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Ecological Factors Affecting the Human Organism Living in the Conditions of the Republic of Karakalpakstan

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Annotation: This article discusses various living organisms inhabiting planet Earth and their interactions with each other and the environment. Special attention is given to the powerful impact of humans on nature. The article analyzes the effects of ecology on human health, focusing on the situation in the Republic of Karakalpakstan based on statistical data. Additionally, it provides an in-depth overview of atmospheric pollution and its negative impact on the human body, particularly on respiratory diseases, cardiovascular issues, and the health of mothers and children.

The author also emphasizes the importance of lifestyle, environmental conditions, and medical services for health preservation, highlighting that air pollution is a global problem. The article aims to illustrate the connection between humans and the environment, the necessity of addressing ecological problems, and ensuring a healthy future.

Keywords: environmental impact, anthropogenic factors, atmospheric pollution, human health, changes in air

composition, environmental problems, respiratory system diseases, harmful impurities in the air, industrial and transport emissions, smog and its consequences, radiation and chemical pollution, air humidity and dust content, genetic diseases and ecology, environmental protection.

Currently, several million species of living beings inhabit our planet. They interact with each other and with their surrounding non-living nature, forming a stable and complexly organized system that has evolved over a long period - through the evolution of living nature.

Although humans are a biological species and their activities fall under biotic influences, anthropogenic impacts on nature are classified as a separate group of factors. No other species on the planet exerts such a powerful influence on all living things, and the degree of human impact on Earth's nature continues to grow rapidly.

People tend to blame their illnesses on radiation and the harmful effects of other environmental pollutants. However, the influence of ecology on human health in Karakalpakstan today accounts for only 25–40% of all impacting factors. According to expert forecasts, in 30–40 years, the dependence of the physical condition and well-being of the Republic of Karakalpakstan's citizens on ecology will increase to 50–70%.

The most significant factor affecting the health of the Republic of Karakalpakstan is lifestyle (50%). This includes:

- ✓ Diet;
- ✓ Beneficial and harmful habits;
- ✓ Physical activity;
- ✓ Nervous-psychological state (stress, depression, etc.).

The second most significant factor affecting human health is ecology (30%), followed by heredity at 20%. The remaining 5% is attributed to medical services. However, cases have been observed where the effects of these four factors overlap.

Examples of Environmental Impact

- ➢ **Global environmental pollution** is a problem for all of humanity but does not pose a significant threat to an individual person.
- ➢ **Regional environmental pollution** affects the residents of a region but is often not extremely hazardous to an individual's health.
- ➢ **Local environmental pollution** poses a severe danger to both the overall health of a city's or district's population and to each resident in that area.

Following this logic, it is easy to determine that the health dependence on air pollution on a specific street is even higher than on district-wide pollution. However, the strongest environmental impact on human health comes from the ecology of one's home and workplace, as people spend approximately 80% of their time indoors. Indoor air is typically dry and contains a significant concentration of chemical pollutants:

- Radioactive radon levels are 10 times higher (in basements and lower floors, possibly hundreds of times higher).
- Air ion composition is 5–10 times altered.

Factors Affecting Indoor Ecology:

- ✓ The floor level of residence (higher radiation exposure on lower floors).
- ✓ The material used in house construction (natural vs. synthetic).
- ✓ Type of kitchen stove (gas vs. electric).
- ✓ Flooring material (linoleum, carpets, or safer alternatives).
- ✓ Type of furniture (contains formaldehyde-based compounds).
- ✓ Presence and quantity of indoor plants.

Air Pollution and Its Effects

Atmospheric air is one of the most vital elements of our environment. Humans inhale approximately 12–15 cubic meters of oxygen daily and exhale around 580 liters of carbon dioxide.

Children living near major power plants without dust collectors exhibit lung changes similar to silicosis. Dust containing silicon oxides causes a severe lung disease—silicosis. High air pollution levels with smoke and soot over several days can lead to fatal poisoning. Atmospheric pollution is especially harmful when meteorological conditions cause air stagnation over a city.

Harmful atmospheric substances affect the human body upon contact with the skin or mucous membranes, particularly when a sweating person walks along a polluted street. If they do not take a warm (not hot) shower immediately after returning home, these harmful substances may penetrate deep into the body.

Airborne pollutants not only damage the respiratory system but also affect vision, smell, and vocal cords, sometimes causing spasms. Inhaled solid and liquid particles (0.6–1.0 microns) reach the alveoli and enter the bloodstream, with some accumulating in lymph nodes.

Air pollution primarily irritates the respiratory tract, leading to bronchitis, emphysema, and asthma. Irritants such as SO2, SO3, nitrogen vapors, HCl, HNO3, H2SO4, H2S, phosphorus, and its compounds have been identified as major contributors. Studies in the UK show a strong correlation between atmospheric pollution and mortality from bronchitis.

Symptoms of air pollution exposure include headaches, nausea, weakness, and reduced productivity. The majority of pollutants enter the body through the lungs, with inhalation being the most dangerous exposure route due to the broad range of harmful substances in the air and the lack of a protective biochemical barrier like the liver.

Conclusion

The primary causes of deaths related to atmospheric pollution include cancer, congenital anomalies, and immune system disorders. Even brief exposure to diesel engine exhaust increases the risk of ischemic heart disease. Industrial enterprises and transport emissions release black smoke and greenish-yellow dioxide, increasing premature death risks. Even low concentrations of these substances in the atmosphere cause 4–22% of deaths before the age of 40. Automobile and industrial emissions saturate the air with fine particulate matter, increasing blood clot risks and raising blood pressure. Due to air pollution, around 5% of hospitalizations in major cities occur.

A severe environmental issue in industrial cities is smog, which adversely affects human health, particularly children, the elderly, and those with cardiovascular and respiratory diseases. High concentrations of pollutants in the morning worsen conditions.

Air pollution also increases the likelihood of birth defects, premature births, and low birth weight. If a pregnant woman breathes air with high ozone and carbon monoxide levels, especially in the second month of pregnancy, the risk of congenital disabilities increases threefold.

The future of humanity depends on clean air, water, and forests. Only a responsible attitude toward nature will ensure a healthy and happy future for coming generations.

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