

# THE SOCIO-DEMOGRAPHIC PROFILE OF INFERTILE COUPLES AND CAUSES OF INFERTILITY IN MOLDOVA: THE CASE STUDY

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## ABSTRACT

The present study aims to analyze infertile married couples' demographic and social characteristics to understand the need for policy interventions to prevent, diagnose, and treat infertility in Moldova. The study provides information about couples facing the problem of infertility, its causes and risk factors. The study is based on the analysis of medical documentation from the files submitted by infertile couples, during 2017-2021, to the Commission for the Evaluation of Insured Couples. In addition to the documentary analysis, the individual interviews were followed during the Commission meetings with the 244 couples whose files submitted met all the conditions stipulated in the normative acts of the Ministry of Health. The study results showed that the primary beneficiaries of in vitro fertilization are people aged 30-39 who live in urban areas, usually in the capital city of Chisinau. Married couples from rural areas are less likely to use specialized services, which is associated with their low level of information and the low financial availability of this service for rural residents. Among the main infertility factors, the tubal factor was detected, which determined more than half of the cases of infertility among the studied couples. Based on the research, some policy recommendations are formulated, such as improving the information system and databases, increasing access to services and the quality of the services offered, and introducing measures to prevent infertility.

*Keywords: infertility, causes of infertility, infertile couples, in vitro fertilization*

Studiul de față își pune drept scop de a analiza caracteristicile demografice și sociale ale cuplurilor conjugale infertile pentru înțelegerea necesității intervențiilor de politici de prevenire, diagnostic și tratament al infertilității în Moldova. Studiul prezintă informații despre cuplurile care se confruntă cu problema infertilității, cauzele și factorii de risc. Studiul are la bază analiza dosarele medicale depuse de către cuplurile infertile pe parcursul anilor 2017-2021 la Comisia de evaluare a cuplurilor asigurate. Adicional analizei documentare, s-au urmărit interviurile individuale în cadrul ședințelor Comisiei cu cele 244 cupluri a căror dosare depuse au întrunit toate condițiile stipulate în actele normative ale Ministerului Sănătății. Rezultatele studiului au arătat că principalii beneficiari ai fertilizării in vitro sunt persoanele în vârstă de 30-39 de ani care locuiesc în orașe, de obicei în capitală, or.Chisinau. Cuplurile conjugale din mediul rural sunt mai puțin probabil să apeleze la servicii specializate, ceea ce este asociat cu un nivel scăzut de informare a acestora, precum și cu disponibilitatea financiară scăzută a rezidenților din mediul rural pentru acest serviciu. Printre factorii principali ai infertilității a fost depistat factorul tubar, care a determinat peste jumătate din cazuri ai infertilității în rândul cuplurilor studiate. În baza cercetării sunt formulate unele recomandări de politici precum: îmbunătățirea sistemului informațional și a bazei de date, creșterea accesibilității la servicii și a calității acestora, dar și introducerea măsurilor de prevenire a infertilității.

*Cuvinte cheie: infertilitatea, cauzele infertilității, cuplurile infertile, fertilizarea in vitro*

Настоящее исследование направлено на анализ демографических и социальных характеристик бесплодных пар в Молдове, чтобы понять необходимость политических мер по профилактике, диагностике и лечению бесплодия. В исследовании представлена информация о брачных парах, сталкивающихся с проблемой бесплодия, его причинах и факторах риска. Исследование основано на анализе медицинской документации, представленной бесплодными парами Комиссии по оценке застрахованных брачных пар в течение 2017-2021 годов. Помимо документального анализа, на заседаниях Комиссии были проведены индивидуальные интервью с 244 парами, чьи документы соответствовали всем условиям, предусмотренным в нормативных актах Минздрава. Результаты исследования показали, что основными бенефициарами экстракорпорального оплодотворения являются люди в возрасте 30-39 лет, проживающие в городах, как правило, в столице г. Кишиневе. Брачные пары из сельской местности реже обращаются в специализированные службы, что связано с низким уровнем информированности, а также низкой финансовой доступностью данной услуги для сельских жителей. Среди основных факторов бесплодия выявлен трубный фактор, определяющий более половины случаев бесплодия среди исследованных пар. На основании исследования сформулированы некоторые рекомендации, включающие совершенствование информационной системы и базы данных, повышение доступности и качества предлагаемых услуг, а также внедрение мер по профилактике бесплодия.

*Ключевые слова: бесплодие, причины бесплодия, бесплодные пары, экстракорпоральное оплодотворение*

## INTRODUCTION

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse ([WHO, 2018](#)). Infertility should be treated as a couple's condition because men and women alike can have states that cause the inability to conceive.

Addressing infertility is central to achieving Sustainable Development Goal (SDG) 3 – Ensure healthy lives and promote well-being for all ages – and SDG 5 – Achieve gender equality and empower all women and girls. Addressing infertility is central to achieving the human right to enjoy the highest attainable physical and mental health standards.

In the context of demographic changes, emigration and the continuous decrease in the population, infertility has become a public health problem and a demographic challenge for Moldova. Analyzes recently developed based on the data of the Generations and Gender Study (GGS) find out changes in reproductive behavior, characterized by postponing childbearing to older ages. With advancing age, couples are also more likely to suffer from diseases that affect the reproductive system, causing the inability to conceive. At the same time, the tendency to postpone childbirth causes a low probability for couples to have the desired number of children.

Understanding the magnitude of infertility is critical for monitoring, assessing, and improving equitable access to quality fertility care services and addressing risk factors for and consequences of infertility ([WHO, 2023](#)).

A recent study shows that infertility prevalence decreased in high-income and developed countries and increased in others ([Borumandnia et al., 2022](#)). The official statistics of Moldova do not provide data on female and male infertility, both male and female, unexplained infertility, and primary and secondary infertility, including as a result of genital tract infections. According to the Gender and Generation Survey, about 11 per cent of couples of reproductive age in Moldova declare that they cannot conceive. The share of women who stated that they have difficulty conceiving is about 12%, compared to 10% of men who cannot induce a pregnancy. The limitation of the ability to conceive registers higher values in the urban environment (13.4%) compared to the rural setting (9.3%). At the same time, for both men and women, the value of this indicator is higher in Chisinau compared to the country's other territories. The estimates of infertility are needed to guide the planning and coordination of infertility prevention, diagnosis, and treatment efforts at the national level ([GGS, 2022](#)).

Depending on whether or not a pregnancy preceded infertility, it is classified as primary or secondary infertility. Primary infertility implies that the person did not have any pregnancy during the reproductive period, and secondary – previously, at least one pregnancy was obtained. At the global level, secondary infertility is associated with infection-related pathology resulting from postpartum infections, unsafe abortions ([Sharma, Mittal, Aggarwal, 2009](#)), and some sexually transmitted infections ([Chemaitelly et al, 2021](#)).

The current demographic trends, along with the obligation to respect human rights to the highest possible standard of physical and mental health, including sexual and reproductive health, the right to freely decide the desired number of children, the period and interval between pregnancies, lead the Government of Moldova to take concrete measures to support citizens in their achievement. In this context, one of the priority areas focused on by the reproductive health protection services, organized and coordinated by the Ministry of Health, is the prevention, diagnosis and treatment of infertility. Infertility diagnostic and treatment services are provided in the public and private sectors. Moreover, couples can benefit from infertility treatment by applying assisted reproductive technologies (ART).

There are situations when people/couples can achieve their reproductive function only through ART technologies, namely the In Vitro Fertilization (IVF) procedure that allows the couple to overcome the problem of infertility when other ways to get pregnant naturally may have failed ([Zegers-Hochschild, Dickens, Dughman-Manzur, 2013](#)).

In Moldova, public and private medical institutions can provide assisted reproductive technologies services, accredited or licensed for this activity. The in vitro fertilization procedure has been performed only in the private sector.

Not all people/couples have income that would allow them to pay the costs of the IVF procedure. In this sense, the state came with support, offering the opportunity to couples whose partners are medically insured and meet the medical criteria established by the Ministry of Health to benefit from an IVF procedure.

In 2017, by order of the Ministry of Health, the Regulation was approved regarding IVF services provided through compulsory medical assistance insurance funds. The medical insurance fund covers about 40 per cent of the actual cost of IVF. Couples are paying a

significant part of the costs related to laboratory diagnostic services, andrology services and the procurement of medicines.

The study's objectives were to analyze the demographic and social profiles of infertility couples in Moldova and to determine the risk factors of infertility.

## CONDITIONS FOR FACILITATING IVF PROCEDURE

During the five years (2017-2021), 244 insured couples benefited from the IVF procedure. Couples within the insurance policy can only request the IVF procedure financed by the medical insurance fund. To benefit from such a procedure, the applicants must go to the family doctor to execute free investigations and medical consultations, including the obstetrician-gynecologist.

The family doctor and the obstetrician-gynecologist complete and sign the referral ticket to the Commission, and the applicants personally submit the files. The file must contain the couple's referral ticket to the Commission, the couple's request and agreement, copies of identity cards and documents of medical insurance policies

According to the Regulation of ART procedures, the medical indications to benefit from the IVF procedure are grouped as follows:

- the primary (the tubal factor of infertility,

such as the absence of fallopian tubes or tubal obstruction in the absence of effect from repeated laparoscopic treatment; the endocrine factor, such as anovulation and ovarian polycystic in the absence of effect from specific treatment during two years; documented endometriosis, in the absence of effect from specific treatment during two years; infertility of other etiology, if conventional treatments did not give results during five years);

- complementary (uterus without pathology, such as congenital anomalies, synechiae, submucosal or interstitial uterine myoma; ovarian reserve within normal limits and antimullerian hormone values  $> 1.1$  ng/ml; body mass index with values  $\geq 20$  and  $\leq 25$ ; sperm formula within the norm; absence of extragenital diseases, established in annex no. 4 to this Regulation).

Couples who meet one of the primary and all complementary indications can benefit from an IVF procedure.

## DATA AND METHODS

The case study was conducted to provide in-depth qualitative information about couples facing the problem of infertility, its causes and predisposing factors. The medical documentation submitted by infertile couples from Moldova to the Commission for the Evaluation of Insured Couples (from now on, the Commission) was analyzed. This Commission operates at the Center for Reproductive Health and Medical Genetics within the Mother and Child Institute of the Ministry of Health. It evaluates the files of couples who submitted to benefit from IVF, the costs of which were partially covered by the medical insurance fund.

The research started from the assumption that no demographic profile of the beneficiaries/ couples facing the infertility problem exists. Based on the documentation, the demographic profile of infertile couples and the causes of infertility were studied.

In addition to the documentary analysis, individual interviews were conducted with 244 couples, which took place during Commission meetings. Thus, 488 men and women facing infertility as a couple were interviewed. Based on the in-depth interviews, the risk factors predisposed to infertility were highlighted.

## MAIN RESULTS

Due to the purpose of the analysis and the need to identify the demographic profile of couples developed with policy recommendations in the prevention, diagnosis and treatment targeted at certain population groups, the data were disaggregated by age groups and residence.

The women in the couples who benefited from the IVF procedure are between 24 and 45 years old. The largest group of women is the 30-34-year-old group (49.6%), followed by the 35-39-year-old group (30.7%) and the 25-29-year-old group (11.5%). About 80 per cent of the couples who resorted to the IVF procedure are between 30 and 39 years old. These data are explained by the fact that before the IVF procedure, older couples, over the years, resorted to numerous drug and surgical treatments that did not result in success. Therefore, with increasing age, the probability of using the IVF procedure increases; simultaneously, it is essential to consider that the procedure's success

decreases progressively after 35 years.

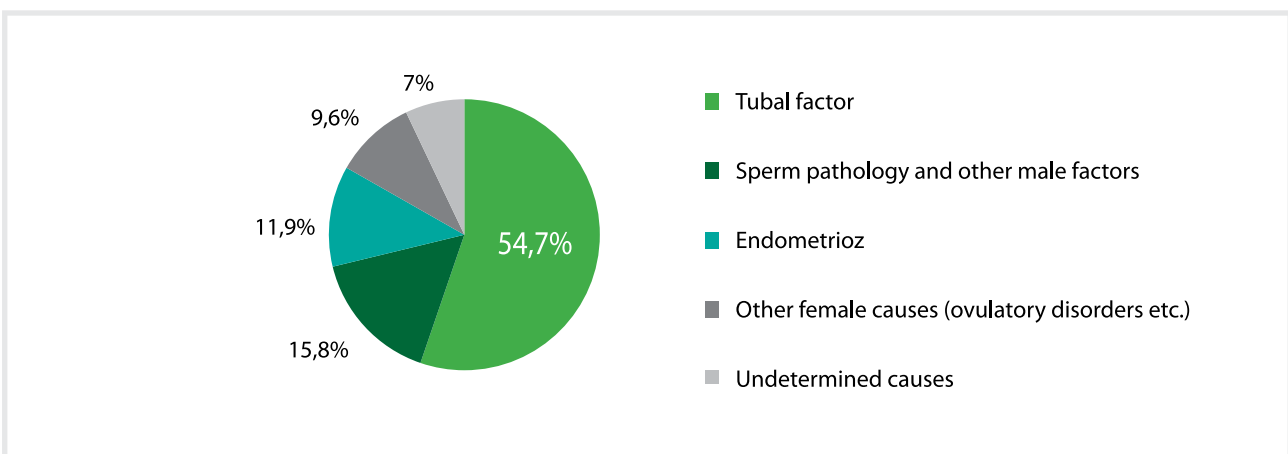
The tendency of infertile couples from the urban environment to turn to specialists and benefit from specialized services to diagnose and treat infertility is superior to those from the rural setting. This finding is also valid for the IVF procedure. According to the study results, more than 2/3 of couples are from urban areas. Among the couples with an urban residence environment, 83.4% are from the Municipality of Chisinau.

Analyzing the time of onset of infertility, we found that of the total number of couples who benefited from IVF, 55.7% were with primary infertility and 44.3% with secondary infertility.

The analysis of the causes that led to infertility in couples, which required the application of ART technologies, namely IVF, allowed the highlighting of the most frequently encountered reasons and their ranking (Fig 1).

### Figure 1:

*Causes of infertility in couples who benefited from IVF in 2017-2021 years*



Many factors, including the tubal factor, can cause female infertility. For couples with the tubal factor of infertility (TFI), IVF is the only way to get pregnant; the results are usually the expected ones. In the structure of the causes of infertility identified in the present analysis, more than half (54.7%) returned to the TFI (tubal obstruction or even the absence of fallopian tubes, in some cases bilaterally, as a result of infections of the genital tract, including STIs, suffered during life and ectopic pregnancies). This fact denotes the need for preventive measures to increase the population's information and education to adopt safe sexual behaviors. Preventative measures are cost-effective compared to infertility treatment and IVF.

Another cause of infertility is endometriosis. Endometriosis is a complicated pathology whose etiology is not definitively known. One thing is sure: it has a detrimental effect on the sexual and reproductive health of women from menarche to menopause. It leads to the impairment of reproductive function by involving the uterus, and ovaries with a decrease in their reserve, adjacent organs and the development of an adhesion process expressed in the pelvis due to a chronic inflammatory reaction, thus creating severe obstacles in the occurrence of a pregnancy. In cases where drug and surgical treatments are not successful, IVF is used. In the structure of the causes of infertility in couples, endometriosis

takes the fourth place, with 11.9%, and in the form of female infertility - the second place, after the tubal factor.

Other uterine disorders that may be inflammatory, congenital (e.g. abnormalities of the development of the uterus) or tumors (such as uterine myoma); diseases of ovarian function such as polycystic ovary syndrome (PCOS); disorders of the endocrine system that cause hormonal imbalances and as a result lead to the appearance of fertility problems, in some cases, can only be solved through IVF, being anticipated, by drug and/or surgical treatments.

In the present study, 9.6% of couples were identified with other causes of infertility (PCOS, anomalies of genital development, etc.), which, although previously corrected, did not result in obtaining a pregnancy naturally. Thus, it was decided to resort to IVF.

Infertility of male origin takes second place in this ranking (15.8%), caused by several factors, such as obstruction of the reproductive tract causing dysfunction in the ejection of semen. This blockage can occur in the tubes that carry semen (such as the ejaculatory ducts and seminal vesicles). Blockages are usually caused by injuries or infections of the genital tract, including STIs. It is also worth mentioning the hormonal disorders that lead to abnormalities of the hormones produced by the pituitary gland, hypothalamus and testicles. Because of the varicocele or medical treatments that affect sperm-producing cells (such as chemotherapy) in cancer patients, the testicular inability

to produce sperm is found. Conditions or situations that cause abnormal sperm quality (oligospermia, azoospermia), defects in the morphological shape of spermatozoa (teratospermia) and low sperm mobility (asthenozoospermia) affect the ability of men to induce a pregnancy.

There are situations when infertility is caused by a combination of two or more factors that simultaneously amplify the adverse effect, such as the absence of fallopian tubes and ovulatory disorders or endometriosis, among other elements. In some couples, both partners have problems conceiving or inducing a pregnancy with the predominance of one factor or another. The defining role in selecting the IVF treatment method belongs to the identified causes.

It is more complicated to intervene and obtain the expected result when both partners have problems achieving reproductive function. According to the analysis, 1 out of 10 couples who resorted to IVF faces a situation when both partners have problems conceiving.

At the same time, it should be noted that there are situations, for various objective or subjective reasons, when the origin of infertility remains unidentified - "unexplained infertility." In the present analysis, of the 244 infertile couples referred to specialized clinics for the IVF procedure, the source of infertility remained unidentified in 17 cases (7.0%).

The success of the IVF procedures performed is shown in Table 1.

**Table 1:**

*The success rate of the IVF procedure in 2017-2022 years*

Reference year	No. of couples	Pregnancies obtained	IVF procedure success rate (%)
2017	30	10	33,3
2018	60	30	50
2019	60	25	41,7
2020	50	18	36
<b>Total</b>	200	83	41,5

\*At the time of the study, the data for 2021 were incomplete.

The best results were obtained in 2018 when the success rate was 50% (30 pregnancies), 16 of which ended with the birth of 24 healthy children (Table 18).

**Table 2:**

*IVF procedure results, the year 2018*

Year	No. of couples	Preg-nancies	Success rate (%)	Births	Duplex	Triplex	Children	Girls	Boys
2018	60	30	50	16	4	2	24	15	8

## CONCLUSION

Infertile couples arrive late to specialized healthcare facilities for various reasons, such as (1) lack of information/knowledge about the facilities and the range of services offered; (2) non-addressing by medical service providers in optimal times at the level of specialized medical assistance, hierarchically superior; (3) inability of individuals/couples to pay for travel to medical institutions outside the towns and making payments for diagnostic and treatment services. These amounts are often beyond the means of a person with low or no income and thus miss the optimal period when they could benefit from the necessary support, which would give them the expected result - the birth of a desired child.

There are obstacles in accessing financial services and the need for adequate information for couples regarding the available infertility diagnosis and treatment services offered by public and private institutions, including IVF. An argument in this regard is that approximately twice as few couples from rural areas (30.7%) compared to those from urban areas (69.3%)

applied to benefit from the IVF procedure. This fact attests to the rural population's low level of information about the current opportunities offered by the state for infertility couples. At the same time, people from rural areas have low incomes and often cannot cover the costs of medicines, investigations, and additional expenses.

The quality of infertility diagnosis and treatment services also depends to a large extent on the training of staff. The lack of a national clinical protocol for medical service providers (family doctors, obstetrician-gynecologists, andrologists, etc.) in infertility couples treatment impedes providing quality medical care.

Even in conditions where medical insurance fund grants financial support of about 40 per cent of the cost of the IVF procedure, some people/couples cannot afford to pay another 60%, including the cost of medicines, thus being deprived of the possibility of being parents.

## POLICY RECOMMENDATION

It is necessary to find mechanisms that would facilitate the systematic collection of accurate and complete data concerning this phenomenon, with their segregation (e.g. male, female and mixed infertility; primary and secondary; by causes; depending on the environment of residence, etc.) to know the magnitude of infertility in Moldova. The database would provide the necessary support to argue the need to allocate resources to provide medical services for infertility issues.

To increase the addressability of the reproductive-age population to specialized services, including IVF, women and men of reproductive age must be informed about the institutions and the type of technical diagnostic and treatment services available in the field of couple infertility. Channels for information

could come from health service providers and other communication channels such as mass media, information and education campaigns.

Preventive measures are considered the most relevant in cost-effectiveness, so they should be considered and set at the national policy level. This postulate is valid in all cases, but mainly in the conditions of a country that is part of the group of states with medium per capita incomes, such as Moldova. In this context, it is time for the Moldovan society to become aware of the importance of measures to inform and educate the population in the field of sexual-reproductive health; it has the role of preventing risky sexual behaviors, especially among adolescents and young people, which would ultimately contribute to the reduced incidence of infertility.

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