STATE OF GLOBAL AIR

The European Union

A Regional Air Quality Snapshot

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.

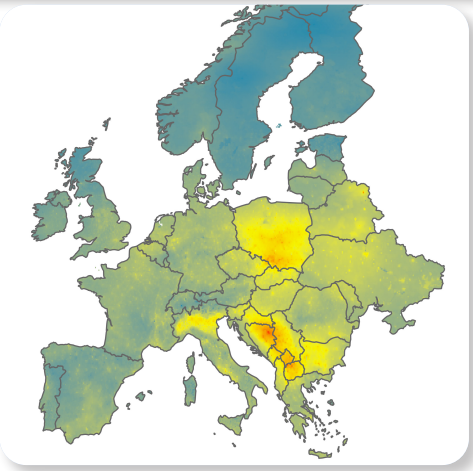


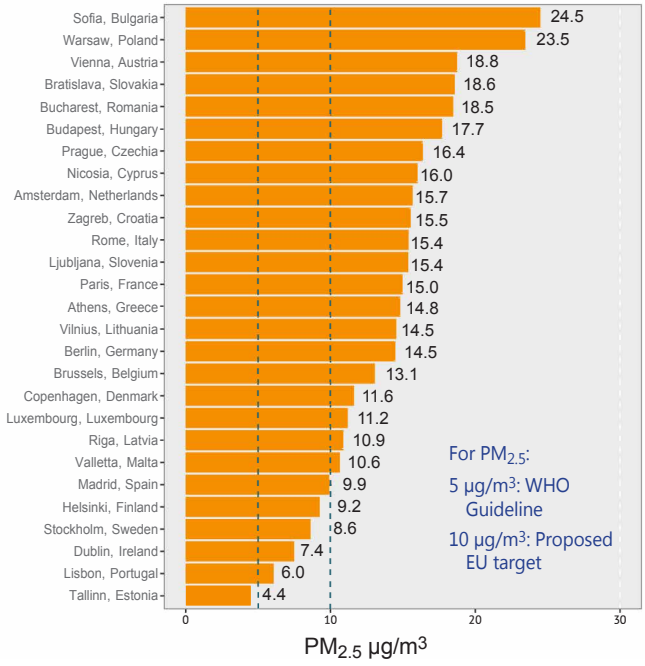
FIGURE 1: Population-weighted annual average $PM_{2.5}$ exposures in 2019

Patterns of exposure for $PM_{2.5}$ and NO_2 vary across the European Union.

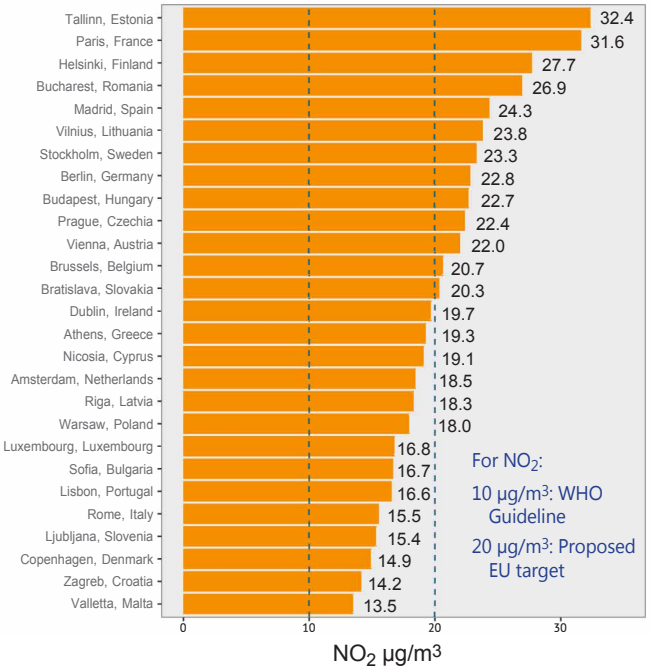
Sofia, Bulgaria

- 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.

Annual $PM_{2.5}$ Exposure in EU Capital Cities in 2019



Annual NO_2 Exposure in EU Capital Cities in 2019



Exposure to air pollutants remains high across the region.

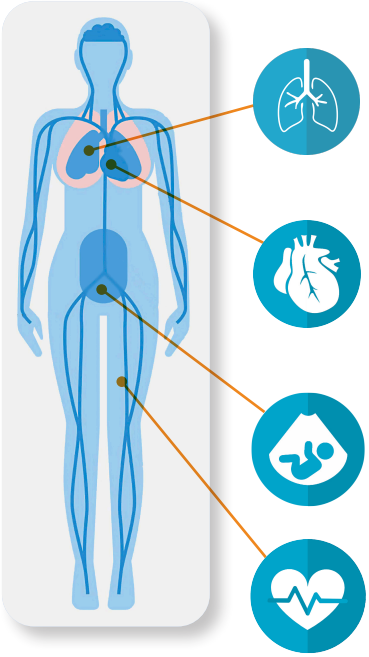
8 out of 10 urban residents are exposed to $PM_{2.5}$ levels above the EU proposed target of 10 µg/m³.

5 out of 10 urban residents are exposed to NO_2 levels above the EU proposed target of 20 µg/m³.

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 Călăraşi (Romania), and Budapest (Hungary) experience death rates nearly 4–6 times higher than cities in Western Europe.

How Air Pollution Impacts Health

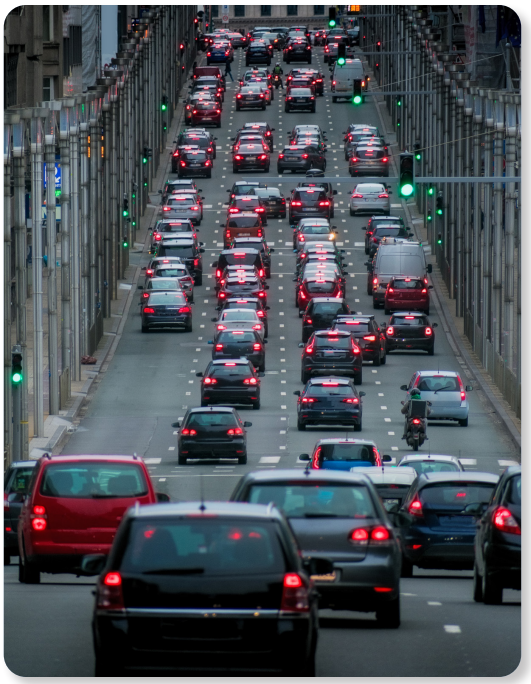


Respiratory
- Chronic Obstructive Pulmonary Disorder (COPD)
- Asthma
- Pneumonia
- Lung cancer

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



Rue de la Loi, Brussels, Belgium

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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