MTMSD 2022
I International Conference «Modern Trends in Governance and Sustainable Development of Socio-economic Systems: from Regional Development to Global Economic Growth»

MORTALITY OF THE POPULATION OF THE REPUBLIC OF NORTH OSSETIA-ALANIA

Mira Kantemirova (a)*, Alla Gurina (b), Alina Kusova (c), Irina Bitarova (d), Ilona Kusova (e)
*Corresponding author

(a) North Ossetian State Medical Academy, Vladikavkaz, Russia, kantemirova.mira@mail.ru
(b) North Ossetian State Medical Academy, Vladikavkaz, Russia, allagurina@yandex.ru
(c) North Ossetian State Medical Academy, Vladikavkaz, Russia, kusalrash@yandex.ru
(d) North Ossetian State Medical Academy, Vladikavkaz, Russia, bitarova_i@mail.ru
(e) North Ossetian State Medical Academy, Vladikavkaz, Russia, ilona@kusov.ru

Abstract

This article investigates the mortality rates in the Republic of North Ossetia-Alania, situated in the Russian Federation, focusing on factors contributing to population decline, low life expectancy, and elevated mortality rates among citizens of working age. The study is particularly significant in light of the prevailing demographic crisis in Russia, necessitating effective strategies for intervention. The authors employ a comprehensive analysis of mortality data, encompassing causes of death, demographic characteristics of the deceased, and distinctions between urban and rural populations. The research aims to shed light on the intricate issues influencing the population of North Ossetia-Alania, providing insights into the challenges faced and potential areas for improvement. The methods employed include a thorough examination of mortality statistics, demographic profiling, and an exploration of the socioeconomic factors influencing mortality rates. By scrutinizing these factors, the study aims to identify patterns and trends that could inform targeted interventions. A notable outcome of the research is the revelation of specific challenges contributing to high mortality rates, particularly among the working-age population. The authors emphasize the impact of socioeconomic factors on health outcomes, underscoring the need for focused interventions to address these disparities. The study offers valuable recommendations for policymakers, healthcare professionals, and stakeholders interested in the welfare and development of North Ossetia-Alania.

Keywords: Able-bodied population, causes of death, mortality rates, number, regularity, structure

1. Introduction

The information base of the study is the regulatory legal acts of the Russian Federation, statistical data of the Republic of North Ossetia-Alania (RNO-Alania), UN reports, materials of the Ministry of Health of RNO-Alania, scientific articles.

The studied indicator in the article is the mortality rate of the population of RNO-Alania. As part of the statistical indicators, the following were analyzed: the overall mortality rate (number of deaths per 1,000 people); mortality rate of the working population.

The need to study the mortality of the population lies in the fact that this indicator should be taken into account as an indicator not only when considering the health status of the country and regions, but also demographic, social, and economic problems. It can also be one of the markers of the ongoing state policy for the socio-economic development of the country and its regions.

2. Problem Statement

The mortality of the population in Russia and its constituent regions has garnered considerable scientific attention, with researchers exploring various aspects such as its condition, causes, consequences, and patterns. Laricheva et al. (2022) have delved into the features of mortality attributed to the consequences of specific diseases, while Hamer, Grigulevich (2013), and others, including Hamer (2020), have contributed to understanding the overall state of mortality and its causes in Russia and its regions.

Existing scientific literature has addressed regional challenges in assessing and forecasting the health status of the working population in Russia. This includes investigating the causes of mortality in the working population, analyzing its structure, and identifying patterns related to age, gender, and nosological nature. Additionally, researchers have explored the impact of various labor and production factors on the mortality rates of the working population.

While these studies have provided valuable insights, there is a recognized need for further research to delve deeper into the specific problems of mortality in individual regions. Moreover, exploring potential strategies to reduce mortality rates remains a crucial avenue for investigation. Therefore, this study aims to contribute to the existing body of knowledge by examining the intricacies of mortality patterns in a specific region (insert the name of the region) and proposing effective measures to address and mitigate the identified challenges.

3. Research Questions

i. What are the current trends in life expectancy in (insert the name of the region), and how do they compare to the national target of 78 years by 2030?

ii. What are the key socio-economic indicators influencing life expectancy in (insert the name of the region), and how do they contribute to the overall health and well-being of the population?

iii. What comprehensive measures are being implemented in (insert the name of the region) to ensure the preservation of public health and increase life expectancy?

iv. What are the main challenges and obstacles hindering the achievement of the target life expectancy in (insert the name of the region)?

v. How can policy interventions and healthcare strategies be tailored to address the specific needs and challenges of (insert the name of the region) to achieve the target life expectancy set by the government? These research questions aim to provide insights into the current status of life expectancy in the region, identify factors influencing it, assess ongoing efforts to improve public health, and propose targeted interventions to enhance life expectancy and overall well-being in line with national development goals. According to the development goals of our country until 2030, it is supposed to increase the life expectancy of the countr's citizens up to 78 years, which requires the achievement of high socio-economic indicators, as well as the implementation of significant comprehensive measures to ensure the preservation of public health (Official publication of legal acts, 2020).

The problem of increasing the life expectancy of citizens refers to the target indicator characterizing the level of preservation of the population, its health and well-being. The value of life expectancy of the population of Russia is 69.4 years (the penultimate place in the world). The life expectancy of the population in Russia is significantly affected by high mortality, which in 2021 is 13.1 (per 1000 population), which exceeds the global level of 8.6. Thus, Russia ranks 221st in terms of the growth of total mortality (out of 236 countries in the world) (United Nations, 2022). The life expectancy of the population is influenced by the mortality rate of people of working age. In 2021, citizens of working age accounted for about a third of deaths (including men, 80% of such deaths).

The Republic of North Ossetia-Alania is also characterized by a decrease in the population, unsatisfactory life expectancy, accompanied by a high mortality rate, including among the working age.

If in 2010 the natural population growth was positive and the increase was 2555 people, then in 2020 it became negative (-346 people), and in 2021 the decline increased to 1765 people. The life expectancy of the population in 2021 was higher than the average for Russia - 72.47 years, which was achieved due to the higher life expectancy of women - 76.46 years, while the relatively low life expectancy of men - 68.08 years.

The current dynamics of the change in the population of North Ossetia-Alania for the period 2015-2021 is shown in Figure 1.
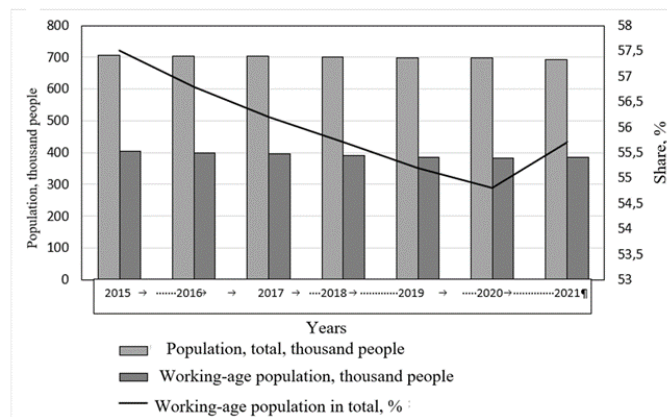

Figure 1. Dynamics of population change in North Ossetia-Alania

The total population of North Ossetia-Alania decreased over the period under review, amounting to only 98.3%. At the same time, the working-age population decreased at a faster rate and in 2021 decreased to 95.2% of the population in 2015. The increase in the share of working-age citizens of the republic in 2021 is mainly due to the consequence of the pension reform, after raising the retirement age for people.

4. Purpose of the Study

The primary purpose of this article is to conduct a thorough analysis of the mortality rates among the population of the republic (insert the name of the republic) and to discern underlying patterns and trends. The study aims to provide valuable insights into the dynamics of mortality, offering a comprehensive understanding of the factors influencing population mortality within the specified region. Through meticulous examination and interpretation of mortality data, the research seeks to contribute to the existing body of knowledge and facilitate a deeper understanding of the patterns associated with mortality in the republic.

5. Research Methods

During the course of the study, the following research methods were employed:

i. Statistical Analysis: - Utilized to systematically examine and interpret the quantitative data related to mortality rates in the specified region. Statistical methods allow for the identification of trends, patterns, and key indicators influencing mortality.

ii. Comparative Analysis: - Employed to compare and contrast mortality rates within the region over different time periods, as well as in comparison to national or global benchmarks. This method provides insights into variations and trends in mortality patterns.

iii. Regression Analysis: - Applied to explore the relationships between mortality rates and various factors, such as socio-economic indicators, healthcare access, or other relevant variables. Regression analysis allows for the identification of potential predictors of mortality.

iv. Correlation Analysis:- Used to assess the strength and direction of relationships between different variables related to mortality. Correlation analysis aids in understanding how changes in one variable may be associated with changes in another, providing valuable insights into potential causal relationships.

These research methods collectively contribute to a robust and comprehensive analysis of the dynamics of mortality rates in the specified region, helping to identify patterns, causal factors, and potential areas for intervention and improvement.

6. Findings

1. Impact of COVID-19 Pandemic:

i. The study revealed the significant impact of the COVID-19 pandemic on the population dynamics of North Ossetia-Alania. Changes in mortality and birth rates were observed, reflecting the disruptions caused by the pandemic on public health and demographic trends.

2. Causes of Death:

ii.   The research identified the leading causes of death among the population, particularly focusing on individuals of working age. Understanding the primary causes of mortality provides valuable insights into the health challenges faced by the region and informs targeted interventions.

3. Healthcare Expenditures:

iii.   An analysis of healthcare expenditures in the republican budget highlighted a downward trend in the share of healthcare spending. This finding underscores potential challenges in allocating resources to healthcare services and the need for prioritizing public health initiatives.

4. Structure of Causes of Death:

iv.   The study established the structure of the causes of death among individuals of working age, shedding light on prevalent health issues and mortality patterns within this demographic group. This information is essential for developing tailored healthcare strategies and interventions to address specific health concerns.

Overall, these findings provide valuable insights into the complex interplay of factors influencing mortality rates and public health outcomes in North Ossetia-Alania. They underscore the need for targeted interventions and policy measures to mitigate the impact of the COVID-19 pandemic, address prevalent health issues, and improve overall population health and well-being in the region.

It should be noted the change in the ratio between birth and death rates. The birth rate had a steady downward trend from -14.6 in 2015 to 11.6 in 2021.

The death rate also decreased from 10.7 in 2015 at all stages until the start of the COVID-19 pandemic in 2019 to 10.3. However, then in 2020 its value (12.3) with a jump-like growth exceeded the value of the birth rate (11.8) with a subsequent noticeable increase in 2021 to 14.1 (Figure 2).
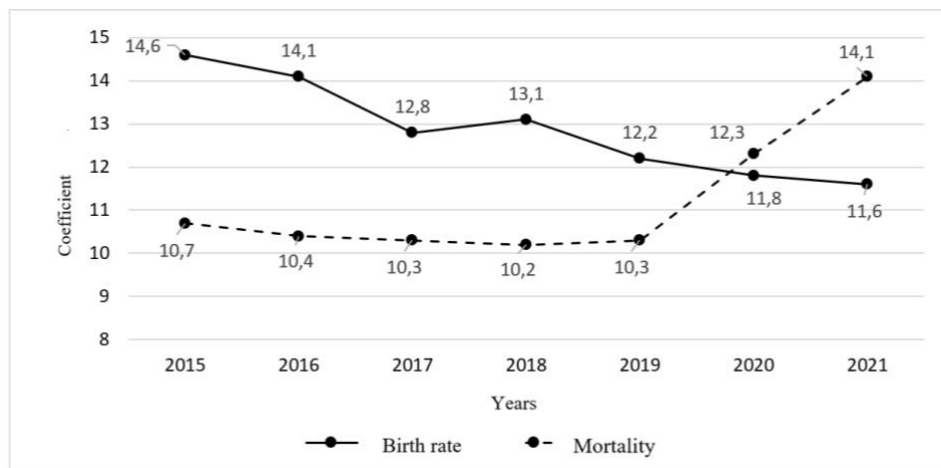

Figure 2. Dynamics of coefficient values birth rate and death rate in North Ossetia-Alania

As a result of a decrease in the birth rate and an increase in mortality under the influence of the coronavirus pandemic, the so-called "Russian cross" has formed in the republic, reflecting the excess of mortality over the birth rate and negatively affecting the population of the republic.

In the structure of causes of death for the entire population of North Ossetia-Alania for 2021, the first place (as in previous years) is given to diseases of the circulatory system with a result of 41.5%;

the second place is given to other diseases - 21.6%.

the third place was taken by the coronavirus infection caused by COVID-19, which led to 18.5% of deaths;

in fourth place - neoplasms - 11%;

in fifth place - diseases of the digestive system - 4.3%;

in sixth place - external causes of death - 3.1%;

in seventh place - diseases of the endocrine system - 2.1% (Office of the Federal State Statistics Service for the North Caucasus Federal District, 2022).

The state and development of the health care system is largely determined by the volume of financial expenditures allocated to meet various needs. The dynamics of the expenses of the consolidated budget of the republic for social and cultural activities in the health care system are shown in Table 1.

Table 1. Dynamics of expenditures of the consolidated budget for activities of a socio-cultural nature for health care of North Ossetia-Alania

Name	2015	2016	2017	2018	2019	2020	2021
The amount of expenses, the total budget, million rubles	18441,8	18576	20803,1	24809,5	26947,0	34760,1	36020,7
Amount of expenditures on health care, million rubles	5211,4	5209,9	2620,2	3338,4	3947,9	6471,3	5321,9
Share of health care expenditures in budget expenditures, in %	28,3	28,0	12,6	13,5	14,7	18,6	14,8

As can be seen, during the period under review, the total expenditures of the consolidated budget of the republic have steadily increased, amounting to 36,020.7 million rubles in 2021. (growth 195.3% by 2015). Health care expenditures also tended to increase, but the growth was relatively low, amounting to only 102.1%.

Visualization of the dynamics of the share of healthcare expenditures in the budget expenditures of North Ossetia-Alania clearly shows that despite the real increase in expenditures by 110.5 million rubles, in 2021 compared to 2015, the current trend is downward (Figure 3).
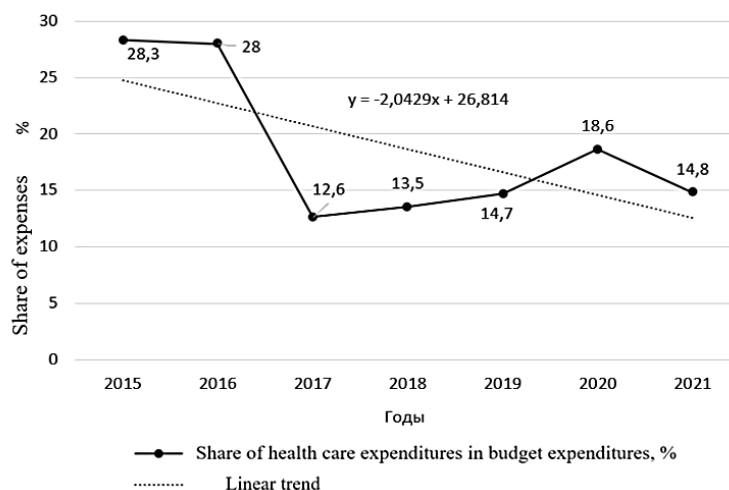
Figure 3. Dynamics of the share of spending on health care in budget expenditures of North Ossetia-Alania

After a significant decline in health care spending in 2017, the republic experienced a certain adjustment of the indicator in subsequent years, which, however, did not lead to their return to the previous level of values.

In 2021, 7992 people were born in the republic, and 9757 people died. Over the past three years (2019-2021), the structure of the causes of death of people of working age has not changed much, the first place is occupied by external causes of death in 2021 - 16%, 2020 - 18%, 2019. - 21%.

The death rate of people from external causes is significantly affected by the number of deaths as a result of transport accidents: in 2021 - 46 people, which amounted to 29.49%; 2020 - 61 people (36.53%), 2019 - 55 people (30.9%).

Deaths from suicide: 2021 - 36 people (23.1%); 2020 - 33 people (19.8%), 2019 - 42 people (23.6%).

Mortality from non-alcoholic poisoning: 2021 - 16 people (10.3%); 2020 - 14 people (8.4%); 2019 - 12 people (6.7%).

Mortality from other external causes: 2021 - 36.51%; 2020 - 35.27%; 2019 - 37.68%.

It should be noted the low mortality rate from alcohol poisoning: in 2019 - 2 people (1.12%), 2020 - 0%, 2021 - 1 person (0.6%). Mortality from alcohol-related causes of death in the entire population and in working age (for 2021) is not relevant for North Ossetia-Alania.

In second place among the causes of death: diseases of the circulatory system, which occupy 14% in 2021, 14% in 2020, and 19% in 2019 (a decrease of 26% is noted);

The third place was taken by neoplasms in 2021 - 10%, 2020 - 10%, 2019 - 11%, or a decrease of 9%;

The fourth cause of death is the coronavirus pandemic caused by COVID-19 (in 2021 - 9.2%, 2020 - 2.3%, 2019 - 0%), an increase of 4 times.

In the structure of mortality from external causes of people of working age in 2021, the mortality of men is 4 times higher than the number of registered dead women in all age categories of working age (15-29 years, 30-34 years and 35-54/59 years), namely, 205 men and 58 women (Office of the Federal State Statistics Service for the North Caucasus Federal District (2021).

7. Conclusion

The analysis conducted reveals that the current dynamics of the population in North Ossetia-Alania are predominantly influenced by mortality factors. Notably, a significant proportion of deaths, exceeding 80%, is attributed to various diseases. This underscores the critical importance of addressing health-related challenges to mitigate the impact on the overall population.

To effectively reduce the mortality rate in North Ossetia-Alania, a comprehensive approach is imperative. This approach should extend beyond the confines of the healthcare system and incorporate multifaceted measures aimed at tackling the root causes of mortality. While supporting and strengthening the healthcare system is crucial, additional measures addressing social determinants, lifestyle factors, and community well-being are equally vital.

The findings emphasize the necessity for strategic interventions that encompass public health initiatives, healthcare infrastructure enhancement, and broader societal measures. Collaborative efforts involving healthcare professionals, policymakers, and community stakeholders are essential for the successful implementation of initiatives aimed at reducing mortality rates and improving the overall health outcomes of the population in North Ossetia-Alania.

In conclusion, a holistic and coordinated approach is pivotal to address the complex interplay of factors contributing to mortality in the region, fostering a healthier and more resilient population in North Ossetia-Alania.

References

Grigulevich, N. I. (2013). Analysis of external causes of mortality in the regions of Russia. *Perm medical journal, 2013, 6.* https://cyberleninka.ru/article/n/analiz-vneshnih-prichin-smertnosti-v-regionah-rossii.pdf

Hamer, G. V. (2020). The level of mortality in Russia: the state and measures to reduce it. *International Journal of the Humanities and Natural Sciences, 3-2.* https://cyberleninka.ru/article/n/uroven-smertnosti-v-rossii-sostoyanie-i-mery-po-ee-snizheniyu

Laricheva, I. V., Yastrebova, E. S., Prostov, M. Y., Nyushko, K. M., & Murashko, R. A. (2022). Opportunities to reduce mortality from prostate cancer in Russia: analysis of data from the state cancer registry for 2018–2020. *Health Manager, 4,* 31-38. https://cyberleninka.ru/article/n/vozmozhnosti-po-snizheniyu-smertnosti-ot-raka-predstatelnoy-zhelezy-v-rossii-analiz-dannyh-gosudarstvennogo-rakovogo-registra-za

Office of the Federal State Statistics Service for the North Caucasus Federal District. (2021). *Analysis of mortality of people of working age in North Ossetia-Alania. Materials of the Ministry of Health of the Republic of North Ossetia-Alania.* https://stavstat.gks.ru/storage/mediabank/OSET_2021_2.pdf

Office of the Federal State Statistics Service for the North Caucasus Federal District. (2022). *The Republic of North Ossetia - Alania in numbers: a brief statistical compendium. OP of the North Caucasus Statistical Office for North Ossetia - Alania,* 2015-2021. https://stavstat.gks.ru/compendium_oset/document/38129

Official publication of legal acts. (2020). *Decree of July 21, 2020 No. 474 «On the national development goals of the Russian Federation for the period up to 2030.* http://publication.pravo.gov.ru/Document/View/0001202007210012

United Nations. (2022). *World Population Prospects. Population Division.* https://population.un.org/wpp/Download/Standard/MostUsed/