# Rise in indoor wood burning linked to accelerated lung decline in affluent UK communities



Burning wood indoors, a practice growing in popularity across Europe and especially in the UK, has been linked to significant lung damage and heightened health risks comparable to cigarette smoke, according to recent research presented at the European Respiratory Society Congress. The University College London study, which analysed data from over 11,000 participants in the English Longitudinal Study of Ageing alongside property energy certificates and census data, found that use of domestic wood-burning stoves is increasingly common in affluent, predominantly white urban areas, including within designated Smoke Control Zones. This growing trend is concerning because domestic wood burning has become one of the largest single contributors to fine particulate matter (PM2.5) pollution, which can penetrate deep into the lungs and cause respiratory issues.

The researchers evaluated lung function over eight years, measuring forced expiratory volume in one second (FEV1), a key indicator of lung health. They discovered that individuals aged 70 to 79 using wood-burning stoves experienced a faster decline in lung function compared to non-users—losing an average of 0.12 litres versus 0.07 litres respectively. Despite lower smoking rates and fewer pre-existing lung conditions among stove users, their lung function deteriorated more rapidly, suggesting that particulate matter from wood smoke inflames and damages respiratory tissues similarly to tobacco smoke. The study coincided with a notable rise in wood fuel use, with self-reported figures increasing from 10% in 2004/05 to 18% in 2021/22.

This health impact is underscored by complementary research from the University of Sheffield, which monitored indoor air quality and found pollutant levels in homes with wood stoves were three times higher during regular use, with dangerous spikes when stoves were refuelled. Such findings raise alarm about indoor exposure to harmful particulate matter, which can exacerbate respiratory illnesses and contribute to long-term damage.

The wider implications of wood burning as a pollution source are evident in regional and national data. A University of Birmingham study highlighted that wood burning accounts for about 20% of PM2.5 pollution in Birmingham and the West Midlands, marking it as a significant environmental health concern. Nationally, it is estimated that domestic wood burning was responsible for 38% of the UK’s PM2.5 emissions in 2019, mostly driven by around 8% of the population who burn wood indoors, often for aesthetic reasons rather than heating efficiency. This demographic skews wealthier, which aligns with findings from UCL's research indicating higher stove use in affluent urban areas.

Health experts warn that the rise in domestic wood burning could undermine public health efforts. Sarah Sleet, Chief Executive of Asthma and Lung UK, emphasised that the increased adoption of wood burners—primarily for their visual appeal—might have serious respiratory consequences for users and their families. She called for stronger government guidance, clearer public awareness, and tighter regulation around domestic wood burning to mitigate these risks. Similarly, Professor Ane Johannessen from the European Respiratory Society noted that while newer "eco-design" wood stoves are marketed as cleaner, older models still prevalent in many homes pose serious risks, and even modern variants may not be entirely safe. She recommended that health professionals routinely inquire about wood stove use in patients presenting unexplained lung function decline or chronic respiratory symptoms.

Further compounding concerns, a study published in the Journal of Building Engineering quantified the impact of indoor wood-burning emissions on life expectancy. It estimated that exposure to PM2.5 from using a fireplace for four hours daily could reduce life expectancy by up to 1.6 years, while woodstove use could shorten it by up to half a year, highlighting the severity of the health consequences.

Despite mounting evidence of the health dangers, policy responses remain cautious. The UK government recently confirmed that modern wood-burning stoves will be permitted as secondary heating sources in new homes under the Future Homes Standard, following industry lobbying that argues for their role in energy resilience and renewable fuel use. This move has been criticised by health and environmental advocates who argue it contradicts efforts to reduce air pollution and carbon emissions.

In Wales, concern about air quality is high, with over half of the population worried about it. Yet awareness of wood burner risks remains limited, according to Asthma + Lung UK Cymru. The charity has urged the Welsh Government to tighten regulations and provide more robust guidance on domestic burning to protect vulnerable groups, such as those with lung conditions.

Taken together, these findings and expert assessments paint a worrying picture of domestic wood burning as an emerging public health hazard in affluent European communities. The aesthetic and cultural appeal of wood stoves is increasingly at odds with their hidden costs: long-term lung damage, worsened respiratory conditions, and broader air quality degradation. Policymakers and public health officials face the delicate challenge of balancing tradition and environmental goals with emerging scientific evidence that cautions against unchecked domestic wood burning.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued), [[6]](https://www.theguardian.com/environment/2021/feb/16/home-wood-burning-biggest-cause-particle-pollution-fires)
* Paragraph 2 – [[1]](https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued), [[4]](https://www.sheffield.ac.uk/news/indoor-wood-stoves-release-harmful-emissions-our-homes-study-finds)
* Paragraph 3 – [[2]](https://www.birmingham.ac.uk/news/2024/woodburning-creates-major-pm2.5-air-pollution-issue-in-west-midlands), [[6]](https://www.theguardian.com/environment/2021/feb/16/home-wood-burning-biggest-cause-particle-pollution-fires)
* Paragraph 4 – [[1]](https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued), [[6]](https://www.theguardian.com/environment/2021/feb/16/home-wood-burning-biggest-cause-particle-pollution-fires)
* Paragraph 5 – [[1]](https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued)
* Paragraph 6 – [[5]](https://www.sciencedirect.com/science/article/pii/S2352710223020284)
* Paragraph 7 – [[7]](https://www.homebuilding.co.uk/news/government-caves-in-as-wood-burning-stoves-allowed-in-future-homes-standard-despite-health-warnings)
* Paragraph 8 – [[3]](https://www.asthmaandlung.org.uk/media/press-releases/air-quality-worry-over-half-of-people-in-wales-but-many-dont-see-wood-burning-danger-3)
* Paragraph 9 – [[1]](https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued), [[6]](https://www.theguardian.com/environment/2021/feb/16/home-wood-burning-biggest-cause-particle-pollution-fires), [[7]](https://www.homebuilding.co.uk/news/government-caves-in-as-wood-burning-stoves-allowed-in-future-homes-standard-despite-health-warnings), [[3]](https://www.asthmaandlung.org.uk/media/press-releases/air-quality-worry-over-half-of-people-in-wales-but-many-dont-see-wood-burning-danger-3)

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## Bibliography

1. <https://www.express.co.uk/news/uk/2114893/popular-household-item-beloved-brits-could-ruining-your-health-grim-warning-issued> - Please view link - unable to able to access data
2. <https://www.birmingham.ac.uk/news/2024/woodburning-creates-major-pm2.5-air-pollution-issue-in-west-midlands> - A study by the University of Birmingham reveals that woodburning significantly contributes to fine particulate matter (PM2.5) levels in Birmingham and the West Midlands, accounting for approximately 20% of the total PM2.5 mass. The research highlights the health risks associated with PM2.5 emissions from woodburning activities and calls for targeted measures to mitigate these risks. The study also notes a substantial increase in woodburning activity over the past decade, making it a major source of air pollution in the region. The researchers advocate for immediate actions at local and national levels to reduce wood burning and improve air quality.
3. <https://www.asthmaandlung.org.uk/media/press-releases/air-quality-worry-over-half-of-people-in-wales-but-many-dont-see-wood-burning-danger-3> - Asthma + Lung UK Cymru has released a report urging stricter regulations on wood-burning stoves and increased public awareness about the health risks of pollutants from domestic burning. The report highlights that over half of people in Wales are concerned about air quality, yet less than half are aware of the dangers of wood burning stoves. The charity emphasizes the need for the Welsh Government to address air pollution from domestic burning, which poses significant risks to public health, especially for those with lung conditions, and to strengthen its draft smoke control guidance.
4. <https://www.sheffield.ac.uk/news/indoor-wood-stoves-release-harmful-emissions-our-homes-study-finds> - Researchers from the University of Sheffield have found that indoor wood-burning stoves emit harmful levels of particulate matter into homes. The study monitored air quality in homes with log burners and discovered that during regular use, levels of harmful particulate matter were three times higher than when the stoves were not in use. The research also found that peak levels of harmful particulate matter occurred when the stove door was opened for refuelling, leading to significant short-term bursts of pollution. The study emphasizes the need for greater awareness of the risks associated with wood-burning stoves and suggests that users should limit burning periods and reduce the number of times the stove door is opened during use.
5. <https://www.sciencedirect.com/science/article/pii/S2352710223020284> - A study published in the Journal of Building Engineering examines the health effects of PM2.5 emissions from woodstoves and fireplaces in living spaces. The research measures the emission factors of PM2.5 from these sources and estimates the decrease in life expectancy due to exposure. The findings indicate that using a fireplace for 4 hours per day can shorten life expectancy by 1–1.6 years, while using a woodstove during the same period can reduce life expectancy by up to half a year. The study highlights the significant health risks associated with indoor wood burning and underscores the need for cleaner alternatives.
6. <https://www.theguardian.com/environment/2021/feb/16/home-wood-burning-biggest-cause-particle-pollution-fires> - An article in The Guardian reports that domestic wood burning is the largest source of fine particulate matter (PM2.5) pollution in the UK, accounting for 38% of PM2.5 emissions in 2019. The report highlights that 8% of the UK population contributes to this pollution by burning wood indoors, with almost half of these individuals being affluent and choosing to burn wood for aesthetic reasons rather than heating. The article emphasizes the health risks associated with PM2.5 pollution, including respiratory and cardiovascular diseases, and notes that the government is not planning a ban on wood burners but will implement restrictions on the sale of wet wood and house coal.
7. <https://www.homebuilding.co.uk/news/government-caves-in-as-wood-burning-stoves-allowed-in-future-homes-standard-despite-health-warnings> - An article from Homebuilding & Renovating reports that the UK government has confirmed that modern wood-burning stoves will be permitted as secondary heating sources in new and self-build homes under the forthcoming Future Homes Standard. This decision follows lobbying from the stove industry, which argues for the stoves' role in energy resilience and renewable fuel use. However, health professionals and environmental groups have raised concerns about the substantial air pollution and public health risks linked to PM2.5 emissions from wood stoves, with critics arguing that this move contradicts efforts to reduce air pollution and carbon emissions.