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**RISK PERCEPTION IN A COMPETITIVE SITUATION: COVID-19
AND RADIATION**



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Abstract

The article analyzes the results of a study of risk perception in a situation of their competition and in conditions of varying degrees of social strengthening. In the spring of 2020, 256 residents of regions exposed to the potential danger of exposure to ionizing radiation and coronavirus (Bryansk, Kaluga, Tula and other regions of the Russian Federation) were interviewed. The results of the study indicate a weak influence of the agenda imposed by the media on personal perception of risks, but not on the general perception of risks. Coronavirus risks have become more socially heightened. The level of trust in official data on coronavirus at the time of the study was rather low. Less than half of respondents trust official statistics and the prevalence of alarmist sentiments about radiation risks is extremely high – half of respondents have more trust in the statements that speak about the danger of the consequences of fires. Any event associated with potential radiation risks will be perceived more sharply by residents of settlements with beneficiary socioeconomic status and representatives of older cohorts than by residents of other settlements and representatives of younger population cohorts. The situation of risk competition can affect the generalized perception of radiation risks, but not the personal ones. People will still be afraid of the radiation risks for themselves, but at the same time argue that the coronavirus pandemic is a more important public issue.

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Keywords: Ionizing radiation, covid-19, risk comparison, risk competition, risk communication, risk perception



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1. Introduction

The research in the field of risk communication carried out in recent years shows differences in the perception of risks by experts and ordinary people. (Arkhangelskaya & Zelentsova, 2019; Davydov et al., 2019; Seong et al., 2017). These differences are due to the fact that experts deal with "objective" data, figures and calculations, whereas in the everyday life and the lifeworld of the lay people there is no practice of handling such information. Knowledge about risks acquired in primary groups (family, work) and via education system enters a person's everyday life and becomes relevant when a significant event occurs. Most often, information about risks is made relevant through a certain transmitter – the media. Media employees interpret the information received from experts, often without having a specialized education in a particular field. Ordinary people, in turn, interpret information received through the media (Vernberg & Murphy, 1996.).

Obviously, the level of trust in the source of information plays a significant role in the interpretation of information. Information from a trusted source is more likely to be perceived as reliable. At the next stage, leaders of public opinion and representatives of reference groups to which an individual belongs or wants to belong join the process of interpretation (Lazarsfeld et al., 1944; Protess & McCombs, 2016). Opinion leaders and representatives of reference groups may not understand technical issues of the topic under discussion, but are considered by individuals as a reliable source of information. Thus, leaders of public opinion and representatives of reference groups participate in the interpretation and dissemination of information about the event, especially among those individuals who do not follow the news in the media but follow the messages of opinion leaders and the behavior of reference groups. That is why the media can impose their own agenda and amplify risks (Kasperson et al., 1988). However, the media agenda does not always coincide with the public agenda: there are obtrusive and unobtrusive topics (Protess & McCombs, 2016). The former, being a part of the lifeworld and everyday life of individuals (for example, inflation, unemployment), are discussed and regardless of the media attention. In the field of research on risk perception, especially the psychometric paradigm (Sjoberg), the described differences in the perception of generalized (a risk relevant to society as a whole) and personal (a risk relevant to a particular individual and / or his family) reflect this idea. The first type of perception is much more influenced by the media, while the second is almost entirely independent of it (Vyncke et al., 2017).

2. Problem Statement

In the spring of 2020, residents of several constituent entities of the Russian Federation bordering Ukraine experienced a rare situation regarding risks. Two types of risks that do not belong to the category of everyday ones became relevant at the same time: risks associated with the spread of COVID-19 and potential radiation risks associated with burning forests near the Chernobyl nuclear power plant. Thus, a situation of competition in the perception of the two types of risks has arisen. The study of the two types of risks with potentially different degrees of media coverage, and hence different degrees of social amplification (Kasperson et al., 1988), can make it possible to determine the degree of media influence on risk perception, differences in the perception of generalized and personal risk by individuals, and the possible impact of trauma (Zhukova, 2016) on risk perception.

3. Research Questions

The subject of this study is the perception of various risks in a situation of their competition, at varying degrees of their social amplification through media coverage and social media, the influence of reference groups, etc. In the study, such risks were radiation risks associated with forest fires in the areas contaminated with radionuclides as a result of the Chernobyl accident and the risks associated with the spread of COVID-19. It should be noted that during the study in the areas where it was conducted isolated cases of death from coronavirus and the lack of information on the spread of radiation contamination were observed. There has been a significant change in routine practices associated with the introduction of the so-called self-isolation regime. At the same time, trauma (in the terminology of trauma studies) associated with a significant change, a breakdown of everyday life in the past -- during the liquidation of the consequences of the Chernobyl accident – could have a lasting impact on some of respondents, especially those from older cohorts and those living in the settlement with a beneficiary socio-economic status.

Thus, it was possible to compare the perception of the two types of risks, which as a result of the actions of those who make managerial decisions regarding these risks changed the everyday life of individuals: one – directly during the survey period, the other – about 30 years ago, during the elimination of the consequences of the accident. At the same time, at the time of the survey it was logical to assume that the topic of coronavirus was more represented in the media. However, life in the territories affected by the consequences of the nuclear accident made the radiation risk a part of everyday life, and not an extreme event, for a part of the population. At the same time, radiation risks are often stigmatized (Slovic, 2012) – fanned by a large number of rumors, myths, and the reaction of indignation to them exceeds the degree of their real danger (Sandman, 1988).

4. Purpose of the Study

The aim of the study is to examine the similarities and differences in the perception of the two types of risks by residents of border areas in a situation of competition of these risks. To achieve this goal, the following tasks were set:

- a) to establish whether people will be afraid of one risk factor significantly more than the other
- b) to compare the level of coverage of the two types of risks in the online media;
- b) to find out what factors influence the differences in the perception of these risks (age, living in a settlement with beneficiary socio-economic status, gender, the –parental status, relatives over 65 years old, the distance from the settlement to the Chernobyl nuclear power plant etc.);
- c) to analyze the differences in the influence of the media on personalized and generalized perception of risks;
- d) to determine the degree of trust of ordinary people in specialists who are competent and responsible for managing these risks;
- e) to identify the relationship between the perception of risks, socio-demographic indicators and fear of certain common diseases.

5. Research Methods

In April-May 2020 we conducted a survey among residents of the Bryansk, Kaluga and Kursk regions. For the survey, we used a questionnaire on the Google Forms platform. The link to the questionnaire was distributed by sending messages to people on social media popular in the surveyed regions. Urban and rural communities on social media were used to share the link. The sample consisted of 256 respondents. We asked questions (19 in total) regarding the following aspects: awareness of respondents of the coronavirus pandemic and of the fires near the Chernobyl nuclear power plant, the assessment of the degree of danger of COVID 19 and radiation, trust in decision-makers, fear of common diseases and respondent's place of residence. Finally, there were questions to determine the socio-demographic characteristics of respondents. We created a variable with the distance from respondent's settlement to Pripyat. The distance along a straight line was calculated using the distance.to service. In addition, one more variable was created – the location of the settlement in the zone of residence with a beneficiary socio-economic status in accordance with the decree of the Government of the Russian Federation of October 8, 2015 No. 1074 "On the approval of the list of settlements located within the zones of radioactive contamination due to the at the Chernobyl nuclear power plant" (Postanovlenie Pravitelstva..., 2015). Hereinafter the residents of such settlements are referred to "beneficiaries", the residents of other settlements as "non-beneficiaries".

We used the following statistical methods:

Mann-Whitney test – to investigate the differences in the assessment of the probability of contracting a severe form of coronavirus and dying from it between “beneficiaries” and “non-beneficiaries”.

Logistic regression with a dichotomized variable of choosing a less dangerous risk as an independent variable and with predictors of gender, age, the presence of minor children in the family, close relatives over 65, the distance from respondent's settlement to Pripyat, the presence or absence of beneficiary status in respondent's settlement.

Chi-square – to compare the significance of differences in the distribution of answers to other questions.

The average age of respondents from settlements with beneficiary economic status is 36, from other settlement – 32. In terms of gender and the presence of relatives over 65 and minor children, the subsamples do not differ significantly; among the “beneficiaries” there are fewer residents with higher education (43% among the residents in settlements with beneficiary socio-economic status and 60% among the residents of settlements without benefits).

The sample is not representative for the regions. However, the objective of the study was not to achieve representativeness. According to the research data, some aspects of the perception of radiation risk do not depend on age, education, income level, place of residence and occupation of respondents (Melikhova et al., 2013).

To analyze the publication activity, we used Yandex.News search service; to search for news on the topics discussed, we used the keywords “radiation fire” and “coronavirus”. The publication period was determined from April 1 to April 30, 2020 – a time period preceding the survey.

6. Findings

The results of the media analysis show that the problem of the coronavirus pandemic was covered much more intensely, as it was expected. For the period from April 1 to April 30, 2020, we found 479 messages, 46 articles, 3 interviews and 16 photos using the keywords "radiation fire". At the same time, 247,343 messages, 12,230 articles, 1,554 interviews, 52,529 photographs were found using the keyword "coronavirus".

It is natural that the awareness of respondents about the coronavirus pandemic turned out to be higher than the awareness of the burning forests near Pripjat: 100% of respondents were aware of the COVID-19 pandemic, 82% heard about the burning forests near the Chernobyl nuclear power plant. However, the study showed that the residents were quite well-informed about both types of risk.

In general, there is no consensus among the public on which risk factor is more dangerous: if a respondent was asked to remove one of them from their life, then about half (54.5%) would get rid of COVID-19 at the time of the survey, and about a third (32.9%) – from burning forests and potential radiation contamination. At the same time, the ratio among those who do not live in settlements with beneficiary socio-economic status after the Chernobyl accident is 53.5% to 35.1%, and among those living in settlements with beneficiary economic status after the Chernobyl accident 63.2% to 21.1%, but the differences are not statistically significant.

Logistic regression with predictors gender, age, the presence of minor children in the family, close relatives over 65, the distance from respondent's settlement to Pripjat, and the presence or absence of a beneficiary status of respondent's settlement did not reveal significant differences in the preferences of these groups when choosing the most dangerous of the two competing risks: radiation and coronavirus.

At the same time, personal perception of risks presents a paradox. 61.6% of respondents believe that they or their loved ones can get infected with COVID-19, while 73.2% of respondents believe in the reality of the radiation threat from burning forests near the Chernobyl nuclear power plant. This observation confirms the findings of previous studies. In general, respondents tend to consider the risks less likely for themselves personally than for society as a whole, with the exception of some cases including radiation risks (Sjoberg, 2003) when individuals have low degree of risk control, when the risk is not considered voluntary and is considered dreadful (Visschers & Siegrist, 2018). Here we see confirmation: despite the fact that at the level of perception of personal risks coronavirus is less frightening (when the risk concerns only an individual) than radiation, at the level of the society as a whole, when choosing the lesser of two evils respondents are more inclined to get rid of coronavirus, and not of radiation.

The radiation factor turned out to be more serious for respondents. In general, the sets of fearful respondents overlap: 45.3% of respondents are afraid of both COVID-19 and radiation, a quarter (25.4%) only of radiation, and 14.5% only of COVID-19, 14.8% are not afraid of either of the risk factors.

Comparison of the perception of risks from burning forests near the Chernobyl nuclear power plant shows that for the residents of settlements with beneficiary socio-economic status the problem of radiation contamination is still relevant and radiation risks are still perceived as high. 70.4% of "non-beneficiaries" and 86.9% of "beneficiaries" believe that there is a radiation threat to their health as a result of fires near the Chernobyl nuclear power plant. Moreover, this difference is statistically significant (73.2% in general).

28.1% and 52.6% respectively, answer this question unequivocally, “definitely yes”. When answering the question about the degree of radiation contamination of settlements of residence, 13.8% of “non-beneficiaries” and 57.9% of “beneficiaries” characterize it as “severe” contamination. Also, the opinion about strong radiation contamination is more widespread among older age cohorts: among respondents 35 years old and older, 26.1% believe that their settlements are “heavily” contaminated, while only 16.4% of respondents under 35 believe so; the differences are statistically significant.

Half (49.2%) of respondents have more trust in the “statements of scientists, nuclear scientists, ecologists quoted in the news” which claim that “the consequences of fires are dangerous” and only 5.5% in the statements that claim the opposite. The rest found it difficult to answer. At the same time, 39.5% of respondents have more trust in “the official data on the number of people infected with COVID-19, the number of the recovered, the number of deaths,”. The data that contradicts these figures is more trusted by 29.7% of respondents. In regard to both questions, there is significant percentage of those who are undecided: 45.3% and 30.6%, respectively. At the same time, young people are more inclined to trust the official data on coronavirus: among respondents under 35, 45.8% have more trust in the official data, while among respondents 35 and older, only 30.4% of them do so.

Most of all, respondents are afraid of getting cancer (87%), followed by coronavirus (44%), HIV / AIDS (39%) and cardiovascular diseases (38%). Comparing the “beneficiaries” and “non-beneficiaries”, “beneficiaries” in all cases are more worried about their health (except for the case of oncological diseases), although statistically significant differences are observed only for pneumonia and influenza (28.4% among “non-beneficiaries” and 47.4% among “privileged recipients” and 5% and 15.8%, respectively). At the same time, when asked about the possibility of contracting a more severe form of coronavirus and the probability of dying from this disease, “beneficiaries” have higher average ranks (Likert scale, Man-Wilkinson test), i.e. are more worried about their health. The difference is statistically significant.

7. Conclusion

In the study, respondents were not asked questions about discussing the two types of risk with their acquaintances and about the amount of information on the two types of risk that they got familiar with. Nevertheless, it seems quite obvious that the first type of risk (coronavirus), which was more vividly covered by the media, was more actualized in the daily communication of residents of the studied territories and thus much more socially amplified.

In a situation of choice between competing types of risks, most of respondents would rather get rid of coronavirus as an important and urgent social problem, which confirms the conclusions of the theory of social risk amplification (Kasperson et al., 1988).

At the same time, for themselves personally, most of respondents assess the radiation risks as high. This paradox is associated with the difference between personal (for oneself) and generalized (for society as a whole) perception of risks. In previous studies (Sjoberg, 2003), it was noticed that respondents tend to overestimate the risks for society and underestimate those for themselves. This happens with the risks of smoking, driving a car and many others. However, radiation risks stand apart – the assessments of personal perception of this risk factor are equal or exceed the generalized estimates.

In addition, previous studies (Vyncke et al., 2017) noted that the media can strongly influence the perception of generalized risk, but have very little influence on the perception of personal risks. Our findings are consistent with the findings of previous research.

Any event associated with potential radiation risks will be perceived more sharply by residents of settlements with beneficiary socioeconomic status and representatives of older cohorts than by residents of other settlements and representatives of younger population cohorts.

The level of trust in official data on coronavirus at the time of the study was rather low. Less than half of respondents trust official statistics and the prevalence of alarmist sentiments about radiation risks is extremely high – half of respondents have more trust in the statements that speak about the danger of the consequences of fires. Rather high percentage of undecided respondents indicate the lack of public opinion on this issue and the lack of reflection on it. At the same time, the ratio of the shares shows that in the spring of 2020, the coronavirus problem was discussed more actively than the problem of fires near the Chernobyl nuclear power plant.

Living in communities with beneficiary socio-economic status stigmatizes radiation risks and provokes a heightened perception of other health risks as well.

To sum up, we can say that the situation of risk competition can affect the generalized perception of radiation risks, but not the personal ones. People will still be afraid of the radiation risks for themselves, but at the same time argue that the coronavirus pandemic is a more important public issue.

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