Editorial

Nicotine: Science, regulation and policy

Few drugs have a more complicated and chequered history than nicotine. Although nicotine is the addictive ingredient in tobacco, the well-documented harms associated with smoking stem from the carcinogens and gases in cigarette smoke rather than nicotine itself. Nicotine does not impair consciousness in the manner of other licit and illicit drugs; indeed, it often enhances it. For these reasons, it is perhaps the clearest instance of a drug where the 'delivery system' (the cigarette) rather than the drug itself causes harm.

In light of the distinctive attributes of tobacco and nicotine, harm reduction approaches – in the form of safer nicotine delivery systems – would appear to have a lot to offer tobacco control and public health. Indeed, in Sweden, the widespread use of snus (a moist, pasteurised smokeless tobacco) has contributed to unusually low rates of smoking and attendant reductions in the prevalence of lung cancer and myocardial infarction (Foulds et al., 2003; Maki, 2015, this issue). The argument for tobacco harm reduction was set out by the UK Royal College of Physicians in 2008, that "Harm reduction in smoking can be achieved by providing smokers with safer sources of nicotine" (Royal College of Physicians, 2008; Britton & Edwards, 2008). However, despite such endorsements, tobacco harm reduction remains controversial (Eversman, 2015, this issue).

A clear factor that has limited the mainstream acceptance of tobacco harm reduction is the view that it acts as a "Trojan horse" that serves tobacco industry interests (Fairchild & Bayer, 2015). This view has been buttressed by a strong degree of scepticism bolstered by the industry's past experiments with 'harm reduction' – i.e., the development of so-called 'light' and 'low tar' cigarettes in the 1950s and 1960s (Pierce, 2002; Warner, 2002; Sweanor, Alcabes & Drucker, 2007; Benson, 2010). As Benson (2010: 52) notes: "Members of the tobacco control movement fear that this expanded concept will help sustain existing tobacco markets and facilitate new ones, and that it is really a project of 'harm maintenance'". Harm reduction is thus viewed as counter to the tobacco control endgame of both an end to smoking and the tobacco industry itself. Thus, while there is considerable enthusiasm for reducing the levels of nicotine in cigarettes to make them less attractive, efforts to encourage the use of other nicotine products are treated as intrinsically suspect (Kozlowski, 2015, this issue).

The emergence of electronic cigarettes (or 'e-cigarettes') has challenged mainstream tobacco control narratives about harm reduction. Invented by Hon Lik in 2003, and launched in 2006 by an electronics company, they are battery-powered devices that

deliver varying levels of nicotine (sometimes none at all) via an inhaled mist (Goniewicz et al., 2015, this issue). Electronic cigarettes contain no tobacco, do not involve combustion, and emerged independently of the tobacco and pharmaceutical industries; thus, they are markedly different from either medicinal nicotine products or smokeless tobacco. For this reason they have posed substantial problems for regulators – for example, should they be regulated as a medicinal product, a tobacco product, a consumer product, or as a category of their own (Capponetto et al., 2015, this issue)?

There are two distinct narratives about electronic cigarettes currently in global circulation. The prevailing view in the fields of tobacco control and public health is that these new nicotine delivery systems are but the latest incarnation of the tobacco 'menace': an untested product with the potential to enslave ever-greater numbers of people – especially adolescents – to a dangerous addiction. The following comments by Dame Sally Davies, the Chief Medical Officer for England, reflect the tenor of mainstream public health responses in many countries, some of which, like Australia, have banned e-cigarettes containing nicotine outright (see Gartner & Hall, 2015, this issue). When asked "why are you against increased use of e-cigarettes?" Davies responded:

> If they were properly regulated as a medicine and we knew what was in them and the dose of nicotine, then they might play a useful role in stopping smoking. But they aren't, so at the moment we don't know their safety or the dose they deliver. They are often aimed at children with their flavourings – not only menthol but cookies and cream and bubblegum. They are sold rather cheaply and many of them are made in China, so I worry about what is in them. We have even got a verb for e-cigarette use: to vape. I am worried about normalising once again the activity of smoking. This matters particularly with children and adolescents (Austin, 2014).

Conversely, the dominant harm reduction narrative is that most smokers want to stop smoking, many are unable or unwilling to stop using nicotine, and that safer nicotine delivery systems allow the use of nicotine at much lower risk than smoking cigarettes. Whilst many harm reductionists are also concerned about 'Big Tobacco', the fear is more with how the industry might structure the market, removing popular and effective products and reducing innovation. Optimists view the 'endgame' as a potential for the transformation of tobacco companies into nicotine companies (at least in richer countries), rather than their destruction altogether. Many e-cigarette advocates and users view it as a consumer-led initiative fitting within a public health model of citizen engagement expressed in the WHO Ottawa Charter: "Health promotion is the process of enabling people to increase control over, and to improve, their health..." (World Health Organisation, 1986).

These two narratives articulate a similar vision of why people smoke and they share the goal of bringing about an end to smoking (Bell, 2013). Where they differ is primarily in relation to how that end might be accomplished and whether it requires the abandonment of nicotine itself. The gap between tobacco control and harm reduction narratives echoes longstanding debates in drug policy between those who advocate for abstinence-based approaches and those who emphasise ways of making drug use safer. And it echoes their differing ethical concerns – for one side it is unethical to provide harm reduction materials, for the other it is unethical not to do so. As Fairchild

and Bayer (2015: 375) observe, the opposing perspectives "reflect very different understandings of what the protection of public health requires".

There are several distinct ways in which we might examine these two narratives. First, we could evaluate each side's claims on the basis of the available evidence – evidence that several papers in the special issue present regarding who uses e-cigarettes and why (Hummel et al., 2015; Fraser et al., 2015; Farsalinos, Romagna & Voudris, 2015) and the degree of residual exposure to nicotine these products pose (Bush & Goniewicz, 2015). From this standpoint, the primary question relates to which perspective is more grounded in empirical research and which is not. This is the question Capponetto et al. (2015, this issue) address in discussing e-cigarette regulation. It is also the approach taken by McKeganey and Russell (2015, this issue) in their discussion of another area of current legislative interest in tobacco control: plain cigarette packaging.

There is much that is valuable to this kind of approach, drawing attention as it does to what kinds of claims about electronic cigarettes – and tobacco control legislation more broadly – are empirically grounded and what are not. However, a complicating factor is that *both* sides claim to be evidence-based. For example, the positions adopted by e-cigarette advocates and critics tend to be strikingly similar in tone, with each simultaneously invoking what Latour (2004) has called the 'fact' and the 'fairy' positions. They present their own arguments as neutral 'facts' and the opposition as fetishists (or 'fairies') who, depending on the position taken, either demonize or valorize e-cigarettes. Thus, a fundamentally political dispute is framed in largely technical terms, with each party rallying its own experts, "much like lawyers offering to the jury a parade of expert witnesses" (Epstein, 1996: 6).

A second and rather different approach to what are often cast as 'tobacco control' and 'harm reduction' viewpoints would be one that treats science and politics not as two distinct and separable phenomena but as inextricably intertwined. From this standpoint, neither viewpoint is 'neutral'; indeed, there can be no such thing. Accordingly, the categories of 'good' and 'bad' nicotine are not objective facts, but merely have the appearance of such. To quote Keane (2013, p. 190):

> The categories of good and bad nicotine are precarious and contingent because of their reliance on the assemblage of elements such as drug effects, technological and clinical innovations, habits of tobacco consumption, regulatory frameworks and the interests of both tobacco and pharmaceutical companies in the smoking cessation/smoking reduction market.

This is the approach taken by Elam (2015, this issue) in discussing the contests over Nicorette before its identity as a 'good' form of nicotine was stabilized.

Regardless of one's epistemological orientation to the 'truth' about electronic cigarettes (and other related topics of intense interest to tobacco control), the assembled papers clearly show that electronic cigarettes are radically disruptive, not only in a technological sense, but as an innovation that challenges prevailing ideas and social relations (Stimson, Thom & Costall, 2014). They are a challenge not only to the business of tobacco manufacturers, but for consumers – who now have new opportunities for consuming nicotine – and hence can redefine their relationship with nicotine. They can also redefine their relationship to routes away from smoking – rather than using a medical 'treatment' (nicotine replacement therapy) to 'quit', they can use electronic

cigarettes to 'switch'. They are also disruptive for regulators and governments who have to 'do something' about electronic cigarettes and who struggle to fit them into existing regulatory frameworks: as a tobacco product, medicine, consumer product, drug or whatever. And as we have indicated, they are also disruptive for tobacco control experts.

In sum, nicotine science, regulation and policy are an intriguing and highly topical area of drug research and analysis. The contributors to the special issue provide a critical orientation to major developments in these areas across a variety of national settings and policy contexts. Taken together, they suggest that nicotine and tobacco use in the future will probably look rather different from what it does today. However, the form it will take remains an open question and very much depends on who ultimately wins the contest for ownership of the issue.

Kirsten Bell*
Department of Anthropology, University of British Columbia, Canada

Gerry V. Stimson
London School of Hygiene and Tropical Medicine and Knowledge-Action-Change, United Kingdom

*Corresponding author.
E-mail address: kibell@mail.ubc.ca

25 March 2015

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