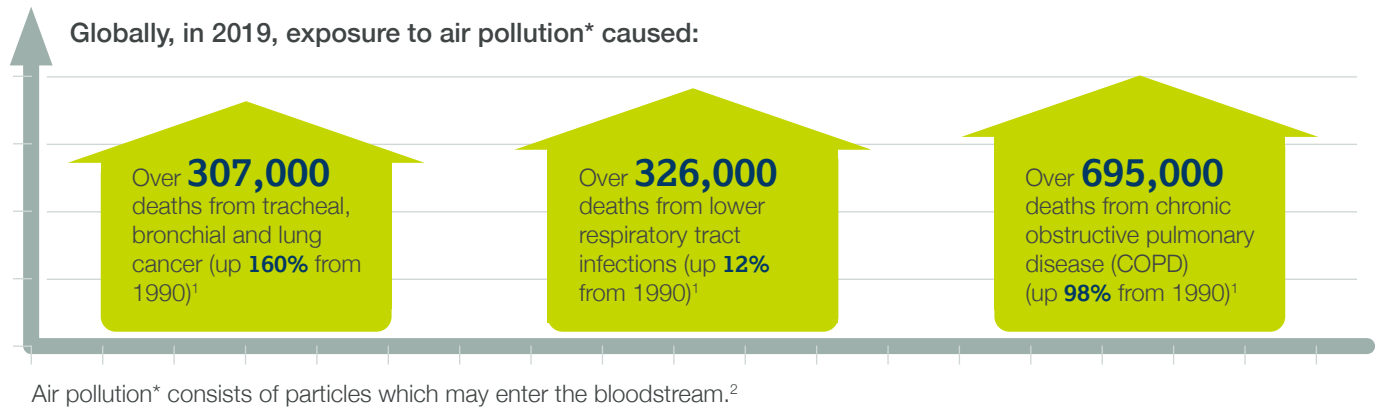


Climate change and respiratory diseases

Climate change is an important contributor to increased deaths and morbidity



Children may be disproportionately affected by climate-related respiratory issues



Children are vulnerable to air pollution as their lungs are still developing and they breathe twice as fast as adults.³



Almost half of lower respiratory tract infection deaths in children under five are caused by air pollution (soot) generated in the home.⁴



A staggering two billion children still live in areas where pollution exceeds standards set by the World Health Organization.³

What can be done to improve patient outcomes and reduce the carbon footprint of respiratory care?

All healthcare interactions have a carbon footprint⁵

In respiratory care:

Patients with uncontrolled asthma or COPD have higher healthcare demands, and their care is associated with an increased carbon footprint.^{6-8†}

In the UK, poorly controlled asthma has a three-times greater carbon footprint per capita than well-controlled asthma, with greater healthcare resource utilisation and higher use of SABA[‡] reliever inhalers accounting for much of the difference.⁸

Therefore, policies and actions that advance implementation of guideline-based care for respiratory disease and improve patient outcomes are needed to protect the health of people and the planet.

Drive early and accurate diagnosis as well as implement evidence-based guidelines to reduce healthcare utilisation and use of reliever inhalers¹⁰

- Partner with healthcare system stakeholders, including specialist centres and patient advocacy groups to implement local guidelines to prioritise disease control and improve patient outcomes¹¹

Deliver targeted interventions¹²

- Prescribe the right medication at the right dose,¹¹ to the right person
- Provide targeted interventions to high-risk patients e.g. ensuring good inhaler technique¹¹

Adopt community-based care and use of digital technologies¹³

- Conduct digital respiratory assessments when appropriate¹¹
- Promote use of apps that facilitate self-management¹¹

Drive improved clinical knowledge about the effects of climate change¹⁴

- Educate clinicians on sustainable practice¹⁴ and include climate change on the medical curricula¹⁵
- Promote safe disposal and inhaler recycling¹¹

Transition to a future of climate-friendly propellants in respiratory inhalers

- Lower-carbon propellant options for inhalers are in development¹⁶⁻¹⁸
- This transition is important to enable continued personalisation of inhaler choice for optimal disease control and better health outcomes¹⁹
- Working with regulators will be critical to support the safe and efficient transition to low Global Warming Potential inhaled medicines

* Ambient particulate matter pollution
† Observational analysis of 10 SABA use IN Asthma (SABINA) datasets involving 1,033,564 patients (≥12 y) from Canada, France, the Netherlands, Poland, Spain, the United Kingdom, and the United States.⁸

References:

1. Wu Y, Song P, Lin S, et al. 2021. *Front Public Health* 9: 740900
2. World Health Organization. <https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/health-impacts/types-of-pollutants> [accessed February 2023].
3. United Nations Children's Fund. 2021. *The climate crisis is a child rights crisis: introducing the children's climate risk index*.
4. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health> [accessed February 2023].
5. Tennison I, Roschnik S, Ashby B, et al. 2021. *Lancet Planet Health* 5(2): e84-e92
6. Quint JK, Arnetorp S, Kocks JWH, et al. 2022. *J Allergy Clin Immunol Pract* 10(9): 2297-309.e10
7. Janson C, Maslova E, Wilkinson A, et al. 2022. *Eur Respir J* 60(2): 2102760
8. Wilkinson A, et al. Greenhouse gas emissions associated with asthma care in the UK: results from SABINA CARBON. Oral session presented at European Respiratory Society (ERS) International Congress, 2021 Sep 5-8.
9. Janson C, Menzies-Gow A, Nan C, et al. 2020. *Adv Ther* 37(3): 1124-35.
10. Crowther L, Pearson M, Cummings H, et al. 2022. *BMJ Open Respir Res* 9(1): e001155
11. The Primary Care Respiratory Society. 2020. *PCRS Greener Respiratory Healthcare That is Kinder to the Environment White Paper and Call to Action*.

‡ Short-acting β₂-agonist. Many patients experiencing asthma symptoms use a SABA as a reliever medication; however, taking a SABA alone does not address inflammation, leaving patients at risk of asthma attacks.⁹ One third of patients across Europe are over-reliant on SABAs,⁹ which account for 66% of the emissions from inhalers.⁸

12. Mortimer F. 2010. *Clin Med (Lond)* 10(2): 110-11.
13. The World Bank Group. 2017. *Climate-smart healthcare: low-carbon and resilience strategies for the health sector*.
14. Dzau VJ, Levine R, Barrett G, et al. 2021. *N Engl J Med* 385(23): 2117-19
15. Jamilia F. 2022. *The climate crisis and its health impacts*.
16. AstraZeneca. AstraZeneca progresses Ambition Zero Carbon programme with Honeywell partnership to develop next-generation respiratory inhalers. Available at: <https://www.astrazeneca.com/press-releases/astrazeneca-progresses-ambition-zero-carbon-programme-with-honeywell-partnership-to-develop-next-generation-respiratory-inhalers>. [Accessed February 2023].
17. Chiesi. Chiesi Group calls for #ActionOverWords in the fight against climate change. [Online] Available at: <https://www.chiesi.com/en/chiesi-group-calls-for-actionoverwords-in-the-fight-against-climate-change/>. [Accessed February 2023].
18. GSK. GSK announces major renewable energy investment and low carbon inhaler programme alongside Life Sciences sector Race to Zero 'breakthrough' at NYC Climate Week. [Online]. Available at: [https://www.gsk.com/en-gb/media/press-releases/gsk-announces-major-renewable-energy-investment-and-low-carbon-inhaler-programme-alongside-life-sciences-sector-race-to-zero-breakthrough-at-nyc-climate-week/#:~:text=A%20new%20lower%20greenhouse%20gas,dose%20\[A%20February%202023](https://www.gsk.com/en-gb/media/press-releases/gsk-announces-major-renewable-energy-investment-and-low-carbon-inhaler-programme-alongside-life-sciences-sector-race-to-zero-breakthrough-at-nyc-climate-week/#:~:text=A%20new%20lower%20greenhouse%20gas,dose%20[A%20February%202023)
19. Doyle S, et al. What happens to patients who have their asthma device switched without their consent? *Prim Care Respir J* 2010; 19 (2): 131-139.