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Occupational incidence in the modern socio-economic conditions of Donbass

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An analysis of the current state of occupational pathological assistance to the working contingent of industrial enterprises of the Donetsk People's Republic is presented. When analyzing the dynamics of occupational morbidity for the period 2017–2021, it shows a significant increase from 12.3 cases in 2017 to 30.5 cases in 2021 (per 10,000 workers), mainly due to workers in coal mines. Most of all occupational diseases were registered among workers of the main underground professions — miners of a stope (37.5%) and sinkers (23.3%). The observed increase in occupational morbidity is considered from the standpoint of today's specifics of the working conditions of coal mining enterprises in Donbass. First of all, the absence of a leading occupational hazard with simultaneous multifactorial industrial exposure, often exceeding the threshold values of limit values, as well as a change in operating factors and the intensity of their impact during the length of service. Most cases of occupational diseases identified when workers applied for medical help to the Republican Center for Occupational Pathology had pronounced chronic forms of diseases in workers with work experience in harmful production factors of 20–39 years (up to 75%) and over 50 years of age — more than half of all cases (2020 — 52.7%, 2019 — 51.2%, 2018 — 53%, 2017 — 51.8%). At the same time, when analyzing primary medical documentation (originals of outpatient cards, professional examination cards) working in hazardous conditions, it is noted that more than 80% are «healthy». One of the main reasons for the growth of occupational morbidity is the poor quality of medical examinations carried out by general medical institutions, which causes late detection of occupational and work-related pathologies, the development of advanced forms of general somatic diseases that prevent employees from fulfilling their job duties. In the structure of occupational pathology in the DPR, the largest share falls on diseases caused by physical overload — 44.3%; industrial aerosols — 37.1%; physical factors: vibration — 17.2%, noise — 0.7%. It is concluded that all of the above processes are due to a number of interrelated reasons — a change in the socio-economic situation caused the economic instability of coal enterprises, which led to worsening working conditions, a reduction in the number of employees, an increase in intensive appeals to the Republican Center for Occupational Pathology in order to resolve the issue of the relationship of morbidity with the profession, and , consequently, the solution of social problems through compensation for damage to health.

Keywords: *occupational diseases; workers of industrial enterprises; harmful and dangerous labor factors; periodic medical examinations*

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Onishchenko G.G. — significant contribution to the concept and structure of the study, approval of the final version, which is submitted for publication;
Denisenko A.F. — analysis and interpretation of data, writing the text of the article;
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Introduction. The provision of occupational pathology care occupies a special place in the system of providing medical care to the population in any state, primarily because it is a guarantee of preserving labor potential and, accordingly, the level of economic development that ensures the quality of life [1]. Since 2014, due to certain events, changes in the economy have taken place in the territory of Donbass, which led to a forced reduction in the production sector (by 59%), and a reduction in the number of employees (mass outflow of specialists), including in harmful and dangerous conditions. At the same time, with the forced reduction of industrial production, there is a significant growth in the services market with a decrease in employment in the manufacturing sector. The consequence of these transformations were changes in the social sphere. The social significance of occupational pathology is due to the mass of contingents involved in the range of possible adverse effects of production factors, and the difficulties of solving issues of compensation for damage to public health from industrial and environmental pollution [2].

The study aims to research the dynamics and structure of occupational morbidity in the Donetsk People's Republic.

Materials and methods. The researchers have carried out an analysis on the basis of indicators of occupational morbidity of workers in the DPR over the past 5 years on the basis of official statistical materials "Indicators of public health and the activities of health institutions".

Experts have studied the indicators of occupational morbidity of workers in leading industries (per 10 thousand workers and per 1000 examined), the distribution of occupational diseases among workers in the main industries (%), coverage of workers in these industries with periodic medical examinations (% of subjects), the structure of occupational diseases (%).

We took into account the requirements of Order No. 355 of 27.02.2015 of the State Mining and Technical Supervision of the Donetsk People's Republic "On approval of the Regulations on investigation and accounting of accidents and occupational diseases at work" and Order of the Ministry of Health of the DPR No. 186 of 07.02.2018 "On approval of the

procedure for mandatory preliminary (when hiring), periodic and extraordinary medical examinations workers engaged in heavy work and work with harmful and(or) dangerous working conditions."

Results and discussion. Today in the Donetsk People's Republic the main share in industry is occupied by metallurgy and metalworking — 38%; energy — 26%; 10% falls on the food industry; 9% — coke chemistry; 8% — coal industry, 2% — chemical industry; 2% — mechanical engineering, etc. [3, 4].

The specific weight the number of workers employed in harmful and unfavorable working conditions has fluctuated over the past five years in the range of 29.3–32.1%. Consistently unsatisfactory working conditions at individual enterprises of the republic cause a high risk of developing occupational diseases.

According to the decision of the Medical Expert Commission (MEC) of the Republican Center for Occupational Pathology and Rehabilitation of the Ministry of Health, DPR, in 2021, 674 cases of occupational disease were found in 443 patients ***(table)***.

Table

Occupational diseases, 2017–2021

Year	The number of examined on the MEC	Number of cases of established occupational diseases	% of patients with established occupational disease from examined
2017	579	251 / 211 patients	36.4
2018	593	291 / 232 patients	39.1
2019	600	418 / 295 patients	49.2
2020	691	585 / 400 patients	57.9
2021	710	674 / 443 patients	62.4

Attention is drawn to the steady growth of newly identified occupational diseases in recent years — almost every second presented at the MEC. In addition, among the newly identified cases of occupational diseases, more than 40% are of a combined nature — the presence of two or more occupational diseases in one patient.

Traditionally, the largest number of occupational diseases (95.2%) has been established for employees of the coal industry. The proportion of occupational diseases established for employees of the metallurgical industry is 1.4%, for employees of other ministries — 3.4%. At the same time, 142,726 workers worked in the industrial sector (as of 2021), of which 26.1% work in the coal industry, metallurgy — 16.5%, transport — 11.5%, energy — 7.4%.

A decrease in the number of workers (by 26% compared to 2017) and an increase in detected cases (by 2.5 times) led to an increase in occupational morbidity (per 10 thousand workers) from 12.3 cases in 2017 to 30.5 cases in 2021 ***(Fig. 1)***.

It should be noted that traditionally, "occupational disease" refers to the number of people with a newly diagnosed occupational disease per 10 thousand employees. However, all over the world, "occupational morbidity" is the number of cases (2 or more nosologies of occupational disease can be detected in one person). The indicator of "occupational morbidity" used in official statistics (cases of diseases) per 1000 examined reflects not so much the actual morbidity

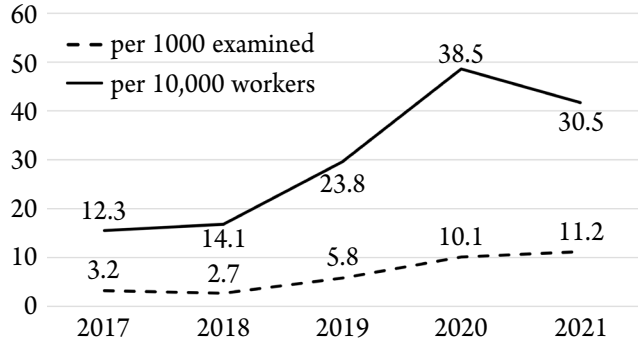

Fig. 1. Indicators of occupational morbidity

as the appeal and quality of occupational examinations of industrial contingents of workers.

The analysis of occupational pathology (data for 2020) by profession ***(Fig. 2)*** showed that most occupational diseases were registered in workers of the main underground professions — miners of the treatment face (37.5%) and tunnellers (23.3%). We have been following this pattern for the past 15–18 years. However, only 20 to 30% of miners work steadily in one profession during their working life. The rest of the miners only change their profession up to eight times, which depends on the work experience and qualifications of this worker [5–8]. When changing a profession, a production site or a coal company, the working conditions of miners sometimes change dramatically due to certain factors.

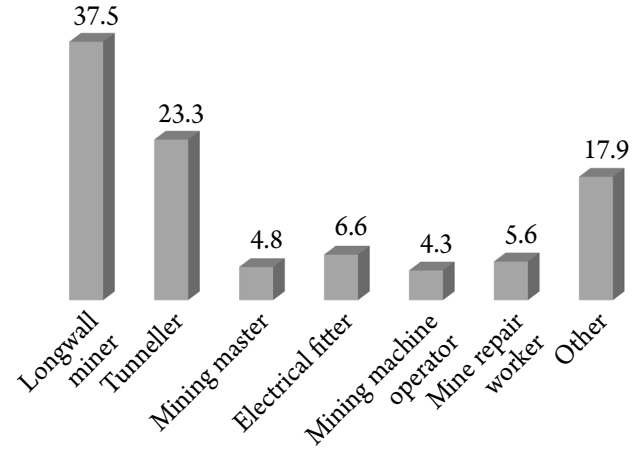

Fig. 2. Distribution of occupational diseases by profession in 2021 (%)

In this regard, the last place of work and profession today can no longer be considered as one of the determining conditions for the objectification of cause-and-effect relationships of health disorders with working conditions.

The marked distinct increase in occupational morbidity in recent years, both according to traditional statistical indicators and cases of their combined detection in one patient, experts consider from the point of view of today's characteristic working conditions of coal mining enterprises of Donbass. First of all, this is the absence of a leading occupational hazard with simultaneous multifactorial production impact, often exceeding the threshold values of MPL and MPC, as well as a change in the active factors and the intensity of their impact during the work experience. The information presented in the sanitary and hygienic characteristics about working conditions

no longer reflects the real accumulated work experience load with industrial hazards to which the employee was subjected during the entire period of work experience. This fact, in comparison with the clinical symptoms characteristic of certain occupational diseases, in some cases, does not allow linking the disease with professional activity.

Analyzing the indicators of occupational morbidity, it is necessary to note the prevalence of active primary treatment of workers in medical and preventive institutions and low detection of early signs of the impact of adverse factors of the working environment on the health of workers during occupational examinations.

The majority of cases of occupational diseases identified when workers seek medical help at the Republican Center of Occupational Pathology are already pronounced chronic forms of diseases in workers with work experience in harmful production factors of 20–39 years (up to 75%) and over 50 years of age — more than half of all cases (2020 — 52.7, 2019 — 51.2%, 2018 — 53%, 2017 — 51.8%). At the same time, the analysis of primary medical documentation (originals of outpatient cards, occupational examination cards) working in harmful conditions shows that more than 80% are "healthy".

It becomes obvious that medical institutions of the general medical network cannot cope with the specific tasks of servicing the working population at the level of conducting both preliminary and periodic medical examinations of workers employed in harmful working conditions, and additional medical examination of the able-bodied population. Not all doctors are narrow specialists of general practice institutions who take part in periodic medical examinations, have special training in occupational pathology and can diagnose early preclinical manifestations (syndromes and symptoms) of occupational diseases in a timely manner. Recommendations for rational employment and transfer of the patient to light work in accordance with medical recommendations based on the results of medical examinations are carried out only in every second case [9–11].

We note that today the detection of employees with suspected occupational pathology during periodic medical examinations (PME) remains low. The reason for this is the poor quality of professional examinations by medical and preventive institutions of general practice, which causes the late detection of professional and production-related pathology, the development of neglected forms of general somatic diseases that prevent employees from fulfilling their work duties.

The reasons for this fact are in health care institutions conducting PME, where there is often no appropriate medical equipment that allows to fully carry out laboratory and functional research methods provided for by the relevant orders of the Ministry of Health of the DPR.

In addition, most of the specialist doctors involved in medical examinations according to the orders regulating their conduct in the Republic (oncologist, dermatologist, allergist, etc.) are full-time employees of specialized healthcare institutions, and their work in the relevant medical organizations does not provide for long-term distractions to conduct examinations of a large number of employees with the necessary replacement of a specialist at an appointment in a polyclinic or in a hospital. These circumstances, among other things, contributed to the fact that the coverage of occupational examinations of industrial workers in certain regions of the DPR in recent years has been recorded from 20.3% to 95.7%.

There is a situation when early diagnosis of occupational diseases is not beneficial either to the employer, or to an employee who is afraid of losing his job, or to a medical institution.

Being afraid of being out of work or losing their main profession, those who work under the influence of industrial hazards hide their existing diseases during the medical examination, do not make appropriate complaints, refuse to carry out preventive and rehabilitation measures in a timely manner.

The main reason for the weak effectiveness of the attempts currently being made to increase the detection of occupational diseases is the administrative and compulsory orientation against the background of the lack of motivation of all participants in the process: the employee, the medical institution, the employer [12].

At the same time, according to periodic medical examinations conducted by the staff of the Republican Center for Occupational Pathology and Rehabilitation of the DPR, the detection of persons with suspected occupational diseases is more than 4–6 times higher than when conducting occupational examinations by doctors of the general medical network. Of course, under the current conditions, the role and workload of the Republican Center for Occupational Pathology and Rehabilitation of the DPR is increasing, which, along with its medical and diagnostic, methodological and expert work, should be more actively involved by the relevant health authorities and institutions for joint activities on the prevention of occupational and general diseases in workers, carrying out medical and rehabilitation measures.

The experience of specialists of the Centers of Occupational Pathology of Russia, who annually carry out such work, both in outpatient outpatient settings and in the polyclinic and hospital of their institutions, shows a significant increase in the number of timely identified persons with early signs of occupational diseases and highly trained workers (with experience of 20 years or more) who were not sent for examination for any reason to the Centers of Occupational Pathology [13–17].

In addition, in Russia, the Order of the Ministry of Health and Social Development No. 302n dated 12.04.2011 regulates the referral of trained workers to occupational pathology centers one time in five years. It is necessary to introduce such experience in the organization of preventive examinations of all persons working in harmful conditions, as well as in the Donetsk People's Republic when reforming the occupational pathology service.

In the structure of professional pathology of the DPR, the greatest share falls on diseases caused by physical overload — 44.3%; then there are diseases caused by industrial aerosols — 37.1%; physical factors: vibration — 17.2%, noise — 0.7%. The structure of occupational diseases by etiological factor is similar to many Russian regions. According to nosologies, the picture looks as follows ***(Fig. 3)***.

There is absence of pronounced dynamics of changes in the structure of occupational morbidity throughout the observation period. Only in the last 3–4 years, experts have noted a distinct decrease in the proportion of pneumoconioses and an increase in lumbosacral radiculitis and vibration disease.

The high levels of occupational morbidity of workers in the coal industry of the Donetsk coal basin, which are still

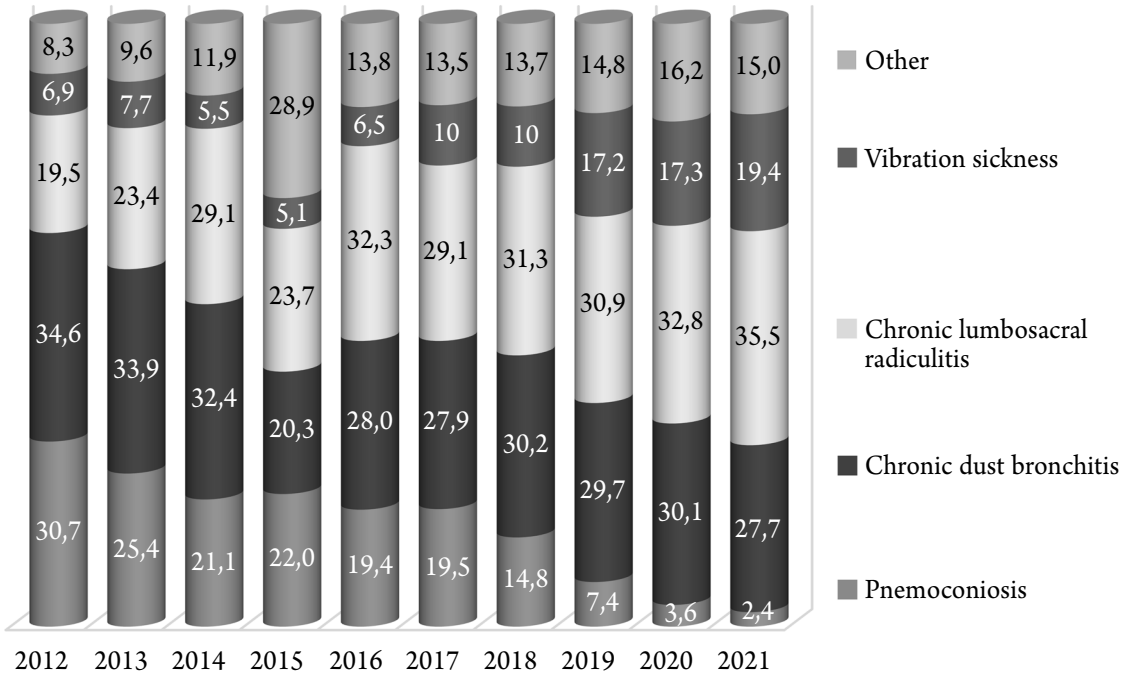

Fig. 3. Structure of occupational morbidity in Donetsk People's Republic (%)

noted today, are explained by the impact of a complex of harmful and dangerous factors of the production environment on the health and life of miners.

Traditionally, there is no basic principle — compliance with hygienic MPC and MPL. So far they are unattainable for the coal industry with modern coal mining technology. At the enterprises of the coal industry, the air of the working area is polluted with dust and aerosols with a significant excess of hygienic standards. When performing technological processes, in addition, in the workplaces of workers of leading professions (thunderstorms, slaughterer, mining machine driver, etc.), increased noise and vibration levels, unfavorable microclimate prevail [18–19][1]. In addition to physical factors, experts have noted high indicators of severity and tension (class 3.1–3.3), nervous and emotional tension, special geological conditions and conditions of increased risk to health at coal industry enterprises. The increased level of functional stress and overload continues for a long time, and accordingly, short-term rest does not lead to a complete recovery of spent resources, which entails the development of pathological changes in organs and tissues at the cellular level, transforming into occupational and production-related diseases.

Of course, the determining importance in the late examination of the connection of the disease with the profession is also the desire of the employee himself to keep his workplace.

Thus, the overwhelming number of patients (2021 — 81.4%) with a primary occupational disease have 20–39 years of work experience in contact with harmful and dangerous production factors (2020 — 76.4%, 2019 — 72.3%, 2018 — 69.8%, 2017 — 62.1%).

Summing up, we want to note that all of the above processes are due to a number of interrelated reasons. Thus, the change in the socio-economic situation caused the economic instability of coal enterprises, which led to a deterioration in working conditions, a reduction in the number of employees, an increase in intensive appeals to the Republican Center of Occupational Pathology in order to solve the problem of the connection of morbidity with the profession, and, consequently, the solution of social problems through compensation for damage to health in monetary terms.

Conclusion. *These data show that the occupational pathology service of the Republic needs optimization primarily due to synchronization with the legislation of the Russian Federation. Despite the ongoing military operations on the territory of Donbass, the Republic still has a significant and promising industrial potential, which needs time and money to restore and stabilize its own functioning.*

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