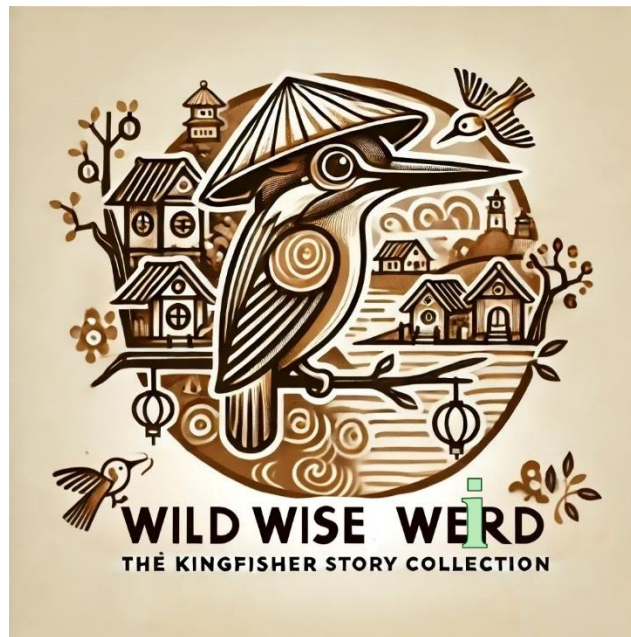


# Breathing in Fire: The Growing Respiratory Threat of Wildfire Smoke

Cú Muõĩ

14-04-2025



“Kingfisher: “Sir, I’ve encountered ghosts three times. The first time, while I was sleeping, a white ghostly figure appeared. Its face was blurry and indistinct but exuded a heavy and ominous aura. The ghost approached, plucked every single feather from my body, and then hung me over a stove. The fire was scorching, and my fat dripped into the flames, sizzling...””

In “Ghosts”; *Wild Wise Weird* [1]



•••••

As climate change accelerates, wildfires are becoming more frequent, intense, and widespread [2-4]. An international study published in *Nature Sustainability* offers compelling evidence that wildfire-specific fine particulate matter (PM<sub>2.5</sub>)—tiny airborne particles less than 2.5 micrometers in diameter—poses a serious and disproportionate threat to respiratory health across the globe [5].

Drawing on data from 1,052 communities in Australia, Brazil, Canada, Chile, New Zealand, Vietnam, Thailand, and Taiwan from 2000 to 2019, the study assessed the short-term impacts of wildfire-derived PM<sub>2.5</sub> on hospitalizations for six respiratory conditions. A 1 µg/m<sup>3</sup> increase in wildfire-specific PM<sub>2.5</sub> was associated with a 0.36% rise in hospitalizations for all respiratory causes, with the highest risk increase (0.79%) recorded for influenza.

Vulnerable groups—particularly children, older adults, and residents of low-income or highly polluted areas—faced significantly greater risks. In countries such as Brazil, Thailand, Vietnam, and Taiwan, wildfire PM<sub>2.5</sub> had the greatest impact, while asthma-related hospitalizations were notably elevated in Australia and New Zealand.

Though wildfire smoke contributed just 17.1% of ambient PM<sub>2.5</sub> levels, it accounted for a staggering 42.4% of PM<sub>2.5</sub>-related respiratory hospitalizations. Compared with pollution from non-wildfire sources, wildfire PM<sub>2.5</sub> was significantly more harmful across all categories of respiratory illness.

The study also documented a concerning trend: the burden of wildfire-related respiratory hospitalizations is increasing over time, particularly in Australia, Taiwan, and Vietnam. This rise reflects not only greater exposure but also amplified vulnerability due to population aging, urbanization, and persistent socioeconomic inequalities [6,7].

This research is the most extensive of its kind, applying a unified analytical framework across countries to produce robust and comparable estimates. It provides clear evidence that wildfire smoke is not only an environmental issue but a growing public health emergency.

The findings highlight a profound nature–human nexus: as climate-driven wildfires become more severe, the health of populations—especially the most vulnerable—is increasingly at risk. Addressing this challenge requires urgent and sustained action to mitigate emissions, improve air quality monitoring, and strengthen healthcare responses. Protecting human health in the age of climate change means recognizing our deep interdependence with the natural world [8,9].

## References

- [1] Vuong QH. (2024). *Wild Wise Weird*. <https://www.amazon.com/dp/B0BG2NNHY6/>
- [2] Xu R, et al. (2020). Wildfires, global climate change, and human health. *The New England Journal of Medicine*, 383, 2173-2181. <https://www.nejm.org/doi/10.1056/NEJMSr2028985>
- [3] Morawska L, et al. (2021). The state of science on severe air pollution episodes: quantitative and qualitative analysis. *Environment International*, 156, 106732. <https://doi.org/10.1016/j.envint.2021.106732>
- [4] Senande-Rivera M, et al. (2022). Spatial and temporal expansion of global wildland fire activity in response to climate change. *Nature Communications*, 13, 1208. <https://www.nature.com/articles/s41467-022-28835-2>
- [5] Zhang Y, et al. (2025). Respiratory risks from wildfire-specific PM2.5 across multiple countries and territories. *Nature Sustainability*. <https://www.nature.com/articles/s41893-025-01533-9>
- [6] Xu R, et al. (2023). Climate change, environmental extremes, and human health in Australia: challenges, adaptation strategies, and policy gaps. *The Lancet Regional Health: Western Pacific*, 40, 100936. [https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065\(23\)00254-7/fulltext](https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(23)00254-7/fulltext)
- [7] Xu R, et al. (2023). Global population exposure to landscape fire air pollution from 2000 to 2019. *Nature*, 621, 521-529. <https://www.nature.com/articles/s41586-023-06398-6>
- [8] Ho MT, Nguyen DH. (2025). Of Kingfisher and Man. <https://philarchive.org/rec/HOOKAW>
- [9] Nguyen MH. (2024). How can satirical fables offer us a vision for sustainability? *Visions for Sustainability*. <https://ojs.unito.it/index.php/visions/article/view/11267>