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BMJ INVESTIGATION

The growing threat of domestic wood burning stoves—and industry’s legal attempts to shut down clean air campaigns

As public health officials warn about rising emissions from urban wood burning, a BMJ investigation finds that just under a third of councils in high use areas have faced pressure from the stove industry to tone down or withdraw campaigns. **Sophie Borland** investigates

Sophie Borland *freelance journalist*

Councils in England are being threatened with legal action for running public health campaigns warning against the use of wood burning stoves, *The BMJ* can reveal.

Freedom of information requests by *The BMJ* found that just under a third of the councils in England with the highest concentration of wood burning stoves had been threatened with legal action or lobbied by the Stove Industry Association (SIA). Other local authorities have received leaflets from the main stove trade group claiming that wood burning can be good for you by lowering blood pressure and stress.

UK government data on emissions show that domestic burning is a major source of fine particle air pollution (PM_{2.5})—particles of 2.5 micrometres or less that the World Health Organization considers the most harmful pollutant to human health.¹ Outdoor PM_{2.5} pollution, which includes residential heating as a predominant source, has been classified by the World Health Organization as a carcinogen that causes lung cancer and is associated with an increased risk of bladder cancer.¹

In the UK, PM_{2.5} emissions from domestic burning are comparable to levels from road transport, with wood burning responsible for around 50% of PM_{2.5} released from fires in the home.² Figures suggest that one in 10 homes in England now own a wood burning stove.³ The fine particles released can enter the bloodstream and internal organs, and there’s a growing body of evidence associating PM_{2.5} exposure with a range of debilitating health conditions, including cardiovascular disease, cancer, and asthma⁴ (box 1).

Box 1: What are the health effects of wood burning stoves?

A 2020 systematic review in *Lancet Global Health* found that indoor air pollution, including domestic wood burning, was associated with heart and lung disease, lung cancer, strokes, stillbirth, and asthma.⁴ Lighting fires at home is a major source of small “particulate matter” that can enter the bloodstream and be transported around the body, lodging in the heart, brain, and other organs.

The Stove Industry Association (SIA) argues that the review includes data from low income countries, where exposure is typically driven by open fires and very basic stoves. However, a 2023 North American cohort analysis of 50 226 non-smoking women¹¹ found that using fireplaces or wood stoves for more than 30 days a year

was associated with a 68% rise in lung cancer risk. The SIA said that the study didn’t distinguish between open fires and modern stoves.

Research from Imperial College London in 2024¹² linked short term exposure to carbon particles, including those from wood burning, with a higher risk of death from respiratory causes.

England’s chief medical officer, Chris Whitty, has repeatedly warned that an “enthusiasm for wood burners” in the UK is worsening indoor air pollution. Although new eco design stoves emit less particulate matter than older models, Whitty’s 2022 report said that they still produced 450 times more toxic air pollution than gas central heating. Older stoves, now banned from sale, produce 3700 times more.

A study published in the journal *Scientific Reports* last July showed that, although the improved stoves reduced pollution overall, they still produced significant spikes during refuelling, lighting, and ash removal.¹³

The SIA argues that emissions of PM_{2.5} and PM₁₀ from domestic combustion fell by 17% from 2020 to 2023. A spokesperson says, “This can be attributed to several factors, including adoption of modern stove appliances, the use of better quality fuel, and increased consumer awareness of the importance of burning best practice.”

Laura Horsfall of University College London’s Institute of Health Informatics, tells *The BMJ*, “Recent research shows that even eco design and other modern stoves can emit ultrafine particles into the home during normal use. These particles are small enough to penetrate deep into the lungs and potentially enter the bloodstream, yet they are not routinely monitored or regulated.”

Senior government advisers, including the chief medical officer for England, Chris Whitty, are particularly concerned about these stoves.⁵ Whitty tells *The BMJ* that their rise in popularity in urban areas “contributes a significant and growing proportion of air pollution and in some places is reversing many decades of progress.”

The government’s 10 year health plan for England states that domestic burning is “a major source of emissions of harmful particulate matter, especially in urban areas.”⁶ The newly launched UK consultation on solid fuel burning could see mandatory health warnings added to new stoves, akin to those on cigarettes.⁷

Not all forms of domestic burning are equally polluting: when compared with open fires, the newer “eco” stoves reduce air pollution emissions by as much as nine times. But research cited by Whitty has

shown that even the newest stoves emit considerably more pollution than a gas boiler or electric heating.⁸

Gary Fuller, air pollution scientist at Imperial College London, says, “Wood burning seems natural, but it’s misleading to think that it’s harmless. Smoke from wood burning adds to the particle pollution in our air. It also contains many harmful chemicals, some that carry a risk of cancer. Numerous studies show that reducing wood burning pollution leads to improved health. This should be our goal.”

Local public health campaigns—including those run by the government funded London Wood Burning Project, representing London borough councils—have seen the stove industry take action against them for asking households to think twice before lighting their fires and wood burners.

The SIA, which represents stove manufacturers, suppliers, and retailers, said that it took very seriously the allegations that it had wrongly threatened councils and that several factors had been taken out of context.

“The correspondence we have had with local authorities and trading standards has been aimed at trying to provide a balanced and educational position on behalf of our members,” it told *The BMJ*. “At no point have we intentionally set out to undermine public awareness about the health effects of domestic wood burning. Air quality is a key priority for the SIA. Our members have worked and continue to work hard to drive down emissions by improving technology.”

Stove Industry Association attacks London boroughs’ health campaign

The BMJ sent freedom of information requests to the 50 councils in England with the highest number of wood burning stoves per area, identified using data collected by researchers at the University College London’s Institute of Health Informatics.⁵ In total, 15 authorities (30%) had received emails from the SIA, including letters threatening legal action, as well as press releases about the supposed benefits of wood burning.

Eight London boroughs—Croydon, Haringey, Islington, Lewisham, Merton, Richmond, Southwark, and Wandsworth—were threatened with legal action in late 2023 over a joint public awareness campaign on the harms of wood burning. The SIA argued that flyers stating that wood burners were “careless not cosy” had breached the UK’s advertising codes because they were dishonest, inaccurate, and not backed up by evidence. The trade group also objected to a cartoon of a smoke plume with an angry face, which it claimed was “excessively large” and too close to the ground.

The SIA told the London boroughs that it was seeking advice on “whether legal action will be appropriate” over breaches of the advertising code. It was also “exploring options for potential legal action” over unfair trading laws.

In the event, the Advertising Standards Authority (ASA) took no action, and the SIA didn’t take legal action. But the threat has had a chilling effect, councils tell *The BMJ*. Tom Parkes, air quality programme manager for Camden Council, which leads the London Wood Burning Project, says, “It’s had quite a detrimental effect on local authorities’ confidence. There’s a degree of worry about what happens if we are challenged, even if we’re confident that the science backs up what we’re saying.”

Advertising watchdog raps Brighton and Hove’s “cosy killer” campaign after stove manufacturer complains

Brighton and Hove City Council has also faced pressure over a public health campaign warning that wood burning is a “cosy killer.”

Hove Wood Burners, a local stove business and SIA member, complained to the ASA last year. The ASA investigated and advised the council not to make one particular claim—that particulate pollution was linked to one in 20 deaths—unless it had “adequate evidence.” This wasn’t a formal ruling, but the SIA and one stove manufacturer called it a “key development” in wood burning and a “return to common sense,” in news stories on their websites.

The council relaunched the campaign again this winter, still making the disputed mortality claim, and Hove Wood Burners has said that it has filed another complaint to the ASA. Data from air quality sensors across Brighton and Hove showed dramatic increases in harmful particle pollution last winter, peaking at 10 pm, when wood burners would typically be lit.⁹

A local councillor, Tim Rowkins, tells *The BMJ* that particle pollution in Brighton and Hove is twice as high in winter as in summer. “I don’t think you could sit and look at that data, especially comparing the winter to the summer months, and not see that there’s a very major thing going on,” he says. “The key thing is that in almost every case, people who are burning wood at home are doing so because it’s nice to do—they’re not doing it instead of their central heating.”

In November the ASA ruled against the SIA for its advertising claim that modern stoves burning dry wood fuel can “significantly lower emissions and improve efficiency compared to an open fire or older stove.”¹⁰ The ASA pointed to the official database of air pollutants in the UK, which showed that while modern stoves emitted considerably less PM_{2.5} than open fireplaces, they actually produced more PM_{2.5} than the older stove types listed.

Public health campaigners shocked by evidence of stove industry lobbying

Oxford City Council received an email from the SIA in December 2022 after a similar public health campaign. The trade group requested evidence that wood burning harmed health and claimed that there was “no scientific evidence” for “adverse” health effects, but it didn’t threaten legal action.

Larissa Lockwood, director of policy and campaigns at the climate action charity Global Action Plan, tells *The BMJ*, “I’m shocked. I’ve actually never heard of anything like this—industry lobbying public health servants to ignore a serious public health issue and go against medical advice. If health researchers and the chief medical officer of England and the government in their 10 year health plan all recognise that domestic burning is a public health problem, then it is a public health problem.

“It’s not for industry, who are obviously selling domestic burning products, to go around telling councils otherwise and scaring them off from communicating the facts and the health advice to residents.”

Jemima Hartshorn, founder of the campaign group Mums for Lungs, which campaigns to end the use of wood burners, tells *The BMJ*, “Commercial bodies with financial interest are putting pressure out there to stop health information. For local authorities, the threat of being sued is a real concern—there’s a lot of financial and media pressure on them when this happens.”

Stove trade body sends claims of “health and wellbeing benefits” to councils

Three councils—Dudley in the West Midlands, Elmbridge in Surrey, and Rushmoor in Hampshire—were sent a leaflet from the SIA claiming that wood burning provides “health and wellbeing benefits.” The trade group claimed that it helped to lower blood pressure, reducing anxiety and depression, and contributed to a “better sense of family cohesion and togetherness.”

Dudley Council also received a video from the SIA rebutting the “misconceptions” that wood burning stoves were harmful. The video claimed that “eco” stoves were the “future of low carbon, low emission, sustainable heating.” The Dudley councillor Phil Atkins tells *The BMJ* that the information sent by the SIA “is not something the council has used nor promoted.”

A spokesperson for Elmbridge Borough Council says that it has a “statutory duty to review and assess local air quality and to take proportionate action to protect public health.”

Adur and Worthing Councils in West Sussex were sent a series of emails and press releases from the SIA from 2022 to 2024 promoting the benefits of stoves. The SIA cited an unpublished literature review from the University of Manchester that it had funded, which found “no scientific evidence” for adverse health effects from modern wood burning stoves.

The review, seen by *The BMJ*, also gave the caveat that a lack of scientific evidence didn’t mean no risk, highlighting the World Health Organization’s warning that there’s “no safe level” of particulate matter exposure and saying that “data in the context of developed world studies is extremely limited.” This wasn’t reported in the SIA’s publicity material.

Eastbourne Borough Council in East Sussex received press releases in February and June 2024, which argued that “eco” stoves produced very few harmful emissions.

Commenting on *The BMJ*’s findings, Jonathan Blades, head of policy at the charity Asthma + Lung UK, tells *The BMJ*, “These tactics by the stove industry clearly try to undermine public awareness of those risks, and that means people aren’t able to make informed decisions for their health. That’s a real concern that the councils need to address.”

An SIA spokesperson tells *The BMJ*, “There were some campaigns by local authorities that we and our members felt were not balanced and could, in our opinion, be seen as scaremongering the public. It was these that we challenged. That action was not to oppose public health objectives but to try to seek to ensure that the messaging used was fair and balanced.”

Nineteen of the 50 councils said that they hadn’t run any sort of public health campaign on wood burning stoves in the past five years, and 15 said that they had no plans to launch one this winter.

“It’s a hard backdrop to be fighting against,” says Matthew Clark of the Chartered Institute of Environmental Health’s advisory panel on pollution. “It’s a very, very challenging time for local authorities. People aren’t aware that they are polluting themselves within their own home and that this pollution often stays trapped in there when they’re doing it.”

Whitty tells *The BMJ*, “Air pollution is an extremely important, solvable health problem that leads to many diseases, including asthma in children, cancers, heart disease, and stroke. The effects of air pollution are greatest on the most vulnerable people—children, pregnant women, and people with pre-existing cardiovascular or

lung conditions who can be exposed to outdoor air pollution without any choice.

“In urban areas, high concentrations of medically vulnerable people and high concentration of solid fuel burning can combine. The growth of wood burning stoves in urban areas now contributes a significant and growing proportion of air pollution and in some places is reversing many decades of progress.”

Laura Horsfall of the Institute of Health Informatics says, “We need clearer and more honest public health messaging. Wood burning is often marketed as natural, cosy, or environmentally friendly. There’s also a need for greater awareness that even ‘eco design’ stoves are not pollution free.”

Horsfall cites the ASA’s finding against the SIA that “the data did not show a significant decrease in all relevant GHG [greenhouse gas] and other air pollutant emissions between older stoves and open fireplaces, and Ecodesign stoves.”¹⁰

A Defra spokesperson says, “Dirty air robs people of their health and costs our NHS millions each year. We’ve set new ambitious targets to cut air pollution by a third by 2030, including the public’s exposure to fine particulate matter—the pollutant most harmful to human health.

“To help reach this target, we are planning stricter limits on newly purchased stoves and health labels for fuels, as we strive to protect public health and the environment.”

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