

The results of the state population policy in the field of rehabilitation, medical and social expertise, social insurance, labor and employment of work-injured people

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Abstract

Aim. To study the indicators of industrial injuries and occupational morbidity in the Russian Federation and the effectiveness of measures for the professional rehabilitation of injured workers in the context of the implementation of state programs aimed at enhancing the labor force and employment.

Methods. The analysis of statistical indicators on the number of workers, insured and injured at work from 2007 to 2018 and the results of measures for victim rehabilitation between 2014 and 2019, using data from Rosstat, reporting form No. 7 — social security and open data of the social insurance fund. Descriptive statistics were used in the analysis.

Results. The level of employment of disabled people planned by the Government of the Russian Federation by 2020 at the level of 40% in relation to people who are injured at work has not been achieved. At the same time, about 80% of the injured person had mild and moderate dysfunctions, about 50% were of working age. Against this background, employment at the level of 0.2 to 6.6% per year indicates the insufficient effectiveness of vocational rehabilitation. In most EU countries, where the return to work rate for work-injured people exceeds 90%, the employer and the insurer jointly participate in the professional rehabilitation of the injured, applying and financing all the necessary organizational and rehabilitation measures. In the Russian Federation, measures for occupational adaptation, maintenance of employment and the creation of special jobs are not subject to reimbursement from insurance funds, only educational events are financed. An employer who has caused harm to the health of work-injured is not economically interested in restoring his professional status. The authors encouraged to amend the regulations of the Russian Federation to ensure financing of the entire range of measures for vocational rehabilitation and the economic interest of employers in restoring the occupational status of work-injured people.

Conclusion. Despite the favorable decreasing trend of industrial injuries and occupational morbidity at the enterprises of the Russian Federation over the past 12 years, the number of industrial injuries with permanent disability remains high, and the effectiveness of their vocational rehabilitation is low, which requires an expansion of the list of measures for vocational rehabilitation financed from the social insurance fund and ensuring the economic interest of employers in restoring the professional status of work-injured people.

Keywords: social insurance, injured at work, vocational rehabilitation, industrial accident, occupational disease.

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Background. The current unfavorable demographic situation in the Russian Federation is revealed not only in several scientific works [1–3] but also in official documents, such as the “Concept of the demographic policy of the Russian Federation for the period up to 2025,” which was approved by the Decree of the President of the Russian Federation on October 9, 2007, No. 1351.

The health status of the working-age population is a concern, as it has a significant effect on the quality of labor resources, labor productivity, and economic development [4]. The negative effects of occupational injuries and occupational diseases on the level of disability and mortality of the working-age population were reported in several studies [1, 5]. The low efficiency of rehabilitation

of workers injured in the workplace is reported in studies of not only by occupational medicine specialists but also by medical and social specialists [6–8]. Moreover, the available literature does not fully cover the issues of the professional rehabilitation of people injured at work.

Despite the low level of fulfillment of the recommendations for vocational rehabilitation as stated annually by Rosstat, the available literature did not provide systemic proposals for revising approaches to preserve and maintain the professional status of people injured at work throughout their working life. These proposals are relevant in the light of the measures implemented in Russia to overcome negative trends in human potential development and to increase the employment rate.

This study aimed to analyze the indicators of industrial injuries and occupational diseases in factories in the Russian Federation and the efficiency of measures for the professional rehabilitation of injured workers through the implementation of state programs and projects aimed at improving the demographic situation, quality of labor resources, and employment level.

Materials and methods of research. The study was conducted in two stages.

In stage 1, an observational analytical study was performed, which included a comparative analysis of the statistical indicators of Rosstat according to the data of Russian statistical yearbooks (Tables 5.4, 5.5, 5.39, 5.40, and 5.41) [9] and the Social Insurance Fund of the Russian Federation according to the data of the open data portal [10] on the number of people employed, insured, and injured at work in the period from 2007 to 2018.

In stage 2, data on the professional rehabilitation of people injured in industrial accidents and occupational diseases were analyzed. Data from reporting form No. 7-sobes provided on the Rosstat website [11] for 2014–2019 and data from the Social Insurance Fund of the Russian Federation on expenses incurred to finance preventive measures to reduce occupational injuries and occupational diseases of workers and medical, social, and vocational rehabilitation of people injured by industrial accidents and occupational diseases in 2014–2019 were obtained [10].

Descriptive statistics were used in the analysis. The estimations of the standard error, standard deviation, and level of significance of the mean values and analysis of time series were performed using the standard analysis package in Microsoft Excel.

The growth rate was calculated using the following equation:

$$\Delta t = (Y1 \times 100\%/Y0) - 100\%,$$

where Y0 is the indicator level in the previous year and Y1 is the indicator level in the succeeding year.

For the indicators of growth rates, the arithmetic mean values for 12 years were calculated. A paired two-sample *t*-test was used to assess the significance of differences in mean values. The calculation was made using the standard analysis package for Microsoft Excel.

Results and discussion. From 2007 to 2019, in accordance with the “concept of long-term socio-economic development of the Russian Federation until 2020” approved by the Government of the Russian Federation in 2008 (hereinafter, the concept), several measures were taken in the medical and social sphere and labor and employment sphere, to stabilize the demographic situation in the society and increase the employment level of various groups of the population, including persons with disabilities. The implementation of additional measures in the field of employment was provided by the following regulations:

- Decree of the Government of the Russian Federation on December 31, 2008, No. 1089 “On additional measures aimed at reducing tension in the labor market of the constituent entities of the Russian Federation”

- Order of the Government of the Russian Federation on December 25, 2012, No. 2524-r “On approval of the Strategy for the long-term development of the pension system of the Russian Federation”

- Order of the Government of the Russian Federation on October 15, 2012, No. 1921-r “On a set of measures aimed at increasing the efficiency of the implementation of measures to promote the employment of people with disabilities and to ensure the availability of vocational education”

- Order of the Government of the Russian Federation on November 30, 2010, No. 2136-r “On approval of the concept for sustainable development of rural areas of the Russian Federation for the period until 2020”

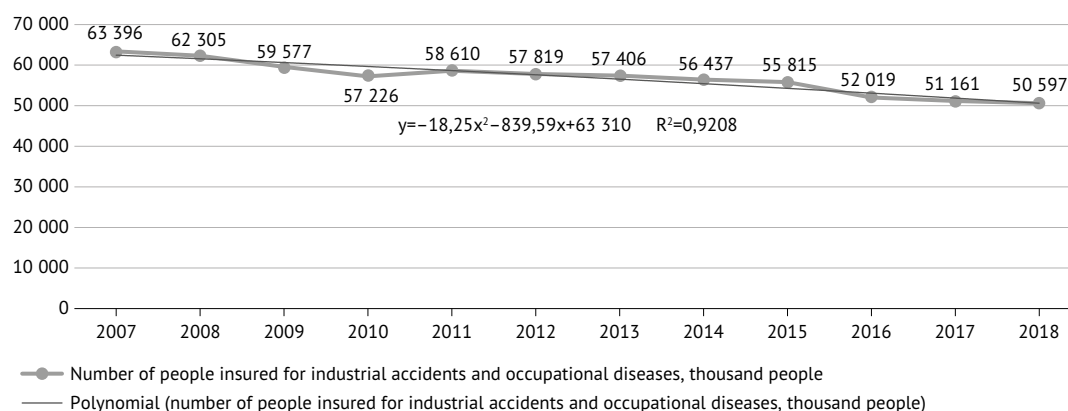
- Decree of the Government of the Russian Federation on April 15, 2014, No. 298 “On approval of the state program of the Russian Federation ‘Promotion of employment of the population’”

Despite the implementation of these programs, the population in the Russian Federation, according to Rosstat [12], increased insignificantly from 142.9 million in 2007 to 146.9 million in 2018. The average growth rate was 0.25% annually, with the standard error of 0.16%, standard deviation of 0.53%, and significance level (95%) of 0.35.

The number of people employed and participating in the economy also grew proportionally from 68.0 million in 2007 to 72.1 million in 2018. The

Table 1. Ratio of the population of the Russian Federation and the average annual number of people employed

Year	Population as of January 1, thousand people [12]	Growth rate, %	Average annual population employed (by type of economic activity), thousand people [9]	Growth rate, %	Proportion of people employed, %
2007	142 862.7	—	68 019	—	47.6
2008	142 747.5	–0.08	68 474	0.67	48.0
2009	142 737.2	–0.01	67 343	–1.65	47.2
2010	142 833.5	0.07	67 493	0.22	47.3
2011	142 865.4	0.02	67 644	0.22	47.3
2012	143 056.4	0.13	67 968	0.48	47.5
2013	143 347.1	0.20	67 901	–0.10	47.4
2014	143 666.9	0.22	67 813	–0.13	47.2
2015	146 267.3	1.81	68 389	0.85	46.8
2016	146 544.7	0.19	72 065	5.38	49.2
2017	146 804.4	0.18	71 843	–0.31	48.9
2018	146 880.4	0.05	71 562	–0.39	48.7
Average values	—	0.25	—	0.48	—

**Fig. 1.** Number of people insured for industrial accidents and occupational diseases in 2007–2018.

average growth rate of the latter indicator over 12 years was 0.48% annually, with standard error of 0.53%, standard deviation of 1.76%, and significance level (95%) of 1.18 (Table 1). Differences between the average growth rates of the total population and the number of employed people are not significant ($t = -0.42$, with $t_{crit} = 1.81$).

Thus, despite the implementation of several government programs and systemic measures, it was not possible to achieve an outstripping growth in the average annual number of people employed compared with the population growth for the analyzed period.

According to Rosstat [12], the number of registered industrial accidents and occupational diseases is decreasing annually. Thus, according to the Social Insurance Fund [10], annually among those

participating in the economy, the number of workers insured for industrial accidents and occupational diseases decreases (Fig. 1). The average annual growth rate is negative and accounts for 2%, with standard error of 0.71, standard deviation of 2.37, and significance level (95%) of 1.59. The proportion of insured workers has decreased from 93.2% to 70.7% over 12 years, which most likely confirms the increase in “gray” employment without paying insurance contributions to the Social Insurance Fund of the Russian Federation by employers.

Sequentially, this leads to a decrease in the registration rate of industrial accidents and occupational diseases and a limitation of using social insurance funds for the treatment and rehabilitation of employees in the event of an occupational injury or occupational disease.

Table 2. Change in expenditures on labor protection measures and reduction in the rate of industrial injuries and occupational diseases in the Russian Federation.

Year	Number of people injured for industrial accidents with disability for 1 working day or more and with a fatal outcome, thousand people [12]	Number of patients with newly diagnosed occupational disease (poisoning) [12]	Expenses for labor protection measures calculated per 1 worker, rubles [12]	Financial provision of preventive measures to reduce occupational injuries and occupational diseases of workers [10]	
				Financed enterprises	Amount of financing, thousand rubles
2007	66.1	7501	4725.5	18 985	3168.2
2008	58.3	7265	5505.9	19 896	3798.4
2009	46.1	8081	6493.1	19 407	4298.8
2010	47.7	7671	6724.2	24 642	4623.6
2011	43.6	7836	7966.2	27 628	5419.6
2012	40.4	6696	8758.1	27 658	6332.5
2013	35.6	6993	8881.3	29 397	7647.6
2014	31.3	6718	9615.5	36 101	8862.8
2015	28.2	6334	10 930.4	44 502	9527.4
2016	26.7	5520	11 479.8	45 112	10 104.4
2017	25.4	3614	12 964.7	45 614	10 578.6
2018	23.6	3323	14 246.4	47 530	10 979.4

The annual decrease in the number of industrial accidents and occupational diseases is quite related to the improvement of the working conditions of employees given the annual increase in labor protection costs per employee (Table 2). The expenses of the Social Insurance Fund of the Russian Federation for financing preventive measures to reduce industrial injuries are also increasing.

One of the targets of the concept is the employment of people with disability in the Russian Federation at 40% of the total number of people with disability by 2020, but this has not been achieved. Considering the overall rehabilitation system of people injured at work and the results of their employment, improvement is required.

For the first time, 8.6–13.8 thousand people were examined annually because of the loss of the professional ability to work following industrial accidents and occupational diseases. This accounts for approximately 30% of the total number of people injured from industrial incidents in a given year, and 116–133 thousand people were reexamined to determine the degree of loss of the professional ability to work and to develop a program for the rehabilitation of the people injured at work.

In most cases (>60% at the initial examination and >50% at repeated examination), minor functional impairments and some degrees of the loss of the occupational capacity to work (from 10% to 30%) were noted in people injured at work. However, this does not become the basis for establishing

a disability group (Table 3) and for determining their high rehabilitation potential and fundamental possibility of rational employment.

Material and financial resources for the rehabilitation of injured workers are sufficient, as there is no shortage of this insurance type. However, the rehabilitation costs are growing annually, despite a decrease in the total number of payees; this reflects increases in costs per one insured person per year (Table 4).

Currently, rehabilitation management services have been established in most of the regional branches of the Social Insurance Fund. One of their main fields of activity involves coordination of the activities of all necessary medical and other organizations at the rehabilitation. Operational coordination management is aimed at the maximum possible rehabilitation of people injured, taking into account the available time, information, personnel, material, and financial resources.

Analysis of the results of the implementation of rehabilitation programs for 2014 to 2019 revealed the consistently high level of rehabilitation results (Table 5). Positive results of medical rehabilitation within 6 years were recorded in >60% of cases (mean, 62.44%; standard error, 0.52%; standard deviation, 1.36%; significance level (95%), 1.26), with an average annual rate of gain of 0.04% (standard error, 1.54%; standard deviation, 3.76%; significance level (95%), 3.95).

These results are achieved because of the partial recovery and partial compensation of impaired

Table 3. Results of examination and re-examination of people injured at work in 2014–2019 in the Russian Federation

Year	Initial examination		Repeated examination	
	Established from 10% to 30% of the LOC, <i>n</i> .	Proportion of people examined, %	Established from 10% to 30% of the LOC, <i>n</i> .	Proportion of people examined, %
2014	9173	66.3	60 339	50.6
2015	9411	73.3	59 004	49.5
2016	9072	77.0	61 137	53.0
2017	8404	78.2	62 827	55.2
2018	8155	88.1	60 661	56.2
2019	7503	86.9	61 252	57.0

Note: LOC, loss of occupational capacity.

capabilities, as the proportion of people who have fully restored or compensated for impaired capabilities decreases annually. The average rate of the increase in the proportion of people injured who, according to the results of the next scheduled examination, had restored impaired functions or had fully compensated for the impairment, is negative, at -5.25% ($m = 3.01\%$, $\sigma = 7.38\%$; 95% confidence interval, 7.75) and -9.29% ($m = 11.08\%$, $\sigma = 27.15\%$; 95% confidence interval, 28.49).

One of the targets of the concept is the employment of 40% of persons with disabilities in the Russian Federation by 2020. However, this indicator was not achieved in those injured at work, which is confirmed by Rosstat (Table 6).

If the need for vocational rehabilitation measures is established annually in more than 70 thousand cases, the implementation of these measures does not exceed 25%, and the share of patients actually employed is even less and fluctuates at 0.2%–6.6%. The number of special jobs created annually in the Russian Federation for people injured at work did not exceed 100 over the entire follow-up period.

The employment service is the main implementer of vocational rehabilitation measures (with the exception of measures for vocational training and obtaining additional vocational education) for people injured at work and people with disabilities. The employment service does not implement any special programs for the vocational rehabilitation of people injured at work, and this category is not allocated as a separate group in the regulations governing the activities of the service (Resolution of the Government of the Russian Federation on June 30, 2004, No. 324 “On approval of the Regulations on the Federal Service for Labor and Employment,” Decree of the Government of the Russian Federation on September 07, 2012, No. 891 “On the procedure for registering citizens for the selection of suitable job, registering unemployed citizens, and requirements for the selection

Table 4. Changes over time in the number of people injured at work, who were payees of insurance premiums, and rehabilitation expenses over 12 years (2007–2018)

Year	Number of payees, <i>n</i> . [10]	Expenses for rehabilitation, thousand rubles [10]	Average amount per one person injured per year, thousand rubles
2007	552 018	3 282 503.2	5.95
2008	536 746	4 148 450.3	7.73
2009	527 379	5 082 220.2	9.64
2010	518 574	5 447 179.2	10.50
2011	511 908	5 957 504.2	11.64
2012	504 102	6 696 966.0	13.28
2013	495 643	7 309 515.8	14.75
2014	489 151	7 921 303.4	16.19
2015	477 947	8 740 472.9	18.29
2016	470 313	9 605 876.0	20.42
2017	465 507	9 823 177.6	21.10
2018	453 321	10 607 743.1	23.40

of suitable job,” etc.). That is, there is no guaranteed source of funding for vocational rehabilitation measures of people injured at work; therefore, the indicators are not the best. Thus, considering the overall system of rehabilitation of people injured at work and the results of their employment, we can state that its improvement is necessary.

An analysis of the international experience revealed that in most countries of the European Union, particularly in Germany, i.e., the model of social insurance for industrial accidents, which Russia is trying to adopt, the role of the insurant (Social Insurance Fund) and the tortfeasor (the employer whose employee had an accident at work or an occupational disease) in vocational rehabilitation is quite high [13]. The injured person retains a workplace; the tortfeasor, on the recommendation of the insured, implements the necessary set of measures for vocational rehabilitation and industrial adaptation, if necessary, finances the creation of

Table 5. Indicators of medical rehabilitation of injured employees in 2014–2019 in the Russian Federation

Rehabilitation indicators [11]	Calendar year					
	2014	2015	2016	2017	2018	2019
Issued conclusions on the implementation of PRI, pcs., included	111 520	108 950	108 878	106 629	97 174	98 046
Positive results of rehabilitation	70 991	67 367	69 514	64 043	60 133	62 327
Share of conclusions, %	63.66	61.83	63.85	60.06	61.88	63.57
Achieved full compensation for the capabilities lost, <i>n</i>	6037	5037	5093	4722	4495	3989
Share of conclusions, %	5.41	4.62	4.68	4.43	4.63	4.07
Partial compensation of capabilities lost, <i>n</i> .	44 985	43 933	45 332	42 764	40 198	41 849
Share of conclusions, %	40.34	40.32	41.64	40.11	41.37	42.68
Achieved complete restoration of capabilities, <i>n</i>	3043	1274	1121	1282	1369	1230
Share of conclusions, %	2.73	1.17	1.03	1.20	1.41	1.25
Achieved partial restoration of capabilities, <i>n</i>	15 538	19 732	17 695	15 484	16 057	17 029
Share of conclusions, %	13.93	18.11	16.25	14.52	16.52	17.37

Note: PRI, a program for the rehabilitation of a person injured following an industrial accident and occupational disease.

Table 6. Indicators of the professional rehabilitation of employees injured at work in 2014–2019 in the Russian Federation

Rehabilitation indices [11]	Calendar year					
	2014	2015	2016	2017	2018	2019
Need for vocational rehabilitation measures has been established, <i>n</i> .	77 573	90 414	82 985	77 897	72 394	72 973
Employment has been recommended under normal production conditions, <i>n</i> .	55 439	66 477	62 832	58 095	53 929	54 269
Profession (specialty) has been obtained, including a new one, <i>n</i> .	0	31	1	2	3438	3090
Advanced training, <i>n</i> .	1096	883	785	625	504	411
Level of vocational education has been increased, <i>n</i> .	266	87	90	80	70	73
A suitable workplace has been selected, <i>n</i> .	8802	7876	8478	7848	6716	6690
Special jobs have been created, <i>n</i> .	2547	83	87	75	35	33
Necessary conditions have been created for the professional activity of the people injured, <i>n</i> .		392	24	178	2078	873
A suitable workplace has been selected, <i>n</i> .	7921	1505	280	200	4965	5565
Recommendations for vocational rehabilitation implemented, total, <i>n</i> .	18 085	10 857	9745	9008	17 806	16 735
Visual expression indicator, %	23.31	12.01	11.74	11.56	24.60	22.93

a special workplace, and so on, which restores the ability to work and professional status in >90% of people injured [14, 15].

Within the medical, social, and vocational rehabilitation of people injured in industrial accidents and those with occupational diseases, no more than 0.04% of the total amount of funds spent on the implementation of various rehabilitation measures is spent annually for vocational training and additional vocational education over the past 6 years from the funds of the Social Insurance Fund of the Russian Federation. The insurant does not provide funding for any types of vocational rehabilitation.

To expand the list of measures with a guaranteed source of funding, if there are appropriate recommendations in the rehabilitation program for the people injured following an industrial accident and occupational disease, the recommendation was to consider reimbursing the employer for the cost of equipment (equipment) used for the special workplace for a person injured at work and personal expenses in the process of industrial adaptation at the expense of the Social Insurance Fund. This will require amending Article 8 of the Federal Law on July 24, 1998, No. 125-FZ "On compulsory social insurance for industrial accidents and occupational diseases," allowing the expansion of the list of vocational rehabilitation measures provided as part of insurance indemnity.

As a mechanism that allows the tortfeasor to be interested in the professional rehabilitation of the insured, existing rules for establishing discounts and premiums to the insurance rate can be followed, as approved by the Decree of the Government of the Russian Federation No. 524 on May 30, 2012, "On approval of the Rules for establishing discounts and premiums to insurance rates for insurers for compulsory social insurance for industrial accidents and occupational diseases," with some adjustments.

Some of the main indicators affecting the amount of the premium established to the policyholder, in accordance with the current methodology for calculating discounts and premiums to the insurance rates for compulsory social insurance for industrial accidents and occupational diseases, as approved by the order of the Ministry of Labor of Russia on August 01, 2012, No. 39n, are as follows:

- Amount of paid temporary incapacity allowance, made by the insured.
- Amount of insurance payments and payment of additional costs for medical, social, and vocational rehabilitation, made by the territorial body of the insurer in connection with insured events that have occurred to the insured.

- Number of insurable events per 1,000 employees.

The higher these indicators, the higher the amount of the premium; therefore, the possibility of excluding the insurance cases and their expenses from the calculation of the premium when employing a person injured at a given company will motivate the harm-giver economically and increase the level of employment of people injured, especially those with minor and moderate dysfunctions.

CONCLUSION

Despite the favorable trends in the decrease in the rates of industrial injuries and occupational morbidity in factories of the Russian Federation over the past 12 years, the number of people with permanent disability who were injured at work remains high and the effectiveness of their vocational rehabilitation is low. This requires an expansion of the list of occupational rehabilitation measures, as financed by the Social Insurance Fund of the Russian Federation. This is to ensure the economic interest of employers in restoring the professional status of people injured at work.

Author contributions. I.A.B. was the work supervisor. M.A.S. and M.V.G. developed the ideas and programs of the study and collected and analyzed the results. O.N.V. and A.V.D. developed the research ideas and presented the results.

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