North Macedonia

Air pollution was the 6th leading risk factor for premature death in North Macedonia in 2019, accounting for nearly 16% of all deaths (nearly 3,500). Considered separately, ambient particulate matter (PM$_{2.5}$) ranked as the 6th leading risk factor, and household air pollution (HAP) ranked 14th. Ozone was not in the top 20 risk factors.

**Key Statistics at a Glance**

<table>
<thead>
<tr>
<th>More than 3,000 deaths due to air pollution in 2019.</th>
<th>30 µg/m$^3$ population-weighted annual average PM$_{2.5}$ concentration.*</th>
<th>27% of the population used solid fuels for cooking.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% of infant deaths attributable to air pollution.</td>
<td>More than 2,500 deaths attributable to exposure to outdoor PM$_{2.5}$.</td>
<td>More than 500 deaths attributable to exposure to household air pollution.</td>
</tr>
</tbody>
</table>

**Key Exposure Facts**

**100% of North Macedonia's population** lives in areas where PM$_{2.5}$ levels are above the WHO guideline for healthy air (10 µg/m$^3$).**

- Between 2010 and 2019, exposures to PM$_{2.5}$, household air pollution, and ozone all declined.
- There are less than 20 stations reporting PM$_{2.5}$ concentrations in North Macedonia.***

- Among the 29 countries in the Central Europe, Eastern Europe, and Central Asia region, North Macedonia ranks 5th in PM$_{2.5}$ exposure.

**How Have Pollutant Exposures Changed Between 2010 and 2019?**

<table>
<thead>
<tr>
<th>2010</th>
<th>2019</th>
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<tbody>
<tr>
<td>36 µg/m$^3$ PM$_{2.5}$</td>
<td>30 µg/m$^3$</td>
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<table>
<thead>
<tr>
<th>2010</th>
<th>2019</th>
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<tbody>
<tr>
<td>46 ppb Ozone</td>
<td>36 ppb</td>
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<th>2010</th>
<th>2019</th>
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<td>34% of population relying on solid fuels</td>
<td>27% of population relying on solid fuels</td>
</tr>
</tbody>
</table>

* Please note that PM$_{2.5}$ concentrations reported here are estimated using a combination of satellite data, ground air quality monitoring data, and chemical transport models. These estimates can be more uncertain in regions where ground monitoring data are limited or not available. In North Macedonia, the best estimate of the annual average exposure is 30 µg/m$^3$, but it may range from 27 µg/m$^3$ to 33 µg/m$^3$.

** WHO provides an Air Quality Guideline of 10 µg/m$^3$ for PM$_{2.5}$ to minimize health risks to populations, as well as three interim targets (35 µg/m$^3$, 25 µg/m$^3$, and 15 µg/m$^3$) as incremental steps toward the progressive reduction of air pollution.

*** Based on data from OpenAQ.
Air Pollution Accounts for a Substantial Percentage of Global Deaths from Specific Causes.

Air pollution exposures, including exposure to outdoor PM$_{2.5}$ and HAP, have been linked to increased hospitalizations, disability, and early death from respiratory diseases, heart disease, stroke, lung cancer, and diabetes, as well as communicable diseases like pneumonia. Exposure to ozone is linked to chronic obstructive pulmonary disease (COPD), and in children, especially those under the age of 5, increases susceptibility to lower respiratory tract infections. Exposure to PM$_{2.5}$ also puts mothers at risk of delivering babies too early and smaller than normal, and such babies are more susceptible to dying from a range of diseases.

Percentage of Deaths (by Cause) Attributed to Air Pollution in North Macedonia in 2019

- 26% of COPD deaths
- 22% of diabetes deaths
- 20% of ischemic heart disease deaths
- 22% of lung cancer deaths
- 22% of stroke deaths
- 18% of lower respiratory infection deaths
- 10% of neonatal deaths

Key Health Facts

- Air pollution is the 6th leading risk factor for premature death in North Macedonia. Leading causes of death in North Macedonia include ischemic heart disease, ischemic stroke, lung cancer, intracerebral hemorrhage, and diabetes, while leading risk factors include high blood pressure, tobacco, high blood sugar, dietary risks, and high BMI.
- There are 118 deaths per 100,000 people attributable to air pollution in North Macedonia compared with 86 deaths globally, adjusted for differences in age.
- 7% of total air-pollution-attributable deaths in North Macedonia are in children under 5, and 14% are in people over 70.

FOR MORE INFORMATION:

For the full report and additional data, please visit www.stateofglobalair.org.

ADDITIONAL RESOURCES:

For open-access, real-time air quality data, visit OpenAQ.

The State of Global Air website is a collaboration between the Health Effects Institute and the Institute for Health Metrics and Evaluation, with expert input from the University of British Columbia.