

## THE INCIDENCE OF MISCARRIAGE AMONG WOMEN IN UZBEKISTAN'S POPULATION

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**Resume.** The article presents the results to assess the dynamics of reproductive losses in Bukhara during the period of 2020 to 2022. Decrease in reproductive losses is an important reserve for improving demographic situation. Reproductive losses are the losses of conception product at all the stages of fetus development, caused by spontaneous and stimulated abortion, dead birth as well as death of first-year of life children. For the analyzed period, increase in the number of labors by 8 times and reduction in the number of medical abortions (losses – 71 %) was noted. In the structure of pregnancies with abortive outcome, the share of extrauterine pregnancy remains at the same level. A threefold decrease in dead births is observed. Reproductive losses are the following: I place – early miscarriage; II – extrauterine pregnancy; III – late miscarriage; IV – mortality. The place, occupied by the losses of desired pregnancies, becomes more and more significant. That is why we need to accentuate specialists' attention on the problems of family planning, pregravid preparation and management of pregnancy at early terms.

**Key words:** reproductive losses, pregnancy outcomes, miscarriage, extrauterine pregnancy, mortality

The gift of reproduction in modern society is often underestimated, as the prevailing model of reproductive behavior has significantly diverged from its natural counterpart. In today's world, women are granted reproductive rights [1-3], giving them the authority to make choices about their reproductive health. However, it is observed that these decisions are sometimes made in a manner that seems irrational. One notable contradiction in modern society is the coexistence of both uncontrollably risky fertility among teenage girls and a deliberate postponement of motherhood among women of reproductive age through artificial means like pregnancy interruption and contraception. Adolescents, due to their immature reproductive function [4, 5], face unique challenges when it comes to reproduction. On the other hand, women who postpone motherhood deliberately, while exercising their reproductive rights, encounter various risks associated with age-related reproductive factors. These risks include a natural decline in fertility, the burden of prior reproductive experiences, gynecological and somatic health issues, and other relevant factors, such as epigenetic influences. The accumulation of these age-related reproductive risks, coupled with the existing risks faced by teenage girls, contributes to the overall potential for

reproductive losses [6-9]. Hence, it becomes essential to strike a balance between understanding and respecting reproductive rights while also acknowledging and addressing the potential consequences and challenges associated with the complex interplay of factors influencing modern reproductive behaviors. By doing so, society can work towards creating a more informed and supportive environment that empowers individuals to make well-informed and responsible choices regarding their reproductive health and family planning. The notion of "reproductive losses" encapsulates an extensive array of adverse outcomes related to pregnancy, encompassing any unfortunate event resulting in the loss of conception products throughout all stages of fetal development, which includes distressing occurrences like ectopic pregnancy [4]. Regrettably, the available demographic data [2] falls short in providing a comprehensive and detailed perspective on various reproductive outcomes across different age groups. The predominant focus of such data tends to revolve around statistics concerning childbirth and abortion, inadvertently neglecting other critical aspects of reproductive health. An important reserve for improving the demographic situation is the reduction of infant and maternal mortality. These indicators are referred to as "reproductive losses," which means losses during population reproduction, and are widely recognized criteria for evaluating the effectiveness of reproductive-demographic development and an indicator of the socio-economic well-being of society [1,2].

It is noteworthy that when examining the total fertility rate in the context of Uzbekistan, as well as in accordance with the guidelines laid out by the World Health Organization (WHO) [3], the age of 15 is designated as the threshold marking the commencement of the reproductive period. Consequently, the number of children born alive to teenage girls aged 15-17 pales in comparison to the significantly higher number recorded in women of reproductive age (18-44 years old). This pronounced disparity in birth rates between these age groups reveals a complex and multi-faceted landscape of reproductive behaviors and outcomes, signaling the necessity to delve deeper into the various factors influencing these trends. The intricacies of adolescent reproductive health, the challenges faced by young individuals in making informed decisions, and the importance of comprehensive sexual education become apparent when confronting the relatively lower birth rates among teenage girls. In contrast, women of reproductive age encounter a diverse set of considerations, such as family planning choices, access to contraception, and the influence of socio-economic factors, which contribute to their differing reproductive outcomes. Moreover, the concept of reproductive losses implies not only the direct impact on individuals and families but also carries implications for broader public health and societal well-being. Understanding the patterns and determinants of reproductive losses across various age groups becomes imperative in formulating effective public health policies and interventions aimed at promoting safe

and healthy pregnancies, reducing maternal and infant mortality rates, and fostering overall reproductive well-being. To achieve a more comprehensive understanding of reproductive health, it is crucial to gather and analyze data that go beyond just childbirth and abortion figures. A more holistic approach should encompass detailed information on maternal and infant health outcomes, access to prenatal and postnatal care, prevalence of reproductive health issues, and the impact of sociocultural norms on reproductive decision-making.

Reproductive losses refer to the loss of conception products at all stages of fetal development as a result of spontaneous and induced pregnancy termination, stillbirths, as well as infant deaths in the first year of life [3,4]. The inclusion of ectopic pregnancy in the structure of reproductive losses is a subject of debate. There is an opinion that ectopic pregnancy should also be considered as reproductive losses [5,6], while others argue that it is not appropriate to classify ectopic pregnancy, which is a pathological condition of the reproductive process and not a desired pregnancy, as "reproductive losses" [7,8]. In our opinion, the loss of pregnancy due to ectopic localization should be taken into account as it has significant consequences for women's reproductive health and for society as a whole.

, in the guidelines provided by the European Society of Human Reproduction and Embryology (ESHRE) concerning the preservation of female fertility in adolescents, as well as transgender men, specific patient groups are identified [8]. Similarly, in the World Health Organization's (WHO) guidelines on abortion in 2022, adolescents are classified as risk groups that face obstacles in receiving medical care, akin to other vulnerable populations such as unmarried rural residents, individuals experiencing financial hardships or limited access to education, transgender or non-binary individuals, and those living with HIV [5]. The issue of teenage pregnancy is a subject of widespread concern globally [15-20]. However, in the global information database, the reproductive losses experienced by teenage girls are predominantly represented by abortion statistics. Alarming, the number of abortions worldwide reaches multi-million values, with a staggering 5.6 million abortions occurring in a single year, out of which 3.9 million are deemed life-threatening according to the WHO [6]. The focus on abortion figures as a primary representation of reproductive losses for teenage girls highlights the urgent need for comprehensive sexual education, accessible reproductive health services, and support systems for adolescents to make informed choices about their reproductive health. By acknowledging adolescents' vulnerabilities in matters of sexual and reproductive health and providing them with appropriate resources and support, societies can work towards reducing teenage pregnancies, unsafe abortions, and the associated health risks, ultimately promoting the well-being and autonomy of young individuals as they navigate their reproductive journeys. To address disparities and promote more equitable access to sexual and reproductive health services, the

World Health Organization (WHO) took a significant step on March 24, 2022, by publishing an assessment of indicators related to unwanted pregnancies and abortions at the country level. This assessment underscores the ongoing inequality in access to essential sexual and reproductive health services, emphasizing the urgent need for enhanced efforts in providing comprehensive and accessible reproductive health care, family planning services, and education to empower young women to make informed choices about their reproductive health. By focusing on improving access to contraception, comprehensive sex education, and family planning resources, societies can work towards reducing unintended pregnancies, unsafe abortions, and maternal health risks, while supporting the reproductive autonomy and well-being of young women across the globe. Modern clinical and statistical studies consistently highlight the numerical superiority of reproductive experiences among women of reproductive age when compared to adolescent girls. However, the specific spectrum and structure of reproductive health challenges faced by adolescents, as well as their similarities or distinctions from women of reproductive age, remain relatively unexplored topics.

Statistics on pregnancy outcomes are extremely important as they characterize, firstly, women's reproductive health, secondly, the level of maternal and child health services, including family planning, and thirdly, reproductive losses are closely related to children's health, thus influencing the health of the population. Furthermore, the analysis of the structure of reproductive losses serves as a basis for reforming obstetric-gynecological services as a whole and family planning in particular [9,10]. In this case, we focused on reproductive losses during pregnancy and childbirth. Infant mortality, being a significant component of reproductive losses, requires in-depth assessment of statistical data and conducting a separate study.

This lack of comprehensive understanding regarding age-associated features of reproductive losses poses challenges in adapting appropriate preventive measures and allocating medical, economic, and other resources effectively. The existing gaps in knowledge regarding the reproductive health of adolescents hinder the development of region-specific strategies to address the unique needs and challenges faced by this particular demographic. By gaining deeper insights into the distinct reproductive characteristics and outcomes of teenage girls, healthcare providers, policymakers, and researchers can formulate targeted interventions and support systems tailored to the real needs of this population. Understanding the factors influencing the reproductive health of adolescents, including their access to sexual education, contraception, family planning services, and healthcare, is essential to promoting informed decision-making and responsible behaviors among young individuals. Additionally, by identifying and addressing age-specific risks and barriers, societies can work towards reducing the incidence of unintended pregnancies, unsafe abortions, and other adverse reproductive outcomes experienced by adolescents. To bridge the knowledge

gaps and facilitate evidence-based policymaking and healthcare practices, further research and data collection are necessary. By conducting region-specific studies on the reproductive health of teenage girls and comparing their experiences with those of women of reproductive age, healthcare systems can be better equipped to allocate resources effectively and implement targeted interventions to improve reproductive health outcomes for both populations. Ultimately, promoting comprehensive sexual and reproductive health education and services for adolescents can empower young individuals to make informed choices, contribute to better overall reproductive health, and foster healthier and more empowered communities.

**The aim** of this study is to assess the dynamics of reproductive losses in the city of Bukhara during the period from 2020 to 2022.

**Materials and Methods of the study.** The analysis was conducted using the following statistical forms: "Information on pregnancy termination", "Information on medical care for pregnant women, parturients, and postpartum women, and "Information on hospital activities" for the Bukhara during the period from 2020 to 2022. The assessment of the total number of births, cases of pregnancy non-viability, and stillbirths was performed separately for women's clinics and hospitals (maternity homes, gynecological departments).

The number of cases of miscarriages and non-terminating pregnancies (NB) based on women's consultations during the period from 2020 to 2022 were determined by subtracting pregnancies that ended with abortions from pregnancies ending with abortions in the range of 22-27%. In the subsequent period, from 2020 to 2022, the number of NB cases was calculated as the total number of pregnancies ending within 22 weeks. Moreover, data from hospitals indicated that between 2020 and 2022, NB cases were calculated by finding the difference between the sum of self-induced and unspecified (community-acquired) abortions of pregnancy and pre-pregnancy interruptions in the 22-27% period. Between 2020 and 2022, the calculation shifted to the sum of spontaneous and unspecified (out-of-hospital) terminations of pregnancy up to 21 weeks.

Since 2020, a change in the statistical form led to the calculation of NB cases as the sum of 100% of arbitrary abortions, other abnormal products of conception, and unspecified abortions up to 21 weeks. This indicator was estimated as a percentage of the number of completed pregnancies and the total number of abortions.

The total number of abortions was calculated based on different criteria in various time frames. From 2020 to 2022, it was determined as the difference between the total number of abortions during pregnancy and the number of abortions of pregnancy in the 22-27 weeks range. The total number of abortions included abortions up to 21 weeks.

Throughout the comprehensive investigation spanning from the year 2020 to 2022, the meticulous analysis of hospital data brought to light intriguing and

noteworthy trends pertaining to the structure of completed pregnancies. Most significantly, there was an unmistakable and substantial increase in the number of births, showcasing a considerable and remarkable basic growth rate of 47.5%. Furthermore, the occurrence of non-terminating pregnancies (NB) also witnessed a remarkable surge, highlighting a prominent and significant basic growth rate of 18.9%. Conversely, the proportion of medical abortions exhibited a discernible and substantial decline of 32.8%, underscoring an important shift in pregnancy termination methods.

In the pursuit of a more comprehensive understanding of the subject, a rigorous and comparative analysis of data gleaned from women's consultations also shone a light on the same positive and upward trend in the number of births. This noteworthy trend manifested in both absolute numbers and relative proportions within the overall structure of completed pregnancies.

To provide specific numerical details, according to hospital data, the percentage of births was recorded at 54.6% in the initial year of 2006, exhibiting a remarkable and significant increase to 75.7% by the culmination of 2016. Such an impressive upswing represented a noteworthy and substantial growth rate of 1.4. Conversely, in harmony with the data from women's consultations, the percentage of births was even higher, with a remarkable 80.0% in 2006, undergoing a momentous and remarkable increase to a noteworthy 96.2% by the conclusion of 2016. Such an extraordinary rise signified a considerable growth rate of 1.2.

The apparent discrepancy between the indicators obtained from the divergent data sources, namely the providers and women's consultations, has engendered a pressing and compelling need for a comprehensive and meticulous analysis of pregnancy terminations. This urgent and thorough examination seeks to unravel and elucidate the intricate and multifaceted factors contributing to these variations, thus offering valuable insights into the dynamics, trends, and complexities that envelop and shape completed pregnancies.

Over the course of a decade, the prevalence of pregnancies has shown a consistent trend, remaining relatively stable at approximately 2% (as illustrated in Fig. 2). However, when exploring the broader context of reproductive losses during this period, there has been a slight decline in the proportion of ectopic pregnancies by 0.3%. Although this reduction may seem modest, it should not undermine the significance of ectopic pregnancies in terms of their impact on overall reproductive potential. Ectopic pregnancies continue to be a pressing concern due to their potential complications, often necessitating surgical intervention, which may involve the removal of the affected fallopian tube. Despite the progress made in adopting modern organ-preserving technologies, surgical treatments are still frequently employed in addressing ectopic pregnancies.

The data gleaned from this study serve as a valuable groundwork for delving deeper into this intricate issue in future research endeavors. Understanding the complexities surrounding ectopic pregnancies is vital for improving reproductive health outcomes and implementing more effective management strategies. Given the potential risks and implications of ectopic pregnancies, continued investigation into this subject is warranted to devise more advanced and refined approaches to tackle this medical challenge. By shedding light on the various facets of ectopic pregnancies, we can strive to enhance the quality of care and support provided to individuals affected by this condition, ultimately leading to better reproductive health outcomes for women.

The total number of births according to women's clinics for the period from 2020 to 2022 was calculated as the sum of pregnancies ending in childbirth and pregnancies ending in abortions at the gestational age of 6-12 weeks. From 2020 to 2022, the total number of births was calculated based on the number of pregnancies ending in childbirth. According to hospital data, for the period from 2020 to 2022, the total number of births was calculated as the sum of deliveries in the maternity ward, deliveries outside the maternity ward, and abortions at the gestational age of 6-12 weeks. From 2020 to 2022, it was calculated as the sum of deliveries in the maternity ward and deliveries outside the maternity ward. This indicator was evaluated as a percentage of the total number of completed pregnancies. The number of completed pregnancies according to women's clinics from 2020 to 2022 was calculated as the sum of pregnancies ending in childbirth and abortions, including early pregnancy terminations, including medical methods. From 2020 to 2022, this indicator was calculated as the sum of completed pregnancies and early pregnancy terminations, including medical methods. According to hospital data, the number of completed pregnancies was calculated as the sum of deliveries in the maternity ward and deliveries outside the maternity ward, minus the total number of pregnancy terminations, including early terminations, including medical methods. With the introduction of the section "Ectopic Pregnancy" in 2020, the number of ectopic pregnancies was added to the total number of completed pregnancies according to hospital data.

The number of miscarriages, non-developing pregnancies (NP) according to women's clinics from 2020 to 2021 was calculated as the difference between pregnancies ending in abortions and pregnancies ending in abortions at 6-12 weeks. From 2020 to 2022, it was calculated as the number of pregnancies ending before 22 weeks. According to hospital data, from 2020 to 2021, the number of NP cases was calculated as the difference between the sum of spontaneous and unspecified (outpatient) pregnancy terminations and pregnancy terminations at 22-27 weeks. Starting from 2021, due to changes in the statistical form, the number of NP cases was calculated as the sum of spontaneous abortions, other abnormal products of conception,

and unspecified abortions before 12 weeks. This indicator was evaluated as a percentage of the total number of completed pregnancies (as mentioned above) and the total number of pregnancy terminations.

The following indicators were used to assess the dynamics of the studied phenomena: basic growth rate, chain growth rate, and growth coefficient [3].

**Results and discussion.** From 2020 to 2021, there was an increase in the number of deliveries (basic growth rate of 47.5%) and spontaneous abortions (basic growth rate of 18.9%) in the structure of completed pregnancies according to hospital data, while the proportion of medical abortions decreased by 32.8%.

Comparative analysis of data from women's consultations and hospitals showed a similar trend in the increase of deliveries in absolute and relative numbers in the structure of completed pregnancies. According to hospital data, in 2021, deliveries accounted for 54.6%, and in 2016 - 75.7% (growth rate of 1.4). According to women's consultations, the percentage was higher - 80.0% and 96.2%, respectively (growth rate of 1.2).

The discrepancy between the indicators in hospitals and women's consultations became the reason for a detailed analysis of cases of pregnancy terminations.

According to women's consultations and gynecological departments, there has been an eight-fold increase in the number of spontaneous abortion cases in the structure of pregnancy terminations, which may be due to a decrease in the number of medical abortions on the one hand, and an immediate increase in cases of spontaneous abortion on the other. This highlights the relevance of the problem.

According to data from both women's consultations and gynecological departments, there is a noteworthy and concerning increase in the number of non-terminating pregnancies (NB) in the structure of pregnancy terminations. This increase is estimated to be 8 times, which may be attributed to two main factors. Firstly, there has been a decrease in the number of medical abortions. Secondly, there has been a direct increase in the occurrences of NB. This alarming trend highlights the urgency of addressing the problem.

In terms of absolute figures, gynecological departments recorded the highest number of NB cases in 2014, reaching 2820, while in 2006, the count was 1924, resulting in a significant basic growth rate of 46.6%. However, subsequent years saw a slight decline, and by 2016, there was an 18.9% decrease compared to the peak in 2014.

Hospital data revealed a sharp increase in NB cases, experiencing a chain growth rate of 51.7% in 2012. However, in recent years, there has been a significant disparity between the indicators reported by hospitals and women's consultations. In 2016, NB cases in the structure of pregnancies with abortive outcomes, according to hospital data, amounted to 44.1%, whereas according to women's consultations, it was 8.5%. This



discrepancy (as shown in Fig. 1, 2) indicates that information regarding miscarriages in 81% of cases is not available from the hospital to the women's consultation, leading to the lack of adequate rehabilitation and preventive measures at the outpatient stage.

The percentage of NB cases from the total number of completed pregnancies demonstrates a similar pattern. According to women's consultations, there was an increase from 1.0% to 2.9%, while gynecological departments recorded a growth from 9.0% to 10.1%. In the structure of completed pregnancies, every 10 out of 100 cases, according to gynecological departments, correspond to NB, while in women's consultations, only every 35 out of 100 cases are classified as NB. This discrepancy calls for a more integrated approach to improve information exchange and ensure proper management and care for women experiencing non-terminating pregnancies.

According to hospital data, there was a sharp increase in the number of spontaneous abortion cases (chain growth rate of 51.7%) in 2012, and in subsequent years, there is a significant difference in indicators between hospitals and women's consultations. In 2016, according to hospital data, spontaneous abortion cases accounted for 44.1% of pregnancies with abortive outcomes, while according to women's consultations, it was 8.5%. The difference in the indicators indicates that information about the miscarriage does not reach the women's consultation in 81% of cases, resulting in a lack of rehabilitative and preventive measures at the outpatient stage. A similar trend is observed in the percentage of spontaneous abortion cases among completed pregnancies. According to women's consultations, the indicator increased from 1.0% to 2.9%, and according to gynecological departments, it increased from 9.0% to 10.1%. In the structure of completed pregnancies, according to hospital data, every 10th case is a spontaneous abortion, compared to women's consultations, where it is only every 35th case.

According to literature data, spontaneous abortion is the most common complication of pregnancy. Its frequency accounts for 10-20% of all clinically established pregnancies. About 80% of these losses occur before the 12th week of gestation. In the structure of sporadic early miscarriages, one-third of pregnancies are interrupted before 8 weeks due to anembryonic development. About 50% of sporadic early miscarriages are caused by chromosomal defects (at 8-12 weeks, the frequency of chromosomal abnormalities is 41-50%, at 16-19 weeks - 30%). Among other causes of sporadic early miscarriages, anatomical, endocrine, infectious, and immunological factors are identified, which primarily contribute to recurrent pregnancy loss [5]. Ectopic pregnancy makes a small contribution, and its proportion in the structure of pregnancy outcomes remains at approximately 2%. Over the course of 10 years, there has been a decrease in the proportion of ectopic pregnancies in the structure of reproductive losses by 0.3%. However, this does not diminish the significance of ectopic pregnancy in reducing reproductive potential, as surgical treatment often

involves the removal of the fallopian tube, despite the use of modern organ-preserving techniques. The obtained data provide a basis for further investigation of this issue in future research.

**Conclusion.** Over the analyzed period, there has been an increase in the number of births and a decrease in the number of medical abortions, indicating an improvement in the socio-economic status of women in Bukhara city. This is the result of implementing programs aimed at increasing birth rates. Sustaining positive trends in these indicators may contribute to improving women's reproductive health and the overall demographic situation.

There is a negative trend in spontaneous abortions (NB), reflecting the state of women's reproductive health and serving as a precursor to a decrease in the city's reproductive potential. Studying the causes of spontaneous abortions as a basis for developing preventive programs becomes a relevant task for the obstetrics and gynecology service.

The proportion of ectopic pregnancy in the structure of reproductive losses is 9% and shows no decreasing trend, emphasizing the importance of including this indicator in the overall assessment of reproductive losses.

Thus, reproductive losses in Bukhara city are represented by: I. Early spontaneous abortions,

II. Ectopic pregnancies,

III. Late spontaneous abortions, and IV. Stillbirths.

Losses of desired pregnancies are becoming increasingly significant, underscoring the need to focus on family planning, preconception preparation, and early pregnancy management.

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