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STATE OF OCCUPATIONAL INJURY IN UKRAINE IN THE CONDITIONS OF THE COVID-19 PANDEMIC

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Introduction. The COVID-19 pandemic has affected the indicators of occupational injuries both in the world and in Ukraine. The International Labor Organization has developed a system of international labor standards that are useful in the field of labor in the context of the crisis response to the COVID-19 outbreak. Compliance with the basic provisions of these norms, related to labor protection, protection of certain categories of workers, is a guarantee that employers and authorities will provide decent employment in the context of the COVID-19 pandemic. Employers must prevent accidents at work, provide safe workplaces, mechanisms, equipment and processes that do not endanger the health of the employee. In Ukraine during the pandemic, regulations appeared (Order of the Ministry of Health of Ukraine № 521 (2020) «On Amendments to the List of especially dangerous, dangerous infectious and parasitic human diseases and carriers of pathogens of these diseases, which include acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2», to be included in the statistical group of accidents at work (AW).

The aim – to identify patterns of spread of industrial accidents in Ukraine in terms of pandemic COVID-19.

Materials and research methods. The method of studying the prevalence of occupational injuries was based on the principle of a continuous statistical sample of primary documents compiled for all cases of first detected and registered in Ukraine AW in production in Ukraine for 2019–2021, in the form of Act H-1 (in the event that the accident is recognized as related to production). According to the State Statistics Service of Ukraine and the State Labor Service of Ukraine, an analysis of occupational injuries over the years by types of economic activity, professions, causes. Data were processed by classical methods of descriptive epidemiology.

Results. In 2020, compared to 2019, the number of AWs increased by 51.3 % due to patients with COVID-19 in the socio-cultural sphere and trade, in the agro-industrial complex, transport, coal industry.

Conclusions. In 2020, the Social Insurance Fund and the State Labor Service of Ukraine received 40,737 reports of AW/acute occupational diseases (poisoning). Compared to 2019, the number of such reports has increased 7 times, the number of fatalities – by 25.5 % due to the large number of diseases of COVID-19 medical and/or other employees. In 2020, 6,646 (of which 393 were fatal) victims of AW/acute occupational diseases were registered, on which acts related to production were drawn up in the form H-1/P. In 2020, compared to 2019, the number of AWs increased by 51.3 %, the number of fatally injured persons decreased by 4.1 %. During this period, the socio-cultural sphere, especially health care with the infection of COVID-19 workers, came out on top in terms of the number of AWs in production. Workers of the following professions were most injured in 2020: nurse, junior nurse (nurse, cleaner, bartender, etc.), driver of vehicles, general practitioner-family doctor, hospital nurse. The number of AWs with a fatal impact on production in the areas of supervision indicates that they are also the largest, in addition to the socio-cultural sphere and trade, in the agro-industrial complex, transport, coal industry. The majority of fatalities in 2019 occurred for organizational reasons (73 %), for technical reasons – 14 %, for psychophysiological reasons – 13 %. The structure of causes of fatal AW changed in 2020, their significant advantage in organizational and psychophysiological terms and less – in technical terms due to the emergence and course of COVID-19. In 2020, the largest number of them occurred for organizational reasons (48.7 %), for psychophysiological reasons – 45.3 %, for technical reasons – 6 %. The work experience of more than half the average duration of occupational disease development in an occupation is a risk factor, and working in hazardous conditions for persons over 40 years of age is critical, which requires the development and implementation of occupational risk assessment and management.

Key words: pandemic, COVID-19, occupational injuries, industries

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Introduction

The COVID-19 pandemic has given the world a new context for assessing the state of occupational injuries. The International Labor Organization (ILO) has developed a system of international labor standards, a useful compass in the context of the crisis response to the COVID-19 outbreak. Firstly, the implementation of core international labor standards related to occupational safety, health and the protection of certain categories of workers ensures that workers, employers and authorities provide decent work standards in the context of the COVID-19 pandemic. Secondly, a broad set of ILO labor standards relating to employment, SME development and cooperation in the world of work provide specific recommendations to facilitate a people-centered approach to the crisis and its aftermath. The recommendations also apply to the specific situations of certain categories of workers, such as nurses, migrant workers, seafarers and fishermen, very vulnerable in the current context. The compliance with the recommendations are in the labor standards, which contributes to maintaining cooperation at work, and is key to preventing a deterioration in employment and working conditions during and after the crisis. The 2019 ILO Declaration on the Future of Work reaffirmed that the establishment, promotion, ratification and monitoring of international labor standards is of paramount importance for the ILO. All ILO legal instruments establish a basic minimum of social norms agreed by all actors in the global economy [1].

Recommendation 2017 on Employment and Decent Work for Peace and Resilience (No. 205) proposes a strategic approach to tackle the crisis situation, including: 1. – Promoting stable employment and decent work, creating viable businesses, especially small and medium-sized enterprises; – Providing support for employers to choose effective measures to identify and mitigate the risks of adverse human rights impacts associated with their activities; – Building or rebuilding labor market institutions; – Building the capacity of governments in terms of employers' and workers' organizations; – Taking measures for the socioeconomic reintegration of those affected; 2. – Governments should: strive to provide basic income security, particularly for those who have lost their jobs; 3. – At the same time, compliance with core provisions of international labor standards related to occupational safety and health, employment, working conditions and protection of certain categories of workers also contributes to the decent work principle during the COVID-19 pandemic [2].

The ILO held a World Day for Safety and Health at Work in 2020, at which a report on COVID-19 and occupational safety and health was presented [3]. As of the publication of this report, the total number of patients in approximately 184 countries exceeded 1 350 000. A newly discovered coronavirus causes COVID-19 coronavirus disease (WHO, 2020d). A crisis like the COVID-19 pandemic, creating a public health emergency, causes shock and directly affects markets, production and the world of work. The ILO estimates that about 25 million people could lose their jobs and the loss of labor income could amount to US$ 3 400 000 000 000 (ILO, 2020a). Businesses of all sizes have already halted operations and reduced working hours and staff. Many care and delivery workers, casual laborers, day laborers and informal traders are obliged to continue working, even if they are sick. The state must take special measures needed to protect millions of people who work in the health sector and risk their health every day. The same protection is needed for truck drivers and seafarers who deliver medical

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equipment and other life-saving goods. In order to take tailored measures, businesses should follow up on messages from health authorities, local health authorities and receive information, materials and technical advice from them (ILO, 2020i). A number of provisions in Convention No. 155 and Recommendation No. 164 address prevention and protection measures aimed at minimizing the negative impact of a COVID-like pandemic on health and safety at work. Employers must ensure that workplaces, machinery, equipment and processes are safe and free from health hazards. Employers must provide appropriate protective clothing and equipment to prevent accidents and incidents in the workplace, (Article 16 of Convention No. 155). Recognition of COVID-19 as an occupational disease during the pandemic, workers may be at risk of contracting an infection during their work. As a result, they may develop post-traumatic stress disorder (PTSD). To the extent that workers who acquire these diseases in connection with their work become incapacitated, they should be entitled to monetary compensation and medical and nursing care, as provided for in the Accident and Occupational Disease Convention, 1964 (No. 121). The regularly updated ILO list of occupational diseases (2010) lists occupational diseases caused by exposure to substances in the course of work, including «various biological substances and infectious or parasitic diseases» as well as «post-traumatic stress disorder». The list is also open-ended in all the sections dealing with the aforementioned diseases. These open entries enable other diseases or disorders (including mental or behavioral disorders) not mentioned in the previous entries to be recognized when a direct link between exposure to risk factors or substances produced in the course of work and the disease(s) or disorder(s) acquired by the worker is scientifically proven or determined by methods consistent with national legislation and practice [4]. The report for the World Day for Safety and Health at Work 2021 (WHS), on «Anticipate, Prepare and Respond to Crises. Invest NOW in a resilient RHB system» in Annex 98 – includes selected resources on «COVID-19 and the world of work». This report analyzes the building blocks of a strong and resilient RHD system. Examples are given in the context of the COVID-19 pandemic, showing how RHB systems can strengthen their capacity after a crisis to meet unanticipated future challenges and protect workers' safety and health – while maintaining survival and business continuity. The 1981 Safety and Health at Work Convention (No. 155) provides the basis for establishing and implementing comprehensive national occupational safety and health systems based on prevention and continuous improvement. The strategy defined by this convention provides for the implementation of activities in the main areas related to RHB as: the full participation of employers, employees and their organizations at all levels [5]. The ILO has developed guidelines for employers based on information, manuals and directives published by the World Health Organization (WHO), States and international organizations (IOs). The «COVID-19 Pandemic Workplace Management» handbook for employers, issued by the Australian Chamber of Commerce and Industry, was used extensively in this context. It was designed to help employers and PRs around the world adapt to the situation created by the pandemic. It was developed by the ILO-ACT/EMP as a general guide for PRs, to be distributed to businesses in their countries [6].

The pandemic has brought new experiences of telecommuting, not only for office workers but also for factory workers. For those working in offices, communication has largely shifted to

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video and audio. Most of the production workers, on the other hand, have continued working. As for the factory workers, the situation is different: not every engineer and production worker can be moved seamlessly to a remote working format. Those who worked at enterprises involved in the continuous technological cycle for the sustenance of the country, the work of the state defense order, the targeted programmers to serve the population were in fact on the spot. Such production facilities continued to operate in an almost normal mode. The key word is «almost», because in the absence of a supervisor or other IT staff, workers were left in the workshops «unattended»; the customary system was broken. What will this lead to in the near future, the development scenario in terms of occupational health and safety, what can be done to avoid a surge in injuries? Two scenarios can be considered.

Scenario for an increase in injuries:

1. Changes in the conditions of ordinary life and work. Nothing may have changed at work, but for many people the living conditions regarding quality of life have changed: not being able to move freely around the city, visiting doctors without an emergency, visiting relatives, the pressure of the media makes one nervous and more likely to be distracted by everyday thoughts at work. It is normal and natural to be distracted from work by one's thoughts, but on the one hand when everything around us is calm and on the other hand we are not pressured by the environment, and quite a different situation is when there are constantly many issues to be solved.

2. A breakdown in communication with a supervisor and a lack of control. Those who used to work in offices – managers, engineers and technicians – were made to work remotely. The head of department, who was insufficient for everyone, is now not in production at all. Many health and safety specialists have been moved to shift work, for example, instead of two full-time attendants, there is now one per day. The level of supervision has fallen. The absence of a supervisor has brought with it additional safety risks: previously he was there, forcing, prompting, reminding, but now there is no one to «lead by the hand». Some continued to work in the shop, in the mine, while others were in Zoom conference and tried to control the situation remotely. This leaves workers without control, but the less control there is, the greater the likelihood of events is. This is an additional safety risk.

3. Temporary downtime. Some businesses were temporarily suspended and workers were sent home. After two months, they went back to work. After a long break, practical skills are partly lost. The loss of small skills after coming out of self-isolation is quite natural, they need to be regained, and in the meantime the risk of injury increases.

4. Annual plans have not been cancelled. Despite temporary downtime, annual plans need to be carried out at an increased pace. Where there is a rush, there is always a disregard for safety.

5. Savings due to crises. Cutbacks in investment projects, material substitutions due to price increases, delayed deliveries across the closed borders etc. – all of these, too, can have an impact on workplace safety. Not directly related to savings is the factor of not having the right PPE. When masks, half-masks and respirators were needed and suppliers were not prepared to provide the required quantity, not only medical workers and ordinary citizens, but also many industries suffered. Especially where production involved harmful chemicals, aerosols. This, too, was not in favor of occupational safety. On the other hand, PPE budgets were used at the expense of unplanned expenditure on masks and antiseptics.

6. More emphasis on fighting COVID-19

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than on other risks. COVID-19 has indirectly affected in other ways. Alcohol is unfortunately one of the most frequent causes of accidents at work. Also, when everyone is focused on fighting the coronavirus, the rest will turn out to be a bit neglected, there are more opportunities to ignore some rules.

Injury reduction scenario. There is a group of experts who are more positive and believe that there will not be an increase in injuries in the near future – quite the opposite, we will see a decrease. The evidence is:

1. Increased control on all sides. The increased attention to health of people, both management and citizens. The general background is that you have to be careful – all of these remind people to be careful in one way or another. Employees have become more attentive to their health and safety. Wearing masks and using antiseptics at home reminds of the use of PPE at work, actualizes the importance of protection and safety.

2. Downsizing. Ironically, this can have a positive effect on safety. Fear of losing your job, focus on the process are cited by experts as factors that reduce injuries. No one wants to lose their job because of the safety violation.

3. Temporary downtime as an opportunity to breathe. Involuntary leave offers the opportunity to take a fresh look at your workplace, its risks and dangers, to see what you might not have noticed before and to correct it. A separate aspect is the mathematical approach to calculations. This is not really a fair argument, as it involves manipulation of data, but it cannot be disregarded either. Its essence is that the injury statistics are counted for a full year, but since the production did not work for the whole year, but for example 10 months, the estimated injury rates will be less, since they are counted per year regardless of whether there was downtime or not. The experience suggests that there is a high probability of the first scenario, where injuries do increase. To avoid a spike in incidents, employers need to think now about what they can do to stabilize the situation and hold their ground [7]. In Belarus, during the COVID-19 pandemic, the Belarus Health Care Workers' Union recorded a decline in occupational accidents in health care institutions (8).

The Social Insurance Fund of Ukraine constantly analyses and prevents occupational injuries through the management of the executive directorates of the Fund's regions, where insurance experts in occupational safety and health are employed. Thus, in forestry in Chernivtsi region, in mining and quarrying, production of cast iron, steel and ferroalloys, production of machinery and equipment for mining and construction in Kryvyi Rih in Dnepropetrovsk region, in some enterprises of Kirovohrad region, the indicators of occupational injuries, including those with fatal outcome, decreased [9–11]. According to the State Labour Service of Ukraine, the level of occupational injuries in certain types of production, such as agriculture, decreased during the pandemic due to the safety of the production process of grain harvesting - the main stage of the annual cycle of agro-industrial production, but the morbidity of COVID-19 increases this indicator [12].

The State Labor Service of Ukraine is introducing new approaches of injury prevention in Ukraine, guided by

The provisions of International Labor Organization Convention No. 81 of 1947 on Labor Inspection in Industry and Commerce and the practical experience of European countries single out three main tasks, the implementation of which ensures the effective functioning of the principles of safety and health of workers, namely

– Ensuring that the provisions of legislation on working conditions and the protection of workers during their work, to the extent that labor

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inspectors are required to enforce such provisions;
- To provide employers and workers with technical information and advice on the most effective means of enforcing legal regulations;
- Bringing to the attention of the competent authority deficiencies or abuses which are not covered by existing legal provisions.

Among all these functions, so far only the organization and implementation of state surveillance activities has received sufficient attention, while prevention has only been in the background and has not received sufficient attention.

Since 2020, the State Labor Inspectorate has laid the foundations for a social dialogue to improve the safety and health of workers. To this end, the territorial bodies analyzed the organization of occupational safety in the region's enterprises to identify the most risky production sectors and developed Occupational Safety Profiles based on this analysis.

For this purpose, permanent working groups have been set up at each territorial body of the State Labor Inspectorate to discuss the highest priority areas of work, identify risky production areas and other issues related to safety in the region.

Representatives of the Federation of Trade Unions of Ukraine, the Federation of Employers of Ukraine, the Social Insurance Fund of Ukraine, the territorial offices of the Ukrainian Road Safety Office, the National Police of Ukraine, the State Emergency Authorities, local authorities and public organizations were involved in the working groups in addition to officials of the territorial bodies. A total of about 300 specialists from various organizations and institutions participated in the working groups. During the meetings, the preventive action plans of the regional bodies of the State Labor Inspectorate for 2021 were discussed and approved. The plans were based on the analysis of occupational traumatism level and proposals of heads of business entities, social partners and local authorities of the region. Based on the results of the consultations, the highest priority areas of preventive work were identified, namely
- Carrying out preventive measures to prevent injuries in forestry workers; establishing close cooperation with the territorial bodies of Ukrainian Road Safety Office and the National Police of Ukraine to improve safety on road, urban electric, railway transport, and to prevent and avoid cases of injuries as a result of road accidents;
- To conduct awareness-raising work on prevention of accidents in health care facilities, as well as in facilities identified for hospitalization of patients with a confirmed case and suspected COVID-19 infection, including on the safe operation of oxygen cylinders and oxygen piping systems.

At the same time, organizing workplace safety in the face of the spread of COVID-19 and its effects has become an important challenge. To this end, the ILO together with the Food and Agriculture Organization of the United Nations developed recommendations «COVID-19 and logging: a checklist of prevention and control measures», which labor inspectors used in carrying out preventive measures in forestry entities. As of 09.06.2021 labor inspectors of territorial bodies of State Labor Inspectorate carried out 26 712 preventive measures which covered 30176 economic entities. A large-scale awareness-raising campaign has had a positive impact on the attitudes of employers and employees towards personal safety, namely on their understanding of the importance of compliance with work safety requirements to build a workplace culture, as well as to reduce the level of occupational injuries in Ukraine.

In order to prevent accidents at work and provide information on their causes, the State Labor Inspectorate's official website has a special

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section entitled «Injuries. Statistics. Causes», which helps employers, employees and all interested parties analyze the most common causes of accidents at work, in the future to prevent the occurrence of similar accidents.

Today, the State Labor Inspectorate continues to work systematically on the prevention and avoidance of accidents at work and on ensuring safety and health in the workplace, using modern and effective methods of injury prevention [13].

The aim of the study was to identify patterns of occupational accident prevalence in Ukraine in the context of the COVID 19 pandemic.

Materials and methods of research

The methodology of the study of occupational accidents prevalence was based on the principle of solid statistical sampling of primary documents, drawn up for all cases of accidents at work, first identified and registered in Ukraine in 2019–2021, according to the form of Act H-1 (in case an accident is considered to be a work-related one). According to the data of the State Statistics Service of Ukraine and the State Labor Service of Ukraine, the analysis of occupational accidents for these years by types of economic activity, occupations, causes of occurrence and the ways to improve the prevention of accidents were carried out [14, 15]. The data were processed using classical descriptive epidemiology methods.

Results of research and discussion

The results of the analysis of occupational injury rates in Ukraine during the pandemic differ significantly from previous years. The fact is that there appeared regulations that provide that acute respiratory disease COVID-19, caused by SARS-CoV-2 coronavirus, should be included in the statistical group of occupational accidents. This is the Order of the Ministry of Health of Ukraine dated 25.02.2020 No. 521 «On amendments to the List of Especially Dangerous, Dangerous Infectious and Parasitic Diseases and Carrying of their Pathogens, Instruction No. 374 «On application of the list of occupational diseases», approved by joint order of the Ministry of Health, National Academy of Medical Sciences, Ministry of Labor from 29.12.2000. No. 374/68/33, Order of the Ministry of Health of Ukraine of 15.07.2020 No. 1604 regarding the «List of Positions of Medical and Other Workers Directly Engaged in Epidemic Elimination and Implementation of Measures to Prevent Spread of Acute Respiratory Disease COVID-19 Caused by SARS-CoV-2 and Treatment of Patients with Cases of Acute Respiratory Disease COVID-19 Caused by SARS-CoV-2», CMU Resolution of 13. On 05.05.2020 No. 394 section V of the List of occupational diseases approved by resolution of the Cabinet of Ministers of 08. 11.2000 No. 1662, was supplemented with acute respiratory disease COVID-19 caused by SARS-CoV-2 coronavirus, which refers only to the work of «Medical and other workers directly involved in the epidemic elimination and implementation of measures to prevent the spread of acute respiratory disease COVID-19 caused by SARS-CoV-2 coronavirus, and treatment of patients with cases of COVID-19 acute respiratory disease caused by SARS-CoV-2». The quantitative indicators and their structure have changed. Therefore, the interpretation of the results separates occupational accidents caused by specific working conditions and technological processes from those caused by COVID-19 infection.

Monitoring of the occupational injury rate shows a downward trend in the total number of occupational accidents in the country. For example, the total number of injuries decreased by 20 times in

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Table 1

Prevalence of occupational injuries in the dynamics of long–term observations

Year	1992	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
The number of people traumatized	124 971	80 450	34 288	20 817	11 698	4260	4428	4313	4126	3876	6121
Including fatalities	2619	2195	1325	1088	644	375	400	366	409	422	653

2020 compared to 1992, although there is a significant increase compared to 2019, due to the high number of medical and/or other employees contracting acute respiratory disease COVID-19 caused by coronavirus SARS- CoV-2 in the performance of their professional duties. Over the years of independence, the number of occupational fatalities has decreased by 4 times. (Table 1).

The number of people injured at work per 100,000 workers declined during this period from 600 to 54, including fatalities from 13 to 5.8. At the same time, the total number of employees in enterprises, institutions and organizations has also fallen significantly since the early 1990s. The number of accidents/acute occupational diseases (poisonings) reported to the working bodies of the executive management of the Fund was 4,737, registered in 2020.

Compared to 2019, the number of reports of accidents/acute occupational diseases (poisonings) has increased by 7 times (from 5,820 to 4,737), the number of reports of fatal accidents has increased by 25.5 % (from 1,228 to 1,541).

A significant increase in the number of reports of accidents/acute occupational diseases (poisonings) registered with the executive management of the Fund, the State Labor Service occurred in: Zakarpattia region – 34.5 times (from 52 to 1792), Cherkasy region – 20 3 times (from 117 to 2377), Ternopil region – 17.9 times (from 86 to 1540), Chernivtsi region – 16.5 times (from 48 to 792) and Chernihiv region – 13.6 times (from 147 to 2000).

This is due to cases of infection among medical and other workers at COVID-19, whose work is associated with the performance of professional duties under conditions of high risk of infection and which are being investigated as cases of acute occupational disease. There were 35 660 such cases reported in 2020, which represents 87.5 % of the total number of cases.

The highest number of reported cases of acute occupational disease COVID-19 was registered in Kyiv region – 3974 (11.1 %), Lviv region – 3785 (10.6 %), Dnipropetrovsk region – 2506 (7.0 %), Zaporizhzhya region – 2320 (6.5 %), Cherkasy region – 2179 (6.1 %) and Chernihiv region – 1902 (5.3 %). The number of reports in these regions is 46.6% of the total number of reports in Ukraine.

In 2020, 6646 (393 of them fatal) victims of occupational accidents/acute occupational diseases were registered and H-1/P certificates were issued for them. Of these, 6,104 (incl. 267 fatalities) H-1/P reports were made for accidents which occurred and investigation of which was completed in the reporting period, while 542 (incl. 126 fatalities) reports were made for accidents which occurred in previous years and for which reports were made during the reporting period.

2020 compared to 2019, the number of insured accidents increased by 51.3 % (from 4394 to 6646), the number of fatally injured decreased by 4.1 % (from 410 to 393).

A significant increase in the number of occupational accidents occurred in: Kyiv, Kharkiv, Ivano-Frankivsk, Lviv, Khmelnytsky, Chernivtsi and Cherkasy regions – by 2.7–4.4 times. The number of fatal accidents increased in Odessa, Zaporizhzhya, Zakarpattia and Rivne region by

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1.7–2.2 times. There was also a slight decrease of the number of accidents (up to 10.0–15.0 %) in Poltava, Sumy and Donetsk regions. The reasons for this are specific to each region and are partly reflected in the following analysis of the causes of accidents at work.

In 2020, at the enterprises with the highest level of injuries, a significant number of insured accidents occurred in Dnipropetrovsk Oblast (10.3 %), the city of. Kyiv (10.2 %), Kyiv region (8.5 %), Lviv region (7.0 %), Donetsk and Kharkiv regions (6.5 %). The number of injured people in these regions accounts for 49.0 % of the total number of injured people in Ukraine. Out of the total number of all injured women constitute 53.7 % (3,566 people) and men 46.3 % (3,080 people). The highest level of occupational injuries was observed among workers aged 50 to 59 years – 27.2 % of the total number of injured in Ukraine. 10.5 % were aged 20–29 years.

For 2020, there were 161 (including 36 fatalities) work-related accidents recorded on Form H-1/P, which constitute 2.4 % of the total number of workers injured in this period. As of 2019, there were 91 (of which 27 were fatal) victims belonging to this category.

The main types of injuries are fractures of the skull, spine and torso bones, intracranial injuries, upper and lower extremities, dislocations, sprains and ligament injuries, wounds and vascular injuries, crush injuries, traumatic amputations, thermal and chemical burns, consequences of foreign body penetration, etc. It is particularly noteworthy that 82 people (1.2 % of the total number of injured in Ukraine) were injured at work while intoxicated during this period, a decrease of 38 compared to 2019. At the same time, 40 people suffered fatal injuries. The highest number of injuries is observed in industry (over 70 %), in road traffic work in production (about 9 %), and in agriculture (about 6 %). Other industries account for 15.0 % of injuries. During the pandemic, the sociocultural sphere, especially health care with infection of workers by COVID-19, took the first place. The following professions suffered more injuries: nurse (nurse-brother) (841), nurse (nurse-brother) nursing (316), nurse (nurse-cleaner, nurse-buffer, etc.) (257), motor vehicle driver (200), general practitioner (200), hospital nurse (nurse-brother) (176). Of the total number of those injured, 56.7 % had long-term consequences. The number of days of incapacity for work per injured person is more than 55 days. An analysis of the distribution of occupational accidents by sector of supervision shows a change in the structure in 2020 compared to 2019. The highest prevalence rates in 2020 reliably come from the socio-cultural sphere and trade, the coal industry, the agro-industrial complex and transport (Table 2, Table 3).

An analysis of fatal accidents in 2019 shows that the largest number of fatalities were due to organizational causes – 310 employees died, or 73 % of all fatalities resulting from work-related fatalities. Technical causes caused the deaths of 57 employees, or 14 %. Fatal accidents due to psychophysiological causes killed 55 employees, or 13 %.

Analysis of the causes of fatal accidents in 2020 shows that the largest number of fatal accidents were due to organizational reasons – 318 employees or 48.7 % of all fatal accidents related to production. Due to psychophysiological reasons, 296 employees died, or 45.3 %. Technical causes were responsible for 39 employees, or 6 % (Figure).

The preferred types of events leading to fatal accidents differed in 2019 compared to 2020 (Table 4).

The structure of the causes of fatal accidents has changed in 2020, with a significant advantage in organizational and psychophysiological

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Table 2

Distribution of occupational accidents by sector of supervision

Supervisory industry	2019		2020	
	Abs	%	Abs	%
Coal industry	690	17,80 ± 1,45**	524	8,60 ± 0,07**
Mining and non-metallic industry	160	0,46 ± 0,53	141	2,30 ± 1,26
Oil and gas production and exploration	30	0,8 ± 1,6	19	0,3 ± 1,5
Energetics	121	3,12 ± 1,50	137	2,2 ± 1,2
Construction and building materials industry	244	6,3 ± 1,5*	212	3,46 ± 1,25*
Boiler supervision and lifting facilities	14	0,37 ± 1,60	23	0,37 ± 1,25
Mechanical engineering	270	6,97 ± 1,50**	230	3,75 ± 1,25*
Metallurgical industry	199	5,13 ± 1,50*	186	3,0 ± 1,25
Chemical, petrochemical and refining industries	129	3,3 ± 2,3	97	1,50 ± 1,23
Transportation	293	7,60 ± 1,54*	351	5,70 ± 1,23*
Communications	47	1,21 ± 1,50	54	0,8 ± 1,2
Gas industry	28	0,72 ± 1,50	46	0,75 ± 1,20
Housing and utilities sector	135	3,48 ± 1,57	132	2,10 ± 1,24
Agro-industrial complex	517	13,30 ± 1,49*	407	6,6 ± 1,2*
Wood processing industry	53	1,3 ± 1,5	55	0,9 ± 1,2
Light and textile industry	22	0,50 ± 0,06	14	0,2 ± 1,2
Socio-cultural sector and trade	924	23,9 ± 0,1**	3493	57,0 ± 1,2**
Total	3876	100,0	6121	100,0

*Note. *, ** Difference in mean by Student's t-test respectively at $p < 0.05$ and $p < 0.01$.*

terms and less in technical terms due to the occurrence and course of COVID-19.

The ranking of occupational accidents for 2019 and 2020 shows a significant difference:

In 2019, the highest number of fatal occupational accidents were workers in the following occupations:

transport workers – 105 fatalities, or 25 % of all fatalities (including 73 drivers and 14 tractor drivers);

among construction workers – 68 dead, or 16% of all deaths (including 20 unskilled workers, 13 assemblers, 8 bricklayers and electric and gas welders);

top managers – 46 people died, or 11 % (including 14 top managers, 9 foremen and 8 heads of subdivisions and departments);

locksmiths – 34, or 8 % (including 18 maintenance workers);

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Table 3

Distribution of fatal occupational accidents by sector of supervision

Supervisory industry	2019		2020	
	Abs	%	Abs	%
Coal industry	20	4,7 ± 1,0*	20	3,07 ± 0,7*
Mining and non-metallic industry	16	3,8 ± 0,9	15	2,3 ± 0,6*
Oil and gas production and exploration	3	0,7 ± 0,4	1	0,2 ± 0,2
Energetics	20	4,7 ± 1,0*	25	3,8 ± 0,7*
Construction and building materials industry	61	14,5 ± 1,7**	47	7,2 ± 1,0**
Boiler supervision and lifting facilities	7	1,6 ± 0,6	10	1,5 ± 0,5
Mechanical engineering	20	0,5 ± 0,3	14	2,1 ± 0,6
Metallurgical industry	13	3,0 ± 0,8	14	2,1 ± 0,6
Chemical, petrochemical and refining industries	15	3,6 ± 0,9	7	1,1 ± 0,4
Transportation	75	17,8 ± 1,9	76	11,6 ± 1,3**
Communications	0	0	0	0
Gas industry	3	0,7 ± 0,4	5	0,77 ± 0,3
Housing and utilities sector	20	4,7 ± 1,0	19	2,9 ± 0,6*
Agro-industrial complex	80	18,9 ± 1,9**	71	10,9 ± 1,2**
Wood processing industry	5	1,2 ± 0,5	5	0,7 ± 0,3
Light and textile industry	1	0,2 ± 0,5	0	0
Socio-cultural sector and trade	63	14,9 ± 1,7**	323	49,5 ± 1,9**
Total	422	100,0	653	100,0

*Note. *, ** Difference in mean by Student's t-test respectively at $p < 0.05$ and $p < 0.01$.*

agricultural workers – 27, or 6 % of all those who died (14 of them were unskilled workers);

electricians – 25, or 6 % of the total number of deaths;

miners – 24, or 6 %.

In 2020, most fatal occupational accidents occurred among workers in the following occupations:

social and cultural workers – 266 deaths, or 41 % of the total number of deaths (including 147 doctors, 84 nurses, 14 paramedics and 7 orderlies) (occupational accidents that occurred to medical workers due to acute occupational diseases of medical and/or other workers acute respiratory disease COVID-19, caused by coronavirus SARS-CoV-2, while performing professional duties in conditions of increased risk of infection by infectious agents);

transport workers – 115 deaths or 18 % of the total number of deaths (including 80 drivers), road transport workers (30 workers), social and

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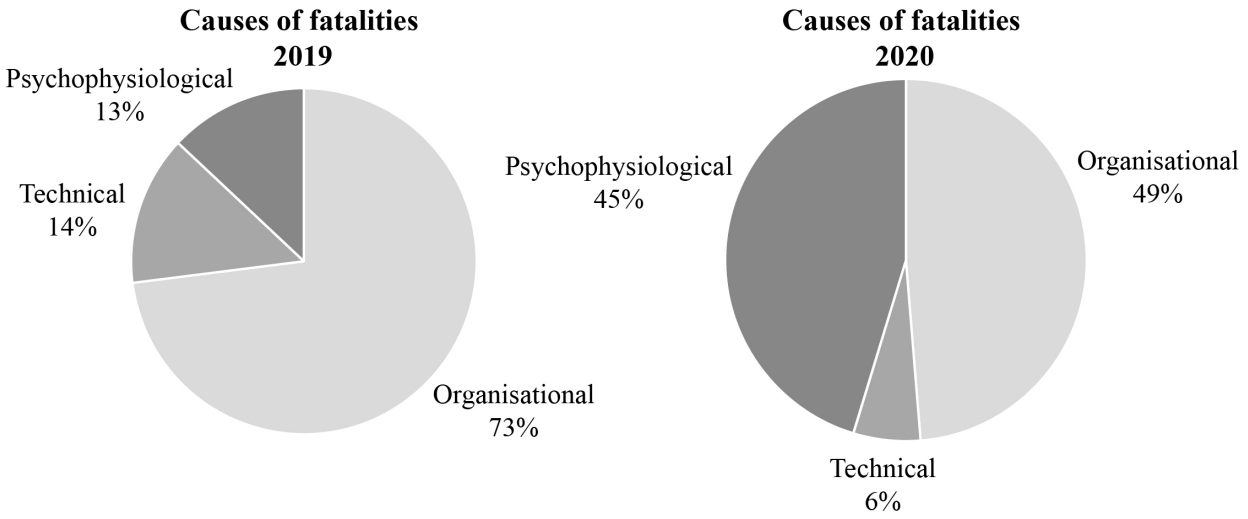

Figure. Causes of fatal accidents in 2019–2020

cultural workers (20 workers), other transport workers (19 workers) and agricultural workers (9 workers);

construction workers – 50 dead, or 8 % (14 unskilled workers, 8 electric and gas welders, 3 concrete workers, 3 construction workers, 3 roofers, 3 plasterers, 3 assemblers), mainly in the construction sector (34 workers);

top managers – 40 people died, or 6 % (including 10 heads of departments, 9 foremen,

Table 4

The main causes of fatal occupational accidents by types of events

Accident	2019		2020	
	Abs.	%	Abs.	%
Road traffic accidents and vehicle collisions	123	29	120	18
Falling victim	86	20	65	10
Falling, collapsing objects, materials, rocks, soil, etc.	57	14	73	11
The action of objects and parts of moving, sprawling, rotating	44	10	31	5
Electrocution	32	8	36	6
As a result of the fire	21	5	4	1
From exposure to harmful and toxic substances	18	4	10	2
Premeditated murder			8	1
Explosion			6	1
Drowning			6	1
Due to a deteriorating health condition	41	9,7	288	44,0
Other			6	0,9
Total	422	100,0	653	100,0

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6 site managers and 5 engineers), mainly in social and cultural institutions (10 workers);

electricians – 32 people died, or 5 %, mostly in energy companies (17 workers);

agricultural workers – 30 died, or 5 %, mostly in forestry (21 workers) and agriculture (7 workers);

miners – 24 deceased, or 4 % of all deceased (including 20 mining workers, 3 electric fitters – underground), the overwhelming majority of deceased miners worked in coal industry (17 workers) and mining and nonmetallic industry (7 workers);

engine fitters – 21 died, or 3 %;

machinists – 12 dead or 2 %;

workers in the core business support sector – 12 fatalities, or 2 %.

According to the results of analysis of the level of occupational injuries in Ukraine for 5 months of 2021 there has been registered a decrease in the number of total injuries in economic entities of water transport, boiler supervision and lifting structures, light and textile industry, utilities-2 (enterprises and facilities of water supply and sewage services), chemical, petrochemical, oil refining industry, energy, metallurgical industry, agro-industrial complex. There has also been a significant decline in the rate of fatal injuries in Ukraine as compared to the same period last year in power engineering, boiler and hoisting structures, transport and the metallurgical industry.

Conclusions

1. Monitoring of the status of occupational injuries shows a downward trend in the total number of occupational injuries in the country. The total number of workplace injuries fell by 20 times in 2020 compared to 1992; the number of workplace fatalities has fallen by 4 times since the independence day. The number of workplace injuries per 100,000 workers in this period fell from 600 to 54, including fatalities from 13 to 5.8.
2. In 2020, the Social Insurance Fund, the State Labor Service of Ukraine received and registered 40737 reports of accidents / acute occupational diseases (poisoning). Compared with 2019, the number of such reports increased by 7 times, the number with a fatal outcome – increased by 25.5 % due to the large number of medical and / or other workers in carrying out professional duties acute respiratory disease COVID-19, caused by coronavirus SARS-CoV-2.
3. In 2020, 6646 (of which 393 were fatal) victims of occupational accidents/acute occupational diseases were registered and reports on Form H-1/P related to the workplace were drawn up. In 2020 as compared to 2019, the number of accidents increased by 51.3% and the number of fatally injured decreased by 4.1 %.
4. During the pandemic period, the number of occupational accidents was dominated by the sociocultural sector, especially health care, with workers being infected by COVID-19. Workers in such occupations as nurse, nurse-caregiver, nursing (nurse-cleaner, nurse-buffeter, etc.), motor vehicle driver, general practitioner, family doctor, hospital nurse were injured more often. The number of fatal occupational accidents by sector of supervision shows that, apart from social and cultural sphere and trade, they are also the largest in the agricultural sector, transport and coal industry. 2020 is characterized by a significant increase in numbers due to COVID-19.
5. Most of the fatalities in 2019 occurred due to the organizational reasons (73 % of all fatalities resulting from work-related fatalities) due to the technical reasons – 14 %, psychophysio-

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logical reasons – 13 %. In 2020, the largest number of fatalities happened due to organizational causes (48.7 % of all fatalities caused by work-related fatalities), psychophysiological causes (45.3 %) and technical causes (6 %).

The structure of causes of fatal accidents changed in 2020, with a significant advantage in organizational and psychophysiological causes and less in technical causes due to the occurrence and course of COVID-19.

References

1. ILO and COVID-19 standards (coronavirus). URL: https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---normes / documents / publication / wcms_741046.pdf (accessed 22.06.2021).

2. Recommendation of the International Labor Organization in 2017 on employment and Decent work in order to ensure peace and the potential for resistance (No 205 from 05.06.2017). URL: https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---Relconf / documents / meeting document / wcms_561474.pdf (accessed 04.06.2021).

3. Occupational safety in a pandemic. World Day for Safety and Health at Work 28 April 2020. URL: http://www.mintrud.gov.by/system/extensions/spaw/uploads/files/ILO-SafeDay- COVID-Booklet-April14Clean- RUS-1.pdf (accessed 24.06.2021).

4. Kalnish V. V. (2020), «The role of spreading the coronavirus infection (COVID-19) in developing stress and chronic fatigue in the working population», *Ukrainian Journal of Occupational Health*, 16, 3, 173–184. https://doi.org/10.33573/ujoh2020.03.173

5. Anticipate, prepare for and respond to crises: let's invest in sustainable ones now OSH systems (2021), International Labor Office. Geneva : ILO. URL: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_741557.pdf (accessed 10.06.2021).

6. An employers' guide on managing your workplace during COVID-19 (2021), ILO. URL: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_741557.pdf (accessed 10.06.2021).

7. Komarov A., Zinovieva T. (2020), «Pan yly propal. Kak pandemyia povlyiaet na uroven travmatyzma na proyzvodstvakh» [Pan or missing. How the pandemic will affect the level Injuries at work]. URL: https://www.ecopsy.ru/insights/pan-ili-propal-kak-pandemiya-povliyaet-na-uroven- travmatizma-na-proizvodstvakh / (accessed 16.06.2021).

8. The number of cases of occupational injuries has decreased in Belarus, *BelTA*, 2021, April 27. URL: https://www.belta.by/society/view/ v-belarusi-snizilos-chislo-sluchaev-proizvodstvennogo-travmatizma-439062-2021/ (accessed 30.06.2021).

9. Analysis of occupational injuries and prevention work for the 1st quarter of 2021. Social Insurance Fund of Ukraine. URL: http://www.fssu.gov.ua/fse/control/chniv/uk/publish/category/94803(accessed 18.06.2021).

10. Analytical information on the state of occupational injuries and occupational morbidity in the Kryvyi Rih region as of June 1, 2020. URL: https://grushivska.gr.org.ua/analitychna-informatsiia-pro-stan-vyrobnychoho- travmatyzmu-ta-profesiynoi-zakhvoriuvanosti-v-kryvoriz-komu-rehioni-stanom-na-01-chervnia-2020-roku / (accessed 18.06.2021).

11. Industrial injuries and occupational diseases at the enterprises of the city Alexandria, Alexandria and Petrovsky districts in 2020. URL: http://olexrada.gov.ua/socia_obj/citizens_info/vyrobnychyj-travmatyzm-ta-profesijna-zahvoryuvanist-na-pidpryyemstvah-mista-oleksandriyi-oleksandrijskogo-ta-petrivskogo-rajoniv-u-2020-rotsi.html (accessed 18.06.2021).

12. Injuries in agricultural production: the main causes (2020), Labor protection and fire safety, 2020, 10 July. URL: https://oppb.com.ua/news/travmatyzm-v-silskogospodarskomu-vyrobnyctvi-osnovni- prychyny (accessed 06/18/2021).

13. State Labor introduces new approaches to injury prevention, State service of Ukraine on labor protection, Kyiv, 2021. URL: http://kiev.dsp.gov.ua/main-news/derzhpratsi-zaprovadzhuie-novi-pidkhody-zapobihannia-travmatyzmu / (accessed 18.06.2021).

14. Injuries at work in Ukraine in 2020. Statistical Information (21 Exel table), State Statistics Service of Ukraine, Kyiv, 2020. URL: http://ukrstat.org/uk/operativ/operativ2021/oz_rik/travm_na_vyr_2020.xls (accessed 10.06.2021).

15. Operational data on injuries in Ukraine in 2021, Public Service of Ukraine on labor protection. Kyiv, 2021. URL: http://kiev.dsp.gov.ua/main-news/derzhpratsi-zaprovadzhuie-novi-pidkhody-zapobihannia-travmatyzmu (accessed 18.06.2021).

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