



**ҚАЗАҚСТАН РЕСПУБЛИКАСЫ ДЕНСАУЛЫҚ САҚТАУ МИНИСТРАЛІГІ  
«ҚДСЖМ» ҚАЗАҚСТАНДЫҚ МЕДИЦИНА УНИВЕРСИТЕТІ**

**MINISTRY OF HEALTHCARE OF THE REPUBLIC OF KAZAKHSTAN  
KAZAKHSTAN'S MEDICAL UNIVERSITY «KSPH»**

**«ҚДСЖМ» Қазақстандық медицина университетінің 25 жылдығына  
және ДДҰ Еуропалық өңірлік бюросы мен Қазақстан Республикасы  
Денсаулық сақтау министрлігі арасында келісімге қол қоюға арналған  
«Global Health» Халықаралық Конгресінің**

## **МАТЕРИАЛДАРЫ**

**23 қыркүйек 2022 ж.**

## **MATERIALS**

**of the International Congress "Global Health" dedicated to the 25th  
anniversary of the founding of KMU "KSPH" and signing of the Agreement  
between the WHO Regional Office for Europe  
and the Ministry of Healthcare of the Republic of Kazakhstan**

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**УДК 614  
ББК 51.1  
G54**

Под общей редакцией ректора КМУ «ВШОЗ»  
профессора Б. Турдалиевой

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«Global Health» Халықаралық Конгресінің материалдары = Materials  
of the International Congress «Global Health» – Алматы:  
КМУ «ВШОЗ», 2022.- 137 с. – англ., каз., рус.

**ISBN 978-601-305-492-6**

В сборнике рассматриваются актуальные вопросы глобального здоровья, общественного здравоохранения, актуальные вопросы клинической и профилактической медицины, медицинского образования, фармации, COVID-19 и др.

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**УДК 614  
ББК 51.1  
ISBN 978-601-305-492-6**



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УДК: 613.63:622.831.3

## COPPER MINING INDUSTRY STUDYING SOME CHARACTERISTICS OF RISK FACTORS AFFECTING THE HEALTH CONDITION OF WORKERS

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### **Introduction**

Every year in the world, annual losses due to unfavorable working conditions are estimated at more than \$ 400 billion. Harmful production factors lead not only to the formation of occupational diseases, but also to an increase in general pathogenetic diseases. The loss of health resources due to men who burned their job potential 1.5 years before retirement age led to a decrease in GDP by 10-12% per year. [1,2,4].

The working conditions of employees of the mining and metallurgical industry are characterized by a number of harmful and dangerous production factors, mainly high levels of dust, aerosols with a fibrogenic effect, strong noise, vibration and unfavorable microclimate, the severity of work, their levels significantly exceed hygienic standards. It should also be noted that not only harmful and dangerous production factors affect the health of workers, but also their lifestyle and conditions, taking into account the age and length of service of workers, harmful habits (smoking, drinking alcohol), etc. affects [3,5,6,].

### **Materials and Methods**

We studied the data of the medical examination of 1761 workers by random selection of workers working at the Copper Processing plant (CPP) and the Copper Smelter (CS), the number of calls to outpatient clinics (2015-2020). In order to study the dynamics, five (20-29 years old, 30-39 years old, 40-49 years old, 50-59 years old, 60 years old and older) and six groups of internships (20-29 years old, 30-39 years old) were examined. The health status of workers, indicators of general morbidity depending on age and length of service (up to 6 years, 6-10 years, 11-15 years, 16-20 years, 21-25 years, 26 years and older) (Figure 1). The state of health of workers was assessed by extensive and intensive indicators (the proportion of disease classes in the total morbidity, % of cases and the number of days per 100 workers). Microsoft Excel 2010, SPSS 25 statistics, Student's t, relative risk (RR), correlation coefficient (r) Pearson's method was used to assess the processing and reliability of the results.

### **Results**

1761 workers of copper beneficiation and copper smelting plants were studied. 80.2% of them were men and 19.8% were women, the average age was  $38.58 \pm 0.28$  years and the average total work experience was  $13.19 \pm 0.2$  years. Health index of workers by age (%) is  $19.5 \pm 1.74$  for 20-29 years old,  $15.8 \pm 1.72$  for 30-39 years old,  $12.2 \pm 1.6$  for 40-49 years old, 50 It was determined that it was  $11.9 \pm 1.84$  at the age of -59, and  $7.5 \pm 3.2$  at the age of 60<.

It can be seen that the largest group was 51-60 years old. When the health index (%) of workers was studied according to the length of service, it was found to be  $19.5 \pm 1.74$  up to 6 years,  $16.3 \pm 1.5$  in 6-10 years,  $14.5 \pm 1.3$  in 11-15 years, 16 It was  $9.1 \pm 0.8$  in -20 years,  $7.8 \pm 0.7$  in 21-25 years, and  $7.3 \pm 0.6$  in 26 years. The number of unfit for work points per 100 workers is 218.1; days of temporary incapacity for work 2081.1; The average duration of 1 case of incapacity for work was 9.5 days. The analysis of the structure and level of illness shows that all workers (74.1%) and temporary incapacity for work points, days correspond to 5 disease classes: Diseases of the respiratory organs, diseases of the nervous system, diseases of the digestive organs, Diseases of the circulatory system and musculoskeletal system and connective tissue. As a result of our investigations, it was found that more than 20% of workers with less than 6 years of experience

do not have chronic diseases. It was found that it is much lower than the groups with 6-10 and 11-15 years of work experience.

The number of diagnosed diseases per 100 workers increased by 2.57 times, but the number of healthy individuals decreased by 2.67 times ( $p= 0.05$ ). Diseases of the nervous system and diseases of the circulatory system increase with the increase of work experience. Diseases of locomotor and genitourinary system, respiratory and digestive organs, endocrine diseases did not change significantly.

### Conclusion

The study of the state of health, taking into account changes in age and working experience, shows that the risk of injuries, poisonings and some other consequences of external causes in workers increases the risk of diseases of the nervous system and circulatory system, musculoskeletal system and connective tissue. showed at the same time, the importance of diseases of the eye and its accessory apparatus, diseases of the respiratory tract, diseases of the digestive tract, diseases of the skin and subcutaneous cells, and some infectious and parasitic diseases decreases with increasing age and length of service. Determining age and length of service is one of the most effective preventive measures in determining the risk of developing various diseases.

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