



### **Evidence and agendas**

For the past few years, scientific journals have been publishing a large volume of commentaries on the EC phenomenon. Most of these focus on hypothetical concerns. Although all commentators now acknowledge that EC are safer than cigarettes, EC are typically presented as a competitor to smoking cessation medications that is possibly less safe and that can somehow increase cigarette use, rather than as a consumer product that competes with cigarettes, and that can make its deadly competitor obsolete.

Some medical organisations which are supposed to protect public health, such as WHO, go further and actively discourage smokers from using EC while lobbying for restricting EC use by regulation. The WHO stance is underpinned by a review they commissioned [9] that has been criticised for an unorthodox use of evidence [10] and illustrates well the anti-EC arguments. Findings that EC vapour contains traces of toxicants is interpreted as a sign of danger and even as a threat to bystanders, even if the levels of these chemicals are well within limits considered safe in the air we breathe [2,11]. Surveys showing that a small proportion of children experiment with EC are presented as a sign of the 'gateway' risk despite the fact that virtually no non-smokers progress to daily EC use and that smoking in youth is declining [12]. Where it fits with the negative agenda, trying EC once in the past month is labelled as 'current use' which by analogy with 'current smoking' is typically interpreted as daily use. Surveys which include only smokers who did not find EC helpful and exclude EC users who stopped smoking are presented as a proof that EC are unhelpful. 'Dual use' is presented as a sign of danger despite the fact that it leads to reduced toxin intake [2]. The toxicity of nicotine is exaggerated [13] and the evidence that it makes little if any contribution to smoking related disease and death [14,15] is ignored. Concerns about the twisting of evidence for ideological ends have generated an exchange of letters by large groups of researchers and activists [16-18]. Given the visibility and influence of the activists and medical organisations opposing EC use, there is a risk that these campaigns will discourage or even bar large numbers of smokers around the world from the unquestionable benefits of switching from smoking to vaping. Indeed, alarming signs are emerging that smokers who could benefit from switching to EC now increasingly believe EC are dangerous and they might as well stick to the conventional cigarettes [6-8].

### **Why is there a controversy?**

EC are a disruptive technology, threatening sales of tobacco products as well as sales of stop smoking medications and so commercially motivated opposition can be expected. The hostility to EC from some tobacco

control activists, however, is puzzling. Future textbooks are likely to discuss this phenomenon at length. Here is one hypothesis.

The field of public health is not always rational. Ideology and morality can play at least as big a role as evidence and logic. Public health policies struggle with ideology in areas ranging from abortion to harm reduction strategies in drug addiction and sexually transmitted diseases. One of the possible explanations of the EC controversy is that for some tobacco control activists, any nicotine use is 'drug abuse' and abhorrent even if it were to carry no physical health risk. When encountering evidence that EC are much safer than cigarettes, do not attract non-smokers, and promise to reduce smoking-related morbidity, people with this 'moral stance' look for objections and counterarguments. Evidence is not needed to discover the truth as the truth is 'self-evident' and there is a higher purpose. Evidence is just a tool to gain converts. Nicotine use should be eradicated, not allowed to morph into an activity akin to drinking coffee. An earlier version of the WHO Report to the Framework Convention on Tobacco Control (FCTC), now off-line, betrayed its missionary ethos when it stated that the group's target is nicotine addiction (that is, nicotine use) 'independently from its source' (that is, whether it impacts physical health or not).

Nicotine use, of course, can have negative consequences even if it does not affect physical health. A proportion of users become dependent. However, compared with disease and death caused by combustible non-nicotine chemicals in tobacco smoke, this is a minor consideration. Worries about nicotine use stripped of the health risks of smoking are on par with worries about drinking coffee. Some coffee drinkers do become dependent and spend a fair amount of money and time on their habit, but this does not constitute a major public health issue. It definitely does not justify denying smokers health benefits of stopping smoking just because they would continue to use nicotine and so their conversion to the true virtue would be incomplete.

### **How best to appraise the impact of EC?**

Negative expectations and concerns can ultimately prove to be correct, even if they were generated by irrational or commercial motives. How should we determine objectively what impact EC are having on public health? For a negative impact, EC use would have to generate an increase in use of cigarettes.

Where commentators worry about gateway effects, undermining tobacco control achievements or re-normalisation of smoking, they should be understood as saying that in their opinion, EC use is generating or is likely to generate an increase in cigarette consumption. When put like this, it appears a highly improbable concern. There is no precedent for a safer technology to

increase the use of the less safe competitor. However, hard data on this issue are needed.

Emerging trends are as expected. In the UK where EC are available and taken up by sufficient numbers of smokers, quit rates are increasing and decline in smoking, especially among young people, is accelerating [19-21]. The same is happening in the US [12]. In France and Italy the decline in cigarette sales has been accelerating [22,23]. Such data, of course, cannot determine the cause of these trends. The sales of EC have so far been too low compared to sales of cigarettes for their impact to be clearly visible. More comprehensive studies of the relationship between sales of cigarettes and sales of EC are currently the number one research priority. Comparisons are needed of time trends in sales of cigarettes in countries that allow and that prohibit EC sales, and sales of cigarettes need to be plotted against sales of EC over time. This is needed urgently, before the drastic regulation of EC advocated by the tobacco and pharmaceutical industries and misguided medical organisations stops the effects of EC sales on cigarette sales unfolding and hard data emerging which could provide a rational guidance to policy.

## Conclusions

Today's e-cigarettes appeal to only a fraction of the smoking population, but if they are allowed to carry on competing with cigarettes as a consumer product and innovate and evolve, there is a good chance that they will continue to improve in offering smokers what they want, cigarette sales will continue to fall, and over the next 10 years, in countries where EC are available and competitively priced, the use of combustible tobacco will virtually disappear. The public health benefit would be huge, even if recreational use of nicotine carries on. If, on the other hand, misleading public health messages discourage smokers from switching and drastic regulations stop EC evolution and make them uncompetitive, the opportunity for a dramatic reduction in smoking related disease and death will be postponed by many years or even missed altogether. Future commentators are likely to consider attempts to remove safer alternatives to cigarettes from the market unethical, however virtuous the missionaries of the nicotine eradication gospel may feel. In the meantime, clinicians facing smokers who cannot or do not want to stop smoking and who follow evidence and common sense rather than ideologically and commercially driven agendas should recommend that their patients try several types of e-cigarettes to see if they can find one meeting their needs.

## Abbreviations

EC: electronic cigarettes; FCTC: Framework Convention on Tobacco Control; WHO: World Health Organisation.

## Competing interests

PH received research funding from and provided consultancy to manufacturers of stop-smoking medications. He has no links with any tobacco or e-cigarette manufacturers.

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PH is Director of Health and Lifestyle Research Unit at Wolfson Institute of Preventive Medicine and of the QM branch of the UK Centre for Tobacco and Alcohol studies. His research focuses on tobacco dependence and its treatment, including studies of EC funded by MHRA, UKCTAS and NIHR.

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