

Employment risks under the conditions of the COVID-19 pandemic and their impact on changes in economic behaviour

Halyna Mishchuk, Yuriy Bilan, Viktoriia Mishchuk

ABSTRACT

Objective: The article aims to study the risks of employment under the conditions of the COVID-19 pandemic, their differences depending on the specifics of professional activity, and the assessment of the impact on the economic behaviour of the employed.

Research Design & Methods: The authors developed the classification of the employed according to the risks of the pandemic impact and considering the differences in labour functions. The research was conducted based on a sociological survey among the employed population aged 18+ with an interval of one year.

Findings: The authors' classification was constructed according to the risks of the pandemic impact, considering the specifics of professional duties, and with the division of workers into three groups: (1) 'front-line' workers; (2) employees who must be personally present at workplaces, but with a limited circle of contacts; (3) employees whose employment allows remote work. Using this approach, we found changes in the economic behaviour of employees of different risk groups.

Implications & Recommendations: The obtained results can be used by public policymakers to improve human resources management depending on employment risks and behavioural changes of employees of different professional groups.

Contribution & Value Added: The new classification allows considering the specifics of employment according to the level of risks of economic interaction during the performance of professional duties. It makes it possible to better assess the behavioural guidelines of workers with different contact frequencies under the pandemic (including possible similar situations in the future).

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INTRODUCTION

The COVID-19 pandemic became one of the most significant challenges for humanity in the recent history of its existence and led to changes in the economic sphere and in the development of human capital. On the one hand, the sudden destruction of usual employment opportunities and communication channels and sudden stops in entire industries and types of economic activity led to large-scale risks in the field of employment and resulted in the threat of livelihood loss. Massive forced shutdowns of economic activity became obvious proof of the unprecedented impact of the pandemic on the sphere of business and work. According to the observations of Deloitte specialists from the beginning of 2020, 'in March, more than a third of humanity was in lockdown. By the end of April, 1.6 billion workers stood in immediate danger of having their livelihoods destroyed' (Deloitte, 2020, p. 2).

Such negative consequences on a global scale led to the growing relevance of research on employment risks. New economic conditions require a transformation of relations in such a way as to

restore health, economy, and society together, as emphasized in the World Health Organization's appeal to governments (World Health Organization, 2020).

At the same time, the forced transition to remote work and the rapid introduction of online services led to the development of new skills and communication channels both in business and at the household level, which caused an increase in the quality of human capital, stimulating the deployment of an innovative spiral even for those population groups that were far from mastering new technologies. Such changes, which took place during the months of the pandemic, lead to ambiguous assessments of the pandemic's impact on economic processes and require research on changes in behavioural guidelines, taking into account the impact of employment risks during the period of the pandemic 'new normal.' In this regard, we share the opinion voiced at the beginning of the global pandemic crisis: 'having a plan to deal with the unexpected, as important as it is, is not all organizations need in such an environment. Even more necessary is to make a fundamental mindset shift: from a focus on surviving to the pursuit of thriving' (Deloitte, 2021, p. 4). At the same time, the path to thriving based on the use of acquired innovative knowledge and developed methods of communication must be accompanied by the creation of a safe work environment.

In this regard, the pandemic can be perceived not only as a global threat but also as a challenge, the overcoming of which requires scientific research in the field of employment, in particular, the risks of pandemic influence on professional activity and changes in the behavioural determinants of the population of different groups of employment risks.

Despite the essential period of the pandemic and its negative consequences in the labour sphere, an important methodological gap in the investigation of employment risks is still typical for studies in the field of employment. In particular, there is no agreed classification of the employed according to the risks of the pandemic impact that would take into account the differences in labour functions. The theoretical importance of justification for the appropriate classification is obvious due to the further development of approaches to study safety in the working environment as well as differences in behavioural reactions and their changes under the influence of extreme circumstances. Despite all the negative consequences of the pandemic, it allows to develop the theoretical tools for studying new risks at work, their perception by different employees (depending on their level of risks), and relevant behavioural changes in labour and linked relations.

Therefore, we consider the study of behavioural guidelines of different groups of employees according to the degree of risk of pandemic influence to be important for the formation of a knowledge base about changes in human capital under the conditions of large-scale socio-economic crises, which will occur further. Such knowledge should serve as the basis for choosing tools for responding to similar risks in the future.

In this regard, the novelty of our research is that it justifies the new classification of employment according to the risks of professional activity under the conditions of the pandemic. This allows us to take into account the specifics of employment according to the risk level of economic interaction during the performance of professional duties, which is significantly different from the dominant approaches to the assessment of health risks by age groups. Such a classification not only fills the existing methodological gaps in studies of the risks of pandemic exposure but also makes it possible to better assess the behavioural guidelines of workers with different frequencies in contacts under the pandemic (including possible similar threats in the future).

Given the above, the purpose of our study was to investigate the risks of employment under the conditions of the pandemic, their differences depending on the specifics of professional activity, and assess the impact of changes on the economic behaviour of the employed.

To achieve this goal, we attempted to accomplish the following research tasks (RTs):

- RT1:** To justify the classification of the employed by the type of professional risks caused by the pandemic.
- RT2:** To conduct sociological monitoring of changes in the behavioural guidelines of the population of different groups by type of risks of professional activity under the conditions of the pandemic and to evaluate the identified changes.

The research aiming to accomplish these tasks was conducted using the methodology of comparative analysis (to justify the classification of employment risks under the pandemic circumstances) and a sociological survey (for research on changes in the economic behaviour of the employees of different risk groups). For the survey the employed population aged 18+ was involved with an interval of one year: December 2020 – January 2021 and December 2021 – January 2022. In these two periods, 414 and 376 people took part in the survey, respectively, which allowed forming representative samples and obtaining results suitable for further analysis.

The results obtained are an approbation of the authors' classification of the employed according to the level of professional risks of the pandemic impact, and accordingly – changes in behavioural determinants obtained during the period of global socio-economic shock. Therefore, we consider the proposed research methodology useful for other periods of similar large-scale crises, which, despite all the desire to avoid them, became an inseparable condition of human development and always have significant manifestations in the field of employment.

The remainder of the article is structured as follows. The literature review will give details regarding the theoretical background of the paper with the development of the authors' classification of employment risks used for further analysis. The materials and method section will highlight the methodological approaches used to perform data collection and analysis. The main findings of the paper will be presented in the results section. Finally, we will discuss the findings obtained in the discussion. The limitations of this research and recommendations on the practical use of the results will be presented in the conclusion.

LITERATURE REVIEW

The risks of the pandemic impact on various spheres of economic activity became the most discussed object of economic research since the beginning of the pandemic. The scale of this challenge and its demographic consequences are truly the most significant ones against the background of other similar social disasters caused by the pandemic impact over the past 50 years (Table 1).

Table 1 The number of the infected and dead from the most massive viral infections in the last 50 years of human existence

Virus	Number of the infected, people	Number of the dead, people
Ebola (1976)	33 577	13 562
H5N1 'bird flu' (1997)	861	455
SARS (2002)	8096	774
H1N1 (2009)	762 630 000	284 500
MERS (2012)	2494	858
H7N9 'bird flu' (2013)	1568	616
COVID-19*	676 044 299	6 877 479

* – retrieved from Johns Hopkins University, Coronavirus Resource Center (2023) on 6 March 2023.

Source: own study.

As you can see, the COVID-19 virus has already caused demographic losses on a global scale, which are among the largest in the last 50 years of human development. Even though at the time of writing this article, there are still fewer cases of infection than from the H1N1 virus, the death rate is already 23 times higher, despite almost three years of global efforts to overcome the pandemic. At the same time, the risk of the spread of the virus is most characteristic in the field of employment, in particular in those activities that require direct contact.

As can be seen from the trends, consequences and duration of the pandemic, the coronavirus has become one of the permanent signs of economic activity in recent years. Its influence is certainly very different across activities, which vary in the degree of contact at workplaces, both in terms of contact between the personnel and consumers. At the same time, the coronavirus provides a unique opportunity to study changes in behavioural economics under extreme conditions.

As we can see from Table 1, such challenges have become regular for humanity despite significant progress in the development of medicine.

Due to the large-scale economic impact, pandemic crises are often considered within the concept of the 'new normal' which was introduced by El-Erian (2010) during the financial crisis of 2009. During the pandemic period, it gained even more popularity in scientific circles.

The COVID-19 pandemic new normal, like the previous crisis of 2008-2009, caused economic instability in many markets, but the scale of the impact is incomparably greater. Mass sudden stops of business and the threat to the existence of entire sectors of the economy, as during the previous crisis, caused scientists to search for new ways of responding to new risks, justifying the possibility of recovery depending on enterprises' activity (Kudej *et al.*, 2021) and the effectiveness of state actions to support business under crisis conditions (Dvorský *et al.*, 2021; Kinnunen *et al.*, 2021). The most sensitive to pandemic risks were the types of activities associated with direct contact with consumers, that is, tourism and the hospitality industry in general (Esquivias *et al.*, 2021; Kostynets *et al.*, 2021; Zain *et al.*, 2022). At the same time, in some cases, it was unexpected that even understanding the weight of the consequences and the experience of other countries in overcoming them, firms did not learn from foreign policy measures, even if they relied on inputs from China or Italy (Buchheim *et al.*, 2022).

Uncertainty, even a certain confusion among business owners in the initial stages of the pandemic, was replaced by the intensification of the search for ways out of the crisis, which led to an unprecedented intensification of the development of online services and the rapid penetration of digital communication tools, especially in the B2C sphere (Kersan-Skabic, 2021; Roshchuk *et al.*, 2022; Głodowska *et al.*, 2023). Along with the search for new opportunities for business development, we witnessed the intensification of research on the public's perception of new risks and expectations regarding the results of government measures to overcome the consequences of the pandemic (Öksüz Nariç, 2022; Popescu *et al.*, 2022). However, the authorities' activities were criticised for inefficiently addressing the worsening COVID-19 disease level (Gaman *et al.*, 2022).

Even before the end of the COVID-19 crisis, it became obvious that its protracted nature and the level of impact on economic activity are significantly different from previous global challenges. The most obvious difference between the pandemic new normal and the previous crisis periods was precisely the large-scale impact on the labour market and – through the employment sphere – on the activities of enterprises, their competitiveness, and financial results. New flexible employment opportunities, including flexible, remote work, were quickly accepted and adapted to business conditions (Le *et al.*, 2023; Raišienė *et al.*, 2021; Sunaryo *et al.*, 2022). In fact, flexible, remote work became one of the components of the employer value proposition during the crisis (Samoliuk *et al.*, 2022). The development of remote communication systems with stakeholders of various levels became a characteristic feature of the formation of business management systems, in particular, social capital management systems, internal auditing, and flexible HRM models (Azizi *et al.*, 2021; Levytska *et al.*, 2022; Mishchuk *et al.*, 2022; Oseghale *et al.*, 2022). The first shock caused by the sudden shutdown of many enterprises and subsequent COVID-19 waves had a permanent impact on business activities under the pandemic new normal: its characteristic feature was the constant monitoring of morbidity and the possibility of returning to normal employment conditions not only because of the end of the pandemic but also through the protective measures.

Therefore, apart from the rapid development of digital technologies, which undoubtedly became a powerful impetus for innovative business development, another important trend of research on the impact of the pandemic on the employment sphere was formed, namely the social focus (Korzynski *et al.*, 2023; Wach *et al.*, 2023). Positive changes in business strategies regarding human resources mostly included the search for new remote working opportunities in all industries, which aimed to alleviate uncertainty and improve employee psychological well-being. It allowed businesses to reinvent HRM techniques to save money and maximize efficiency without compromising their employees' life quality and well-being (Vahdat, 2021). The similar features of decent work ensuring became typical for HRM systems aimed at successful enterprise activity, particularly for firms with growing performance (Mishchuk *et al.*, 2021).

The need for further studies of the risk factors of the pandemic impact results also from confirmed increasing socioeconomic inequalities and weakening traditional mechanisms of employment protection, especially regarding low-skilled individuals and those in occupations with low working-from-home feasibility and/or from non-essential sectors, particularly tourism (Lopes & Carreira, 2021).

Thus, in the field of economic studies of employment under the conditions of increased health hazards during the pandemic, certain dominant areas of scientific interests were formed. Most of them were related to the impact of employment on the conditions and results of business activity.

Another area of research was safety at workplaces and in the process of non-economic communications. In this regard, an important area of research became the safety of the most vulnerable group of employees with regard to the risks of pandemic impact, that is, healthcare workers. Due to the virus' novelty, the perceived risk of the pandemic was very high, which shows that healthcare workers feel stressed and scared to treat COVID-19 patients (Shaikh *et al.*, 2022). Of course, the exceptional importance of healthcare employees in overcoming the pandemic drew special attention to monitoring their psychological and physical condition, working conditions, and stress levels (Bielicki *et al.*, 2020; Spoorthy *et al.*, 2020). Maintaining health and psychological comfort of employees, especially those involved in the operation of critical infrastructure facilities, is the second important area of research on the risks of pandemic impact. Its economic context is not obvious through direct links with productivity or other economic outcomes, but the study of employment risks in vital industries that determine state security in a period of crisis reflects scientists' view on the importance of certain professional groups and their varying risk levels, including in view of the possibilities of further economic development.

Notably, a unified approach to the classification of employees according to the risk groups of the pandemic impact has not been formulated before. The unity of scientists is characteristic only with regard to the selection of the riskiest spheres of activity, and accordingly, workers belonging to the so-called 'frontline workers.' The specifics of their employment, risks and, even additional principles of classification according to the level of risk exposure are sufficiently covered in the works of Blau *et al.* (2021), Jecker *et al.* (2020), Nyashanu *et al.* (2020), or Rodríguez-Rey *et al.* (2020). The concept of 'frontline workers' is widely used not only in scientific research but also, *e.g.*, in recommendations for reducing the stress of such workers as one of the active directions for improving the quality of their working life compiled by World Health Organization (World Health Organization, 2022).

Such a grouping with a division into only two groups ('frontline workers' and all others employed), of course, does not fully reflect the peculiarities of the impact of risks, which changed due to the activation of online means of work. Meanwhile, none of the most well-known classifications of the population according to the risks of pandemic influence fully considers the employment characteristics of a certain professional group. Mass media workers include *e.g.* 'frontline workers,' but there are also other groups, namely those whose employment does not involve constant mass contact, but requires personal presence at workplaces, *i.e.*, the risks of their infection are higher than, *e.g.*, in the case of the employees of the accounting or IT department of the same company, whose employment is possible in a completely remote format. However, so far, such features are not taken into account by any of the existing classifications.

We mention some approaches as examples to identifying employment risks under pandemic conditions (Table 2) used by government organizations of the USA, Great Britain, McKinsey, and the Ministry of Health of Ukraine. This approach is included in the consideration because empirical research was conducted on the example of Ukraine.

As you can see, these classifications have a lot in common. The main purpose of all approaches is to determine the priority of vaccination of the population. Therefore, in the Ukrainian classification, *e.g.*, two ways of grouping are mixed: by the risk of infection according to the health condition (including age) and by the importance of the employment sphere for maintaining the security and vital activities of the country. Meanwhile, the Minister of Health commented that the priority groups for vaccination against COVID-19 (nine population groups) were determined based on the recommendations of Ukrainian experts and a number of international organizations. These groups are medical workers, military personnel, social workers, people living in institutions providing long-term care and support, employees of such institutions, elderly people (60+ years), employees of

critical state security structures, educational workers, persons aged 18 to 59 with concomitant diseases, and inmates (Ministry of Health of Ukraine, 2021).

Table 2. Objects of the risk analysis tangential to the sphere of economic activity

Object of analysis	Authorship of the methodology			
	Ministry of Health of Ukraine	McKinsey	Centers for Disease Control and Prevention (CDC), USA	UK Government
Key terms	Risks of COVID-19 infection and development; professional functions	Risks by sectors of economic activity	Groups of people with an increased risk level	Key employee
Grouping sign	Age, concomitant diseases, the content of professional activity	Criticality of functions, the possibility of providing safety at the workplace	Age, health problems	Employment in activities critical to the response to COVID-19
Risk levels and grouping of the population/types of activity	1) Critical (population of priority groups, medical workers engaged in the treatment of patients with COVID-19, military personnel participating in JFO) 2) extremely high (population by age, health status, as well as medical workers); 3) high (relevant population groups and workers who support the security and vital activities of the state); 4) increased (population with an increased risk of infection and other workers who support the security and vital activities of the State); 5) low (all others not included in priority groups)	1) Critical, highest (social services and health care, public transport, retail - food, medicine); 2) critical, adaptive (government, housing and communal services, education); 3) medium (information, finance, real estate, professional services, management, wholesale); 4) adaptive (agriculture, mining, construction, industry, administration); 5) the most threatening in terms of personal safety (rest, food and hospitality, private transportation, retail, other types)	(-)	Only the critical level is defined. Activities: – health care and social assistance; – education and child-care; – key public services (journalists, employees of the judicial system, religious and charitable institutions); – local self-government and national government; – food products and other necessary goods (including the activities of delivery services); – national security (army, police, other services); – transport and customs; – housing, communications and financial services

Note: (-) – not clearly defined, additional medical conditions are applied.

Source: CDC, 2022; GOV.UK, 2022; McKinsey, 2020; Ministry of Health of Ukraine, 2021.

The classification used in Ukraine has notable common features with the criteria for analysing the risks of pandemic impact used by McKinsey, the UK government, and the CDC (as we can see, the CDC approach is the most generalized). Furthermore, we can see that although the criteria for analysing the risks of pandemic impact are detailed to varying degrees, they actually coincide. These approaches consider to varying degrees individual characteristics, such as age, state of health, and belonging to a certain type of activity. However, in terms of economic activity, the most important feature is the performance of certain professional functions, as a result of which the risks of infection increase.

In this respect, an important omission of all the most developed classifications today is that they take into account belonging to a certain type of activity in general. As emphasized, there is a

big difference in the functions of, *e.g.*, an employee of the information department of a news service and a journalist, both in terms of the method and number of contacts, as well as in the possibilities of performing functions remotely.

Thus, aiming to resolve RT1, we consider it necessary to directly take into account indicators of risk saturation of professional activity in the analysis of factors of changes in economic behaviour. The classification of workers according to the risk of professional activity in relation to pandemic threats can therefore be simplified, which will lead to more accurate assessment results.

In this regard, it is especially important to single out employees of three groups:

1. 'frontline' workers – with critical professional risks of pandemic influence, since remote work is impossible for them;
2. employees whose employment requires personal presence at workplaces but involves limited contacts – employees with high professional risks;
3. employees whose employment allows complete or very significant social isolation if necessary – employees with moderate risks.

The first group should include employees with direct and frequent contact with a potentially dangerous environment, whose employment is impossible in a remote format (*e.g.* medical workers or police). The second group of workers should include those employees who ensure the completion of professional functions of the first group, as well as employees whose work cannot be remote but does not require contact with a constantly changing environment and is sufficiently isolated in the usual workspace (*e.g.*, construction or industry). The third group includes all employees whose employment may be remote, and therefore, the risks are significantly reduced and remain to a greater extent the responsibility of the employee.

Of course, this approach can be combined with the above groupings of professional duties. In this way, an important omission of the previous classifications is filled, *i.e.* it is possible to take into account the real risk saturation that occurs in direct contact with potential carriers of the virus and sick people.

Prior to proposing our classification of the employed according to the risks of pandemic impact, we tested it in an empirical study on the example of Ukraine.

RESEARCH METHODOLOGY

The basis of our empirical research was the proposed grouping of employees according to the level of employment risk under the conditions of the pandemic with the division into three groups, which was substantiated in the previous section.

For the gradation of age groups, the approach of labour market analysts was applied, which was obtained in particular during an interview with representatives of the recruiting agency 'Imperiya-HR,' which is among the top five recruiting agencies in Ukraine in terms of the number of vacancies according to Work.ua. Therefore, according to the results of labour market monitoring carried out by recruiters, the readiness to change the functional in professional duties today is as follows: employees under the age of 30 change the functional once every two years; 31 to 40 – once every three years; from 41 – once every four to five years. Therefore, this division was used as an additional feature of the grouping of respondents. Moreover, we selected the age group of people up to 25 years old to understand the differences in the behavioural guidelines of young people, a significant part of which are just entering the labour market.

The survey was conducted among the employed population of the Rivne Oblast (Ukraine) over the age of 18 using the Google Forms service twice with an interval of one year: in December 2020 – January 2021 and in December 2021 – January 2022.

Through the survey, we collected samples of 414 and 376 people respectively. According to the State Statistics Service of Ukraine, the size of the general population (the entire employed population of the oblast) was: 470.6 thousand people at the end of 2020 and 463.6 thousand people at the end of 2021.

To calculate the representativeness of a sample we used the Cochran formula (Cochran, 1977) with a Confidence level of 95%. The actual value of the confidence interval in the first review was

4.81% and in the second – 5.05%. Therefore, the results obtained were representative and could be used to test the hypotheses of our study.

Respondents were offered a Likert scale (Likert, 1932) for their answers, in particular, its most typical variant of a 5-level scale, in which the answers are rated from 1 point ('insignificant changes') to 5 ('maximum changes'), taking into account that the type of questions involved the evaluation of changes, and not the measurement of the current state, a mark with level '0' was additionally added, which characterized the absence of any changes.

The questions were structured according to the stages of economic relations, in which the population was involved as an employed population (production stage), as well as buyers and final consumers of products – distribution and consumption stages. Therefore, the main questions related to changes in behaviour that occurred between the beginning of quarantine and the time of taking the survey. The questions concerned:

- change of skills in the process of employment (improvement of long-distance relationships, the possibility of using new skills in the future; possibilities of finding secondary income under new conditions);
- motivational aspirations for work and personal values (motivation to keep a job; the value of free time due to saving time for travel to work; general perception of the regime of life in quarantine conditions);
- consumption and savings (change in attitudes towards spending, including the purchase of expensive things; the value of saving money on commutes and clothes).

RESULTS AND DISCUSSION

According to the estimates obtained in December 2020 – January 2021 (hereinafter referred to as Winter-2021), we can conclude that, in general, the pandemic caused an economic shock not only to economic entities but also to the population, a large part of which was forced to quickly adapt to new conditions. However, many found advantages in the situation. The generalized results of the Winter-2021 survey are presented in Table 3, in which the average level for each partial feature is determined in the cells, and the grades reflecting the reaction below the average arithmetic level of 2.5 points are marked with grey shading.

Processing the results, we found that even taking into account the fact that a significant proportion of responses to the questions of the questionnaire showed a neutral attitude (putting '0' in their reaction to life under new conditions and the power of the pandemic; from 12% to 45% of respondents to various questions of the questionnaire), none the group of respondents, formed by any feature of grouping, was completely inert to changes. At the same time, if we single out the conditional average arithmetic level of changes (2.5 points according to the evaluation scale used), then changes in behaviour in at least one of the aspects are present among respondents of different age groups. The most obvious result is the above-average value of acquired remote interaction skills and the intention to use them in the future, regardless of the change or maintenance of quarantine restrictions.

Through the analysis of the changes in behavioural guidelines at the end of the first year of pandemic restrictions through the prism of the proposed classification of workers according to the level of risks of professional activity under pandemic conditions (groups 1-3), it is possible to establish important regularities related to the number of forced contacts and the health risk. As we can see, the most valued new remote interaction skills are in group 3, which is the one with the greatest opportunities for remote work, *i.e.* these respondents have the highest intentions to use new skills in the future. Meanwhile, respondents who belong to the first and second groups of employment risks according to our classification did not feel they saved time or money (which was the expected result for these groups), but they had a lower motivation to prove themselves before the employer in order to keep the job compared to the representatives of the third group. We can consider this as a demonstration of higher confidence in stable employment, given the nature of the work, which does not allow for quickly finding a replacement, and the discrepancies in the assessments are a confirmation of the applicability of our proposed classification.

Table 3. Respondents' self-assessment of changes in economic behaviour and determining skills, max = 5.0 points (Winter 2021)

Group of respondents	A partial sign of changes in economic behaviour during the pandemic						
	Improvement of remote interaction skills	The strength of aspirations to continue using skills after quarantine	Tendency to use funds economically	The cost-saving value of remote interaction	The value of saving commute time during quarantine	The motivation to prove oneself to maintain a position	Tendency to postpone an expensive purchase until the end of the quarantine
All respondents	3.32	3.49	2.58	2.51	2.47	2.28	2.23
Groups of workers according to the risks of professional activity under the conditions of the pandemic							
'frontline' workers (group 1)	3.06	3.17	2.64	2.26	2.23	2.09	2.11
employees whose employment requires personal presence at workplaces but involves limited contacts (group 2)	3.05	3.13	2.61	2.45	1.95	2.29	2.58
workers whose employment allows complete or very significant social isolation (group 3)	3.74	4.02	2.51	2.79	3.06	2.43	2.09
Age groups, years							
less than 25	3.75	3.70	2.68	2.93	3.14	2.45	2.61
26-30	3.20	3.80	2.20	1.60	1.20	2.40	2.00
31-40	2.72	3.28	2.59	2.38	1.90	2.14	2.14
41 and over	2.97	3.20	2.43	1.94	1.80	2.03	1.60
Gender groups							
female	3.43	3.59	2.53	2.43	2.56	2.28	2.33
male	3.05	3.24	2.71	2.71	2.27	2.27	2.00

Note: The grey colour signifies the average arithmetic level below 2.5 points.

Source: own study.

Therefore, it can be expected that not only in the period of economic shock caused by the pandemic but also in the event of other large-scale force majeure events, employees of these two groups – despite being employed under conditions of increased professional risks and psycho-emotional stress – feel higher confidence in future employment prospects. This was the main result of the first round of the survey.

Gender differences appeared mainly due to multidirectional values in the form of saving time (more important for women) or funds related to expenses for economic activity (more important for men). Age differences in changes in economic behaviour were most evident in the fact that respondents under the age of 30 were mostly able to improve their skills of remote interaction and were the most receptive to new opportunities and the chance to improve. Somewhat higher intentions to prove themselves are characteristic of the youngest respondents, under the age of 25. Obviously, in this group, the risks of losing a job during the pandemic and finding a new one is indeed higher, which may be related to the previous employment experience of young graduates of educational institutions.

Comparing these results with the data obtained in the survey conducted at the end of the second year of the pandemic (hereinafter: Winter 2022), we saw certain behavioural changes (Table 4 and Figures 1-3).

As we can see, at the end of the second year of the pandemic, the behavioural guidelines of employees with the highest risks of pandemic influence changed significantly. The motivation for keeping a job and the tendency to use funds more rationally in terms of purchasing expensive things became

more significant. The opportunity to save time became much more valuable, which can only be connected with subjective comparisons of the conditions of employment of employees working remotely. The only motive with decreased intensity in this group was the general propensity to save, excluding the purchase of expensive items. At the same time, although the employment of these workers is not directly related to the use of remote means of work, the growth of digital interaction skills (in general, not only in work matters) was evaluated positively and with an even greater result, compared to the previous year. These changes are shown in detail in Figure 1.

Table 4. Respondents' self-assessment of changes in economic behaviour and determining skills, max = 5.0 points (Winter 2022)

Group of respondents	A partial sign of changes in economic behaviour during the pandemic						
	Improvement of remote interaction skills	The strength of aspirations to continue using skills after quarantine	Tendency to use funds economically	The cost-saving value of remote interaction	The value of saving commute time during quarantine	The motivation to prove oneself to maintain a position	Tendency to postpone an expensive purchase until the end of the quarantine
All respondents	3.76	3.94	2.34	2.57	3.03	2.25	2.25
Groups of workers according to the risks of professional activity under the conditions of the pandemic							
'frontline' workers (group 1)	3.60	4.00	1.50	2.60	3.10	2.90	2.60
employees whose employment requires personal presence at workplaces but involves limited contacts (group 2)	3.86	3.86	2.43	2.71	2.86	2.29	1.86
workers whose employment allows complete or very significant social isolation (group 3)	3.77	3.94	2.45	2.55	3.04	2.15	2.24
Age groups, years							
less than 25	3.80	3.92	2.36	3.20	3.40	2.68	2.04
26-30	4.20	4.20	2.20	3.20	3.60	3.80	3.00
31-40	3.86	4.29	2.43	2.14	2.67	1.62	1.76
41 and over	3.62	3.73	2.30	2.30	2.92	2.11	2.57
Gender groups							
female	3.78	3.99	2.32	2.49	2.94	2.13	2.09
male	3.68	3.79	2.42	2.84	3.37	2.68	2.84

Source: own study.

Similar results are typical of the employees of the second group (Figure 2), the answers to almost all questions are similar. Differences are evident only with regard to saving the family budget; in the second group, this tendency slightly decreased, but not as much as among the workers of the first group, who obviously had a more stable and guaranteed income even under the pandemic conditions. There are other differences in the income sphere, *e.g.*, decisions about expensive purchases were postponed less often compared to the situation in the previous year. The motivation to keep the workplace practically did not change over the year, and the value of remote interaction skills, as well as the employees of the press group, increased even more. As we can see, workers from the second group felt less confident about their income prospects. Instead, the value of free time due to the improvement of communications under the influence of pandemic restrictions increased,

which is similar to the dynamics of the first group. The same applies to the subjective assessment of the value of acquiring digital skills and their convenience for future communications.

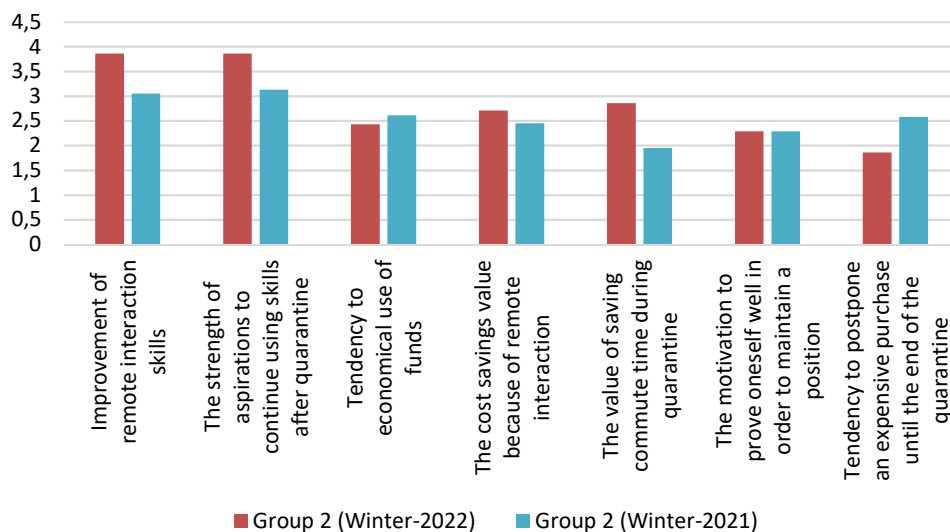


Figure 2. Changes in economic behaviour for the employees whose employment requires personal presence at workplaces but involves limited contacts during the pandemic
Source: own elaboration.

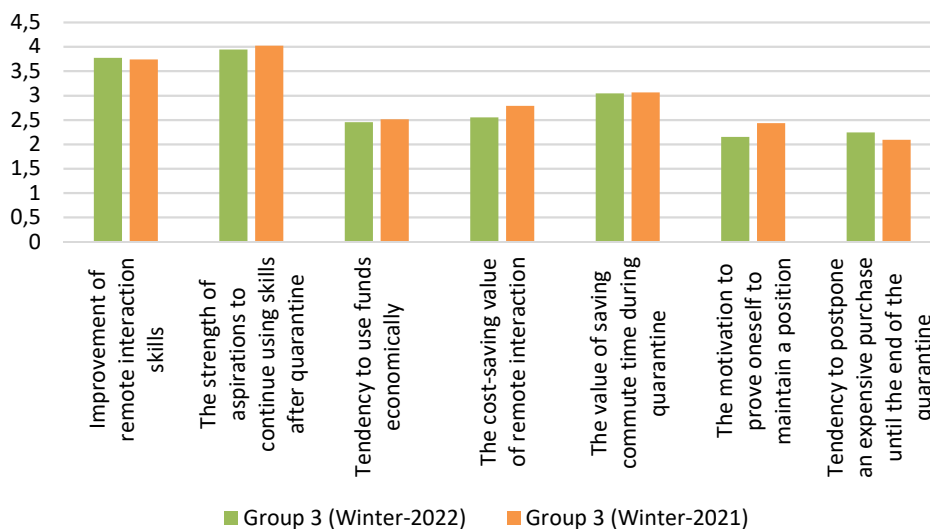


Figure 3. Changes in economic behaviour for the workers whose employment allows complete or very significant social isolation during the pandemic
Source: own elaboration.

Based on the results of our research, we can conclude that the study of determinants of economic behaviour, especially in the field of employment, needs to be supplemented with new approaches to understanding risks in the labour field. Despite its undeniably negative demographic consequences, the COVID-19 pandemic gave a chance to uniquely test the viability of existing approaches to risk assessment in professional activity, as well as changes in behavioural aspirations under the influence of these risks. It is obvious that the classic list of risks in the professional sphere under the conditions of such large-scale threats becomes less relevant than health risks caused by the way of performing professional tasks – directly at workplaces, remotely, or at workplaces, but with the possibility of sufficient

limitation of direct contacts. The pandemic caused an unprecedented rapid change in the quality of human resources. As we can see, almost all employees, to varying degrees, recognized the improvement in their remote interaction skills and confirmed their readiness to use them in the future.

Such conclusions are consistent with the works of other researchers (Le *et al.*, 2023; Raišienė *et al.*, 2021; Sunaryo *et al.*, 2022). However, at the same time, the motivation to save jobs and the resulting consequences in the form of the value of saving time and money under the conditions of economic restrictions and uncertain prospects, the tendency to save the family budget, especially in the aspect of purchasing expensive things, differ significantly in groups of employees with different levels of risks, which reflects their internal expectations of change and self-assessment of opportunities to find other sources of income under extreme conditions. At the end of the second year of the pandemic, the assessments changed significantly, especially in the first two groups. We can partially relate this to the reduction of anxiety and adaptation to new working conditions. Of course, during the two years of working under the pandemic conditions, changes in the perception of new conditions, psycho-emotional, and physical loads had to occur, especially for workers most involved in direct contacts, which was emphasized in the studies of Bielicki *et al.* (2020), Shaikh *et al.* (2022), Spoorthy *et al.* (2020). Such negative effects decreased, while the impact of pandemic restrictions allowed the development of new skills and the benefits of their use, in particular with the estimated benefits of saving time for work tasks. As for the employees of the first group, who often had appropriate additional payments for work under the conditions of increased risks, the motivation to prove oneself can be related to this aspect as well, *i.e.*, the workplace became more valuable in the financial aspect.

We do not consider the obtained empirical results to be the main result of the research. In this work, we emphasize the novelty of the approach to the gradation of employees according to the level of risks in professional activity, which intensified at the end of 2019 under the influence of the coronavirus pandemic, and which may intensify again in the future as a result of other similar events as we may predict based on the dynamics of the last 50 years (Table 1).

Readiness for such events and the ability to quickly adapt and choose levers of primary influence, including protection from excessive risks of the most sensitive professional groups will determine the stability of economic systems at various levels – from individual enterprises to national-level systems.

The empirical results on behavioural responses obtained in this study are important for understanding the direction of changes and the speed of adaptation of workers of different groups. At the same time, we consider the methodological principle of grouping workers according to the level of occupational risks under the conditions of the pandemic and other possible health hazards resulting from direct contact to be valuable for use in scientific and applied purposes.

CONCLUSIONS

The pandemic became a global challenge to humanity and a huge impetus for changes in human capital-related technological and behavioural research. Under the conditions of the pandemic, organizations and countries have the opportunity to gain new knowledge about the specifics of employment and changes in the behaviour of various population groups, which is useful in introducing better ways to protect the most vulnerable employees not in terms of age, health condition, or belonging to critical infrastructure workers but by taking into account the objective employment conditions.

The second important aspect of the practical use of our proposed grouping is the possibility to use it to assess changes in the value of jobs and consequences related to employee motivation. Thus, the proposed classification not only fills the existing methodological gaps in this area but also makes it possible to better assess employment risks and behavioural guidelines of employees with different involvement in contacts under the pandemic. Therefore, our approach can be used in human resources management under similar crisis circumstances. At the entrepreneurial level, the correct identification of the risks in employment caused by employment peculiarities allows us to justify and plan actions regarding the health protection of the employees of different risks groups, improving the compensation and benefits as well as the overall motivation system considering the behavioural changes in certain groups.

However, the results regarding the behavioural changes patterns cannot be generalized to the level of the country or even other national systems. In this study, we had certain limitations in the data collection process, which was carried out by our own efforts, without the involvement of third-party organizations.

It is advisable to conduct further research in this direction using a larger survey base, as well as in the direction of finding factors that affect the quality of work life of various groups of employees, understanding the most relevant opportunities for ensuring labour safety and developing professional skills under crisis conditions.

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Authors

The contribution share of authors is equal and amounted to $\frac{1}{3}$ for each of them.

Halyna Mishchuk

ScD. in Economics and Professor of Labour Resources and Entrepreneurship Department, National University of Water and Environmental Engineering (Ukraine), Professor, Pan-European University, Faculty of Economics and Entrepreneurship (Slovakia). Her research interests include well-being, factors of migration and job satisfaction, employment, and social and economic equality.


Correspondence to: Prof. Halyna Mishchuk, ScD, National University of Water and Environmental Engineering, Faculty of Economics and Management, Soborna str. 11, 33028 Rivne, Ukraine, e-mail: h.y.mischuk@nuwm.edu.ua
Pan-European University, Faculty of Economics and Entrepreneurship, Bratislava, Slovakia, Tomášikova 20, Bratislava, Slovakia, e-mail: halyna.mischuk@paneurouni.com

ORCID  <http://orcid.org/0000-0003-4520-3189>

Yuriy Bilan

Research fellow at the Bioeconomy Research Institute, Vytautas Magnus University, K. Donelaičio g. 58, 44248 Kaunas, Lithuania. His research interests include migration and labour market, sustainable development, energy and society.


Correspondence to: Prof. dr hab. Yuriy Bilan, Bioeconomy Research Institute, Vytautas Magnus University, K. Donelaičio g. 58, 44248 Kaunas, Lithuania, e-mail: y.bilan@csr-pub.eu

ORCID  <http://orcid.org/0000-0003-0268-009X>

Viktoriia Mishchuk

Junior Research Fellow in the project 'Formation of a comfortable environment for living and working for the achievement of social security in a transboundary space' funded by the Ministry of Education and Science of Ukraine (state registration No. 0119U000080), National University of Water and Environmental Engineering (Ukraine). Her research interests include behavioural economics, personal skills, and competencies development.

Correspondence to: Viktoriia Mishchuk, National University of Water and Environmental Engineering, Soborna str. 11, 33028 Rivne, Ukraine, e-mail: mishchuk_em19@nuwm.edu.ua

ORCID  <http://orcid.org/0000-0003-3626-5652>

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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