

**UTILIZING PREDICTION AND MONITORING TECHNIQUES WITH
REGRESSION MODELS FOR THE ANALYSIS AND MANAGEMENT OF
VASCULAR DISEASES**

Dilafruz Nurjabova

*Phd student of Tashkent University of Information Technologies,
100084, Tashkent, Uzbekistan
dilyaranur1986@gmail.com*

Abstract. *The increasing prevalence of vascular diseases poses significant challenges to global healthcare systems. Effective prediction and monitoring are essential for early diagnosis, personalized treatment, and improved patient outcomes. This study explores the application of prediction and monitoring techniques using correlation and regression models to analyze and manage vascular diseases.*

Key words: *prediction and monitoring techniques, correlation and regression models, blood vessel diseases, vascular diseases, morality.*

Alexander Nikolaevich Kryukov, one of the founders of the field of Cardiology in Uzbekistan, is known as the founder of the first scientific therapeutic school in Uzbekistan. Their students were the first researchers in cardiology in the 1930s. Alexander Kryukov was a representative of the Moscow School of therapists, an academician, the founder of Hematology in the country, and also made a significant contribution to the development of emergency therapy and spas. At the first stage, the founders of therapeutic schools in Uzbekistan (M.N. Slonim, I.A. Kassirsky) studied the physics and pathology of the cardiovascular system in hot climates. Their work was particularly focused on the study of hypertension, ischemic heart disease, and other heart diseases. Between 1976 and 2002, at the second stage of Cardiology in Uzbekistan, The Scientific Research Institute of Cardiology of Uzbekistan was established. It conducted scientific research on the treatment and diagnosis of cardiovascular diseases based on the experiences of the institute, the World Health Organization and international experts. Another important stage in the development of Cardiology in Uzbekistan began after the establishment of the Scientific Department of Arterial Hypertension in 2006. In this section, genetic studies and molecular-genetic approaches have been developed, and this is of great importance in the Prevention of arterial hypertension. The Scientific Research Institute of Cardiology of Uzbekistan currently shows its success not only within the country, but also internationally. For example, in 2019, in cooperation with the European Society of Cardiology, he was involved in the development of clinical recommendations on cardiology. Also in 2018, a new high-tech Cardiological support center was opened, and in 2019, with the opening of a new administrative Corps, a new phase in the treatment of cardiovascular diseases began in Uzbekistan. These programs and scientific

work are aimed at improving the early diagnosis and treatment of cardiovascular diseases, and scientific work in the field of Cardiology continues to develop in Uzbekistan, and this field is leading to a wide range of medical achievements in our country. In 2006, in the Scientific Department of Arterial Hypertension (head – professor E. M. Eliseeva, now-Hamidullaeva G.A.) a molecular-genetic research group was established. On the basis of these studies, more than 40 genetic polymorphisms were studied, and for the first time in Uzbekistan A.G. A DNA Bank of patients with (Arterial hypertension) was created. This bank was the basis for the creation of a genetic "passport", which it then used to determine the risk of hypertension. Vascular diseases currently remain one of the pressing problems all over the world, in particular in the countries of Central Asia. The relevance of this topic is based on several factors, which can be explained as follows using scientific concepts and the language of scientific literature:

1. High mortality: vascular diseases (ischemic heart disease, arterial hypertension, etc.) account for 30-40% of the causes of death in the world. According to the World Health Organization (who), these diseases are noted as the most common cause of death in our region. [Global Burden of Disease Study (GBD), 2023]

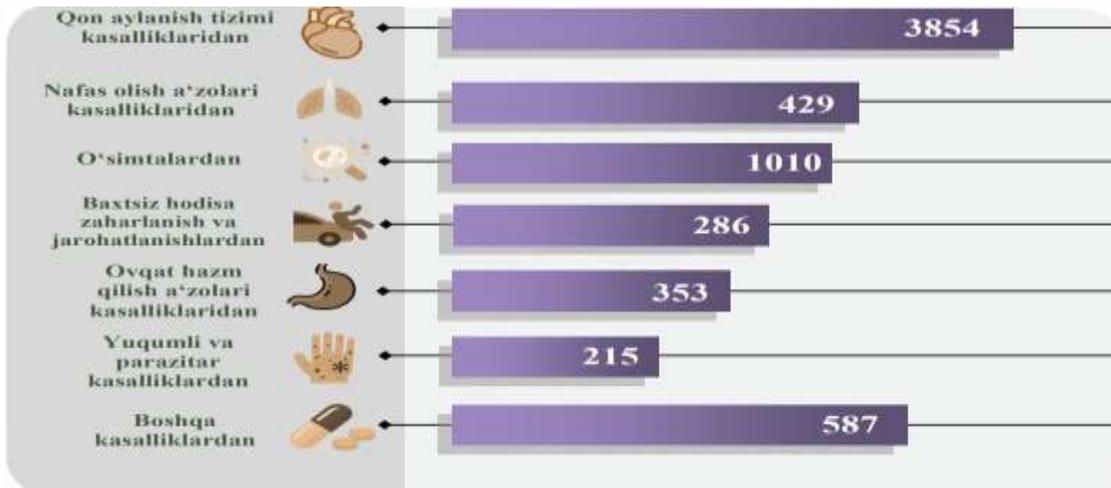
2. Prevalence of risk factors: factors such as rational malnutrition, high blood pressure, obesity, smoking, and low physical activity significantly increase the risk of these diseases. These factors are common in the countries of Central Asia and stand before the health system as an urgent task. [Lancet Public Health Journal]

3. Socio-economic burden: vascular diseases cause not only an increase in the mortality rate, but also an increase in the economic burden. This results in a higher incidence rate among the working population, which reduces productivity and increases health care costs. [European Journal of Preventive Cardiology, 2022]

4. Limited regional health services: the lack of medical centers in Central Asia with advanced diagnostic and therapeutic methods limits the chances of detecting the disease at an early stage and effective treatment. [World Health Organization (WHO) Regional Office for Europe] This figure shows the distribution of the main causes of death from January to June 2023. According to statistics, the largest percentage indicator was caused by diseases of the circulatory system (51.9%).

Other causes include:

- Respiratory organ diseases-11.5%;
- Diseases of the digestive organs-4,4%;
- Infectious and parasitic diseases – 1,4%;
- Tumors-9.5%;
- Accidents, poisoning and injuries-3.6%;
- Other diseases-17.7%.

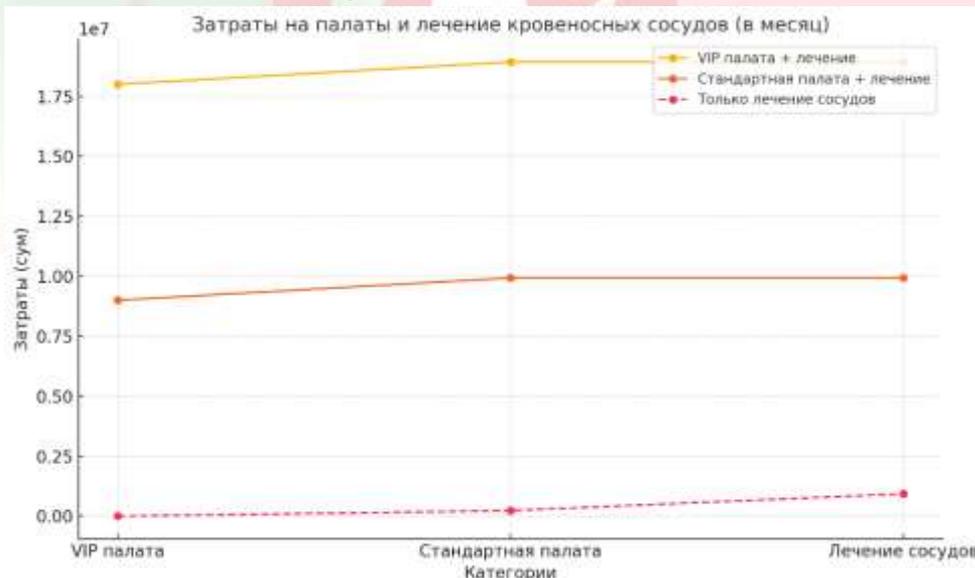


Pic.1. Distribution of major causes of death by January-June 2023(Uz Axa)

Obesity, a critical risk factor, has a direct impact on ischemic heart disease. For every 1% increase in obesity prevalence, there are 40.2 additional cases of IHD per 100,000 men and 38.3 per 100,000 women. A line chart comparing obesity prevalence and new IHD cases demonstrates a stronger effect on men compared to women.

Regionally, urban areas like Tashkent City exhibit the highest mortality rates at 5.5 per 1,000 population in 2024, followed by Tashkent Region (5.4) and Jizzakh (4.2). These disparities emphasize the influence of urbanization and lifestyle factors on CVD rates.

In summary, the data underscores the alarming rise in CVD mortality in Uzbekistan, driven largely by obesity and regional inequalities. It highlights the urgent need for public health initiatives focused on obesity reduction, healthier lifestyles, and improved access to healthcare to mitigate these trends.



Pic.6. Real the price of the Clinic

All these expenses were received in real from the price of the American hospital Clinic. In addition, its separate VIP chamber and standards' were counted separately.

REFERENCES:

1. <https://world-heart-federation.org/world-heart-observatory/countries/uzbekistan/>
2. <https://world-heart-federation.org/wp-content/uploads/World-Heart-Report-2023.pdf>
3. <https://worldpopulationreview.com/country-rankings/heart-disease-rates-by-country>
4. <https://m.kun.uz/en/news/2024/10/25/cardiovascular-disease-leads-death-causes-in-uzbekistans-2024-mortality-data>
5. O‘ZBEKISTON KARDIOLOGIYASI Ilmiy-amaliy jurnal № 3 / 2020(57)-/ 2023
6. [Michelle Lui](#) a, [Saeid Safiri](#) b,c,d, [Alibek Mereke](#) e, [Kairat Davletov](#) e, [Nana Mebonia](#) f, [Akbope Myrkassymova](#) g, [Timur Aripov](#) h, [Erkin Mirrakhimov](#) i,j, [Sargis A Aghayan](#) k, [Amiran Gamkrelidze](#) l, [Mohsen Naghavi](#) m, [Jacek A Kopec](#) a, [Nizal Sarrafzadegan](#) a,n,*, Burden of Ischemic Heart Disease in Central Asian Countries, 1990–2017, <https://pmc.ncbi.nlm.nih.gov/articles/PMC7876559/#b0025>
7. www.lex.uz
8. Global Burden of Disease Study (GBD), 1990–2017
9. Lancet Public Health Journal, 2023
10. European Journal of Preventive Cardiology, 2022
11. World Health Organization (WHO) Regional Office for Europe 2017 from 2022.