Public health and electronic cigarettes

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Public health campaigns need pragmatic revolutionaries, people who can spot opportunities and use them to the benefit of individual and population health. Electronic cigarettes (or vapourizers), which have lately been receiving much attention, appear to offer such an opportunity. These are devices that deliver nicotine via a vapour that a can be inhaled much like a cigarette, but without the vast range of carcinogens and other toxins found in cigarette smoke. The market for these products has recently exploded in Canada, as it has in many other countries. Smokers in Canada can easily access such products over the Internet or from bricks-and-mortar 'vape shops', and social media and personal conversation is abuzz with advice and testimonials from smokers who have successfully used these products to replace cigarettes.

Although it is readily apparent that vape shops are proliferating at a tremendous rate and are attracting many customers, it is difficult to obtain good data on Canadian sales of vapour products. This is largely because in 2009, Health Canada deemed the products illegal in the absence of medicinal approval (1). Retailers and e-cigarette advocates retort that Health Canada does not correctly interpret the law (2), and we are left with a market that is in a regulatory fog and difficult to monitor. However, in other national markets, the data are more robust. For example, in the United States, the market was estimated by the giant investment bank Wells Fargo in May 2012 as being a 'niche' worth $300 million (3). Two years later, the same bank considers the market to be worth $2.5 billion and poised to overtake cigarette sales within a decade (4). In the United Kingdom, academic research monitoring smoking trends and a survey conducted by the public health advocacy group Action on Smoking and Health show that e-cigarettes have become, by far, the most popular way to try to stop smoking; that the uptake of these products is associated with increased cessation (5); that they are now used by >1.3 million consumers (with perhaps 400,000 smokers having totally switched to these devices) and with negligible attraction to those who have not been nicotine users (6). Although it is early in the development of these technologies, the uptake appears to be exceedingly rapid. In addition, these products are improving at a significant pace in terms of consumer acceptability as the technology for such issues as battery power, 'throat hit', flavours and nicotine delivery responds to the demands of consumers. A significant number of smokers are apparently finding this technology to be an effective substitute for smoking and, often, an effective way to cease nicotine use altogether.

We appear to be dealing with a classic example of disruptive technology (ie, new technology that unexpectedly displaces existing technology). Similar to any innovation, there are risks of unintended consequences (such as attraction to nonusers of nicotine or of somehow leading 'vapers' back into smoking). There are also some who will have concerns that are ideological or moralistic. These include views such as an abstinence-only approach to any use of a drug regardless of relative risks, antipathy to capitalism or opposition to anything that could conceivably give tobacco companies any alternative to cigarettes. These views are very real in segments of the antitobacco movement, and are similar to opposition that has been faced in numerous other public health campaigns. However, true public health campaigns take a pragmatic view, meet people 'where they are', value concepts of justice and autonomy, and reject unscientific abstinence-only campaigns.

Regardless of moral or ideological opposition to alternatives to cigarettes, from a public health pragmatist's point of view, this new technology is here; the market is already significant, is rapidly evolving and it is unlikely to be going away. Not least because in an age of Internet-accessible information and social media for sharing it, even the ability of government regulators to prevent consumer access to innovative products has become highly constrained (7). So what does this mean for policy directions as we look at future opportunities in our efforts to reduce smoking? How can we ensure that the phenomenon of vapour products helps us achieve the best public health outcomes?

Cigarette smoking has long been recognized as Canada's leading cause of preventable death. The recognition of the immense magnitude of disease, death, disability and economic loss has led to a decades-long effort to reduce smoking, and accolades for many of us who have been part of that fight. To date, the fight against smoking has been regarded as one of the great public health success stories of the past century. The prevalence of smoking has been reduced dramatically over the past 50 years, and exposure to second-hand smoke has been drastically curtailed since the nonsmokers' rights movement came into its own in the 1980s. However, the success of any effort should be seen in relation to what was possible; if greater things are readily achievable, then settling for middling measures is hardly the sort of thing for which one should be heartily congratulated. We do not congratulate baseball players for hitting a triple but only running to first base.

So, how do our efforts to date on cigarette smoking compare with what could be achievable? We can consider that while the prevalence of smoking has declined steeply, the absolute number of smokers in Canada today is not markedly different than when the antismoking campaign began. Health Canada still reports that there are approximately five million self-reported smokers, and that figure is based on survey data that almost certainly underestimates the actual total, for reasons that include the failure of surveys to capture marginalized populations with high rates of smoking and the tendency of respondents to under-report negatively viewed behaviours. Based on current trends, an additional one million Canadians will die as a direct result of smoking over the next 25 years.

In contrast, other public health campaigns have dramatically reduced the absolute numbers of individuals at risk, often to the point of disease elimination. Think of tuberculosis, polio, smallpox or cholera – diseases that once ravaged Canadians; or of automobile fatalities, in which the campaign for auto safety started at approximately the same time as the campaign against smoking, and for which the maximum number of Canadians reported to be smoking and the maximum number of those dying in traffic accidents peaked at approximately the same time in the late 1970s. However, in contrast with the slow reduction in smoking prevalence and the persistently high death toll associated with smoking, the annual toll of traffic fatalities has not just fallen in terms of a proportion of the population or in relation to the number of vehicles and the distance travelled, but have fallen by two-thirds in absolute numbers (8,9).

One can also consider the rates of stomach cancer, in which the advent of the innovative technology of refrigeration took what had been the leading cause of cancer deaths in the early 1940s and rendered it relatively rare. Compared with the success of some of these other efforts, our success with smoking appears rather less robust.

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The key question, however, is whether tackling smoking-caused harm could happen much more quickly or whether it really is possible to have policies in place that could dramatically accelerate the decline in smoking. In thinking creatively about our policy options, of being pragmatic revolutionaries, a huge remaining opportunity is that the actual disease vector has been left largely unchanged and unchallenged. This is an oddity because it has been known for decades that it is the delivery system (the products of combustion) rather than the drug nicotine that is responsible for the vast majority of all of the deaths caused by smoking, and that it is evidently possible to deliver nicotine without combustion in ways that are acceptable to a great many smokers. Cigarettes are, very simply, an exceedingly and unnecessarily dirty drug delivery device.

Again, considering some other public health efforts gives valuable insights. Technological innovation has played a key role in reducing death, injury and disease in cases such as vaccination programs, water purification, refrigeration, automobile safety, consumer product standards, food preparation, building standards, medical procedures and reproductive health. Furthermore, the interventions used in other areas of public health explicitly acknowledge a key role for risk reduction. In fact, public health campaigns typically have a key 'but if' component. We tell people to avoid dangerous activities, but also say 'but if you are still going to do it, here's how to reduce your risks'. Such messages are ubiquitous. Drinking to excess is harmful, but if you do it, don't drive; driving in a snowstorm is dangerous, but if you do, ensure you have snow tires and slow down; and avoid being outdoors when the UV index is high, but if you do go outdoors wear a hat, long sleeves and use sunscreen. Where is the 'but if' for those using nicotine? Particularly for people often so dependent on the drug that abstinence is not a short-term option?

It is into this 'but if' vacuum that our field needs to move if we are to be truly pragmatic in fundamentally altering smoking's disease burden, and electronic cigarettes appear to open the door. We should focus on opportunities rather than merely focus on potential and theoretical risks as technology delivers products that can replace cigarettes. We should also pursue policies that encourage an ever-greater range of choices for those who wish to get off cigarettes and for those wanting to cease any form of nicotine use. The current generation of electronic cigarettes are fundamentally different than what existed even a year ago, and the pace of change as the field innovates to meet the needs of the millions of Canadians still smoking can accelerate as much as we have witnessed in mobile telecommunications and other forms of technology. The big opportunity is not with what we currently have in vapour products, but where we could be in a few years as technology is harnessed to give each nicotine user a viable alternative to smoking. Intelligent policy development can allow us to contain risks of unintended consequences while moving as fast as possible to make today's cigarettes as obsolete as the automobile technology of 50 years ago.

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