Risk assessment in terms of the basic criterion of evidence-based medicine

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ABSTRACT

A critical state task and an urgent topic for scientific research is the study of issues of women's health in reproductive age. The main indicators of medical and demographic processes in society are mortality rates. The mortality rate depends on the socio-economic development of the country, the well-being of the population, the development of the health care system, and the availability of medical care. The mortality rate of women of fertile age is one of the key factors affecting the indicators of population reproduction. The age-specific mortality rates for women of childbearing age in 2017 did not change significantly compared to 1991. The maximum number of deaths on average per 1000 people of the resident population of the corresponding sex and age group for the urban and rural population fell on the age groups aged 45-49 years, followed by the age groups 40-44 years old and 35-39 years old. The age-specific mortality rate for women of fertile age in urban areas increased from 8.3 per 1000 of the resident population of women in 1991 to 9.3 in 2017, and from 14.1 to 14.5 in rural areas. It should be noted that in rural areas the age-specific mortality rate of women aged 20-24 decreased from 1.4 to 0.4, while a significant increase in the age-specific mortality rate of women aged 35-39 was recorded, which increased from 1.8 to 2.5. The dynamics for the rest of the age groups for both urban and rural populations remained within the margin of error.

Keywords: Risk assessment, Biomedicine, Public health, Reproductive health, Infantile fetal losses, Forecasting.

INTRODUCTION

Fertility is an actual process for research, on which the narrowed, expanded, or simple nature of population reproduction directly depends (Tereshkevich 2011). In the constituent entities of the Russian Federation, which is characterized by an uneven distribution of population density and other demographic indicators, fertility acts as the main problem, the solution of which can change other related indicators, namely to implement the balance in the labour market, increase domestic demand, increase population growth, contribute to the satisfaction of the housing market when the interaction between financial and non-financial sectors of the economy would become more active, etc. (Aganbegyan 2014). This is confirmed by the policy that has been carried out in the country over the past ten years: it includes measures to stimulate the birth rate at different levels (Byrd). These measures and the increase in the birth rate will compensate for the birth rate deficit in the 90s (Volkov 2014). In Russia, there was a steady increase in the birth rate manifested in the number of births per 1000 population: from 8.7 ppm in 2000 to 13.3 ppm in 2014. In 2015, the birth rate stabilized at the previous level of 2014, and since 2016 it began to decline and now amounted to 12.9 ppm. This turn gives special urgency and relevance to the study of fertility

(Talipov *et al*. 2017). The proof base for treating a scope of nonmotor side effects in PD has filled generously as of late. Nevertheless, treatment alternatives generally stay restricted given the high predominance and unfriendly effect of these issues, so the turn of events and testing of new medicines for nonmotor indications in PD remains a main concern. © 2019 The Authors. Development Disorders distributed by Wiley Periodicals, Inc. for the benefit of International Parkinson and Movement Disorder Society (Seppi *et al.* 2019). Suggestions for the plan and usage of danger appraisal devices are considered considering logical impacts and methodological impediments (Gambrill & Shlonsky 2000). Proof based medication, utilizing randomized controlled preliminaries and meta-investigations as the significant instruments and wellsprings of proof about normal outcomes for heterogeneous gatherings of patients, created as a response against ineffectively planned observational treatment exploration and doctor dependence on close to home involvement in different patients as a manual for dynamic about a patient within reach (Horwitz *et al.* 2017). In light of the accessible proof, a viable calculation for hazard appraisal, therapy, and checking of RFS in clinical inpatients was created. In day-by-day schedule clinical consideration, this may assist with advancing and normalize the administration of this weak patient populace (Friedli *et al.* 2018). John Ioannidis has given a clear record, as a report to David Sackett, of how proof based medication was seized to serve personal stakes: major randomized controlled preliminaries are to a great extent done by and to support the business; meta-examinations and rules are overflowed with irreconcilable situations; public and government research reserves can't address fundamental clinical inquiries (Fava 2017). Currently, hazard evaluations in adjustments and scientific emotional well-being are regularly summed up in 1 of 3 words: low, moderate, or high. In spite of the fact that these danger names have solid effect on leaders, they are deciphered distinctively across settings, even among prepared experts (Hanson *et al.* 2017). The perplexing proof expected to control general wellbeing activity is not equivalent to that which is expected to give a fair impact size gauge. The training based proof pathway is neither mediocre nor only the best accessible when all else fizzles. It is regularly the best way to create important proof to address basic inquiries regarding putting resources into populace wellbeing intercessions (Ogilvie *et al.* 2020). Russia is again on the verge of a long period of depopulation, which is unlikely to be able to be blocked by the inflow of external migrants (Fadeeva *et al*. 2017). The purpose of this paper is to draw attention to the characteristics of fertility in modern Russia, to the relationship between fertility and abortion behaviour, as well as to the possibility of reducing the use of abortions.

MATERIALS AND METHODS

The study used such methods as social, socio-hygienic and statistical. The main strategic goal of socio-hygienic research is to study the relationship of demographic, social, economic, ecological processes in society with the development of public health, the prevalence of pathology, the life expectancy of people, which requires knowledge of the entire flow of life expressed in the alternation of human generations (Decree of the President of the Russian Federation dated 07.05.2018). A new paradigm of social and hygienic research is being formed; it combines the biological, social, and economic values of the population into a single criterion for the development of society: a human capital, which establishes the nature of generating an income stream in the form of reproducing health of new generations (Abortion Statistics, England and Wales 2017). In this regard, it is necessary to determine priorities in social and hygienic research, substantiate the synthesizing and integrating role of social hygiene in complex medical research, as well as the development of indicators and criteria of human capital (health capital) as an element of interaction with other sciences (Blum 2018).

Statistical analysis is based on the basic techniques of time series analysis, the rating method and cluster analysis (Brainerd 2018). When analyzing cost indicators, deflators are used to bring the dynamics data to uniform prices. Deflators are developed by Rosstat (Federal State Statistics Service) for each type of economic activity. Perinatal mortality (from Greek "peri" - about, around, and Latin "Natalis" - related to birth), the mortality of foetuses and children in the perinatal period (from 28 weeks of gestation to the end of the seventh day of a newborn's life). The perinatal mortality indicator includes indicators of stillbirth and early neonatal mortality (Clements 2012). The indicator of perinatal mortality is expressed in ppm (0/00) and is calculated by the formula: m (number of stillbirths + number of deaths in the first seven days of life) / number of all births (alive and dead) (Aganbegyan 2016).

Statistical analyses

After normalizing the data, the statistical analysis of results was performed by means of analysis of variance (ANOVA), on a quantitative dependent variable and independent variables. Analysis of variance was used to test

the hypothesis that several means are not the same. In our analyses, we performed several Two-Way ANOVA for different response variables. In addition to determining that differences between the means exist, several post-hoc LSD tests were considered on factor levels. All statistical analyses were performed using SPSS software (SPSS Inc., Chicago, IL). The significant level was considered as $p < 0.05$.

RESULTS AND DISCUSSION

Compared to 1991, maternal mortality has dropped significantly. However, there is no pronounced dynamics in mortality caused by pregnancy or birth complications, as well as post-parturient complications; periods of decline in the number of complications within a long time series in a number of years were accompanied by an increase in the indicator, for example, in 1999-2001, and in 2008-2009. At the end of 2018, the number of women who died was 8.3 per 100,000 live births (in 1991 - 63.5). The results of the analysis made it possible to establish that the level of maternal mortality in rural areas exceeded the same indicator in urban areas by an average of 8.5 per 100,000 of live births, with the exception of 1992, when maternal mortality in rural areas was less than maternal mortality in urban areas by 9.6 per 100,000 of live births), in 1995 - by 0.6, in 1996 - by 24.4, in 2008 - by 11.9, and in 2013 - by 3.2. The analysis showed that in rural areas the age-specific mortality rate of women aged 20-24 decreased from 1.4 to 0.4, while there was a significant increase in the age-specific mortality rate of women aged 35-39, which raised from 1.8 to 2.5.

The age-specific mortality rates of fertile age women in 2018 did not change significantly compared to 1991. The number of deaths on average per 1000 people of the resident population of the corresponding sex and age group for the urban and rural population fell on the age groups aged 45-49 years, followed by the age groups of 40-44 years old and 35-39 years old. The number of deaths during the perinatal period in cities decreased by 60.6% from 23.1 per 1000 live births and deaths in 1991 to 9.1 in 2018. In rural areas, the number of deaths during the perinatal period in 2017 compared to 1991 has decreased by 10.6% from 16 per 1000 live and dead births to 14.3, while the maximum value of the indicator was recorded in 1993-1995: it was from 21.1 to 20.5 per 1000 live and dead births. Positive dynamics is noted for perinatal mortality, but with significant differentiation for the urban and rural population. In urban areas, the level for this indicator was more pronounced than for rural areas (the levels of differences are significant, $p < 0.05$).

The data of statistical analysis can be an evidence base for the development of priority areas in maternal mortality: identifying risk factors, forecasting and modelling processes, and also the development of preventive measures to reduce, minimize, and optimize the processes of modern demography.

Positive dynamics are characteristic of artificial termination of pregnancy. The number of abortions per 1000 women aged 15-49 years decreased from 102 in 1991, 64.6 in 2000, and 30.3 in 2010 to 23.5 in 2018; the number per 100 births decreased from 188 in 1991, 186.3 in 2000, and 63.5 in 2010 to 45.4 in 2020. The number of mini-abortions also decreased from 24.8 per 1000 women aged 15-49 years in 1996, 22.5 in 2000, 11.1 in 2010 to 7.8 in 2015. According to estimates, the average number of abortions per woman decreased from 0.102 in 1993, 0.06 in 2000, and 0.03 in 2010 to 0.02 in 2018, which was 77.1% in relative terms.

On the contrary, the share of the primiparous among all women who terminated pregnancy increased from 4.7% in 1993, reaching the maximum value in 2002, i.e. 9.5%, while a stable dynamics of decrease in this indicator has been observed since 2013, when the share of the primiparous among all women who terminated pregnancy decreased from 8.6% to 5.5% in 2020. Thus, the proportion of the primiparous among all women who terminated pregnancy was characterized in 1991-2018 by a polynomial trend ($P < 0.05$).

Analysis of the age structure of artificial pregnancy termination showed that since 1991-2012 the largest number of abortions fell on women in the age group of 20-34 years, while their number decreased from 124.4 per 1000 women in 1991 to 43.2 in 2012. In terms of size in the structure of artificial termination of pregnancy, the 15-19 age group was further and the value of the indicator for it decreased from 24.4 per 1000 women in 1991 to 11.5 in 2012. Artificial termination of pregnancy in the age group over 35 years old in 2012 was 16.7 per 1000 women against 17.6 in 1996. After 2010, artificial termination of pregnancy in women in the largest age group from 18-44 years has decreased from 38.3 per 1000 women of the corresponding age, and 29.1 in 2015 to 28.5 in 2018; in the age group from 15-17 years it was from 4.9 per 1000 women in 2010, 2.4 in 2015 to 1.8 in 2018. For the age group over 45, on the contrary, there was an increase in the indicator from 1.3 per 1000 women of the same age in 2010 to 2.3 in 2018. To understand the processes associated with demographic issues, it is logical to undertake the

study of trends in the incidence of the child population, in particular, of the reproductive sphere. The number of diseases of the genitourinary system increased: for children aged 0-14 years, the value of the indicator has increased in 3.7 times from 8.8 per 1000 children in 1991 to 32.8; at the age of 15-17 it has increased by 6.1 times from 9.6 per 1000 children to 58.2; in general for Tatarstan as the constituent entity of the Russian Federation, the increase was 63.8% from 23.5 to 38.5 per 1000 population.

SUMMARY

Thus, the study of demographic processes in the territory of the constituent entity of the Russian Federation in the period from 1991-2018 allows us to draw the following conclusions:

1. The age-specific mortality rates of women of childbearing age in 2018 did not change significantly compared to 1991. The number of deaths on average per 1000 people of the resident population of the corresponding sex and age group for the urban and rural population fell on the age groups aged 45-49 years followed by the age groups of 40-44 years old and 35-39 years old.

2. Reliably positive dynamics are characteristic of artificial termination of pregnancy. The number of abortions per 1000 women aged 15-49 years decreased from 102 in 1991 to 23.5 in 2018 and from 188 to 45.4 per 100 births. Positive dynamics is noted for perinatal mortality, but with significant differentiation for the urban and rural population. In urban areas, the downward trend for this indicator was more pronounced than for rural areas (the levels of differences are significant, $p < 0.05$).

3. The number of deaths in the perinatal period in cities decreased by 60.6% from 23.1 per 1000 live and dead births in 1991 to 9.1 in 2018. In rural areas, the number of deaths in the perinatal period in 2017 in comparison with 1991 was decreased by 10.6% from 16 per 1000 live and dead births to 14.3, while the maximum value of the indicator was recorded in 1993-1995: from 21.1 to 20.5 per 1000 live and dead births.

4. In 2018 compared to 1991, the number of sick adolescents between the ages of 0-14 years increased by 130.8% amounting to 1237.8 thousand people. The number of sick adolescents aged 15-17 years increased at a faster rate by 95.1 compared to 1991, amounting to 160.5 thousand people in 2018. The increase in the number of sick children exceeded the same indicator, in general, where the number of cases increased from 684.2 per 1000 people in 1991 to 794 per 1000 people in 2018.

5. The number of diseases of the genitourinary system has increased: for children aged 0-14 years, the value of the indicator increased 3.7 times: from 8.8 in 1991 to 32.8 per 1000 children; at the age of 15-17 it has increased 6.1 times from 9.6 to 58.2 per 1000 children; in general for Tatarstan as the constituent entity of the Russian Federation, the increase was 63.8% from 23.5 per 1000 population to 38.5.

CONCLUSIONS

The study was aimed at identifying trends in the formation of reproductive health and reproductive behaviour (Read *et al.* 2018).

The study was carried out in the dynamics of the years 1991-2018 on the territory of a subject of the Russian Federation. In this regard, the data on infantile foetal losses, stillbirths, abortion rates, as well as the incidence of adolescents in the group of nosological forms of the genitourinary system were analysed. The results of the analysis showed significantly high differences in the level of indicators of reproductive health among the population living in urban and rural areas (Borisov 1976; Byrd 2014; Brainerd 2018).

An unfavourable tendency of an increase in the incidence of adolescents was revealed both in the dynamics of the years of observation and in comparison with the level in the Russian Federation (population).

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ارزیابی مخاطرات از نظر معیارهای اصلی پزشکی مبتنی بر شواهد

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چکیده

یکی از وظایف مهم دولت و یک موضوع مهم برای تحقیقات علمی، مطالعه‌ی مسائل سلامت زنان در سن تولید مثل یا فرزند آوری است. شاخص اصلی فرایندهای پزشکی و جمعیت شناختی در جامعه، نرخ مرگ و میر است. میزان مرگ و میر به رشد اقتصادی - اجتماعی کشور، رفاه جمعیت، توسعه سیستم مراقبت‌های بهداشتی و در دسترس بودن خدمات پزشکی بستگی دارد. میزان مرگ و میر زنان در سن باروری یکی از عوامل اصلی مؤثر بر شاخص‌های تولید مثل جمعیت است. نرخ مرگ و میر وابسته به سن زنان در سنین باروری در سال ۲۰۱۷ نسبت به سال ۱۹۹۱ تغییر نکرده است. حداکثر تعداد به طور میانگین در هر ۱۰۰۰ نفر از جمعیت با گروه‌های سنی و جنسی برای جمعیت‌های شهری و روستایی برای گروه‌های سنی ۴۵-۴۹ و بعد از آن گروه‌های سنی ۴۰-۴۴ و ۳۵-۳۹ سال است. نرخ مرگ و میر وابسته به سن برای زنان در سن تولید مثل در مناطق شهری از ۸,۳ درصد به ازای هر ۱۰۰۰ نفر جمعیت در ۱۹۹۱ به ۹,۳ در ۲۰۱۷ افزایش یافت و در مناطق روستایی از ۱۴,۱ به ۱۴,۵ افزایش یافت. لازم به ذکر است که در مناطق روستایی، نرخ مرگ و میر وابسته به سن زنان ۲۰-۲۴ سال، از ۱,۴ به ۰,۴ کاهش یافت، در حالی که افزایش معنی‌دار در این مقدار در زنان ۳۵-۳۹ سال ثبت شد که از ۱,۸ به ۲,۵ افزایش یافت. پویایی باقی مانده‌ی گروه‌های سنی برای جمعیت‌های شهری و روستایی در حاشیه‌ی خطا، باقی ماند.

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