

European Respiratory Society (ERS) and European Lung Foundation (ELF) submission to the European Commission's consultation on EU climate target for 2040

The European Respiratory Society (ERS) and the European Lung Foundation (ELF) appreciate the efforts made by the European Commission on the call for evidence for an impact assessment on the 2040 Climate Target Initiative. Given this opportunity, we aim to shed light to the effects that climate change has on people with respiratory diseases by providing inputs for the 2040 climate targets. Climate change is currently considered by the World Health Organization (WHO) the biggest global threat to humanity in the 21st century¹ and it is expected to cause at least 250,000 deaths every year by 2050 due to climate-related heat stress, malnutrition, malaria, and diarrhoea², as well as to create further health burdens from more indirect climate-related paths (i.e. migration, conflicts, poverty, disruption of health care and ecosystems).

In the last few decades, we have started witnessing the impacts of global warming on biodiversity, farming, environment, economy, quality of life and human health among others³.

People with respiratory diseases are among the most vulnerable groups impacted by climate change⁴. Individuals with an already impaired respiratory function (e.g. asthma or chronic obstructive pulmonary diseases (COPD) patients) are particularly sensitive to changes in weather or extreme weather events, which can directly lead to a worsening of their health and an increased risk of dying⁵. Exposure to environmental factors, such as air pollution, pollen and other aeroallergens can affect a number of respiratory outcomes. As a result, there could be an increase in allergic responses, existing respiratory diseases and new cases of chronic and infectious respiratory diseases^{6,7}.

Increasing summer temperatures have been associated with risks of respiratory disease hospitalisations and mortality⁸. Extreme heat can trigger respiratory symptoms that may require the use of medication, the examination by a general practitioner or emergency room visits, hospital

¹ WHO Climate change & health <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>.

² IPCC. 6th Assessment Report WG2.

³ Weilhhammer V, Schmid J, Mittermeier I, *et al.* Extreme weather events in Europe and their health consequences - A systematic review. *International journal of hygiene and environmental health* 2021; **233**: 113688.

⁴ Bernstein AS, Rice MB. Lungs in a Warming World: Climate Change and Respiratory Health. *CHEST* 2013; **143**: 1455–9.

⁵ Baccini M, Biggeri A, Accetta G, *et al.* Heat effects on mortality in 15 European cities. *Epidemiology* 2008; **19**: 711–9.

⁶ Gennaro D'Amato, Lorenzo Cecchi, Mariella D'Amato, Isabella Annesi-Maesano
European Respiratory Review 2014 **23**: 161-169; DOI: 10.1183/09059180.00001714

⁷ European Lung Foundation. Climate Change and your lungs <https://europeanlung.org/en/information-hub/keeping-lungs-healthy/climate-change-and-your-lungs/>.

⁸ Baccini M, Biggeri A, Accetta G, *et al.* Heat effects on mortality in 15 European cities. *Epidemiology* 2008; **19**: 711–9.

admission and may even result in death^{9 10 11}. Similarly, abrupt changes in temperature and humidity have also been associated with increases in airway resistance and bronchoconstriction¹². Additionally, climate change will likely increase the frequency of thunderstorms (associated with an increase of allergic asthma outbreaks mediated through allergen exposure)^{13 14} as well as wildfires and dust storms, causing massive air pollution exposure, affecting not only the local communities but also producing harmful particles that can travel thousands of kilometers, affecting populations far away from the source^{15 16 17}, as we recently witnessed with devastating wildfires in Canada.¹⁸

Taking this into consideration, the European Respiratory Society and the European Lung Foundation recommend the following objectives and priorities for a long-term vision to reach the EU climate target for 2040:

- The **Ambient Air Quality Directive (AAQD)** is a core step for Europe to be the first climate neutral continent in the world, by achieving a “Zero Pollution Ambition” or net-zero greenhouse gas emissions by 2050, as set out by the European Green Deal in 2019. A full alignment with the WHO 2021 Air Quality Guidelines is key to achieve this goal. Simultaneously it is necessary to seek higher standards and ambitions for both the **Euro 7 Emissions Standards and the CO₂ emission standards for heavy-duty vehicles**¹⁹. Emissions regulation should be strengthened to ensure that vehicles meet the emission limits on the road, for all pollutants, under all possible driving conditions.

⁹ Iñiguez C, Royé D, Tobías A. Contrasting patterns of temperature related mortality and hospitalization by cardiovascular and respiratory diseases in 52 Spanish cities. *Environ Res* 2021; **192**: 110191.

¹⁰ Konstantinou G, Minelli C, Vicedo-Cabrera AM, Ballester J, Gasparrini A, Blangiardo M. Ambient heat exposure and COPD hospitalisations in England: a nationwide case-crossover study during 2007–2018. *Thorax* 2022; published online April 22. DOI:10.1136/thoraxjnl-2021-218374.

¹¹ Lei J, Peng L, Yang T, *et al.* Non-optimum ambient temperature may decrease pulmonary function: A longitudinal study with intensively repeated measurements among asthmatic adult patients in 25 Chinese cities. *Environment International* 2022; **164**: 107283.

¹² Hayes D, Collins PB, Khosravi M, Lin R-L, Lee L-Y. Bronchoconstriction triggered by breathing hot humid air in patients with asthma: role of cholinergic reflex. *Am J Respir Crit Care Med* 2012; **185**: 1190–6.

¹³ D’Amato G, Vitale C, D’Amato M, *et al.* Thunderstorm-related asthma: what happens and why. *Clin Exp Allergy* 2016; **46**: 390–6.

¹⁴ Andrew E, Nehme Z, Bernard S, *et al.* Stormy weather: a retrospective analysis of demand for emergency medical services during epidemic thunderstorm asthma. *BMJ* 2017; **359**: j5636.

¹⁵ Chen G, Guo Y, Yue X, *et al.* Mortality risk attributable to wildfire-related PM_{2.5} pollution: a global time series study in 749 locations. *Lancet Planet Health* 2021; **5**: e579–87.

¹⁶ Burke M, Driscoll A, Heft-Neal S, Xue J, Burney J, Wara M. The changing risk and burden of wildfire in the United States. *Proceedings of the National Academy of Sciences of the United States of America* 2021; **118**. DOI:10.1073/pnas.2011048118.

¹⁷ Achakulwisut P, Anenberg SC, Neumann JE, *et al.* Effects of Increasing Aridity on Ambient Dust and Public Health in the U.S. Southwest Under Climate Change. *GeoHealth* 2019; **3**: 127–44.

¹⁸ European Respiratory Society (ERS) and International Society for Environmental Epidemiology (ISEE) joint statement. Canada wildfires and record breaking air pollution in USA cities: interlinkages between climate change, wildfires, air pollution and health. https://www.ersnet.org/wp-content/uploads/2023/06/Statement-Climate-change-wildfire-and-health_FinalJune142023-004.pdf

¹⁹ European Public Health Alliance (EPHA). European Respiratory Society (ERS). *Cleaner road transport requires an ambitious Euro 7 Emission Standards Policy*. <https://www.ersnet.org/wp-content/uploads/2023/05/EPHA-ERS-Position-Paper-on-the-Euro-7.pdf>

- **Health care professionals** are one of the main actors involved in the application of adaptation strategies (e.g. providing advice to patients). They need to have the relevant information and resources to help their patients and become active partners in climate change mitigation efforts.
- Promoting the **reduction of carbon footprint created by the health sector** is an important step. The health sector is responsible for the 3-8% of the total greenhouse gas emissions in EU member states, because of the production of pharmaceuticals, medical goods, as well as energy consumption²⁰. Existing and new initiatives should be encouraged and supported at European and national level²¹.
- The European Institutions should provide the right tools at national and local level to ensure the appropriate implementation of infrastructures and innovative projects (i.e. supporting urban planners in promotion of active travel, expansion of public transport and green spaces), while promoting informational campaigns to raise awareness about the connection between climate change and respiratory health.
- Despite the overwhelming evidence we already have showing that climate change will present a major burden to respiratory disease patients, more **research** is still needed to fully map the burden of climate change on respiratory disease under different global warming scenarios, as well as to understand underlying biological mechanisms and complex interactions with other factors such as air pollution, social inequalities, etc. **Lifelong learning** and increase in funding opportunities of programmes such as Horizon and Erasmus + should be consistently promoted and supported to give professionals the opportunity to advance their research, to exchange expertise and good practices, as well as to participate in both European and international projects.
- **Interdisciplinary and interinstitutional collaboration** among a variety of stakeholders (i.e. health care professionals, scientists, epidemiologists, climate change experts, atmospheric scientists, statisticians, political scientists, policy makers as well as patients and patients advocates) is needed to create new approaches based on the existing scientific evidence. To achieve this, member states could create coordinating bodies to facilitate cooperation and communication among different scientists, stakeholders and institutions.

Climate change presents a major threat to lung health. ERS and ELF are calling for urgent measures to mitigate its adverse effects on respiratory patients. At the heart of these measures, bold actions are needed to reduce exposure to air pollution, which would bring immediate benefits to health as well as help directly tackle major sources of greenhouse gases. As the climate scenarios for the next century predict that warming will progress at a much faster speed (if no reductions in greenhouse gas emissions occur), the EU has the opportunity to implement a legal framework to foster climate change and air pollution reduction policies at European and national level, and ultimately support changes across the world.

²⁰ OECD/European Union (2020), *Health at a Glance: Europe 2020: State of Health in the EU Cycle*, OECD Publishing, Paris, <https://doi.org/10.1787/82129230-en>.

²¹ Health Care Without Harm Europe. <https://noharm-europe.org/issues/europe/our-projects>