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The Influence of Atmospheric Air on the Health of the Population Living in Oil and Gas Production Area in Aktobe Region, Kazakhstan

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Abstract : As a result of medical check-up conducted in the framework of this research study an evaluation of the health status of the population living in the oil-producing regions, namely Sarkul and Kenkiyak villages in Aktobe was examined. With the help of the Spearman correlation, the connection between the level of hazard chemical elements in the atmosphere and the health of population living in the regions of oil and gas industry was estimated. Background & Objective. The oil and gas resource-extraction industries play an important role in improving the economic conditions of the Republic of Kazakhstan, especially for the oil-producing administrative regions. However, environmental problems may adversely affect the health of people living in that area. Thus, the aim of the study is to evaluate the exposure to negative environmental factors of the adult population living in Sarkul and Kenkiyak villages, the oil and gas producing areas in the Aktobe region. Methods. After conducting medical check-up among the population of Sarkul and Kenkiyak villages. A single cross-sectional study was conducted. The population consisted of randomly sampled 372 adults (181 males and 191 females). Also, atmospheric air probes were taken to measure the level of hazardous chemical elements in the air. The nonparametric method of the Spearman correlation analysis was performed between the mean concentration of substances exceeding the Maximum Permissible Concentration and the classes of newly diagnosed diseases. Selection and analysis of air samples were carried out according to the developed research protocol; the qualitative-quantitative analysis was carried out on the Gas analyzer HANK-4 apparatus. Findings. The medical examination of the population identified the following diseases: the first two dominant were diseases of the circulatory and digestive systems, in the 3rd place - diseases of the genitourinary system, and the nervous system and diseases of the ear and mastoid process were on the fourth and fifth places. Moreover, significant pollution of atmospheric air by carbon monoxide (MPC-5,0 mg/m3), benzapyrene (MPC-1mg/m3), dust (MPC-0,5 mg/m3) and phenol (MPC-0,035mg/m3) were identified in places. Correlation dependencies between these pollutants of air and the diseases of the population were established, as a result of diseases of the circulatory system (r = 0,7), ear and mastoid process (r = 0,7), nervous system (r = 0,6) and digestive organs(r = 0,6); between the concentration of carbon monoxide and diseases of the circulatory system (r = 0.6), the digestive system(r = 0.6), the genitourinary system (r = 0.6) and the musculoskeletal system; between nitric oxide and diseases of the digestive system (r = 0,7) and the circulatory system (r = 0,6); between benzopyrene and diseases of the digestive system (r = 0,6), the genitourinary system (r = 0,6) and the nervous system (r = 0,4). Conclusion. The positive correlation was found between air pollution and the health of the population living in Sarkul and Kenkiyak villages. To enhance the reliability of the results we are going to continue this study further.

Keywords : atmospheric air, chemical substances, oil and gas, public health
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