LEADING FACTORS AND RECENT TRENDS IN UNDER FIVE-YEAR-OLD MORTALITY

CARMEN DANIELA DOMNARIU[1]

[1]*"Lucian Blaga" University of Sibiu*

Abstract: One of the most important demographic rates is the under five-year-old mortality rate, which correlates very strongly with the socio-economic and cultural status of a country and is among the best predictors of state failure. It is, therefore, a useful indicator of a country's level of health or development, and is a component of the physical quality of life index. The present paper illustrates the situation of infant mortality rates in the world, emphasizing its decrease in the recent years, especially in the developed countries. This tendency is also felt at the level of the developing countries, yet, there are countries that register high levels. The paper also focuses on the factors leading to the situation of infant mortality rate in Romania, which still remains high.

As a definition, infant mortality is an important demographic phenomenon regarding the death of a child, who is less than one year old and it is quantified as infant mortality rate (IMR). IMR is the number of deaths of children under one year of age per 1 000 live births.(1)

Infant mortality can be classified in three major groups: perinatal mortality, which refers to deaths of newborns up to one week postpartum and the stillborn per 1 000 total newborns.

Neonatal mortality is the death of a newborn occurring within 28 days postpartum. Neonatal death is often attributed to inadequate access to basic medical care, during pregnancy and after delivery. This accounts for 40–60% of infant mortality in the developing countries.(2)

Postneonatal mortality is the death of children aged 29 days to one year. The major contributors to postneonatal death are malnutrition, infectious disease, and problems with the home environment.

The death of a child who is between 1 year old and 5 years of age per 1 000 inhabitants of the same age and territory represents the 5 year-old mortality. This rate has recently been in the attention of the United Nations, World Health Organization (WHO) and Eurostat, as it represents an important indicator of the health status of a population.(3)

The infant mortality rate is often used as an indicator to measure the health and well-being of a nation, because the factors affecting the health of entire populations can also influence the mortality rate of infants.(4) It is influenced by economic, social, educational and organizational factors.

The leading causes of infant mortality are congenital malformations, sudden infant death syndrome, maternal complications during pregnancy, and accidents and unintentional injuries.(5) Environmental and social barriers prevent access to basic medical resources and thus contribute to an increasing infant mortality rate. 86% of deaths are due to infections, premature births, complications during delivery, and perinatal asphyxia and birth injuries.(1)

But, there are many other factors that highly contribute to infant mortality nowadays, such as the mother's level of education, environmental conditions, political and health systems.

Infant mortality risk factors can be classified into three major categories. The first one refers to the mother-child biosystem, which includes the endogenous factors and the exogenous ones.

Among the endogenous factors (factors related to mother), the following worth mentioning: age of the mother – less than 19 years old, birth order, previous abortions, general personal pathology, teratogenic drugs, obstetrical factors (toxaemia of pregnancy, bleeding in late pregnancy, caesarean section). The factors related to the child include prematurity, gender, new-born order, age (first trimester), biological handicaps (malnutrition, rickets, anemia, birth defects, infections interfering with the exogenous factors). The exogenous factors comprise the natural environment factors, socio-economic factors, level and quality of healthcare services, accidents, intoxications.

The second category of infant mortality risk factors are family-related factors including: the marital status of the mother, disorganized family, mother's low level of education, family income, alcoholism, wandering, young couples in their first year of marriage.

The last category of risk factors for infant mortality include the demographic factors, such as family planning and variations in the evolution of birth and fertility.(6)

The health status of a child is directly influenced by the well being of the mother, which according to the epidemiological approach (Denver's model, derived from a concept of Lalonde) is conditioned by biological factors (heredity, demographic characteristics of the population), environmental factors (physical and social environment factors in terms of physical, chemical, socio-cultural and educational factors), behavioural factors, attitude, lifestyle. Lifestyle depends on behaviours, which in turn are conditioned by social factors, so lifestyle is the result of social factors and behaviours.

The last category of factors, according to this model refers to *healthcare services*, which can be preventive, curative or of rehabilitation.(7)

Most children under 1 year of age who die at home were aged between 1-3 months. Children who arrive at the hospital in very serious condition and die within the first 24 hours were mostly aged 3-5 months. This is due to factors related to specific vulnerabilities that must be observed within the family and community. The age the most affected by death at home in children of 1-5 years old is the age between 15-24 months, the most common causal factor being the domestic accidents.

Most babies and infants could survive these threats if they had access to simple, affordable interventions. Improving sanitation, access to clean drinking water, immunization against infectious diseases, and other public health measures could help reducing the high rates of infant mortality. Unfortunately, in the world, millions of children died before reaching their fifth birthday, mostly from preventable causes and treatable diseases, even though the knowledge and technologies for life-saving interventions are available. In addition, inequities in child mortality between high income and low-income countries remain large. In 2012, the under-five mortality rate in low income countries was of 82 deaths per 1 000 live births, more than 13 times the average rate in high-income countries.(8)

At international level, many countries still have very high under-five mortality rates, particularly those in Sub-Saharan Africa.(8) In 2015, 4.5 million (75% of all under-five deaths) occurred within the first year of life.

The risk of a child dying before completing the first year of age was highest in the World Health Organization (WHO) African Region (55 per 1 000 live births), over five times higher than that in the WHO European Region (10 per 1 000 live births).(9)

However, at global level, there has been registered a progress in reducing infant mortality rate, from an estimated rate of 63 deaths per 1 000 live births in 1990 to 32 deaths per 1 000 live births in 2015, and it is estimated to decrease by 37% up to 2025.(3) Annual infant deaths have declined from 8.9 million in 1990 to 4.5 million in 2015. 99% of these death can be found in the developing countries (figure no. 1).(8)
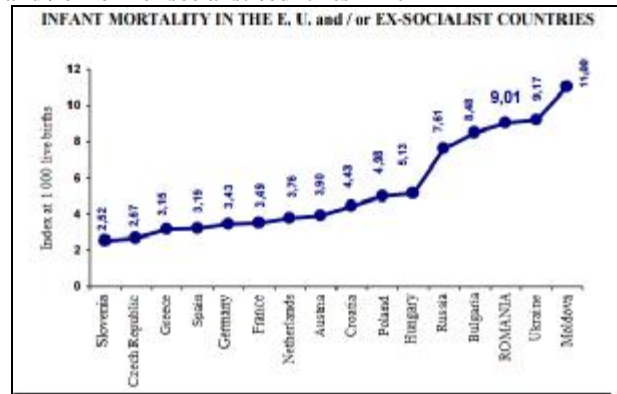
Figure no. 1. Under-five mortality rate by age of 5 per 1 000 live births, 2015

Nevertheless, among the countries, which are already members of the European Union but former socialist countries, the highest infant mortality is recorded in Romania, Ukraine and Moldova (figure no. 2).(10)
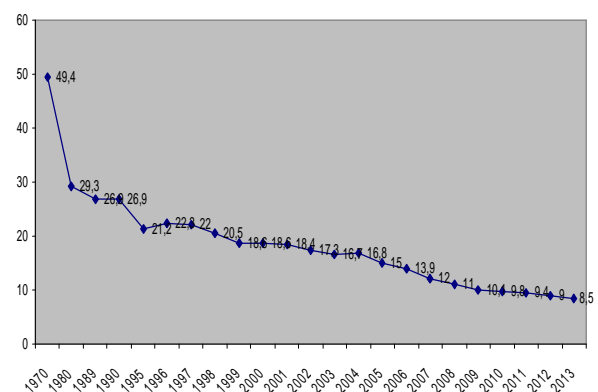
In all European Union countries, there is seen the tendency to decrease infant mortality rate. However, Romania is still placed among the European countries with a very high infant mortality rate.

Figure no. 2. Infant mortality rate in EU-member countries and / or former socialist countries in 2012
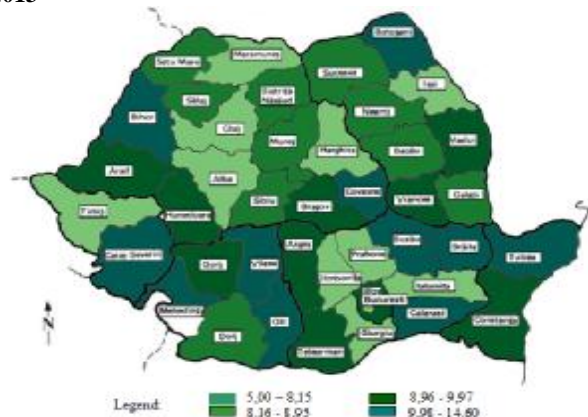

In Romania, crude infant mortality rate in our country has registered a steadily marked decline since 1970, when it registered a percentage of 49.4 ‰. In 2000, infant mortality rate registered the value of 18,6 ‰ within a period of ten year. In 2010, this rate almost halved. Compared to the previous year, in 2013, there is recorded a value of 8.5 ‰, down slightly, which continues the trend of decreasing child mortality index in the last three decades (figure no. 3).(11)

Figure no. 3. Evolution of infant mortality rates in Romania between 1970 and 2013

Values above 9.98 ‰, are recorded, in 2013, in both counties in the eastern Romania, in the counties of Botoşani, Vaslui, Brăila, Călăraşi and in the counties in the south, Olt, Vâlcea, Caraş-Severin, Tulcea (figure no. 4).(11)

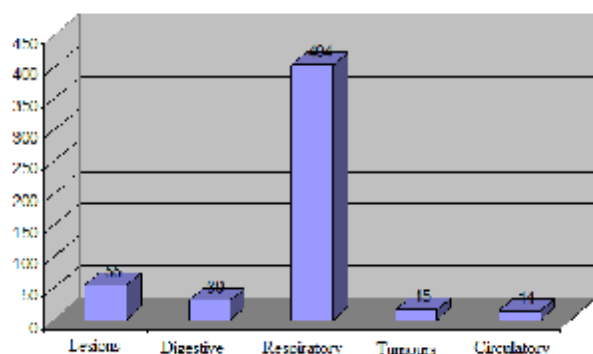**Figure no. 4. Infant mortality per counties in Romania in 2013**

At the opposite pole, among the countries registering the lowest infant mortality rate in 2014, there are: Monaco with an estimated 1.81% out of 1 000 live births, who died in the first year of life. Monaco is followed by Japan (2.13), Bermuda (2.48), Norway (2.48), Singapore (2.53), Sweden (2.6).(12)

As for the main causes of death (especially deaths from diseases of the respiratory system), deaths considered as avoidable for the developed countries, our country registers ones of the highest mortality rates, being surpassed only by the Republic of Moldova (figure no. 5).

Respiratory diseases represent the first cause of infant mortality and of these pneumonia is responsible for most deaths.

Congenital malformations ranged between 34.9 (1965) to 10 000 deaths live births and 21.1 (2012) deaths per 10 000 live births. The major share in the structure of congenital malformations is held by congenital heart defects. In 2012, nearly half of the deaths from congenital malformations are due to malformations of the circulatory system (the rate of 10.2 deaths per 10 000 live births).(11)

Figure no. 5. Distribution of deaths according to the main causes of death in the age group 0-1 year old in Romania in 2013

During the same year, in the age group of 1-4 years, the hierarchy of the main causes of death identifies diseases of the nervous system, tumors, lesions and external contusions, respiratory and digestive diseases.(13)

Substantially progress has been made in reducing under-five-mortality rate in the last two decades. Its annual rate of reduction increased from 1.8 percent in 1990-2000 to 3.9 percent in 2000-2015. The remarkable decline in under-five mortality since 2000 has saved the lives of 48 million children under age five – children who would not have survived to see their fifth birthday if the under-five mortality rate from 2000 onward remained at the same level as in 2000.(8)

Under-five mortality continues to represent a priority for each country and the world in general. National and local governments, non-governemenral organizations, the civil society and the general public should continue paying attention to the health of infant and children population. Many efforts should continuously be putting to improve the quality of life, access to high quality health service, education, human security and rights, improve environments, and remove risk factors and determinants of infant health.

In decreasing infant mortality rate, each country should be awere that most child deaths are caused by diseases that are readily preventable or treatable with proven, cost-effective and quality-delivered interventions. Infectious diseases and neonatal complications are responsible for the vast majority of under-five deaths globally.

It is important that women of reproductive age adopt healthy behaviors in everyday life, such as taking folic acid, maintaining a healthy diet and weight, being physically active, avoiding tobacco use, and avoiding excessive alcohol and drug use. If women follow some of the above guidelines, later complications can be prevented to help decrease the infant mortality rates. Attending regular prenatal care check-ups will help improve the baby's chances of being delivered in safer conditions and surviving.

Focusing on preventing preterm and low birth weight deliveries throughout all populations can help eliminating cases of infant mortality and decreasing health care disparities within communities. Reducing these inequities across countries and saving more children's lives by ending preventable child deaths are important priorities.

REFERENCES

1. Andrews KM, Brouillette DB, Brouillette RT Mortality, Infant. Encyclopedia of Infant and Early Childhood Development. Elsevier; 2008. p. 343-359. doi:10.1016/B978-012370877-9.00084-0.
2. Norton M. New evidence on birth spacing: promising findings for improving newborn, infant, child, and maternal health. Int J Gynaecol Obstet. 2005;89 Suppl 1:S1-S6. doi:10.1016/j.ijgo.2004.12.012. PMID 15820364.
3. Perţache I, Mureşan P. Ministerul Sănătăţii, Centrul de Calcul, Statistică Sanitară şi DocumentaţieMedicală. Aspecte demografice mondiale actuale şi previziuni pentru anii 2025-2050, Bucureşti; 2001. p. 29.
4. Centre for Disease Control and Prevention. Reproductive Health. Infant mortality. http://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm, accessed on 12.06.2015.
5. http://www.womenandchildrenfirst.org.uk/what-we-do/key-issues/infant-mortality-newborn-health/infant-mortality-causes, accessed on 2.04.2015.
6. Domnariu CD, Vulcu L, Cojan A, Frâncu V. Managementul serviciilor de sănătate. Vol. I, Curs postuniversitar, Sibiu. 2008;1103-104.
7. Mincă DG. Sănătate publică şi management sanitar, Editura Universităţii Carol Davila, Bucureşti; 2005. p. 7-8.
8. UNICEF. Levels and trends in child mortality. Estimated developed by the UN Inter-agency Group for Child Mortality Estimation. Report 2015.
9. World Health Organization, Global Health Observatory Data. Infant Mortality. http://www.who.int/gho/child_health/mortality/neonatal_infant_text/en/, accessed on 13.05.2015.
10. Ministerul Sănătăţii. Institutul Naţional de Sănătate Publică. Centrul Naţional de Statistică şi Informatică în Sănătate Publică. Mortalitatea infantilă în România, Anul 2012, Bucureşti; 2013. p. 3.
11. Institutul Naţional de Sănătate Publică. Centrul Regional de Sănătate Publică Sibiu. Monitorizarea inegalităţilor în starea de sănătate a populaţiei României în anul 2013, Sibiu; 2014. p. 34-36.
12. The Statistics portal. Ranking of the 20 countries* with the lowest infant mortality rate in 2014 (child deaths in the first year of life per 1,000 live births) http://www.statista.com/statistics/264717/countries-with-the-lowest-infant-mortality-rate/accessed on 02.04.2015.
13. Ministerul Sănătăţii. Institutul Naţional de Sănătate Publică. Centrul National de Evaluare şi Promovare a Stării de Sănătate. Raportul Naţional de Sănătate a Copiilor şi Tinerilor din România, Bucureşti; 2014.

.