Demographic Dynamics In The Implementation Process Of Medico-Social Programs: Issues Of Birth Rate

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Abstract

The birth rate as one of the indicators of population reproduction is determined not only by biological but also socio-economic processes, living conditions and everyday life, in particular family traditions and other factors. For characteristics of the process of fertility total fertility rate, where total number of children born alive during the year appears for the phenomena and average population for the medium, are used. The last decade of the twentieth century and the first five years of the XXI century are characterized by a significant decrease in the birth rate of the population of Russia in total and most of its constituent territories. Since 2005, the government of the Russian Federation and the Ministry of health have signed a number of decrees and orders aimed at solving health, social and economic problems, among which the improvement of medical care for women during pregnancy, mothers and babies, and healthcare modernization, the introduction of modern medical technologies.

The article presents the results of multivariate analysis of fertility of the population, health indicators of newborns and early neonatal mortality in the Republic of Tatarstan in 2005-2013. The positive dynamics of the majority of the studied parameters are established that confirms the effectiveness of the implementation of health and social government programs aimed at improving the reproduction of the population, preserving and promoting the health of newborns, a further reduction in neonatal mortality determining the level of infant and neonatal mortality.

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Keywords: birth rate, implementation process, population reproduction, fertility index, neonatal health.

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1. Introduction

In changing approaches to population reproduction, in the organization of medical aid to children, especially in early childhood, in the formation of reproductive and demographic indicators in the Russian Federation and its constituent entities in the twenty-first century, 2006 year has been highlighted, that can be considered a turning point, initiating a long-term implementation of the state policy in the field of child health [1].

Components of this policy became the implementation of the priority national project "Health", which provided unprecedented measures to improve medical care for mothers and newborns, the appropriation of significant funds for the modernization of health care, decision making on the appropriation of not less than one-quarter of the budget of the health system to improve the health of children [1].

In recent years serious work on the improvement of normative, defining and regulating the system of rendering of medical aid to pregnant women and children was carried out.

The main directions and further tasks of the state policy in the interests of children were defined in normative documents of the RF Government in the field of health, social development, protection of motherhood and childhood [2], [3], [8]. Pursuant to the legislation of the Russian Federation in the field of health and social Russia has moved on WHO criteria of live birth and dead birth [2].

Having taken into account everything that was mentioned earlier we set a task to assess the dynamics of indicators of birth rate and neonatal morbidity in 2005-2013 which became a period of significant organizational and operational changes in the system of health protection of mother and child basing on the materials of one of the units of the Russian Federation - the Republic of Tatarstan.

2. Methodology.

Dynamics of some indicators of fertility of the population and some indicators of health status of newborns in the Republic of Tatarstan in 2005-2013 were studied according to the materials of the territorial body of Federal service of state statistics in the Republic of Tatarstan and the state autonomous institution of public health "Republican medical information and analytical centre" using medico-statistical and analytical methods. [4, 5, 6, 7] During analysis, we have studied the dynamics of the indicators of each year included in the studied time period, in some cases, careful attention was paid to the indicators 2005, 2010, 2013.

During the period under review in the Republic of Tatarstan significant positive results in the organization of medical care to pregnant women, new mothers, lying-in women and newborns in maternity institutions were achieved, the professional level of doctors (obstetrician-gynecologists, neonatologists, intensive care specialists) and paramedical workers increased, provision of medical equipment and installation improved, modern high-tech medical technologies are being implemented, phasing and continuity in the delivery of health care are improving. These positive changes in the health of mothers and children in the Republic of Tatarstan are expressed in the dynamics of the following key outcome indicators: total fertility rate rose from 9.8% in 2005 to 14.7% in 2013 (an increase of 50.0%), the proportion of easy deliveries increased from 29.0% to 37.2% (an increase of 28.3%), the infant mortality rate declined from 8% to 7.0% (down 12.5 percent) and significantly below the average level in the Russian Federation (to 7.6%) and the Volga Federal district (of 7.2%).

3. Data.

The increase in the fertility index in the Republic of Tatarstan in 2013 compared with 2005, reflected in changes in the number of indicators of population reproduction [9], [10].

First, total fertility rate increased, showing how many children one woman would give birth to during the entire reproductive period, while maintaining in every age fertility rates of that year, for which age-specific birthrates are calculated and reflecting parenthood status. Total fertility rate in the Republic of Tatarstan, extremely low in 2005, that was 1,263, progressively increases according to years of study and at the end of 2013 is 1,832 (an increase of 45.1 per cent), however, the achieved indicator does not provide even a simple replacement of generations of parents with children where the total fertility rate should not be less than 2,15 - 2,17.
The growth of the total fertility rate is set in both urban and rural areas, while urban areas increased by 37.3% and reached 1,725 in 2013, in rural areas the growth was 28.6 per cent, the 2013 index is 2,088. Total fertility rate in rural areas is higher than in urban areas in 2005 on 34.8%, in 2013 on 21.0%.

Secondly, the main feature of the reproduction of the population of Russia in 90th years of the twentieth century was the increasing concentration of births in an increasingly young age - younger than 30 years [4, 5], the authors illustrate this tendency by data for the Republic of Tatarstan, where the cumulative fertility by age 30 was in 1991 76.6 percent, in 2000 76.8 per cent, a similar level of this indicator was retained in the first five years of the XXI century. Since 2005, the cumulative birth rate of women under the age of 30 years in the Republic of Tatarstan is constantly decreasing (2005 - 75.3%, 2010 - 67.9%, 2013 is 65.5%). Whereas the increase in cumulative fertility of women in older age groups aged 30-34 years is clearly observed, it has increased from 17.4% in 2005 to 22.7% in 2013, at the age of 35-39 years - from 5.9% to 10.4% (an increase by 1.8 times), at the age of 40-44 years - from 1.1% to 1.7% (an increase of 54.5%), that shows that a new type of reproductive behavior of the population, which is characterized by a departure from the early (up to 30 years) end of the childbearing and prolonging it for the next decade, is forming. In urban areas against the background of growth of the total number of live births, cumulative fertility at the age of 30 decreased from 75.3% to 64.2 percent, increased at the age of 30-39 from 23.3% to 34.0%. In rural areas a growth of cumulative birth at the age of 30 is from 75.9% to 70.3% and a reduction of aged 30 - 39 years from 23.0% to 27.6%.

Thirdly, in parallel with the increase in the number of births and number of born newborns the birth order of children changed. In 2013 compared with 2005 share of the birth of the first child (the firstborn)declined on 21.3%, but significantly increased the proportion of births of second children (an increase of 25.5%) and third and subsequent children (an increase of 46.3 per cent).

The rate of change of birth order on various urban and rural areas is different, where urban area changes are more denoted.

In the Republic of Tatarstan in the period from 2005 to 2013, the number of live births increased by 52.7% (36967 to 56458), while in urban areas the growth was 57.3%, in the countryside was 38.3%.

The principal feature of perinatal health is its demographic significance not only for the present generation but also for the process of reproduction of the population in the long term, unfounded perinatal mortality and loss of health of newborn children is the grievous loss of the reproductive potential and gene pool of the nation [10].

The main indicators of infant health at the population level are the indicators of physical development of births (live births according to body weight), morbidity and mortality.

Body weight at birth and structure of born children according to body weight are the most important and accurate indicators of the quality of health of a nascent generation, the relevance of which increases significantly due to the transition of Russia since 2012 to WHO criteria of live and stillbirths.

According to the analysis the proportion of children with physiological body weight (“3000 - 3499 g” and “3500 - 3999”) is quite stable with a gradual increase until 2013 at 2.7%. The proportion of infants with low body weight at birth (weighing less than 2500 g) decreased in 2010 in comparison with 2005 by 7.5% and increased in 2013 compared with 2010 by 0.8%, while the proportion of newborns with extremely low body weight rose in 2010 on 13.0%, the most significant growth is noted in 2013 compared with 2010 (an increase of 53.8 percent). The proportion of children "edge" weight category (2500-2999 g) shows a clear tendency to a gradual decrease, while the proportion of large babies (4000 g or more) increased from 2005 to 2010 by 1.3%, then decreased in 2013 in comparison with 2010 by 17.7%.

| Table 1. The distribution of children born in the Republic of Tatarstan in 2005-2013, by body weight at birth in percentage to total number of children live births weighing 500 g or more |
|---|---|---|
| Body weight at birth in grams | 2005 | 2010 | 2013 |
| 500 – 999 | 0.23 | 0.26 | 0.40 |
The incidence of newborns in maternity hospitals (departments) in the Republic of Tatarstan for 2005-2013 decreased by 31.5% to 446.7‰ in 2013. In 2010 compared with 2005, the incidence decreased by 21.4%, in 2013 compared with 2010 decreased by 12.9%. Reduced neonatal morbidity was achieved both among those born full-term (33.7%), and among those born preterm (11.5%), due to the prevailing decline in the incidence of full-term correlation in the incidence of preterm and full-term morbidity increased from 3.31 in 2005 to 4.42 in 2013.

Due to the transition in 2012 to WHO criteria for registering live and stillbirths and focus on nursing infants with very low and extremely low body weight, we studied the incidence and morbidity patterns of newborns in 2010-2013. In the course of the decline in neonatal morbidity, there is a decrease in the frequency of birth trauma on 39.6%, asphyxia and hypoxia on 16.9%, infection of skin and subcutaneous tissue on 9.6%. The frequency of certain conditions, arising in the perinatal period, decreased by 9.0%, congenital anomalies decreased by 14.1%. The frequency of respiratory disorders has increased by 8.6%.

We carried out a comparative territorial analysis of the incidence of newborns, having considered the incidence separately for urban districts and socio-economic regions of the Republic.

The maximum reduction in the incidence of newborns in 2013 compared with 2005 was stated in Naberezhnye Chelny (2.2 times) and Kazan (1.6%). Among regions, the highest incidence of newborns in both 2005 and in 2013, was registered in South-Eastern region, the second rank place occupies the North-Eastern region. In both regions, the incidence of newborns is significantly higher than in Kazan and Naberezhnye Chelny at a sufficiently low rate of reduction (the South-Eastern region is 14.7%, the North-Eastern region is 14.8%).

The lowest incidence newborns was stated in the Kama and Privoljskiy regions, in the dynamics of the period in both regions there was the decrease in 2010 compared with 2005 and the growth in 2013 compared with 2010.

Neonatal morbidity in urban and rural areas declined: in urban area by 28.5%, in rural areas by 12.6%. In 2010-2013 there were not significant differences in these indicators.

In conclusion, we present data on mortality in early neonatal period (0-6 days). The change in the index of early neonatal mortality had distinct biphasic nature: the decline in 2005-2010 and growth in 2010-2013.

In the Republic of Tatarstan early neonatal mortality decreased by 2010 by 30.0% and increased to 2013 on 57.9%, reaching the figure of 2005. In urban areas, early neonatal mortality decreased by 1.6 times, then increased by 55.6%. In rural areas the figure decreased by 1.7 times, to 2013 increased by 85.7%.

The proportion of early neonatal mortality in the structure of infant mortality in the whole country and for urban and rural areas in 2005-2013 underwent biphasic changes. Also the proportion of early neonatal mortality in neonatal
mortality changed. In the whole Republic there is a tendency to decline from 69.8% in 2005 up to 66.7% in 2013, i.e. on average every 2 deaths of 3 in the neonatal period occur in the early neonatal period. In urban and rural areas biphasic indicator is noted, which decreasing in 2005-2010, reached in 2013 in the urban area 68.3% in rural areas 65.0%. The results of the analysis of neonatal mortality rate and comparison of it with infant and neonatal mortality further confirm the importance of increased attention to health care and improve its quality for kids first days of life.

4. Conclusion & Future Study.

Thus, the analysis of indicators of birth rate and neonatal morbidity in the Republic of Tatarstan indicates the effectiveness of the implementation of medical and social programmes in the interests of health protection of mother and child.

A growth of fertility was stated. The total fertility rate grew by 45.1%, this figure increased among urban and rural population. In this case the total fertility rate is higher in rural areas than in urban areas, however, draws attention to the decline of the growth rate (i.e. slow) indicator in the village. The study showed that in the Republic a new type of reproductive behavior of women with prolongation of procreation for the second half of childbearing age is formed. This is confirmed by the fact that every third child in urban areas and one in four children in rural areas were born to women aged 30 to 39 years.

Evidence of implementation of the health and social programs in the development of maternity and childhood was the change of the parenthood status with increase in the proportion of births of second children, third and subsequent children.

One of the most important indicators of neonatal health is the body mass at birth and structure weight births that vividly stands after the transition of the Russian Federation and its subjects to the adoption of a nationwide health organization criteria for live births. The consequence of this shift was the growth in the proportion of newborns with extremely low body weight by more than 50% and with very low body weight by 7.9%.

As a positive evidence of purposeful organizational and practical measures for health protection of mother and child should be recognized the reduction of neonatal morbidity and the rate of early neonatal mortality. The rate of early neonatal mortality continues to be important in the structure of infant mortality, largely determining the degree of manifestation of their positive dynamics.

The materials determine the need for further improvement and/or upgrading of existing approaches to implementing technologies that define healthy motherhood, growth, fertility and healthy childhood.

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