**WITHIN THE FRAMEWORK OF THE SCIENTIFIC AND TECHNICAL PROGRAM "NATIONAL PROGRAM FOR THE IMPLEMENTATION OF PERSONALIZED AND PREVENTIVE MEDICINE IN THE REPUBLIC OF KAZAKHSTAN," RESEARCH INSTITUTE NAMED AFTER B. ATCHABAROV IS ASSESSING THE HEALTH RISKS TO THE POPULATION OF KAZAKHSTAN ARISING FROM INDUSTRIAL FACILITIES OF HAZARD CLASS I, VEHICLES, AND WATER SUPPLY SYSTEMS. THESE ASSESSMENTS WILL AID IN THE DEVELOPMENT OF MANAGEMENT DECISIONS TO SAFEGUARD PUBLIC HEALTH**

Today, in the Republic of Kazakhstan, the impact of environmental objects on the health of the population is assessed based on hygienic standards (MPC, MPC, SHM), most of which were developed in the middle of the 20th century, primarily through experimental methods on animals. Regrettably, the vast majority of these standards have not been revised since Soviet times. Consequently, Kazakhstanis are currently consuming water and breathing air, the quality of which is regulated by outdated hygienic standards.

In OECD countries, a different approach is taken to assess the impact of environmental objects on public health, using the health risk assessment methodology. This methodology is fundamentally different from the post-Soviet space's traditional sanitary and epidemiological surveillance. The main difference lies in its individualized science-based approach to each specific pollution source, which relies on reference doses and concentrations. These values are regularly reviewed based on new information from observational studies, man-made disasters, and other relevant sources. The application of this methodology unifies the system of management technologies in assessing the quality of the human environment and will ensure the harmonization of domestic hygiene standards with international safe exposure levels, especially considering the increasing integration processes worldwide.

The essence of this subtask is to obtain an accurate picture of the impact of industrial facilities, vehicles, and water supply systems on the health of the population in each specific city and regional center of the Republic of Kazakhstan, using the health risk assessment methodology. This research aims to establish, for the first time, the levels of carcinogenic and non-carcinogenic risks to the health of the population living throughout the Republic of Kazakhstan due to exposure to priority chemicals present in atmospheric air and drinking water.

As a result of this research, a realistic assessment of the impact of industrial facilities of the 1st hazard class, vehicles, and water supply systems on the health of the population in each specific city and regional center of the Republic of Kazakhstan will be determined. The main factors affecting public health, as well as the degree of influence and causes of these factors, will be identified. To achieve this, the territories of all regions of the Republic of Kazakhstan will be analyzed and classified according to the degree of acceptability of integral risks to public health using GIS technology (mapping).

Following this assessment, specific measures will be proposed to eliminate or reduce the impact of the identified factors on the health of the population in each specific city and regional center of the Republic of Kazakhstan, considering their local characteristics. These measures may include the replacement of specific state-owned industrial facilities with the best available environmentally-saving equipment or measures, including regulatory ones, that encourage specific private industrial facilities to undergo such modernization. Additionally, a science-based program to combat air pollution caused by motor vehicles in settlements of the Republic of Kazakhstan will be devised. This program may involve the phased strengthening of requirements for vehicles with internal combustion engines, improvements to the system for monitoring such requirements, a system for controlling the entry of vehicles into large cities from satellite cities, and measures for pinpoint screening of specific sections of roads. Moreover, the installation of additional purification systems at specific water intake sites or the installation of additional filters on specific mains of water supply systems, or their replacement, may also be proposed as part of the overall strategy.

1) Sample size:

• 7 industrial facilities of the 1st hazard class for studying air quality;

• 3 cities of republican significance, 14 regional centers and 2 cities of regional significance to study air quality;

• 38 cities to study water quality.

2) Research methods:

• Methodology for public health risk assessment (WHO);

• Modeling dispersion of emissions in the atmospheric air (ERA-risks);

• Mapping of territories according to the degree of risk (GIS ArcGIS 10 by ESRI).