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On 16 November 2019, the CPME Board adopted the 'CPME Policy on Air Quality and Health' (CPME 2019/073 FINAL).

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## CPME Policy on Air Quality and Health

*The Standing Committee of European Doctors (CPME) represents national medical associations across Europe. We are committed to contributing the medical profession's point of view to EU and European policy-making through pro-active cooperation on a wide range of health and healthcare related issues.*

Building on its previous policies on environmental health, CPME reaffirms its commitment to promoting sustainable environments and health. CPME encourages all European doctors to act in this respect in their direct contacts with patients, in their work as public health officers at local level, and through their national medical associations. CPME recognises the relationship between greenhouse gas emissions and the grave consequences on climate. However, the main focus of this paper is the health effects of air pollution.

### Background

Air pollution is defined as any substance in the air that may harm humans, animals, vegetation, or materials.<sup>1</sup> The World Health Organization (WHO) refers to air pollution as the greatest environmental risk to health and one of the 10 greatest threats to global health in 2019.<sup>2</sup> It is estimated globally to kill 7 million people prematurely every year.<sup>3</sup> In Europe, although the air quality is gradually improving, air pollution has major health, environmental and economic impacts. It is responsible for a significant burden of premature deaths, hospital admissions and health symptoms. In the WHO European Region, more than 550,000 premature deaths are attributable to the joint effects of outdoor and indoor air pollution every year.<sup>4</sup>

Globally, air pollution is the second leading cause of deaths from noncommunicable diseases (NCDs) after tobacco-smoking. The main NCDs associated with air pollution are lung cancer, ischaemic heart disease, stroke and chronic obstructive pulmonary disease (COPD).<sup>5</sup> Moreover, air pollution is associated with the risk of asthma and chronic laryngitis.<sup>6</sup> Especially children are harmed by air pollution because they breathe more air per unit body weight and therefore inhale more airborne

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<sup>1</sup> Kampa M, Castanas E. [Human health effects of air pollution](#). Environ Pollution, 2008.

<sup>2</sup> [Ten threats to global health in 2019](#). World Health Organisation (WHO), 2019.

<sup>3</sup> [How air pollution is destroying our health](#). World Health Organization (WHO), 2018.

<sup>4</sup> [Burden of disease from the joint effects of household and ambient air pollution for 2016](#). World Health Organization (WHO), 2018.

<sup>5</sup> [Noncommunicable diseases and air pollution](#). WHO Regional Office for Europe, 2019.

<sup>6</sup> [Air Pollution and Noncommunicable Diseases: A Review by the Forum of International Respiratory Societies' Environmental Committee, Part 2: Air Pollution and Organ Systems](#). Schraufnagel et al., 2019.



toxicants than adults.<sup>7</sup> In addition, there is emerging evidence that air pollution is associated with new-onset type 2 diabetes in adults and systemic inflammation.<sup>8</sup>

There are also considerable economic costs from the health impact of air pollution. In the WHO European region, the annual economic cost of premature deaths from air pollution is estimated to be 1.3 trillion Euro and the overall annual economic cost of health impacts 1.4 trillion Euro.<sup>9</sup> Impacts on the environment include eutrophication, acidification and damage to vegetation.<sup>10</sup> Air pollution is also closely linked to climate change, sharing the same source in the burning of fossil fuels.

The primary source of air pollution in Europe is the burning of fossil fuels in power generation for transport, industry and households. The burning of fossil fuels in households for heating is another major source of pollution in some countries. Agriculture, industrial processes, solvent use and waste treatment are other sources of air pollution.<sup>11</sup> In Europe, the primary air pollutants, which are directly emitted into the atmosphere, are particulate matter (PM), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>), volatile organic compounds (VOC) and methane (CH<sub>4</sub>). Commercial and household heating is mainly responsible for PM, electricity and heat production for SO<sub>2</sub>, road transport, especially urban traffic, for NO<sub>x</sub>, industrial and construction activities for VOC, and agriculture for NH<sub>3</sub> and CH<sub>4</sub>.<sup>12</sup> Secondary particulate matter and ozone (O<sub>3</sub>) are secondary air pollutants which are formed in the atmosphere through oxidation and reactions between primary air pollutants.

Reducing environmental pollutants would generally decrease environmental health risks, be economically beneficial and pose a crucial step towards achieving the UN Sustainable Development Goals (SDGs). Between 1990 and 2016, SO<sub>2</sub> emissions decreased by 91 % and NO<sub>x</sub> emissions by 58 % in the European Union (EU). Also, O<sub>3</sub> concentrations decreased by 40 % between 2000 and 2016.

However, PM concentrations continue to be too high and NH<sub>3</sub> emissions have increased in the agricultural sector.<sup>13 14</sup> Thus, air pollution continues to pose a severe health, environmental and economic threat to the European continent. The urban population in particular may be exposed to a concentration of air pollutants above the EU and WHO recommended levels (outlined below).<sup>15</sup>

Pollution, however, does not affect everyone in the same way, with some groups of the population being more vulnerable than others. Environmental inequalities and injustice continue to be a problem, showing that pollution, poverty and poor health are intertwined.<sup>16</sup> Exposure to air pollutants is mainly

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<sup>7</sup> [Air Pollution and Noncommunicable Diseases A Review by the Forum of International Respiratory Societies' Environmental Committee, Part 1: The Damaging Effects of Air Pollution](#). Schraufnagel et al., 2019.

<sup>8</sup> [Air quality in Europe — 2018 report](#). European Environment Agency (EEA), 2018.

<sup>9</sup> [Economic cost of the health impact of air pollution in Europe: Clean air, health and wealth](#). WHO Regional Office for Europe, 2015.

<sup>10</sup> [Air quality: Pollution sources and impacts, EU legislation and international agreements](#). European Parliamentary Research Service, 2018.

<sup>11</sup> [Emissions of the main air pollutants in Europe](#). European Environment Agency (EEA), 2018.

<sup>12</sup> [Cleaner air for all](#). European Commission, 2019.

<sup>13</sup> [Emissions of the main air pollutants in Europe](#). European Environment Agency (EEA), 2018.

<sup>14</sup> [Air quality in Europe — 2019 report](#). European Environment Agency (EEA), 2019.

<sup>15</sup> [Europe's urban air quality — re-assessing implementation challenges in cities](#). European Environment Agency (EEA), 2018.

<sup>16</sup> [Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe](#). European Environment Agency (EEA), 2018.



beyond individuals' control and, therefore, requires actions by public authorities at the local, regional, national, European and international levels to protect the health of the population.

### European legal framework and the WHO guidelines

The EU has a comprehensive framework in place to tackle air pollution. The two main instruments to tackle air pollution are the 2008 **Ambient Air Quality (AAQ) Directive** which sets air quality measurement standards and local limit values for air pollution concentrations, and the 2016 **National Emission Ceilings (NEC) Directive** which sets national ceilings and seeks to reduce emissions at source. The AAQ requires the member states to develop and introduce air quality plans and protect human health in areas where pollution exceeds the recommended levels.<sup>17</sup> The NEC requires that the member states draw up control programmes to contribute to the implementation of air quality plans established under AAQ.<sup>18</sup> Moreover, the EU sets standards for example for vehicle emissions and fuel quality as well as targets to cut greenhouse gas emissions and to increase energy from renewables.

The limit values set by the EU are legally binding, but they are also the result of a political compromise, and for key pollutants less strict than what the WHO recommends. The 2005 **WHO Air Quality Guidelines** which are based on a comprehensive review of the science offer threshold limits for PM, O<sub>3</sub>, NO<sub>2</sub> and SO<sub>2</sub>, and provide a reference for setting air pollution targets at regional and national levels to improve air quality. Furthermore, the **WHO Guidelines for indoor air quality** make recommendations for instance on NO<sub>2</sub> and household fuel such as unprocessed coal. The WHO is currently reviewing its health-based recommendations, given the latest science which shows health effects already at low concentrations and air pollution being a risk factor or association for a greater number of diseases and health impacts.<sup>19</sup>

Moreover, the European Parliament has adopted a resolution<sup>20</sup> to tackle air pollution which has a local, regional, national and cross-border dimension and requires action at all levels of governance. It urges the European Commission to propose more stringent standards for PM<sub>2.5</sub> particles in the EU air quality rules, as recommended by the WHO. In general, the WHO guideline values are stricter than the comparable EU standards.

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<sup>17</sup> [Europe's urban air quality — re-assessing implementation challenges in cities](#). European Environment Agency (EEA), 2018.

<sup>18</sup> [Air quality in Europe — 2018 report](#). European Environment Agency (EEA), 2018.

<sup>19</sup> [Review of evidence on health aspects of air pollution – REVIHAAP project: final technical report](#). World Health Organization (WHO), 2013.

<sup>20</sup> [A Europe that protects: Clean air for all](#). European Parliament, 2019.



## What can be done

The European Commission has called for a climate-neutral Europe by 2050, and some EU member states have an even more ambitious approach of going carbon-neutral by 2035. The EU 2030 climate and energy framework includes targets and policy objectives for greenhouse gas emissions, renewable energy and energy efficiency.

There are various policy options which may help to improve the air quality, reduce global warming and protect health. Some European countries are pushing for a complete phaseout of coal over the coming years or decades. As one of the main contributors to emissions of pollutants its phaseout would significantly improve air quality and health. Phaseout however urgently requires more support for renewable energy technologies, especially ensuring a just transition<sup>21</sup> in regions where coal remains the major source of energy and employment.

Moreover, many European cities have introduced traffic restrictions, such as low-emission zones where access by some polluting vehicles is restricted or deterred. In addition, there are possibilities to receive financial assistance to replace an old higher emission emitting vehicle with a newer one. Retrofitting, especially of heavy-duty vehicles, is a particularly effective measure in this context. The World Medical Association (WMA) has therefore urged governments to encourage upgrading of all in-use engines with best available (currently Euro VI) technology filters.<sup>22</sup> Moreover, reducing speed limits on motorways to 110km/h can significantly reduce emissions of pollutants, particularly reducing NO<sub>x</sub> and PM output from diesel vehicles, while it may increase carbon monoxide (CO) emissions from diesel cars, and NO<sub>x</sub> from petrol cars.<sup>23</sup>

Cities have also invested in cleaner public transport and the promotion of walking and cycling. Different policies could also encourage a shift to more energy-efficient and healthy buildings and for example district heating, using heat from existing industry or renewable energy sources. Especially heat pumps have great potential not only for heating but also for cooling buildings without the unwanted side effect of warming the environment, as opposed to conventional air conditioning.

Reducing environmental pollutants at a local level is crucial to reduce inequalities in health. There is evidence that people in more deprived neighbourhoods and along busy roads, with lower incomes, higher unemployment rates, and a higher percentage of ethnic minorities and rental accommodation, are more exposed to air pollution.<sup>24</sup> <sup>25</sup> Income-related inequalities in exposure to ambient PM<sub>10</sub> may contribute to Europe-wide mortality inequalities.<sup>26</sup>

Therefore, it is important to reduce these inequalities by improving urban and transport planning practices for example by reducing motor traffic and promoting active and public transport, particularly

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<sup>21</sup> "A Just Transition aims to secure the future and livelihoods of workers and their communities in the transition to a low-carbon economy. It is based on social dialogue between workers and their unions, employers, government and communities." International Trade Union Confederation (ITUC)

<sup>22</sup> [WMA Statement on the Prevention of Air Pollution due to Vehicle Emissions](#). World Medical Association, 2014.

<sup>23</sup> [Do lower speed limits on motorways reduce fuel consumption and pollutant emissions?](#) European Environment Agency (EEA), 2019.

<sup>24</sup> [Unequal residential exposure to air pollution and noise: A geospatial environmental justice analysis for Ghent, Belgium](#). Verbeek, 2018.

<sup>25</sup> [More action needed to protect Europe's most vulnerable citizens from air pollution, noise and extreme temperatures](#). European Environment Agency (EEA), 2019.

<sup>26</sup> [Particulate air pollution and health inequalities: a Europe-wide ecological analysis](#). Richardson et al., 2013.



in highly polluted areas.<sup>27</sup> Vulnerable groups such as children should be given specific attention. This could be done for instance by restricting traffic around schools and promoting active mobility.<sup>28</sup>

Doctors and other healthcare professionals should participate in the discussion on the impacts of air pollution on health and raise awareness among their patients about the risks of air pollution. Therefore, further education for doctors and other healthcare professionals is needed to understand the effects of air pollution on health and its links to climate change. Also, further research is necessary, for instance on health improvements when measures for clean air at local level have taken place.

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<sup>27</sup> [Socioeconomic inequalities in urban and transport planning related exposures and mortality: A health impact assessment study for Bradford, UK](#). Mueller et al., 2018.

<sup>28</sup> [Healthy air, healthier children: 50 schools across the EU monitor air quality](#). Health and Environment Alliance (HEAL), 2019.

## Recommendations (1)

CPME calls on policymakers to:

- make air quality a political priority at all levels from local to European
- update the EU air quality standards to reflect the WHO recommendations and the latest scientific evidence on the health effects of air pollution
- foster cross-sectoral stakeholder collaboration, e.g. between policy makers, healthcare professionals and researchers
- promote and prioritise those measures that will foster clean air, tackle climate change and protect health, including active mobility such as biking and walking in non-polluted areas, as well as affordable public transport based on renewable energy
- support investment in ecological urban public transport infrastructure
- improve urban and residential planning and increase green spaces in cities to ensure good air quality and to increase physical activity, particularly among children and lower socio-economic population groups
- create opportunities to develop and implement new solutions to reduce air pollution, e.g. by
  - creating more cycle and pedestrian friendly roads,
  - expanding clean air zones in cities,
  - limiting the number of cars in cities, particularly diesel and petrol vehicles, and consider reducing speed limits on motorways
  - retrofitting heavy duty emitters of ultrafine particles with diesel particle filters,
  - supporting renewable energy sources, and
  - developing green and health-promoting architecture and urban planning, particularly in areas of lower socio-economic status and places where vulnerable groups are likely to be exposed to air pollution
- rethink the economic framework around air quality externalities, e.g. remove subsidies on fossil fuels and diesel cars, and invest in financial incentives for people to switch to electric vehicles
- invest in further research of health impacts of air pollution and its link to NCDs
- promote research for new limits and harmonised measurement methods for pollution particles, including methods to define the toxic potential of different particles





## Recommendations (2)

CPME calls on European doctors, and especially local public health officers, to:

- actively participate in preventive actions by raising awareness of the negative health impacts of air pollution and climate destabilisation but also of the health benefits of air quality measures
- promote strict air quality standards, “greening cities” and improved access to green/natural areas, particularly for vulnerable groups and in residential areas for people of lower socio-economic status
- engage in debates on the health impacts and costs of air pollution
- live sustainably and promote walking, biking and using public transportation more often, and reducing air travel and energy consumption
- support your organisation to reduce any levels of air pollution it might create (i.e. through transport), and advocate for changes to reduce pollution in your local area
- discuss how emissions of healthcare services could be decreased