

RISK ASSESSMENT OF NON-CARCINOGENIC EFFECTS OF AMBIENT AIR POLLUTION IN DONETSK REGION

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This article provides a comparative analysis of risk assessment of non-carcinogenic effects connected with the environmental hazards in Donetsk region.

The methodology of risk is actively developing in Ukraine nowadays. The risk of contaminant exposure of species is defined as the probability of a person to have any adverse effect as a result of the impact. The concept of environmental risk can provide a quantitative description of the environmental hazards of a wide class of phenomena and processes. This quality of risk assessment is interesting for environmental monitoring. A comparative analysis of risk assessment was made in selected settlements in Donetsk region, in Donetsk, Yenakievo, Gorlivka, Makiyivka, Mariupol, Thorez, Slaviansk and Artemovsk. This risk assessment is connected with the health of population and non-carcinogenic effects of air pollution.

We calculated the individual non-carcinogenic systematic toxicity risk; annual non carcinogenic risk (the amount of toxic effects), risk characterization of carcinogenic effects when nitrogen dioxide and undifferentiated dust enter simultaneously during inhalation.

The purpose of this report is to give the definition of the development of non carcinogenic effects on human health associated with air pollution in the residential areas of Donetsk region. To analyze the relationship of environmental risk of carcinogenic activity and health status the rates of aging population in the cities were calculated. To calculate the environmental risk we used two methods: the first was used in the Kurolap`s study and the second is named "Guidance on the assessment of environmental risk when exposed to chemicals that pollute the environment".

According to the data calculated by the method of Kurolap in the Donetsk region the highest level of risk of nitrogen dioxide and dust air pollution was observed in Mariupol. Then go Makeevka, Donetsk, Gorlivka, Yenakievo. The relatively low level of risk is observed in such cities as Donetsk, Slovyansk, Thorez. According to the methods of risk assessment we can say that if the values of the calculated risks do not exceed one point, the chances of having a harmful effect on human life are not essential and this effect is characterized as acceptable.

The data showed that the levels of risk development of such non carcinogenic effects on the health of the population in the cities in ambient air pollution were valid.

Then the tempo of population aging was calculated. 320 people took part in the survey. Among them there were 80 men aged 35-60, 80 women aged 34-60 and 160 teenagers aged 15-21. We calculated the biological age and the real biological age and the difference between them was estimated using classes of aging from one to five. Thus, I class corresponds the very slow tempo of aging, and V very accelerated tempo, III class characterizes the approximate correspondence of biological age and calendar. People assigned to classes IV and V in terms of aging, should be included in the risk group for their health status.

According to a study we came to the conclusion that men of all settlements are more likely to accelerate and dramatically accelerate the tempo of aging. If you compare boys and girls, the boys are more likely to the accelerated tempo of aging.

Since the concentrations of pollutants in the environment in the studied area do not exceed health standards, the cases of acute toxicity aren't observed. Variations in health status are associated mainly with chronic effect on the organism thanks to low concentrations of pollutants. As a result we found definite relationship between the rate of population aging and the development of risk assessment of non-carcinogenic effects of two pollutants: nitrogen dioxide and dust. There is an evidence of overlap between the risk group with the accelerated tempo of aging and the environmental risks. The exception is city Yenakievo.

When harmful substances are inhaled in a human body this dramatically influences aging and human health.

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Матеріали надійшли 18 січня 2014 р.