

A modeling approach to gauging the effects of nicotine vaping product use on cessation from cigarettes: What do we know, what do we need to know?

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Abstract

BACKGROUND AND AIMS: The long term population health impact of nicotine vaping products (NVPs) use among smokers is unknown and subject to a range of plausible assumptions about the use and health consequences of NVPs. While NVPs use may substitute for cigarette smoking and thereby aid in quitting cigarette use, it is also possible that smokers who would have otherwise quit would instead delay quitting cigarettes. We aimed to develop a cohort-specific simulation model of the impact of NVPs on smoking cessation by adult smokers and resulting premature deaths (PD) and life-years lost (LYL).

DESIGN: A cohort-specific simulation model of the impact of NVPs on smoking cessation by adult smokers and resulting premature deaths (PD) and life-years lost (LYL) was developed by gender for two birth-cohorts, age 30 and age 50 in 2012. Extensive sensitivity analyses were conducted.

SETTING: United States **PARTICIPANTS:** Smokers in two birth-cohorts, age 30 and age 50 in 2012 **MEASUREMENTS:** Data were from the 1965-2012 National Health Interview Surveys and the 2014/5 Tobacco Use Supplement of the Current Population Survey. The model incorporated a range of plausible assumptions from published literature about transition rates from regular smoking to exclusive NVP and dual use, from dual use to exclusive NVP use and from exclusive NVP use to no use.

FINDINGS: Compared with the No-NVP scenario, the male (female) model projected 17.8% (19.3%) fewer PDs and 22.9% (26.6%) fewer LYL for the 1982 cohort and 5.4% (7.3%) fewer PDs and 7.9% (11.4%) fewer LYL for the 1962 cohort. These gains were sensitive to NVP use over time, age of initial NVP use, transitions from smoking to dual, exclusive NVP and no use, and relative NVP mortality risks.

CONCLUSIONS: Nicotine vaping product (NVP) use in the US is projected to have a net positive impact on population health over a wide range of plausible levels of NVP use, transitions to dual, exclusive NVP and no use, and NVP risks. However, net impact is sensitive to parameter estimates.

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