Air pollution is a significant environmental health threat across the European Union.

Comparing levels of PM$_{2.5}$ and nitrogen dioxide (NO$_2$) across the European Union (EU) reveals strikingly different geographic patterns. In October 2022, the European Commission proposed revisions to the Ambient Air Quality Directives, including tightening the PM$_{2.5}$ limit value. Using 2019 data, only 120 EU cities (22%) meet the new proposed 10 µg/m$^3$ limit value for PM$_{2.5}$, while 454 cities (84%) meet the proposed 20 µg/m$^3$ target for NO$_2$.

Hot spots for poor air quality can be seen in cities across Central and Eastern Europe. There are also important regional differences in relative contribution of fossil fuels to outdoor fine particulate matter (PM$_{2.5}$) levels. For example, coal combustion is the primary contributor in Eastern and Central Europe, while oil and gas combustion are larger contributors in Western Europe.

Patterns of exposure for PM$_{2.5}$ and NO$_2$ vary across the European Union.

- Across the EU, average PM$_{2.5}$ exposure was 13.5 µg/m$^3$ — nearly 35% higher than the newly proposed EU air quality limit value of 10 µg/m$^3$. On the other hand, the average exposure for NO$_2$ was 16.8 µg/m$^3$ — 16% lower than the newly proposed EU air quality limit value of 20 µg/m$^3$.
- Notably, 15 out of the top 20 cities with the highest PM$_{2.5}$ exposures in the EU were in Poland.
- Although exposures to PM$_{2.5}$ tend to be higher in cities in Central and Eastern Europe, exposure to NO$_2$ is high across the most populated cities. Combustion of fossil fuels in vehicles, energy production, and industries is the leading source of NO$_2$.

**FIGURE 1:** Population-weighted annual average PM$_{2.5}$ exposures in 2019
Exposure to air pollutants remains high across the region.

- 8 out of 10 urban residents are exposed to PM$_{2.5}$ levels above the EU proposed target of 10 µg/m$^3$.
- 5 out of 10 urban residents are exposed to NO$_2$ levels above the EU proposed target of 20 µg/m$^3$.

### Air pollution is the 10th leading cause of death in the EU.

- Breathing even low levels of pollution over time can produce a myriad of health effects — including reduced life expectancy, missed school and work, chronic illnesses, and even death — putting enormous strains on communities and economies.
- The magnitude of health impacts varies across the EU with the highest impacts in Central and Eastern Europe. Cities including Katowice and Warsaw (Poland), Plovdiv (Bulgaria), Bucharest and Călărași (Romania), and Budapest (Hungary) experience death rates nearly 4–6 times higher than cities in Western Europe.

### How Air Pollution Impacts Health

**Respiratory**
- Chronic Obstructive Pulmonary Disorder (COPD)
- Asthma
- Pneumonia
- Lung cancer

**Cardiovascular**
- Congestive heart failure
- Arrhythmia
- Myocardial infarction
- Stroke
- Hypertension

**Maternal and Infant Health**
- Premature birth
- Reduced weight at birth
- Preeclampsia

**Other Impacts**
- Diabetes
- Dementia
- Increased risk for death
- Reduced life expectancy

### The good news is that there are signs of improvements in air quality.

- Cities are not only at the front line for air pollution impacts, but also for progress and interventions. 93% of the cities in the EU saw reductions in NO$_2$ exposures between 2000 and 2019 as new vehicles entered the market, and tighter regulations for power plants, vehicle emissions, and industrial boilers were established.
- More than 300 cities have created low-emission zones for vehicles, generating declines in traffic air pollution. Other cities are establishing or expanding strict clean air policies that target vehicle fuel efficiency and decreased emissions from coal-fired power plants.

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**FOR MORE INFORMATION:**

Air Quality and Health in Cities: A State of Global Air Report

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