

The contribution of Kazan scientists to the success of the fight against child mortality

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Abstract

The work aims to analyze and present the contribution of scientists from Kazan medical universities and their pupils to the success of combat child mortality in Russia in the twentieth century using the historical and medical method. The most important results of the works of Kazan scientists can be considered the following: (1) the finding of underestimation of infant mortality; (2) development of methods for its statistical analysis; (3) identification of medical-statistical and social hygienic patterns of child mortality; (4) scientific substantiation of the methodology and strategy for reducing infant mortality in the USSR; (5) a comprehensive study of the problems of child mortality and substantiation of ways to reduce it in the Russian Federation in the late 20th — early 21st centuries. Measures are proposed to further reduce child mortality, including a regional approach, reduction of the population's genetic load, priority implementation of antenatal and neonatal prophylaxis, prompt and full provision of treatment by the state for children with rare diseases, further development of specialized and rehabilitation assistance provided to children, intensive development of medical and social assistance.

Keywords: works of Kazan scientists, achievements in studying the patterns of child mortality, proposals for reducing child mortality.

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By order of the Government of the Russian Federation No. 8950 dated February 25, 2011, a group of pediatric scientists was awarded the title of laureates of the 2010 Government Prize in the field of science and technology “For scientific substantiation, development and implementation of a system of measures to reduce infant mortality in the Russian Federation”. Two Kazan Medical School graduates were among them: academician A.A. Baranov (head of work) and Professor V.Yu. Albitsky, and their recognition is the undoubted success of the Kazan Medical School! The expressed assessment of “the success of the Kazan Medical School” is not an exaggeration nor a tribute to the generally blissful memories of the distant youth of the first two authors of this article. It is their firm conviction that they were formed as adherents of the preventive direction of medicine at the Kazan Medical Institute during their studies and the beginning of their scientific activities [1,2].

Returning to the subject of the publication, we can say that the first outstanding event in the history of Kazan pediatrics in the field of com-

bating infant mortality was the brochure of the head physician Mark Aleksandrovich Nechaev, titled “On ways to avert the mortality of infants in the first year of their life in the everyday life of the peasant head physician Nechaev” published in 1837 [3]. It was one of the few works on the extreme health problems of peasant children addressed to the Russian society in the first half of the 19th century.

The constant, extremely high level of infant mortality (220–260 per 1000 live births) is a negative social indicator in Imperial Russia, and to reduce this, a purposeful, systematic approach was reflected in the work of the future classics of Soviet pediatrics, Kazan professors Viktor Konstantinovich Menshikov and Efim Moiseevich Lepsky. In 1904, on the initiative of the Yekaterinburg doctor N.A. Russkikh, a public organization named “Union for Combating Child Mortality” was created. Following this example, the Society for the Fight against Child Mortality was organized in Kazan in 1909 by Assistant Professor V.K. Menshikov and medical secretary E.M. Lepsky.

In 1914, V.K. Menshikov wrote an extensive summary report of a meeting held by the society, proposing a system of measures to reduce infant mortality. He published a series of works on dietetics and eating disorders in young children and shared their results at all Russian Congresses of Children's Doctors, thereby contributing to the fight against the leading cause of infant mortality of that time—acute gastroenterological diseases [4].

Another classic of Soviet pediatrics, Professor E.M. Lepsky, had outstanding scientific achievements that should also be mentioned; we recall that he was at the origins of the creation of a system for protecting the health of all mothers and children in the Republic of Tatarstan. Even in pre-revolutionary times, he consulted mothers on feeding and caring for a child in two antenatal clinics at maternity hospitals and organized a summer colony for “weak-chested” schoolchildren. In the beginning of the Soviet era, Efim Moiseevich headed the subdivision of motherhood and childhood in the People's Commissariat of Health of the Tatar Republic for two years (1919–1921), and in one of the most beautiful mansions of Kazan (the former house of the merchant Okonishnikov), he housed a children's hospital (1919), which a year later became the Kazan Clinical Institute [5].

From the dawn of the Soviet era, the name Fatykh Garifovich Mukhamedyarov, senior assistant of the Department of Social Hygiene of the Kazan State Institute for Advanced Medical Education is also worth mentioning. Even before coming to his position, he worked from 1920 in the People's Commissariat of Health of the Tatar Republic as the head of the Children's Health Department, and from the end of 1922 to 1927 as the People's Commissar of Health. Thus, it is plausible that the formation and development of the system for the protection of mothers and children in Tatarstan in the first decade of Soviet power were undoubtedly connected with the activities of F.G. Mukhamedyarov [6].

However, publications on the clinical and social factors of infant mortality in the 30s–50s of the last century are few. One of the reasons for this is the censorship ban on the publication of data on its level and social factors. The abnormal situation is well evidenced by materials for official use on the natural movement of the population of the TASSR, prepared by professors F.G. Mukhamedyarov, T.D. Epstein, and M.Kh. Vakhitov. They provided information on the level and causes of infant mortality that were unknown to the general medical community.

Of the publications at that time, the following works attract attention. The article by Mikhail Al-

bertovich Dykhno, head of the Department of Social Hygiene of the Kazan Institute for Advanced Medical Education (years of management: 1926–1930) have showed the positive dynamics and causes of infant mortality in the 1920s [7]. Problems regarding the statistical analysis of infant mortality, raised in N.A. Laptev (1940), became the subject of further research at the Department of Health Organization of the Kazan State Medical Institute [8]. A publication by R.Sh. Aminova testified an important fact for the protection of children's health during the Great Patriotic War: the level of infant mortality, which significantly increased in 1941–1942 and dropped below the pre-war level by the end of the war in Kazan [9].

In 1966, Professor T.D. Epstein and M.Kh. Vakhitov encouraged V.Yu. Albitsky and graduate student A.A. Baranov to study infant mortality. The result was the defense of the following candidate dissertations: “Child mortality in rural areas of the TASSR” (Baranov AA, 1969) and “Child Mortality and its causes in Kazan” (Albitsky V.Yu., 1970). Although the dissertations were intended for “Official Use,” the thaw of the 1960s opened the door for such works, and their results, albeit with some limitations, began to be published widely enough. Among these limitations was identified by A.A. Baranov as the phenomenon of underestimation of infant mortality (up to 20%–30%) in rural areas. However, he was well remembered by the dissertators, and in the late 1980s, they published a number of works on the underestimation of infant mortality in the Soviet Union [10, 11], on the need to “restore order in the statistical accounting of infant mortality, the end of which was the decision to switch 2012 on the international criteria for registering live and stillbirths” [2, p. 91].

As for the statistical analysis of infant mortality, in the 1970s–1980s, representatives of the Kazan Medical School published a series of relevant works [12–14]. Methods for calculating the infant mortality rate, its seasonal fluctuations were proposed, a guide was published on the methods of studying and analyzing infant mortality.

During the years of perestroika (1987–1990), an outstanding event in the fight against infant mortality was the implementation of a system of measures to reduce it. Under the leadership and with the direct participation of A.A. Baranov, who was then working as the First Deputy Minister of Health of the USSR, the methodology and strategy for reducing infant mortality were scientifically substantiated. The USSR Ministry of Health, together with the leading scientific institutions of the country, created a directive-normative, scientific-methodological and organizational basis for

overcoming stagnation trends in the dynamics of infant mortality.

The main directions of the developed strategy included the following [15–17]:

- priority financing of the maternal and child health service;
- implementation of comprehensive regional programs of medical and social measures for the protection of mothers and children, reduction of infant mortality in areas with high, medium and relatively low levels;
- priority impact on preventable causes of infant mortality;
- creation and development of perinatal and neonatal care (development and implementation of resuscitation and intensive care at all stages of obstetric and pediatric care; creation of a new type of institution—a perinatal center; introduction of modern technologies for nursing premature babies) [2].

It was the successful implementation of this strategy that explains the following outstanding phenomenon. In the 1990s, against the background of a landslide deterioration in most indicators in the socio-economic and demographic spheres, the infant mortality rate not only did not increase, but also steadily decreased [2].

It would not be an exaggeration to say that in the second half of the 1990s, Kazan became the center for studying the problems related to child mortality in Russia. Convincing proof of this is the defense of seven Ph.D. theses, carried out under the guidance of Professor V.Yu. Albitsky, by the following Kazan scientists:

- Abrosimova M.Yu. Infant mortality in rural areas of the Republic of Tatarstan (trends, causes, territorial features)—1997.
- Korchagina A.V. Dynamics and causes of mortality among children aged 0–4 years in a large industrial center. (Comprehensive clinical and social research based on materials from Kazan)—1997.
- Nikolskaya L.A. Socio-hygienic study of fetal infantile losses (based on the materials of the Republic of Tatarstan)—1997.
- Glushakov A.I. Potential losses due to mortality in pre-working age (medical and demographic study based on the materials of the Republic of Tatarstan)—1999.
- Shaikhutdinova L.N. Congenital malformations: social and hygienic significance and ways to reduce infant mortality—1999.
- Rybkina N.L. Premature babies: fetal infantile losses, morbidity, hormonal characteristics of the adaptation period—2000.
- Umyarova F.R. Mortality of the child population from external causes (a comprehensive

socio-hygienic study based on the materials of the Republic of Tatarstan)—2000.

In the 21st century, Kazan scientists did not leave the field of combating child mortality. This is evidenced by the candidate's dissertation by I.K. Zakirova “Organization of medical care for children born with extremely low body weight (based on the materials of the Republic of Tatarstan)”—2011.

To these theses, one should reasonably add the research of T.V. Yakovleva, Ph.D.'s thesis “Regional features and ways to reduce the mortality of the child population of the Russian Federation” (2001) and doctoral dissertation “Disability and mortality of the child population of Russia: regional features and legislative support for ways to reduce” (2005) (scientific advisers and consultants A.A. Baranov and V.Yu. Albitsky).

The results of these dissertation studies were widely used in three final monographs, in which the medical-statistical and clinical-social causes of death in children in our country since the 18th century were analyzed [18–20].

In subsequent publications, two important conclusions were made [21–23].

First, the goal of state policy from the beginning of the 20th century to achieve comparability in the level of infant mortality with that of European neighbors has been achieved! The reliability of this conclusion is convincingly evidenced by the indicators in the European Union as a whole (3.6‰) and in the United States (5.6‰), which are most comparable with our country in terms of population and ethnic diversity [23, p. 97]. We believe that the data presented in Tables 1 and 2 will support this conclusion.

The problem of reducing the mortality of children and adolescents in our country from the category of “socio-economic” and “demographic” has passed into the category of “humanitarian.” Thus, the mortality of children in the Russian Federation “... having lost their demographic influence (first of all, on the average life expectancy) clearly improved its socio-predictive value, social and humanistic meaning. In conditions of low fertility, the preservation of each life and the quality of its health in a small generation which will appear in the coming 20s. - the main challenge for the system of protection of mothers and children. For this is also the preservation of the national gene pool, and the preservation of Russia as a developing state” [23, p. 98].

The system of measures to further reduce child mortality in the country requires the following:

- a regional scientific-based approach appropriate to the present realities;

Table 1. Dynamics of infant mortality in some countries of the world

Country	1913	1930	1950	1970	1990	2000	2018
Russia	269.3	230.6	80.7	22.8	17.4	14.6	6.1
Sweden	63.2	55.4	21.3	11.2	5.9	3.4	2.4
Austria	156.9	103.7	66.1	25.9	10.2	5.6	2.9
England	79.8	59.7	29.9	18.2	9.1	5.8	3.6
France	98.9	78.3	52.1	15.3	8.3	4.8	3.4
USA	86.4	66.2	29.2	21.4	10.1	6.9	5.6

Table 2. Infant and child mortality rate in countries of the European region with a population of over 15 million (2018)

Country	IM	0–4 years old	Country	IM	0–4 years old
Spain	2.5	3.0	Russia	6.1	7.2
Italy	2.6	3.0	Romania	6.1	7.3
France	3.4	4.0	Ukraine	7.5	8.7
Germany	3.1	3.7	Kazakhstan	8.8	9.9
Netherlands	3.3	3.9	Turkey	9.1	10.6
Great Britain	3.6	4.3	Uzbekistan	19.1	21.4
Poland	3.8	4.4	Turkmenistan	39.3	45.8

Note: Values are provided according to data [knoema.ru>atlas/topics/здоровохранение](https://knoema.ru/atlas/topics/здоровохранение); IM—infant mortality.

– active, targeted implementation of preventive measures aimed at reducing the genetic load of the population;

– prompt and fully provided treatment of children with rare diseases by the state;

– scientific substantiation of the further development of specialized and rehabilitative medical care for children (with oncological, neurosurgical, traumatological and orthopedic, psychiatric pathologies, tuberculosis, as well as with autoimmune diseases and diseases of the immune genesis).

– intensive development of the organization of medical and social assistance to children at high social risk.

In this way, we could conclude that Kazan's scientists have made a significant contribution to the success of the fight against child mortality in Russia. The most important results of the works of Kazan scientists are the following:

1) establishment of the fact of underestimation of infant mortality;

2) development of methods for its statistical analysis;

3) identification of medical-statistical and socio-hygienic patterns of mortality in children;

4) scientific substantiation of the methodology and strategy for reducing infant mortality in the USSR;

5) a comprehensive study of the problems of child mortality and substantiation of ways to reduce it in the Russian Federation in the late XX–early XXI centuries.

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