

Young people's e-cigarette use is not a substantial gateway to regular smoking

Peer reviewed: Yes

Method of research: Observational study

Subject of study: People

A study published by the scientific journal *Addiction* has found that prevalence of e-cigarette use in England among young adults between 2007 and 2018 did not appear to be associated with substantial increases or decreases in the prevalence of smoking uptake.

Several longitudinal observational studies have previously pointed towards a possible gateway effect between initiation of e-cigarettes and later use of cigarettes in adolescents. However, these findings may reflect shared vulnerability such that the same young people who would try e-cigarettes would also more likely later to smoke cigarettes.

One way to avoid this self-selection bias is to assess the impact at the population level rather than the individual level, using an approach called time series analysis. Using this method, the current study measured the gateway effect of vaping by looking at the association between prevalence of e-cigarette use among young adults and prevalence of uptake of smoking generally, including among people who have never smoked. The researchers reasoned that if a gateway effect existed, there ought to be associated population-wide changes in the prevalence of smoking uptake when the prevalence of vaping changed. Conversely, if a gateway effect did not exist, changes in e-cigarette prevalence should not be associated with changes in uptake of smoking among young adults.

The authors found no statistically significant association between the prevalence of e-cigarette use and ever having smoked regularly (used as an indicator of uptake) among those aged 16 to 24. To interpret this finding further, the authors used Bayes factors and robustness regions. Bayes factors help interpret whether a non-significant finding is evidence of no difference or whether the study was not sensitive enough to detect an effect. Robustness regions identify the size of effect which can be plausibly dismissed. The authors were able to rule out a gateway effect from e-cigarette use to smoking uptake of the size commonly reported in the literature but were not able to rule out very small effects for a gateway in or out of smoking (where e-cigarette use makes it less likely that young people start to smoke).

Lead author Dr Emma Beard states, "These findings suggest that the large gateway effects reported in previous studies can be ruled out, particularly among those aged 18 to 24. However, we cannot rule out a smaller gateway effect and we did not study younger age groups. If the upper estimates are true, we would estimate that of the 74 thousand e-cigarette users aged 16 to 17 in England, around 7 thousand would become ever regular smokers as a consequence of e-cigarette use. At the same time, approximately 50 thousand smokers are estimated to quit per year as a consequence of e-cigarette use".

Professor Lion Shahab, senior author, states, "These findings are important given the contrasting advice given by health bodies and governments in different countries. Research to date supports the argument that e-cigarettes are less harmful than tobacco and help smokers to stop smoking. Although some harm from vaping relative to never vaping cannot be ruled out, this study suggests there is little evidence of a substantial gateway effect into smoking."

The analysis plan and data set were pre-registered on the Open Science Framework (<https://osf.io/8b7pr>).

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For editors:

This paper is free to read for one month after the embargo lifts from the Wiley Online Library: <https://onlinelibrary.wiley.com/doi/10.1111/add.15838> or by contacting Jean O'Reilly, Editorial Manager, *Addiction*, jean@addictionjournal.org.

To speak with lead author Professor Lion Shahab please contact him at University College London by email (lion.shahab@ucl.ac.uk) or telephone (+442076791895)

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