

EFA's response to the consultation Adapting to Climate Change – EU Strategy communication (Directorate General for Climate Action)

The European Federation of Allergy and Airways Diseases Patients' Associations (EFA) is the voice of 200 million people living with allergy, asthma, and chronic obstructive pulmonary disease (COPD) in Europe. We bring together 39 national associations from 24 countries and channel their knowledge and patients' needs arising to the European institutions. We connect European stakeholders to ignite change and bridge the policy gaps on allergy and airways diseases so that patients live uncompromised lives, have the right and access to the best quality care and a safe environment.

EFA fully supports the European Commission initiative of renewing the scope of the 2013 EU Climate change adaption strategy to the future decade taking into account current times. We also welcome the many links the strategy has with the EU Green Deal and the EU zero pollution ambition. However we are concerned that health issues are not given the priority they should and we encourage the Commission to #ShowLeadership and apply a One Health in this strategy.

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A climate emergency is a human emergency

Climate change does not just dramatically affect the environment, it is also severely impacting human health. In a moment where Europe, and the world, are hitting temperature records, the fastest biodiversity loss in history and a growing number of destructive natural catastrophes, the number of people dying and suffering due to climate change is also increasing.

As allergy and respiratory patients, we are especially concerned about the following climate-change related issues:

Climate change and outdoor air quality

Deadly heatwaves

In Europe, allergy and respiratory disease patients are amongst the most vulnerable people against extreme weather events. A non-negligible consequence of global warming is the intensification in the frequency of heatwaves, which increase the number of hospitalisations and the mortality rate.

During the heatwave that affected France in 2003, hospitals in Paris registered 2,400 additional visits to the emergency care units and 1900 additional hospital admissions. A recent modelling predicts that **hospital admissions in Europe will more than double** in the period 2021-2050¹.

Emergency visits and hospitalisations are not the only health impact and cost to our societies under heatwaves. People literally die to extreme temperatures. The heatwave in France killed in less than three weeks 14,729 people, equivalent to an excess mortality of 55%². According to EU project EuroHEAT, during heatwaves mortality has risen up to 33% in European cities, **affecting the most the children, the elderly and specially people with chronic respiratory diseases**³.

These extreme temperature events not only affect people with respiratory disease, but in general patients with chronic conditions. American researchers have observed that during heatwaves in California there is a significant impact on cardiovascular disease, respiratory disease, dehydration, acute renal failure, heat illness, and mental health⁴. It is therefore paramount that a future EU strategy on climate change adaptation fully addresses health protection and needs so that future actions takes into the account the needs of vulnerable people, who are also part of the society, and suffer disproportionately.

Wildfire and lung-fonction decline

Wildfire smoke contains many air pollutants of concern for public health, such as carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs).

Consistent evidence documents associations between wildfire smoke exposure and general respiratory health effects, specifically exacerbations of asthma and COPD. Exacerbation is a significant, debilitating event and a major setback in disease control in the life of patients with asthma and COPD, and in COPD it means permanent decline of lung function. Due to the toxicity of wildfire smoke, people with respiratory conditions register **increased hospital admissions, visits to the physician, reliever medication use and lung function decline**⁵.

A future EU climate change strategy should frame how to especially protect those at highest risk. As for tobacco smoke, exposure to wildfire smoke is associated with an increase number in preventable deaths. A meta-analysis of data from 2003 to 2010 in 10 cities in Europe found increases in cardiovascular mortality associated with PM10 levels that were stronger on smoke-affected days

¹ Heat-related respiratory hospital admissions in Europe in a changing climate: a health impact assessment, C Åström, H Orru, J Rocklöv, et al, Heat BMJ Open 2013;3:e001842

<https://bmjopen.bmjjournals.org/content/3/1/e001842>

² Excess mortality related to the August 2003 heat wave in France, A. Fouillet, G. Rey, F. Laurent, G. Pavillon, S. Bellec, C. Ghienneuc-Jouyaux, J. Clavel, E. Jouglard, D., Int Arch Occup Environ Health. 2006 Oct; 80(1): 16–24:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950160/>

³ The impact of heat waves on mortality in 9 European cities: results from the EuroHEAT project D'Ippoliti, P. Michelozzi, C. Marino, F. de'Donato, B. Menne, K. Katsouyanni, U. Kirchmayer, A. Analitis, M. Medina-Ramón, A. Paldy, R. Atkinson, S. Kovats, L. Bisanti, A. Schneider, A. Lefranc, C. Iñiguez, C. Perucci Environ Health. 2010 Jul 16;9:37. doi: 10.1186/1476-069X-9-37: <https://pubmed.ncbi.nlm.nih.gov/20637065/>

⁴ The impact of recent heat waves on human health in California. Guirguis K, Gershunov A, Tardy A, Basu R. J Appl Meteorol Climatol. 2014;53:3–19. <https://journals.ametsoc.org/jamc/article/53/1/3/13739>

⁵ Critical Review of Health Impacts of Wildfire Smoke Exposure, C. Reid, M. Brauer, F. Johnston, M. Jerrett, J. Balmes, C. Elliott, Environ Health Perspect. 2016 Sep; 124(9): 1334–1343: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5010409/>

than on non-affected days⁶. Research on wildfire and mortality rates due to respiratory disease is mostly coming from USA California, but the existing evidence from Europe also confirms a **direct increase in mortality among asthma and COPD patients due to wildfire**⁷.

More pollen and more allergenic

EFA would like to draw the Commission's attention to **pollen emissions**, which are intimately linked with the onset of respiratory allergy. Despite pollens are from natural sources, they are very much affected and exacerbated by climate change and human industrial processes.

At EFA, we are calling the European Commission for action on pollen issues and the EU Climate change adaptation strategy, because of its all-encompassing nature, is a perfect occasion to start. As patients, we are affected by climate-change related pollen in two ways.

On the one hand, climate change is dramatically affecting the plant cycles. Consistent evidence shows that independently of the species planted for food, climate change is contributing to:

- **extended seasonal duration**⁸. For example, in Poland the fall weed season has increased in duration in recent decades because of a later end date to the season⁹. Moreover, the lengthier the pollen season, the higher the number of people sensitised to pollen, as a study from Italy evaluating 1981-2007 demonstrates¹⁰.
- **increased amount of pollen released during the seasons**, heavily impacting human health¹¹.
- **Increased allergenicity**. There is some evidence that greater temperatures affect IgE binding. Namely, Finnish researchers have demonstrated that birch pollen (Bet v 1) extracts from trees grown in warmer temperatures had stronger IgE binding intensity¹².

On the other hand, the production of allergenic pollen is also very much affected by the planting of highly allergenic trees and plants in urban settings. These include allergenic species indigenous in Europe, such as birch trees, olive trees, oilseed rapes, which are found at a wide scale in monocultures, as well as new or non-indigenous plants such as ragweed, which was brought in Europe by humans

⁶ Critical review of health impacts of wildfire smoke exposure. Reid CE, Brauer M, Johnston FH, Jerrett M, Balmes JR, Elliot CT. Environ Health Perspect. 2016;124:1334–1343

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5010409/>

⁷ Climate change, extreme weather events, air pollution and respiratory health in Europe

M. De Sario, K. Katsouyanni, P. Michelozzi, European Respiratory Journal 2013 42: 826-843:

<https://erj.ersjournals.com/content/42/3/826>

⁸ Ziska L. et al., Temperature-related changes in airborne allergenic pollen abundance and seasonality across the northern hemisphere: a retrospective data analysis, 2019,

[https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(19\)30015-4/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(19)30015-4/fulltext)

⁹ Trends in atmospheric concentrations of weed pollen in the context of recent climate warming in Poznan (western Poland), Bogawski P., Grewling L., Nowak M., Smith M., Jackowiak B, Int J Biometeorol. 2014; 58: 1759-1768: <https://link.springer.com/article/10.1007/s00484-013-0781-5>

¹⁰ Possible role of climate changes in variations in pollen seasons and allergic sensitizations during 27 years. Ariano R., Canonica G.W., Passalacqua G., Ann Allergy Asthma Immunol. 2010; 104: 215-222:

<https://pubmed.ncbi.nlm.nih.gov/20377111/>

¹¹ Damialis A., Traindl-Hoffmann C., Treundler R. "Climate Change and Pollen Allergies"

https://link.springer.com/chapter/10.1007/978-3-030-02318-8_3

¹² Genetic and environmental factors affecting the allergenicity of birch (*Betula pubescens* ssp. *czerepanovii* [Orl.] Hämet-ähti) pollen, J U Ahlholm, M L Helander, J Savolainen, Clin Exp Allergy. 1998 Nov;28(11):1384-8:

<https://pubmed.ncbi.nlm.nih.gov/9824411/>

and has spread across the continent and has become invasive posing major challenges to respiratory health¹³.

Researchers within the EU project Atopica estimated that air concentrations of allergenic **ragweed pollen could quadruple in Europe by 2050**. Climate change would be responsible for two thirds of this increase, the remaining third would be due to the colonisation of the plant as a result of human activities¹⁴. Simulation studies have demonstrated that the number of subjects sensitized to ragweed is expected to more than double in Europe within only a few decades¹⁵. In the meantime, data shows an increasing trend in yearly amount of airborne pollen that was more pronounced in urban areas.¹⁶

In light of the above, EFA holds that our longstanding ask **for a real-time monitoring of pollen remains urgent as ever**, as it would ensure the timely dissemination of and access to information to citizens with pollen allergies¹⁷. Unfortunately in many European countries, pollen monitoring and information remains a voluntary activity conducted by researchers and patient organisations.

Climate change and indoor air quality

Climate change affects it all, so it does the quality of indoor environment. The adverse health effects indoors due to climate change are both direct and indirect such as building overheating due to insufficient or nonexistent ventilation systems exacerbated by energy efficiency which is not synchronised with healthy indoor climate, indoor air pollution, biological contamination, and flooding and water damage¹⁸. For example, the catastrophic floods resulting from Hurricanes Katrina and Rita in New Orleans, Louisiana, in 2005 promoted heavy microbial and mould growth, with levels of indoor moulds, endotoxins, and fungal glucans similar to levels found in agricultural environments and at levels associated with adverse respiratory health effects¹⁹.

According to a recent European survey, indoor pollutants have a big impact on a patient's condition, with one in two patients not feeling protected by the authorities against indoor pollution. Their

¹³ Hamaoui-Laguel L., Vautard R., Liu L., Solmon F., Viovy N., Khvorostyanov D. et al, Effects of climate change and seed dispersal on airborne ragweed pollen loads in Europe. Nat Climate Change. 2015; 5: 766-771:

<https://www.nature.com/articles/nclimate2652>

¹⁴ Effects of climate change and seed dispersal on airborne ragweed pollen loads in Europe, 2015 Hamaoui-Laguel L., Vautard R., Liu L., Solmon F., Viovy N., Khvorostyanov D., Essl F., Chuine I., Colette A., Semenov M.A., Schaffhauser A., Storkey J., Thibaudon M. & Epstein M.M., <https://www.nature.com/articles/nclimate2652>

¹⁵ Lake I.R., Jones N.R., Agnew M., Goodess C.M., Giorgi F., Hamaoui-Laguel L., et al. Climate change and future pollen allergy in Europe, Environ Health Perspect. 2017; 125: 385-391:

<https://pubmed.ncbi.nlm.nih.gov/27557093/>

¹⁶ Ziello C., Sparks T.H., Estrella N., Belmonte J., Bergmann K.C., Bucher E. et al. Changes to airborne pollen counts across Europe, PLoS One. 2012; 7: e34076: <https://pubmed.ncbi.nlm.nih.gov/27557093/>

¹⁷ We need to secure real-time pollen monitoring in Europe!, EFA Press Release 06 September 2013:

<https://www.efanet.org/news/2198-17press-release-we-need-to-secure-real-time-pollen-monitoring-in-europe>

¹⁸ Impact of climate change on the domestic indoor environment and associated health risks in the UK, S. Vardoulakisa, C. Dimitroulopoulou, J. Thornes, K. Laid, J. Taylor, I. Myers, C. Heaviside, A. Mavrogianni, C. hrubsole, Z. Chalabib, M. Daviese, P. Wilkinson, Environment International Volume 85, December 2015, Pages 299-313: <https://www.sciencedirect.com/science/article/pii/S0160412015300507?via%3Dihub>

¹⁹ Impact of weather and climate change with indoor and outdoor air quality in asthma: A Work Group Report of the AAAAI Environmental Exposure and Respiratory Health Committee, J. Poole, C. Barnes, J. Demain, S. Kagen, J. Portnoy, A. Nel, 2019 Journal of Allergy and Clinical Immunology Volume 143, Issue 5, P1702-1710: [https://www.jacionline.org/article/S0091-6749\(19\)30281-7/fulltext](https://www.jacionline.org/article/S0091-6749(19)30281-7/fulltext)

perception raises the question on whether the current EU legal framework is sufficient in safeguarding human health²⁰.

Long-term exposure to polluted air indoors can result in the development of respiratory diseases, aggravate allergy and chronic respiratory diseases such as asthma and chronic obstructive pulmonary disease (COPD)²¹²²²³. The health and economic burdens of poor indoor air quality are alarming:

- People are 40% more likely to have asthma when living in a damp or mouldy home²⁴.
- About 10-15% of new cases of childhood asthma in Europe can be attributed to indoor exposure to dampness and mould. This exposure can be linked to more than 37,000 years of healthy life lost for European children²⁵.
- Children living in damp, mouldy homes are between one and a half and three times more prone to coughing and wheezing – symptoms of asthma and other respiratory conditions – than children living in dry homes²⁶.
- Generally, children living with unhealthy indoor climates are significantly more likely to report eczema, coughing, wheezing, asthma, allergy and poor respiratory health²⁷.

A study from 2016 showed that over 2 million disability adjusted life years (DALYs) are annually lost in the EU due to polluted indoor air²⁸. The indoor air quality issue is a regulatory matter as it is affected by many variable, whose control belongs to different parties: climate change, outdoor air and temperature, buildings and its systems, construction materials, finishing products, furnishing, cooking systems, cleaning products, maintenance and occupant behaviour. It is a classic example of an issue that imperatively needs to be considered in climate change adaptation/mitigation.

²⁰ Active Patients Access Care report, 2019 European Federation of Allergies and Airways Diseases Patients' Associations (EFA): https://www.efanet.org/images>ShowLeadership/Report-Showleadership_FINAL.pdf

²¹ X.Q. Jiang, X.D. Mei, D. Feng, "Air Pollution and Chronic Airway Diseases", *Journal of Thoracic Disease*, 2016 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4740163/>

²² E. Garshick, "Effects of short- and long-term exposures to ambient air pollution on COPD", *European Respiratory Journal*, 2014 <https://erj.ersjournals.com/content/erj/44/3/558.full.pdf>

²³ D. Schraufnagel et al., " Air Pollution and Noncommunicable Diseases", *Chest Journal*, 2019 [https://journal.chestnet.org/article/S0012-3692\(18\)32723-5/fulltext#sec5](https://journal.chestnet.org/article/S0012-3692(18)32723-5/fulltext#sec5)

²⁴ P. Foldbjerg, G. Grün, S. Urlaub "Mould and dampness in European homes and their impact on health", Fraunhofer-Institut für Bauphysik IBP, 2016

https://www.researchgate.net/publication/310600268_Mould_and_dampness_in_European_homes_and_their_impact_on_health,

²⁵ World Health Organisation, "Environmental burden of disease associated with inadequate housing. A method guide to the quantification of health effects of selected housing risks in the WHO European Region", 2011 http://www.euro.who.int/_data/assets/pdf_file/0017/145511/e95004sum.pdf?ua=1

²⁶ Peat, J K, et al. "Effects of Damp and Mould in the Home on Respiratory Health: a Review of the Literature." *Allergy*, U.S. National Library of Medicine, 1998 www.ncbi.nlm.nih.gov/pubmed/9534909,

²⁷ Healthy Homes Barometer 2019: Growing up in (un)healthy buildings, 2019 https://velcdn.azureedge.net/~/media/com/healthy%20homes%20barometer/hhb-2019/hhb_main-report_2019.pdf

²⁸ A. Asikainen, P. Carrer, S. Kephalopoulos, E. de Oliveira Fernandes, P. Wargocki, O. Hänninen, "Reducing burden of disease from residential indoor air exposures in Europe", *Environmental Health*, March 2018, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895703/#:~:text=Conclusions, and%20by%20controlling%20indoor%20sources>

The future EU climate change adaptation strategy should propose climate change mitigation and adaptation measures in the residential building sector involving improved building design and ventilation, passive cooling, and energy efficiency measures with the aim to benefit health outcomes and certainly not harm them.

Climate adaption and mitigation should protect human health: EFA Patients recommendations

The European Union has the mandate to ensure a high level of human health protection in the definition and implementation of all Union policies and activities (TFEU Art. 168), and consequently to adopt a health-in-all-policies approach. Therefore EFA fully welcomes the development of an observatory on social/health vulnerability to help identify health and social/distributional risks linked to climate change.

A future Horizon Europe mission on Adaptation to Climate Change, including Societal Transformation, is an idea that we also support, provided that it fully integrates the adaptation needs to protect our health and ultimately reduce the prevalence of climate-provoked allergy and airways diseases, and includes those who represent citizens and patients affected.

A future EU climate adaptation strategy should aim at introducing effective action to prevent climate-change related diseases and mortality:

- Finance **conclusive European research studies** linking climatology with environmental health-diseases, to generate the missing evidence that will serve to propose clear and effective health-related climate adaptation indicators and diminish political hesitancy
- Improving urban resilience to climate change through effective **city planning across policies** addressing buildings, mobility and green spaces
- Strengthening national and European **emergency alert systems** by incorporating detailed considerations on the short and long-term effects climate change events have on allergy and respiratory health
- Reinforcing the European **civilian protection mechanisms** and their readiness to intervene not only during natural catastrophes but also against extreme climate events such as heatwaves
- Supporting **regional and local authorities** on the instruments and services to effectively protect those living with chronic diseases such as allergy and respiratory disease, such as helplines, monitoring, priority access to chilled areas, protection material such as anti-dust masks and cooling systems, and financial support for building adaptation.
- Investing in **clear, timely and accessible public information** on the phenomena linked to climate change and their effects on health tailoring the information to specific vulnerable groups such as allergy and airways diseases patients.
- **Empowering citizens**, including those most vulnerable, to take action locally and in their own or rented homes for healthy resilient living.