



FAMILY HEALTH AND BIRTH RATE AT THE BEGINNING OF THE 21ST CENTURY FROM THE PERSPECTIVE OF THE NEONATOLOGIST

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Over time, there has been a decline in the global birth rate, and the factors that have influenced this change are the transition from the pre-industrial to the modern economy, social emancipation and increasing infant mortality. Economic development and social emancipation have led to the implementation of jobs at the industrial level, but also to the improvement of reproductive education of the general population. In recent years, in Romania, the fertility rate and the birth rate have been influenced by factors such as the communist regime and its impact on the possibility of abortion, but also the differences observed between rural and urban areas. It has been observed that the national demographic transition has reduced the incidence of birth defects by improving pregnancy control and early identification of life-incompatible abnormalities. It has also been shown that in order to prevent perinatal morbidity, it is important to implement successful strategies to reduce prematurity, which has also contributed to reducing the incidence of infections in the pediatric population by supporting national vaccination programs. As neonatologists, we consider important to reduce the existing deficits in Romanian maternity hospitals by equipping them with modern medical equipment and access to specialized investigations, also treating and combating infertility, as well as investing in the education of medical staff involved in the care of newborns.

Keywords: birth rate, fertility rate, national programs, prematurity, neonatologist.

Over time, the birth rate has influenced a country's economic prosperity, urbanization, and social structure.¹ The decline in the birth rate is a fundamental change in human history and this has been observed globally since the 1950s.²

In the period between the two world wars, there were growing concerns about the population decline and the inability to replace generations effectively. After that, the 1950s and the 1960s caused a “baby boom” in which birth rates remained normal, followed by a significant decline in births after 1970.³

In less developed countries, due to the poor level of education, but also due to the couples' lack of access to contraceptive methods, the fertility rate remains high but the birth rate is low, mainly due to maternal and fetal mortality.¹ Currently, in two thirds of the world's population (Europe, parts of East Asia, North America, Australia) the total fertility rate is less than 2 children per woman. In other places, such as Africa, the situation remains unchanged, with increasing birth rates.⁴

The total fertility rate is the median number of children a woman can give birth to during childbirth.¹ Major factors that have led to a decline in global birth rates include declining infant mortality rates, social emancipation (especially that of women), and economic growth. These factors also led to the modernization of society and industrialization.²

Long-term analysis has shown that the health of the population improves and the mortality rate decreases as population growth increases.² Before modernizing society globally, it was found that, although the total fertility rate was about 4.5–7 children per population, the population was reduced by an increased infant mortality rate.² This infant mortality can be characterized as a standard reflecting the degree of socioeconomic development of a country.⁵ The demographic literature describes two mechanisms used in the past to adapt to an increased infant mortality rate in a population.² The first mechanism demonstrates that to cope with the inevitable loss of one or more children, a woman will give birth to more children to replace the lost ones. Thus, the replacement process is the reaction to

experiencing the death of a child.² On the other hand, given that in the pre-modern era, one-third of children in a family die before the age of 5, another mechanism has been discovered, called “child-hoarding”. This second mechanism assumes that, at that time, a family “anticipated” the possibility of the death of a child and gave birth to a larger number of children than desired. Therefore, in a country where the infant mortality rate exceeds 9%, the birth rate increases because the total fertility rate exceeds 4 children per woman.²

It has been observed that in middle-income countries, the infant mortality rate has been reduced over the last three decades by improving health services and living conditions.⁵

The emancipation of women has also been determined by the increase in access to education and it has been observed that, in countries where education has increased from 0 to 6 years, the birth rate has decreased significantly. It was noticed that access to education usually influences the choice of having or not having children.² Studies have also shown that women with better education, especially health education, know and consider the possibilities of contraception.²

Also, with the advancement of technology, there has been an increase in the employment of women, mainly through the transition from agriculture to manufacturing and industrial work.² Women's involvement as a labor force and access to education has changed the social status of women, things closely related to the change in the birth rate.²

At the same time, socioeconomic factors that influence the lifestyle, such as increasing the rate of obesity, increasing the incidence of sexually transmitted diseases, but also environmental factors that intervene in the urbanization process, impact fertility.¹

Initially, it was considered that the urban environment is a source of economic opportunity and increasing access to health services. However, over time, it has been observed that the urban environment generates factors that can negatively influence the health of the population, such as the level of air pollution.⁵

All the factors listed above lead to a delay in conception, which in turn reduces ovarian reserve, decreased fertility and thus birth rate.¹ For this reason, it is important to introduce global projects to prevent infertility by increasing sensitivity at the individual, family and community level. It is necessary to implement health education programs,

both for sexually transmitted diseases prevention and for fertility protection.¹ Reproduction is essential for progress at community level, but also for ensuring the socio-economic equality and diversity of future generations.¹

Romania is characterized by significant differences at territorial level in terms of fertility and birth rate. Thus, given that the values and lifestyle of Romanians in various regions vary depending on cultural and social factors related to local traditions and customs, this has a direct impact on population numbers.^{6,7}

In Romania, the total fertility rate in 1955 was 3.1 children per woman, to gradually reach 1.6 children per woman in 2020. It is considered necessary a fertility rate of at least 2.1 children per woman to maintain a generation, without being necessary international immigration. On the contrary, a lower value will lead to the decline of the native population.⁸ We note, on the one hand, that in Romania the birth rate decreased from 20.9 per 1,000 inhabitants in 1971 to 9.5 per 1,000 inhabitants in 2020⁹, but, on the other hand, the average age of women giving birth to their first child has changed from the age of 23 between 1990 and 1994 to 25.2 between 2000 and 2005.¹⁰ This is due to change in the condition of women in society, through the acquired economic independence, both through the extension of schooling, but also through the involvement in economic activities, which increases the desire among women not to have children.^{3,6,11}

The demographic transition from the pre-industrial economy to the modern economy has progressively decreased birth rate in Romania. According to theorist Jean-Claude Chesnais, this transition initially occurs after a decrease in the mortality rate, followed shortly by a reduction in the fertility rate, due to a combination of factors.³

As early as 1957, when Romania was under the Soviet regime, the possibility of abortion was legalized, which significantly reduced the fertility rate to 1.9 children per woman, similar to Hungary and Japan.^{6,12} Since 1966, the anti-abortion decree has been approved and the use of contraceptive methods was banned, which increased the birth rate in Romania until 1989, when the communist regime fell.^{6,13} Abortion is regulated by the Criminal Code of 2014, which allows abortion before 14 weeks of gestation, with the informed consent of the patient and with a licensed specialist.¹⁴

After 1990, when the transition from a communist to a democratic political regime occurred, the fertility

rate was steadily declining. The national decline is correlated with global decline, with women's access to further education, including higher education, increased employment and increased access to modern methods of contraception.⁶

Although all these changes decreased the birth rate, other factors contributed significantly to the decision of having a child. These include the drastic reduction in maternal and child care centers, which has diminished the ability of single mothers to raise and educate a child, which in turn is linked to a lack of adequate financial resources (low wages or unsafe jobs).⁶ In addition, the constant lack of access to health services has influenced these changes in Romania, with significant differences between rural and urban areas.

As solutions, it can be seen that with the demographic transition and the changes that have taken place at the economic, political and social levels, health services and epidemic prevention programs have improved. Thus, according to the data obtained from I.N.S and C.N.S.I.S.P, there is a reduction in perinatal mortality caused by congenital malformations and chromosomal abnormalities. This is achieved through better control of pregnancies in terms of early detection, through periodic ultrasounds, of birth defects, which are often incompatible with life.¹⁵ In this regard, we also observe changes in the infant mortality rate. In 1985, the infant mortality rate was 25.5 children per 1000 live births and 33.4 children under the age of 5 per 1000 live births. In 2020, the infant mortality rate was 5.8 children per 1000 live births and 6.9 children under the age of 5 per 1000 live births.⁸

Regarding Romania, the literature also describes three categories of factors that influence perinatal mortality. Are mentioned risk factors such as socioeconomic factors, but also factors related to the mother (parity), preexisting pathological conditions of pregnancy, obstetrical factors (birth care, type of birth, presentation), gestational age. Determining causes including infectious, toxic, deficiency, immunological, traumatic, chemical, mechanical factors were also considered. In 2019, the most common causes of perinatal mortality include perinatal-specific respiratory and cardiovascular disorders, maternal disorders and pregnancy complications, as well as newborn hemorrhagic and hematological disorders.¹⁵ For all of these controllable causes of perinatal mortality, there are needed changes to increase the survival of

newborns, but at the same time increase their quality of life.

To prevent neonatal and infant mortality, it is important to implement educational programs and strategies to reduce prematurity and its complications. Interventions are especially effective for premature newborns, as the incidence of premature mortality is high in low- to moderate-income countries. We consider that the antenatal administration of corticosteroids in pregnancies at risk of premature birth, as well as the administration of postnatal surfactant reduces the incidence of severe forms of respiratory distress syndrome. Studies and clinical experience have shown that early use of noninvasive CPAP ventilation significantly reduces the risk of barotrauma and volutrauma associated with invasive ventilation and long-term pulmonary complications of preterm infants. This "strategy" is effective over time and it is important to maintain and implement such prevention methods in as many maternity hospitals as possible.¹⁶

Infections have made an important contribution to neonatal and infant mortality. The main interventions that can be carried out at present for preventing infections are the vaccination of pregnant women according to the recommendations of the Ministry of Health, the immunization of the newborn according to the national vaccination program and breastfeeding. To reduce the mortality caused by infections, it is necessary to start the vaccination of newborns from maternity. The National Vaccination Program has significantly reduced both pediatric morbidity and mortality by preventing childhood-specific infectious diseases. This intervention has proven its success over decades in the field of public health, by drastically reducing cases of polio, eradicating smallpox, and reducing severe complications and deaths associated with measles, whooping cough, diphtheria and tetanus.¹⁷ Neonatal sepsis is one of the most common causes of morbidity and mortality in the newborn in the first days of life. For this reason, it is imperative to identify and treat appropriate cases of neonatal sepsis, to avoid pediatric morbidity, with a predominance of neurological disabilities.

Promoting and sustaining breastfeeding is a major issue, as early initiation of breastfeeding and enteral nutrition with breast milk reduces neonatal mortality by 44%.¹⁶ Studies show that with increasing breastfeeding in the first week of life, there is a reduction in the rate of necrotizing

enterocolitis and sepsis in the same population of premature from neonatal intensive care. Also, early breastfeeding involves a deep and unique emotional relationship between mother and child, and in the long run prevents abandonment and positively influences the psychosocial behavior of the child.^{18,19}

Caring for a premature baby is a delicate and complex medical activity, which involves many responsibilities even after discharge from the maternity ward. The adoption of the “Family Centered Care” principle increases the quality of life of premature babies, by stimulating normal neurological and psychomotor development during maternity hospitalization. In this regard, it is important to involve parents in the care of premature babies from the earliest days of life by directly encouraging the “*kangaroo mother care*” mode. This will increase the degree of responsibility of the parents, as well as their confidence and care skills of a premature baby. Parents, during maternity hospitalization, are encouraged to participate in the daily care of their newborn – handling, feeding, skin care. Also, before discharge, an important aspect is to inform and, as far as possible, educate parents about the initial steps of neonatal resuscitation.

In the same way, it is necessary to be aware of the existing deficits in maternity hospitals in Romania and to implement the necessary steps to improve medical services. It is imperative to equip neonatology departments with modern medical equipment, constant access to investigations, both laboratory and imaging, as well as qualified medical staff to ensure quality health care, especially in case of newborns at risk. Efforts are currently being made to continuously improve residency programs for training of specialists in the field, using evidence-based practices, access to a constantly evolving technology, to control and reduce perinatal morbidity and mortality. An example is the worldwide program called “Helping Babies Breathe”, which develops a methodology to train and improve the basic skills of neonatologists in terms of neonatal resuscitation. During these educational sessions, the emphasis was mainly on providing standard care at the delivery room – thermal comfort, breathing stimulation, positive pressure respiratory support. By implementing this program from 2010 to the present, neonatal mortality has dropped dramatically globally – by almost 44%.²⁰

At the same time, we are still looking for optimal solutions to increase the birth rate in Romania,

preferably solutions that can be intervened directly, by treating infertility, but also indirectly, by educating the population about fertility health and encouraging reproduction. In this regard, since 2011, in Romania, funds have been allocated by the Ministry of Health to support the implementation of the National Assisted Reproduction Program, which was interrupted in 2013 and resumed in 2015. This program is addressed to couples who have been diagnosed with infertility and covers the costs of in vitro fertilization procedures, intrauterine insemination, intracytoplasmic sperm insemination, screening and preimplantation genetic diagnosis, as well as the possibility of gamete donation. Access to these state-funded procedures increases fertility and birth rates in Romania, but at the same time, using constantly updated procedures and protocols, assisted reproduction techniques directly contribute to reducing perinatal mortality. This has been observed with the increasingly widespread implementation of the single embryo transfer protocol. Statistics show that the transfer of a single embryo significantly reduced the risk of intrauterine death of a fetus, but also the number of multiple pregnancies and implicitly the complications associated, preferably prematurity.

As neonatologists, on the one hand, we consider essential the development, support and widespread use of national programs and strategies that can reduce prematurity and associated complications to reduce neonatal mortality. On the other hand, it is necessary to facilitate access to quality assisted reproduction services through state funding, improve medical services by equipping modern maternity facilities, but also invest in education, for development of medical staff in general and for the population in particular.

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