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RESEARCH NOTE

The impact of transition to a remote work format on the mental health of employees

Marina O. Gorshkova [1], Polina S. Lebedeva [1]

1 *Lomonosov Moscow State University, Moscow, 119991, Russia*

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Abstract

The subject of employee mental well-being has recently been discussed in the Russian corporate world and now it is a hot topic. According to the survey results, most domestic companies consider the problem of employee burnout to be important and recognize its negative impact on the staff, while over half are reluctant to do anything about it. However, for those companies that started thinking about implementing employee psychological wellness programs before 2019, the pandemic accelerated the process. The purpose of our study is to identify the causal relationship between the shift to remote working in connection with the COVID-19 pandemic and the mental state of workers. In-depth interviews with HR managers of the Russian branches of six large international companies and econometric analysis were used in this work. The research reveals that the abrupt shift to work from home (WFH) had a negative impact on employee mental state, which forced the companies to promptly implement new measures to support their workers. Over time, the staff was able to adapt to the new environment, and the opposite effect was observed: during the subsequent waves, those who were at WFH felt more psychologically stable compared to those transferred to a remote format later.

Keywords

mental health, work from home, personnel management, remote format

JEL codes: C2, I3, J5, J8

Introduction

The SARS-CoV-2 coronavirus pandemic had a major impact on the world's economy as well as negative consequences for physical health. Studies also bring up the psychological impact of COVID-19 (Stasiuk-Piekarska 2021). The measures taken by governments, including lockdowns, social distancing and the transition to a remote work format, as well as

irregular work schedules, loss of work-life balance and other factors caused an increase in anxiety and other negative psychological consequences. Thus, according to the survey from 46 countries, " fully half of respondents who reported a decline in well-being pointed to deteriorating mental health[1] as the main culprit" (Campbell, Gavett 2021). But a competent personnel policy during the pandemic, carried out in some companies, contributed to the growth of the mental well-being of employees (İlhan 2021).

Literature review

There are a number of papers aimed at studying the consequences of the COVID-19 crisis for the working population and identifying key factors of this influence. First of all, let's consider two articles which dataset provide the basis for this paper, thereby showing the novelty of our approach.

The first of these was an article by F. Knolle et al. (2021). In it, the researchers published the results of two waves of a three-part survey (May and October) of respondents from the UK and Germany (the first part – presence or absence of symptoms of coronavirus infection, the second – SCL-27 (symptom check list – survey to assess psychological problems), the third – schizotypal personality questionnaire).

The authors worked with the data from the first wave of the survey, paying much attention to the country effect in the differences in the impact of lockdowns: respondents from the UK noted a stronger direct effect of restrictions on health, financial condition and family relationships: they had a higher self-perception of psychological problems, that is, their mental state was worse according to the data in questionnaire SCL-27 (dedicated to mental state diagnosis). I addition, according to the data of the first part of the questionnaire, the sub-sample consisting of British people had more cases of infection, i.e. higher morbidity, which is an important result, since coronavirus also affects mental health.

The second work, based on the same dataset, is published by S.Daimer et al. (2021). In contrast to the first paper, data from the second wave of the survey are added to the analysis. Based on the data of GSI-27 (global symptom index), the authors note that the mental state of respondents in the first wave of the survey was worse than in the second one. Due to the design of the survey, the researchers were able to separate the current temporary effects from the offset of the pandemic from cumulative ones: it turns out that during the second period, respondents noted that their general mental health was better compared to the previous one, since they were able to adapt to the new reality, but the results on the schizotypal questionnaire were higher, which indicates a cumulative effect of the lockdowns: respondents are finding it increasingly difficult to cope with loneliness and financial difficulties over time. Therefore, the authors conclude that the longer the restrictions last, the more individuals will be susceptible to depression.

It is worth noting that in both articles the authors focused on the mental health of respondents in general and its changes because of the pandemic, paying great attention to the results obtained after filling out the part of the schizotypal personality questionnaire. In this paper, we study a narrower issue, focusing on the effect of WFH, which has not been considered before.

1 According to the World Health Organization, "mental health is a state of mental well-being that enables people to cope with stressful situations in life, to fulfill their potential, to learn and work successfully, and to contribute to society. The other terms in the paper are used as synonyms to this.

In addition to these studies, we will review papers aimed at studying the consequences of the COVID-19 crisis for the mental health of employees and identifying key factors of this influence. For example, in the article by A.Oksanen et al. (2021), the researchers assessed the possible stressful effects of social media communication[1] at work during the pandemic.

The results showed that social media communication at work increased during the pandemic, which, according to the authors, should have led to a deterioration in the mental health of employees. It turned out that there is a difference in the effect for different groups of workers: those who were used to using social networks at work before the pandemic coped better, and their stress and fatigue levels decreased. One of the conclusions of the researchers was the understanding that building a balance between personal life and work, as well as mental well-being, help to cope with the corona crisis. This paper indicates the heterogeneity of the impact of the pandemic on employees, and emphasizes the importance of a competent policy behalf the companies' HR managers and measures taken to improve the well-being of employees.

The work-life balance of those employees who started working remotely in connection with the COVID-19 outbreak had a positive effect on mental well-being. N. Yüceol et al. came to this result (2021). The main objective of the paper was to determine the impact of remote working on mental well-being, due to the Covid-19 pandemic. In this context, surveys were applied to 397 generation Y[2] academicians working at public and private universities. However, characteristics such as gender, age, and degree status did not significantly affect work-life balance or mental well-being.

According to C. Pieh et al. (2020), self-isolation and the COVID-19 pandemic led to an increase in depression and a decrease in quality of life. The authors assessed the mental health of respondents during the lockdown and wanted to find out how age, gender, income, work and physical activity affected mental well-being. It turned out that the effect is more pronounced in young people, women, the unemployed and people with low income.

Phadnis et al (2021) are the authors of a research aimed at studying the impact of remote work on mental health. According to the results of the research over half of the Indian organizations employees faced an increase in workload when working from home, some felt lonely and lost, as well as disconnected from the real world, which indicates the negative impact of switching to a remote format on the mental health of employees.

However, in foreign and domestic literature, the issue of the relationship between the format of work during the pandemic and the mental well-being of staff has not been sufficiently investigated. Therefore, in this study, we want to answer the question: "Has the transition to a remote format affected the mental health and well-being of employees, and if so, how?".

Data and methods

The purpose of this study is to identify a causal relationship between the transition to a remote work format in connection with the COVID-19 pandemic and the condition of wor-

1 With the introduction of lockdown, "many organizations were forced to start using new digital technologies and social media applications as their primary means of communication and collaboration." In the study, social networking at work is about communicating with colleagues, regardless of where they go online, which is why the loss of work-life balance is considered. The authors also divide social networking during the pandemic into formal (work-related) and informal.

2 A generation of people born from about 1981 to 1996.

kers. It was interesting for us to compare the mental health of employees forced to work from home with those who did not change the format of work during the pandemic, aiming over time to isolate the effect of the remote format of work from the overall effect of the pandemic on mental well-being.

Based on the purpose of the study, the following research tasks can be distinguished:

- To study modern econometric research within the framework of the topic of interest;
- To identify whether there is a connection between the mental health of respondents during the pandemic and the format of work;
- If there is a connection, then to build econometric models for their detailed study;
- To test the developed hypotheses concerning the subject of the study;
- To summarize the work done, making necessary conclusions.

Research methods:

- analysis of foreign and domestic literature and Internet sources related to the research problem,
- conducting in-depth interviews with HR managers of Russian branches of six large international companies to study the real experience of switching to a new format of work and measures taken by companies,
- building econometric models (multiple linear regression, ordered logistic regression), selection of the model specification, determination of significant variables, conducting econometric tests, testing hypotheses.

The relevance of the study is driven by the fact that the problem of mental health is urgent today. For example, the clear majority of companies reported facing mental health issues with employees in 2020-2021. Deterioration of mental well-being is one of the serious risks associated with human resources around the world, so the discussion and formation of human resources strategies on this issue is key at this moment for companies around the world. Understanding the factors affecting employee well-being, including the optimal work format, will enable managers to intelligently shape the psychological environment and conditions for productive work in both the short and long term.

Besides, for further work, we put forward the following hypotheses:

1. Employees cannot organize their professional life in a remote format, what does not give them a sense of well-being. That is, home office has negatively affected the mental health of employees.
2. The effect of switching to a remote format is more pronounced in women than in men.
3. The abrupt transition to a new work format affected employee mental state. Over time, getting used to and adjusted to the new reality, employees began to feel better working remotely.
4. The effect of the remote format of work is less pronounced among young employees, since it was easier for them to adapt to the new format, unlike older workers.

Data

Before proceeding directly to econometric calculations, we should notably mention the dataset design used in this paper.

The data were collected by researcher F. Knolle et al. to study a related topic (in the part devoted to the literature review, we explained in detail the scientific novelty of our paper in comparison with those published). Respondents mainly from Germany and the UK were asked to take an online survey on the EvaSys platform (https://www.evasys.de, Electric Pa-

per Evaluationssysteme GmbH, Luneburg, Germany). Following the snowball sampling strategy[1] respondents from other European countries were added, but the questionnaire was available only in German and English. The survey consisted of three parts: the presence of symptoms and/or the fact of contracting COVID-19 disease, a Checklist of symptoms (SCL-27) and a Schizotypal Personality Questionnaire, which reflected the impact of the pandemic on the financial situation and work, the consumption of psychoactive substances and media content, as well as questions of self-assessment of mental health.

4 waves of the survey were conducted: in the spring and autumn of 2020, in the winter and spring of 2021. The completion of the survey took approximately 35 min. The respondents took part voluntarily and did not receive monetary compensation.

We conducted a preliminary analysis of the variables, highlighting only those that directly relate to the research topic and are control ones. The interpretation of the variables is presented in Appendix 1, and the descriptive statistics are given below (see Table 1).

Table 1. Descriptive statistics

Variables	N	Mean	St. Dev.	Min	Median	Max
Suspected_Co19	2.329	0.19	0.39	0	0	1
Work_NoChange	2.341	0.23	0.42	0	0	1
Work_HomeOffice	2.341	0.43	0.50	0	0	1
Work_ReductionHours	2.341	0.09	0.28	0	0	1
Work_UnpaidLeave	2.341	0.02	0.13	0	0	1
Work_LostJob	2.341	0.04	0.20	0	0	1
Work_Overtime	2.341	0.10	0.30	0	0	1
Children_atHome	2.311	0.32	0.47	0	0	1
Exercise	2.335	2.39	1.20	1	2	5
gender_2	2.298	0.76	0.49	0	1	3
age	2.313	43.12	15.52	17	42	93
Country_residence	2.341	0.23	0.42	0	0	1
Higher_education_self*	2.332	0.82	0.39	0	1	1
MentalHealthStatus_BeforeCo19	2.312	2.58	1.06	1	2	5
MentalHealthStatus_now	1.542	3.31	1.12	1	3	5

* Note: This variable is binary and indicates whether the respondent has a higher education.

Source: compiled by the authors according to F. Knolle et al. (2021)

1 Note: the so-called "snowball" method is a sampling method widely used in studies whose main source of data is interviews with respondents: the technique consists in the fact that the individuals in the initial sample share the interview and/or contacts of those individuals who will be interviewed next, i.e. a chain reaction occurs, which allows a multiple increase in the sample Note: This variable is binary and indicates whether or not the respondent has a higher education

We conducted an initial analysis of the results and received the following:

- The average age of the respondents was 43.12 years;
- Most of the survey participants are women.
- The most of respondents in the sample have a higher education, which can rather be attributed to a bias in the data;
- The mental state of the respondents at the time of the survey averaged 3.31 units, which according to the encoding is close to normal;
- About a third of the respondents live with children;
- One in five respondents did not change the format of work in connection with the pandemic;
- Almost half of the respondents switched to a remote work format;
- 10% of employees faced overwork.

To assess the degree of closeness of the relationship between variables and to identify the direction of the relationship, we constructed a correlation matrix (see Figure 1. Correlation matrix of characteristics.

There is a negative correlation between the indicator of mental health and remote format of work. However, according to the survey design, the lower the indicator of mental

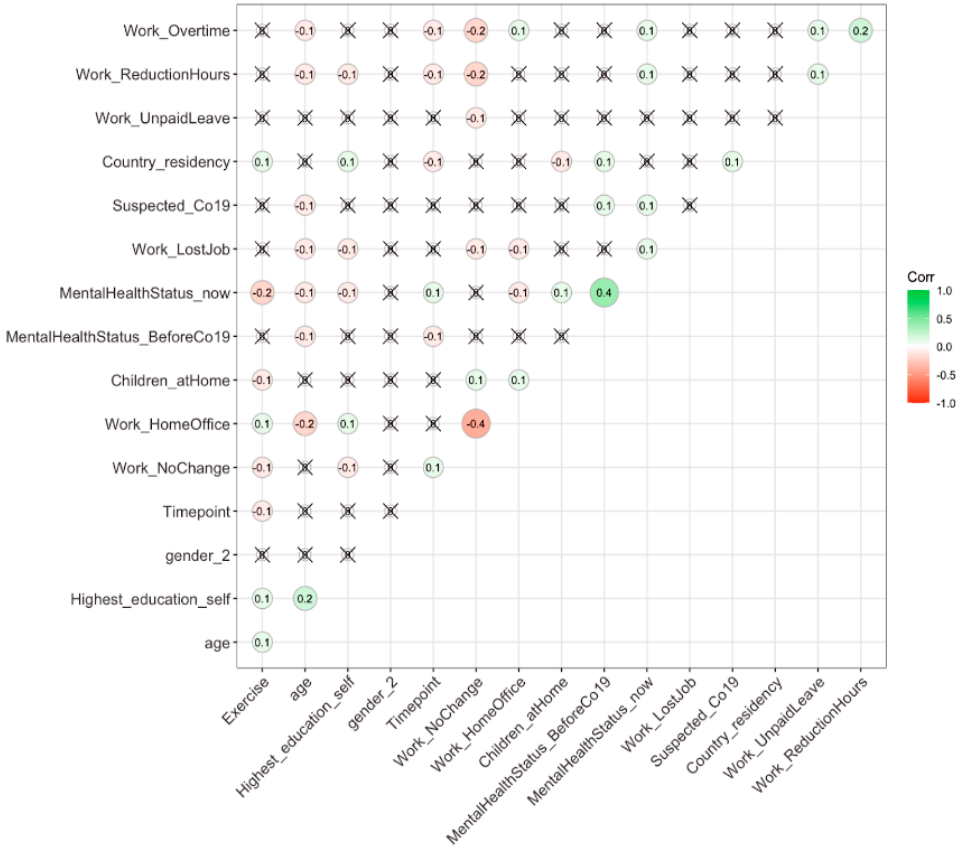

Figure 1. Correlation matrix of characteristics. *Source:* compiled by the authors according to Knolle et al. (2021)

health, the better it actually is[1]. Consequently, home office and mental health are positively correlated.

- Sports and mental well-being of respondents positively correlate.
- The younger the individual, the worse the mental state currently is (as of the survey).
- Over time, mental health deteriorated on average in the sample (according to the sign of the correlation coefficient between the survey wave number and the mental health indicator).
- On average, individuals living with children rated their mental health worse during the pandemic.
- Respondents with higher education were less likely to be dismissed, and they also assessed their mental state at a higher level.
- The presence of a confirmed diagnosis or symptoms of COVID-19 negatively correlates with the mental health of respondents.

We also plotted the distribution density of the mental health indicator to compare respondents who worked remotely and from the office during the pandemic. They show that the mental state of people who worked from home is better than that of those survey participants who did not change the format of work (see Figure 2 and Figure 3).

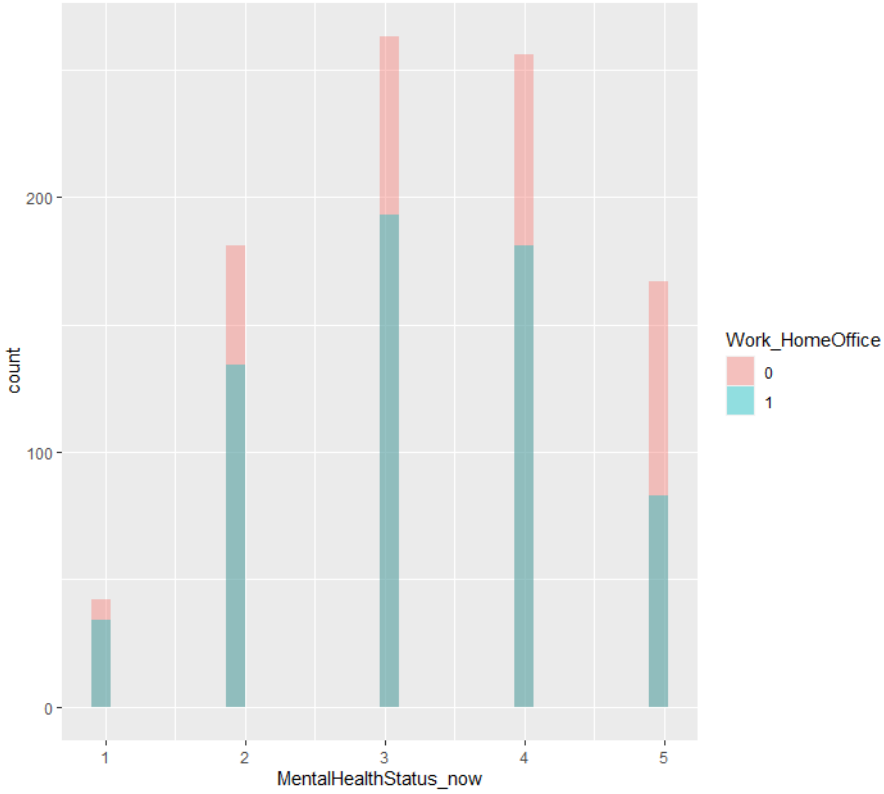

Figure 2. Distribution density of the mental health indicator for respondents who worked remotely and from the office during the pandemic. *Source*: compiled by the authors according to Knolle et al. (2021)

1 The scale varies from 0 to 5, where 0 is excellent mental state, 5 is very bad.

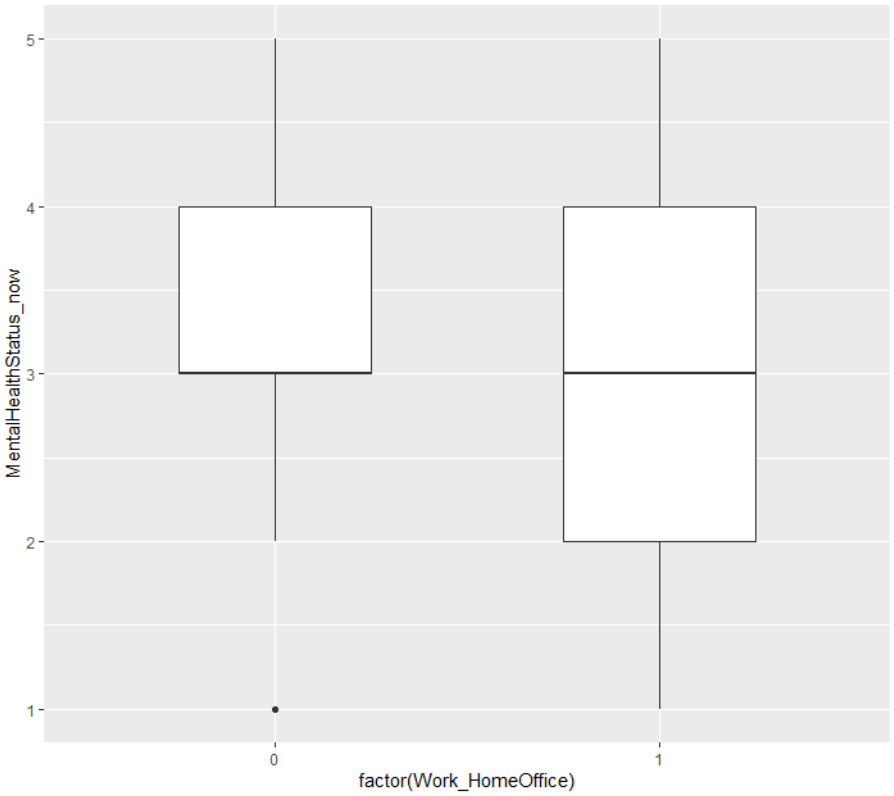

Figure 3. Box plot of mental health indicator for respondents who worked remotely and from the office during the pandemic (1- people who worked from home, 0 - people who did not change work format). *Source*: compiled by the authors according to Knolle et al. (2021)

Models

Having studied the entire econometric apparatus in the scientific literature on related topics, we came to the conclusion that it is worth starting the work with a linear regression constructed be means of the least squares method.

Taking the mental state of an individual as a dependent variable, we set all other variables as regressors (except for the individual participant number and the observation code). After checking them for multicollinearity, we found out that it is missing from the data, since all the obtained VIF coefficients are less than 5 (see Table 2).

It should also be noted that despite the low value of the VIF coefficient, it is necessary to more accurately disclose the definition of the variables "overtime" and "reduction of hours of work" and justify their simultaneous inclusion in the model. At first glance, if an individual had a decrease in working hours (Work_ReductionHours = 1), then it can be concluded that there is no overtime work (Work_Overtime = 0). Conversely, if an individual worked overtime (Work_Overtime = 1), then he did not have a decrease in working hours (Work_ReductionHours = 0). However, there are other combinations of these two variables: an individual can get a formal limitation of working hours (Work_ReductionHours = 1), but in fact overwork relative to the specified limitation (Work_Overtime = 1) and vice versa.

It follows that there is no unambiguous relationship between the combinations of values of these variables. Accordingly, there is no linear relationship between the variables, and the both should be included in the model.

Then we improved the model based on the Akaike criterion, obtaining an optimal set of regressors and an MLS model. We also conducted a model comparison test and received a p-value of 0.8778, which means that at all levels of significance, the "short" model is more accurate (the corresponding screenshot of the console in R is given in Appendix 2. **Statistical tests**)

However, such a model may be incorrect, since there may be a temporary effect due to the presence of several waves of the pandemic, which is reflected in the Timepoint variable. Therefore, we introduce models with random and fixed time effects into the analysis. After conducting the necessary tests to compare all the models, we found out that the model with random effects is optimal from an econometric point of view (see Table 3).

We also conducted a series of tests for heteroscedasticity for all models, according to the p-value of which (3.315e-06 for MLS; 4.206e-07 for FE and 4.206e-07 for RE, the screenshots are also given in Appendix 2. **Statistical tests**) it is advisable to use robust standard errors to determine the significance of variables and test hypotheses. Then we formed a summary table with the evaluation results of all three models (see Table 4).

Let's give a statistical interpretation to some variables in a model with random effects:

- There is a causal relationship between the indicator of mental state and the format of work: all other things being equal, the indicator of mental health is on average 0.1 better for respondents who worked remotely from home as compared to those who did not switch to the remote format.

Table 2. Multicollinearity Check

Timepoint	Suspected_Co19	Work_NoChange
1.045866	1.029186	1.372785
Work_HomeOffice	Work_ReductionHours	Work_UnpaidLeave
1.370682	1.083768	1.019067
Work_LostJob	Work_Overtime	Children_atHome
1.078923	1.0966614	1.055766
Exercise	gender_2	age
1.060835	1.013172	1.156627
Country_residency	Highest_education_self	MentalHealthStatus_BeforeCo19
1.067035	1.083099	1.047809

Source: compiled by the authors according to Knolle et al. (2021)

Table 3. Results of Model comparison tests

Name of the test	p-value	Result
Breusch-Pagan Test (MLS or FE)	0.9409	The MLS model is better
F test (RE or MLS)	< 2.2e-16	A model with random effects is better

Source: compiled by the authors according to Knolle et al. (2021)

Table 4. Results of evaluation of pool regression models, with fixed and random effects

	Dependent variable:		
	MentalHealthStatus_now		
	OLS	panel linear	
	Pooled	FE	RE
	(1)	(2)	(3)
Timepoint	022***		
	(0.03)		
Suspected_Co19	0.15**	0.15***	017***
Work_HomeOffice1	-0.10*	-0.13**	-0.10**
	(0.06)	(0.06)	(0.05)
Work_ReductionHours	0.22**	0.25**	0.20**
	(0.09)	(0.12)	(0.09)
Work_LostJob	0.22	0.26*	0.26
	(0.15)	(0.15)	(0.17)
Work_Overtime	0.16*	0.10	0.13
	(0.09)	(0.06)	(0.08)
Children_atHome	0.15***	0.18***	0.16***
	(0.05)	(0.01)	(0.03)
Exercise	-0.10***	0.10***	0.11***
	(0.02)	(0.02)	(0.004)
age	-0.01***	-0.01***	-0.01***
	(0.002)	(0.003)	(0.002)
Highest_education_self	-0.25***	-0.33***	-0.26***
	(0.07)	(0.07)	(0.04)
MentalHealthStatus_BeforeCo19	0.40***	0.34***	0.38***
	(0.03)	(0.03)	(0.05)
Constant	2.21***		2.93***
	(0.17)		(0.31)
Observations	1,470	1,470	1,470
R^2	0.22	0.18	0.19
Adjusted R^2	0.21	-0.30	0.19
Residual Std. Error	0.99		
F Statistic	37.12***	19.81***	350.21***
Note:	*p<0.1;	**p<0.05;	***p<0.01

Source: compiled by the authors according to Knolle et al. (2021)

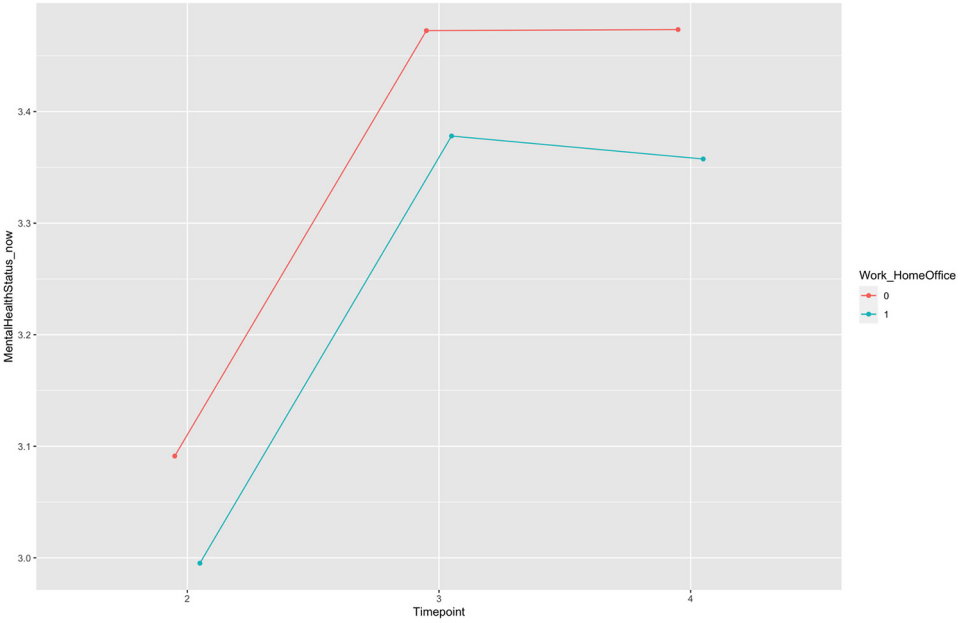

Figure 4. Chart of the dynamics of the average value of the mental health indicator for two groups of respondents, depending on the wave of the survey. *Source:* compiled by the authors according to Knolle et al. (2021)

For a more detailed study, we plotted the dynamics of the average value of the mental health indicator depending on the survey wave for those who worked remotely from home all this time, and those who worked from the office (see Figure 4).

The effect of time and the tightening of covid restrictions during the third wave of the survey is clearly traced here: there is a significant deterioration in the average value of the mental health[1] index for both groups. The further dynamics of the indicator is also interesting: in the fourth wave of the survey, respondents who worked remotely noted an improvement in their mental state by 0.019. Most likely, this is due to the fact that people have adapted to the new format of work during the introduction of restrictions, and some employers have also begun to realize the problem of the mental health of employees and implement stimulating policies. So, to improve their workers well-being many companies launched pulse surveys of their staff mental state, which resulted in educational workshops and trainings conducted by company employees and invited speakers, more online meetings, including informal ones, and psychological services.

The situation among those who worked at the office is the exact opposite: during the strengthening of the lockdown, due to the lack of relevant experience, they could not adapt to the changed conditions, which made them feel more depressed in the future: the average for this group increased by 0.005 units during the transition from the third to the fourth wave. All these conclusions are confirmed by the dynamics of the group averages in the context of the survey waves (see Table 5).

1 The value of the mental health indicator was evaluated on a scale from 0 to 5, where 0 – excellent condition, 5 – very bad

Table 5. Dynamics of averages by groups in the context of survey waves

	Timepoint = 2 10/09/2020 – 18/10/2020	Timepoint = 3 10/01/2021 – 07/02/2021	Timepoint = 4 01/05/2021 – 31/05/2021
Average value of the mental health index for those who worked remotely.	2.990	3.378	3.359
Average value of the mental health index for those who worked at the office.	3.085	3.468	3.473

Source: compiled by the authors according to Knolle et al. (2021)

Let us turn to the meaningful interpretation of the obtained coefficients. Here it is also worth noting that the conclusions concerning the interpretation of the remaining variables apply to both formats of work in the pandemic.

- There are no statistically significant differences in the indicator of mental health depending on gender.
- There is a causal relationship between the indicator of mental state and the age of employees: all other things being equal, with an increase in age per unit, the indicator of mental health improves by an average of 0.01. This conclusion coincides with the results of studies on related topics that were conducted earlier.
- There is also a connection between the presence of children in the household and the indicator of mental well-being: other things being equal, individuals with children rated their mental health on average 0.16 worse than individuals without children. It is probably more difficult to maintain a work-life balance with children.
- The indicators of physical activity and mental health of an individual are also interrelated: other things being equal, with an increase in the number of sports activities per week, one's mental health improves by an average of 0.11. Indeed, sport is an effective way to deal with stress.
- Interestingly, all other things being equal, individuals with higher education assessed their mental state on average 0.26 better than individuals without higher education.
- In addition, other things being equal, individuals who had a confirmed diagnosis of COVID-19 or its symptoms rated their mental health on average 0.17 lower, which is due to the direct effect of the disease on the nervous system.

This approach may still be unreliable, since the number of values that the dependent variable can take is finite. This method does not guarantee that the estimate of the dependent variable will be strictly in the range from 1 to 5. Therefore, we turned to another method that is often used in this kind of research — ordered logistic regression (see Table 6). We also decided to build 3 models for each of the survey waves in order to study the effect of the remote format of work that interests us.

To interpret the coefficients, we used a graphical method to understand the impact of the work format on the probability of what level of mental health the respondent had in a particular wave of the survey.

So, if we consider the second wave of the survey, we can say that for those who worked remotely from home in the autumn of 2020 the probability of having a better mental state score turned out to be higher on average, other things being equal (see Figure 5). However, it should be noted that during this period, all employees, regardless of the format of work, on average assessed their mental well-being as "normal".

Table 6. Evaluation of ordered logistic regression models for 3 survey waves

	Dependent variable:		
	MentalHealthStatus_now		
	(1)	(2)	(3)
Suspected_Co19	0.31	0.39**	0.16
	(0.23)	(0.20)	(0.21)
Work_HomeOffice1	-0.16	-0.04	-0.30*
	(0.18)	(0.17)	(0.18)
Work_ReductionHours	0.23	0.61**	0.29
	(0.30)	(0.26)	(0.37)
Work_LostJob	1.35**	0.53	0.01
	(0.55)	(0.36)	(0.44)
Work_Overtime	0.01	0.43*	0.59*
	(0.26)	(0.25)	(0.33)
Children_atHome	0.20	0.13	0.36**
	(0.19)	(0.17)	(0.18)
Exercise	-0.19**	-0.17**	-0.18**
	(0.09)	(0.07)	(0.08)
age	-0.01	-0.01**	-0.02***
	(0.01)	(0.01)	(0.01)
Highest_education_self	0.01	-0.52***	-0.39*
	(0.26)	(0.20)	(0.23)
MentalHealthStatus_BeforeCo19	1.40***	0.62***	0.67***
	(0.11)	(0.09)	(0.09)
Observations	467	528	475
Note:	*p<0.1;	**p<0.05;	***p<0.01

Source: compiled by the authors according to Knolle et al. (2021)

As for the third wave of the survey (see Figure 6), in the winter of 2021, the proportion of people assessing their mental health as "good" and even more so "very good" was small and decreased compared to the second wave of the survey, and the proportion of those assessing it as "bad" is quite large and increased significantly compared to the previous period. Moreover, such a pattern can be traced for both groups of workers. It seems to us that this can be explained by the fact that the third wave of the survey is the period of the most severe covid restrictions in the countries studied, when the format of remote work became a forced measure taken by companies. Employees had to find a new model of work and life in the current situation and readjust.

In May 2021, people working remotely from home adapted to the new format. Most employees found a new, most comfortable model of work and interaction within the company. Of course, as we suppose, organizational and technical solutions of personnel management specialists played a major role. As a result, looking at the graph, we can say that those who worked remotely from home in May 2021 are more likely to have a better mental state indicator, on average higher, other things being equal (see Figure 7).

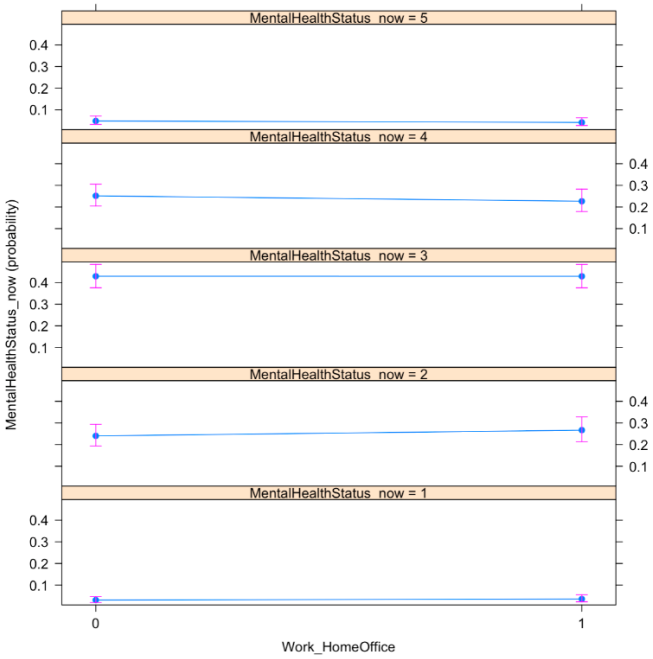

Figure 5. Graphical interpretation of coefficients for the respondent's mental health indicator in the second wave of the survey. *Source*: compiled by the authors according to Knolle et al. (2021)

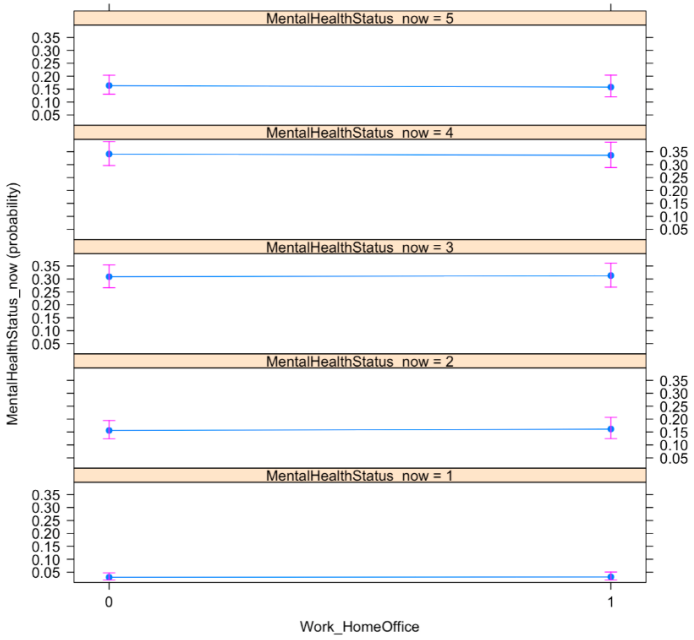

Figure 6. Graphical interpretation of coefficients for the respondent's mental health indicator in the third wave of the survey. *Source*: compiled by the authors according to Knolle et al. (2021)

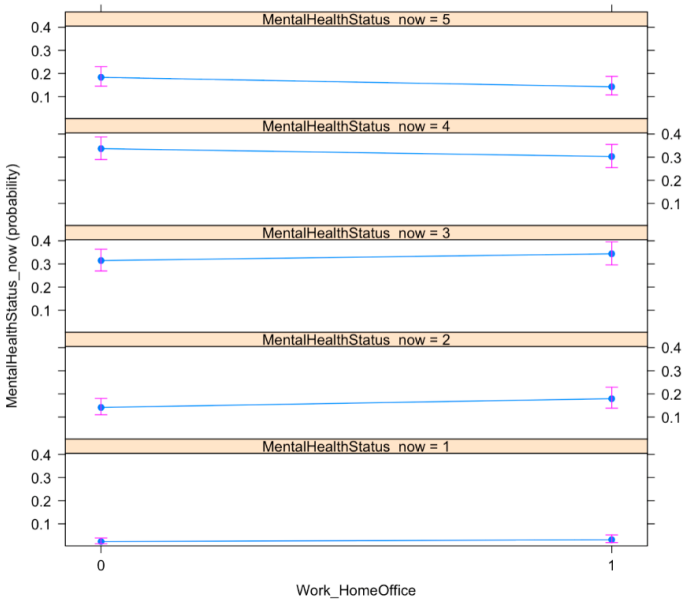

Figure 7. Graphical interpretation of coefficients for the mental health indicator of the respondent in the fourth wave of the survey. *Source*: compiled by the authors according to Knolle et al. (2021)

Results

The COVID-19 pandemic has led to the spread of remote work as a response to government measures to limit the increase in the incidence of the population. Our study was aimed at examining the effect of the remote format of work during the pandemic on mental health of workers from Germany and the UK. We were able to demonstrate that there is a causal relationship between the mental health of respondents during the pandemic and their work format. While noting that here we were interested in investigating the only significant effect for each moment of time in order to interpret it more correctly. In comparison with the pre-pandemic period, respondents assessed their mental state worse. However, those who worked remotely from home and over time got used to the new format of work, adapted better to the COVID-19 crisis, and began to note an improvement in their mental health compared to those who continued to work at the office. All this enables asserting that the purpose of our research has been achieved.

Besides, at the beginning of our work, we put forward a number of hypotheses to be tested while working on various econometric models (remarkably, that they all give consistent results, which enables bringing up the stability of the results):

1. In a non-standard situation and forced shift to a remote work format, the home office did not have a negative impact on the mental state of employees. On the contrary, during periods of severe restrictions, they, having used to this format of work, assessed their mental health at a higher level than those for whom it was new. In addition, they were not at risk of getting sick while traveling to and from work, that also reduced mental pressure.

2. There is no statistically significant influence of the gender identity of individuals on adaptation to a new format of work in the pandemic.
3. We managed to confirm our hypothesis about the temporary effect of switching to a remote work format, the stuff of it has already been disclosed in the first item.
4. Our hypothesis about the age of the respondents was not confirmed either. On the contrary, young employees perceived the abrupt transition more negatively.

Discussion

In December 2021, in-depth interviews were conducted with HR managers of Russian branches of six large international companies as part of a project on the impact of remote work on health and productivity of employees in the pandemic. It is worth noting that these were mainly companies from the IT sector, but the surveys were conducted anonymously, so more detailed information is not provided in the text of the paper.

While interviewing, were conducted periodic pulse surveys to measure the indicator of mental health. The results showed that during the first lockdown, due to the transition to a remote work format, employees faced a deterioration in their mental state and needed additional psychological help. This trend forced HR managers and company executives to promptly implement new measures to support employees:

- including psychological consultations on both work and personal issues in the social package;
- distributing awareness about the importance of mental well-being and drawing attention to this problem. In particular, at group general meetings, along with business goals, it is necessary to emphasize the value of each employee and the importance of contacting the executive or HR manager in case of burnout signs;
- conducting educational programmes on the topic of mental health: courses on the definition of burnout and counteracting it, trainings and various lectures on psychological well-being and ways to preserve it;
- maintaining the organizational culture of the company, addressing its goals and priorities. The companies having done this before, realized the need to do it even more often (once a quarter) in order to maintain a sense of employee involvement despite on WFH in the pandemic;
- arranging virtual focus groups to identify certain trends relating to employee psyche and to understand what is important for them. The goals of organizational decisions determined, the programmes in the most relevant areas should be implemented in time.

And then, after determining the goals of organizational decisions, the timely implementation of the programs themselves in the most relevant areas.

According to pulse surveys conducted at companies, all these measures, as well as employee adjusting to the new work format, had a positive impact on mental health of the staff. Of course, the experience of the pandemic revealed the need to monitor the condition of employees, including mental one. Following the need some companies employed specialists for monitoring the development of the employee well-being indicator to minimize any possible risks.

It is important to note that in the companies which had spelt out the rules for remote work even before the pandemic, the model of manager – subordinate interaction hardly

changed. In fact, the employees turned out to be ready to switch to the new format, because all the methods of interaction, remote information systems and online access had been worked out. However, despite the chance of WFH before the pandemic, almost none of the employees had used it for two reasons:

1. employees did not see any advantages of the remote format of work for them;
2. managers did not trust their subordinates and faced problems with monitoring the way of implementation of assigned tasks.

After the experience of working remotely during the pandemic, the results of the surveys revealed that both employees and managers would prefer a hybrid work format. The decision to maintain the hybrid format, in turn, will help to optimize office spaces, reduce their maintenance costs and introduce a "hot desk" system, i.e. instead of a fixed workplace, the employee occupies a vacant one.

The following offers the recommendations developed on the bases of companies' experience and the research aiming at improving the organization of labour in remote format:

1. provide employees with a flexible work schedule to improve the balance between personal life and work in a remote format. As the conducted research shows, good balance building between work and personal life has a positive effect on employee mental well-being, that in turn increases their job satisfaction and productivity.
2. it is important to identify specific goals and set clear tasks to be completed. A specific work plan helps employees to concentrate on the work and cope with it better.
3. it is necessary to determine the contribution of each employee individually and fix his movement towards his goal set. More attention should be paid to the individuality of each employee, because there are people who prefer a hands-off approach of their managers and those, preferring a hands-on approach. The task of the manager is to identify these people and provide them with better environment for them to find most effective and efficient solution while completing their tasks In any case, the manager is responsible for the productivity of the team.
4. in addition, it is worth holding meetings of colleagues more often in order to maintain the organizational culture of the company. This practice helps to increase the level of employee engagement, because they feel involved in the main mission of the company and its development strategy.
5. ensure proper training of employees, conducting trainings and webinars aimed at developing digital literacy, personal growth, competent organization of working hours and places in a remote work format, as well as improving and maintaining mental health.
6. periodically remind employees about maintaining healthy habits, such as discipline, an active lifestyle, proper nutrition, water balance and sleep patterns.

It should be noted that the proposed recommendations on personnel policy are not universal, since the measures taken to support the mental health of the young able-bodied population differ from the measures aimed at maintaining the mental health of workers of older age groups. The separation of recommendations and the analysis of their heterogeneous effects is a field for further research, since this issue requires a more detailed analysis in terms of the perception of various age groups of certain measures to maintain the mental well–being of employees. Moreover, the introduction of such events is also closely related to the corporate culture of the organization.

Conclusions

This study examined the introduction of a remote work format as a response strategy to the COVID-19 pandemic and its impact on the mental health of employees.

The abrupt transition to a new remote format had negative consequences for company personnel, since most employees and employers had experienced remote work for the first time. So, in the course of the conducted research, it turned out that employees faced burnout, loss of balance between work and personal life, as well as a sense of involvement and belonging. All these problems are actualized in the context of global competitiveness due to the rethinking of the value of human capital.

Under the current conditions, it is important for executives and HR managers of companies to adopt new organizational and technical solutions in order to use all the advantages and minimize the negative consequences of remote work for the well-being of remote workers.

Within the framework of this paper, we examined modern studies, affecting the issues of the relationship between the mental health of employees and the transition to a remote work format. Besides, by means of econometric modeling, we revealed the relationship between the variables of our interest, and tested a number of hypotheses.

In conclusion, we would like to outline the prospects for further research on this topic: the fact is that the accuracy indicators in the models we have obtained are quite small. It seems to us that this may be due to the omission of significant variables that, because of the limited data set, could not be added to the analysis: for instance, an individual's monthly income, the level of interpersonal communications, the atmosphere in the working team, the availability of supportive measures to adapt to the new reality from the employer (online teambuilding), relationships within the household, the level of physical health of the respondent, since it has been scientifically proven that the quality of body health affects the mental health of an individual, the size of the household and other variables that could potentially be significant.

We cannot but note some problems and limitations of the study: in addition to the possible omission of significant variables, which is discussed in the section on the logistic regression model, there are following limitations:

- voluntary completion of the survey can be a source of bias in the data;
- self-assessment of mental health can generate endogeneity;
- regional differences: the fact is that the professional community of Germany and the UK often used the practice of remote work or home office before the pandemic period, while Russian employers for the most part had a fundamentally different task: to organize a completely new format of work within a short time in a way that the resulting system would support workflows at the same level of quality as in the pre-crisis period.

From our point of view, conducting this kind of research (even in a post-covid reality) will allow employers to understand their employees more accurately and develop appropriate measures to stimulate their effective work.

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Appendix 1. Description of variables

№	Variable name	Decoding
1.	Timepoint	Time of surveys for data collection 1, if the observation belongs to the “Spring 2020 survey”: 27/04/2020 - 31/05/2020, 2, if the observation refers to “Autumn 2020 survey”: 10/09/2020 – 18/10/2020; 3, if the observation refers to “Winter 2021 survey”: 10/01/2021 – 07/02/2021; 4, if the observation refers to “Spring 2021 survey»: 01/05/2021 – 31/05/2021
2.	Participant_Nr	Individual number of the survey participant

№	Variable name	Decoding
3.	Consent	Consent to processing of personal data 1, if they gave consent to data processing 0, if they did not give consent in the first wave of the survey 2, they did not give consent in subsequent waves
4.	Suspected_Co19	The fact of contracting COVID-19 Binary variable, equal to 1 if the respondent has a positive test result, the presence of symptoms or a virus is diagnosed, and 0 otherwise
5.	Work_NoChange	No changes in work format A binary variable equal to 1 if the format of the work has not changed, and 0 if it has changed
6.	Work_HomeOffice	Remote work format Binary variable equal to 1 if the individual switched to a remote work format, and 0 if not
7.	Work_ReductionHours	Reduction of the individual's working hours A binary variable equal to 1 if the individual's working hours have decreased, and 0 if not
8.	Work_UnpaidLeave	Binary variable equal to 1 if the individual was sent on forced unpaid leave, and 0 if not
9.	Work_LostJob	Binary variable equal to 1 if the individual lost his job, and 0 if not
10.	Work_Overtime	Binary variable equal to 1 if the individual worked overtime, 0 if not
11.	Children_atHome	Binary variable equal to 1 if the individual has children living with him and 0 if not
12.	Exercise	Number of days per week that an individual devoted to physical activity
13.	gender_2	Variable responsible for the gender of the participant: 1, if female 0, if male 3, if non-binary
14.	age	Age of the participant
15.	Country_residence	Respondent's country of residence 1 if the respondent lives in the UK 0 if the respondent lives in Germany
16.	Higher_education_self	Education of the individual: 1, have a higher education 0, otherwise
17.	MentalHealthStatus_BeforeCo19	The parameter of the respondent's own mental health before the pandemic 1 - excellent mental health 2 - very good 3 - good 4 - normal 5 - bad

№	Variable name	Decoding
18.	MentalHealthStatus_now	The parameter of his mental health assessed by the respondent himself at the moment is 1 - excellent mental health 2 - very good 3 - good 4 - normal 5 - bad
19.	Code	Individual surveillance code

Source: compiled by the authors

Appendix 2. Statistical tests

Short versus Long test for the MLS model

Analysis of Variance Table						
	Res. Df	RSS	Df	Sum of Sq	F	Pr (>F)
1	1458	1421.0				
2	1454	1419.9	4	1.1732	0.3004	0.8778

Test for comparing the MLS model and regression with fixed effects

F test for time effects		
F=0.88533	df1=526, df2=932	p-value = 0.9409
alternative hypothesis: significant effects		

Test for comparing models with random effects and MLS models

Lagrange Multiplier Test (Breusch-Pagan)		
chisq=487.97	df=1	p-value < 2.2e-16
alternative hypothesis: significant effects		

Heteroskedasticity tests (m2 - MLS, m3 - FE, m4 - RE)

	m2 - MHK	
BP=45.939	df=11	p-value=3.315e-06
	m3 - FE	
BP=48.924	df=10	p-value=4.206e-07
	m4-RE	
BP=48.924	df=10	p-value=4.206e-07

Appendix 3. HR Managers Survey

We, students of the Faculty of Economics of Moscow State University, are working on a project on the impact of the remote format of work on the health and productivity of employees during the pandemic. We are interested in real cases and measures taken by companies within the framework of this topic. The interview consists of three sections: questions about physical and mental health as well as productivity of employees. Then, we suggest you familiarize yourself with an approximate list of questions. We guarantee the anonymity of the data received.

First, please tell us about your company and the position you hold. In which HR department (if there is a division) do you work? What functions do you perform?

Which of the three sections of the interview is closer to you? Which ones do you directly relate to in your work? What kind of information do you possess? Do you have any data from colleagues?

Section dedicated to the physical health of employees

- Is the issue of physical health of employees important for your company? Do you have corporate insurance?
- Does your company measure the physical health of employees?

If the respondent answered affirmatively, the following questions were asked:

  - How is this indicator measured?
  - Do you conduct employee surveys?
  - Is there a record of the number of sick days and calls for voluntary medical insurance?

- Have you noticed any changes in the physical health of your employees during the pandemic? Did they differ during the introduction of the first lockdown and subsequent ones?

If the respondent answered affirmatively, the following questions were asked:

  - How did you notice that? Have there been any changes in health, behaviour, productivity? Has the number of sick days and voluntary medical insurance appointments increased?
  - Did these changes differ depending on the gender and age of the employee?
  - Were the changes positive or negative? What factors influenced this?

If the respondent answered that the changes were negative, then the following questions were asked:

  - How did you counteract them? What events were held and how effective were they?

- Have you given any recommendations on equipping a home office?
- Have you provided office equipment for the employee's home?
- Have you covered the expenses of employees incurred in connection with the transition to remote work?
- What is included in VMI? Has its content changed after the start of the pandemic?
- Have you carried out measures to encourage vaccination?

Section dedicated to the physical health of employees

- Is the issue of physical health of employees important for your company?
- Does your company measure mental health of employees?
  - How is this indicator measured?
- Is a psychologist included in VMI? Do you conduct surveys about the mental state of employees?
- Have you noticed any changes in the physical health of your employees during the pandemic? Did they differ during the introduction of the first lockdown and subsequent ones?

- How did you notice that? Have there been any changes in health, behaviour, productivity? Did they differ among employees of different genders and ages?
- Were these changes positive or negative? What factors influenced this?

If the respondent answered that the changes were negative, then the following questions were asked:

- How did you counteract them?
- What events were held and how effective were they? How often do you communicate with your employees?
- Did you give instructions on switching to a remote format during the first lockdown?
- How do you cope with the loss of a sense of belonging among employees?
- Have you conducted events/trainings to recreate the psychological field and external stimuli of employee motivation at home (by field we mean the external environment that activates the desired mental state)?
- Is there any information about employees who are at risk due to the housing and family factor (presence of children, elderly relatives)? Have they received special support?

If the respondent answered that the changes were positive, then the following questions were asked:

- How did you maintain the health of employees? Have you held online meetings, team building trainings?

Section dedicated to employee productivity

- Does your company measure the physical health of employees?
  - How is this indicator measured?
- Has the productivity of employees changed after switching to remote work and in which direction? Did the results of the employees' work in the first lockdown and subsequent ones differ?
  - What do you associate the increase/decrease in employee productivity with?
  - Have employees started working after hours: early in the morning and late at night, at weekends?
- Has the employee-subordinate interaction model changed?
- Has the process of monitoring the fulfillment of tasks, the effectiveness of the employee and his work schedule changed?
- Have you provided a structured work plan for the day?
- What time is considered working, when and how does an employee report on the work done, through what channels does he interact with the employer?
- Has the remuneration of labour (from fixed to piecework) changed due to the transition to a remote format?

Final question

- What would you prefer for your employees in the future in the absence of a pandemic: remote/hybrid /full-time format of work?

Information about the authors

- Marina O. Gorshkova bachelor student of the Faculty of Economics of Lomonosov Moscow State University, Moscow, 119991, Russia. Email: gorshkova_mo@gkl-kemerovo.ru
- Polina S. Lebedeva bachelor student of the Faculty of Economics of Lomonosov Moscow State University, Moscow, 119991, Russia. Email: poljalebedeva@yandex.ru