

SOME PROBLEMS WITH CREATING A MEDICAL-GEOGRAPHICAL ATLAS MAP OF UZBEKISTAN

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Abstract. This article discusses one of the modern branches of geography, medical geography and its importance, the creation of medical atlases and the problems and shortcomings encountered in it. Creating medical maps has its own difficulties, as it is based on statistical data on the prevalence of various diseases, not a specific area. It is known that the disease develops depending on the condition of the area. In the Republic of Uzbekistan, the integrated development of the regions is economically important but has a significant impact on the ecology of the regions and the health of the population. The slogan COVID-19, which is a global concern, once again demonstrates the importance of focusing on the sanitary-epidemiological situation. An integrated approach to the implementation of these measures is becoming more relevant, which requires monitoring the medical condition of the regions using GIS technologies. The following is a detailed description of the creation of the Medical Geographical Atlas of the Republic of Uzbekistan and its components.

Keywords. Medical-geographical atlas, COVID-19, epidemiological situation, nosogeographic situation, disease distribution area, life expectancy.

Introduction. In the context of globalization of the world economy and fierce competition, as well as pandemics, the incidence of various diseases among people is becoming more frequent. International organizations are also paying great attention to combating these problems and eliminating their consequences. In particular, the UN Sustainable Development Program until 2030 emphasizes "the elimination of epidemics of diseases such as AIDS, tuberculosis, malaria, as well as measures to combat hepatitis and other water-borne diseases by 2030." Successful implementation of these tasks requires stabilization of nosoecological conditions in arid climates [1].

The development of modern geographical maps and their application in production is of great importance, both theoretically and practically. In this regard, the creation of medical-geographical maps that assess the health of the population and reflect the natural-ecological, socio-economic and demographic factors affecting it is an urgent problem.

Geographical differences in morbidity and life expectancy on a global and regional scale are related to regional variability in the impact of adverse natural and socio-economic factors on population health. Therefore, it is necessary to determine the relationship between the environment and regional differences in morbidity, to create maps reflecting the medical-geographical situation in the world and certain regions, taking into account the requirements of improving the health system, to develop medical-geographical forecasts. These circumstances determine the relevance of this case [2].

The main part. An important aspect of the research is the analysis of geographical differences in the nosoecological conditions of the regions of Uzbekistan, the development of a series of maps on the assessment of the nosodemographic and nosoecological situation, to determine the level of environmental impact on public health, as well as recommendations for sustainable development.

It is known that medical geographical research, including the incidence of the population and the regional structure of the disease, has been studied by scientists from the former Soviet Union and the current CIS countries. Among them are, first of all, D.K.Zabolotny, E.N.Pavlovsky, A.A.Shoshin, A.V.Chaklin, A.P.Avtsyn, E.I.Ignatov, B.B.Prokhorov, E.L. Reich, V.P.Podolyan, A.A.Keller, A.G.Voronov can be included. Each of the above-mentioned scientists has contributed to the development of this or that branch of medical geography. In particular, on theoretical issues of medical geography AA Shoshin, D.K. Zabolotny, E.L. Reich; Scientific research on medical geographical zoning was carried out by B.B. Prokhorov, V.P. Podolyan, E.I. Ignatiev, A.G. Voronov. As the founder of oncogeography, A.V. Chaklin, A.P. EN Pavlovsky laid the foundation for the doctrine of foci of infectious diseases that occur in certain landscapes. Although the above studies are devoted to medical geography, we cannot call them medical cartographic studies [3].

In many countries around the world, a lot of attention is paid to a number of priority areas of medical geography, including research to determine the impact of climatic and geographical conditions on public health and the creation of medical and geographical maps. including developed methods for monitoring the impact of climate on human health, developed nosogeographic maps of natural foci of the world's leading diseases (University of North Carolina); theoretical issues of medical ecology and human ecology were identified (Harvard University); alternative options for improving the quality of the health care system have been developed. Medical-geographical and nosoecological maps related to the theory and methodology of medical geography, medical and geographical modelling, and medical-geographical forecasting were compiled at the Institute of Geography of the Russian Academy of Sciences. The project also envisages scientific cooperation with the editor of the Medical Geographical Atlas of the Russian Federation, the head of the Department of Biogeography of Moscow State University S. Malkhazova, which will further enrich the content of the atlas [4].

O.B. Ata-Mirzaev (within the problems of national population policy), H. Tursunov (issues of morbidity of the population connected with the ecology of Tashkent, 1994), M. Nazarov (Problems of medical services to the population, 1996) with areas close to the problem in Uzbekistan, N.Kamilova (Nosogeographic situation of Bukhara region (territorial aspects of morbidity, 1999; Geographical analysis of medical geographical conditions of Uzbekistan and problems of population health, 2012), I.R.Turdimambetov (Medical-geographical situation of the Lower Amudarya region, 2005), M.Khamroev (Khorezm Region Social Ecology and Geographical Features of Population Health, 2009), Specialists from the Research Institutes of Health and Medical Statistics, Epidemiology, Microbiology and Infectious Diseases, and the Center for Public Opinion [5].

It should be noted that in recent years in many countries around the world have published a lot of work on the development of various medical-geographical maps and regional atlases.

During the former Soviet Union, especially in 1975-1980, the Congresses of the Geographical Society made important decisions to strengthen the work on the preparation of materials for the compilation of medical-geographical cadastre, regional medical-geographical atlases, especially medical-geographical atlases. This led to the development of atlas cartography (Medical Geographic Mapping, 1978). In 1976, in Cheboksary, F.G. Grigorev published a medical-geographical atlas of the Chuvash Republic. Medical care in Belarus (S.I. Belov), Kyrgyzstan (B.I. Khojamberdiyev), Georgia (A.F. Aslanikashvili), Siberia, the Far East and Moldova (E.S. Feldman), Armenia (A.P. Hayriyan) - Intensive work has begun on the creation of geographical atlases. Similar atlases were created in Ukraine, which covered regional aspects of malignant tumours. It reflects the regional system of morbidity of malignant tumours in the population of Ukraine. Compiled regional maps of the population of cancer allowed the authors to identify the oncological-geographical zoning of the area and landscape-geochemical and man-made factors that increase the risk [5,6].

The created atlases are large cartographic works, a source of evidence-based data on medical geography, as well as serve primarily for the health of the population and the protection of the environment.

E.S. Feldman's contribution to the creation of the Medical-Geographical Atlas of the Republic of Moldova is significant. According to the scientist, regional medical-geographical atlases should be created in two stages. In the first stage, analytical maps are developed, which provide selected data for regional and comparative analysis, and in the second - maps that provide quantitative and qualitative analysis of location, relationships, processes, and events.

In Kazakhstan M.Sh.Ishankulova, I.X. Shuratova, B.V. Extensive research has been conducted to create a medical-geographical atlas of scientists such as Rayushkin. It describes the medical-geographical laws of the impact of the natural environment, social, living and working conditions on the emergence of a number of somatic and infectious diseases.

Based on the method of analyzing the relationship between geographical factors and the origin of diseases, research was conducted in the Republic of Georgia to create a medical-geographical atlas of some parasitic diseases. According to G.M. Maruashvili, I.I. Topuriya and T.L. Bakradze, these atlas maps reflect the direct and direct impact of natural and socio-economic factors on the spread of parasitic diseases, the spread of pathogens and carriers, the incidence of certain parasitic diseases in the population.

The special significance of the regional medical-geographical atlases created in recent years is, first of all, that they allow the health and environmental authorities to scientifically substantiate specific measures to prevent the negative impact of geographical factors on the human body.

The basic rules of the methodology of such a complex medical-geographical atlas were created by A.A. Shoshin (1962), E.S. Feldman (1977), I.A. Khlebovich (1972) and others.

Later, scientists in Russia created a series of atlases devoted to medical geography. This will provide a scientific basis for the emergence of a number of complex environmental problems in the country and the rapid implementation of measures to protect health and the environment. In particular, SM Malkhazova has been conducting effective research in this area for many years [6].

Scientists from Russia, the United States, the United Kingdom and Japan have made significant progress in developing maps based on the analysis and assessment of the natural-ecological and socio-economic conditions of the regions, regional differences, and determining the impact of adverse environmental factors on public health.

Research work on the creation, study and application of medical maps is being carried out at Moscow State University, the University of California, Oxford and Tokyo.

Content and structure of the medical-geographical atlas of Uzbekistan.

It is known that the creation of medical-geographical maps reflecting the laws of natural and socio-economic conditions of certain regions related to the health of the population, the emergence and spread of diseases is of great theoretical and practical importance. In particular, the wider application of the cartographic method in medical geography serves to reveal more deeply the complex aspects of this field.

It should be noted that in complex medical geographical research, the collection and study of statistical materials on all aspects of health care in the country, the analysis of environmental problems and their solutions, forecasting, as well as expert assessment and other sociological surveys can achieve the necessary results. The study of natural, socio-economic conditions and factors of the country is of great practical importance in creating a medical-geographical atlas covering the health and morbidity of the population.

The main purpose of the planned medical-geographical atlas of Uzbekistan is to provide important information about the health status and incidence of the population, the impact of natural and socio-economic factors on the spread of various diseases in a particular area [3].

The main functions of the atlas:

- identification and reflection of a set of natural and socio-economic conditions that affect the health of the population;
- Demonstration of the state and prospects of development of the health care system in the country;
- to identify and reflect the characteristics of the emergence and geographical distribution of infectious, somatic, natural foci of disease, and on this basis develop scientifically based proposals and recommendations for anti-epidemic measures;
- Assisting health authorities in developing recommendations for further development of their sector;
- the creation of a series of maps reflecting the impact of the environment on human health and on this basis promoting targeted planning of the health system;
- use as a reference for specialists working in the field of medical geography, medicine, ecology and cartography;
- Serves as a textbook for higher and secondary education, medical research and design institutions;

Medical geographic maps based on the composition and prevalence of diseases in the population are submitted to the Ministry of Health of the Republic of Uzbekistan for the development of a state program for disease detection and improvement of public health. The State Committee for Ecology and Environmental Protection of the Republic of Uzbekistan uses a model of nosoecological monitoring, developed taking into account the relationship between the health of the population and the state of the natural environment. This is essential in the development of a plan of continuous monitoring of changes in the environmental situation in the regions and the preparation of medical geographical forecasts.

The created special cards are submitted to the Ministry of Health of the Republic of Uzbekistan and the State Committee for Ecology and Environmental Protection of the Republic of Uzbekistan and are commercialized.

Experts of the Department of Biogeography and Geoecology Laboratory of Moscow State University, as well as scientists of the Cartographic Production Enterprise of the Republic of Uzbekistan, Tashkent Research Institute of Vaccines and Serums [3].

The medical-geographical atlas of Uzbekistan is planned to consist of eight sections.

- I - Political-administrative and landscape maps of Uzbekistan are included.
- II - population,
- III - the health status of the population;
- IV - nosogeography of diseases;
- V - Health,
- VI - complex medical and geographical assessment of natural conditions;
- VII - Comprehensive geographical assessment of socio-economic conditions,
- VIII - Comprehensive medical-graphical assessment of the area.

I - General geographical definition.

This section includes political-administrative and landscape maps of Uzbekistan. The first section contains a political and administrative map; includes a landscape map.

II - Population.

The second section is devoted to the medical and demographic assessment of the population of the republic. The study of the characteristics of population geography plays an important role in solving many demographic problems of health, in particular, in determining the general sanitary-epidemiological condition of the region, the location of medical facilities, and the distribution of medical personnel. This section includes: a comprehensive description of the population; population size, density, migration and composition; birth; death; infant mortality; maternal mortality; natural population growth; the number of marriages and divorces; disability

III - Public health status

In the third section, the maps allow the analysis and generalization of materials on medical and demographic assessment of the population of the republic. This section provides maps of the state of health of the population and the success of the health care system of the republic in the prevention of infectious diseases. The study, accounting and mapping of the health status of the population allows to plan the location of medical institutions, training and distribution of personnel, as well as to determine in many ways the direction and subject of research in the field. These include somatic diseases (tumours; endocrine system diseases, eating disorders, metabolic disorders, including gout, diabetes, obesity; diseases of the blood and blood-forming organs; mental disorders; diseases of the nervous system; diseases of the circulatory system; respiratory diseases. ; diseases of the digestive system; diseases of the urinary system; complications of pregnancy, childbirth and the postpartum period; diseases of the skin and subcutaneous tissue; diseases of the musculoskeletal system and connective tissue) and infectious and parasitic diseases (including intestinal infections, typhoid fever, paratyphoid A, B, C, bacterial dysentery, tuberculosis, anthrax, brucellosis and other diseases including bacterial zoonoses.

The third section reveals the laws of formation of natural foci of disease in maps of disease nosogeography, as well as the reasons for their occurrence. The diagrams are supplemented with additions on the dynamics of the disease.

The purpose of the **fourth section** is to assess, analyze and summarize the state of the health care system of the republic. With the help of these maps, the health authorities of the republic will be able to purposefully develop specific proposals and measures for the distribution of medical care among the population, to determine the availability of medical personnel and their rational training, etc.

The fifth and sixth sections are devoted to the medical-geographical assessment of the natural and socio-economic conditions of the region. They are based on the systematization, analysis, and generalization of various statistical data and materials describing their negative effects.

The seventh section provides a comprehensive assessment of the natural and socio-economic conditions of the country, as well as the health of the population.

Each section of the atlas must be accompanied by special text. It is advisable to fill in the maps with graphs and diagrams to reflect the history and prospects of health development in the country.

Part 2 of the Medical Geographical Atlas is regional in nature.

At the same time, the regions of Uzbekistan will be medically analyzed, evaluated, and regionalized and relevant forecasts will be developed. In particular, in certain selected regions of Jizzakh and Syrdarya regions (Tangier, Khavas and other districts), conducting nosogeographic analysis: identification of the causes of some high-risk diseases among the population; statistical data on certain types of high-risk diseases (smallpox, anthrax, hemorrhagic fever, brucellosis), hearth-forming diseases are collected, methodical manuals or cartographic developments are prepared on the basis of expert opinions (scientists of the Tashkent Research Institute of Vaccines and Serums). Materials related to the creation of specific maps for certain regions of certain infectious diseases (tuberculosis, AIDS / HIV) are collected and maps are prepared based on expert opinions.

-Special maps reflecting the tanotogeographic (death process) situation in the area (total mortality, maternal and infant mortality); demographic maps are created (population, density, life expectancy); morbidity indicators by disease classes, as well as specific maps of individual hearth-forming diseases are created.

Special cards will be developed for cases of COVID-19; special cards will be developed for medical services to the population (number of doctors, number of nurses, provision of doctors by speciality, number of beds); special maps for the analysis of the urboecological situation (industrial, atmospheric air, water, soil maps), medicinal plants available in Jizzakh and Syrdarya regions; maps of fauna and flora are created. The generated maps will be summarized and submitted to the Medical Geographical Atlas for publication.

Conclusion. The emergence and regional spread of diseases among the population depends directly on the natural and socio-economic conditions, especially the ecological condition of the environment. The emergence of such a nosoecological situation is leading to the emergence and geographical spread of many diseases in some regions. The circulatory system, tumours, respiratory organs, and infectious diseases are among the leading causes of death among the population. Since there are natural and social foci that cause various diseases in the natural and social environment, research such as their identification, characterization, mapping, local natural geographical conditions, relief structure,

microclimate, hydrochemical and geochemical properties of the surface, groundwater and soil, vegetation and analysis of wildlife, landscape complexes based on a system of taxonomic units, can be done by analyzing the impact of socio-economic and demographic factors. In illuminating the nosogeographic situation, the creation of medical geographic maps plays an important role in a deeper understanding of the situation.

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