

# THIS WEEK

## EDITORIALS

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## Time to address a burning issue

*The debate about e-cigarettes is polarized. Whether the devices help people to quit smoking, or increase health risks, will emerge only from better data.*

For more than half a century, the world has known that tobacco kills — yet it is still killing more than 8 million people a year. Tobacco use remains the world's worst entirely preventable public-health emergency, and there is a desperate need for fresh ways to tackle it.

So it is little wonder that e-cigarettes have attracted attention as a potential solution. More than half of US adult smokers try to quit each year: in theory, e-cigarettes might boost their chances of success. It is generally agreed that vaping is safer than smoking standard cigarettes.

But even as e-cigarette sales have boomed — the global market was worth US\$11.3 billion in 2018 — concerns have mushroomed, and research has failed to keep up. Urgent questions about vaping remain: whether it really does help people to quit smoking, whether it serves as a gateway to cigarettes, and whether the liquid formulations have short- and long-term health effects. Until such questions are answered, it seems premature to advocate strongly for e-cigarette use, and imperative that regulators develop guidelines to limit vaping by adolescents.

A UK study published this year highlights the evidence gap. In a large, randomized, controlled trial, researchers found that smokers who used e-cigarettes to help them quit were less likely to start smoking again for at least a year, compared with those who used other aids such as nicotine gum or patches (P. Hajek *et al.* *N. Engl. J. Med.* **380**, 629–637; 2019). The study was one of the most rigorous so far — yet the benefit was slight, and 75% of study participants had already tried and failed to quit using the other cessation aids, so it was less surprising that they failed again. Overall, studies have not found strong evidence for a benefit of e-cigarettes over other quitting strategies.

In the past few years, US vapers have flocked to use devices that contain nearly three times the European Union's legal limit on nicotine concentration. The most concentrated pods of the popular devices, made by Juul of San Francisco, California, for example, contain as much nicotine as a pack of 20 cigarettes.

There is huge concern about the surge of vaping among young people, and the potentially addictive nature of such products, which have been backed by aggressive marketing campaigns. Vaping among high-school students in the United States (14–18 years old) rose 78% between 2017 and 2018. Many studies have shown that adolescents who vape are more likely to take up smoking, but none has established a causal link. And the long-term effects of e-cigarettes — particularly ones with a high nicotine concentration — on young brains remain unknown.

With so few data, researchers' debate over e-cigarettes has been divisive and sometimes emotional. Proponents of e-cigarettes see them as a way to help the millions who are trying to quit smoking. Vaping critics fear that they could cause ground to be lost in the decades-long battle against tobacco and create a generation of e-cigarette addicts.

Studies showing that cigarettes cause lung cancer turned tobacco into an enemy of public health. Now researchers, research funders, public-health agencies and policymakers must unite to provide answers about e-cigarettes by designing better studies, repeating those already done and addressing new nicotine products.

The right policies on e-cigarettes will be built on evidence and collaboration, not on opinion and vitriol. It might be too early to say whether e-cigarettes will help many adult smokers to quit. It's the right time for regulators to protect the next generations from having to. ■

## Ground work

*The hardened soles of those who live barefoot still provide a good sense of the ground.*

The human body is a fluid thing, forever adapting to life's challenges. The more we exercise, the more our muscles strengthen, and the more our bones remodel themselves in response to the increased loading. The more we work with our hands, the more our skin hardens and thickens. It's the same with feet. The soles of the feet of people who live barefoot develop calluses — patches of thickened and hardened epidermis — to protect their feet from harm.

This is important because, as one of the few obligate bipeds among mammals, we use our feet a lot. And because we are quite large, as mammals go, our feet take a lot of punishment. Repeated hard contact with the ground takes a toll on the sole.

But do the calluses trade protection for sensitivity? This is the question posed — and answered — by Daniel Lieberman and colleagues in *Nature* this week (N. B. Holowka *et al.* *Nature* <https://doi.org/10.1038/s41586-019-1345-6>; 2019). Lieberman is an evolutionary biologist with something of an obsession for how we use our feet. The new study put people from Kenya and the United States through their paces on a treadmill and measured sole thickness and responsiveness to vibration. What emerged is that, although calluses protect our feet, they transmit tactile sensation almost as effectively as does soft skin.

Humans have walked barefoot for hundreds of thousands of years. Shoes are a relative novelty, appearing perhaps tens of thousands of years ago and even then as simple sandals or moccasins. The widespread wearing of thick soles and built-up heels is a product of the Industrial Revolution. Platforms, stilettos and trainers have been around for a mayfly blink, in evolutionary terms. Because we wear shoes nearly all the time, our soles are tender — any parent will attest to the pain of treading barefoot on a Lego brick in the small hours of the morning.

As Lieberman and colleagues observe, a person with callused feet would feel that Lego brick just as acutely. But the researchers also find that bare feet offer a better guide to the force with which our feet strike the ground than do artificially cushioned soles, comfy as those might feel. This difference could have untold consequences for the rest of our skeleton. ■