Predicting the long-term effect of e-cigarette use on population health: A systematic review of modelling studies

Giang Vu (1,2), Daniel Stjepanovic (1), Gary Chan (1)

(1) National Centre for Youth Substance Use Research, The University of Queensland, Brisbane, Australia School of Psychology
(2) School of Psychology, The University of Queensland, Brisbane, Australia

Presenter's email: g.vu@uq.net.au

Introduction

In absence of epidemiological data on long-term effects of e-cigarette use on population health, mathematical modelling of possible projected outcomes has been the popular alternative. This study aims to systematically review these studies.

Method

PubMed, Scopus, Web of Science and PsycINFO were systematically searched for eligible English publications. Data on study characteristics, model attributes and population health outcomes estimates were extracted from each article.

Key Findings

In most cases, the introduction of e-cigarette was associated with decreased mortality, QALY improvement and reduction in costs for the health system. Most studies reported lower rate of cigarette smoking in the presence of vaping. Detriment of health outcomes appeared in cases where significantly high initiation among otherwise non-smokers was assumed or when e-cigarettes were modelled as discouraging smoking cessation substantially. There has been a heavy focus on the USA and an absence of studies set in developing countries. Inclusion of risk factors other than smoking state was limited. Only a minority of studies assessed non-mortality outcomes or was particularly focus on youth population.

Discussion and Conclusion

Mathematical simulations generally suggested that e-cigarettes may contribute to smoking prevalence reduction and population health improvements in the long run, given that their use can be restricted to smoking cessation. This, however, should be viewed in light of the various unverifiable assumptions used and the lack of real-world factors included. Future modelling studies may also benefit from exploring the situation in low-and-middle-income countries as well as having a focus on young people.

Disclosure of Interest Statement

The authors declare no conflicts of interests.