




Socio-ecological Aspects of the Demographic Profile of the Volgograd Region Population

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Abstract: In the work, on the basis of the gender differentiation coefficient, the demographic profile shall be determined and the age periods of the decrease in the male population of the Volgograd region shall be established. In urban living conditions, the decline begins at the age of 30-34; in rural conditions - from 50-54 years. However, the fact of a fast decrease in the proportion of men 60-64 years old living in rural areas of the Volgograd region was revealed. This decrease has a number of interrelated reasons: firstly, at a given age, labor activity decreases, the social status of a person changes; secondly, the decline in labor activity is superimposed on a kind of shortage of leisure activities that maintain a high socio-cultural standard of living of this age stratum. The vacuum of creative social activity is filled with elements of addictive behavior, increased consumption of alcohol, family conflicts, and gender-based violence at home, which are the triggers of the loss of gender balance. Analysis of the trend of the gender differentiation coefficient in 13 age groups (from "16-17 years old" to "over 70 years old"), taking into account the "comfort / hypo-comfort" of living conditions, made it possible to establish an inversion of the dominance of this factor for people of the older age group of the population. Upon reaching the pre-retirement and retirement age, emotional-psychological, inherently endogenous factors, the transformation of a person's social status, a deficit of full-fledged active leisure become predominant in terms of limiting life expectancy and determine the rate of premature aging of the population.


1 INTRODUCTION


South of Russia is characterized by vast territorial agglomerates, among which there are several regions where comfortable living and effective creative activity of the working-age population depend on a set of environmental factors (Sevriukova, 2020). Among the main factors that significantly affect the duration of active social life of a person, there are technogenic factors caused by a large-scale industrial sector formed over decades (Cai, 2019).


The ecology of the Volgograd region is determined by anthropogenic and technogenic factors: emissions (nitrogen oxides, carbon monoxide, suspended solids, sulfur compounds, hydrocarbon compounds, metal oxides, hydrogen

chloride) enter the atmospheric air for a long time; the unstable state of the water management complex, that affects the quality of drinking water; the presence of unauthorized dumping sites added an additional affection to the balance of the ecological system of the Volgograd region.

The common ecological situation is closely interconnected with the climatic and seasonal conditions of the sharply continental climate of the Volgograd region, which are effect on the health and quality of life of the able-bodied population. All of the above allows us to state the presence of a multifactorial, longitudinal negative impact of anthropogenic transformation of the environment on the duration, quality of life and comfort in the

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implementation of socio-economic activities of people of working age in the region.

The accumulation of the effects of negative factors affecting the health and quality of life of people (Alves, 2017; Anderson, 2019), actualizes the need for comprehensive studies of the demographic situation in the Volgograd region, taking into account the territorial ("city-village") and socio-ecological differences in conditions of working activities and living (comfortable - hypo-comfortable).

The purpose of the study: determination of socio-ecological factors influencing the formation of the demographic profile of the population of the Volgograd region.

2 RESEARCH METHODOLOGY

The sociological survey involved 1268 respondents from the Volgograd region. The ratio of men and women in the sociological survey: 42.8% and 57.2%, respectively. During the study, the principle of informed consent was observed: the respondents were informed about the guarantee of non-disclosure of personal data.

The quality of life was studied on the basis of a subjective assessment (questionnaire - Google forms), which included a list of the basic values of human life: material wealth, living conditions, ecology in the area of residence, family, food, sexual relations, entertainment and recreation, position in society, work, spiritual needs, social support, health of relatives, personal health, peace of mind, bad habits, hereditary diseases, geographical features (place of residence).

The analysis of the state of the environment of the Volgograd region and the city of Volgograd was assessed by exogenous factors influencing the demographic situation:

I - the level of air pollution according to the registration of pollutants (nitrogen oxides, sulfur dioxide, carbon monoxide, phenol, hydrogen chloride, hydrogen sulfide, formaldehyde) and their excess of maximum permissible concentrations;

II - the state of the water management complex and the quality of drinking water (the number of samples that do not meet hygienic standards in terms of sanitary and chemical indicators, as well as the number of priority pollutants in drinking water: chloroform, iron, chlorides, sulfates, magnesium, ammonia, fluorine, manganese, sodium);

III - the state of the soil cover (the presence of radionuclides, problems of managing the processes of formation, accumulation and processing of waste);

IV - the social and medical situation according to the data of the diseases established for the first time and exceeding the regional coefficient by 1.5 times. Gender Differentiation Coefficient (GDC) (1):

$$GDC = \ln \frac{M}{F} \quad (1)$$

where GDC is the gender differentiation coefficient; M - male, people; F - female, people), proposed by the authors and first time used in works of this kind, made it possible to compare not only the numerical value of the ratio "men / women", but also the direction of changes in the compared numbers: negative GDC sign - decrease; positive sign - increase.

3 RESEARCH RESULTS

According to the statistics of the Volgograd region (2019-2020) the female population generally prevails over the male population.

At the same time, the number of men of working age (16-59 years old) was 74,429 more than women of the same age group.

The gender differentiation coefficient for all age groups of the urban population is 0.075; rural - 0.223. Obviously that the male population predominates, and this predominance is 2.97 times higher in rural areas than in urban areas. However, statistics on the population over the working age (men over 60 years old; women over 55 years old) indicate a sharp decline in the number of men. In general, in the Volgograd region, there are less men (GDC = -0.815) than women by 269,961 people. For the urban population, this coefficient is -0.846, for the rural population is -0.713. This indicates a smaller decline in the number of men living in rural areas.

A detailed analysis of the quantitative ratio of men and women by age showed that in urban conditions of residence (Volgograd) the number of men decreases starting from the age of 30-34, while in rural conditions of residence - from 50-54 years. Fluctuations in the proportion of men relative to the women in the Volgograd region have both sharply positive peaks and sharply negative ones (Figure 1). Thus, in the Volgograd region, the proportion of boys aged 18-19 was significantly lower compared to the number of girls (negative peak GDC). Presumably, this is due to the service in the ranks of the Army of the Russian Federation of males, who were called up, for the most part, from the districts of the Volgograd region, rather than from the city of Volgograd. Urban

youths perhaps had a postponement in connection with their studies at the higher educational establishments. Many young people from districts of the region who come to study at Volgograd higher educational establishments temporary live in the city and often stay there for permanent residence.

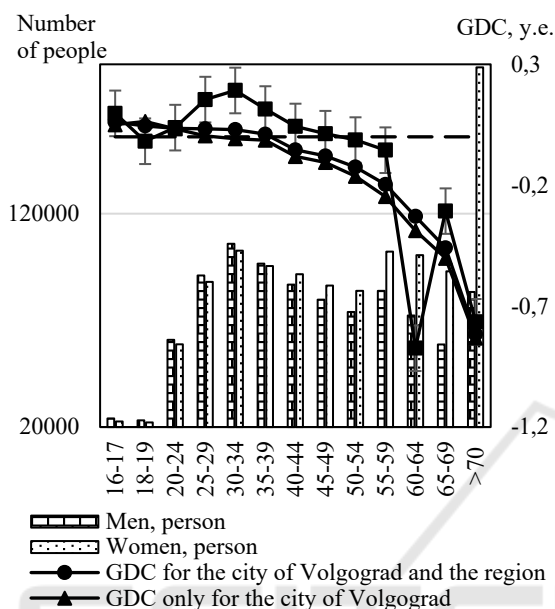


Figure 1: The ratio of the population of the Volgograd region by the gender differentiation coefficient as of January 1, 2020.

In general, in the Volgograd region (city, region), a significant decrease in the proportion of the male population shall be observed from the age of 50-54. However, there was a fast decrease in the proportion of men aged 60-64 and also over 70 years old, living in rural areas of the Volgograd region, compared with urban residents.

Gender differentiation, on the example of the Volgograd region, according to the analysis performed, is not in favor of the male population. Differentiation characterized by unevenness, with the proportion of the male population by age group decreasing progressively in relation to the proportion of the female population with aging. Analysis of statistical data for 1991-1994 - the period when citizens who reached 50-54 years old in 2019 were 20-24 years old - showed the predominance of males, i.e. the assumption that the number of men was initially low compared to women was not justified. Thirty years ago, the male population aged 20-24 was 24,960 more than the male population of the same age as of January 1, 2020; 20 years ago, similar

differences were - 41,431 people and 10 years ago - 53,035 people.

The negative trend of gender differentiation became the basis for the assumption about the co-dependence of the environmental situation and the rate of premature aging of the working age population, especially men over 50-54 years old. This fact determined the vector of further research, which were aimed at identifying the features of the demographic situation among the working-age population of the Volgograd region, taking into account the territorial and socio-ecological criteria for the quality assesment of the living environment and labor activity of the population.

Analysis of the state of the environment in Volgograd and the Volgograd region made it possible to identify areas with relatively comfortable and hypocomfortable living conditions. Within the city of Volgograd, there were identified areas with hypocomfortable living conditions: Kirovsky, Krasnoarmeisky, Traktorozavodskaya; in the Volgograd region - Gorodishchensky, Mikhailovsky, Novoanninsky. We have selected Kalachevsky, Uryupinsky and Frolovsky as regional districts - models, where living conditions are relatively comfortable and satisfactory, taking into account the principle of “copies of pairs”: a) remoteness from the administrative center (Volgograd); b) population size (Figure 2).

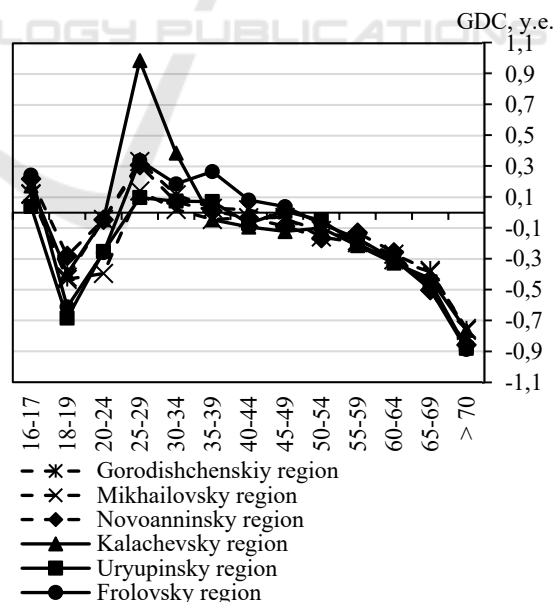


Figure 2: Gender differentiation coefficient depending on age and living conditions has: positive GDC values - the predominance of the male population; negative GDC values - female predominance.

According to our research, people in the age range 20 - 40 years old, living in areas with comfortable conditions of the socio-ecological situation, have significant differences in the gender differentiation coefficient. In particular, there is a common tendency for the appearance of "peaks" in the prevalence of the male population in comparison with those parameters in the indicated age interval in areas with hypocomfortable living conditions. At the same time, in all districts with hypocomfortable living conditions, the statistical significance of interregional differences in the coefficient of gender differentiation is absent, that is, there is no "surge" in the prevalence of the male population over the female population.

4 DISCUSSION OF RESULTS

Analysis of the quantitative ratio of men and women by age made it possible to establish a decrease in the number of men living in urban conditions (from 30-34 years old) and in rural conditions (from 50-54 years old). However, fast decrease in the proportion of men living in rural areas of the Volgograd region, compared with urban residents, is noted at the age of 60-64, as well as over 70 years old. It is possible that this decrease may have a number of interrelated reasons.

Firstly, at this age, males often reduce their labor activity, since the main professions of the village are associated with physical labor - the social status of a person changes (Alves, 2017; Guner, 2020; Stromberg, 2021).

Secondly, the decrease in labor activity shall be superimposed on a kind of deficit of leisure activities, which to a certain extent discipline a person and maintain a high socio-cultural standard of living of this age stratum (Weber, 2020). The vacuum of creative social activity fills with elements of addictive behavior, increased consumption of alcohol including low-quality or surrogate ones, intra-family conflicts, and gender-based violence at home.

All of the above can serve as a trigger for the accelerated development of a number of somatic diseases and mental disorders, leading to the death of men of early retirement age in a short period of time.

It should be noted that comfortable living conditions in the village are the dominant factor in maintaining health and the quantitative predominance of the proportion of the male population for the age group 20-40 (up to 49 years old). High-quality, full-fledged leisure, the development of the health care infrastructure, combined with a more favorable environmental situation, contribute to the health

preservation of young men, so that in some districts (Kalachevsky and Frolovsky), the proportion of the young male population significantly prevails in the simulated systems.

After 50 years, the comfort or hypo-comfort of the living environment loses its dominant importance for the formation of GDC: in all the simulated regions, there were no significant differences in this indicator. It can be assumed that upon reaching the pre-retirement and retirement age, the factors of emotional and psychological perception of the information and social environment come to the first place (Börsch-Supan, 2013). These factors limit life expectancy and determine the rate of premature aging (Wind, 2018; Cambois, 2020). It has been proved that the male population is less resistant to stress, what is quantitatively and objectively confirmed by the overall negative dynamics of the gender differentiation coefficient.

5 CONCLUSION

The problem of finding effective ways to prolong the active longevity of the population of the Volgograd region, especially those of pre-retirement and retirement age, is inextricably linked with the solution of many priority tasks that determine the conditions for the diverse life of the population and their quality of life.

According to the data obtained, the Volgograd region is extremely heterogeneous in relation to the influences of many factors of territorial, ecological, socio-medical origin on the duration of a person's socially and professionally active life.

At the same time, the most important factor in maintaining the stability of the demographic profile in the continuum of further anthropogenic, technogenic, informational (associated with the digitalization of society) transformation of the environment is gender balance, which persists in different age groups of the population.

The relative loss of gender balance, even in certain private age groups, negatively affects the state of the demographic situation as a whole. Gender ratio are very flexible and are significantly related to age. As the age increases, the proportion of men in the Volgograd region as a whole decreases rather rapidly. Moreover, this phenomenon is especially accelerated in urban conditions, where the number of males begins to decline from the age of 30-34. The rate of decrease in the number of men in rural areas is "lagging" in relation to the rate of urban areas by

about 20 years (a decrease in the male population shall be observed from the age of 50-54).

An important factor in maintaining the stability of the demographic environment (situation) is the comfortable living conditions of a person in a particular area of the city and region.

However, "comfort" is a collective, complex concept determined by the ratio of at least four particular exogenous factors: a) the level of anthropogenic transformation of the air environment; b) the state of the water management complex; c) the state of the soil cover; d) the social and medical situation in a particular area. Note that in some cases all four factors are interrelated and can lead to the effect of cumulation of negative effects on human health and life expectancy.

The analysis of the listed particular exogenous factors made it possible to identify comfortable and hypocomfortable areas of the Volgograd region, including the city of Volgograd. The latter in the city include Kirovsky, Krasnoarmeisky, Traktorzavodsky districts, in the region - Gorodishchensky, Mikhailovsky, Novoanninsky districts. Later, using the method of "copies of pairs", the relative comfort of a number of rural districts was established - Kalachevsky, Uryupinsky, Frolovsky.

However, the analysis of long-term temporal trends of the demographic situation requires the search for rational quantitative indicators that clearly reflect the ratio of the male and female population in comfortable and hypocomfortable areas.

In connection with the above, in these studies, along with an assessment of the general demographic situation in comfortable and hypocomfortable areas of the Volgograd region, the analysis of the dynamics of the effective indicator, which clearly characterizes the ratio of the number of men and women in the population under consideration: the gender differentiation coefficient (GDC), was carried out.

The study of the GDC trend in 13 age groups (from "16-17 years old" to "over 70 years old") was carried out differentially in different districts of the Volgograd region, taking into account the comfort or hypocomfort of living there. The Volgograd is represented as a whole, due to the difficulty of obtaining reliable statistical data on the gender structure of the population of different age groups in the inner city areas. Nevertheless, it should be noted that the trend towards a decrease in the male population, established in the present studies, continues for several decades. Based on the data obtained, a significant decrease in the influence (loss of dominance) of the "comfort / hypocomfort" factor

for the formation of GDC in the older age groups of the population was established.

After fifty years, upon reaching the pre-retirement and retirement age, emotional-psychological, inherently endogenous factors, the transformation of a person's social status, a deficit of full-fledged, active leisure become predominant in terms of limiting life expectancy and determine the rate of premature aging of the male population of the Volgograd region.

In view of the above, further in-depth studies are needed to analyze the endogenous factors of aging. Undoubtedly, the results of such studies will make it possible to highly effectively influence the prolongation of active longevity and an increase in the life expectancy of the population of the Volgograd region.

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