Review of: "Higher Sales of Electronic Nicotine Delivery Systems (ENDS) in the US Are Associated with Cigarette Sales Declines, according to a Trend Break Analysis"

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Potential competing interests: No potential competing interests to declare.

Based on data on weekly per-capita cigarette and ENDS purchases in the US during 2014-2019 obtained from a national sample of retail outlets, the authors demonstrate that actual cigarette sales in 2017-2019 were lower than predicted by the trend in 2014-2016, a period before ENDS had a substantial market share. The authors consider that these results support the view that the introduction of ENDS had caused cigarette consumption to decline.

While the analyses are well described, with no obvious errors, I have a few comments.

First, the period used to establish an underlying trend (2014-2016) seems quite short - only three years, and in many ways a longer period gives more confidence in an established trend. I note that earlier related studies used longer periods to extrapolate from. Thus, one of the papers cited[1] projected data from 1999 to 2009 to study observed and expected prevalences up to 2018, while another[2], which used data from various surveys also used much longer pre-vaping periods, the same being true for another study not cited[3].

It is also clear that the period 2014-2016 is not really before ENDS use, and such use before 2017 may already have affected the use of cigarettes.

While the conclusion that ENDS use has reduced cigarette consumption is very likely to be correct, and I agree with the statement that “risk-proportionate tobacco regulation could mitigate the tobacco-related health burden”, I feel that the wording of the statement that “ENDS potentially pose a lower risk than cigarettes” is far too cautious. While there is no reliable epidemiological data yet relating long-term ENDS use to the major smoking-related diseases such as lung cancer, COPD, ischaemic heart disease and stroke, the level of exposure to toxicants for ENDS is clearly much lower than for cigarettes.

Turning now to points of detail:

1. The data concern weekly per-capita cigarette and ENDS purchases. Apart from the semantic point that per-caput it is more logical than per-capita (humans only have one head) I think that it does not come over clearly enough that the

data are weekly. The word “weekly” appears very few times in the paper, and a reference to sales without mentioning it is per week appears much more often. Please give the units (especially in tables and figures).

2. It seems slightly odd in paragraph 4 of the introduction to refer to lack of knowledge about population effects, when there are citations in paragraph 2 of results “at the population level”.
3. Paragraph 4 of the introduction refers to results for Japan. Are there no results for other countries than US or Japan? Indeed, my 2019 paper[3] cites UK data.
4. Figure 1 has a key implying that there are two blue lines, but I see only one. In any case, to my old eyes, the two blue lines in the key look to have virtually the same colour.

References

1. ^*Foxon F, Selya AS. Electronic cigarettes, nicotine use trends and use initiation ages among US adolescents from 1999 to 2018. Addiction 2020;115(12):2369-78.*
2. ^*Levy DT, Warner KE, Cummings KM, Hammond D, Kuo C, Fong GT, et al. Examining the relationship of vaping to smoking initiation among US youth and young adults: a reality check. Tob Control 2019;28(6):629-35.*
3. a, b*Lee PN, Coombs KJ, Afolalu EF. Considerations related to vaping as a possible gateway into cigarette smoking: an analytical review [version 3; peer review: 2 approved] (https://doi.org/10.12688/f1000research.16928.3).F1000Res 2019;7:1915.*