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Occupational morbidity in Russia: problems and solutions

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Introduction. The article presents the results of the analysis of the problems associated with occupational diseases in the country caused by adverse production factors. The facts of discrepancy between the official occupational diseases statistics and the assessment of the potentially possible number of them are established. The main reason for not registration of occupational diseases is the disinterest of the employer, employee and the commission, which conducts medical examinations, and also imperfection of legislative and standard base.

Problem Statement. The purpose of this study is to develop measures to reduce the level of morbidity caused by professional activity.

Theoretical Part. The problems associated with occupational diseases, factors that can and should solve the problem of ensuring the safety of production are considered, and measures are proposed to solve these problems.

Conclusion. The importance of the official registration of occupational diseases, their investigation and prevention is shown. Ways to solve problems both at the state level and at the enterprise level are proposed. The probabilistic assessment of harmful production factors affecting the risk of occupational diseases are determined. Key dependencies in the formation of occupational diseases at each specific enterprise are identified and the improvement of the enterprise's labor protection management system is proposed taking into account the risk of occupational diseases.

Keywords: occupational diseases, registration of occupational diseases, prevention of occupational diseases, production dependance of violations, assessment of the risk of occupational diseases obtaining and developing.

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Introduction. As you know, unsatisfactory working conditions and unfavorable factors of the production environment are the main causes of occupational diseases. After reviewing the official statistics, which show 12-13 thousand cases of occupational diseases registered annually, we can conclude that this is several times lower than the indicators of countries with a fairly high level of safety culture. There is also a big difference in comparison with the statistics of the United States, where more than 500 thousand occupational diseases are registered annually [1]. Such widely differing figures raise reasonable doubts that official statistics reflect the true state of affairs.

Problem statement. Calculations carried out by the Research Institute of Occupational Medicine of the Russian Academy of Medical Sciences show an approximate proportion of the number of patients with occupational diseases from the number of employees undergoing mandatory medical examinations due to harmful working conditions, which is approximately 7.7 %. This is more than 60 thousand people and clearly exceeds the officially registered annual statistics, ranging from 9,000 to 12,000 cases per year [2]. In addition, a significant number of occupational diseases occur among employees who do not pass mandatory medical examinations, which also increases the estimated number of patients with occupational diseases.

Such a significant discrepancy between the officially registered occupational morbidity in the country and the potential (assumed) one is the evidence of a number of problems in this area.

We will try to identify them and suggest possible solutions, in the opinion of the authors.

Theoretical part. According to the regulatory requirements, three factors can and should solve the problem of ensuring production safety. This is the interest of the employer and employee. The state, regulating their interests, should guarantee the preservation of labor resources, quality and life expectancy of the population [3].

Of course, most of the problems associated with occupational diseases could be solved by improving the occupational health management system at the enterprise and sufficient funding for prevention measures.

Unfortunately, this is still a possibility, since the main goal of the employer is to get the maximum profit. Business considers investments in labor protection as necessary from the point of view of the law, but burdensome for itself. Registration of occupational diseases increases the level of social insurance for the employer (with a maximum surcharge of up to 40%), and simultaneously with the growth of direct costs, indirect losses appear [4].

The employee is also not interested in official confirmation of their professional illness, as this is often due to the need to change jobs [5].

The experience of conducting medical examinations of employees confirms this forced position of employees. Research shows that 85% of employees are not interested in detecting their occupational disease and prefer to continue working, to have legally established benefits (compensation) for working in harmful working conditions instead of establishing an occupational disease [6]. An employee engaged in work with harmful or dangerous working conditions has a minimum wage increase of 4 % of the salary of an employee with normal working conditions (article 147 of the Labour Code), a shortening of the duration of working time not exceeding 36 hours per week (article 92 of the LC RF), guaranteed annual additional paid vacation with minimum duration of 7 calendar days (article 117 of the Labour Code).

Official registration of an occupational disease requires a transfer, usually to a less paid job, or a search for an excuse to get rid of a problem employee.

The failure to report cases of occupational disease by commissions conducting medical examinations of employees is due to a number of reasons:

— lack of motivation to detect occupational diseases among doctors conducting examinations. For comparison, in European countries, a doctor receives remuneration from an employer for identifying a patient with signs of an occupational disease. In our country, a medical organization with a high degree of detection of occupational diseases risks losing an employer as a client.

— insufficient training of doctors participating in examinations in the specific features of the clinical course of occupational diseases [7].

Under the current conditions, only the government can and should change the situation in the field of prevention, detection and registration of occupational diseases by creating an effective model in cooperation with employers and trade unions. This is a serious resource for achieving success in the government's program to ensure high life expectancy in the country. Of course, the main direction should be the development of prevention of industrial injuries and occupational diseases.

Let us focus on a qualitatively new approach to the organization of prevention, which combines three areas: safety, occupational health and well-being of employees at all levels of production. The entire modern world participates in the Vision Zero movement.

The essence of the Vision Zero concept is the development of prevention of industrial injuries and occupational diseases, which allows you to eliminate the causes of accidents and prevent accidents at work. In April 2018, the Vision Zero campaign was launched in Russia. In our country, the function of social and financial protection of the working population is performed by the Social Insurance Fund (SIF RF). For citizens who work under labor contracts, employers pay contributions to the Social Insurance Fund. These funds provide guaranteed payments for medical, social and professional rehabilitation after an accident at work. They can also be used to finance measures for accident prevention, to increase the economic interest of employers in improving working conditions and safety. That is why the International Social Security Association (ISSA) awarded the SIF of the Russian Federation the certificate of the official partner of the program to promote the Vision Zero concept.

Unfortunately, the SIF works with the consequences of tragedies when nothing can be corrected. However, efforts should be directed towards accident prevention.

Such measure as the financing of preventive measures on reducing industrial traumatism and occupational diseases, which is due to the amounts of insurance contributions is aimed at increasing the economic interest of the employer in ensuring safe labor conditions

All policyholders, regardless of their organizations' form of ownership, type of activity and the number of employees, have the right to preventive measures financial support for labor protection at the expense of insurance premiums.

For this purpose, you can spend no more than 20% of the amount of insurance premiums for the previous calendar year, minus the cost of paying injury benefits. For the purpose of economic incentives for employers to improve working conditions, it is possible to raise the bar, for example, to 30% of the amount of insurance payments, especially since the costs are spent on specific measures to prevent injuries and occupational diseases.

Since 2019, twelve measures to provide financial support for preventive measures, including reimbursement of costs for training in labor protection, the purchase of personal protective equipment (PPE), breathalyzers, tachographs, periodic medical examinations, provision of therapeutic and preventive nutrition, and a number of others, have been added with one more — sanatorium-resort therapy of employees of preretirement age [8].

However, it should be borne in mind that the cost of purchasing PPE is compensated only if the products are made on the territory of Russia and from domestic materials. The purchase of the imported PPE will not be financed.

It is prevention that is recognized as the most promising — it is better to prevent accidents, injuries and diseases than to deal with their consequences.

The SIF uses legal instruments to influence the economic interest of employers in reducing the level of industrial injuries and occupational diseases through discounts and surcharges to the insurance rate. The amount of discounts (surcharges) depends on the level of occupational injuries and occupational diseases, as well as labor protection conditions.

The economic interest of employers is that employers who have a minimum level of occupational injuries have the right to apply for a discount to the insurance rate. And vice versa, if the company's indicators for the level of occupational injuries exceed the indicators established by the current legislation, the employer must be set a surcharge to the insurance rate.

The amount of the discount or surcharge is set taking into account information about the special assessment of working conditions (SAWC), and the calculation takes into account the results of mandatory medical examinations of employees. Organizations that have conducted SAWC and provide medical examinations of employees are entitled to receive a discount to the insurance rate. The amount of the discount (surcharge) can reach 40% of the established insurance rate.

If the employer is not motivated to create favorable working conditions at his enterprise, the result is the payment of insurance premiums in an increased amount, which is increased by the amount of the established allowance. The highest surcharge (40%) is "earned" by policyholders who have no interest in taking measures to reduce the level of occupational injuries.

The SIF sets the premium to the insurance rate independently [9].

To ensure objectivity in the detection and registration of occupational diseases, it would be useful to return to the existing practice that obliges managers of industries with harmful and dangerous factors (a large set of factors and the number of employees) to conclude contracts with certain medical institutions specializing in the identification and treatment of workers with occupational diseases and regular medical examinations. To increase the responsibility of medical institutions for the completeness of detection of primary signs and occupational diseases themselves, they use the regulatory and legislative framework for assessing the quality of medical care, which includes such concepts as the quality of diagnosis, creating conditions for increasing the risk of a new pathological process.

Federal law No. 326-FZ of 29.11.2010 (ed. from 01.04.2020 No. 98-FZ) "On compulsory health insurance in the Russian Federation" states: "Examination of medical care quality is the detection of violations in the provision of medical care, including assessment of the timeliness of delivery and the correct choice of methods of prevention, diagnosis, treatment and rehabilitation, the achievement of the planned results" [10].

The Order of the Ministry of Public Health and Social Development of Russia dated 12.04.2011 No. 302n (ed. by 18.05.2020) "On the approval of lists of harmful and (or) dangerous production factors and works, under which

compulsory preliminary and periodic medical examinations (surveys), and the Order of the obligatory preliminary and periodic medical examinations (surveys) of workers in physically demanding jobs and working with harmful and (or) hazardous working conditions," says that medical board must be led by occupational physicians.

The mentioned Order, on the one hand, significantly increases the number of employees subject to preliminary and periodic examinations, since the list of works that require these examinations has almost doubled. On the other hand, according to the Order, examinations should be carried out only for employees engaged in work with harmful heavy working conditions. However, there is official data that even at the acceptable level of HPF (class 2), occupational diseases are registered: in 2010, they were 2.6%, and in 2011 — 3.78% [11].

It is necessary to make changes to the regulations on occupational diseases for the mandatory examination of all employees who come into contact with harmful production factors, regardless of the class of working conditions.

You can also criticize the List of occupational diseases approved by Order No. 417n of the Ministry of Public Health and Social Development of the Russian Federation dated April 27, 2012 "On approval of the List of occupational diseases". Only the diseases specified in it can be determined [12].

International Labour Organization (ILO) Convention No. 121 of 1964 established the List of occupational diseases for the first time [12]. In 1980, the 66th international labour conference updated this List. However, there is still no generally accepted and unified classification of occupational diseases. Each ILO member country sets its own list of occupational diseases and defines measures for their prevention and social protection of victims.

In the Russian Federation, there is a List of occupational diseases approved by Order No. 417p of 27.04.2012 of the Ministry of Public Health and Social Development of Russia. This list is the main document that is used when establishing the diagnosis of an occupational disease, its connection with the work performed or profession, when solving issues of examination of working capacity, medical, social and labor rehabilitation, as well as when considering issues related to compensation for damage caused to an employee and damage to health. The specified list of occupational diseases includes diseases that are caused solely or primarily by exposure to harmful, dangerous substances and production factors [12].

The list of occupational diseases approved by the ILO for the first time in 1964 was updated by the ILO in 1980 without the adoption of new legislative documents. The next version of the List appeared only 22 years later.

The work on the revision of the list of occupational diseases was carried out by a group of ILO experts in 2005-2009 and in 2010. The ILO governing body approved an updated the list of occupational diseases, which includes 40 occupational intoxications (including 9 new ones: from nickel, platinum, ammonium, isocyanates, pesticides, sulfur oxides, organic solvents, latex, chlorine), 6 occupational diseases from the action of physical factors (including optical radiation, including laser radiation), 8 occupational diseases caused by biological factors that were not detailed in the old version of the list (brucellosis, viral hepatitis, human immunodeficiency virus, tuberculosis, etc.).

The section "Professional cancer" is supplemented with 6 new factors: arsenic, beryllium, cadmium and their compounds, erionite, ethylene oxide, Hepatitis b and C viruses and now contains twenty diseases [13].

The above mentioned requires changes to the List of occupational diseases of the Russian Federation in accordance with the legislative List of diseases proposed by the ILO.

Also, the need to simplify the cumbersome system of establishing the final diagnosis of occupational diseases in Russia should be attributed to the measures of state regulation for the preservation of personnel. It is two-stage: the suspicion of the doctor of the polyclinic, and the final diagnosis is made by a specialized center of occupational pathology. Why can an ordinary doctor of a polyclinic finally make a diagnosis (for example, flu, pneumonia, polyneuropathy, glaucoma, sensorineural hearing loss, etc.), but does not have the right to make a diagnosis of an occupational disease? There is no answer to this question yet.

With the aim of changing management approaches in the sphere of labor protection, the Ministry of Labor has prepared and submitted to the Government of the Russian Federation a Draft Federal law providing for the addition to the Labor code with the conceptually new standards.

The main goals of the draft law are to increase the effectiveness of prevention of occupational injuries and occupational diseases, increase the dynamics of reducing group, severe and fatal injuries, and increase the level of safe work culture.

Main changes and additions proposed by the draft law:

1) introduction of accounting for microtraumas received by employees and analysis of their causes, as a basic principle of prevention of occupational diseases, based on the constant identification of hazards in the workplace, analysis and elimination of the causes of these hazards to improve working conditions;

2) personal participation of employees in ensuring safe working conditions at their workplaces, manifested in:

— informing employees about the existing hazards when performing work;

— refusal of the employee to perform official duties if safe working conditions are not provided. Thus, it is possible to ensure the introduction of a ban on working in dangerous working conditions;

3) changing the approach to providing employees with PPE by switching from the list principle of security to security depending on the specific working conditions at the workplace, taking into account the specifics of the working conditions of employees;

4) introduction of the institute of employer's self-assessment of the compliance with labour legislation, which will be held on a pre-formed by Rostrud list of issues.

The adoption of this law will:

— give new impetus to improving working conditions in the workplace;

— maintain positive dynamics of reducing the number of occupational diseases, deaths and injuries due to accidents and occupational diseases;

— provide a reduction in administrative burden and greater flexibility for the employer in building a modern occupational health management system based on systematic analysis, assessment and reduction of the existing occupational risks;

— raise awareness of employees about working conditions in the workplace, about existing occupational risks, guarantees provided to them, compensations and PPE, as well as to ensure the involvement of employees in ensuring appropriate working conditions [14, 15].

According to the authors, the proposed improvements to the legislative, regulatory, and local labor safety management framework will have a significant impact on solving the problems of occupational diseases in the country.

However, even the full implementation of the planned changes will not eliminate the relevance of occupational disease prevention. Therefore, to develop effective measures for the prevention of occupational diseases, we suggest that employers use the algorithm of combined risk assessment for getting and developing occupational diseases with ranking criteria for a special assessment of working conditions. The main resource of the enterprise is personnel, so forecasting risks and detecting pathological changes in the body at an early stage should become a priority task for preserving the health and working capacity of the staff.

Professional risk assessment allows you to monitor its occurrence and rank its specific indicators. On this basis, an algorithm for assessing occupational risk has been developed, which makes it possible to scientifically justify professional groups for assessing the risk of staff morbidity and reduce the impact of harmful factors.

The algorithm for combined risk assessment of occupational diseases with ranking criteria for special assessment of working conditions was developed on the example of oil-production enterprises, since they are complex natural and man-made systems, where processes can lead to accidents and the emergence of occupational diseases.

Currently, workers employed primarily in the main technological operations of oil-production enterprises are exposed to harmful and dangerous production factors, namely vibration (45 %), increased noise (40 %), difficult working conditions (21 %), chemical factors (11%), unfavorable microclimate (9%), dust (9%), which lead to the development of occupational diseases. The analysis carried out at oil production enterprises shows 170 cases of occupational diseases in 122 employees. In addition to the main type of occupational diseases, concomitant diseases

have also been identified. Employees are often diagnosed with 2-3 occupational diseases, which is explained by a variety of effects of harmful production factors on the body of an employee of the oil industry.

Based on the results of the assessment of occupational risks, it can be concluded that the degree of industrial conditionality of violations in the body systems of personnel depends on the length of service, profession, but mainly on the degree of harmfulness of working conditions. The overall assessment of the situation shows a very high degree of industrial conditionality of diseases of the musculoskeletal system, diseases of the hearing organs, which indicates their strong relationship with working conditions. The average degree of industrial conditioning is assigned to cardiovascular and respiratory diseases.

According to the results of the analysis of the impact of production conditions on the human body and the results of the quantitative assessment of working conditions there was proposed an integrated scoring of specific severity of the industrial processes negative factors based on probabilistic assessment of hazardous occupational factors influencing the risk of occupational diseases, risk assessment of the production conditionality of health problems and the expert and statistical evaluation of cases of occupational diseases.

The probabilistic assessment of harmful production factors affecting the risk of occupational diseases is determined by the occupational diseases index ($И_{пз}$) — a single-digit indicator that takes into account both the probability and the severity of occupational diseases by their categories:

$$И_{пз}=1/(К_р \times К_т),$$

where $К_р$ — risk category, $К_т$ — severity category.

The use of the inverse value of the product of these categories allows us to evaluate occupational diseases qualitatively and quantitatively with an integral indicator that lies within the range of $0 < И_{пз} < 1$.

The risk assessment of occupational health conditions was assessed by the index of professionally determined diseases (PDD), a single-digit indicator that is the inverse of the product of the risk, severity, and work-related categories:

$$И_{поз}=\sum I_i \, [1/(К_р \times К_т \times К_с)],$$

where $К_с$ — is the work-related category, i = 1, 2, 3 ... = n — is the number of diseases

$К_р$ = 1, 2, 3 etc. corresponds to the values of PDD >10 %, 1–10 %, <1 % etc. $К_т$ = 1, 2, 3 correspond to the medical prognosis of the disease and the type of disability it causes. $К_с$ = 1, 2, 3, 4, 5 accepted on the scale of assessment of the connection of health disorders with work.

As a result, depending on the prevalence rate, severity, and relationship of the disease to work (or the environment), the index ranges from 0 to 1, i.e. $0 < И_{поз} < 1$. For a set of diseases $И_{поз} > 1$ is possible.

Occupational risk assessment allows you to monitor the risk of occupational disease and rank its specific indicators:

Ultra-high risk ($И_{пз} > 1.0$)

Very high risk ($И_{пз}$ = 0.5-1.0)

High risk ($И_{пз}$ = 0.25-0.49)

Medium risk ($И_{пз}$ = 0.12–0.24)

Low risk ($И_{пз}$ = 0.05–0.11)

Ranking of occupational risk values makes it possible to scientifically justify professional groups for assessing the risk of staff morbidity and reduce the impact of harmful factors (Fig. 1).

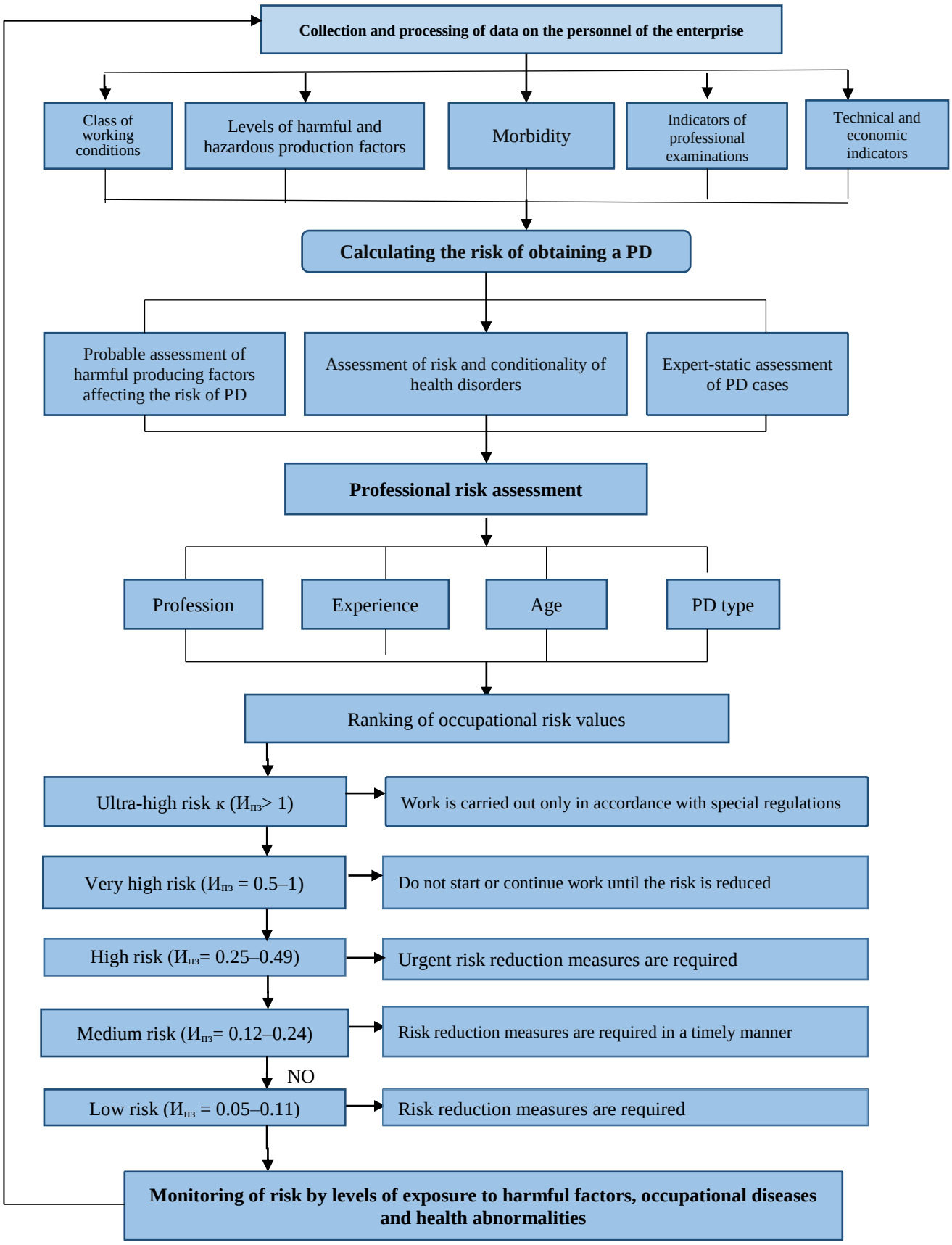

Fig. 1. Algorithm for assessing the risk of getting and developing of occupational diseases

Conclusions. Thus, this article identifies ways to solve problems related to occupational diseases, both at the state level and at the enterprise level. The importance of official registration of occupational diseases, their investigation and prevention is shown. A probabilistic assessment of harmful production factors affecting the risk of occupational

diseases and the assessment of the risk of industrial conditionality of health disorders was carried out. The analysis revealed that the acceptable risk (1×10-3) for professional groups, while maintaining the technology of work and working conditions, is provided by limiting the length of service to 3-4 years. The key dependencies in the formation of PD at each specific enterprise are revealed.

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M. A. Gallyamov — scientific guidance, the formation of the basic concept, goals and objectives of the study; N. V. Vadulina — making calculations, analyzing research results, forming conclusions; S. M. Devyatova — preparation and revision of the text, correction of conclusions.