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STUDYING THE IMPACT OF NOISE ON HUMAN HEALTH IN RESIDENTIAL PLACES

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Annotation
The article studies the impact of noise as one of the environmental factors on human health. The main sources of noise in populated areas are considered to be motor vehicles, trains, air transport, and manufacturing enterprises. According to the results, due to noise in cities, life expectancy has decreased by 8-12 years. It is recommended to develop practical recommendations and guidelines for protecting people from noise.

Keywords. Noise, transport noise, noise standards, human hearing impairment.

Introduction

Maintaining human health has been the focus of researchers for many centuries. The level of mental and physical health of a person determines his high working capacity and activity. Health is the sum of the physical and spiritual characteristics of a person: it is a necessary condition for his longevity and the implementation of creative plans, high labor productivity, the creation of a strong, harmonious family, the birth and upbringing of children for the happiness of our society [1].

The increase in noise is also negatively affecting the natural state of the environment and the deterioration of human health. Therefore, combating noise is an integral part of nature protection. Noise is an unpleasant and dangerous sound that does not have a musical character. Therefore, it interferes with the normal work and rest of people, reduces labor productivity and working capacity, relaxes the nerves, weakens the cardiovascular system, causes headaches, insomnia, increases heart rate, in short, it causes negative physiological changes in the human body [7].

The World Health Organization (WHO) considers traffic noise to be a serious threat, as it affects not only deafness, but also the risk of developing heart and nervous system diseases. According to estimates, approximately 50,000 people die prematurely every year from heart attacks caused by traffic noise. About 200,000 people are observed to develop cardiovascular and nervous system diseases due to noise exposure [2]. Noise in residential areas is mainly caused by air transport, railway transport, industrial enterprises of motor transport, construction machinery, household service enterprises, loud radio and television. The urgency of the problem under consideration is associated with the tightening of requirements for noise pollution from vehicles that have the most negative impact on the environment in residential areas where roads pass.

The purpose of the study is to select possible methods of protection against noise pollution to ensure comfortable living for the population and compliance with environmental standards and parameters, taking into account the economic feasibility of their installation in the territory of settlements.

Research material and methods. For noise measurement, class 1 or 2 sound level meters with octave filters and, if necessary, a tape recorder, statistical level distribution analyzer, oscilloscope, noise calibration standard (pistonphone) and other devices are used. The following devices are recommended: small-sized sound level meter "VShM-201"; logarithmic noise vibration integrator "SHVIL - 001"; noise and vibration meter "VShV - 003-M2" (Russia); various types of sound level meters from "RFT" (Germany); sets of "Brühl and Kjær" (Denmark), etc. All equipment must undergo metrological control annually at the Metrological Services Center of the "Uzstandard" agency [3].

Research results. Noise affects the human body primarily through the auditory organs. Noise causes continuous strain on the auditory analyzers. Noise at a level of 70 dB interferes with fluent speech. The gradual impact of noise on the human body leads not only to hearing impairment, but also to dizziness, headache, tinnitus, and rapid fatigue. Older people are more sensitive to noise. For example, 46.3% of people under 27 years old, 57.0% at 28-37 years old, 62.4% at 38-57 years old, and 72% at 58 years old and older perceive noise well. The level of noise exposure is stronger in people who are more engaged in mental work, since work is dependent on the nervous system, the ratio is 60.2 and 55% [5].

Noise in the city has a greater impact on the human circulatory system, increasing cholesterol levels, and worsening heart function. It also leads to impaired pancreatic function and brain activity. The strength of noise is measured in decibels (dB). One decibel noise is considered the lowest and is difficult to notice. 200 decibel noise is strong, and its effects can be fatal. It is divided into 4 groups according to the strength and nature of the noise. 1. If the noise strength is 0-50 dB, it is considered normal sound. This includes the rustling of trees in the wind, the ticking of a clock, and the sound of normal music. 2. If the noise strength is 60-90 dB, it is considered unpleasant sound, and this includes traffic noise, vacuum cleaners, and washing machines. 3. Noise levels of 100-120 dB are considered harmful and have a negative impact on human health. These include noise from machines, cars, motorcycles, trams, railways, agricultural and construction machinery, and loud music. 4. Noise levels of 130-200 dB are considered dangerous. These include air raid sirens, jet aircraft, explosions, and others (Table 1).

When the noise level exceeds 130 dB, drastic changes occur in the human body, causing illness and even death (if it exceeds 130 dB). Noise is stronger in cities than in villages. Because the main industrial enterprises are located in cities. Also, the large number of vehicles increases the noise several times. Because of this, the noise level in the world, including in large cities in Uzbekistan, has increased by 10-12 dB over the past 10 years. In Tashkent, on Sh. Rustaveli, A. Navoiy, Beruniy, Uzbekiston streets, the noise level exceeds 80-90 dB. In apartments located on the outskirts of these streets, the noise level reaches 70-80 dB. According to Sanitary rules

and regulations No. 0267-09, the permissible noise level in residential buildings from 07:00 to 23:00 should not exceed 40 dBA, from 23:00 to 07:00 - 30 dBA. The maximum level during the day should not exceed 55 dBA, and at night - 45 dBA [3].

Table 1 The impact of noise on human health

An example of the effect of noise	Noise level, dBA	Changes in the human body as a result of long-term exposure to noise
When fired from a gun	170	Eardrum rupture
Shot from a rifle	160	
When a jet plane takes off	140	
Unacceptable level		
Thunderstorm	130	Human pain threshold
Orchestral music	110	
Train	100	Risk of hearing loss
Heavy truck, subway train	90	
Busy city street	80	
Quiet conversation	60	Normal level
Raindrops	40	
Rustling leaves	20	Quiet (peaceful) level
Whisper	10	

According to the results, the life expectancy of the population in cities is reduced by 8-12 years due to noise. The main sources of noise are motor vehicles, railways and air transport, as well as industrial enterprises. The noise level is especially high on the main streets of the city. When the average number of motor vehicles per hour reaches 2000-3000, the maximum noise level reaches 90-95 dB.

In cities such as Rome, Mexico City, Paris, and Moscow, where the equivalent sound level standard was set at 45-55 dBA, urban traffic noise increased to 75-80 dBA [4]. Practice shows that despite the tightening of vehicle standards in terms of reducing noise pollution and the requirements for creating "quiet" cars, the annual increase in the number of cars leads to an increase in noise levels in populated areas by 0.5-1.0 dBA.

Noise in large cities shortens human life. According to Australian researchers, noise causes 30% of the aging of the urban population, reduces life expectancy by 8-12 years, and encourages people to commit violence, suicide, and murder. Noise is of greatest concern to people engaged in mental labor, compared to those engaged in physical labor [6].

There are two ways to reduce noise pollution in residential areas: 1. Reducing vehicle speeds, strictly controlling traffic on the streets, stopping some vehicles at certain times of the day or completely, and implementing high-quality noise-proofing and landscaping of residential buildings; 2. Ensuring that the engines and drivetrains of vehicles operate as noise-free as possible at the highest level.

It is advisable to develop methodological guides on the following practical recommendations for protecting people from noise: creating a city noise map - this will show the location of noise sources in the city, which will play a huge role in monitoring the noise level regime, protecting homes, hospitals, etc. from excessive noise; installing barriers on the windows in some

buildings - can weaken the noise by 8 times before it enters the room; placing recreation facilities at least 500 meters from main highways and 1 km from railways, and landscaping the area will reduce the noise level; noise-absorbing layers can have a 100% noise absorption capacity if 0.7-1.5% epoxy resin is added to the asphalt; observations show that shrubbery planted in one row reduces noise by 3-4 dB, and in two rows by 6-8 dB.

In conclusion, we are surrounded by various sounds, some of which are comfortable, and some are not. Every day we are exposed to various noises (railway transport, motor transport industrial enterprises, construction machinery, household services, television, etc.) in our living and working places. This can affect not only the ears, but also the whole body. Thus, taking into account the above results, it is advisable to develop methodological guidelines and regulatory and legal documents on reducing noise levels in residential areas.

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