Review of: "Modelling Potential Health Gains and Health System Savings Associated with Vaporised Nicotine Products in Canada"

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Potential competing interests: I have no conflict of interest to declare here. I have worked as a paid consultant to both the federal government of Canada in the area of alcohol taxation and tobacco control, and acted as a consultant to lawyers who advise private-sector clients.

This paper represents a valuable contribution to the literature on the health impacts of partially replacing combustible cigarettes (c-cigs) with e-cigarettes (e-cigs).

The methodology follows well-accepted practice in the literature. The paper involves a substantial amount of research and computational work, including randomization and Monte-Carlo methods. I was present at a seminar where the authors presented this methodology and findings early in 2020, and had the opportunity, like other participants, to question the authors about methodology and simulations. Like many other papers in this area, the authors conclude that the introduction of vaping products results in a gain in life years and a reduction in health costs.

- The authors have been pretty conservative in computing the potential number of life years saved as a result of partial switching because they assume just a 5% reduction in health costs for dual users.
- A key assumption in these models is the rate of transition from smoker to dual user to solely vaper. The Canadian Tobacco and Nicotine Survey of 2019 indicates that a high percentage of those who adopt vaping continue to smoke. We will learn during the next few years how those dual users evolve: how many will become solely vapers and ho many will remain dual users. We will also need data on how much of each product dual users consume.
- A novel feature of this paper is that it is able to separate out indigenous communities (First Nations and Inuit Peoples in Canada - FNIPs). It complements nicely a paper by Marewa Glover et al (Tobacco smoking in three "left behind" subgroups: indigenous, the rainbow community and people with mental health conditions, in *Drugs and Alcohol Today*, 2020, DOI 10.1108/DAT-02-2020-0004). When data become available in sufficient amounts for individuals with mental health problems (who experience high smoking rates) it will be interesting to see the extent of the benefits to that group associated with the choice of less harmful products in the market place that can deliver nicotine.
- The results are presented in both dollar terms and life-years gained. This is a good feature because the choice of discount rate can camouflage important happenings in these multi-generational models.
- This class of model will benefit from updating in the next few years, because we will be able to observe how state transition rates evolve in reality as more data on actual behaviors over time become available. It is to be kept in mind that while vaping has been around for about a decade in Canada, it is really only since 2018 that a sizable percentage of nicotine consumers began to vape. As an example of growing knowledge: some summary results from the 2020 Canadian Tobacco and Nicotine Survey indicate a dramatic decline in smoking rates among individuals in their early

twenties. This suggests that the transition rates from smoking to vaping may be indeed very high at this age point, and thus the gains to the availability of vaping products will be greater than we have envisaged. No doubt further iterations of this particular model will provide answers to this exciting possibility.

- This solid paper is well worth a read for anyone interested in the likely health benefits of introducing vapes into the nicotine market. It is the first paper to map the possibilities in Canada, and the model workings are clearly described in the paper's development.