Have the tobacco police gone too far?

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Editorial: *The dangers of inhaling dubious facts*

I'VE been called a traitor," says Michael Siegel, a public-health doctor at Boston University in Massachusetts. "It's been a character assassination." This treatment seems surprising as, reading Siegel's CV, you'd think he was a poster boy for the anti-smoking movement. He regularly publishes research on the harmful effects of passive smoking and has testified in support of indoor smoking bans in more than 50 US cities.

Despite these credentials, Siegel has come under fire from colleagues in the field of smoking research. His offence was to post messages on the widely read mailing list Tobacco Policy Talk, in which he questioned one of the medical claims about passive smoking, as well as the wisdom of extreme measures such as outdoor smoking bans.

In front of his peers, funders and potential future employers, other contributors posted messages accusing Siegel of taking money from the tobacco industry. When Siegel stood his ground, the administrators kicked him off the list, cutting off a key source of news in his field. "It felt like I was excommunicated, says Siegel. "I was shocked: I've been a leader in the movement for 21 years."

An anti-smoking activist plays dead on November 11, 2008 during a demonstration near São Paulo State Legislative Assembly, in São Paulo, southeastern Brazil (Image: Sérgio Castro / Agência Estado / AE / Image Forum

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Siegel's case is perhaps the most clear-cut example of a disturbing trend in the anti-smoking movement. There are genuine scientific questions over some of the more extreme claims made about the dangers of passive smoking and the best strategies to reduce smoking rates, but a few researchers who have voiced them have seen their reputations smeared and the debate stifled.

Putting aside the question of whether such tactics are ethical, they could ultimately backfire. About half of US states and many parts of Europe do not yet ban smoking even indoors in public places like bars and restaurants, so the anti-smoking movement cannot afford to lose credibility.

On the other hand, in some parts of the US, particularly California, the anti-smoking movement has grown so strong that smoking bans outdoors and in private apartments are in force in a few places, and being considered in more. These measures are at least partly based on disputed medical claims, so it is vital their accuracy be determined. But questioning the orthodoxy seems to be frowned on. "It's censorship," says Siegel. "We're heading towards scientific McCarthyism."

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The irony is that the tobacco industry is notorious for its history of unethical research conduct. As evidence emerged in the 1950s linking smoking to lung cancer, several firms paid scientists to produce contrary findings. They held scientific conferences, and published journals to promote their results.

By the mid-70s, the dangers of first-hand smoke were indisputable, so the industry switched to questioning emerging evidence of the dangers of second-hand smoke. In spite of their efforts, a convincing case has now been made that long-term exposure increases the risk of heart disease, cancer, respiratory illness and cot death.

By the 1990s, California had banned smoking in all indoor public places, and in 2004 Ireland became the first country with a nationwide ban. The UK, Australia, some other European countries and about half of US states have since followed (see map).

Researchers like Siegel, and others under fire from the anti-smoking lobby, do not question that people regularly exposed to second-hand smoke suffer harm. "It's difficult to imagine that there's an easier argument to make than 'smoke is bad for you';," says Carl Phillips, an epidemiologist from the University of Alberta in Edmonton, Canada, who has also been targeted.

But in the past few years some of the claims about passive smoking have gone further. Siegel first got into trouble when he questioned assertions that breathing in second-hand smoke for just 30 minutes raised people's risk of a heart attack to that of an active smoker.

There is no doubt that passive smoke affects blood flow, even over the very short term. Research in the 1980s showed that 20 minutes' exposure makes blood platelets slightly more sticky, which could theoretically raise the risk of blood clots and hence heart attacks and strokes. Realistically, though, this would only be a danger for those already at high risk.

In 2001, a study showed that 30 minutes of passive exposure to smoke reduces the blood vessels' ability to dilate (*Journal of the American Medical Association*, vol 286, p 426). If this happened repeatedly over a long period, it could permanently harm blood vessels and harden arteries. In a few people who are on the verge of a heart attack, it is possible that 30 minutes' exposure could tip them over the edge. But it would be no worse than eating a high-fat meal; most people would easily cope.

When anti-smoking lobby groups highlight this issue, however, they fail to mention that most people would be OK. Here is a typical claim, from the US group Action on Smoking and Health (ASH) in 2006: "Breathing drifting tobacco smoke for as little as 30 minutes (less than the time one might be exposed sitting on a park bench) can raise a non-smoker's risk of a fatal heart attack to that of a smoker."

Siegel has counted at least 65 organisations making such claims, and they are not fringe groups but anti-smoking stalwarts. They include the American Cancer Society and the UK National Health Service (NHS). "These claims are ridiculous," says Siegel. "Just telling the truth would be enough to show that second-hand smoke is toxic."

Even Stanton Glantz, a cardiologist at the University of California, San Francisco, who did a more recent study confirming the blood-vessel effect, acknowledges some of the claims about it are overblown. "A healthy 25-year-old won't drop dead from a heart attack by breathing second-hand smoke," says Glantz, who is one of the linchpins of the anti-smoking establishment.

Another disputed claim is whether the introduction of smoking bans in indoor public places brings about an immediate drop in heart attacks. A few studies of individual US cities have suggested this effect. According to Siegel, however, they covered small populations and were too short to account for yearly fluctuations, or indeed the fact that many western countries have seen a gradual long-term decline in heart-disease deaths.

Then last year, a large study was published that seemed to shore up the argument that bans cause a fall. The study covered most of the biggest hospitals in Scotland and compared the two 10-month periods before and after the introduction of the smoking ban in indoor public spaces in March 2006 (*The New England Journal of Medicine*, vol 359, p 482). It found a 17 per cent drop in people admitted to hospitals with acute coronary syndrome (ACS), which comprises heart attacks and angina.

Confusingly, however, the results of the study seem to be contradicted by the publicly available statistics on emergency admissions to hospitals due to heart attacks, released by the Scottish NHS in November 2007. These admittedly show fewer heart attacks in the year after the ban, but the fall was smaller, at only 7 per cent, which does not stand out from the background decline. In 2000 there was an 11 per cent drop, and between 2004 to 2006 the rate fell by roughly 5 per cent a year.

Sheila Bird is a statistician from the MRC Biostatistics Unit in Cambridge, UK, who is independent of either side in this debate. She points out that it is hard to compare the two sets of Scottish data because

they measure different things: ACS diagnoses are made using blood tests while heart attack admissions are based on ECG measurements.

Bird also points out that because the *NEJM* study compared 10-month periods before and after the ban - not 12-month periods - it could have been distorted by seasonal fluctuations in heart-attack rates. The period before the ban spanned more colder months, when people generally have more heart attacks.

The picture in Scotland remains unclear, but last month saw a body blow to the side who say bans cause a fall. The first set of NHS data was published for England since the smoking ban came into effect there in July 2007. Between April 2007 and March 2008 there was a 3.7 per cent drop in heart attacks. That's exactly the same as the year before the ban. Although the "post-ban" year includes three months before the ban, a crude analysis suggests that should only reduce the size of any fall by about one-quarter.

Third-hand smoke

Another issue that is currently raising eyebrows is the concept of "third-hand" smoke. This refers to the particles of smoke that linger on smokers' clothes, hair and the carpets and furniture of a room for days, "outgassing" toxic vapours. Young children may be at particular risk, since they could ingest the residue while crawling around or mouthing their toys.

The first signs that third-hand smoke may be a danger emerged in 2004. A study showed that even if parents only smoke outside the home, detectable levels of cotinine - a metabolite of nicotine - were present in their children's urine (*Tobacco Control*, vol 13, p 29).

Levels were much lower if the parents only smoked outside the house: 2.32 nanograms per millilitre compared with 15.57 from second-hand smoke. Still, some researchers think even this low level could be enough to cause harm, particularly to a child's developing brain. "My sense is that these levels are high enough to be concerning," says Kimberly Yolton, a psychologist at Cincinnati Children's Hospital Medical Center in Ohio, who has previously shown that exposure to nicotine from second-hand smoke seems to slightly depress a child's school results.

As yet there is no consensus on whether the cotinine levels are high enough to have any meaningful effect. "We'll need a lot more evidence before we act on this," says Martin Dockrell of Action on Smoking and Health in London.

In January, the issue of third-hand smoke gained new prominence after a paper on the subject in *Pediatrics* (DOI: 10.1542/peds.2008-2184). Many news outlets and even the US Department of Health and Human Services covered the "new-found risk". Author Jonathan Winickoff, a paediatrician at Massachusetts General Hospital in Boston, said people should "hammer home" the risks of third-hand smoke, and urged smokers to wash their hands - and possibly clothes - before interacting with children.

The paper, however, sheds no new light on the degree of risk. It was just a telephone poll showing that people were more likely to have smoking bans in their house if they believed that third-hand smoke was harmful.

Does it matter if the dangers are exaggerated? Yes, says Siegel, because it risks alienating parents who might otherwise have heeded advice to avoid exposing their children to second-hand smoke. It could also leave people distrustful of health advice in general.

Establishing the truth relies upon researchers engaging in open debate about what the evidence really shows. This is less likely if criticism entails the risk of excommunication, as Siegel experienced. "It's like an unwritten rule in this movement that you don't question these claims," he says.

At the time of going to press, the administrator who removed Siegel from the tobacco mailing list had not responded to *New Scientist*'s requests for a comment. However, one of the list's current administrators, Bill Godshall, who is an executive director of SmokeFree Pennsylvania in Pittsburgh, defends the decision, claiming that some of Siegel's posts had been "uncivil". Siegel "staunchly opposed the very purpose of the listserve: advocating reasonable and responsible policies to reduce the leading cause of disease and death", says Godshall.

But Siegel has his defenders. "It is sobering and scandalous to think, if Mike is correct, that our field now is guilty of the same junk science long perpetrated by the tobacco industry," says Alan Blum, director of the Center for the Study of Tobacco and Society at the University of Alabama in Tuscaloosa.

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Ensuring the science is rigorous becomes paramount at a time when the anti-smoking clampdown is reaching new levels. Siegel fears that the growing concerns around third-hand smoke will trigger more firms to bring in non-smoking hiring policies, already in place at several US companies and the World Health Organization. Several independent researchers have voiced concerns that such measures will further exacerbate social inequalities between smokers and non-smokers (*New Scientist*, 31 January, p 5).

And even the most fanatical enemies of smoking have reason to be wary of the anti-smoking movement's current direction. Making exaggerated claims will only reduce the movement's impact in regions where smoking bans in indoor public spaces have not yet been introduced, Siegel believes. "It's like the boy who cried wolf - the public won't know the difference when the claims are true," he says.

Siegel says his experience has not damaged his career, and has since set up a blog about the anti-smoking movement's extremes. But Carl Phillips almost lost his job after he questioned the orthodoxy. Phillips is one of a few researchers who favour "harm reduction" strategies in tobacco control (*New Scientist*, 10 November 2001, p 28). This means promoting smokeless tobacco products - such as chewing tobacco, a form of "sucking" tobacco known as snus, and electronic cigarettes - to allow nicotine addicts to get their fix without many of the risks of smoking. Many anti-smoking researchers are vehemently opposed to such strategies.

Unlike Siegel, Phillips has accepted research grants from the US Smokeless Tobacco Company - a fact he declares on his research papers, and which was approved by his university as they came with no strings attached. This has allowed anti-harm-reductionists to paint him as a tobacco-company stooge, and he has experienced vandalism to a poster paper at a medical conference. After his adversaries threatened to block the school's academic accreditation and cancel funding for other projects, the School of Public Health tried to terminate his contract. Phillips appealed to the university's central administration, however, who overturned the school's decision, and he remains in his post.

For many researchers like Phillips it's a catch-22 situation. If their research challenges the orthodoxy, anti-smoking groups refuse to fund it, so they turn to tobacco firms instead. This provides ammunition to question the results. "It drives researchers from doing anything innovative," says Phillips.

Given the tobacco industry's reputation, this deep suspicion may be understandable. "The industry has sown the seeds of so much distrust that scientific debate can be difficult," says Kelley Lee from the London School of Hygiene and Tropical Medicine, who has uncovered some of the industry's dirty tricks.

On the other hand, many anti-smoking researchers accept grants from the drug firms that make nicotine-replacement therapies. When it comes to research ethics, the pharmaceutical industry's reputation is not exactly whiter-than-white either.

So where can the anti-smoking movement go from here? "They must be intellectually mature enough to recapture the process of producing sound science," says Lee. "There is no room for mud-slinging."

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