

DIFFERENCES IN THE STATE OF POPULATION HEALTH IN URBAN AND RURAL AREAS OF THE RUSSIAN FEDERATION (THE CASE OF ORENBURG REGION)

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Abstract: The relevance of this research is high as the negative trend in the state of health of the population in some regions of the Russian Federation remains constant. Due to the above, this paper seeks to explore the living conditions of population in Orenburg region that affect the state of health. The leading approach to investigation of this problem was a comparative analysis of mortality rates in male population by age. This paper presents results of a comparative study of men's mortality rates across different age groups from the circulatory diseases, malignant neoplasms, alcohol addiction in rural and urban areas, and explains the reasons. The paper proceedings may be useful in developing social programs to support rural population and the efforts to protect the health of population.

Keywords: mortality, health, rural population, environment, social pollution, unemployment.

1 Introduction

The problem of the relationship between public health and environmental factors is widely discussed both in scientific circles and in community and remains relevant. A number of researchers note that socio-economic conditions in Russia are gradually changing, new technologies are being introduced in all spheres of life, the education is restructured, etc. However, the deterioration of health by a number of indicators in some localities and regions is alarming. Negative dynamics is not attributable to the COVID-19 pandemic, which began in 2020. It has deeper systemic roots related to the entire complex of social and living conditions of population in a certain city or village of the Russian Federation. Changes in the factors that have direct impact on the health of population are occurring unevenly across different social strata and groups of population.

Difference between the living standards of urban and rural population has historical reasons. City was evolving as an industrial center, a place where the plants, factories, financial flows and a large number of people are concentrated within a limited space. The village developed as a center for plant growing and livestock breeding, which required large tracts of land. These differences left their mark on the way of life, which in the city is highly competitive and rapid, pushing for development and adoption of new technologies and advanced equipment, while in the village life is flowing without rush, subject to seasonal and daily rhythms, is well grounded and based on family ties. Living conditions also differed: overcrowded apartment buildings for city dwellers, and private houses with vegetable gardens for villagers. Social changes that occurred in Russia in the early 20th century significantly changed the perceptions of urban and rural life. Extensive efforts have been made to reduce the gap in living conditions, level of education, culture, and health care between the urban and rural areas. It should be noted that the Soviet Union made substantial progress in developing the rural areas. The end of the 20th century was marked by the construction of a new economic structure of the state, which affected the standard of living of a huge number of people, leading many to poverty and loss of moral basis. This caused a sharp decrease in the population of the Russian Federation (primarily male in rural areas) and an increasing gap between the living standards and opportunities of the urban and rural population. Still, the concepts of "city" and "village" are perceived by many as antonyms, since even today there are factors that contribute to higher mortality rates in the rural area. Better understanding of the role of socio-economic, ecological and other groups of factors in the higher mortality rates across different ages in certain regions from circulatory

system diseases, malignant neoplasms and alcohol-related diseases will help to develop approaches and methods for reducing mortality and sustaining growth of population in Russia.

2 Literature Review

For describing the adverse effects of the economic activities of business entities, recently the term "social pollution" has been increasingly used, which, according to researchers, refers to instability in the social and labor field, high differentiation in wages, cancellation of social guarantees for increasing the intensity of work and compulsion to work, reducing the headcount, dismissal by the initiative of employer, dismissal due to retirement, unpaid overtime work and unpaid leaves. All these factors have a heavy destructive impact on workers, ruining their physical and psychological well-being (Popova, 2016; Fedorova & Parsyukevich, 2013; Pfeffer, 2007). At the same time, specialists pay attention to socio-economic signs of the increasing life expectancy in the Russian Federation, taking into account regional specifics (Zaitseva et al., 2019). In studies more and more attention is paid to the assessment of socio-economic aspects of health of the rural population (Blinova et al., 2020; Komleva et al., 2018). Scientists express concern about existence of a large number of families where one or both spouses abuse alcohol. Smirnova E.O. (2018), Safronova A.N., Verbitskaya N.O. (2014), Yakovleva T.P. (Yakovleva et al., 2020), Pochitaeva I.P., Lyutsko V.V. (2015) and a number of foreign researchers (Bousono et al., 2017) examine the factors and causes of the student's propensity to use psychoactive substances, the relationship between the cognitive sphere in adolescents and family history of alcoholism, the causes of age-specific motives for the use of psychoactive substances and the role of social environment of the student's youth in these processes. A.E. Fyodorova, A. Parsyukevich (2013) reveal the relationship between the social pollution and economic activities of business entities. Popova A.Yu. (2016) highlights the problems of occupational diseases among agricultural workers in the Russian Federation. Gradual changes in socio-economic setting, deployment of new technologies in all realms of life, trigger changes in the structure of population by education, as indicated by researchers Bobkov V.N., Veradyuk O.V. (2013), but at the same time lead to instability of employment.

When studying the phenomenon of social pollution, scientists have noticed its differences in urban and rural areas. Significant negative factors for the rural population are the lack of opportunities for good education; lack of jobs and low wages, giving the employer a power to be manipulative with employees, forcing them to take on a huge workload; lack of amenities common to city dwellers: running water, sewage, stove heating; numerous heavy chores around the house; lack or insufficient development of cognitive and entertainment sphere. All this takes a heavy toll on the way of life of families in the rural areas, their traditions, values, lifestyles and upbringing, development of healthy habits to protect health and increase the duration of life (Bobkov & Veradyuk, 2013; Report on the Implementation and Effectiveness of State Supervision and Control in the Field of Labor and Social Protection of the Population in 2012, 2014; Zaitseva et al., 2019; Results of a Sample Survey of the Labor Force, 2019; Komleva et al., 2018). It is also important to mention many families raising children, where parents abuse alcohol and drugs (World Drug Report 2018, 2019; Komleva et al., 2016).

3 Research Methodological Framework

The purpose of this study was to assess the role of the living conditions in rural areas of Russia and changes in the mortality rates from the leading causes of death in male population as compared to urban areas.

Mortality rates are traditionally regarded as indicators of the state of health of population. The social group most exposed to negative socio-economic factors in rural areas that adversely affect health, in our opinion, is the male population. Hence, the object of our study were males aged 20 years and older living in the villages and cities of the Orenburg region, the Volga Federal District of Russia in 2018, and the studied subject were the factors influencing the indicators of health of the male population.

The objectives of this research were as follows:

1. Analyze the causes of differences in the state of health of population in urban and rural areas in the Russian Federation (the case of the Orenburg region in the Volga Federal District (VFD)).
2. Identify socio-economic factors behind the higher mortality of the male population of different ages in rural areas by analyzing changes in the rates of mortality from the leading causes of death in male rural population in comparison with urban areas.

In order to solve the tasks we have carried out a comparative analysis of age-specific mortality rates of the male population living in urban and rural areas in the Volga Federal District, Russia. For assessing the weight of socio-economic factors in the male population mortality rates, we used the method of standardization involving calculation of the hypothetical mortality rate.

The leading causes of death topping the list of death causes (diseases of the circulatory system – ICD-10: II malignant neoplasms (C00-C97); IX diseases of the circulatory system (I00-I99), as well as external causes of death were included in the research. Causes related to the alcohol abuse, according to ICD-10, were taken from the Section F10-F19 Mental and Behavioral Disorders Due to Psychoactive Substance Use (International Classification of Diseases, 10th Revision (ICD-10), 2019).

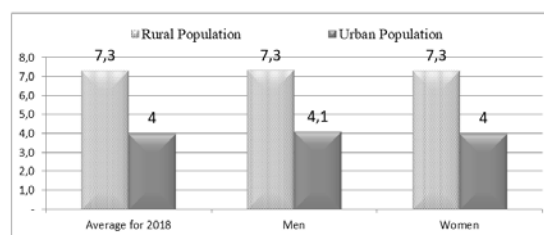
The group of alcohol-attributable causes of death includes: acute alcohol intoxication, harmful alcohol use, alcohol-induced dependence syndrome (chronic alcoholism), other and unspecified alcohol-induced psychiatric behavioral disorders, alcohol psychoses, encephalopathy, dementia, alcohol-induced nervous system degeneration, alcoholic polyneuropathy, alcoholic cardiomyopathy (ICD X: 96-100, 113, 115, 116, 135, 176, 182, 187, 240, 279, 283, 288, 315).

For calculations we relied on the Rosstat data (Distribution of the Deceased by Sex, Age and Causes of Death. Urban and Rural Population of the Russian Population 2018, 2019, p. 51; The Population of the Russian Federation by Gender and Age, Averages for 2018, 2019). Distribution of the diseased by sex, age and causes of death). Based on these data we calculated the mortality rates of urban and rural male population of the Orenburg region in the Volga Federal District, Russia, at the age of 20 and older (per 10,000 population of the corresponding age group). The method of standardization by age of the mortality rates in the urban and rural male population, made it possible to calculate the weight of structural (age) and intensive mortality rates.

4 Results and Discussion

Processes causing social pollution, undoubtedly, exist in each type of economic activity, but their intensity and scale differ. This, in part, can be judged by such indicators as the structure of employment, education, income. Individuals aged 15 years and older, who in the period under consideration satisfied all of the following criteria: did not have a job (income-yielding occupation); were searching for a job during the past four weeks using any means; were ready to start working during the survey week, were classified as unemployed according to ILO definition. The proportion of such people in rural areas is 1.85 times higher than in cities (Fig. 1).

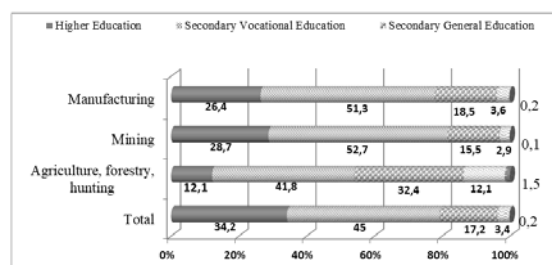
Figure 1 Level of Unemployment in Rural and Urban Areas in Russian Federation (%) in 2018



Source: Results of a Sample Survey of the Labor Force, 2019

Moreover, the rural labor market is contradictory, when, on the one hand, unemployment is high, and, on the other hand, it is grappling with a real shortage of qualified personnel in such important sectors of the economy as health care, education, agriculture, high migration of young talented educated people to cities and to more prosperous regions (Komleva et al., 2018).

Figure 2 Employment Structure in Certain Economic Sectors by Education (2018)



Source: Russian Statistical Annual Report, 2019

Thus, the unemployment rate in rural areas of Russia is almost twice higher than in cities (Fig. 1), and the level of education of agricultural workers by a number of indicators is lower than that of workers involved in other economic activities (Fig. 2). For example, the share of persons having no basic general education among agricultural, hunting, forestry workers is seven or more times higher than among workers employed in the manufacturing and fifteen times higher than among workers in mining. At the same time, the share of persons with higher education in agriculture is twice or more times lower than in other leading economic activities of the Russian Federation.

Medical care for the rural population, judging by the number of doctors per 10,000 population (46.7 in urban areas versus 21.3 in rural areas) is less accessible.

And, despite the overall favorable trend in indicators reflecting the state of health of the Russian population (Distribution of the Deceased by Sex, Age and Causes of Death. Urban and Rural Population of the Russian Population 2018, 2019), which is manifested in the growing life expectancy of the country's population, it is highly important to turn attention to the differences between the urban and rural areas.

Agriculture, forestry, hunting, fishing and fish farming accounted for 9.3% in the structure of the gross regional product in the Orenburg region in 2017. The main types of economic activity were: mining – 36.0%; manufacturing – 13.4%; construction – 7.1% (Russian Statistical Annual Report, 2019).

On the one hand, the presence of a variety of economic activities in the region drives development, improves the socio-economic situation and employment of the population. On the other hand, it should be noted that mining, manufacturing and construction are the economic activities which heavily pollute the atmosphere. Emissions of air pollutants from stationary sources by economic sectors in 2018 in the Orenburg region amounted to 285.8 thousand tons in mining, 84.8 thousand tons in manufacturing and 18.2 thousand tons in the production and

distribution of electricity, gas and water, which amounts to 388.8 thousand tons. The emission load from stationary sources per 1 thousand sq.km in the Orenburg region is 3.1 thousand tons (State Report on Environment Protection in the Orenburg Region 2018).

Table 1 shows the total age-specific mortality rates (from all causes) of the rural and urban population, as well as the age structure of the population (Table 1) based on the analytical materials of the Federal State Statistics Service (Distribution of the Deceased by Sex, Age and Causes of Death. Urban and Rural Population of the Russian Population 2018, 2019; The Population of the Russian Federation by Gender and Age, Averages for 2018, 2019).

Table 1 Age Structure and Total Mortality Rates of Urban and Rural Male Population of the Orenburg Region of the Volga Federal District, Russia, at the Age of 20 and Older (2018)

Age	Age structure of male population		Mortality rate (per 1000 population)	
	Urban	Rural	Urban population	Rural population
20–29	0,18	0,16	1,93	2,77
30–39	0,26	0,19	5,43	6,67
40–49	0,19	0,18	10,73	10,21
50–59	0,17	0,22	18,38	16,45
60–69	0,14	0,16	36,14	34,25
70–79	0,04	0,06	78,62	66,95
80 years and older	0,02	0,03	164,1	149,7
Total	∑1,0	∑1,0	18,93	20,44

Source: authors' own processing

It is obvious that in the age structure of the rural population the share of persons aged 50 years and older is higher versus the urban population, but the mortality rates in these age groups are lower than in the urban environment. That is why the calculation covers the 20-49-year-old population.

In Table 2, the authors present the calculated weight of causes of structural (broken down by age) and intensive mortality rates for persons aged 20 to 49 year. Hypotheticals were calculated based on mortality rates of the rural population, but applied to the age structure of the urban population (the calculation of hypotheticals is presented in Table 2).

Table 2 Estimated Hypothetical Mortality Rate for the Age Structure of Urban Population and Death from All Causes in Rural Male Population of Orenburg Region, Volga Federal District, Russia, in 2018 (20-29 year-olds)

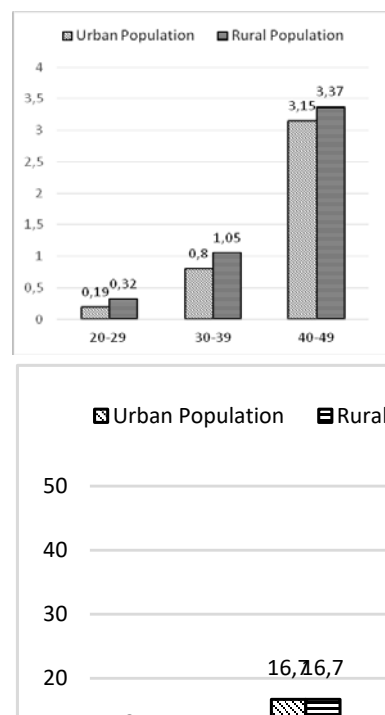
Age	Age composition of the urban male population in Omsk region	Mortality rate (per 1000 population) Urban population	Mortality rate (per 1000 population) Rural population	Assessed hypothetical mortality rate (‰)
20–29	0,29	1,93	2,77	0,8
30–39	0,41	5,43	6,67	2,73
40–49	0,29	10,73	10,21	2,96
Total	1,0	5,8	6,67	∑6,49

Source: authors' own processing

The hypothetical mortality rate (6.49‰) reflects how many deaths there would have been in the population if the mortality rates of men living in rural areas of the age structure as in the urban male population in the Orenburg region had remained the same. The difference in mortality rates between rural and urban population is taken as 100% (6,67‰-5,8‰=0,87‰). Then, the differences between mortality rate in rural population and hypothetical rate will indicate the role of age, i.e. structural differences (6,67-6,49‰=0,2‰), which corresponds to their weight in mortality rate differences of 23.0%. Correspondingly, the impact of other living conditions, which primarily include differences in socio-economic situation, is assessed at 77.0%.

These differences have been predetermined by the leading causes: circulatory system diseases (CSD), malignant neoplasms (MN), and external causes (EC). Alcohol-attributable causes of death (ALC) also had an impact (Fig. 3-7).

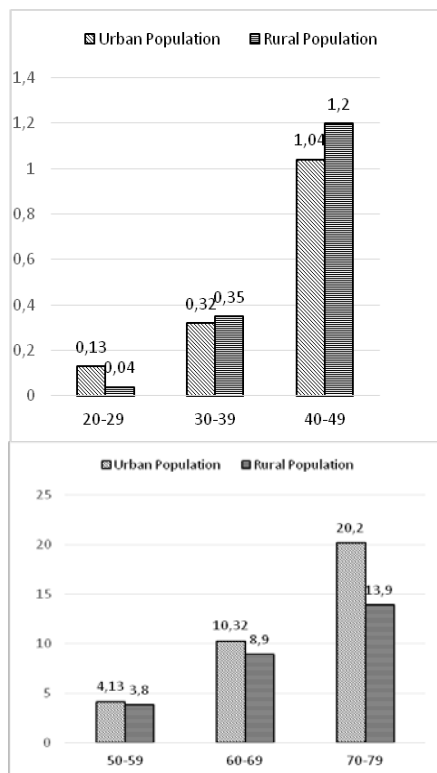
Figure 3 Mortality Rates in Urban and Rural Male Population of Orenburg Region Aged 20-49 Years and 50-79 Years from CSD



Source: authors' own processing

Mortality from circulatory system diseases (CSD) in the male population in rural areas was significantly higher in the most active and working age group: 20-49 years. At older ages, the ratio of indicators changes. Similar tendencies are seen with regard to other leading cause of death: malignant neoplasms. The leading localizations which determined the differences in mortality rates at the age of 30-49 years in this class of causes were: malignant neoplasms of digestive organs (esophagus, pancreas, liver and bile ducts) as well as malignant neoplasms of respiratory organs.

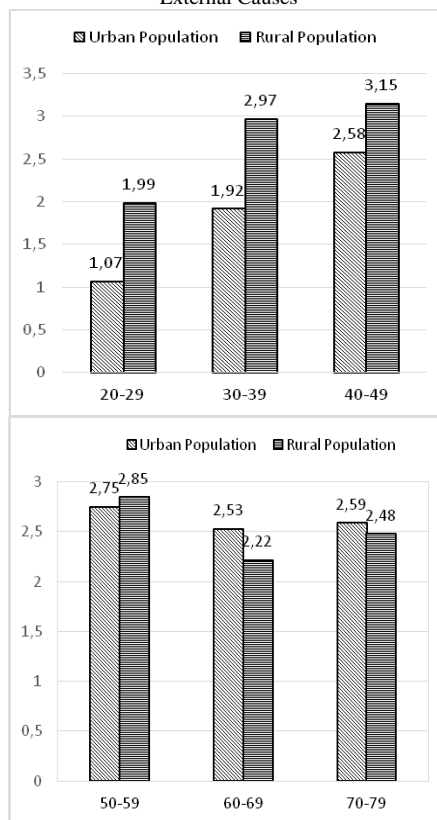
Figure 4 Mortality Rates in Urban and Rural Male Population of Orenburg Region Aged 20-49 Years and 50-79 Years from MN



Source: authors` own processing

The higher mortality rates in the urban male population from CSD and MN aged 50 and older can be explained by the accumulative long-term effect of technogenic pollution in urban areas, significantly higher amount of airborne pollutants emitted by stationary and mobile sources per unit of space, and a more intense life rhythm.

Figure 5 Mortality Rates in Urban and Rural Male Population of Orenburg Region Aged 20-49 Years and 50-79 Years from External Causes

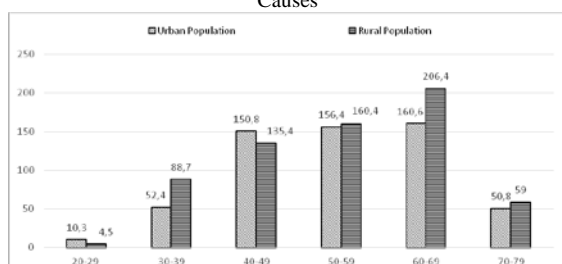


Source: authors` own processing

Among external causes, injuries are the major cause. As for death causes related to bad habits, the aggravation reflects the current situation of growing social tensions and the modern trend of seeking new sensations (Blinova et al., 2020; Report on the Implementation and Effectiveness of State Supervision and Control in the Field of Labor and Social Protection of the Population in 2012, 2014; Komleva et al., 2016; Pochitaeva & Lyutsko, 2015; Socio-Economic Indicators of Poverty, Regions of Russia, 2017; Smirnova, 2018; Yakovleva et al., 2020). As the data in Figures 6 and 7 show, in urban areas the mortality rate associated with the drug use is significantly higher than in rural areas. This can be explained by a more traditional way of life in rural areas. But as follows from Figures 6 and 7, in the rural areas the mortality rate among the male population 50 years and older from causes related to alcohol abuse is higher. Among all diseased in rural areas, 5.6% of deaths were from alcohol-related causes. In urban areas, this rate is lower, 4.9%.

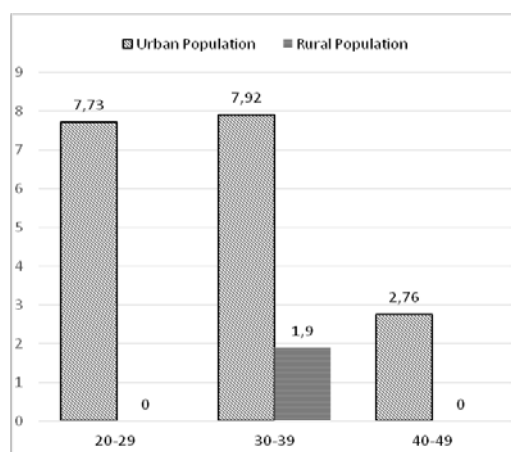
On the contrary, in the urban environment, mortality from causes related to the use of psychoactive substances in the male population aged 20 to 49 years is several times higher. In rural areas this cause of death was registered only in one age group: 30-39 years.

Figure 6 Mortality Rates in Urban and Rural Male Population of Orenburg Region Aged 20-79 Years from Alcohol-Related Causes



Source: author's own processing

Figure 7 Mortality Rates in Urban and Rural Male Population of Orenburg Region Aged 20-79 Years from Drug-Related Causes (ICD X Code: 102,281,287)



Source: authors' own processing

Thus, the population groups that differ significantly by a great number of socio-economic indicators reflecting the standard of living are the people living in rural and urban areas. Social differentiation between population in rural and urban areas is manifested in the employment, the structure of education, and the income levels related thereto. In addition, the proportion of people belonging to the middle class and more affluent population segments is higher in urban areas.

Back in 2014, the following was characteristics for rural areas: underdeveloped social and engineering infrastructure; limited labor opportunities, seasonal employment and hidden unemployment; insufficient reconstruction and modernization of existing production facilities in the agricultural sector, introduction of modern technologies and equipment; hazardous and dangerous working conditions in agriculture; relatively low income level (Komleva et al., 2018). The described differences in the socio-economic sphere affect state of health of population in the urban and rural areas of the Orenburg region, and despite the extensive efforts of the government aimed at the revival of Russian regions distant from the central region, rural areas and settlements, the situation continues to be alarming.

5 Conclusion

Mortality of male population aged 20-49 years in rural areas (Orenburg region) is higher than in urban areas.

The leading causes of higher mortality rates of male population in rural areas are the following: diseases of circulatory system, malignant neoplasms, external causes (77.0%). The social factor contributing to the higher mortality rate was, first of all, the high level of unemployment in rural areas (almost twice as high as in cities). At the same time, the rural areas are struggling with shortage of highly qualified personnel seeing to the social well-being of the population (teachers, doctors, workers of culture)

and undertaking the main labor in rural areas, which is the crop and livestock production (agronomists, veterinarians). On the one hand, this leads to higher social tension, while on the other, to higher social indifference. The traditional escape to "relieve tension" is alcohol, which induces certain diseases and increases the risk of fatal injuries.

Social pollution, in particular, longer working hours, lack of or excessive supervision over execution of work tasks, unfavorable social and psychological climate, downsizing, dismissal by the employer and other factors, contribute greatly to urban population mortality, resulting primarily in high stress, addiction to alcohol or psychotropic substances and family conflicts caused by the above mentioned factors. The high mortality rate in the urban male population is also due to the cumulative effect on health of xenobiotics and other harmful substances, the source of which is man-caused pollution to the urban environment.

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