

SMOKE

IN

UP

SOME BELIEVE E-CIGARETTES ARE HEALTHIER THAN CONVENTIONAL CIGARETTES AND CAN HELP THEM QUIT SMOKING. JUST HOW SAFE ARE THEY?

Words Gina Flaxman

For people who are trying to cut down on or give up cigarettes, vaping – inhaling the vapour from an electronic cigarette – is sometimes seen as a useful tool. But not enough is known about the side effects of vaping, or whether it really helps people quit nicotine.

E-cigarettes have become a worldwide phenomenon since they were first developed in 2005. In 2014, the World Health Organization reported that the industry had grown to an estimated US\$3 billion global business. In Australia the National Drug Strategy Household Survey found use of e-cigarettes had increased significantly. The percentage of smokers aged over 18 who had tried e-cigarettes increased from almost 18% in 2013 to 31% in 2016.

E-cigarettes are small battery-operated devices that don't contain tobacco and, crucially, they heat the liquid inside them but don't burn it. This liquid is known as e-liquid or e-juice.

"There's no carbon monoxide in e-cigarettes and you don't get tar," says Simon Chapman, Emeritus Professor at the Sydney School of Public Health at the University of Sydney. Tar is tobacco residue "with a lot of carcinogenic and toxic material and irritants, which is inhaled into the lungs", he says.

In Australia, the sale and use of liquid nicotine in e-cigarettes is illegal. Instead, e-cigarettes sold in Australia may contain liquid solvents propylene glycol or glycerin and are usually infused with flavourings.

A US study found the most common reasons people vape include social image and to help quit smoking cigarettes.

WHAT ARE THE POTENTIAL HEALTH IMPACTS?

Are they a healthier option? "The theory is that because there's no dangerous stuff from tar, e-cigarettes are a lot less dangerous," says Prof Chapman. "But the diseases that we get from smoking cigarettes are not immediate." He says chronic diseases like heart or respiratory disease or cancer only show up years later. "E-cigarettes have only been around in common use for a maximum of 10 years. The data on the health consequences of long-term e-cigarette use is simply not there."

A comprehensive review, by the US National Academies of Sciences, Engineering and Medicine, looked at more than 800 studies. It found that overall, even e-cigarettes with nicotine contain fewer numbers and lower levels of toxic substances than conventional cigarettes and are likely to be less harmful. But it also found they are not risk free and the long-term effects are unclear.

One of the potential risks, according to Prof Chapman, is that of the estimated 8,000 flavourings available to infuse the e-liquid, none have been approved for inhalation as vapour, only for ingestion as food flavouring.

Another issue is the many variations in e-cigarettes and the e-liquids they contain. The vaporising process involves rapid heating by batteries and some e-cigarettes allow users to adjust the temperature at which the mixture is heated for taste and heat preferences. Each mixture also contains different concentrations of ingredients. Prof Chapman says all this variation makes it very difficult to accurately measure the health effects. "There's no standardised product that you can be confident in making predictions about." >

In addition, a study led by the University of Birmingham in the UK found vaporised e-liquid disables important protective cells in the lungs, which help to remove dust, bacteria and allergens that have entered the organs. The study's co-author, Professor David Thickett, says, "The public must be aware these devices are not harmless."

Prof Chapman says, "There is some early indication that there is an increased inflammatory response in the airways. That's an early sign that things aren't going well."

There is also the danger of the batteries in an e-cigarette exploding, with more than 200 reported cases of e-cigarettes overheating, catching fire or exploding in the US and UK.

DO E-CIGARETTES CONTAIN NICOTINE?

In Australia, nicotine is classified as a poison and the only way you can legally buy it other than through conventional cigarettes is through nicotine replacement therapy, which is regulated by the Therapeutic Goods Administration.

Several groups, which include health professionals, recently lobbied against this ban. They believe Australia should follow the examples of the UK, the US, Canada and New Zealand in legalising the use of nicotine in e-cigarettes. They point to debated research from Public Health England, which found vaping was around 95% less harmful than smoking and that there were "substantial health benefits" in switching from conventional cigarettes to e-cigarettes.

These groups argue that, for hardened smokers, particularly those who are disadvantaged and have illnesses related to heavy smoking, there would be significant health benefits in switching to e-cigarettes with nicotine.

But the government has so far upheld the ban on nicotine, which Prof Chapman supports. "I'm a believer in strong regulation of e-cigarettes until we have enough evidence either way," he says. This view has been echoed by Dr Tony Bartone, President of the Australian Medical Association (AMA), who was reported as saying, "There's no irrefutable and reliable evidence that [e-cigarettes] are safe, that they don't pose a future risk to the users."

Vaping advocates argue that e-cigarettes help people quit smoking but Prof Chapman says the data available on this is mainly anecdotal and is only on people who succeeded in quitting. A recent CSIRO review found there was not enough convincing evidence that e-cigarettes were an effective way to quit smoking.

Prof Chapman says "by far the biggest category" of smokers are dual users – those who use both conventional and e-cigarettes.

Nicotine in e-cigarettes is illegal in Australia, though some people buy it through overseas websites. And even in Australia, users may not know what they are buying. NSW Health says e-cigarettes "may contain nicotine, even when they claim not to".

This makes it even more difficult to accurately assess the effects and health risks.



SIMON CHAPMAN

Emeritus Professor at the Sydney School of Public Health at the University of Sydney

SOURCES: 2016 NATIONAL DRUG STRATEGY HOUSEHOLD SURVEY; WORLD HEALTH ORGANIZATION; PARLIAMENT OF AUSTRALIA; PUBLIC HEALTH JOURNAL; THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL; PLOS ONE



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THE GATEWAY EFFECT

The percentage of children aged 12–17 who had tried e-cigarettes tripled from 2013 to 2016. And there is a concern that vaping in adolescence may lead to a later uptake of smoking.

Prof Chapman says critics of this 'gateway theory' say that someone who is going to smoke cigarettes is usually someone who is open to risk-taking activities in general and that it has nothing to do with vaping. But the research shows there could be a gateway effect.

"Even when you control for other factors, there is still an independent association between early use of e-cigarettes and later uptake of smoking."

A study of schoolchildren in the UK found more than half of the e-cigarette users surveyed hadn't used tobacco, but just under 40% of them were unsure or didn't know that e-cigarettes can contain nicotine (which is legal in the UK); and almost 30% of them weren't aware e-cigarettes with nicotine were addictive.

SECONDHAND SMOKE

NSW has recently banned vaping in non-smoking public spaces and on public transport, joining Queensland, Victoria, Tasmania and the ACT. "I fully support this ban," Prof Chapman says. "Studies have shown that, in places where there are lots of people vaping, the amount

of particulate matter [pollution] in the air is as high as it used to be when smoking was allowed in [those] public places."

THE VERDICT

The bottom line, say health experts, is that there is no long-term data on the effects of e-cigarettes, so there may be a lot we still don't know. 🗣️



If you need help quitting smoking, contact Quitline on **13 78 48** or visit quitnow.gov.au