

## **Urgent call to ensure clean air for all in Europe, fight health inequalities and oppose delays in action.**

Ebba Malmqvist,<sup>2</sup> Zorana Jovanovic Andersen,<sup>1</sup> Joseph Spadaro,<sup>3</sup> Mark Nieuwenhuijsen,<sup>4-6</sup> Klea Katsouyanni,<sup>7</sup> Bertil Forsberg,<sup>8</sup> Francesco Forastiere,<sup>7</sup> Barbara Hoffmann<sup>9</sup>

<sup>1</sup> Department of Public Health, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark.

<sup>2</sup> Division of Occupational and Environmental Medicine, Faculty of Medicine, Lund University, Lund, Sweden.

<sup>3</sup> Spadaro Environment Research Consultants (SERC), Philadelphia, PA, USA.

<sup>4</sup> Barcelona Institute for Global Health (ISGlobal), Barcelona, Spain.

<sup>5</sup> Universitat Pompeu Fabra (UPF), Barcelona, Spain.

<sup>6</sup> CIBER Epidemiología y Salud Pública (CIBERESP), Madrid, Spain.

<sup>7</sup> Imperial College, London, United Kingdom.

<sup>8</sup> Department of Public Health and Clinical Medicine, Umeå University, Umeå, Sweden.

<sup>9</sup> Institute for Occupational, Social and Environmental Medicine, Centre for Health and Society, Medical Faculty, University of Düsseldorf, Düsseldorf, Germany.

As part of the Green Deal, the European Union's (EU) ambitious plan to be the first climate neutral continent by 2050, EU launched the Zero Pollution Action Plan in 2021. One of the key elements of this plan is an update of the current air quality legislation, the EU Ambient Air Quality Directive (AAQD) with air quality limit values of 25 µg/m<sup>3</sup> for particulate matter with diameter < 2.5 µm (PM<sub>2.5</sub>) and 40 µg/m<sup>3</sup> for nitrogen dioxide (NO<sub>2</sub>). The need for a revision became clearer upon release in 2021 of the World Health Organization Air Quality Guidelines (WHO AQG), which recommendations are annual mean of 5 µg/m<sup>3</sup> for PM<sub>2.5</sub> and 10 µg/m<sup>3</sup> for NO<sub>2</sub>. The WHO AQGs are based on a comprehensive global review of the key scientific evidence on health effects of ambient air pollution(1). The difference between these values exposed the large gap between science-based standards aimed at protecting health and the current, outdated EU AAQD.

This is an historic opportunity towards clean air in Europe for all that could prevent hundreds of thousands of premature deaths and millions of new cases of non-communicable diseases (NCDs) every year(2), as well as improve patients' prognosis, and health and quality of life of all European citizens. Full alignment with WHO AQG would enhance children health in Europe by improving lung function(3), and reducing asthma and respiratory infections burden. Achieving the WHO AQG would also lower the economic cost of health care, reduce social, environmental and health inequalities across Europe, boost economic growth, and help mitigate the adverse environmental and health effects of climate change(4).

To set the stage, in October 2022 the European Commission presented its proposal for a revised AAQD with limit values of 10 µg/m<sup>3</sup> for PM<sub>2.5</sub> and 20 µg/m<sup>3</sup> for NO<sub>2</sub> to be met by 2030. While the Commission's proposal is an important step in the right direction, it provided no clear pathway on how to fully align with WHO AQG, a major shortcoming (5). In September 2023, the European Parliament went a step further than Commission, and voted to adopt the WHO AQGs with full implementation by 2035. Parliament's historical vote to endorse science-based air quality standards was much welcomed and applauded by the scientific community. However, in November 2023, the European Council adopted its negotiating mandate (the Council version of the AAQD proposal), which endorsed the Commission proposal, again leaving out full alignment with WHO AQGs. Another blow by the Council, was allowing delays in achieving limit values up to 2040 for those countries whose gross domestic product (GDP) per capita is below EU average. This is the case for 17 of 27 countries, mainly those in Eastern Europe and Italy(6). The delay in cleaning up air pollution would widen the social, economic and health inequality between East and West Europe. The Council's proposal also allows for another delay possibility: a ten-year delay for all countries that could demonstrate through modelling that they will not reach the limit values by 2030.

Currently (December 2023), the European Council, Parliament, and Commission are engaged in trilateral discussions of the revision of the AAQD. The lack of pathway to full alignment with WHO AQGs and potential delays are of great concern to the scientific community, patients, and general public:

## **1. Delays mean lost lives and poor health.**

Delays in cleaning up the air in Europe are highly problematic, as they would result in preventable loss of life and exacerbate inequities across the European population. For example, for those EU Member States with a mean population-weighted PM<sub>2.5</sub> exposure above 10 µg/m<sup>3</sup> in 2020,(7) a delay by 10 years in achieving a level of 10 µg/m<sup>3</sup> (i.e. 2040 instead of 2030) would result in an excess of 327,600 premature deaths. This calculation assumes a linear decrease of PM<sub>2.5</sub> levels from 2020 to a level of 10 µg/m<sup>3</sup> in either 2030 or 2040 and uses the relative risk estimate from the meta-analyses on PM<sub>2.5</sub> and all-cause mortality prepared for the WHO (8). It is notable that two-thirds of the preventable health burden affects the poorer countries in Eastern Europe, and about one-third in Italy (Figure 1). These numbers make it clear that allowing delays will impose a substantial, unjust, and unacceptable loss of human lives in Europe. These numbers do not include the millions of cases of cardiovascular and respiratory diseases, as well as impact on cognition and early life development, and the associated suffering, sick days, and health care costs. It is important to stress that delays will mean failure to protect those who are most susceptible to harmful effects of air pollution: children, pregnant women, elderly, already sick, and people in low socio-economic groups.

## **2. Delays will widen the inequality gap between East and West Europe**

The proposed delay by the Council would mean that by 2030, residents of the 11 most affluent EU states could legally demand to be protected from the dangers of air pollution, while over 240 million people in 17 lower-income EU countries would still be exposed to harmful air pollution for another 10 years(6). Eastern European countries are those that have the highest levels of air pollution and related health costs in Europe. The emissions come from coal-based energy production and outdated industry sectors, followed by use of wood and coal for residential heating and cooking, and old vehicle fleets (9). Council proposal would increase these inequalities, using poverty as an excuse to fail to act, is the exact opposite of what these countries need. It would be more beneficial for health with a fair and clear legislative framework and financial support targeted to accelerate (and not delay) urgently needed clean air actions and policies in all relevant sectors. There are currently EUR 147 billion, or 8.3% of the multiannual financial framework for the 2021-2027 period of the EU budget dedicated to the clean air objective(10).

## **3. Delays on urgent action on air pollution means delays in additional health benefits.**

As the health care systems around Europe are struggling with increasing visits and costs related to ageing and multi-morbidities, saving costs by preventing air pollution related NCDs and enhancing healthy ageing, is an opportunity that must not be missed. Finally, strict air pollution policies and initiatives would provide additional health co-benefits by enhancing physical activity (e.g. supporting a shift to active travel such as cycling, walking, and public transport in cities), reducing road traffic noise, increasing greening and of the cities, and help mitigate climate change impacts on our societies and our health. A robust policy on air quality will enhance the quality of life and prosperity of citizens, reduce disparity between groups, enhance economic growth, as well as help mitigate the effects of climate change.

## **Conclusion**

Tripartite negotiations between the EU Council, Commission and Parliament have started. A deal must soon be reached. We strongly urge the EU environment ministers to put European health and environmental justice at the core of their political aspirations. This is a unique public health opportunity for EU Member States to follow the scientific evidence and listen to the concerns of citizens whose lives are in balance.

## References

1. Organization WH. WHO global air quality guidelines. Particulate matter (PM 2.5 and PM 10 ), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. . Geneva: WHO; 2021. Contract No.: ISBN: 9789240034228.
2. (EEA) EEA. Harm to human health from air pollution in Europe: burden of disease 2023. 2023. Report No.: 2467-3196 -.
3. Yu Z, Merid SK, Bellander T, Bergström A, Eneroth K, Georgelis A, et al. Associations of improved air quality with lung function growth from childhood to adulthood: the BAMSE study. *Eur Respir J*. 2023;61(5).
4. Turner MC, Andersen ZJ, Neira M, Krzyzanowski M, Malmqvist E, González Ortiz A, et al. Clean air in Europe for all! Taking stock of the proposed revision to the ambient air quality directives: a joint ERS, HEI and ISEE workshop report. *Eur Respir J*. 2023;62(4).
5. Boogaard H, Andersen ZJ, Brunekreef B, Forastiere F, Forsberg B, Hoek G, et al. Clean air in Europe for all: A call for more ambitious action. *Environ Epidemiol*. 2023;7(2):e245.
6. Union TE. Eurostat [Available from: [https://ec.europa.eu/eurostat/databrowser/view/sdg\\_08\\_10/default/table](https://ec.europa.eu/eurostat/databrowser/view/sdg_08_10/default/table)].
7. Agency EE. Air quality in Europe 2022. Copenhagen, Denmark; 2022 24 Nov 2022. Report No.: 05/2022.
8. Chen J, Hoek G. Long-term exposure to PM and all-cause and cause-specific mortality: A systematic review and meta-analysis. *Environ Int*. 2020;143:105974.
9. Institute HE. Trends in Air Quality and Health in Southeast Europe. Boston, USA.; 2022.
10. Comission E. Clean-air tracking [Available from: [https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/clean-air-tracking\\_en#:~:text=Projected%20clean%20air%20contribution%20from%202021%20to%202027,multiannual%20financial%20framework%2C%20to%20the%20clean%20air%20objective](https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/clean-air-tracking_en#:~:text=Projected%20clean%20air%20contribution%20from%202021%20to%202027,multiannual%20financial%20framework%2C%20to%20the%20clean%20air%20objective)].

**Figure 1.** Number of preventable premature deaths (per 100,000 persons) for avoiding a 10-year delay in reaching a PM<sub>2.5</sub> target concentration of 10 µg/m<sup>3</sup> in Member States with a mean population-weighted PM<sub>2.5</sub> exposure above 10 µg/m<sup>3</sup> in 2020.