Tackling air pollution for improved health and a greener future

UNDP Istanbul Regional Hub for Europe and Central Asia

Mean annual exposure to PM2.5 ($\mu g/m^3$) – ECA vs. EU

% of population exposed to air pollution – PM2.5 concentrations


WHO new recommended value for PM2.5 is 5 $\mu g/m^3$ (annual-mean), 2021 Guidelines.

Min 7 times higher than the new threshold set by WHO.
Annual average PM2.5 concentrations in 2020, compared to WHO PM2.5 recommended value (5 μg/m³, annual-mean)

- The COVID-19 lockdowns have caused short-term global air pollution declines last year.
- In 2020, PM2.5 concentrations exceeded the WHO threshold in all capital cities in the region.

PM2.5 – particles less than 2.5 micrometers in diameter

Penetrate deeply into the lung, irritate the alveolar wall, and impair lung function.

Solid fuels combustion for heating and cooking, fossil-fuel based power generation...

Case study 1: Correlation between COVID-19 and air quality in Serbia

- **Objective**: Short-term exposure to air pollutants and COVID-19 incidence in two cities with the highest number of COVID-19 cases - Belgrade and Niš.
- **Air pollutants analysed**: PM2.5, PM10, SO₂, CO, and NO₂
- **Results**: Short-term exposure to PM2.5, PM10, CO, NO₂ is correlated with the increase in the number of COVID-19 cases, while SO₂ concentrations are negatively associated with the number of daily confirmed cases (due to its virucidal nature).

- The strongest positive correlation observed for PM2.5, PM10, compared to other pollutants analysed (CO, NO₂).

More research needs to be undertaken in this area.

Source: Analysis of the correlations between the COVID-19 pandemic and air quality. UNDP Serbia Country Office and Vinča Institute, 2020. Available at: https://www.rs.undp.org/content/dam/serbia/Publications%20and%20reports/English/Environment/Analysis%20of%20the%20correlations%20between%20the%20COVID-19%20cases%20and%20air%20quality.pdf
Case study 2: Air quality monitoring data for analysis of the pace and intensity of COVID-19 spread in Central and Eastern Europe and the Balkans

- The study is based on the data gathered by Airly – a Polish innovator and promoter of air quality identified under the Polish Challenge Fund, implemented by UNDP IRH.
- Research period: from November 2020 to the end of March 2021 (heating season).
- Air pollutant analysed: PM2.5
- Results: positive correlation between PM2.5 and COVID-19 outcomes (0.88 for the number of deaths and 0.58 for the number of cases, calculated based on the Pearson correlation coefficient).

Note: the results do not imply direct causality, as the morbidity and mortality rates are the outcome of many factors (e.g., population age and density, healthcare quality and capacity, implemented restrictions and policies, etc.).
**UNDP’s Nature, Climate and Energy Offer: integrated policy solutions**

**Framing Air Pollution for post-COVID-19 recovery – policy suggestions**

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<td>✓ Mitigate risks from degradation and destruction of nature, conservation of critical ecosystem services (&gt; restoration of forests and wetlands, sustainable forest management).</td>
<td>✓ Clean energy investment to enhance Nationally Determined Contributions (NDCs).</td>
<td>✓ Modernization of energy infrastructure and green renovations.</td>
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<td>✓ Greening cities and promoting eco-design.</td>
<td>✓ Energy efficient buildings and clean heating/cooking (&gt; mandatory building codes, HVAC standards and labelling, improve insulation and maintenance, efficient solid fuel stoves and boilers, clean cookstoves).</td>
<td>✓ Leverage climate-friendly and resilient infrastructure investment to speed up recovery.</td>
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<td>✓ Chemical and waste management, zero-waste pathway.</td>
<td>✓ Energy efficient power generation and renewables (&gt; wind, solar, geothermal energy).</td>
<td>✓ Engage utilities to clean up the grid and introduce smart-grid solutions.</td>
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<td>✓ Sustainable agriculture and supply chain using circular economy practices.</td>
<td>✓ Low-carbon transport and long-term decarbonization strategies (&gt; shared mobility, electric vehicles, fuel quality, etc).</td>
<td>✓ Energy storage systems.</td>
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<td>✓ Greening stimulus packages – repurposing harmful subsidies to sustainable management of natural resources.</td>
<td>✓ Regulatory reform and innovation for a transition to sustainable energy systems, including regulations to quantify short-lived climate pollutants to improve GHG inventories and MRV systems.</td>
<td>✓ Diversifying portfolio of oil and gas companies with a strong focus on renewable energy.</td>
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Air pollution is directly mentioned under: SDG 3.9 (substantial reduction of health impacts from hazardous substances) and SDG 11.6 (reduction of adverse impacts of cities on people).

Pollutants such as SO$_2$ and NO$_x$ from the combustion of fossil fuels mix with precipitation causing harmful acid rain that can compromise water quality, increase acidity of the oceans and pose a major threat to forests and ecosystems.

Power generation, industry and transport are large contributors to air pollution. Electricity from renewable energy offers significant public health benefits.

Chemicals released into the air increase air pollution and contribute to harmful effects on human health. Sustainable waste management practices are critical to control these harmful chemicals.

It can cause health problems, crop damage and affect food quality and security. Reducing air pollution can help families become healthier, save on medical expenses, and improve productivity and prosperity.

Less than 10 yrs left to deliver on the Agenda 2030
Useful UNDP resources published in the ECA region, 2020 and 2021.

Tackling air pollution in Europe and Central Asia for improved health and a greener future. UNDP IRH, 2021.


Thank you!

For any questions, please contact us: cansu.demir@undp.org