UDC 316.622+304.3+614
DOI: 10.21668/health.risk/2023.4.05.eng

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Review

RISKY HEALTH-RELATED BEHAVIOR OF RUSSIANS: DYNAMICS AND IMPACT FACTORS

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The review analyzes health risk behaviors of Russians in the 'pre-pandemic' (2018–2019), 'pandemic' (2020–2021) and 'post-pandemic' (2022) periods. Risk behaviors of Russians have been studied in dynamics relying on the secondary analysis of the longitudinal database of the Russian Longitudinal Monitoring Survey of the National Research University Higher School of Economics; also, factors able to induce changes in them have been established. Evidence is provided to prove a multidirectional dynamics in risk behaviors among Russians during the COVID-19 pandemic: there was a decrease in medical and physical activities along with conditionally stable alcohol and tobacco consumption

Men, people younger than 35, and those who did not have children were established to be less active in their interactions with official healthcare organizations and less concerned about their health. A size of a settlement where respondents resided had certain influence on their physical activity (more than 80 % of rural residents pointed out they did not do sports regularly). Addictive behaviors depended on sex, age, and having a partner: men and those respondents who were either married or cohabitated with a partner smoked and drank alcohol much more often.

Certain socio-demographic groups tended to replace health protection practices with risky behaviors during the COVID-19 pandemic. Women, elderly people and single people tended to become less active as regards healthcare (and many of them remained non-active in the post-pandemic period). In addition to that, single respondents tended to become less physically active during eh pandemic. Addictive behaviors were more typical for men and employed people.

Based on the obtained empirical data, the 'pandemic' period is described as a stage that does not facilitate occurrence and maintenance of greater adherence to health protection behavior among Russian citizens. Given low levels of trust in the public healthcare and high anxiety, lower medical activity of population has become an entrenched risk behavior pattern as regards health during the 'post-pandemic' period as well. It seems highly advisable to develop effective complex programs on health protection for different population groups including those aimed at making healthcare more available, conducting relevant preventing activities, and raising people's awareness about value of health and ways to protect it.

Keywords: *risk behavior, health, health risk factors, COVID-19 pandemic, addictive practices, health protection, 'pre-pandemic' period, 'post-pandemic' period.*

Health risk behavior and factors that determine it have long been in a focus of medical and social discourse [1–4]. This issue requires considerable expert attention and some urgent measures taken to solve it. Health risk behavior is defined as conduct that poses a threat for a person's life and results in disease, disability, or death [5]. Such behavior substantially limits a person's capability to be physically, mentally and socially healthy. Many studies that focus on risk behavior also concentrated on factors that determine it as well as made an effort to systematize routine behaviors, their co-occurrence and interrelations [6]. Conventionally, risk behaviors include alcohol misuse [7], tobacco smoking [8], insufficient physical activity [9], as well as irresponsible medical behavior [10].

At present, many scientific publications [11–13] with their focus on health behavior during the COVID-19 pandemic outline an issue related to growing prevalence of risk be-

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havior in various social groups (adolescents, youth, workers employed in various branches, or ethnical minorities). There is evidence that certain population groups became less committed to health protection and pursued a less healthy lifestyle in an adverse epidemiological situation. This highlights the relevance of examining risk behavior in Russia during the pandemic in dynamics and identifying contextual and individual behavioral factors able to create health risks. In addition to direct serious consequences for physical and mental health caused by the COVID-19 pandemic, changes in behavior can have long-term consequences for health protection [14].

Literature review. ***Changes in tobacco smoking.*** Studies on the matter establish that smokers changed their behavior towards smoking in a different way during the COVID-19 pandemic: some of them increased tobacco consumption but others, on the contrary, reduced it [15]. As revealed in a study by J. Bommele with colleagues [16], while 14.1 % of smokers reported smoking less due to the COVID-19 pandemic, 18.9 % of smokers reported smoking more. Stress and anxiety experienced by people during the pandemic were typical reasons to go on smoking or even start doing it and smoking was considered a way to ease off psychoemotional strain they had to suffer [16]. Forced limitations imposed on traveling and social activity also had a certain role in wider prevalence of smoking. Many people felt bored and lonely and it stimulated their wish to smoke [17].

Individual perception of risks associated with the coronavirus infection could induce positive changes in behavior among some smokers (in particular, giving up smoking). T.M. Klemperer with colleagues [18] established in their study that over 20 % of American respondents reported a quit attempt in order to reduce risk of harm from COVID-19.

Another possible explanation is that some smokers reduced their smoking due to fewer social activities, and not because they were motivated to reduce or quit smoking to protect their health [16]. The coronavirus confinement measures limited social smoking (i.e. smoking with friends, at parties, or when going out) because smokers had to stay at home.

Studies on smoking behavior have yielded somewhat multidirectional results. For some people, individual risks caused by the COVID-19 pandemic stimulated reduction in smoking or even quitting the habit completely. Such an anti-tobacco behavior was perceived as an opportunity to reduce likelihood of severe COVID-19 and as a factor facilitating successful recovery after the infection. Consequently, we can name several determinants for reducing tobacco consumption such as environmental factors, namely, limited possibilities for so called social smoking (with friends, in the street, etc.) as well as individual (microsocial) factors (risk perception by a person at risk). At the same time, many people had to face elevated stress during the pandemic due to uncertain future, fear for one's health and health of family and friends, as well as social isolation.

In some cases, stress impacts induced depression, feeling of dejection, boredom, and loneliness; all this enhanced a person's need in smoking. In such cases, smoking could create an illusion of temporary stress relief and optimization of individual mental state. That is, environmental factors (confinement) and, consequently, adverse psychoemotional state of a person and stress reactions to these circumstances can be considered factors facilitating greater tobacco consumption during the pandemic.

Changes in alcohol consumption. Studies on frequency of alcohol consumption during the pandemic have yielded rather controversial results [19]. Some publications reported lower alcohol consumption, the other mentioned higher volumes of it, and there were also some studies that established mixed consumption picture. In different studies, a share of people who drank alcohol during the pandemic varies between 21.7 % [14] and 81.4 % [20]. Chinese authors [21] reported a slight reduction in alcohol consumption during the pandemic. In some cases, alcohol consumption was established to grow in the same period [22].

Let us examine some factors for a growth or reduction in alcohol consumption. An adverse psychoemotional state of a person is

thought to be associated with heavier drinking [23–24]. It is noteworthy that psychological stress and alcohol misuse often occur simultaneously; social isolation [25] and stress [26] are major adverse factors causing them. A person suffering from stress and anxiety is more motivated to use psychoactive substances as a way to overcome difficulties in an unpredictable and uncertain situation. A study [27], which was conducted in Russia and Belarus, established that people who had to face some problems with their mental health (irritability, insomnia, and emotional disorders) increased their alcohol consumption.

Obviously, when a person has to face a growth in infectious incidence, which unavoidably concerns everybody, there is an objective necessity in protective reactions of the body that can relieve some psychological stress. Certain groups of people consider alcohol consumption the easiest way to achieve this stress relief.

Some studies established a statistically significant relationship between having / not having social contacts and alcohol consumption. People with more social support and stronger social connections consumed less alcohol against their counterparts who suffered from communicative isolation [28].

H. Mustonen with colleagues [29] analyzed the Finnish drinking culture and as a result pointed out that drinking occasions were significant factors able to determine volumes and consequences of alcohol consumption. This empirical study established that heavy drinking was associated with drinking with friends or family members. Thus, the modern behavior culture regulates alcohol consumption by people and manifests itself through formal and informal social norms. These norms should act as mechanisms limiting certain drinkers' behaviors (for example, prohibition to consume alcohol in public places) as well as encouraging some of them (for example, buying certain amount of alcohol). A considerable number of such social norms aim to regulate people's behavior during alcohol consumption or after it. Regulatory norms differ depending on a social context, namely, time, place, and drinking occasion. So, we have to consider the drinking culture to be a set of meanings and concepts that are constantly revised and changed within a given society.

If people had available alcohol at home and their home confinement was long, alcohol consumption easily became an everyday habit (actions and practices). Alcohol consumption ceased to be a practice that required some special occasion; rather, it became a social practice embedded in a person's routine. An empirical study [30] also revealed some new contexts for drinking. Some respondents reported drinking alone as a 'substitute for social interaction' as well as virtual drinking with friends or family.

Socio-demographic factors had certain influence on alcohol consumption. The study [31] established that men tended to drink alcohol more frequently than women. However, Polish experts [23] detected a rather opposite situation: women consumed alcohol more frequently and took more standard drinks per one drinking occasion than men. Age as an influencing factor was also estimated differently in different studies: an older age [14] and a younger age [32] were associated with heavier drinking.

Therefore, we can name several groups of factors able to change alcohol consumption practices during the COVID-19 pandemic. They are individual psychological factors (psychoemotional state, fear, mental disorders); situation and environment (having social contacts and changes in social contexts); sociodemographic factors (sex, marital status, and age).

Irresponsible medical behavior. During any pandemic, medical behavior should include not only following relevant recommendations on how to protect oneself from infection but also visiting doctors to have a preventive examination or to treat a disease. Regular (systemic) hospital visits are an important health protection practice; they usually involve a health examination with estimating a person's health in dynamics and discussing preventive activities aimed at health protection with a healthcare expert. Some studies [33, 34] established fewer visits to healthcare institutions during the pandemic. Against the 'prepandemic' period, the total number of primary care visits went down during the COVID-19

pandemic in Canada; this concerns several chronic diseases (primarily, diabetes and hypertension), common colds, and family planning [35].

Data derived by a national survey in the USA (June 2020) indicated that 40.9 % of the respondents delayed or avoided medical care, including emergency (12.0 %) and planned (31.5 %) care [36]. Almost one third of respondents reported that delaying a healthcare visit or directly avoiding it were caused by the necessity to follow recommendations on social distancing as well as temporary closure of some healthcare organizations. A social survey conducted among Japanese parents [37] in 2020 revealed a decrease in a number of visits to children healthcare organizations due to fear of getting infected with the coronavirus infection.

In addition to that, an empirical study [36] established that a number of preventive healthcare visits (periodic health examinations, vaccination, or baby care) also went down considerably during the pandemic. Also some publications provided comments on the pandemic determining a certain reduction in scopes of preventive care that had been formerly available during periodic health examinations including cancer screening [38], vaccination [39] and diagnostics of chronic non-communicable diseases [40]. Russian experts name several basic reasons for this reduction in hospital visits including low confidence in healthcare workers and in the healthcare system as a whole [41].

Therefore, irresponsible medical behavior manifested itself during the pandemic through a reduced number of hospital visits including preventive examinations. Let us highlight basic reasons for these changes. First of all, fear of getting infected with COVID-19 in a healthcare organization resulted in people staying at home and avoiding any visits to a hospital or a clinic. Secondly, some healthcare organizations introduced temporary limitations on some planned manipulations or operations or even canceled them to release additional resources for treating COVID-19 patients and scheduled visits to a doctor and examinations were postponed due to it. And finally, economic factors also had their role since some people lost their jobs or faced considerable financial difficulties due to the pandemic. This led to reduction in their expenditure on paid healthcare. Many patients might face impairment of their health and more complicated treatment in future due to this postponement of scheduled hospital visits.

Insufficient physical activity. Adequate physical activity plays a substantial role in health protection, the pandemic period included [42]. Regular physical exercises strengthen the immune system, reduce stress and anxiety, improve sleep and provide a person with necessary energy. In addition to that, physical activity can be a great way to socialize even under imposed limitations on social contacts. For example, friends can do exercises together or people can join virtual groups to do fitness.

Researchers report lower physical activity during the pandemic due to influence of *environmental factors*, including limited access to places for doing sports / exercises or their total closure (fitness centers, public parks and places to do sports) [43]. Widely spread practices of remote work might have had their role in reduction of routine physical activity.

Results obtained by an Australian study [44] among students and lecturers highlight some *sociodemographic factors* of reduced physical activity. Among them, the authors mention sex (women were less active than men), age (younger people were less active than older ones), as well as a living area (urban citizens were less active than rural ones).

Need in physical activity is largely determined by a *person's health*. A study [45] reports a bi-directional relationship between mental health and physical activity: poor mental health often led to hypodynamia and growing prevalence of sedentary lifestyle, which, in their turn, had negative effects on patients' mental health.

Therefore, most factors (environmental, sociodemographic, and mental health) determined lower physical activity during the pandemic and self-isolation. Such a factor as hav-

ing more free time created wider opportunities to have physical activity or do exercises.

Our analysis of Russian and foreign empirical studies has established that at present overall dynamics of risk behavior during the COVID-19 pandemic remains unclear. An issue of identifying exact factors that had their influence on changes in health protection behavior in different population also remains not clarified.

In this study, our aim was to describe Russians' health behavior between 2018 and 2022 (*this time span includes three periods with different levels of epidemiological stress, namely, 'pre-pandemic', 'pandemic' and 'post-pandemic'*) and to establish what sociodemographic factors determine risk trends in behavior and its dynamics.

Materials and methods. The study relied on the secondary analysis of the longitudinal database of the Russian Longitudinal Monitoring Survey of the National Research University Higher School of Economics between October 2018 and January 2023[1]. The 'pre-COVID-19 pandemic' period covers 2018–2019; the COVID-19 pandemic, 2020–2021, the 'post-pandemic' period, 2022. Respondents aged 18 years and older were included in the analysis; they all annually participated in the survey during our selected period between 2018 and 2022. The total sample was made of 6317 people; its structure is given in Table 1.

Russians' health risk behavior was estimated by asking questions about prevalence of certain behavioral practices such as:

1) Irresponsible medical behavior including:

a) a visit to a doctor one a year or rarer (Please, tell how often do you visit a doctor during one year? The suggested answers: *several times a month; once a month; 2–3 times a year; 1 time a year; rarer than 1 time a year*);

b) failure to have a periodic health examination (In the last three months, have you had a visit to a doctor to have a preventive check-up and not due to an actual illness? The suggested answers: *yes; no*)[2] [46, 47];

c) self-treatment in case of any health problems (What did you do to solve any health problem that has occurred during the last month? The suggested answers: *did not visit a doctor and relied on self-treatment; went to a healthcare organization or asked for a doctor's help*);

2) Insufficient physical activity (Have you done the following sports at least 12 times during the last 12 months…? The suggested answers: *yes; no*);

Table 1

The structure of the analyzed sample

Parameter		Number (people)	Fraction (%)
Sex	Men	2531	40
	Women	3786	60
Age	Young (born in 1984–2000)	1348	21
	Middle-aged (born in 1953–1983)	3025	48
	Elderly (born in 1924–1952)	1944	31
Having a partner	Yes	3880	62
	No	2431	38
Having children	Yes	5243	83
	No	1069	17
Employment	Employed	3206	51
	Unemployed	3111	49

[1] Russian Longitudinal Monitoring Survey – HSE. *RLMS-HSE: official web-site*. Available at: https://www.hse.ru/en/rlms/ (October 17, 2023); Russia Longitudinal Monitoring Survey of HSE. *RLMS-HSE, UNC Carolina Population Center*. Available at: https://rlms-hse.cpc.unc.edu (October 17, 2023).

[2] Results of many empirical studies prove that regular preventive health exams reduce risks of hospitalization and applying for emergency; they are a marker of effective disease management. Lower adherence to preventive healthcare visits is especially risky for middle-aged and elderly people. At this age, chronic diseases caused by natural ageing become more prevalent. Therefore, regular visits to doctors, including preventive ones, are especially important for elderly people since they help prevent new diseases and control already developed ones.

3) Addictive behavior, namely:

a) smoking (Do you smoke? The suggested answer: *yes; no*);

b) alcohol consumption (Do you sometimes drink alcohol, beer included? The suggested answers: *yes; no, never*).

The data were statistically analyzed using SPSS Statistics software. Risk behaviors were described using descriptive statistic methods. Correlation analysis and odds ratio computations were applied to analyze effects of sociodemographic factors on adherence to risk behavior; authenticity of data was calculated based on 95 % confidence interval.

Results. The resulting data indicate a multi-directional dynamics of Russians' health behavior (Figure). On the one hand, the COVID-19 pandemic (2020–2021) induced a growth in a fraction of people with low physical activity (79 % in 2018 and 83 % in 2020) and with irresponsible medical behavior with a growing fraction of those relying on self-treatment (28 % in 2018 and 29 % in 2021), paying only rare visits to a doctor (52 % in 2018 and 57 % in 2020), and avoiding preventive health exams (89 % in 2019 and 97 % in 2020). On the other hand, addictive behavior became less prevalent: fractions of smokers (25 % in 2018 and 24 % in 2022) and alcohol consumers (62 % in 2019 and 60 % in 2022) went down slightly in the post-pandemic period against the pre-pandemic one[3].

Irresponsible medical behavior was established to have an authentic relationship with such parameters as sex, age, and marital status. Men were established to have fewer visits to doctors both when sick (*OR* = 2.586, *CI*: 2.335–2.871) and to have a preventive exam (*OR* = 0.793, *CI*: 0.703–0.896). At the same time, 'young' respondents (Pearson r = -0.212 at $p < 0.001$), childless Russians (*OR* = 0.639, *CI*: 0.560–0.729) and single Russians (*OR* = 1.306, *CI*: 1.179–1.447) tended to be less active as regards their health.

Insufficient physical activity was mostly determined by a living area in comparison with other analyzed sociodemographic indicators: the smaller a settlement was where respondents lived the more frequently they stated they did not do any sports (Pearson r = 0.188 at $p < 0.001$). Given that, we can trace an association between doing sports and a type of a settlement (Spearman ρ = -0.187 at $p < 0.001$). More than 80 % of the respondents

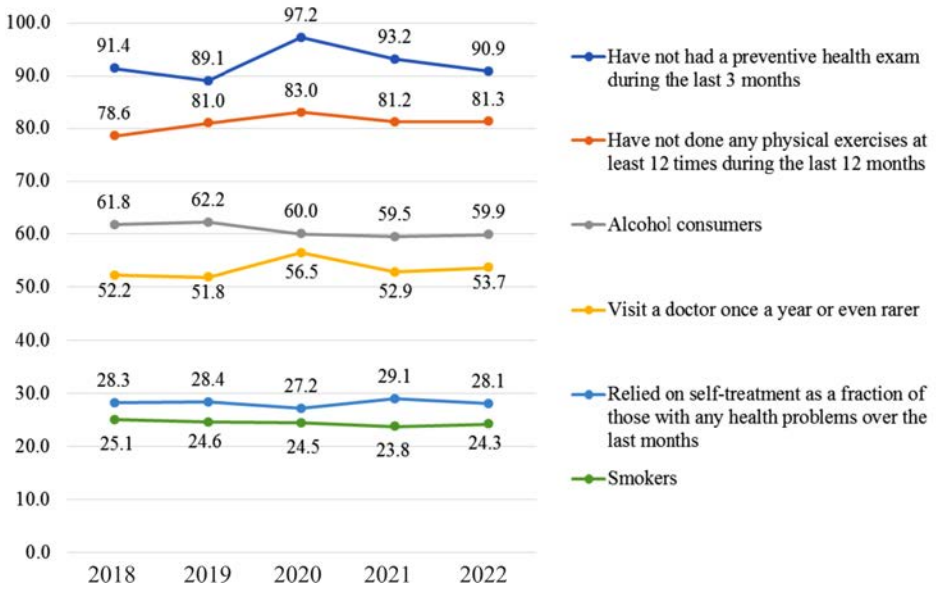

Figure. Russians' health risk behaviors in dynamics between 2018 and 2022 (%)

[3] Even this slight change in fractions that equals 1–2 % is considered by researchers because the sample is made of the same people and any changes in fractions are evidence of actual changes in the respondents' behavior and not statistical errors.

who lived in urban-type communities and rural settlements stated they did not do some specific sports regularly.

Addictive behaviors depend on respondents' sex and age. Male respondents reported smoking 5 times more frequently (*OR* = 5.371, *CI*: 4.732–6.096) and alcohol consumption 2 times more frequently (*OR* = 2.082, *CI*: 1.873–2.314). Among those who pursue such rick behaviors, more than 70 % are young and middle-aged people. A correlation between smoking, alcohol consumption and age was confirmed by correlation analysis (Pearson r = -0.187 at $p < 0.001$; Pearson r = -0.215 at $p < 0.001$). It is noteworthy that having a partner (official marriage or cohabitation) had influence on respondents' addictive behavior: those who had a partner smoked 1.5 times more often (*OR* = 1.513, *CI*: 1.337–0.711) and consumed alcohol 1.7 times more often (*OR* = 1.767, *CI*: 1.594–1.959).

The next stage in analysis involved clarifying how the COVID-19 pandemic influenced dynamics of Russians' health risk behavior; namely, the aim was to identify a fraction of the respondents who changed their behavior from health protection to health risk behavior; whether health risk behaviors persisted during the 'post-pandemic' period or people returned to their usual health protection patterns. Table 2 clearly illustrates that health risk behaviors not only became more frequent during the COVID-19 pandemic but also became entrenched in Russians' routines in subsequent periods. In particular, healthcare activities decreased as Russians tended to visit doctors less frequently (16 %) and quit having preventive health examinations (15 %); it is noteworthy that such practices became routine for most respondents during the post-pandemic period.

Several factors facilitated replacing health protection behavior with health risk one during the COVID-19 pandemic. First, sex and age turned out to be significant parameters for explaining irresponsible medical behavior during the pandemic. Although women tended to be more active than men in this regard prior to the pandemic, they were established to apply for medical aid less frequently during the pandemic in case of any health issues (*OR* = 0.578, *CI*: 0.383–0.873) and to have less frequent visits to doctors (*OR* = 0.719, *CI*: 0.590–0.876). Moreover, self-treatment as a behavior persisted predominantly among women in the post-pandemic period *(OR* = 0.382, *CI*: 0.263–0.556). In addition to that, it was established that the older the respondents were, the less frequently they tended to go to a doctor (Pearson r = 0.116 at $p < 0.001$), although such health protection behavior prevailed in the older age groups both prior to and in the post-pandemic period. During the pandemic, single Russians were more likely to acquire health risk behaviors (*OR* = 0.657, *CI*: 0.484–0.892).

Secondly, changes in physical activity during the COVID-19 pandemic depended on family. Thus, negative dynamics in physical activity was less typical for those Russians who had

Table 2

Fraction of Russians who changed their behavior from health protection to health risk behavior during the COVID-19 pandemic (%)

Behavior practice	Risk behavior occurrence	During the post-pandemic	
		Returned to health protection	Health risk behavior became entrenched
Irresponsible medical behavior			
Quit having preventive health examinations	14.7	4.5	10.1
Visited doctors less frequently during a year	15.5	7.5	8.0
Started to rely on self-treatment	4.5	1.8	2.7
Insufficient physical activity			
Quit doing sports	9.8	3.3	6.4
Addictive behavior			
Started smoking	2.4	0.9	1.5
Started drinking alcohol	8.2	3.4	4.8

a partner (*OR* = 0.767, *CI*: 0.648–0.907) and children (*OR* = 0.559, *CI*: 0.460–0.679).

Thirdly, dynamics in addictive behaviors depended on respondents' sex and employment status. After the pandemic, even more men who were already prone to smoking and drinking alcohol acquired some 'bad habits' (for example, smoking: *OR* = 2.725, *CI*: 1.786–4.158). During the pandemic, addictive behaviors were more typical for employed people (smoking, *OR* = 2.056, *CI*: 1.188–3.558; alcohol consumption, *OR* = 1.466, *CI*: 1.159–1.854).

Discussion. Our study revealed that tobacco smoking and alcohol consumption were relatively stable among Russians between 2018 and 2022. This allows concluding that the COVID-19 pandemic did not have any substantial influence on addictive behavior. Results reported in other studies in the sphere establish rather ambiguous changes in behaviors as regards smoking [48] and alcohol consumption [19] during the pandemic but these changes are also insignificant against the 'pre-pandemic' levels [49].

Our conclusions on lower medical and physical activity of Russians during the COVID-19 pandemic are confirmed by other studies. For example, Russian researchers [34, 41] report a considerable growth in a number of people who avoided visiting doctors during the pandemic; this made it difficult to provide people with timely and adequate healthcare. Authors of another study [43] used impersonal data of Azumio Argus (a popular smartphone app) users (1,255,811 people) over the period between January 2019 and February 2022; this allowed them to establish lower physical activity of people in more than 200 countries worldwide. In addition to that, 'daily step count' as a physical activity indicator was established to be below than its pre-pandemic level all over the world.

Special attention is usually paid to environmental factors among those influencing spread of health risk behavior among some population groups. Such factors include limitations on travelling and impossibility to leave home that resulted in psychoemotional stress [17]; cancelling sport events and closing down sport facilities [50]; overloaded healthcare systems and a resulting decrease in quality and availability of qualified healthcare [41] etc.

Sociodemographic parameters turned out to be just as important. Correlation analysis of these parameters and Russians' health behavior in 2022 allows concluding that at present health risk behavior is more typical for men and people living in small settlements. Russian researchers point out that sex differences in health behavior are associated with different meanings of health as a category accepted by men and women [51]. Men see health as capabilities and tend to idealize their own health; therefore, they are less frequently committed to health protection. As for people living in small settlements, their health risk behavior might be explained by poor infrastructure in their living areas with lower availability of relevant facilities and expert aid as regards health protection.

Our study established that sociodemographic factors not only determine risk behavior but also have certain effects on its dynamics. First of all, sex has significant influence on the matter: men tended to pursue more risky and hazardous behavior during the pandemic. Similarly, Chinese researchers reported that men tended to drink more often and consumed stronger alcohol than women during the COVID-19 pandemic [21]. A different situation was established only for actual disease. In our study, women were established to behave irresponsibly as regards their health more often during the pandemic and this practice persisted in their behavior in the post-pandemic period as well. A possible reason for that might be that women tend to care more about their loved ones, including sick family members, and therefore they might have feared for their health during the pandemic. This resulted in them delaying their own visits to a doctor so that they wouldn't pose a threat of infection for their family and friends. Given elevated anxiety, women might have resorted to self-treatment and avoided going to healthcare organizations in order to escape additional stress and worry. A Russian study established that

women reported fearing not only for their health but also health of their family members and friends during the COVID-19 pandemic much more frequently than men; they also were afraid of getting infected much more often [52].

Secondly, age also produced considerable effects on dynamics of health risk behavior. Addictive practices became a peculiarity of behaviors pursued by middle-aged people during the pandemic; irresponsible (probably, forcedly) medical behavior, by elderly people. This thesis has been confirmed in other studies. For example, middle-aged people were established to drink alcohol in big amounts more often [53] and elderly people complained they were excluded from healthcare since their scheduled visits to doctors, examinations, and surgeries were postponed [54]. In addition to that, rare visits to healthcare organizations might have been associated with elderly people having some anxiety as regards getting infected with COVID-19 as well as limited capacity to travel typical for them. An American study established that young people aged between 18 and 24 years prevailed among those who ignored any possibility to apply for medical aid [36].

Thirdly, a marital status (having / not having a partner / children) was established to be an influencing factor as regards changes in health behavior. This influence turned out to be ambiguous. On the one hand, having a family can stimulate people to pursue a more active lifestyle since they can feel themselves responsible for their own health and health of their loved ones. A study [55] reported an increase in physical activity in families with children due to the necessity to provide active leisure for them given a growth in available free time. In addition to that, having a partner / children can provide a person with substantial social support and give motivation to do sports or have physical activity in general. Absence of family or close friends results in weaker motivation to pursue health protection behaviors, limited access to information about health and healthcare; therefore, lonely people (especially elderly ones) are more vulnerable as regards risk health behavior. A foreign study [27] reported that higher levels of alcohol consumption were identified in people who were under quarantine / social isolation in comparison to those who were not socially restricted. On the other hand, social capital has a so called ‘dark side’, which is a social group being capable of thrusting health risk behavior on its members or influencing a growth in such practices in any other way. It is worth noting that this influence can grow under self-isolation. A French study [56] reported an association between likelihood of consuming more alcohol and having more children at home.

Fourthly, employment can also be considered a factor influencing health risk behavior. Addictive behaviors were more common among employed people. Changes in a social context influencing people’s alcohol consumption were associated with a reduction in formal limitations that acted as a restricting factor in routine ‘non-COVID’ conditions. It was especially true for those people who switched to remote work or were unable to continue their work as before. Changes in daily routines (for example, disappearing difference between workdays and weekends) gave some people an opportunity to consume alcohol in a new setting. Thus, respondents who participated in an Australian study [30] reported having these new opportunities: they were able to drink alcohol during a working day; they could drink late at night and get up later than usual; they worked feeling hangover on the next day without any negative consequences; they could drink alcohol whenever they wished because they did not have to drive anywhere.

Some studies also mention growing negative trends as regards health risk behavior due to changes in a social and financial status [24]. In this study, we did not find any statistically significant relationship between changes in risk behaviors and financial status.

Conclusions. Our analysis established multidirectional dynamics of Russians’ health risk behavior during the COVID-19 pandemic. Secondary analysis of the longitudinal

database of the Russian Longitudinal Monitoring Survey of the National Research University Higher School of Economics established a decrease in physical and medical activity of the country population, on the one hand; and a slight but still a decrease in adherence to addictive behaviors (tobacco smoking and alcohol consumption), on the other hand. We identified social risk groups in relation to behavior able to create health risks for Russians during a crisis. Adherence to risk behaviors is more typical for men and people living in small settlements.

Irresponsible medical behavior of Russians was established to be directly associated with sex, age, and marital status: women, younger people, people who did not have a partner or children visited doctors less frequently, either to treat an actual disease or to have a preventive examination. A living area predominantly determines Russians' physical activity: people living in smaller settlements had the lowest levels of physical activity during the pandemic. Adherence to addictive behaviors is determined by sex and age: men and young and middle-aged people smoked and consumed alcohol more often. We did not establish any principal dynamics of 'return' to health protection behavior after the pandemic ended. Thus, lower medical activity became entrenched in Russians' behavior in the 'post-pandemic' period. The trend is apparent due to rare visits to healthcare organizations, including preventive ones.

Difficulties in monitoring and predicting people's health behavior arise due to, among other things, non-linear development of the contemporary Russian society and high levels of social stress. A better insight into factors able to induce health risk behavior can help clearer understanding of complex ongoing processes in the society. Knowing social determinants of health risk behavior in different population groups is a significant component in developing targeted disease prevention programs. It is necessary to create effective strategies for preventing health risk behavior among Russians considering sociodemographic, socioeconomic, environmental, and other risk factors. Given rapid development of information and other relevant technologies, changes in social structures and growing numbers of stressful situations, we can expect health risks to only grow in future. Therefore, it is necessary to develop adequate activities aimed at creating commitment to health protection considering all factors able to influence health risk behavior.

Funding. The research was supported by the Grant of the Russian Scientific Fund No. 23-18-00480 'Self-Protection Strategies of Russians under the New Normal'.

Competing interests. The authors declare no competing interests.

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Received: 11.10.2023
Approved: 28.11.2023
Accepted for publication: 20.12.2023