

## THE EFFECT OF ATMOSPHERIC AIR POLLUTION ON POPULATION HEALTH (in the example of Kashkadarya region)

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**Abstract:** The article compares the level of atmospheric air pollution in the Mubarak and Yakkabog districts of Kashkadarya region and examines the incidence of disease among the population.

**Keywords:** atmospheric air pollution, sources of atmospheric air pollution, disease.

**The urgency of the problem.** Air pollution is one of the main environmental problems in the Republic of Uzbekistan. The climate of the republic is located in a dry zone, in its territory there are large natural aerosol emission sources into the atmosphere, such as karakum and kizilkum, where there are frequent dust storms, and the Arolboyi zone (Arolkum), which is considered a dry part of the Aral Sea. The fact that the cities are mainly located in the highlands and valleys, the hot and dry climate has led to a relatively high level of atmospheric air pollution in Uzbekistan. The atmospheric air in Uzbekistan is heavily polluted, especially in the economic regions of Tashkent and Fergana, where the population, industry and transport are highly concentrated. The level of air pollution is very high in the cities of Almalyk, Tashkent, Fergana, Bekobod, Andijan, Chirchik, and Navoi, which are centers of metallurgy, chemistry, and mechanical engineering. Some of these cities are at risk of photochemical smog, with scores higher than REM for a number of harmful compounds .

Nowadays, in the era of advanced science and technology, atmospheric air pollution is becoming more and more intense. Stationary polluters of atmospheric air include industrial enterprises, utilities, and power generating facilities, while mobile polluters include automobiles, railroads, and air vehicles.

The main solid suspended particles (aerosols) of these sources are soil and mineral particles.

The main anthropogenic air pollutants of Uzbekistan are sulfur oxides, nitrogen, carbon, solid suspended particles of different composition and origin.

If the amount of soot in atmospheric air reaches  $2 \text{ mg/m}^3$ , daylight will decrease to 90%. The sun's rays are reduced by 2/5 before they pass through the upper boundary of the atmosphere to the earth's surface. Based on the data, it was determined that the solar radiation in large and developed European cities decreases in air-polluted areas. For example: 26-30% reduction was observed in Paris, and up to 60% in Berlin. Dust particles in the air absorb most of the ultraviolet rays, preventing them from reaching the earth's surface. Suspended substances contained in waste in atmospheric air create an aerodisperse system. Aerodisperse system is the spread of dust particles in the air, they take different forms in the air. These particles absorb ions, molecules, water vapor from the surrounding environment and form different charged particles. As can be seen from the above, atmospheric air pollution has a negative impact on public health and sanitary lifestyle.

**The purpose of the study.** SEO and JS service of Kashkadarya region on the level of atmospheric air pollution in Mubarak and Yakkabog districts of Kashkadarya region according to the information It consists of mutual comparison and hygienic assessment of the environmental and hygienic characteristics of the atmospheric air and the analysis of the disease state among the population according to the data of the district polyclinics and the Ministry of Health.

**Research object and materials.** In the research, the atmospheric air of Mubarak and Yakkabog districts of Kashkadarya region was used and statistical analysis was carried out.

**Research results.** In order to assess the impact of atmospheric air pollution on public health in Kashkadarya region, the disease status of the population was studied in the dynamics of 2016-2018. For this purpose, the total population of Mubarak and Yakkabog Districts was determined during these years.

Table 1. Population of Mubarak and Yakkabog districts in 2016-2018 (thousands)

Years	2016 year	2017 year	2018 year
Blessed district	85,895	85,947	86.004
necklace district	259,889	259,953	260.005

Table 1 shows that the population of Mubarak has increased by 109 people and the population of Yakkabog district by 116 people.

In addition, the death rate for Uzbekistan was statistically analyzed by comparing its value per 1,000 inhabitants. In this regard, when the number of death rates of Kashkadarya region by region was studied from 2010 to 2017, the number of deaths in 2010 was 3.9 per 1000 inhabitants, and by 2017 this rate was 4.3. It can be seen that along with the increase in the population, the development in the urban and rural areas will increase and become more global. This, in turn, affects the health of the population. We can see the increase in the number of deaths over the years in table 2.

Table 2

Provinces	2010	2011	2012	2013	2014	2015	2016	2017
1 Tashkent city	7.1	7.2	7.0	6.9	6.9	6.9	6.8	6.7
2 Andijan	5	5.2	5.2	5.1	5.1	5.2	5.1	5.4
3 Bukhara	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.5
4 Jizzakh	3.9	3.9	4.0	4.0	4.1	4.2	4.2	4.4
5 Kashkadarya	3.9	4.0	3.9	3.9	4.1	4.0	4.1	4.3
6 Navoi	4.6	4.7	4.7	4.6	4.7	4.7	4.7	4.7
7 Namangan	4.6	4.7	4.7	4.6	4.7	4.7	4.6	4.9
8 Samarkand	4.5	4.4	4.5	4.6	4.4	4.5	4.5	4.5
9 Surkhandarya	4.0	4.1	4.2	4.2	4.2	4.1	4.3	4.5
10 Syr Darya	4.8	4.7	4.9	4.8	4.8	4.8	5.0	5.0
11 Tashkent city.	5.9	5.8	6	5.8	5.9	5.9	5.8	5.8
12 Ferghana	5.1	5.1	5.1	5.0	5.1	5.0	4.9	5.0
13 Khorezm	4.4	4.4	4.7	4.4	4.6	4.5	4.6	4.7
14 Karakalpakstan	5.1	4.9	4.8	4.7	4.7	4.6	4.7	4.7
15 Uzbekistan Republic	4.9	4.9	4.9	4.8	4.9	4.9	4.8	5.0

In order to study the influence of atmospheric air on the health status of residents of Yakkabog and Mubarak districts, the state of atmospheric air pollution was studied in the dynamics of 2016-2018. SanRandN 0293-11 - "List of permissible concentrations of atmospheric air pollutants of settlements in the territory of the Republic of Uzbekistan" contains mainly 3 indicators (dust-0.15mg/m<sup>3</sup>, NO<sub>2</sub>-0.04mg/m<sup>3</sup>, SO<sub>2</sub>-0, 1mg/m

<sup>3</sup>), the level of dust in Yakkabog district in 2016 We can see that it is  $0.1 \text{ mg/m}^3$  ·  $0.13 \text{ mg/m}^3$  in 2017 is within the norm, and in 2018 it is  $0.16 \text{ mg/m}^3$ , which is 1.0 times higher than the norm. we can see.

$\text{NO}_2$  was  $0.024 \text{ mg/m}^3$  in 2016,  $0.029 \text{ mg/m}^3$  in 2017, and  $0.032 \text{ mg/m}^3$  in 2018.

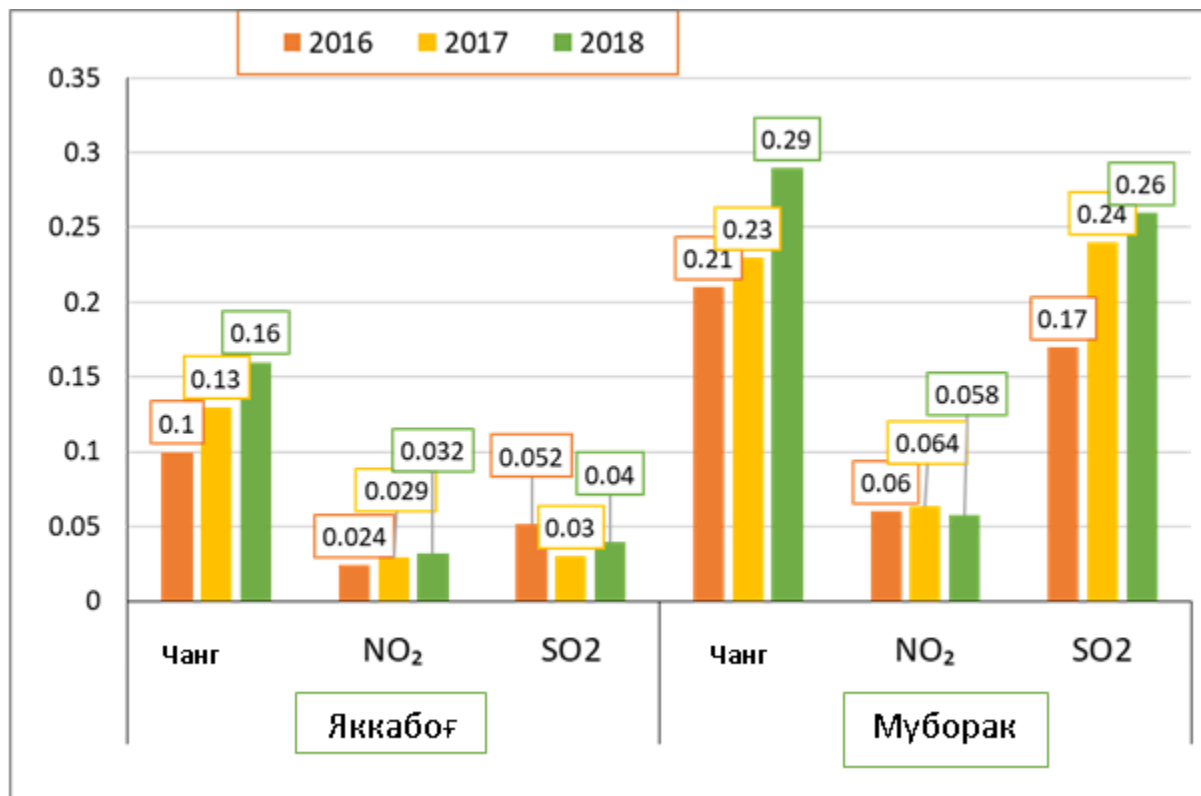
$\text{SO}_2$ , it was  $0.052 \text{ mg/m}^3$  in 2016,  $0.03 \text{ mg/m}^3$  in 2017, and  $0.04 \text{ mg/m}^3$  in 2018, so we can see that it did not exceed the standard level.

In 2016, the level of dust in Mubarak district was  $0.21 \text{ mg/m}^3$  · 1.4 times the standard level, in 2017 it was  $0.23 \text{ mg/m}^3$  · 1.5 times the standard level, in 2018 and we can see that it is  $0.29 \text{ mg/m}^3$ , which is 1.9 times higher than the standard level. One of the main reasons for this is the fact that the main part of the district is a desert zone, and it is the result of the influence of the wind entering the Mubarak district and various dusts from the industrial sector.

$\text{NO}_2$ , it was  $0.06 \text{ mg/m}^3$  in 2016, 1.5 times the standard level, in 2017 it was  $0.064 \text{ mg/m}^3$ , 1.7 times the standard level, and in 2018, it was  $0.058 \text{ mg/m}^3$  We can see that it is 1.45 times higher than the standard level of  $\text{m}^3$ . The main reason for this is considered to be the effect of industrial production and gases from the Muborakneftgaz refinery.

$\text{SO}_2$ , it was  $0.17 \text{ mg/m}^3$  in 2016, 1.7 times the standard level, in 2017 it was  $0.24 \text{ mg/m}^3$  · 2.4 times the standard level, and in 2018 We can see that  $0.26 \text{ mg/m}^3$  is 2.6 times higher than the standard level. The main reason for this is considered to be the effect of industrial production and gases from the Muborakneftgaz refinery (diagram 1).

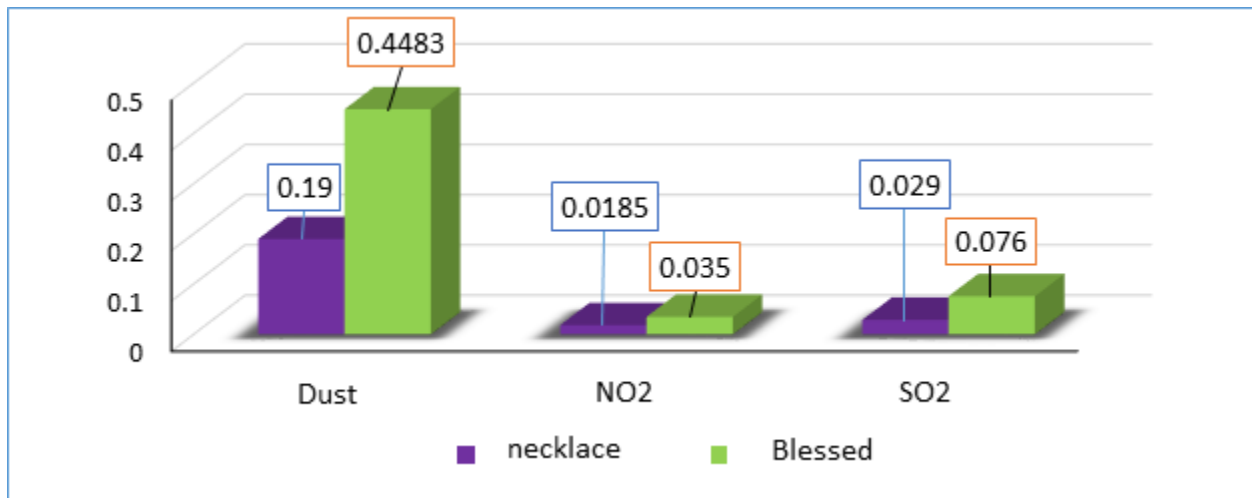
Diagram 1



In addition, the SSECC of Kashkadarya region obtained the average annual results as a result of testing the atmospheric air pollution of residential areas of Yakkabog and Mubarak districts with the help of laboratory instruments, and it is sanitary and hygienic according to SanRandN 0293-11 - "List of permissible concentrations of atmospheric air pollutants of settlements in the territory of the Republic of Uzbekistan".

Atmospheric air pollution level of atmospheric air of Yakkabog District it was noted that the level of dustiness increased by 1.26 times, it did not exceed the standard level for NO<sub>2</sub>, and it was also normal for SO<sub>2</sub>. It was noted that the level of atmospheric air dust in the district increased by 2.98 times, it did not exceed the standard level for NO<sub>2</sub>, and it was also within the standard for SO<sub>2</sub> (2018y)

Diagram 2



In accordance with the 6th order of the Ministry of Health, data on respiratory system diseases were analyzed according to the results of medical examinations conducted in Yakkabog and Mubarak districts in 2016-2018, divided into age groups under 18 and over 18. Of course, based on the population, Yakkabog district had 1860 (0.71%) among 1-18 year olds in 2016, 1087 (0.41%) in 2017, 613 (0.23%) in 2018. 1,356 (0.52%) in people over 18 years old in 2017 1204 (0.46%), 514 (0.19%) disease cases were recorded in 2018. In Mubarak District, 527 (0.61%) among 1-18 age groups in 2016, 483 (0.56%) in 2017, 420 (0.48%) in 2018, 431 in 2016 among 18-year-olds. (0.50%), 452 in 2017 (0.52%), there were 324 (0.37%) cases in 2018 (Table 3)

Table 3

Diseases of the respiratory system						
	necklace			Blessed		
	1-18	18+	Total	1-18	18+	Total
2016	1860	1356	3216	527	431	958
2017	1087	1204	2291	483	452	935
2018	613	514	1127	420	324	744

**Summary.** Atmospheric air pollution in residential areas is of great hygienic importance, and this situation is directly related to the location, power and amount of emissions of polluting sources. This, in turn, affects public health.

It can be concluded that in 2015-2017, the morbidity of the residents of Mubarak and Yakkabog Districts is directly related to atmospheric air pollution, and it was found that among children, teenagers and adults, mainly respiratory diseases and other causal diseases increased.

#### Used literature

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