A European Outlook

How air quality impacts health

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Health impacts of air pollution

- Headache and anxiety ($SO_2$)
- Impacts on the central nervous system (PM)
- Irritation, inflammation and infections
- Asthma and reduced lung function ($NO_2$)
- Chronic obstructive pulmonary disease (PM)
- Lung cancer (PM, BaP)
- Irritation of eyes, nose and throat
- Breathing problems ($O_3$, PM, NO$_2$, BaP)
- Cardiovascular diseases (PM, $O_3$, SO$_2$)
- Impacts on liver, spleen and blood ($NO_2$)
- Impacts on the reproductive system (PM)
90% of EU deaths attributed to the environment: non-communicable disease

Top 10 non-communicable diseases driven by environmental pollution

Source: WHO, 2016, Global Health Observatory

- Air pollution is linked to:
  - 17% of deaths from lung cancer
  - 12% of deaths from ischaemic heart disease
  - 11% of deaths from stroke
New WHO Global Air Quality Guidelines aim to save millions of lives from air pollution

Press release

Copenhagen and Geneva, 22 September 2021

Air pollution is one of the biggest environmental threats to human health, alongside climate change.

New World Health Organization (WHO) Global Air Quality Guidelines (AQGs) provide clear evidence of the damage air pollution inflicts on human health, at even lower concentrations than previously understood. The guidelines recommend new air quality levels to protect the health of populations, by reducing levels of key air pollutants, some of which also contribute to climate change.

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WHO global air quality guidelines

Particulate matter (PM$_{2.5}$ and PM$_{10}$), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide

Executive summary
Health impacts of air pollution: mortality results

Health impact of key pollutants in the EU-27 in 2019

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Premature deaths</th>
<th>Years of life lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine particulate matter</td>
<td>307,000</td>
<td>3,370,000</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>40,400</td>
<td>435,600</td>
</tr>
<tr>
<td>Ozone</td>
<td>16,800</td>
<td>190,000</td>
</tr>
</tbody>
</table>

2019 years of life lost per 100,000 people attributed to PM$_{2.5}$

- Iceland: 147 YLL per 100,000 people
- Hungary: 1,205 YLL per 100,000 people
- Bosnia and Herzegovina: 1,742 YLL per 100,000 people

EEA, 2019
2019 concentrations of two main pollutants

PM$_{2.5}$

PM$_{2.5}$ concentrations in 2019
- Unit: µg/m$^3$
- EU annual limit value: 25 µg/m$^3$
- WHO guideline: 5 µg/m$^3$

NO$_2$

NO$_2$ concentrations in 2019
- Unit: µg/m$^3$
- EU annual limit value: 40 µg/m$^3$
- WHO guideline: 10 µg/m$^3$
### 2019 urban population exposure

<table>
<thead>
<tr>
<th></th>
<th>EU standards</th>
<th>2021 WHO guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine particulate matter</td>
<td>4 %</td>
<td>97 %</td>
</tr>
<tr>
<td>Coarse particulate matter</td>
<td>15 %</td>
<td>81 %</td>
</tr>
<tr>
<td>Ozone</td>
<td>34 %</td>
<td>99 %</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>4 %</td>
<td>94 %</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>15 %</td>
<td>75 %</td>
</tr>
<tr>
<td>Sulphur dioxide</td>
<td>&lt; 1 %</td>
<td>7 %</td>
</tr>
</tbody>
</table>
PM$_{2.5}$ concentrations in 2019 by country in relation to:

- the EU annual limit value
- 2005 WHO guideline
- 2021 WHO guideline – all countries have exceedances

2021 WHO guideline: 5 $\mu$g/m$^3$
NO$_2$ concentrations in 2019 by country in relation to:

- the EU annual limit value & 2005 WHO guideline
- 2021 WHO guideline – all countries have exceedances
Progress towards the Zero pollution action plan 2030 target

Chart — Premature deaths attributed to PM2.5 in the EU-27 (2005-2019), and progress towards the Zero Pollution Action Plan target on air pollution.
**Minimum health benefits** had all areas in the EU-27 met the range of EU standards and WHO guideline levels in 2019.

72 % fall in premature deaths compared with 2005.

Achieving the Zero Pollution Action Plan target.

Minimum benefits – as concentrations would also have fallen in areas where standards were already met.
European air quality index

Budapest Korakas (HU0042A)
- Air Quality Index: Poor (due to PM10)
- Date: 2022-01-25 13:00 UTC+1
- Country: Hungary
- Location: Budapest
- Classification: Background
- Area: Urban

General population
Consider reducing intense activities outdoors, if you experience symptoms such as sore eyes, a cough or sore throat.

Sensitive population
Consider reducing physical activities, particularly outdoors, if you experience symptoms.
Explore air quality information
European city air viewer

How clean is the air in my city?
based on the levels of fine particulate matter measured in the air in cities in 2019 and 2020

PM2.5 annual mean concentration, µg/m³

<table>
<thead>
<tr>
<th>Concentration (µg/m³)</th>
<th>Category</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>good</td>
<td>green</td>
</tr>
<tr>
<td>10 - 15</td>
<td>moderate</td>
<td>orange</td>
</tr>
<tr>
<td>15 - 25</td>
<td>poor</td>
<td>red</td>
</tr>
<tr>
<td>25 - 35</td>
<td>very poor</td>
<td>black</td>
</tr>
</tbody>
</table>

For Budapest, Hungary:
- Rank: 240/323
- Fine particulate matter in µg/m³: 14.19
- Air quality category: moderate
- Number of stations: 2
- City population: 1,728,868
Thank you

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