

## IMPACT OF COVID-19 PANDEMIC ON THE WORKLOAD AND HOME OFFICE IN SOME EUROPEAN COUNTRIES

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**Abstract.** The spread of a new and unknown viral infectious disease named the Covid-19 pandemic paralysed world without any preparation time. It has significantly changed approaches to organizational management as well as HR policy. Governments have taken immediate measures to address the challenges caused by the COVID-19 pandemic, including protecting jobs, providing financial support to businesses and households experiencing a sharp drop in income. Based on a 4-country-wide European questionnaire survey, increase in workload, fear, and teleworking have been examined with attitude research and linear modelling. As results, authors found that the same epidemic in each country led to different workload increases and affected subordinates and non-subordinates, and women and men to different degrees. Among the effects of the crises caused by the pandemic, the increase in workload is the most significant. That must be taken into consideration in the HRM policy. The most important finding is that the increasing frequency of remote work to a certain extent can be considered as innovation. The nature of the research conducted on basis of four European countries can contribute to the future development of scientific study related the solution of similar problems in HR management and labour organization.

**Keywords:** economic crisis, home office, human resource management, pandemics, workload.

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### Author contributions

JP and AT collected data, BGK made statistical analysis, NP-N and AT collected relevant literature resources. JP and BGK interpreted results of analysis; NP-N was responsible for discussion and conclusions.

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## INTRODUCTION

The coronavirus (COVID-19) epidemic ended one of the longest periods of continuous growth in economic history in 2020. This recession is different from the previous ones, as it was not caused by overproduction, over-lending or loss of investor confidence, but by COVID-19, which directly attacks the human factor. Initially, the only possible defense was to limit personal direct contact. Because of this, many workplaces have closed or, at best, moved to the online space. The biggest losses were in the tourism, hotel and hospitality sectors and commerce that was unable to transition online (Coldiretti, 2020; Forbes, 2020). To compensate for lost income, states introduced fiscal rescue

packages and strengthened the social safety net (Laborde et al., 2020), and companies tried to help their employees by reorganizing working hours and teleworking. The spread of remote work, which was previously rare and considered an innovation in many sectors, has led to changes in the labor market.

The purpose of the study is to get precise information on the impact of the pandemic on workload and teleworking in its peculiar demographic and geographic breakdown.

In the research, the authors examined the change in workload and the effects of remote work in four European countries, which differ from several points of view. Reviewing the literature, the authors found that even within a continent, significant differences can be seen between individual countries in terms of the effects of the same epidemic. However, there was no any comprehensive analysis that provides a complex overview of the effects of the pandemic on work from several countries and their relationship to several demographic variables (gender, education, position, job characteristics). That was a reason for conducting the study in four European countries.

At the beginning of the study, the following hypotheses have been formulated: H1 - As a result of the epidemic, people's workload changed to a different extent in the examined countries and demographic groups; H2 - In the four countries and demographic groups examined, the frequency of working from home increased to a different extent during the pandemic and the lockdowns.

## THEORETICAL FRAMEWORK

A pandemic always has a long-term recessive effect on economic development. It causes a problem both in the form of loss of production due to the deterioration of health, rising health care costs and the anti-epidemic measures to be taken. The role of human resources management (HR) is particularly important in such situations (Malatyinszki, 2015). Namely, because the economically developed countries have already reached the level at which the basis of efficient economic growth is not additional capital investment, but added human value, the so-called human capital. The theory of human capital and the role of economic growth based on the human factor were discovered in the second half of the last century by researches that have since been awarded the Nobel Prize (Fogel, 1994; Schultz, 1961, 1980). Today, the most important aspect of the theory is that the human factor plays the main role in increasing the competitiveness of developed economies.

As part of the Hungarian KoronaHR project, several surveys were conducted on the impact of the epidemic on human factors and human resource management (HRM) during the various phases of the pandemic (Poór, Balogh, Dajnoki, Karoliny, Kun, et al., 2020; Poór, Balogh, Dajnoki, Karoliny, & Szabó, 2020; Poór, Balogh, et al., 2021; Poór, Dajnoki, et al., 2021). Based on this, the three most common measures served to protect health and the social situation, as well as the use of remote work as an innovative solution in every possible case (Figure 1).

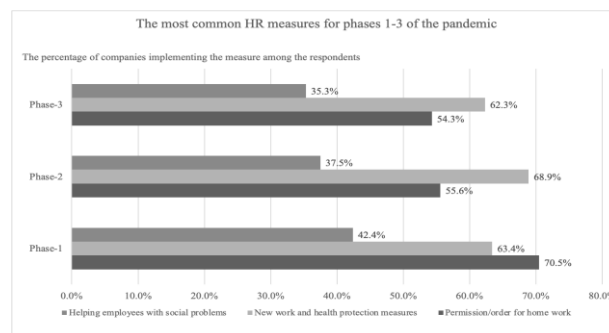


Figure 1. The most common HR measures for phases 1-3 of the pandemic (Source: authors own)

The most difficult task in keeping jobs was that due to the closures to prevent the explosive spread of the infection, getting to the workplace and keeping a distance during work or personal contact with customers was a particularly big problem (Koh, 2020). Telecommuting is considered to be an innovative solution because the most common HRM strategy in previous crises was downsizing and cost reduction. Together with remote work, the role of digitization and robotization has grown, but the importance of localization has also increased (Bagó, 2020). At the same time, according to surveys, telecommuting did not lead to the strengthening of family relationships but made it more difficult to separate work and private life (Moran, 2020). Worldwide, the workload and the resulting frequency of psychological problems and burnout among both employees and managers have increased (Baska, 2020). The appearance of the negative effects of remote work also draws attention to the fact that short-term decisions made in emergency situations, in addition to immediate solutions, can also have effects that cannot always be properly assessed in the long term.

## METHODOLOGY

To verify their hypotheses, the authors conducted attitude research (Gajar, 1983; Stebbins, 2001), with a self-edited questionnaire containing well-defined answers, designed for quantitative research (Cameron & Price, 2009). Although online surveys are increasingly popular due to their cost-effectiveness, the questionnaire was prepared offline (Gunter et al., 2002). When compiling the questions, it was an important aspect that the questionnaire was appropriate in terms of research ethics. This was ensured by the application of the ethical rules of medical research (Leeuw et al., 2008) to one's own research (Leavy, 2020), and by taking into account the recommendations of the APA Scientific Board (Cherry, 2020). Therefore, the selection of the queried demographic variables was done in consideration of the preservation of anonymity. Also based on ethical considerations, the authors ensured the voluntary and anonymous nature of the filling.

The questionnaire consisted of groups of questions containing a total of 19 statements. In addition to the demographic characteristics (age, gender, place of residence, position), one group of questions was about the development of the workload, and one about the more complicated working conditions. A separate group of questions assessed the decrease in income due to the pandemic, the fear of infection at work and the trend in the frequency of remote work. Among these, the present study focuses on the evolution of workload and the evolution of the frequency of remote work.

The survey countries were selected so that the sample included EU member states and third countries, countries from the western and eastern half of Europe, and northern and southern countries. That is why Hungary, Montenegro, Spain and the United Kingdom were chosen. The respondents were selected using a respondent-driven time space sampling procedure (Heckathorn, 1997; Parsons et al., 2008). Based on the closer interaction and the offline form of the questionnaire, a higher response rate can be expected than the 20-40 percent response rate of online questionnaires (Ilieva et al., 2002). This expectation was indeed met, as 90% of the returned questionnaires were completely filled out. A total of 899 questionnaires were returned from the examined countries in the following breakdown:

- 314 people Hungary (HU),
- 145 people Montenegro (MN),
- 179 people Spain (ES),
- 261 people United Kingdom (ES).

Descriptive statistics of the sample are included in Table 1.

Table 1 Descriptive statistics of full sample

Descriptives	N=899
Gender	
male	574
female	325
Graduation	
basic	32
intermediate	229
advanced	638
Employment relationship	
owner*	83
manager*	308
subordinate	508
Working hours	
complete	654
part time	224
other	21
Employment contract	
indefinite (permanent)	647
fixed-term (contractual)	232
other	20

\* in the following, these two groups are included as one category (with a non-subordinate name) in order to make the sample representative

Given the sampling procedure, the sample is not representative. This problem was corrected by the authors by applying weights, which were based on Eurostat (2021) data. Table 2 contains the weights used.

Table 2. Weights used by the authors

	Non-subordinate		Subordinate	
	Female	Male	Female	Male
Hungary	0.5087	0.7760	1,7730	0.8594
Montenegro	0.2640	0.4028	1,6597	3,8926
Spain	0.7545	0.5242	2,0832	0.8941
United Kingdom	0.5087	0.7760	1,7730	0.8594

Source: authors own calculation based on Eurostat (2021) data

The authors sought an answer to whether the previously detailed demographic variables have an effect and what effect they have on the responses to the 19 statements in the questionnaire. Individual effects and interactions between individual explanatory variables were also examined. Special emphasis was placed on the country as a group-forming criterion. Based on the central limit distribution theorem, the normality of the sample can be assumed from the number of elements in the sample. Therefore, the analysis of covariance (ANCOVA) method was used for the tests. For each investigated statement, a linear model was set up, which included all demographic variables and their interaction with the country as explanatory variables in the first step, and then, eliminating the non-significant variables, only the model in which all explanatory variables were significant was analyzed. An exception to this was made only when two variables alone did not, but their interaction had a significant effect on the outcome variable; in this case, the non-significant individual variable was also included in the final model. The authors performed the quantitative analyzes using R Studio 1.3.1093 and Microsoft Excel 365. The present study only includes an analysis of the results of the responses related to workload (Q1) and telecommuting (Q7). Q1 and Q7 are the number of the given group of questions in the questionnaire.

The initial model for all questions was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_2 + \beta_5 X_1 X_3 + e_i \quad (1)$$

where:

X<sub>1</sub>- Country (HU, MN, ES, UK)

X<sub>2</sub>- Employment relationship (Non-subordinate, Subordinate)

X<sub>3</sub>- Gender (Female, Male)

## RESULTS

Table 3 summarizes the results of the linear model related to workload and the increasing frequency of remote work, and Table 4 shows the partial test results Table 4. The global test results of all models show a significant fit (sig < 0.05). The explanatory power of the workload model is 27.81%, in the case of telework becoming more frequent, this value is 41.93%.

Table 3. The explained variance of the linear models and the partial Eta-square indices of the parameters

Model	R <sup>2</sup>	Country	Employment relationship (ER)	Gender	Country * ER	Country * Gender
Q1	0.2781	0.0307	0.0034	NA	0.1256	NA
Q7	0.4193	0.0843	0.2030	0.0031	0.3822	0.1246

Source: authors' own calculation

Table 4. F-statistics and significance values of the parameters of the linear models. (The parameters and the degrees of freedom of the residual term are shown in brackets.)

Variable	Intercept (1)	Country (3)	ER (1)	Gender (1)	Country * ER (3)	Country * Gender (3)
Q1 (891)	5704.545	110.257	12.867	NA	37.778	NA
sig	<0.001	<0.001	<0.001	NA	<0.001	NA
Q7 (887)	818,753	21,312	537.820	4.046	122.883	3.119
sig	<0.001	<0.001	<0.001	0.045	<0.001	0.025

Source: authors own calculation

Significant (p<0.001) differences can be detected according to countries and positions, and the interaction of these two variables is also significant. As it has been demonstrated, the total explained variance of the model is 27.81%, the interaction (12.56%) is the largest of the significant effects, the effects of the country (3.07%) and the position (0.34%) are much smaller. In the case of countries, there is only a significant difference between Montenegro and the other three countries: in Montenegro, the workload was found to be almost unchanged, while in the other three countries the workload increased significantly.

A significant difference can also be detected by position (Non-subordinates (3.83) generally reported a greater increase in workload than subordinates (3.56). However, this result only actually appears in the case of Montenegro, where the difference between the two groups is the largest. (Non-subordinate: 4.06; Subordinate: 2.35).

Table 5 and Table 6). Non-subordinates (3.83) generally reported a greater increase in workload than subordinates (3.56). However, this result only actually appears in the case of Montenegro, where the difference between the two groups is the largest. (Non-subordinate: 4.06; Subordinate: 2.35).

Table 5. Q1 – Estimated marginal averages of changes in workload by country and position

Q1	ERs	Non-subordinate	Subordinate
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Country	Mean of group	3.83	3.56
HU	3.77	3.53	4.01
MN	3.20	4.06	2.35
ES	3.87	3.77	3.98
UK	3.94	3.96	3.92

Source: authors' own calculation

In Hungary, the opposite can be observed, i.e. the workload of subordinates (4.01) increased significantly more than that of non-subordinates (3.53). In Spain (Non-subordinated: 3.77; Subordinated: 3.98) and the United Kingdom (Non-subordinated: 3.96; Subordinated: 3.92) no significant difference can be detected between the two groups, roughly the same amount of increase in workload (average of 4) was reported (Table 7).

Table 6. The significance values of the deviation of the estimated marginal averages of the workload responses between each job group by country and in the entire sample

ER	All	HU	MN	ES	UK
Non-subordinate – Subordinate	<0.001	<0.001	<0.001	0.202	0.773

Source: authors' own calculation

Table 7. Significance values of the differences of the estimated marginal averages of the responses between individual countries by position and in the entire sample

Country	All	Non-subordinate	Subordinate
HU – MN	<0.001	0.031	<0.001
HU – ES	0.769	0.594	0.978
HU – UK	0.247	0.039	0.677
MN – ES	<0.001	0.505	<0.001
MN – UK	<0.001	0.939	<0.001
ES – UK	0.918	0.721	0.936

Source: authors' own calculation

By comparing the averages of the four countries in pairs, it can be stated that the change in the workload of non-employees in Hungary (3.53) is significantly lower than in Montenegro (4.07) and the United Kingdom (3.96), but it does not differ significantly from the average in Spain (3.77). In the case of subordinates, the average of Montenegro (2.35) shows significant differences from the average of all three other countries (HU: 4.01; ES: 3.98; UK: 3.92). This different relationship in the two groups causes the significant interaction between the two variables.

Table 8. Estimated marginal averages of changes in telework by country and position

Q7	ER	Non-subordinate	Subordinate
Country	Mean of group	0.72	2.03
HU	0.65	-1.1	2.61
MN	1.01	0.40	1.62
ES	2.01	1.84	2.18
UK	1.83	1.95	1.72

Source: authors' own calculation

The increase in the frequency of home work was observed on average in the entire sample. (Table 3 and Table 4) as a result of the pandemic and the closures. Country ( $p<0.001$ ), position ( $p<0.001$ ), the interaction of these two ( $p<0.001$ ) and gender ( $p=0.045$ ) and its interaction with country ( $p=0.025$ ) have a significant effect on the answers to the question. The model has a relatively strong explanation (41.93 %), this is mostly due to the interaction of the country and the position (38.22 %), the position has the second largest effect (20.30 %), followed by the interaction of the country and the gender (12.46 %). the country (8.43%), and finally the gender (0.31%), the effect of which is far below the other stronger effect sizes (Table 9 and Table 10).

Table 9. The deviation of the estimated marginal averages of the change in telework between each position group (significance values per country and in the entire sample)

ER	All	HU	MN	ES	UK
Non-subordinate– Subordinate	<0.001	<0.001	<0.001	0.098	0.123

Source: authors' own calculation

Table 10. Significance values of the deviation of the estimated marginal averages of the change in telework between individual countries by position and in the full sample

Country	All	Non-subordinate	Subordinate
HU – MN	0.040	<0.001	<0.001
HU – ES	<0.001	<0.001	0.001
HU – UK	<0.001	<0.001	<0.001
MN – ES	<0.001	<0.001	<0.001
MN – UK	<0.001	<0.001	0.883
ES – UK	0.495	0.965	0.001

Source: authors' own calculation

No significant difference can be detected between the representatives of the two genders for the entire sample, i.e. there is an increase of the same degree in the case of women and men in terms of how often they worked from home during the pandemic and the lockdowns than before. A more significant but opposite difference can be found in Montenegro (female: 0.86; male: 1.17) and the United Kingdom (female: 2.02; male: 1.65) (Table 11, Table 12 and Table 13).

Table 11. Estimated marginal averages of the result of changes in telework by country and gender

Q7	Gender	Female	Male
Country	Mean of group	1,43	1,32
HU	0.65	0.77	0.53
MN	1,01	0.86	1,17
ES	2,01	2,09	1,94
UK	1,83	2,02	1,65

Source: authors' own calculation

Table 12. Differences in the estimated marginal averages of the change in telework between each gender (significance values per country and in the full sample)

Gender	All	HU	MN	ES	UK
Female–Male	0.133	0.535	<0.001	0.950	<0.001

Source: authors' own calculation

Table 13. Differences in the estimated marginal averages of changes in telework between individual countries (significance values by gender and in the entire sample)

Country	All	Female	Male
HU – MN	0.040	0.969	<0.001
HU – ES	<0.001	<0.001	<0.001
HU – UK	<0.001	<0.001	<0.001
MN – ES	<0.001	<0.001	<0.001
MN – UK	<0.001	<0.001	0.012
ES – UK	0.495	0.975	0.260

Source: authors' own calculation

## DISCUSSION

Overall, among the examined countries, the increase in workload was the largest in the United Kingdom, which primarily affected non-executives, but subordinates also reported a similar increase. There is no significant difference between the two groups. According to the Good Work Index, which examined the topic in April 2020 (CIPD, 2020), three quarters of subordinates and two thirds of non-subordinates complained of increased workload. The average increase in additional burdens is 28 percent, but 44 percent of workers in the key sectors of the epidemic situation (health and social sector, education, public services) complained of significant overload. Spain came in second place in this regard, where, however, compared to the United Kingdom, the workload of subordinates increased, although no significant differences were found between the two groups here either. Spain's second place may also be a consequence of the fact that the country was in a very critical epidemiological situation in the spring and summer of 2020. The general level of the increased workload was determined by literature data at 44 percent, which is almost the same as the workload of the English key sector (Salas-Nicás et al., 2021). In the case of third-placed Hungary and fourth-placed Montenegro, however, a significant difference could be shown between the two groups: in the former, the workload of subordinates increased to a greater extent (they reported the largest increase in workload among subordinates living in the examined countries). In Montenegro, on the other hand, the workload of non-affiliated employees increased more, among the non-affiliated respondents of the four countries, they perceived the increase in workload to be the greatest.

Another peculiarity of the Hungarian situation is that, due to the economic shutdown and restrictions in March, primarily not the workplace, but rather the mental burdens increased, such as fears of unemployment, loss of income, and their negative effects on family relationships (Poór, Balogh, Dajnoki, Karoliny, Kun, et al., 2020; Poór, Balogh, Dajnoki, Karoliny, & Szabó, 2020). One of the most important findings regarding Montenegro is that it had the highest proportion of people working from home among the countries examined, even before the pandemic. It is probably due to this characteristic of remote work that the literature (IJAS, 2020) reports that the workload of those working from home has decreased as a result of the measures associated with the pandemic, while that of other workers has increased. However, the frequency of working from home increased the most in Spain as a result of the epidemic, which can probably be explained mostly by the already mentioned strict lockdown restrictions.

## CONCLUSIONS

The present study focuses on a subfield of a previous larger research, on the change in workload due to the COVID-19 pandemic and the increase in the frequency of remote work, as well as their consequences. The increase in telecommuting is one of the innovations that can clearly be attributed to the impact of the pandemic. It has become an accepted form of work in many sectors where even the professionals did not think of using it before.

The research has been conducted based on the questionnaire consisted of groups of questions related to the demographic characteristics (age, gender, place of residence, position), development of the workload, and the more complicated working conditions caused by Covid19 pandemic. The respondents from Hungary, Montenegro, Spain and the United Kingdom were selected using a respondent-driven time space sampling procedure. The method of sampling and the size of the target group can be considered as limitations of our research - the statistical conditions for evaluation are nevertheless met, given the for the number of elements and normality of the sample as a whole and its individual groups.

The results of the linear model related to workload and the increasing frequency of remote work shows that the total explained variance of the model is 27.81%, the interaction (12.56%) is the largest of the significant effects, the effects of the country (3.07%) and the position (0.34%) are much smaller. In the case of countries, there is only a significant difference between Montenegro and the other three countries: in Montenegro, the workload was found to be almost unchanged, while in the other three countries the workload increased significantly. By comparing the averages of the four countries in pairs, it can be stated that the change in the workload of non-employees in Hungary (3.53) is significantly lower than in Montenegro (4.07) and the United Kingdom (3.96), but it does not differ significantly from the average in Spain (3.77).

As a summary of research results, it can be argued that the examined countries all reacted similarly at the government level, although two fundamental schemes were recognized in governments support: 1) financial aid and compensations for the effects of unemployment; 2) providing subsidies to save jobs and create new ones.

In the field of HR measures, different priorities have been found in each country. The examined countries have in common that the workload of managers has increased and their work has become more complicated.

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## ВПЛИВ ПАНДЕМІЇ COVID-19 НА РОБОЧЕ НАВАНТАЖЕННЯ ТА ДОМАШНІЙ ОФІС У ДЕЯКИХ ЄВРОПЕЙСЬКИХ КРАЇНАХ

**Анотація.** Поширення нового і невідомого вірусного інфекційного захворювання, названого пандемією Covid-19, паралізувало світ без будь-якого часу на підготовку. Ця пандемія суттєво змінила підходи до управління організаціями, а також до кадрової політики. Уряди вжили негайних заходів для вирішення проблем, спричинених пандемією COVID-19, включаючи захист робочих місць, надання фінансової підтримки бізнесу та домогосподарствам, які зазнали різкого падіння доходів.

Це дослідження зосереджується на попередньому більш масштабному дослідженні – зміні робочого навантаження через пандемію COVID-19 та збільшення частоти віддаленої роботи, а також на їхніх наслідках. Зростання віддаленої роботи є одним із нововведень, яке однозначно можна віднести до впливу пандемії. Вона стала прийнятною формою роботи в багатьох секторах, де раніше навіть професіонали не думали про її використання.

Дослідження проводилося на основі анкети, що складалася з груп питань, пов'язаних з демографічними характеристиками (вік, стать, місце проживання, посада), розвитком



робочого навантаження та ускладненням умов праці, спричиненим пандемією Covid19. Респонденти з Угорщини, Чорногорії, Іспанії та Сполученого Королівства були відібрані за допомогою процедури просторово-часової вибірки, керованої респондентами. Метод відбору та розмір цільової групи можна вважати обмеженнями нашого дослідження – статистичні умови для оцінки, тим не менш, дотримані, враховуючи кількість елементів та нормальність вибірки в цілому та її окремих груп.

У результаті проведеного дослідження автори виявили, що одна і та ж епідемія в кожній країні призвела до різного збільшення робочого навантаження і в різній мірі вплинула на підлеглих і неподлеглих, а також на жінок і чоловіків. Серед наслідків криз, спричинених пандемією, збільшення робочого навантаження є найбільш значущим. Це необхідно враховувати в політиці управління персоналом. Найважливіший висновок полягає в тому, що збільшення частоти віддаленої роботи певною мірою можна вважати інновацією. Характер дослідження, проведеного на базі чотирьох європейських країн, може сприяти подальшому розвитку наукових досліджень, пов'язаних з вирішенням подібних проблем в управлінні персоналом та організації праці.

**Ключові слова:** економічна криза, домашній офіс, управління людськими ресурсами, пандемія, робоче навантаження.

## **IMPACT OF COVID-19 PANDEMIC ON THE WORKLOAD AND HOME OFFICE IN SOME EUROPEAN COUNTRIES**

**Abstract.** The spread of a new and unknown viral infectious disease named the Covid-19 pandemic paralysed world without any preparation time. It has significantly changed approaches to organizational management as well as HR policy. Governments have taken immediate measures to address the challenges caused by the COVID-19 pandemic, including protecting jobs, providing financial support to businesses and households experiencing a sharp drop in income.

The present study focuses on a subfield of a previous larger research, on the change in workload due to the COVID-19 pandemic and the increase in the frequency of remote work, as well as their consequences. The increase in telecommuting is one of the innovations that can clearly be attributed to the impact of the pandemic. It has become an accepted form of work in many sectors where even the professionals did not think of using it before.

The research has been conducted based on the questionnaire consisted of groups of questions related to the demographic characteristics (age, gender, place of residence, position), development of the workload, and the more complicated working conditions caused by Covid19 pandemic. The respondents from Hungary, Montenegro, Spain and the United Kingdom were selected using a respondent-driven time space sampling procedure. The method of sampling and the size of the target group can be considered as limitations of our research – the statistical conditions for evaluation are nevertheless met, given the for the number of elements and normality of the sample as a whole and its individual groups.

As results, authors found that the same epidemic in each country led to different workload increases and affected subordinates and non-subordinates, and women and men to different degrees. Among the effects of the crises caused by the pandemic, the increase in workload is the most significant. That must be taken into consideration in the HRM policy. The most important finding is that the increasing frequency of remote work to a certain extent can be considered as innovation. The nature of the research conducted on basis of four European countries can contribute to the future development of scientific study related the solution of similar problems in HR management and labour organization.

**Keywords:** economic crisis, home office, human resource management, pandemics, workload.

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