

# Medical Geographical Analysis Of Population Health In Arid Climate Areas

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**Abstract.** *This article examines the nosogeographic conditions of Bukhara region and the peculiarities and problems of public health. Bukhara region is located in the south-west of Uzbekistan, in the lower reaches of the Zarafshan River, and the main part of its territory consists of deserts. The influence of the desert plays a leading role in the nature of the region. Although there are differences in the nature of oases compared to desert areas, they have all the features of desert conditions. Extreme aridity and heat, as well as a lack of precipitation, have a direct impact on the health of the population. The unsuitability of drinking water content and high salinity of soils are also likely to cause various diseases. Representatives of flora and fauna, which are widespread in the region, have also adapted to these natural conditions. They can be conditionally divided into desert and oasis types. Some of the most common medicinal plants in the region can be used in medicine to make a variety of medicines. Due to the natural conditions of the region, there is an opportunity to build health facilities in the region for the treatment of certain diseases, including kidney, musculoskeletal and other diseases.*

**Keywords:** *Medical geography, nosogeographic conditions, public health, epidemic processes, medical sanitary culture*

## 1. INTRODUCTION

Improving the living standards and health of the population in the region, first of all, the implementation of radical socio-economic changes set by the leadership of the country, development and regional organization of the national economy in line with modern requirements and needs, ensuring environmental transparency. Solving these problems on a scientific basis will allow raising a healthy generation, increasing the material and spiritual well-being of the population not only in Bukhara region, but also in all regions of the country.

*The main part*

The United Nations 2030 Agenda for Sustainable Development emphasizes "measures to end epidemics of diseases such as AIDS, tuberculosis, and malaria by 2030, as well as measures to combat hepatitis and other water-borne infectious diseases." Successful implementation of these tasks requires the stabilization of nosoecological and nosogeographical conditions in arid climates.

For Uzbekistan, which has unique natural conditions, nosogeographic and medical-landscape features, it is important to study the geographical aspects of nosogeographic research. Because in the territory of our country there are specific diseases among the population in the mountain and plains, desert and oasis nature complexes, large urbanized cities, sparsely populated villages and auls, industrial centers with large industrial enterprises. In this regard, Bukhara region also stands out in the country with its unique nosogeographic situation.

The territory of Bukhara region is located in the south of the Turan lowland, in the lower reaches of the Zarafshan river, surrounded on all sides by deserts. Its natural geographical structure consists of two large natural regions that differ sharply from each other: the southwestern Kyzylkum deserts and the Bukhara-Karakul oasis, which formed the ancient Zarafshan River.

It is known that the relief features of places are one of the important factors influencing the health of the population. Depending on the location of certain areas at high or low, the health of the people living there and the types of diseases also differ in their specific aspects. The territory of Bukhara region consists mainly of lowlands, with an average absolute height of 222.5 m the surface of the earth decreases from northeast to southwest. This creates a unique nosogeographic situation in the region, ie the upper (north-eastern) part of the region differs significantly from the lower (south-western) part in its climate, soil, water composition and other aspects. This is because as the altitude of the area decreases relative to sea level, the circulation of air in them, the properties of groundwater and surface water also change in a peculiar way. It is natural that these cases affect the health of the population of this country.

In the south-eastern part of the region there are 102 km long, 52-55 km wide Bukhara and 48 km long, 25 km long Karakul deltas formed by the Zarafshan river. Today, these areas are the main residential areas and cultural landscapes of the region. The oases consist of flat-surfaced terraced irrigated areas and are the product of centuries of human activity. The total slope of the oasis relief decreases towards the river flow, ie the absolute height is 466 m in the Bukhara oasis, and 288 m in the Karakul oasis. Its nature is inextricably linked with the Zarafshan River. Although the oasis is very similar to the surrounding deserts in its natural conditions, it is radically different from them in its climate, hydrological properties, soil, flora and fauna.

The desert oases of Uzbekistan are characterized by a sharp continental climate, short but cold winters, long and hot summers, extreme dryness, and large temperature differences. The climate of the region is characterized by its low cloud cover, lack of precipitation, the presence of a thin layer of snow.

The oases stand out from the surrounding deserts with their unique features. They are considered to be part of the inland basin and are located on the border of transition from temperate climate zone to subtropical climate zone. This has an impact on the formation of the climate geographically the climate of the province is tropical in summer and cold in winter under the influence of cold air currents from the northern, temperate latitudes.

As the region is located in lower latitudes, the period of solar illumination also lasts much longer. The average sunshine period in Bukhara is around 2960-3030 hours a year, which is 50-100 hours more than in Samarkand. On a monthly basis, it gets 90-92% energy in July. Because there will be almost no clouds this month.

The total amount of radiation from the sun is 150-160 kcal. The highest radiation is observed in the summer months (June-19.7, July-20.4, August-18.7 kcal / cm<sup>2</sup>). In the desert part of the region, the amount of radiation per day in June-July is 0.65-0.75 kcal / cm<sup>2</sup>. In the oases, the radiation reaches 1 kcal / cm<sup>2</sup>. A certain part of the total radiation reaching the earth's surface is absorbed and converted into heat. In addition to the energy it receives from the sun, oases also receive some heat from the surrounding deserts. The radiation obtained is used to heat and evaporate soil, water and air. If almost all of the radiation falling into the lakes is used to heat the air, the bulk of it goes to the heating and evaporation of the air due to the abundance of vegetation and water bodies in the oases. Compared to the desert, oases use 2-2.5 times more heat to evaporate.

Polar, temperate and tropical air currents have an impact on the regional climate. It is in the activity of these air currents that the regional climate occurs.

The average annual temperature in Lower Zarafshan is 14.2-15.10C. The average monthly air temperature in the coldest month-January varies from an average of 0.00S (in Bukhara) to 2.10S (Foot-Fertilizer). Bukhara region is one of the regions with a mild climate according to the sum of cold months (150-2500C). However, it should be noted that the lowest air temperature in the region reaches -280C in December, -290C in January and -240C in February. Even in such severe cold periods, it is difficult to do some winter work in agriculture and seriously impairs the health of the population. Factors contributing to severe frosts: Polar and Siberian anticyclones are the influx of cold air currents into the region during the winter.

The maximum air temperature in the oases in summer rises to 45-460C. Due to the high evaporation of water on such hot days, the plants shed their crops unbearably, making the life processes in living organisms, including the human body, much more difficult. Days with air temperatures up to 400S last from May to September. Such high temperatures also cause a number of inconveniences for those working in agriculture.

Due to the low air temperature, the absolute humidity will be low in all parts of the region in winter. In January, the absolute humidity was 9 mm in Bukhara and 8.7 mm in Orakol. In summer, when the temperature is high, the absolute humidity is around 13-15 mm in the oases and 10-12 mm in the deserts. This situation is reminiscent of China's turf, Africa's Libya, Kalahari, Namib, South America's Atacama Desert. Relative humidity increases during the cool periods of the year. Especially in December and January, it is 74-76 percent. The period with the lowest relative humidity is June-July, which accounts for 30-35% of the total precipitation.

It is known that air with a relative humidity below 30 percent is dry air. In deserts and oases, such days have been found to average 200-205 days a year. In summer it decreases to 23-28% in the oasis, to 28-32% in the deserts, and even to 10% on some days. On such days, the air becomes very dry, which causes sand migration in the desert zone and leads to the formation of dusty winds. Sometimes such winds also enter the oases. They adversely affect plant development, increase soil and water salinity, and cause great harm to plant, animal, and human health.

In general, the average annual relative humidity is around 52-56 percent. In summer, high air temperatures lead to a decrease in relative humidity during the day. This situation creates hot winds. In July, when the moisture deficit is the highest, the pressure is 75 mb in Orakol and 69 mb in Bukhara, during which the temperature exceeds 400C. Such natural disasters are repeated 25-30 times a year in Orakul and 10-12 times in Bukhara. The speed of Garmsel wind is 15-20 m / sec and dust rises into the air. During the long years of Garmsel, saline and sandy soils expand, and even in some periods many people and livestock perished due to such disasters on the planet.

These areas are low-rainfall, arid countries. The average annual rainfall is around 104-105 mm. From the north-west to the south-east of the region, the rainfall gradually increases. The main reason for this is the increase in the height of the territory of the region. About 80-90 percent of the precipitation in the region falls in spring and winter. The month with the most rainfall during the year is March. The average amount of precipitation in this month is 20-35 mm, and in the years of maximum precipitation it reaches 80-120 mm. Rainfall is very low from June to September, and only 2-4 percent of annual rainfall falls during this period.

The average amount of precipitation in the region for years and months is around 128 mm, and the years with the lowest rainfall are 2-3 times less than this figure. In particular, 43 mm (1947) and 58 mm (1937) were observed in Karakol and Kogan. In some years the amount of annual precipitation is two or more contributions. For example, its size reached 198 mm in Karakul (1958) and 226 mm in Kogan (1931). Snow cover averages 10-15 mm of annual precipitation. Although snow forms in the area, but it does not last long, its average thickness is 6-10 mm per year.

In general, the average rainfall in the region is 130 mm, which meets 30% of the annual moisture demand, and therefore such areas are included in the list of countries with extraarid (extremely dry) climate. Under such arid conditions, biological processes in living things become somewhat more difficult. It also has a direct impact on the health of people living in the area. In Bukhara region, the winds blow mainly in the northern and western directions. The average annual wind speed is 3.0 m / sec Winds with a speed of 15 m / s and stronger blow 5-6 times a year. During the day, winds blow from the oases to the deserts, and in the evening from the surface of the deserts to the oases. There are also windless days in the country throughout the year. They last 10-16 days in the region. On such days, industrial facilities and road traffic are heavy and the air in areas where railway junctions are located is highly polluted. As a result, the health of the population of these areas will be significantly damaged.

Due to the climatic conditions of the oasis, it should be noted that the climate of the region is very dry. This has a significant impact on human health. Dryness of the air causes inconsistencies in the digestive and respiratory processes in the human body. Observations of windless, humid weather throughout the year lead to the accumulation of gas and dust particles in the atmosphere and air pollution in residential areas. This is particularly the case in cities, as well as in densely populated areas of industry and transport.

Atmospheric air is polluted under the influence of human activities, and changes in its gas composition are increasing. Each cubic meter of regional air contains 2.8-3.6 mg of dust, both naturally and artificially generated. The amount of fine, solid particles in the air has been found to increase by 3-5 percent over the next 15-20 years.

According to the regional nature protection organization, the emissions of dust, soot and various toxic gases from existing industrial enterprises, automobiles and other vehicles amount to an average of 240-260 kg per capita, or about 400 thousand tons per year in the region.

The windless period is repeated in the region for 5-37 days, resulting in a foggy situation with harmful dust and gases as a result of prolonged persistence of polluted air. Due to the greater number of cloudy, foggy days in the cities of the region, they receive much less solar radiation than the surrounding areas. Carbon dioxide in the air prevents ultraviolet rays from passing to the surface. However, such rays are very important for human health. In industrial centers such as Bukhara, Kagan, Karavulbozor and Gijduvan, one-third of the ultraviolet pomegranates needed for human life and one-fifth in rural areas are blocked by dust and smoke in the air.

If we compare Bukhara and relatively small cities of Karakol, which are densely populated with industrial enterprises and cars, foggy days are observed for an average of 16 days in the

first, a maximum of 32 days, and 11 to 24 days in the second. The same difference in other components of the climate is noticeable in Bukhara and adjacent areas.

Depending on the climatic characteristics of the region, it is possible to build treatment facilities with a drier climate, which means that the necessary conditions for rehabilitation facilities in the area are limited. Due to the natural conditions of the region, more kidneys, musculoskeletal organs, rheumatic diseases can be treated in the country. Therefore, treatment facilities for this type of disease have been established in the region. In particular, such medical institutions as Sitorai-Mohi-Xosa, F.Allaev are among them.

The territory of the Bukhara oasis does not have a constant flow of water sources due to its integral connection with the desert nature. Its demand for water has long been met by the Zarafshan River. In recent years, the development of new lands has led to a shortage of river water. The construction of irrigation canals such as Shohrud, Shafirkan, Zandana and Jilvon has led to a sharp decline in the water level of the Zarafshan River. Currently, the river is completely depleted in Navoi region. The part of the river that passes through the Bukhara oasis is called the Central Bukhara ditch, and it is used only for drainage and drainage. In 1993, the Damkhoja water pipeline from Samarkand region through the territory of Navoi region significantly alleviated the problem of providing the population with clean drinking water.

The water needs of the population and farms of the region are now mostly supplied by the Amudarya. For this purpose, in 1962, the 53 km long Amu-Karakul canal was put into operation. Later, the Amu-Bukhara canal was used to meet the needs of the people.

We know that Bukhara region has three major irrigated lands, ie oases: Bukhara, Karakul and Karavulbozor oases. A system of ditches has been established to improve the reclamation of irrigated lands in these areas. Every year, 1.5 m<sup>3</sup> of runoff is discharged from the oasis through these ditches and discharged into the Amudarya River. Another part is concentrated in lakes such as Karakir, Oyak-Ogitma, Dengizkul. According to some estimates, these reservoirs carry about 5 million tons of water a year, tons of salt and various toxic chemicals. This has a significant impact on the environmental situation in the region. Therefore, the removal of the above discharges from the oasis remains one of the main problems in the region.

The territory of Bukhara region is also rich in various mineral waters in the subsoil, their composition and temperature vary. There are species in the region, ranging from weakly mineralized waters, which contain active biological substances (iodine, bromine, boron, fluorine, iron, etc.). The region's groundwater is divided into seven balneological categories:

- 1) Mineral waters without specific components and compounds;
- 2) Sulfite mineral waters;
- 3) Iron mineral waters;
- 4) Silicon mineral waters;
- 5) Iodine-bromine mineral waters;
- 6) Iodized mineral waters;
- 7) Brominated mineral waters.

Among them, especially the waters of the first and fourth groups are used for healing purposes. They are mainly widespread in areas such as Momojurgoti, Uchkir, Kagan, Romitan, Ortabulak, Chukurkul. Among the waters of this group, in particular, ferrous mineral waters (group 3) are used in the treatment of cardiovascular and gynecological diseases.

At present, hospitals with mineral water have been established in Bukhara region, which are used in the treatment of various diseases. In particular, Sitorai-Mohi-Xosa sanatorium is located 4 km south of Bukhara. Since 1961, he has been treated mainly for musculoskeletal disorders, as well as neurological diseases. In summer, this healing facility is used to treat

more heart diseases, as hot and dry climates play an important role in the prevention of this disease.

Examples of medical facilities in the region include Khoja Ubbon, Khoja Zafaron and Zamonbobo. Although the use of these facilities for medical purposes has not been regulated by the state, they have been used by the local population for centuries to restore their health. First of all, they are used in the treatment of skin diseases, including eczema, vitiligo. In order to study such sources from a medical point of view, a number of studies were conducted by the staff of the Research Institute of Rehabilitation and Physiotherapy under the Ministry of Health of Uzbekistan.

It is known that the problem of clean drinking water is an age-old dream of the people of the region. According to historical sources, thousands of people perished, especially during the khanate period and even earlier, as a result of the consumption of water stored in many pools and cisterns in the country. Because the waters of the existing water basins in the region would not be renewed for a long time, as a result they would become sources of various infectious diseases. According to Zahiriddin Muhammad Babur, due to the fact that the Zarafshan River did not reach Bukhara during the summer months, the population was provided with pool water, which was replenished only once every two weeks in the summer. In some years, without changing the waters, various diseases among the population, first and foremost, led to the spread of the terrible ringworm disease. As a result, more than 20% of the population of Bukhara was infected.

It should be noted that over time, such diseases have been completely eradicated in the country. However, the water content used for the consumption of the population of the region cannot be assessed positively even today. Even the Damkhoja-Bukhara water pipeline, built for this purpose, does not solve this problem.

We know that the main sources of human health are the environment, water, soil and air. Their current situation in Bukhara region is not satisfactory. This is especially the case in Karakul, Alat and Romitan districts. The level of soil contamination with pesticides in the oases is 5.0-10.0 kg per 1 hectare.

According to available data, every year in our country 120-140 thousand people are diagnosed with acute infectious diseases. This figure is even higher in Bukhara region. For example, such diseases are common among the residents of the western part of the oasis, near the sewers in the region.

1<sup>st</sup> table

General medical geographical description of the nature of Bukhara region

<b>Natural Factors</b>	<b>Characteristics</b>	<b>Nosogeographic analysis of natural conditions</b>
Relief	PLAIN	Relief Plain In such conditions, the free state of the air is observed. This area is suitable for the movement of groundwater and surface water. This allows the spread of some infectious diseases.
Иқлими	Sharply continental	The main part of the territory of the region consists of deserts, where the air temperature is very hot and dry. Even in the summer months, the temperature in the deserts rises above 50°C. The climate of the oases also has sharp continental features, as in the deserts. Due to the significant annual variation in temperature seasons, the extraaridity of the climate, especially in the summer months, there are many cases of dilation of blood vessels, heart failure, sunstroke. During the working season, the air is very dry and cold, and the lack of

		precipitation has a negative effect on the metabolic process in the human body.
Water	Sodium chloride-calcium	Water pollution is high. Unfit for consumption. Water is an important factor in the spread of various intestinal and other types of infectious diseases.
Тупрок-лари	Чўл ва воҳа	Soils Desert and oasis The region is rich in brown sur, sandy bald, bald soils and salt marshes. The salinity of the soils is high, which has led to an increase in diseases of the musculoskeletal and degenerative organs among the population of the region.
Flora and fauna	Desert and oasis	The flora and fauna Desert and oasis In the territory of the region, in accordance with the conditions of the desert and oasis, in particular, many species of xerophytes: saxaul, yantak, singren, cherkez and other species of plants are widespread. Many of them are used in medicine to obtain various drugs. In particular, the plant, which is common in the region, is used as a means of dilating blood vessels, calming the central nervous system. The influence of desert nature is also significant in the animal kingdom. For example, the region has a large number of rodents, reptiles and mammals. Especially among them, some representatives of rodents play an important role in the spread of some infectious diseases.

The table was developed by the authors.

The territory of Bukhara region has long been one of the oldest settlements in Central Asia. According to archeological sources, in the primitive period, the population of the region lived mainly in the lower reaches of the Zarafshan River, ie in the settlements such as Mohandarya, Gujayli, Daryosay, located on the border of the present-day Shafirkan and Romitan districts. Later, with climate change and declining river water, these areas became uninhabitable. As a result, the residential area is slightly retreated to the riverbed. They moved around the lakes Zamonbobo, Mohonkol, Poykent and settled and engaged in agriculture.

The recent history of the region is also unique, it is mainly connected with the Karakul oasis of Bukhara and the Karavulbozor oasis, which was built in recent years. Today, these oases are the main inhabited areas of the region. In the remote areas outside the oases, however, the population is much sparse and includes more agricultural land.

Although the overall morbidity rate of the population has been declining slightly in recent years, this figure is particularly high in Romitan, Vobkent districts, as well as in Kagan. The mortality rate is also not the same in different parts of the province. While this process is slightly higher in Kagan), the overall mortality rate of the province's population is much lower than in the republic.

If we analyze the infant mortality at the district and city levels, it is clear that these figures are higher in Jondor districts and Bukhara. However, compared to the country, we are witnessing a much lower infant mortality rate in the province.

To some extent, the existing internal migration in the region also affects the health status of the population. In particular, the migration of people from neighboring districts and regions

for the construction of settlements, the development of new lands can lead to the spread of various diseases among the population.<sup>1</sup>

Cases of migration of the population from one area to another within the regional boundary also lead to the spread of some infectious and non-communicable diseases among them. In particular, since ancient times, the Orovulbozor district and surrounding areas have been considered an endemic outbreak of some diseases known as "pendinka", ie "Afghan ulcer" among the population. Even today, the population of this district has a large number of patients with this disease.

In recent years, the development of industrial sectors in Bukhara region, the opening of protected areas further increases the demand for labor resources. All this requires the placement of the population within the territorial complexes. The cities of Bukhara, Kagan, Gijduvan, Gazli and Karavulbozor can be included in the list of industrial centers in the region. Almost all of these industrial facilities are located in the above industrial centers. Most of them (textile, cotton ginning, cannery, etc.) are concentrated primarily in and around Bukhara (in the agglomeration). The fact that these networks are mainly concentrated in several regions of the region has a significant impact on the health of people living in these areas. Noise, environmental pollution, various unpleasant situations, as well as the fact that the regional intelligentsia also work in these centers cause occupational and other diseases.

The region's industry specializes primarily in the processing of agricultural products, including raw cotton, oil, natural gas, various metals and construction materials. The industry is dominated by oil refineries and textile enterprises.

The mining industry has a certain negative impact on the health of the population. This is especially noticeable in Karavulbozor district and adjacent areas of the region. It should be noted that the company has made a significant contribution to achieving fuel and energy independence of the country. But it is also possible that over time, the ecological situation around it will become more complicated.<sup>2</sup>

Another key sector of the region's economy is light industry, which has more than 30 enterprises. The development of light industry was associated with the launch of the Bukhara cotton mill, and today the plant is expanding.

There are also textile joint ventures established in Alat and Karakul in cooperation with foreign countries.

Cotton mills in Kagan, Karakul, Gijduvan and other cities in the region produce more than 4/5 of the region's gross domestic product. In Bukhara region there are factories for silkworm breeding, embroidery, sewing. A karakul factory has been operating in Bukhara for many years. At the same time, handicrafts and handicrafts, various national traditions are being revived in the cities and villages of the region.

There are food industry enterprises in the region: oil extraction, canning, confectionery, beer, pasta factories, meat, dairy and bread factories. Most of the above industrial facilities are located in Bukhara, Gijduvan and Orakul. If we evaluate the medical geography of these industrial centers, it should be noted that in these areas there are a large number of diseases associated with blood and blood-forming, respiratory and digestive organs. The high density of population and industrial hubs and the dense location of the transport network in these areas contribute to the further development of these diseases.

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The main sources of human health are the environment, air, water and soil. But their current situation in the region cannot be considered satisfactory. According to the regional nature protection organization, the amount of toxic substances released into the atmosphere is more than 200 thousand tons per year, which means about 160-165 kg per capita in the region. This figure is even higher around industrial centers. Naturally, such an ecological environment has a negative impact on the health of the population.

The number of some diseases has increased in the region due to the strong winds and their direction. Here the winds blow mostly in the north and northeast direction. This in turn plays an important role in the health of the population. This is due to the fact that such winds often blow in the winter months, which further increases the impact of existing industrial facilities in the neighboring Navoi region (IRES, cement plant, Navoi Nitrogen, Mining and Metallurgical Combine, etc.). Especially the amount of dust and dirty gases that are blown into it by the wind in the neighboring / ijduvan district is high. Probably due to this, due to the existing industries in the district and in the region as a whole, respiratory diseases in this region occupy one of the leading positions in terms of their weight.

There is also a high incidence of disease in the main transport hubs of the region. In particular, in Bukhara and Kagan this situation is even more noticeable. Respiratory and nervous system diseases are particularly prevalent among the population of these areas.<sup>3</sup>

Diseases related to water resources are also on the rise in the region. In particular, the accumulation of sewage and ditch water flowing through the Zarafshan River, dissolved salt and other chemicals in the region further aggravates the ecological situation in the region. As a result, diseases of the digestive system are becoming more common among the population. This is especially common near sewers, ie in the western part of the oasis.

Bukhara agriculture is dominated by two industries - cotton and karakul. The bulk of cotton and other agricultural crops are grown in irrigated oases. The bottomless desert areas of the region are mostly used as pastures for livestock. Bukhara is a leader in the production of astrakhan skins not only in the country, but also among neighboring Central Asian countries.

The main part of the population engaged in agriculture is engaged in cotton growing. This leads to diseases among them that are inextricably linked to the same field. The reason is that until recent years, the widespread use of various chemicals in cotton fields has caused great damage to the health of the population, especially children.

In recent years, in Bukhara region, as in other regions of Uzbekistan, there are cases of occupational diseases among the population engaged in agriculture. This situation is further due to the deterioration of the ecological environment, as well as the improper use of technical means in agriculture.

The results of a study conducted among the population engaged in agriculture show that such occupations are particularly common among people with chronic diseases, including diseases of the gastrointestinal tract, eyes, respiratory organs and nervous system. In particular, certain diseases have been found to occur in mechanics and similar professions who have worked with machinery for many years due to constant constant stress. There are also many patients with radiculitis among those working in this field. Bukhara region has long been a hotbed of some infectious diseases. This was due to the fact that, along with its natural conditions, the social sphere was not sufficiently regulated. Unfortunately, even today, the industries in this area are not satisfactory.

It is known that social factors have a greater impact on the course of epidemic processes than natural factors. This includes the living conditions of the population: housing conditions,

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population density, lack of sewerage, clean drinking water and other facilities, material well-being of the population, food composition, medical culture, migration processes and the state of health (in general). In other words, the social infrastructure system) is important. Each of these factors has a specific impact on the health of the population. In particular, the level of clean drinking water and natural gas supply to the population of the region is insufficient. This, in turn, has a negative impact on the health of the population.

## 2. CONCLUSION

Based on the above, we can conclude the following:

- Bukhara region is located in the south-west of Uzbekistan, in the lower reaches of the Zarafshan River, the main part of which consists of deserts;
- The influence of the desert plays a leading role in the nature of the region. Although there are differences in the nature of the oases in relation to the desert areas, they also have all the features for the desert conditions;
- Extreme aridity and heat, lack of precipitation have a direct impact on the health of the population;
- Inadequate drinking water content and high salinity of soils are also likely to cause various diseases;
- Representatives of flora and fauna, which are widespread in the region, are also adapted to these natural conditions. They can be conditionally divided into desert and oasis types. Some of the most common medicinal plants in the region (cherke, syngre, wormwood, etc.) can be used in medicine to obtain various medicines;
- Due to the natural conditions of the region, there is an opportunity to build health facilities in the region for the treatment of certain diseases, including kidney, musculoskeletal and other diseases.

Thus, in the geography of population health, changes in the state of the main factors of the natural environment: relief, climate, water and soil composition, etc., lead to an increase in various infectious and non-communicable diseases among people. It should be noted that in addition to the above factors, socio-economic factors are also important in determining the health of the population.

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