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MULL IT OVER: CANNABIS VAPORIZERS AND HARM REDUCTION

Legalization of cannabis is likely to lead to greater use. Balanced regulation of potentially less harmful modes of administration, such as vaporizers, is needed. Further research is warranted not only on the direct health effects of vaping cannabis, but also on its potential to decrease co-administration of tobacco with cannabis.

Budney *et al.* [1] argue that cannabis vaporizers should be regulated similarly alongside 'e-cigarettes', i.e. vaporizers used typically with nicotine. Indeed, the distinction between what is an e-cigarette and what is a cannabis vaporizer is increasingly blurred, as many vaporizers come with interchangeable attachments for vaping e-liquids, waxes or oils and loose-leaf (or 'dry herb'). There has also been some overlap between the tobacco and vaporizer industries, with Japan Tobacco International being a partner-investor from 2011 to 2015 in the US vaporizer company, Ploom [2,3]. Few would argue that many of the regulatory options being discussed for e-cigarettes are not equally appropriate for cannabis vaporizers, such as restricting sales to adults and curtailing aggressive marketing, especially directed at young people.

The legalization of cannabis use in several jurisdictions is likely to increase cannabis use as its availability and social acceptability as a legal substance increases. In the context of a growing cannabis market, careful consideration needs to be given to how we regulate all aspects of the market, including new delivery systems such as vaporizers. The challenge will be to strike an optimal regulatory balance between ensuring that vaporizers are truly harm-reducing at both the individual and population levels and potentially discouraging use of a less harmful alternative in favour of more harmful delivery modes involving combustion. Over-regulation of cannabis vaporizers could replicate the perverse regulatory situation for tobacco and nicotine in jurisdictions such as Australia, where the most harmful nicotine products (combustible cigarettes) are the least regulated, while some less harmful products (e-cigarettes and snus) are banned from sale [4]. Restricting access to less

harmful options while freely allowing more harmful consumption methods raises many ethical concerns and may be detrimental to public health [5].

Budney *et al.* raise the possibility that vaporizer use may result in more frequent cannabis and tobacco administration 'to the extent that vaping devices promote smoking a tobacco-cannabis mixture' [1]. However, there is another possible alternative scenario that deserves consideration; namely, that vaporizer use may reduce the practice of adding tobacco to cannabis, known as mulling. In many countries, mulling is the most common way to use cannabis [6,7]. Mulling appears to contribute to the high prevalence of tobacco smoking observed among cannabis users and is also a potential gateway to tobacco smoking among young people [8,9]. Co-administration of tobacco with cannabis could be more harmful than use of each substance alone because cannabis smokers take longer, deeper inhalations that increase exposure to tars. The reasons cannabis users cite for mulling include to make the cannabis burn easier, to make the smoke easier to inhale, to save money by stretching out the cannabis and to alter the experience of smoking cannabis alone [6,10].

In some surveys, cannabis vaporizer users report quitting or reducing tobacco smoking as a benefit of using a vaporizer [11,12]. In one survey, only two of 96 participants reported mixing tobacco with cannabis in a vaporizer compared with 15 who added tobacco when they smoked cannabis [12]. Participants in online forums give a number of reasons why they do not add tobacco to cannabis when vaping, including: vaped tobacco has an unpleasant taste; is harsher on the throat; clogs and dirties the vaporizer; there is no combustion, so it is not necessary to add tobacco to assist burning; and vaping is a more efficient way to use cannabis (no wasted smoke between draws), obviating the need to add tobacco to eke out the cannabis [13,14].

Some cannabis smokers who are not interested in quitting cannabis are interested in quitting tobacco [15]. For these cannabis users, switching to a vaporizer may present a harm reduction opportunity in addition to any direct reduction in risk from vaping rather than smoking cannabis, because they no longer need to mix tobacco with cannabis. As with nicotine vaporizers, more research on the health risks and benefits of vaping cannabis is warranted, and is likely to be welcomed by users. Given the high rates of tobacco smoking among cannabis smokers [7,8,16], the potential for vaporizers to reduce tobacco smoking among cannabis users should also be researched, particularly in countries such as Australia, where mulling cannabis is common.

Declaration of interests

None.

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CORAL E. GARTNER

School of Public Health, The University of Queensland, Public Health Building, Cnr Wyndham Street and Herston Road, Herston, Queensland 4006, Australia
E-mail: c.gartner@uq.edu.au

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CONFIRMATION OF THE TRIALS AND TRIBULATIONS OF VAPING

Responses to our article indicate consensus on the need for expedited scientific and regulatory action related to vaping of cannabis and other substances to curtail untoward public health impact and identify potential benefits. How to speed up science, increase knowledge and enact responsible regulatory policy poses a formidable challenge.

The responses to our paper on the emerging phenomenon of vaping cannabis confirmed the pressing need to understand more clearly its public health impact, but this should not keep us from implementing common-sense policies before all the data can be gathered. Dr Tashkin, the foremost expert on the toxicology of cannabis smoke, suggests that the health benefit of vaping cannabis is probably limited to a reduction in symptoms of bronchitis [1]. This may benefit cannabis users with compromised lung health, but overall produces fewer health benefits than those projected from using e-cigs to replace burning tobacco.

Fischer and colleagues speculate that proliferation of vaping devices could herald the development of novel and more hazardous cannabis formulations for use in these devices [2]. They reflect on how vaping may decrease the perceived risk associated with cannabis use, and thereby increase use and the negative consequences of misuse. Drawing from observations from Canada they warn that, as with e-cigs, consumers appear to be ahead of policy leaders, underscoring the urgent need to gain control over already well-established operations of the cannabis and vaping industries. One example of how to combat industry is the State of California's Blue Ribbon Commission on Marijuana Regulation, which is adapting tobacco policies previously implemented successfully to control tobacco proliferation [3].

Dr Cox focuses on the need for increased regulation of the commercialization of vaporisers to minimize the adverse impact of vaping [4]. He reminds us of the tobacco industry's huge commitment to