INFERTILITY IN MOLDOVA: EVIDENCE FROM THE GENERATIONS AND GENDER SURVEY

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ABSTRACT

Statistical analysis on the topic of infertility issues in Moldova will improve understanding of infertility causes and treatment-seeking.

Data for this research come from the Generations and Gender Survey (GGS), which was conducted in 2020 in Moldova. The GGS covers topics related to fertility behavior, intention to have children, infertility disease and treatment, and other issues. Statistical analysis includes crosstabulations, and bivariate and multivariate logistic regressions. Approximately 12% of the sampled population ages 15-49 have had trouble conceiving in 12 months, and about 9% of the population indicates they are either definitely or probably not able have a/another baby. Reports of infertility are highest among women aged 40 and over, and secondary infertility appears to be more prevalent than primary infertility. Most individuals reporting infertility have no diagnosed cause for their infertility and almost three-quarters of the population who said they are definitely or probably not able to have a baby have done "nothing" to treat their infertility. Results indicate that individuals in the sample favor delayed and/or spaced childbearing, which may result in fertility challenges as they attempt to achieve their desired fertility later in life. The high prevalence of undiagnosed infertility may be the result of a lack of interest in having more children, or lack of information or access to infertility services. This research also revealed an absence of treatment-seeking behavior which may also be due to social, physical or financial barriers.

Keywords: Infertility, desired fertility, Moldova

Studiul privind infertilitatea în Moldova va îmbunătăţi înţelegerea cauzelor infertilităţii şi identificarea tratamentului. Datele pentru această cercetare provin din studiul Generaţii şi Gen (GGS), care a fost realizat în Moldova în anul 2020. GGS acoperă subiecte legate de comportamentul de fertilitate, intenţia de a avea copii, boala şi tratamentul infertilităţii şi alte probleme. Analiza statistică include tabele încrucişate şi regresii logistice bivariate şi multivariate. Aproximativ 12% din populaţia eşantionată cu vârsta cuprinsă între 15 şi 49 de ani a avut dificultăţi în a concepe în 12 luni, iar aproximativ 9% din populaţie indică că fie sigur, fie probabil nu poate avea un/alt copil. Raportările de infertilitate sunt cele mai mari în rândul femeilor cu vârsta de 40 de ani şi peste, iar infertilitatea secundară pare să fie mai răspândită decât infertilitatea primară. Majoritatea persoanelor care raportează infertilitate nu au o cauză diagnosticată pentru infertilitatea lor şi aproape trei sferturi din populaţie care a declarat că cu siguranţă sau probabil nu pot avea un copil nu au făcut „nimic" pentru a-şi trata infertilitatea. Rezultatele indică faptul că indivizii din eşantion preferă naşterea întârziată şi/sau distanţată, ceea ce poate duce la provocări de fertilitate în timp ce încearcă să-şi atingă fertilitatea dorită mai târziu în viaţă. Prevalenţa ridicată a infertilităţii nediagnosticate poate fi rezultatul lipsei de interes pentru a avea mai mulţi copii, al lipsei de informaţii sau al accesului la serviciile de infertilitate. Această cercetare a evidenţiat, de asemenea, o absenţă a comportamentului de căutare a tratamentului, care se poate datora şi barierelor sociale, fizice sau financiare.

Cuvinte cheie: Infertilitate, fertilitate dorită, Moldova

Исследование проблем бесплодия в Молдове улучшит понимание причин бесплодия и обращения за лечением. Работа основывается на данных исследования «Поколения и гендер» (GGS), проведенного в Молдове в 2020 году. GGS охватывает темы, связанные с поведением в отношении фертильности, намерением иметь детей, бесплодием и его лечением, а также другие вопросы. Статистический анализ включает перекрестные таблицы, а также двумерную и многомерную логистическую регрессию. Согласно результатам, около 12% опрошенного населения в возрасте от 15 до 49 лет имели проблемы с зачатием в течение 12 месяцев, и около 9% населения указали на то, что они либо определенно, либо, вероятно, не могут иметь/еще одного ребенка. Сообщений о бесплодии больше всего среди женщин в возрасте 40 лет и старше, а вторичное бесплодие, по-видимому, более распространено, чем первичное. Большинство людей, сообщающих о бесплодии, не имеют диагностированной причины, и почти три четверти населения, заявили, что они определенно или, вероятно, не могут иметь ребенка, «ничего» не делали для лечения бесплодия. Результаты показывают, что опрошенные предпочитают отсроченное и/или интервальное деторождение, что может привести к проблемам, поскольку они пытаются достичь желаемой рождаемости в более позднем возрасте. Высокая распространенность не выявленного бесплодия может быть результатом отсутствия заинтересованности в рождении большего числа детей, отсутствия информации или доступа к услугам по лечению бесплодия. Это исследование также выявило

отсутствие обращений за лечением, что также может быть связано с социальными, физическими или финансовыми барьерами

Ключевые слова: бесплодие, желаемая рождаемость, Молдова.

INTRODUCTION

Infertility is a growing challenge in the world especially in the Eastern Europe and Central Asia (EECA) region, where low fertility and the decline in population in some countries has become a serious concern. Moldova, as part of the EECA region, faces serious demographic challenges such as shrinking population, low fertility, out-migration and ageing. The issue of infertility in Moldova is not only a concern for the demographic future of the country but is also an issue of reproductive health and rights as men and women are not able to achieve their desired fertility.

Currently, there is a lack of research on the actual short-term and long-term impact of infertility determinants, prevention and treatment in Moldova. Statistical analysis on the topic of infertility will improve understanding of the infertility burden as a major public health concern, infertility causes and to what extent infertility should be a factor of concern for policy makers.

LITERATURE REVIEW

Maternal age at first birth in Moldova has been increasing steadily since the mid-1990s (Gagauz et al., 2016). The country is currently going through the second phase of the demographic transition, characterized by a decrease infertility among younger women (due to an increase in the mean age of first birth) and an increase in childbearing at older ages (Grigoras & Gagauz 2022). The 2005 Demographic and Health Survey (DHS) report showed a steady decline in age-specific fertility rates among the youngest age groups from 1990 to 2005 and increases in age-specific fertility rates among the 25-29 and 30-34 age groups from 1995 to 2005 (NCPM and ORC Macro, 2006). Compared to other countries in the EECA region, the demographic transition in Moldova has been slow (Grigoras 2019). Population decline is projected to continue at a fast pace for the following decades before eventually stabilizing in the final stage of the fertility transition.

Also referred to as the postponement of fertility, the second demographic transition is typically brought about by women's increased educational attainment, rising labor market participation and wider availability of effective contraceptive methods (Grigoras 2019; Beaujouan 2020). In Moldova, gendered roles in the family, where men's roles are concentrated around professional advancement and women's roles are focused on children and household tasks, are widely accepted (Gagauz et al., 2016). Women have acquired equal opportunities in education and labor participation but have not obtained equal responsibilities in families. They continue to perform all or most of the household tasks, and fertility reduction or delayed fertility has therefore become one strategy for women to seek professional or social self-fulfillment (Gagauz et al., 2016).

Research suggests that as the delay in first birth increases, the likelihood of becoming spontaneously pregnant declines, and the number of children at older ages becomes smaller (Beaujouan and Toulemon 2021; Vander Borght and Wyns 2018). Infertility generally increases with female age as higher fertility at older ages is often accompanied by an increase in the number of unsuccessful attempts to have children (Beaujouan 2020; Kuohung and Hornstein 2022). Though both epidemiological and clinical definitions of infertility also exist, UNFPA and the International Union for the Scientific Study of Population provide a more demographic-centric definition of infertility as "the inability to bear any children, either due to the inability to conceive or the inability to carry a pregnancy to a live birth" (Sloggett, 2015). The timing of unprotected sexual intercourse, female age, and reproductive health (both male and female) are all factors related to the likelihood of achieving a pregnancy (Vander Borght and Wyns 2018).

Globally, infertility affects between 8 and 12% of reproductive couples (Inhorn and Patrizio 2015). According to model-based estimates from 277 demographic and reproductive health surveys, in 2010, approximately 1.9% of child-seeking women ages 20-44 who were exposed to pregnancy were unable to have a first birth (primary infertility) (Mascarenhas et al., 2012). The proportion of all child-seeking women exposed to pregnancy who are unable

to have an additional child after a previous birth, (secondary infertility) was even higher, at approximately 10.5%, with the EECA region having the highest prevalence of secondary infertility relative to other regions (18.0%) (Mascarenhas et al., 2012). While the prevalence of primary infertility is higher among younger women, secondary infertility increases dramatically with age (Mascarenhas et al., 2012). In Moldova, primary infertility affects about 2.5% of the population and secondary infertility is experienced by about 3.8% of the population (Gagauz et al., 2016). However, when infertility is examined among child-seeking women, the figures are much higher; over 3% for primary infertility and over 13% for secondary infertility (Mascarenhas et al., 2012). Though much of this literature review focuses on female infertility, it is important to note that male infertility is a chronic reproductive health condition for millions of men, contributing to over half of all cases of childlessness (Inhorn and Patrizio 2015).

While causes of infertility vary based on local demographics, and uncertain causal relationships make determining the actual cause of infertility difficult, some of the main causes for both sexes include hypogonadotrophic hypogonadism, hyperprolactinemia, cystic fibrosis, coital problems and other systemic diseases (Deshpande and Gupta 2019; Kuhoung and Hornstein 2022; Vander Borght and Wyns 2018). Among females, ovulatory disorders, endometriosis, tubal blockage, pelvic adhesions and uterine fibroids are among the most common causes of infertility and among males, testicular deficiencies and semen decline are commonly cited (Vander Borght and Wyns 2018; Walker and Tobler 2022). One study found 28% of infertility cases to be unexplained (Kuhoung and Hornstein 2022).

With a total fertility rate (TFR) below replacement level, at around 1.6 to 1.65 children per women, population decline has become a huge concern for the government of Moldova (Gagauz et al., 2016). With more and more women choosing to delay childbearing, the issue of infertility is also one of reproductive rights. This research aims to help describe and contextualize the issue of infertility, including causes and treatment-seeking behaviors in Moldova so policy makers and program managers can meet the needs of child-seeking men and women in the country.

DATA SOURCES AND METHODS

To understand the demographic trends and strengthen the demographic resilience of the country, the Government of Moldova supported the Generation and Gender Programme. Under this program, the most comprehensive demographic Generations and Gender Survey (GGS) was conducted in 2020. The GGS covers more than 10,000 respondents ages 15-79 and collected evidence about fertility behavior, in-tention to have children, unmet need for contraception and use of contraception, reproductive rights, infertility disease and treatment, health issues, and other issues.

The main infertility variable of interest for this research was FER04d, which asked respondents "was there ever a time when you were trying to get pregnant but did not conceive within at least 12 months?" One bias of this variable is that it was asked of all respondents, regardless of whether they have ever had sex or are at risk of pregnancy. To mitigate this bias, all individuals who never had sex were removed from this indicator and the infertility analysis was limited to respondents aged 15-49. A secondary variable measuring infertility, FER05, was also examined. FER05 asked respondents "as far as you know, is it physically possible for you, yourself, to have a/another baby?" An additional outcome variable of interest was a constructed binary variable for "not met" fertility, where 1 is coded when total number of living children is less than ideal number of children, and 0 is coded when total number of living children is equal to or greater than ideal number of children.

Post stratification weights were applied based on age, gender and region of residence. Statistical analysis includes crosstabulations, and bivariate and multivariate logistic regressions. Results of the logistic regressions are presented as odds ratios. All analyses were performed in StataSE 15.

Table 1 summarizes the demographic characteristics of the surveyed population of reproductive age (15-49)[1], including sex, age, area of residence, educational attainment, type of employment and household income. About half of the population surveyed is female (49.6%) and the smallest age group are those ages 15-19 (9.6%). Most of the population has achieved at least secondary education, with about 19% having achieved a bachelor's degree or higher. Almost half of the population is employed, about 15% are homemakers and 10% on parental/family leave. Just under half of the surveyed population of reproductive age has a net household income of 1,000-10,000 lei, the second-lowest income bracket. Under 6% have a net household income less than 1,000 lei, and almost a quarter have a net household income of greater than 30,000 lei (the highest income bracket).

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[1] All analysis is presented with survey weights.

Table 1:

Demographic Characteristics among Total Population of Reproductive Age (15-49) (N=4,405)

	n	%
Sex		
Male	2,222	50.4
Female	2,183	49.6
Age		
15-19	423	9.6
20-24	503	11.4
25-29	688	15.6
30-34	873	19.8
35-39	743	16.9
40-44	630	14.3
45-49	545	12.4
Area of residence		
Rural	2,616	59.4
Urban	1,789	40.6
Education		
None/Early education	25	0.6
Primary	121	2.7
Secondary	1,389	31.5
General/High school	705	16.0
Vocational	769	17.5
Specialized college/Technical	552	12.5
University/Bachelor's	703	16.0
Master's	132	3.0
Doctorate/Postdoc	9	0.2
Employment		
In school/training	460	10.5
Employed	1,932	43.9
Homemaker/Helping family	664	15.1
Unemployed	648	14.7
Retired	17	0.4
Military/Civic service	3	0.1
Parental/Family leave	444	10.1
Disabled	122	2.8
Other	105	2.4
Don't Know	4	0.1
No response	6	0.1
Net household income		
<1,000 lei	220	5.8
1,000-10,000 lei	1,845	48.6
10,000-20,000 lei	531	14.0
20,000-30,000 lei	277	7.3
>30,000 lei	926	24.4

Table 2 summarizes variables related to relationship status. About two-thirds of the surveyed population have a partner, with 84.3% of those living with their partner and 74.9% being married. Most of the surveyed population had sex for the first time from age 15-19 (67.6%), followed by ages 20-24 (31.1%). Just under two-thirds of the population are sexually active (63.1%), having had sex in the last four weeks. Almost half of the population intend to have another child (definitely (35.9%) or probably yes (21.7%)), but only 38% plan to have another child in the next three years (definitely (16.4%) or probably yes (21.6%)) (not shown in table).

Table 2:
Relationship Status (N=4,405)

	N	%
Respondent has partner		
Yes	3,063	69.5
No	1,332	30.3
No response	10	0.2
Living with partner (N=3,145)		
Yes	2,650	84.3
No	495	15.7
No response	0	0.0
Married to partner (N=3,145)		
Yes	2,356	74.9
No	788	25.1
No response	2	0.0
Age at first sex		
<10	40	0.9
10-14	135	3.1
15-19	2,976	67.6
20-24	578	13.1
25-29	69	1.6
30-34	20	0.2
>34	4	0.1
Don't know	373	8.5
No response	220	5.0
Average age at first sex: 17.8		
Had sex in last four weeks		
Yes	2,725	63.1
No	1,452	33.6
Don't know	19	0.5
No response	120	2.8
Intend to have a child		
Definitely not	707	17.5
Probably not	397	9.8
Unsure	522	12.9
Probably yes	875	21.7
Definitely yes	1,452	35.9
Don't know	73	1.8
No response	16	0.4

MAIN RESULTS

INFERTILITY ANALYSIS

To examine the issue of infertility, the variable FER04d was used. This variable asked respondents if there was ever a time when they tried to get pregnant but did not conceive within 12 months. One bias with this variable is that it was asked of all respondents, regardless of whether they have ever had sex or are at risk of pregnancy. For this analysis, individuals who have not had sex were removed from this indicator.

Table 3 shows the proportion of the population who have experienced problems conceiving. Overall, 11.6% of respondents aged 15-49 have tried to become pregnant but did not conceive within 12 months. Women were more likely to report problems conceiving than men, 12.9% compared to 10.3%. Those age 35-39 and 40-44 had the highest reported problems conceiving. Urban residents were more likely to report problems conceiving than rural residents. Individuals with higher education reported difficulty conceiving more than those with lower levels of education, as did people with higher incomes compared to those with lower incomes. Those who want four or more children had the highest proportion of problems conceiving of all desired family sizes, which aligns with them spending more of their lives trying to conceive to reach their desired family size. People with one child were the most likely to report difficulty conceiving compared to people at other parities.

Table 3:
Percent of Demographic Groups who have experienced problems conceiving (has tried to become pregnant but did not conceive within 12 months)

Entire population age 15-49 (N=4,125)			
	% Yes	% No	% Unsure	n
Total	**11.6**	**88.1**	**0.3**	**4,125**
Sex				
Male	10.3	89.1	0.5	2,109
Female	12.9	87.0	0.1	2,016
Age				
15-19	0.9	98.3	0.9	231
20-24	4.1	95.7	0.3	472
25-29	10.4	88.9	0.7	667
30-34	12.8	86.9	0.3	865
35-39	17.3	82.4	0.4	731
40-44	15.2	84.9	0.0	622
45-49	10.4	89.4	0.2	536
Area of residence				
Rural	10.0	89.9	0.1	2,432
Urban	13.9	85.4	0.7	1,693
Education				
None/Early education	5.4	84.5	10.1	17
Primary	8.9	91.2	0.0	86
Secondary	10.4	89.4	0.2	1,242
General/High school	9.4	90.2	0.4	663
Vocational	13.3	86.7	0.0	751
Specialized college/Technical	10.1	89.8	0.2	535
University/Bachelor's	13.9	85.5	0.6	691
Doctorate/Postdoc	44.5	55.5	0.0	8

Entire population age 15-49 (N=4,125)			
	% Yes	% No	% Unsure	n
Employment				
In school/training	0.8	98.5	0.7	279
Employed	12.9	86.8	0.4	1,895
Homemaker/Helping family	12.6	87.1	0.3	642
Unemployed	10.2	89.6	0.3	636
Retired	29.0	71.0	0.0	17
Military/Civic service	0.0	100.0	0.0	3
Parental/Family leave	12.2	87.8	0.0	441
Disabled	14.1	85.9	0.0	108
Other	13.6	86.4	0.0	95
Don't Know	0.0	100.0	0.0	4
Net household income				
<1,000 lei	7.2	92.8	0.0	203
1,000-10,000 lei	10.7	88.9	0.4	1,727
10,000-20,000 lei	10.8	89.2	0.0	493
20,000-30,000 lei	11.9	88.1	0.0	266
>30,000 lei	15.6	84.1	0.3	891
Age at first sex				
<10	5.5	94.5	0.0	40
10-14	9.1	90.0	1.0	135
15-19	11.5	88.4	0.1	2,979
20-24	14.2	85.6	0.2	579
25-29	15.5	84.5	0.0	69
30-34	0.0	91.9	8.1	10
>34	33.3	66.7	0.0	4
Don't know	16.7	81.3	2.0	89
No Response	5.7	92.1	2.2	221
Ideal Family Size				
0	6.3	93.7	0.0	14
1	10.7	88.8	0.5	197
2	10.2	89.4	0.4	1,861
3	12.7	87.1	0.2	1,396
4	12.1	87.9	0.0	357
>4	18.3	81.1	0.6	210
Don't know	8.1	91.9	0.0	78
No Response	8.2	78.5	13.4	10
Total number of children				
0	10.9	88.4	0.7	1,160
1	16.4	83.3	0.3	840
2	10.7	89.2	0.1	1,343
3	9.7	90.3	0.0	543
4	7.7	92.3	0.0	163
>4	7.1	91.3	1.7	77

Table 4 shows the results of bivariate logistic regressions of infertility (tried to conceive for 12 months without becoming pregnant) and each demographic characteristic (Model 1) and multivariate logistic regression (Model 2). Results are presented as odds ratios.

Compared to males, females are 1.28 the odds of reporting infertility in Model 1 and 1.42 in Model 2 (which controls for other characteristics). Age is also significantly associated with infertility, with each year older contributing to a 3% increase in the odds of reporting infertility (4% with controls). Compared to rural residence, respondents living in urban areas are more likely to report infertility (OR=1.47, CI [1.20,1.79]), with even larger odds ratios in Model 2. Looking at education, compared to those with no education, those with a doctorate have higher odds of reporting infertility in both models, but the sample size was very small resulting in wide confidence intervals. Compared to in school/training, every other employment type has a higher odds of reporting infertility.

However, the confidence intervals for these odds ratios are extremely wide, and results are no longer statistically significant (except for retired and other) when controlling for other demographic characteristics (like age and income) in the multivariate model. Net household income shows an association with the odds of reporting infertility. Compared to the lowest wealth group (<1,000 lei), those in the 20,000 lei-30,000 lei wealth group and the >30,000 lei wealth group have higher odds of reporting infertility, in Model 1, and all categories are statistically higher than the lowest income group in Model 2. Each year older for sexual debut results in a 3% increase in the odds of reporting infertility, but this relationship was no longer statistically significant when controlling for other demographic characteristics in the multivariate model. Finally, in the bivariate relationship and multivariate model, larger ideal family size is associated with higher odds of experiencing difficulty conceiving and more living children is associated with lower odds of experiencing difficulty conceiving.

Table 4:
Association between problems conceiving and demographic characteristics

Outcome variable: Problems conceiving in 12 months	Model 1 (bivariate logistic regressions)	Model 2 (multivariate logistic regression)
	Odds Ratio	**Odds Ratio**
Sex		
Male	Ref.	Ref.
Female	1.28 (1.05-1.56)**	1.42 (1.10-1.84)***
Age	1.03 (1.03-1.04)***	1.04 (1.03-1.06)***
Area of residence		
Rural	Ref.	Ref.
Urban	1.47 (1.20-1.79)***	1.61 (1.24-2.08)***
Education		
None/Early education	Ref.	Ref.
Primary	1.51 (0.78-13.02)	1.85 (0.20-17.28)
Secondary	1.82 (0.24-14.00)	1.35 (0.62-11.15)
General/High school	1.63 (0.21-12.65)	1.21 (0.14-10.14)
Vocational	2.38 (0.39-18.37)	1.49 (0.18-12.42)
Specialized college/Technical	1.75 (0.22-13.60)	1.17 (0.14-9.93)
University/Bachelor's	2.53 (0.33-19.51)	1.33 (0.16-11.16)
Master's	3.59 (0.45-28.87)	1.31 (0.14-12.05)
Doctorate/Postdoc	12.5 (1.03-151.05)**	9.51 (0.73-124.62)*
Employment		
In school/training	Ref.	Ref.
Employed	18.69 (4.51-77.43)***	0.68 (0.35-1.31)

Outcome variable: Problems conceiving in 12 months	Model 1 (bivariate logistic regressions)	Model 2 (multivariate logistic regression)
Homemaker/Helping family	18.31 (4.37-76.77)***	0.82 (0.47-1.64)
Unemployed	14.3 (3.38-60.40)***	0.74 (0.37-1.51)
Retired	51.56 (8.78-302.83)***	3.06 (0.88-10.66)*
Military/Civic service	---	---
Parental/Family leave	17.54 (4.16-79.90)***	0.85 (0.41-1.75)
Disabled	20.76 (4.62-93.27)***	0.74 (0.31-1.75)
Other	19.82 (4.23-92.87)***	---
Net household income		
<1,000 lei	Ref.	Ref.
1,000-10,000 lei	1.54 (0.92-2.58)	1.85 (1.02-3.36)**
10,000-20,000 lei	1.55 (0.87-2.75)	1.78 (0.93-3.40)*
20,000-30,000 lei	1.73 (0.94-3.21)*	1.86 (0.93-3.74)*
>30,000 lei	2.37 (1.40-4.01)***	2.58 (1.39-4.80)***
Age at first sex	1.03 (0.99-1.06)*	1.00 (0.96-1.03)
Ideal number of children	1.17 (1.07-1.27)***	1.34 (1.22-1.48)***
Total number of children	0.92 (0.85-0.99)**	0.68 (0.61-0.77)***
***p<0.01 **p<0.05 *p<0.10		

Causes for infertility and fertility treatments were explored to determine the extent to which people reporting infertility are currently diagnosed and seeking treatment. A second question regarding infertility was asked in the survey: "Some people are not physically able to have children. As far as you know, is it physically possible for you, yourself, to have a/another baby?" People who respond that they are definitely or probably not able to have another baby were asked "Have you been diagnosed with anything that might explain your infertility?" All survey respondents were asked if they have used fertility treatment. Results are presented on infertility diagnoses for those who believe they cannot have a/another child, and treatments undertaken are presented for those who believe they cannot have a/another child and those who report trying to conceive unsuccessfully for 12 months. Results can help form guidance on what types of programs and incentives may be most effective.

Table 5 summarizes variables related to problems conceiving and infertility. Among those asked whether they were physically able to have a baby (individuals ages 15-49), 9.3% of the total population reported they were definitely or probably not able to have a baby.

Among women under 40 and men, this number was lower, at 6.6% and 5.6%, respectively. The proportion of people definitely or probably not able to have a baby was largest among women aged 40 or older (30.9%). Among people who reported they were definitely or probably not able to have a baby, across all subgroups, most said no cause was found for their infertility. In terms of diagnosed causes, "blocked tubes" closely followed by "uterine fibroids" was the most common cause across the entire population, women under 40 and women 40 and older. "Poor sperm count/quality" was the most common cause among men. Most people reporting infertility have done nothing to treat their infertility (around 70% across all subgroups). "Other medical treatment," "consulted a physician," and "receiving medication" were the three most common reported treatments in all groups.

Looking at those who reported trying to conceive for at least 12 months, the highest subgroup reporting being unable to conceive was women over 40 (14.5%), almost half of all subgroups reported using no type of fertility treatment. Around a quarter of people in each group reported consulting a physician, and over 10% used medication.

Table 5:
Main causes of infertility and fertility treatments used

	Total Pop 15-49 (N=4,146)		Women <40 (N=1,793)		Women ≥40 (N=746)		Men (N=1,607)	
	n	%	n	%	n	%	n	%
Tried to Conceive for 12 Months without Conceiving								
No	3,633	88.1	1,500	87.5	690	85.6	1,431	89.1
Yes	478	11.6	210	12.3	116	14.5	166	10.3
Unsure/No response	14	0.3	3	0.2	0	0.0	8	0.5
Physically possible to have a baby								
Def. or prob. yes	3,433	82.8	1,557	86.8	377	50.5	1,419	88.3
Def. or prob. not	384	9.3	118	6.6	230	30.9	90	5.6
Unsure/No response	329	7.9	119	6.6	139	18.6	98	6.1
Main cause of infertility (among those who reported definitely or probably not able to have a baby)								
Endometriosis	13	2.9	5	3.7	9	3.8	1	0.8
Adhesions	4	0.8	1	0.8	3	1.3	0	0.0
Blocked tubes	31	6.9	13	10.7	20	8.7	1	1.0
Polycystic Ovary Syndrome	6	1.3	0	0.0	7	3.0	0	0.0
Pelvic Inflam. Disease	10	2.2	3	2.3	7	3.1	1	0.8
No/irregular ovulation	13	2.9	5	4.1	10	4.3	0	0.0
Poor sperm count/quality	8	1.8	1	0.7	1	0.5	5	4.8
Uterine fibroids	24	5.3	9	6.9	19	8.1	0	0.0
No cause was found	221	48.3	56	45.0	106	45.1	55	55.6
None of the above	127	27.7	32	25.8	52	22.2	37	37.2
Fertility treatments used (among those who reported definitely or probably not able to have a baby)								
Medication	17	3.7	4	3.2	10	4.3	3	3.3
Ovulation tracking	5	1.0	3	2.5	2	0.9	0	0.0
IVF/ Micro fertil.	2	0.4	1	0.8	1	0.5	0	0.0
Surgery	1	0.2	1	0.7	0	0.0	0	0.0
Artificial insemination	1	0.2	1	0.7	0	0.0	0	0.0
Consulted a physician	30	6.7	5	4.3	20	8.6	6	5.8
Other medical treatment	34	7.5	8	6.3	17	7.3	9	9.0
Nothing	327	71.7	91	73.7	169	72.0	69	69.3
Don't know	15	3.4	5	3.7	6	2.6	4	4.2
No response	24	5.3	5	3.9	9	3.8	8	8.5
Fertility treatments used (among those who tried to conceive for 12 months)								
Medication	62	12.8	34	15.7	12	10.7	18	11.2
Method for tracking ovulation	8	1.7	6	2.6	3	2.8	1	0.6
IVF/Micro fertil.	5	1.0	3	1.3	3	2.8	0	0.0
Surgery	10	2.1	8	3.6	1	0.9	2	1.4
Artificial insemination	2	0.3	1	0.4	1	0.9	0	0.0

	Total Pop 15-49 (N=4,146)		Women <40 (N=1,793)		Women ≥40 (N=746)		Men (N=1,607)	
	n	%	n	%	n	%	n	%
Consulted a physician	127	26.0	54	25.0	24	21.4	46	28.7
Other medical treatment	35	7.1	13	6.2	15	13.5	9	5.5
Nothing	224	45.9	94	43.8	51	45.3	77	47.9
Don't know	4	0.9	2	0.9	1	0.9	1	0.8
No response	10	2.1	1	0.4	1	0.9	6	4.0

INFERTILITY ANALYSIS

About 65% of all respondents reporting problems conceiving said they probably or definitely want another child, and over half (57.9%) of those reporting problems conceiving definitely or probably want another child in the next three years (data not shown). This section examines desired fertility to try to determine whether different groups are able to achieve their ideal fertility, and whether infertility appears to impact the ability to reach ideal fertility.

Looking at the total population and the total population who have experienced problems conceiving, the population with problems conceiving has the same number children on average as the total population (1.4 children) (**Table 6**). There is a small difference in ideal number of children (2.7 for the total population and 2.9 for those who have experienced infertility). Both groups have about 1.5 children less than their ideal fertility, so experiencing fertility issues does not appear to result in a larger gap between actual and ideal fertility. Among women under the age of 40, total number of children is the same again among those with problems conceiving compared to all women under 40 (1.5). Ideal fertility is slightly higher among these women with problems conceiving (2.8) than the total population (2.7). Women over the age of 40 with difficulty conceiving have fewer children (1.6) compared to all women over 40 (2.3) – the largest gap among any of the subgroups – and both groups have the same ideal number of children (2.8). Lastly, men who have experienced difficulty conceiving have slightly fewer children (1.2) than the total population of men (1.5) and ideal fertility is higher among the group with problems conceiving (2.9) than the total population (2.7). Problems conceiving appears to have the largest impact on achieving ideal fertility among women aged 40 and older and men.

Table 6:
Average total number of children and ideal fertility among different populations

	Average total number of children	Average ideal number of children
Total population age 15-49 (n=4,405)	1.4	2.7
Total population experienced infertility (n=494)	1.4	2.9
Women <40 (n=1,880)	1.5	2.7
Women <40 experienced infertility (n=215)	1.5	2.8
Women ≥40 (n=4,331)	2.3	2.8
Women ≥40 experienced infertility (n=116)	1.6	2.8
Men age 15-49 (n=3,825)	1.5	2.7
Men experienced infertility (n=163)	1.2	2.9

Table 7 shows the percent of different demographic groups who have met or exceeded their fertility. When comparing the total population of each subgroup, the largest proportion of women 40 years or older have met or exceeded their ideal fertility, and the smallest proportion was women younger than 40 years. Comparing the total population to the population reporting problems conceiving within each subgroup, the percent that met

or exceeded ideal fertility among the entire population is almost 20 percentage points higher than those who have experienced trouble conceiving. In all three subgroups, those with problems conceiving are less likely to have met or exceeded their ideal fertility than each subpopulation – the difference is 30 percentage points for women over the age of 40.

Table 7:
Percent of different populations who have met or exceeded their ideal fertility

	% met or exceed ideal fertility
Total population age 15-49 (n=10,036)	41.2
Total population with infertility (n=494)	21.6
Women <40 (n=1,880)	30.5
Women <40 with infertility (n=215)	23.0
Women ≥40 (n=4,331)	60.7
Women ≥40 with infertility (n=116)	29.6
Men (n=3,825)	34.3
Men with infertility (n=163)	17.4

Table 8 shows the results of bivariate logistic regressions of not met ideal fertility and each demographic characteristic (Model 1) and multivariate logistic regression (Model 2). The variable for not met ideal fertility is a binary variable where 1 is "not met" (i.e., total living children is less than ideal number of children). Results in Table 10 therefore show the odds of a respondent having not met their ideal fertility. Note that ideal number of children and total number of children were not included in these regressions because they were used to construct the outcome variable.

Compared to those not reporting infertility, those who said they were unable to conceive with 12 months of trying were more likely to have not met their ideal fertility (OR=1.87, CI [1.49,2.36]). Females were lower odds than males of not meeting their ideal fertility, and each year of age resulted in an individual being less likely to not have met ideal fertility (older people are more likely to have met their ideal number of children). Compared to rural residents, urban residents had 34% greater odds of not meeting ideal fertility, but this relationship was no longer significant after controlling for other demographic characteristics. Compared to respondents with no education, the odds of not meeting ideal fertility were greater among those with primary education, general/high school, university/bachelors, or a master's degree, though the confidence intervals were fairly wide. Compared to those in school/training, every other employment type had lower odds of having not met ideal fertility. Compared to the poorest wealth group (<1,000 lei), those in the higher wealth groups (20,000 lei – 30,000 lei and >30,000 lei) had greater odds of having not met their ideal fertility. Finally, each year

older for sexual debut contributed to a 6% decline in the odds of having not met ideal fertility, but this relationship was no longer statistically significant after controlling for other demographic characteristics.

After controlling for other demographic characteristics, the relationship between not met ideal fertility and experiencing trouble conceiving was larger. Females had lower odds of not meeting ideal fertility compared to males (OR=0.43, CI [0.36,0.52]). Age was still significantly associated with meeting ideal family size after controlling for other demographic characteristics – younger people are less likely to have met their ideal family size than older people. Area of residence, primary education, and general/high school were no longer significant after controlling for other demographic characteristics. Compared to respondents with no education, those with university/bachelor's or master's degrees had higher odds of having not met ideal fertility, but again, confidence intervals for these results were wide. After controlling for other demographic characteristics, employment type was still statistically significantly associated with having not met ideal fertility. Compared to being in school/training every other job type, except disabled had lower odds of having not met ideal fertility. Lastly, compared to the poorest wealth group (<1,000 lei), those in the higher wealth groups (20,000 lei – 30,000 lei and >30,000 lei) had greater odds of having not met their ideal fertility. These results seem to indicate that many individuals have not met their ideal fertility because they are younger and may therefore still have more children in the future, and/or they have delayed or foregone childbearing to pursue higher levels of wealth.

Table 8:
Association between not met ideal fertility and demographic characteristics

Outcome variable: Has not met ideal fertility	Model 1 (bivariate logistic regressions)	Model 2 (multivariate logistic regression)
	Odds Ratio	**Odds Ratio**
Infertility		
Has Not Experienced Trouble Conceiving	Ref.	Ref.
Has Experienced Trouble Conceiving	1.87 (1.49-2.36)***	2.80 (2.10-3.73)***
Sex		
Male	Ref.	Ref.
Female	0.46 (0.40-0.53)***	0.43 (0.36-0.52)***
Age	0.90 (0.89-0.90)***	0.90 (0.89-0.91)***
Area of residence		
Rural	Ref.	Ref.
Urban	1.34 (1.17-1.53)***	1.02 (0.84-1.23)
Education		
None/Early education	Ref.	Ref.
Primary	4.79 (1.72-13.32)***	1.94 (0.51-7.45)
Secondary	1.81 (0.76-4.34)	1.93 (0.60-6.26)
General/High school	2.14 (0.89-5.16)*	2.50 (0.76-8.21)
Vocational	1.45 (0.60-3.49)	2.01 (0.61-6.58)
Specialized college/Technical	1.48 (0.61-3.58)	1.86 (0.56-6.13)
University/Bachelor's	2.10 (0.87-5.07)*	3.18 (0.96-10.51)*
Master's	3.23 (1.24-8.38)**	4.70 (1.33-16.61)**
Doctorate/Postdoc	1.75 (0.37-8.32)	1.94 (0.33-11.52)
Employment		
In school/training	Ref.	Ref.
Employed	0.03 (0.01-0.06)***	0.16 (0.60-0.46)***
Homemaker/Helping family	0.02 (0.01-0.05)***	0.16 (0.57-0.45)***
Unemployed	0.03 (0.01-0.07)***	0.18 (0.06-0.50)***
Retired	0.01 (0.00-0.05)***	0.10 (0.02-0.49)***
Military/Civic service	---	---
Parental/Family leave	0.02 (0.01-0.05)***	0.10 (0.04-0.27)***
Disabled	0.04 (0.01-0.09)***	0.48 (0.15-1.47)
Other	0.05 (0.02-0.14)***	0.29 (0.09-0.89)**
Net household income		
<1,000 lei	Ref.	Ref.
1,000-10,000 lei	1.08 (0.80-1.45)	0.96 (0.66-1.39)
10,000-20,000 lei	1.16 (0.83-1.62)	1.01 (0.67-1.53)
20,000-30,000 lei	1.51 (1.032.23)**	1.70 (1.06-2.73)**
>30,000 lei	1.45 (1.06-2.00)**	1.45 (0.98-2.16)*
Age at first sex	**0.94 (0.91-0.96)***	**1.02 (0.99-1.05)**

***p<0.01 **p<0.05 *p<0.10

PRIMARY VS. SECONDARY INFERTILITY

To get a sense of the prevalence of primary versus secondary infertility in the sample, results were examined among those who have no children compared to those who have at least one child, using both infertility variables. **Table 9** shows the percent of those who have had problems conceiving in 12 months and those who are definitely or probably not able to have a baby among individuals with no children and individuals with at least one child. Proportions for those with problems conceiving are similar across those with and without children. One major limitation using this variable (FER04d) for this particular analysis is that it does not indicate when the problems conceiving occurred, whether before or after the birth of a child. Looking at those who are definitely or probably not able to have a baby, differences are more pronounced between those with and without children. The percent who are definitely or probably not able to have a baby is larger among those with at least one child compared to those with no children.

Table 9 also shows treatment seeking behavior among those with and without children. Doing "nothing" to treat infertility was still the most common response among those with and without children for both infertility variables. However, the proportion of those doing "nothing" to treat infertility was greater among those with at least one child (47.6% of those reporting problems conceiving and 74.4% of those who are definitely or probably not able to have a baby). It is possible that these individuals have achieved their desired fertility and are therefore less likely to seek treatment. Among treatments, "consulted a physician" was the most common treatment among both those with and without children experiencing problems conceiving, and among those with no children who are probably or definitely not able to have a baby. "Other medical treatment" was the most common treatment among those with at least one child who were definitely or probably not able to have another child.

Table 9:
Experience with infertility and fertility treatments used among those with and without children

	No children		At least 1 child	
	n	**%**	**n**	**%**
Problems conceiving (tried to Conceive for 12 months without conceiving)				
No	1,025	88.4	2,608	87.9
Yes	126	10.9	352	11.9
Unsure/No response	9	0.7	5	0.2
Physically possible to have a baby				
Definitely or probably yes	1,176	87.9	2,257	80.4
Definitely or probably not	73	5.4	311	11.1
Unsure/No response	89	6.6	240	8.6
Fertility treatments used (among those who tried to conceive for 12 months)				
Medication	12	10.3	51	13.7
Method for tracking ovulation	3	2.4	6	1.5
In Vitro Fertilization/Micro fertilization	1	0.6	4	1.1
Surgery	3	2.5	7	2.0
Artificial insemination	1	0.6	1	0.2
Consulted a physician	33	28.8	93	25.1
Other medical treatment	10	8.8	24	6.5
Nothing	48	41.2	177	47.6
Don't know	3	2.8	1	0.2
No response	2	2.1	8	2.1
Fertility treatments used (among those who reported definitely or probably not able to have a baby)				

	No children		At least 1 child	
	n	%	n	%
Method for tracking ovulation	1	1.3	4	1.0
In Vitro Fertilization/Micro fertilization	1	1.0	1	0.3
Surgery	0	0.0	1	0.2
Artificial insemination	0	0.0	1	0.2
Consulted a physician	7	10.4	22	5.8
Other medical treatment	5	7.5	29	7.5
Nothing	42	59.7	287	74.4
Don't know	6	9.0	8	2.0
No response	5	6.5	19	5.0

DISCUSSION

Overall, 11.6% of respondents aged 15-49 have tried to become pregnant but did not conceive within 12 months. Individuals reporting infertility are more likely to be female, older, wealthier and living in an urban area. Higher ideal fertility is associated with higher odds of experiencing trouble conceiving, which aligns with these individuals spending more of their lives trying to conceive to reach their desired family size. Unsurprisingly, more living children is associated with lower odds of experiencing difficulty conceiving.

Causes of infertility were only asked of those who reported they were definitely or probably not able to have a baby. About 9.3% of the total population believe they could not have a/ another child, and this belief is most prevalent among women in the older age group (40-49). Most of these individuals said no cause was found for their infertility. These results may reflect lack of access/knowledge, or lack of a desire to have more children. Among treatments for infertility, most individuals reported doing "nothing" to treat their infertility, reflecting a lack of treatment-seeking behavior, possibly due to social, physical or financial barriers.

Total number of children and desired fertility were examined to try to determine whether different groups are able to achieve their ideal fertility, and whether infertility appears to impact the ability to reach ideal fertility. Across the sample, the average number of children is 1.4, but the average ideal number of children is 2.7, well above replacement level. Almost half of the population intends to have another child, but only 38% plan to have another child in the next three years, indicating a desire to delay or space childbearing. Among those

reporting problems conceiving, about 65% of all respondents reporting problems conceiving said they probably or definitely want another child, and over half (57.9%) definitely or probably want another child in the next three years. Looking at the total population and the total population who have experienced problems conceiving, the population with problems conceiving has the same number children on average as the total population with a small difference in ideal number of children. Across the total population and women under 40, experiencing fertility issues does not appear to result in a larger gap between actual and ideal fertility. However, women over the age of 40 with difficulty conceiving have fewer children compared to all women over 40 – the largest gap among any of the subgroups. Men who have experienced difficulty in conceiving have slightly fewer children than the total population of men and ideal fertility is higher among the group with problems conceiving than the total population of men. These findings suggest that infertility is likely a limiting factor for achieving ideal fertility and that many individuals experiencing infertility do indeed desire a/ another child.

"Met fertility," or the proportion of the population where total living children is greater than or equal to desired fertility was also explored. When comparing the total population of each subgroup, the largest proportion who have met or exceeded their ideal fertility are women 40 years or older, and the smallest proportion are women younger than 40 years. This is likely due to the fact that younger women have had fewer childbearing years and may still have more children in the future. However, when we compare the

total population to the population reporting problems conceiving within each subgroup, we see that those with problems conceiving are less likely to have met or exceeded their ideal fertility. The difference is largest for women over the age of 40.

Associations between not met ideal fertility (total living children is less than ideal number of children) and demographic characteristics were also explored. After controlling for other demographic characteristics, individuals reporting problems conceiving are almost three times as likely to not meet their ideal fertility. Females are more likely to have met their ideal fertility compared to males and younger people are less likely to have met their ideal family size than older people. Compared to the poorest wealth group (<1,000 lei), those in the higher wealth groups (20,000 lei – 30,000 lei and >30,000 lei) have greater odds of not meeting their ideal fertility. These results seem to indicate that many individuals have not met their ideal fertility because they are younger and may therefore still have more children in the future, and/or they have delayed or foregone childbearing to pursue higher levels of wealth.

Finally, results were explored among those with and without children to try to better understand secondary versus primary infertility. Looking at those who are definitely or probably not able to have a baby, the percent who are definitely or probably not able to have a baby is larger among those with at least one child compared to those with no children, indicating secondary infertility may be more prevalent in the population. Doing "nothing" to treat infertility was still the most common response among those with and without children for both infertility variables examined. However, the proportion of those doing "nothing" to treat infertility was greater among those with at least one child. It is possible that these individuals have achieved their desired fertility and are therefore less likely to seek treatment.

There are several limitations associated with the data on infertility from the GGS. First, data come directly from respondents themselves and are not triangulated with official medical diagnoses. It is possible that some respondents reporting problems conceiving are not exposed to pregnancy (no or infrequent sex, use of contraception, sterilization or partner's use of contraception or sterilization, etc.). To help reduce the impact of this bias, individuals who had never had sex were removed from the main infertility variable used in this analysis. Diagnoses and treatments may have also been misreported by respondents. It is also possible that social norms and taboos related to the topic of infertility have impacted responses. For example, the finding that problems conceiving is more common among women likely represents women's greater awareness and/or willingness to discuss this topic rather than a higher incidence of infertility among women compared to men. Second, it was not possible to determine timing of relevant events, including experience with problems conceiving, birth of children and sterilization. Information on the timing of these events could have led to richer analysis on secondary infertility and causes and treatments of infertility. Findings presented here would be strengthened by additional qualitative research on decision-making around childbearing and treatment-seeking for infertility.

CONCLUSIONS

Infertility represents an important demographic and reproductive rights issue in Moldova. Many individuals experiencing problems conceiving desire a/another child, but are not seeking treatment. Programs should focus not only on overcoming barriers related to physical and financial access to infertility treatments but also on increasing awareness about infertility and related health concerns and the types of services available to combat these issues. Mass media and education campaigns, as well as counseling by health care providers can help encourage infertile couples and individuals to seek help. In addition, increased fathers' (or partners') involvement at home can help overcome the trade-off between having children and seeking professional or social advancement. Media campaigns that challenge traditional gender roles may help to continue making progress towards a more equitable division of labor within the home, which may in turn help reduce the burden of childbearing in Moldova.

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