

# THE CONVERSATION

## Explainer: what do we know about e-cigarettes?

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Pop up e-cig bar. Lefteris Pitarakis/AP

E-cigarettes are increasingly popular in a number of countries including the UK, while in others such as Norway and Brazil they are banned altogether.

So amid all these differences in policy, what do we know and what don't we know about e-cigarettes? And why, if they have the potential to save many of the lives taken by tobacco smoking each year are e-cigarettes currently one of the most contentious issues in public health research and policy?

### Combustible simulation

E-cigarettes are battery operated devices that aim to simulate combustible cigarettes. They don't contain tobacco but operate by heating nicotine and other chemicals into a vapour that is inhaled. Nicotine is the addictive substance in tobacco but we know that it is the many

other chemicals in cigarettes that are responsible for smoking-related diseases.

Because electronic cigarettes deliver nicotine without the vast majority of these other chemicals, organisations such as the Medicines and Healthcare Products Regulatory Agency (MHRA) and the National Institute for Health and Care Excellence (NICE) have indicated that electronic cigarettes are less harmful than tobacco.

## Questions, questions

Questions remain about the safety of e-cigarettes despite the fact that any risk that arises from using them is less than the risks of continuing to smoke normal cigarettes – and strong arguments have been made in favour of e-cigarettes from a health perspective because of this lower risk.

The first unanswered question is about the longer-term impact on health of inhaling nicotine and propylene glycol (a substance used in e-cigarettes that is also common in a range of other consumer products) deep into the lungs.

As e-cigarettes are largely unregulated, there are also questions about quality; variation in the chemicals in different cartridges, leaking cartridges and other problems such as the batteries in these devices. In other words, different companies can make very different products. There is some evidence that these technical safety issues are reducing as the quality of products on the market improves.

Another potential safety issue is around the vapour produced by e-cigarettes. There are still relatively few studies that have looked at the effects of exposure to vapour but one study examining vapour from 12 brands of e-cigarettes found a number of toxic substances, but these were at levels between nine to 450 times lower than in cigarette smoke.

Studies of the prevalence of use of e-cigarettes show that these products are being used predominantly by current smokers or recent quitters, either to stop smoking or to cut down. To date, there is limited evidence that people who don't smoke are using e-cigarettes – just 0.5% of non-smokers in the UK in 2012, for example.

There are also unanswered questions about the extent to which children may be attracted to these products. In studies of e-cigarette use that include adolescents, including one that looked at use in Poland, most of those who had tried e-cigarettes were already current smokers. However, there is little doubt that some of the advertising of e-cigarettes may appeal to children, and recent research has highlighted the need for advertising controls in this area.

## Getting the vapours about 'vapers'

Users of e-cigarettes, particularly those who have successfully stopped smoking, are understandably enthusiastic about these products. There are an increasing number of vocal and well-organised "vaper" groups.

E-cigarette manufacturers are also a growing force in the economy of a number of countries, most notably China. However, health professionals and the public health community in particular have been less enthusiastic. This is due at least in part to some of the unanswered questions about e-cigarettes.

As Sally Davies, Britain's chief medical officer, put it recently:

*We do not yet know the harm that e-cigarettes can cause to adults let alone to children, but we do know they are not risk free.*

In addition to the issues above, public health officials and others have argued that e-cigarettes could undermine smoke-free laws, such as bans on indoor smoking. They believe the e-cigarettes could confuse attempts to enforce laws when electronic products look like cigarettes, particularly from a distance.

An additional concern is that the increasing availability and popularity of the products may be driving smokers away from more evidence-based methods of trying to stop (like using a smoking cessation service or licensed stop smoking medication such as Nicotine Replacement Therapy) and that relapse to smoking might be more common as a result.

## The tobacco industry

There is also considerable scepticism about the role of the tobacco industry in the e-cigarette market. A number of tobacco companies have now launched their own e-cigarette products (such as RJ Reynold's VUSE) or have bought into existing e-cigarette companies (such as Lorillard's purchase of Blu in 2012). New e-cigarette brands manufactured by tobacco companies are expected to continue to emerge in 2014.

This involvement has led some to wonder whether this is about finding safer alternatives to cigarettes or simply about creating a new market of "dual" users of combustible and e-cigarettes. It may also allow the tobacco industry to present a more "acceptable" image in the developed world while it continues to increase its profits from cigarettes in developing countries.

All these considerations mean that the use of e-cigarettes is currently one of the most contentious issues in public health research and policy. All the signs are that they represent a real opportunity to change the stubbornly persistent toll that tobacco takes on society. What the unintended consequences of their use will be, however, remains to be seen.



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