***	0.000624**	0.000714***
	(0.000421)	(0.000282)	(0.000251)
Number of dead siblings<5	0.0148***	0.00699***	0.00850***
	(0.00174)	(0.00117)	(0.00104)
R-squared	0.1294	0.0833	0.0763
Observations	25 254	25 254	25 254
Standard error in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

6.3. Conclusion

Early marriage is one of the negative practices in many countries of the world. Women who marry before the age of 18 do not have the opportunity to get an education, as a result of which they do not have a paid job, suffer from health problems, have a low body mass index, low blood pressure, which makes pregnancy and childbirth difficult, after which there is a high risk of child mortality. The purpose of this research work was to study the factors affecting early marriage and the effect of early marriage on child mortality under five among all children, sons and daughters. According to the results that were obtained from the regression analysis, education, ethnicity, region, place of residence, employment, media exposure, the current age group and the age at the first sex affect the age at which the girl gets married. Lack of education, unemployment, living in rural areas, as well as in border areas in southern Afghanistan, early sexual intercourse leads to the fact that a woman marries before the age of 18. Moreover, as a result of probit and OLS regression analysis, it was found that early marriage increases the number of child

mortality. According to the results, early marriage increases the number of child mortality more among sons than among daughters. This is because sons are more vulnerable to infectious diseases than daughters in the first six months, which leads to more children mortality among sons (Mahy, 2003). Despite the significant impact of early marriage on child mortality, the number of early marriages continues to grow in Afghanistan.

6.4.   Policy implications

First policy recommendation would be to give girls the opportunity to get an education. Based on the results obtained, it can be concluded that education has a significant impact on the age at which a girl marries. To reduce the level of early marriage, it is necessary to motivate girls to learn and gain new knowledge and skills, know their rights and create a society around them to discuss interests and different perspectives. Moreover, this aspect includes the creation of various programs to study medicine, finance, business and other areas of life. For example, those women who did not have the opportunity to get an education and later married, can attend seminars and workshops within these programs to gain certain skills in the above areas. Thus, a woman will receive information about caring for a child, gain skills in finance or business, thereby increasing her chances of getting a paid job. Women included in these programs will be able to find friends and good mentors who can always give advice in one area or another. It is important to give lectures on sexual and reproductive health to adolescents in order to inform them of the consequences of early marriage. The next recommendation would be to work with families, men and boys. There is a need to raise awareness among families about the negative effects of early marriage. In Afghanistan, society is driven by traditional culture and a mentality that is deeply rooted in people, but it is necessary to take these norms to a new level to prevent early marriages. In this regard, it is important to conduct interviews with families in order to raise their awareness of the negative aspects of early marriage. Moreover, it is necessary to inform men, fathers, brothers, future husbands, since in traditional societies such as Afghanistan, they make the final decision in the family. Also, religious leaders should conduct conversations, lecture and promote education for women, as the population in Afghanistan is very religious, and it will listen to religious leaders. Organizations should also help reduce early marriage through street theaters and presentations on the negative effects of early marriage, educate and inform people through various types of media communications, such as TV, radio, and newspapers. Police makers should improve the quality of education services as well as medicine. It is necessary to provide affordable ways of getting education for the poor families, as well as building medical facilities and improving the quality of services to reduce the number of child mortality. In addition, it is necessary to increase the economic independence of women in society. By providing benefits to low-income families, loans, and benefits, it will reduce the level of early marriage, as families will not consider their daughter as an economic burden. Moreover, with the implementation of the above programs, women will be able to gain knowledge in the field of finance and apply it when opening a bank account, applying for a loan for education and conducting other banking operations.

To implement all of the above policies, it is important that the government itself takes the issue of early marriage more seriously. Laws must be valid not only on paper, but also in

life. The first step to preventing this practice should be to increase the minimum age of marriage to the minimum age prescribed in the UN Convention on the Rights of the Child. Moreover, the state should make every effort to reduce gender inequality and protect women's rights. It is important to take the registration of marriages and the issuance of birth certificates to a new level in order to better track the level of early marriages and motherhood for further action to prevent them. It is necessary to change the norms and foundations of society so that women become agents of change.

6.5.   Limitations of this study and avenues for further research

Despite testing for endogeneity, this study may contain other endogeneity issues. They were not resolved in this study due to a lack of necessary information in the AfDHS data. So, we could not check endogeneity on women selection because there was no information about the height and weight of women. The height of a woman significantly affects the health of the child, since the height is one of the main indicators of healthy development in childhood. Aberration of height by 2 standard deviations is a sign that a woman had poor nutrition in childhood, which affected her health and growth during her life.

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