

The concentration of harmful particles in Nur Sultan exceeds the annual norm by 2.5 times. Air quality in Almaty did not exceed the norm for only one day in five months. Bishkek often falls into the top of the most polluted cities in the world. The most dangerous days in 2019 for Dushanbe were summer and autumn, when dusty storms covered the city. In Ashgabat, the level of air pollution rarely exceeds the acceptable norm. Air in Tashkent was harmful 80% of the days in 2019.



*Smog over Almaty. Photo: Igor Efimov*

With the onset of winter, the Central Asian cities are enveloped in smog. Air becomes so harmful that people have to use respiratory masks and air purifiers.

Coal burning, cars and dust storms increase the concentration of harmful PM2.5 particles in the air. Not only they harm the respiratory system, but they also increase the risk of cardiovascular disease.

PM2.5 particles are air pollutants that comprise solid microparticles and tiny droplets of liquids. They easily penetrate biological barriers and therefore pose the greatest threat to the body.

According to the standards of the World Health Organization (WHO), the average daily level of PM2.5 should not exceed 25  $\mu\text{g} / \text{m}^3$ , and the average annual level of 10  $\mu\text{g} / \text{m}^3$ .

According to the [AirVisual](#) air monitoring project, Bishkek has frequently fallen into the top of the world's most polluted cities over this winter. It even bypasses Beijing, a record holder in the preceding years.

## Air quality and pollution city ranking

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Major city	US AQI	Followers
1  Delhi, India	187	1.68M <a href="#">Follow</a> 
2  Bishkek, Kyrgyzstan	185	12.2K <a href="#">Follow</a> 
3  Karachi, Pakistan	180	30.2K <a href="#">Follow</a> 
4  Lahore, Pakistan	178	75.8K <a href="#">Follow</a> 
5  Dhaka, Bangladesh	177	60.1K <a href="#">Follow</a> 
6  Ulaanbaatar, Mongolia	176	46.6K <a href="#">Follow</a> 
7  Mumbai, India	164	1.52M <a href="#">Follow</a> 
8  Chongqing, China	160	54.9K <a href="#">Follow</a> 
9  Beijing, China	159	3.35M <a href="#">Follow</a> 
10  Chengdu, China	155	1.34M <a href="#">Follow</a> 

According to the AirVisual, Bishkek has frequently fallen into the top of the most polluted cities in the world over this winter.

The concentration of PM2.5 particles, in almost all cities, increases during the heating season from November to March. Air quality in Almaty did not exceed the norm for only one day in five months, while similar figure has been 6 days for Bishkek.

Air in Tashkent was harmful 80% of the days in 2019.

Pollution in Dushanbe is also noticeable with the onset of the heating season. Nonetheless, the most dangerous days in 2019 were summer and autumn, when dusty storms covered the capital of Tajikistan. Over these days, average concentration of PM<sub>2.5</sub> rose to 475 mg / m<sup>3</sup>, and the maximum value per hour - up to 838 mg / m<sup>3</sup>. This is 33.5 times higher than acceptable.

The situation is better in Nur-Sultan, but the concentration of harmful particles exceeds the annual norm by 2.5 times.

Ashgabat data is available from August 1, 2019. During this time, sensors recorded 41 out of 150 days, when the air pollution level exceeded the mark of 25 µg / m<sup>3</sup>.

Air quality in cities varies depending on the time of day and days of the week. Usually, air in Bishkek deteriorates in the winter from 9 a.m. to 3 p.m. and from 6 p.m. to 9 p.m., and in Nur Sultan from 8 a.m. to 10 a.m. and from 6 p.m. to 1 a.m.

Safe hours in Tashkent fall on Mondays from 5 to 8 in the morning and from 14 to 17 in the evening, when the streets are free of cars.

Children, the elderly and vulnerable groups are at risk when the PM<sub>2.5</sub> level rises above 35.5 mgk / m<sup>3</sup>. When contamination reaches 55.5 mcg / m<sup>3</sup> and beyond, everyone is advised to wear masks and spend less time outside.

In the chart below, you can filter the data by day of the week.

### **What pollutes the air in Central Asia?**

Exhaust emissions from vehicles are a common cause of air pollution in Central Asian cities. For example, there are 420 thousand cars registered in Bishkek, while the city is designed for a maximum of 50 thousand cars. There are 450 thousand cars in Tashkent, and 472 thousand in Almaty.

The private sector also pollutes the air, the inhabitants of which heat houses with coal and do not install filters in chimneys. Due to the decreased air circulation in the atmosphere over winter, harmful particles accumulate forming an urban smog.

The dust storms present the main danger to the population of Dushanbe. In Tajikistan, their number has increased at least 10 times over the past 30 years. The main reason for more frequent dust storms is associated with desertification. In the early 1990s, people destroyed 70 percent of the country's forest area - that's 700 thousand hectares. Scientists argue that forest strips on the way of dust storms, from Aivaj to Dushanbe, are practically destroyed. It is the trees, which stand in the way of the wind, that filter the air from dust.

Emissions from thermal power plants, which provide heat to apartment buildings, also affect air quality. However, Bishkek's authorities claim that powerful filters that are installed on the heating center of the Kyrgyzstan's capital purify particulate emissions by 97 percent.

### **How to protect yourself from harmful air?**

You can monitor air quality through the [AirVisual](#) app . For several cities of Kazakhstan and Bishkek, data is also available on the [AirKaz](#) website .

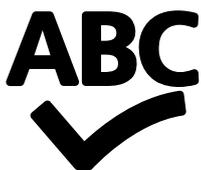
When the air becomes unhealthy, you need to:

- Tightly close down all windows in the premises.
- Use air purifiers with HEPA filters; only they can effectively purify small particles.
- Wear special respirators on the street with a degree of protection N95 or higher. Medical masks do not filter PM2.5 particles.

Following these guidelines will reduce the effects of harmful particles on your body.

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