

Social risks and population resilience: sociological assessment

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Abstract. The article analyses the resilience of the population based on the results of a Selective observation of the health status of the Russian population in 2023. Based on the methodology of socio-economics and human social biology, we proposed to assess the resilience of the population through the experience of its health. The authors have identified socio-demographic groups of the population demonstrating different strength of resilience, as well as identified social risks contributing to its change. It is concluded that the most resilient are the younger, educated, who do not have financial difficulties and have a stable family status. Occupational (field of employment) and communication (social isolation) risks, as well as material (threat of poverty) and physiological (bad household habits) risks, have a significant impact on the resilience of the population, while reproductive risk and the risk of destructive behaviour are less significant. The results obtained can be used both at the individual level to form some effective behavioural strategies, and at the macro-levels in to create a social policy.

1 Introduction

Nowadays Russian society faces a pool of severe global challenges that significantly reduce the sustainability of social development. Thus, the scientific community gets a task to analyse the prevailing trends comprehensively. In our opinion, a possible avenue for a reflection includes the development of an interdisciplinary view on this issue based on the synthesis of socio-economic and sociobiological approaches. Such a collaboration makes reasonable to consider the population as a complex of its social and biological properties and to employ the concept of population resilience [1]. The last means to assess the qualitative characteristics of a population due to its health and life expectancy which determine its ability to work and directly characterizes the quantity and quality of labour resources for socio-economic development [2]. Moreover, following the socio-economic methodology of SASE [3, 4], the population resilience should take into account both a social dimension (for example, the level of anxiety and stress, morbidity, household habits,

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etc.) and an economic one (such as the standard of living, income, quality of consumption, housing provision, etc.) [5].

Measuring population resilience according to the listed parameters should declare that its dynamics is associated with the implementation of different social risks determined a socio-economic status. Risk theory appeared at the beginning of the XX century with defining a risk as a mathematically measurable event, and defining an uncertainty as an event in which mathematical calculation of probability is impossible [6].

The concept of risk is under consideration of different points of view such as psychology, sociology, physics, mathematics, economics, philosophy, etc. Especially the research of an economic profile on insurance and finance, management, social policy and social protection employed this concept widely. In recent years, the study of social risks has been gaining popularity again due to the growing global challenges in society. This allows approaching the study of social risks from various methodological approaches, e.g. economic, technological, behavioural, psychological, and socio-cultural and others. Such a variety of scientific views defines a wide subject field and, depending on research tasks, suggest using different grounds for classification and identify different types of social risks [7, 8, 9].

This study presents a sociological analysis of population resilience based on identifying the self-assessments of population health and the corresponding social risks that represent how the macro-level challenges and threats implement at the individual level. This approach allows, on the one hand, to differentiate the different socio-demographic groups by the strength of their resilience, on the other hand, to identify the key social risks and effective behavioural strategies to increase population resilience. We proposed to assess the following social risks affecting the resilience of the population: material, professional, physiological, reproductive, communication risks, and the risk of destructive behaviour.

2 Data and methods

An empirical basis of the study addresses the results of the Rosstat survey "Selective monitoring of the health status of the Russian population" for 2023 (Selective monitoring of the health status of the Russian population. URL: https://rosstat.gov.ru/free_doc/new_site/zdor23/PublishSite_2023/index.html (accessed 19.03.2024)). This survey was conducted in order to obtain statistical information on the expected life expectancy of the population, the proportion of people committed to a healthy lifestyle and bad habits, as well as the social well-being of the population. The unit of observation is a private household and household member. The sample covers 60 thousand households in all regions of the Russian Federation. Rosstat carried out the data collection in the period from September 9 to October 10, 2023; and the specially trained interviewers using a personal survey method.

The analysis used answers to questions that, firstly, determine the resilience of the population using health estimations as a proxy measure, and secondly, characterize individual social risks involved in the survey process. The authors construct tables and graphs for one-dimensional and two-dimensional distributions of respondents' responses, as well as calculate coefficients of statistical significance for the distributions obtained.

3 Results and discussion

Based on data on population health assessments for 2019-2023, the resilience of the Russian population has increased over the period 2019-2023. At the beginning of the period, about 49.5% of respondents rated their health as good and very good, contrary at the

end of the period their share was 57.8%. At the same time, Table 1 shows some a decrease of those who consider their health satisfactory (by 5.3 percentage points) and those who assess their health as poor and very poor (by 3.0 percentage points) decreased.

Table 1. Respondents' assessment of their health status, % of the total population.

Health assessment	2019	2020	2021	2022	2023	2019
Very good	6,7	7,0	7,0	8,5	9,2	6,7
Good	42,8	43,3	43,4	46,8	48,6	42,8
Satisfied	41,0	40,6	41,0	37,8	35,7	41,0
Bad	8,3	8,2	7,6	6,2	5,8	8,3
Very bad	1,0	1,0	0,9	0,6	0,5	1,0
Couldn't answer	0,2	0,6	0,1	0,1	0,2	0,2

The different demographic groups should demonstrate varied population resilience. Thus, there are no statistically significant differences in the estimates of the health of men and women (conjugacy coefficient 0.119, $p=0.000$), as well as between urban and rural populations (conjugacy coefficient 0.056, $p=0.000$). At the same time, significant socio-demographic characteristics for assessing health are age (conjugacy coefficient 0.767, $p=0.000$), education level (conjugacy coefficient 0.731, $p=0.000$), family status (conjugacy coefficient 0.777, $p=0.000$), financial well-being (conjugacy coefficient 0.354, $p=0.000$), and the residence region of the Russian Federation (conjugacy coefficient 0.253, $p=0.000$).

Due to the data above, Fig. 1 displays that respondents are more likely to assess their health as "very good" and "good" if they are at a young age, have higher professional and postgraduate education, do not experience financial difficulties, as well as those who are in relationships and married or have never entered into them. Thus, these demographic groups demonstrate greater population resilience.

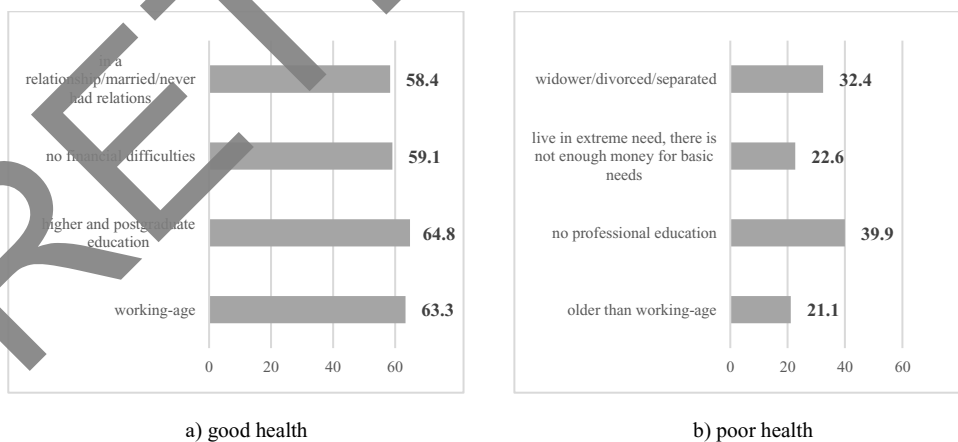


Fig. 1. Social and demographic characteristics of the groups of respondents by health level, % of this group among the respondents for each characteristic

Population resilience directly depends on implementing the physiological risk associated with the potential threat to disrupt the functioning of the human body. The behavioural component of this risk, in our opinion, is associated, firstly, with a person's daily habits in nutrition and physical activity. The survey results show that respondents who have a good understanding of a rational diet and diet feel healthier (Fig. 2a), as well as to a lesser extent having a sufficient level of physical activity (Fig. 2b).

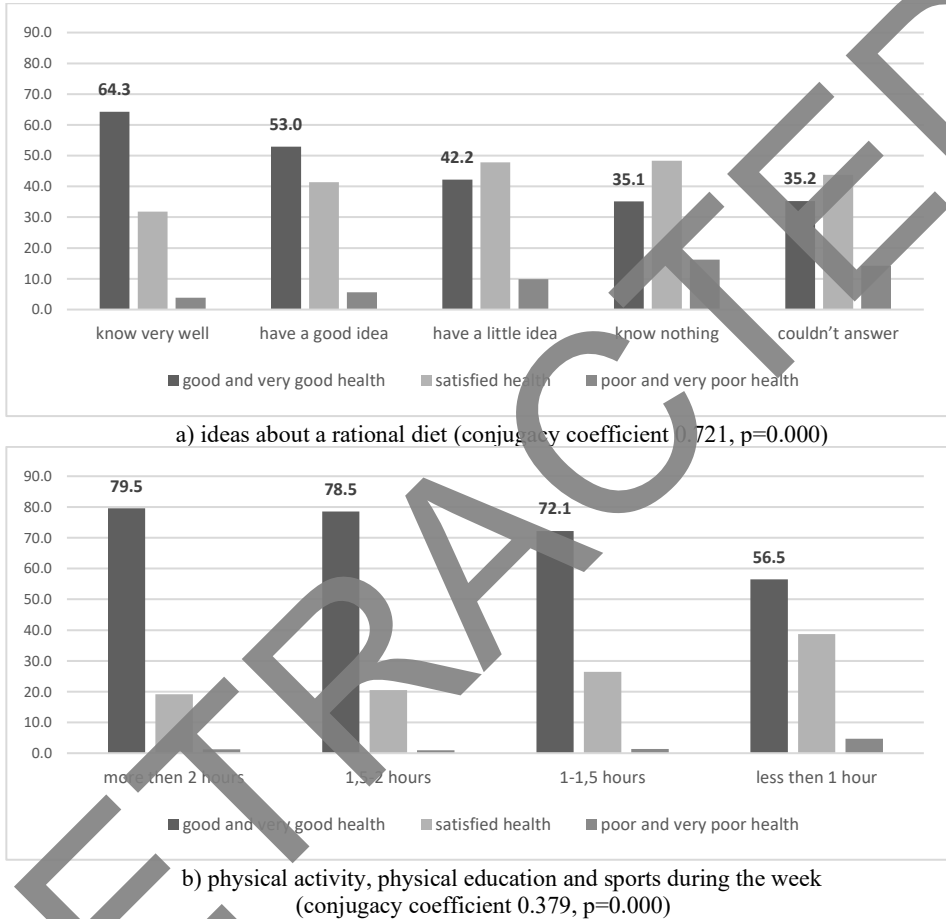


Fig. 2. Paired distributions of respondents' assessments of the health and household habits of the population. % of those who chose the appropriate habit

Secondly, the physiological risk is obviously related to the strategy of the population's behaviour in case of health worsening. Fig. 3 shows that in such case the respondents with good and very good health often do nothing (52.3%) or seek traditional medical care (59.1%); the respondents with poor health more actively turn to alternative medicine (10.7%) and other options to alleviate their condition (11.9%). At the same time, the respondents with a satisfactory state of health demonstrate the greatest variety of behavioural strategies in seeking help while health worsening.

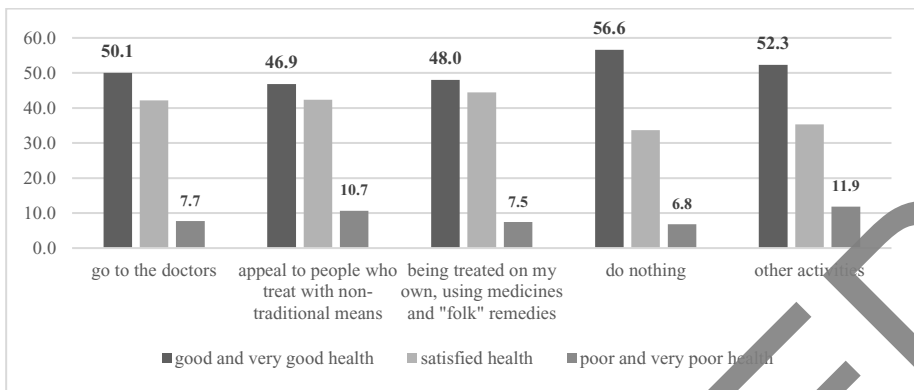


Fig. 3. Paired distribution of health assessments and strategies for receiving medical care in case of deterioration of well-being, % of the number who chose this strategy (conjugacy coefficient 0.707 at $p=0.000$)

Thus, the strategy of self-preservation behaviour of an individual level associated with implementing the physiological risk both in the field of household habits and in the field of receiving medical care. At the same time, the survey results show significant statistical differences between the self-preservation strategies of the respondents with distinct level of resilience.

The material risk to population resilience is associated with the level of human well-being, including poverty and inequality in a society. According to the survey data, respondents with a higher level of well-being demonstrate better health assessments (Fig. 4).



Fig. 4. Paired distribution of health and material well-being ratings, % of the number of respondents (conjugacy coefficient 0.729 at $p=0.000$)

The respondents' responses to the assessment of health and food costs (the Engel coefficient (It is a share of food costs in consumer spending that determines the poverty level)) were distributed similarly (the coefficient of conjugacy is 0.718 at $p=0.000$). On the one hand, it is obvious that the nutrition quality determines health, so food costs are an important factor in population resilience. On the other hand, this distribution in the substantive part duplicates the question of material well-being, and the similarity of the estimates increases the reliability of our conclusion that better-off people are healthier. Separately, we should note that a quality of housing as an element of well-being has no

pronounced relationship with population resilience (conjugacy coefficient 0.042 at $p=0.000$).

The reproductive risk reflects the relationship between the population resilience and the human capital creating, primarily due to the demographic processes. A subjective assessment of this relationship is based on the priority of key life values. The respondents' responses demonstrate the low reproductive risks both in relation to themselves (the weighted average value of health is 4.82 points) and in relation to future generations (the value of a good family is 4.71 points and the value of children is 4.63 points) (Fig. 5).

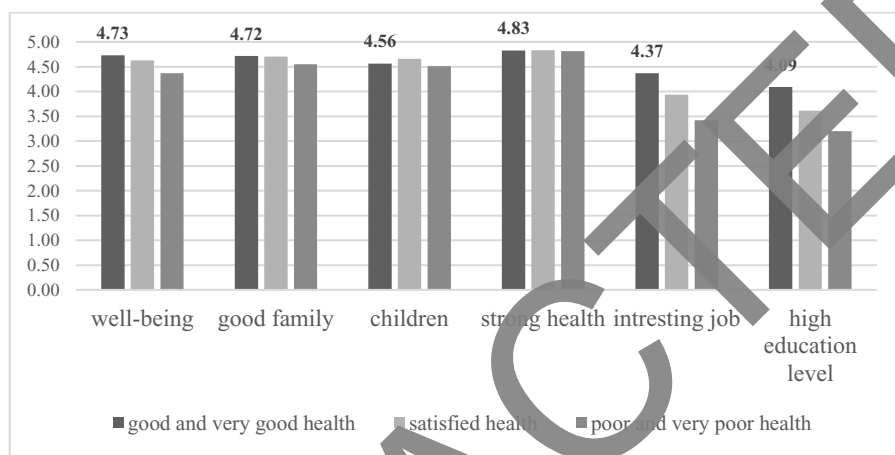


Fig. 5. Paired distribution of health and life values scores by weighted average value (conjugacy coefficient 0.710 at $p=0.000$)

There are statistically significant differences in the life values of respondents with different resilience. The strong health is the most valuable for all the respondents despite their resilience. However, the rest of the value rating varies due to the health status. Therefore, for those respondents with good health the life value "children" shifts to 4th place and has a score of 4.56 points, while material well-being and a good family received a score of 4.72-4.73 points (second and third places respectively). At the same time, respondents with poor health put a good family in second place among the life values (4.51 points), children in third place (4.51 points), and material well-being is only in fourth place (4.27). Such elements of human capital reproduction as an interesting job and a high education level have significantly lower scores in the respondents' value system; however, statistically significant differences are observed in these life priorities for groups of respondents with different resilience.

Thus, the reproductive risk is concluded to be important in creating the population resilience from the point of view both for an individual human capital (health, education, work) and for a sustainability of future generations (family, children).

Occupational risk is a potential of decreasing the quality of employment, as well as the threat of job loss because of socio-economic instability and/or labour market transformation due to technological development. Figure 6 shows that respondents employed in the field of public production have a higher resilience than those having the labour market limits due to age or health status, for example, disability.

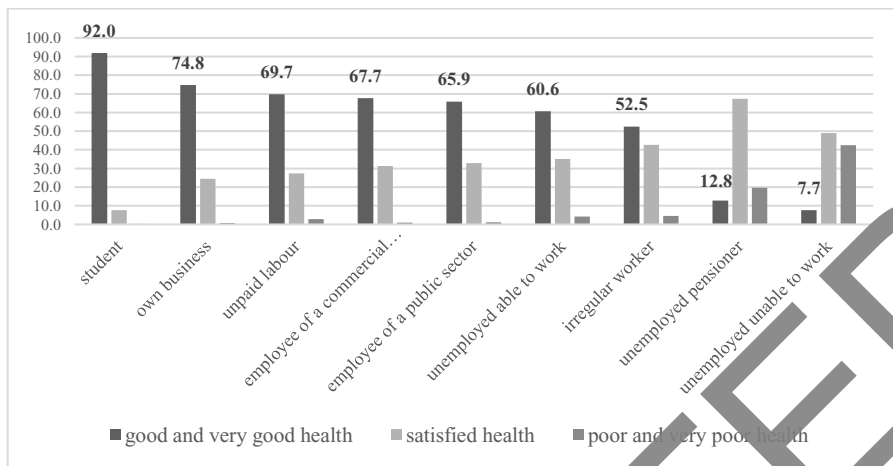
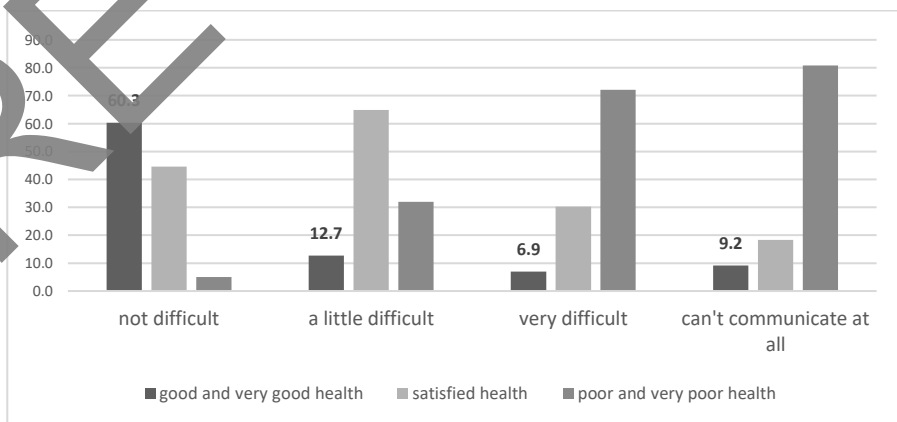


Fig. 6. Paired distribution of respondents' health and employment status ratings, as a percentage of the number of respondents (conjugacy coefficient 0.764 at $p=0.000$)

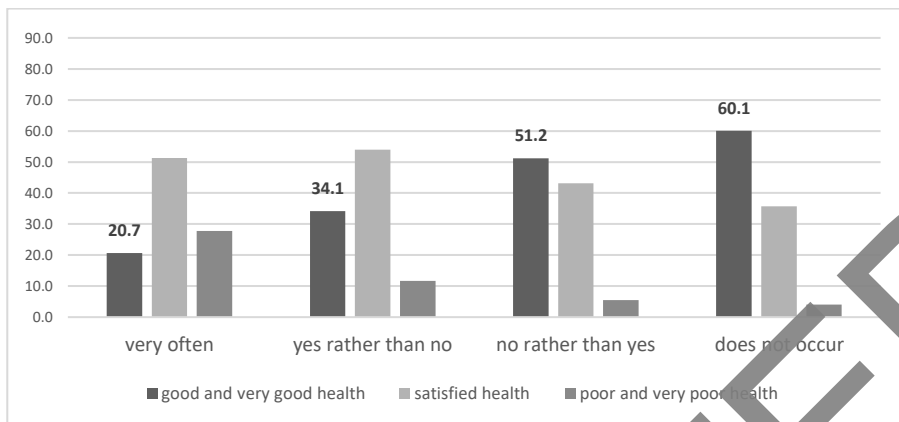
It is obvious that an opportunity for individuals to realize their abilities to work increases population resilience/ In addition, work provides income or other remuneration (for example, in the form of moral satisfaction), which can be spent on maintaining health at a sufficient level, thus resilience also strengthens.

Another component of occupational risk is the threat of job loss. An analysis of the distribution of respondents' responses to whether they are worried about the threat of losing their job showed that only 37% of respondents are worried about the likelihood of losing their job, while 62% of respondents are not worried about this. At the same time, the relationship between the potential threat of job loss and the health state is moderately pronounced although statistically significant, (the conjugacy coefficient is 0.472 at $p=0.000$). Thus, the occupational risk of the population resilience is more likely to be related to the lack of work, rather than the threat of losing it.

Communication risk includes, on the one hand, the ability to establish relationships with other people, and, on the other, a feeling of loneliness and social isolation. The survey results show that respondents who are actively involved in social communication are more resilient (Fig. 7).



a) communication difficulties (conjugacy coefficient 0.751, $p=0.000$)

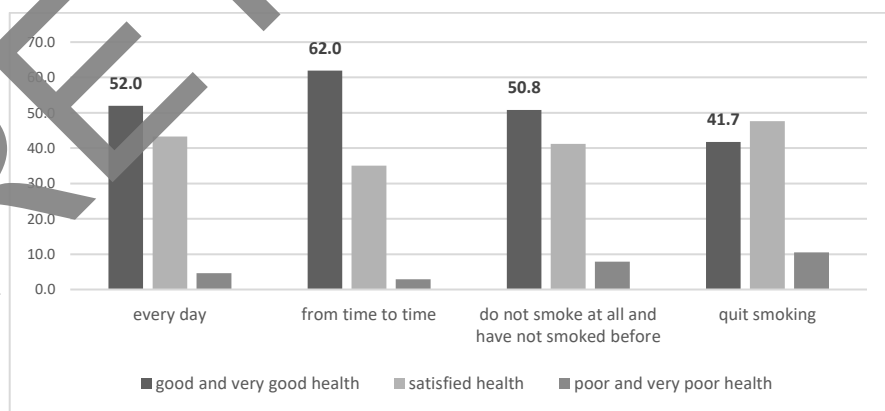


b) feeling loneliness (conjucy coefficient 0.734, p=0.000)

Fig. 7. Paired distributions of respondents' assessments of health and social isolation of the population, % of respondents

The pronounced relationship between communication risk and health state emphasizes the importance of a person's social ties for a subjective sense of well-being, including his involvement in social and labour relations, which was discussed above in terms of occupational risks. Thus, a communication risk is an important component of the resilience population.

Population resilience is closely tied with a risk of destructive behaviour such as using alcohol and narcotic substances, and smoking tobacco products and electronic cigarettes. The harmful effects of these habits on the human body is a proven by medicine and is widely known to humankind. However, some people continue to adhere to obviously destructive behaviour, reducing resilience at the individual level. It should be noted that 18.4% of respondents smoke tobacco products, 3.1% smoke e-cigarettes, 45.5% drink alcohol more often than once a month, and 0.7% have tried drugs at least once in their lives. Thus, the destructive risk of population resilience is realized mainly through smoking and to a lesser extent through alcoholism, which is confirmed by the presence of statistically significant differences between the groups of respondents in terms of health and the prevalence of bad habits (Fig. 8).



a) smoking tobacco products (conjucy coefficient 0.713, p=0.000)

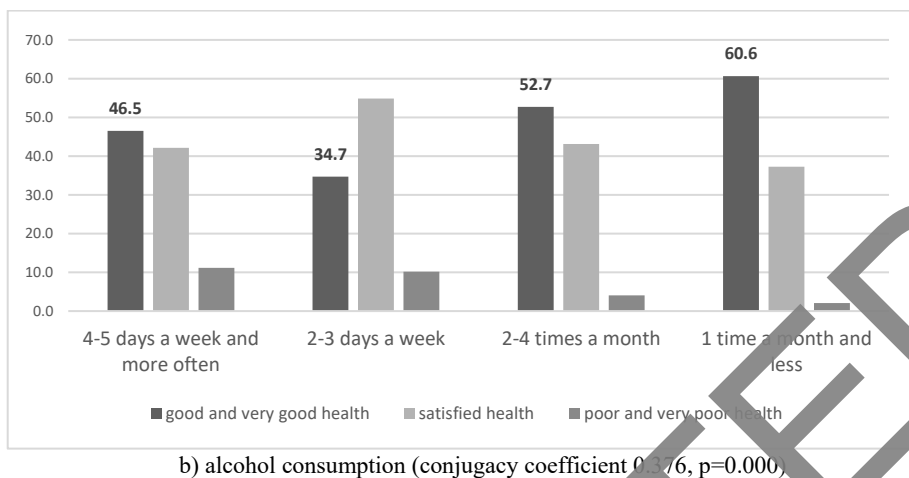


Fig. 8. Paired distributions of respondents' assessments of health and destructive habits, % of respondents

Regular daily alcohol consumption and tobacco smoking are less common among respondents with good health, while respondents with poor health are those who have already quit smoking or smoke every day, and also drink alcohol more than once a week. In addition, it should be noted that in small samples of respondents who smoke electronic cigarettes and have tried narcotic drugs, there are also significant differences between the groups of respondents in terms of health state (conjugacy coefficient 0.715 and 0.711, respectively, at p=0.000).

Thus, the risk of destructive behaviour is closely related to the population resilience. The harmful habits significantly reduce subjective health assessments both at the individual level and at the aggregated level. At the same time, the prevalence of harmful habits among respondents is limited (except for smoking tobacco products), which may indicate a lesser contribution to the population resilience as a whole.

4 Conclusion

The research of the population resilience was based on social biology and socio-economics ideas, when the health state acts as a proxy measure of the phenomenon under study, and various social risks of a social and economic nature introduce the factor variables. Based on the analysis of the results of Selective monitoring of the health status of the Russian population in 2023, we found that population resilience differs significantly for different socio-demographic groups. Thus, individuals feel healthier and more resilient if they are at a younger age, have higher professional and postgraduate education, a high level of material well-being, as well as those who are in a relationship (marriage, cohabitation) or have never entered into them.

As a result, some social risks are suggest to increase or reduce population resilience. We have identified occupational risk (type of employment, the very existence of a job and the threat of losing it) as the most significant, as well as communication risk (loneliness, communication difficulties and general anxiety). Slightly less significant risks are the material one (subjective poverty and food costs) and the physiological one (household habits and behavioural strategies in case of worsening health). The reproductive risk associated with the priorities of human capital formation, as well as the risk of destructive behaviour (smoking, alcohol, drugs), are somewhat less interconnected with population resilience, because of delayed negative effects of implementing these risks.

The results obtained reflect those social risks that directly affect the population resilience. The conclusions are a potential basis for developing the effective behavioural strategies at the individual level for increasing resilience. Overcoming social isolation and changing employment are likely to have a more rapid positive effect on the subjective health-assessments, while overcoming destructive behaviour should contribute to achieving higher resilience in the future because of its more inert character. In addition, the results obtained could be used to develop social policy measures aimed at increasing the population resilience as a whole in terms of overcoming reproductive and well-being risk, creating the favourable conditions for reducing physiological risk.

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