England SimSmoke: The impact of nicotine vaping on smoking prevalence and smoking-attributable deaths in England

Levy, D., Sanchez-Romero, L.M., Li, Y., Yuan, Z., Travis, N., Jarvis, M.J., Brown, J., & McNeill, A.

Abstract
Background and Aims: Whereas the use of nicotine vaping products (NVPs) is widespread, their impact on smoking prevalence is controversial. This study considered the potential impact of NVPs on smoking prevalence in England. **Design:** Indirect simulation model. The England SimSmoke model is validated through 2012, before NVP use became more widely used by smokers. Because information on NVP-related transitions is limited, an indirect method is used; the difference in observed smoking prevalence (reflecting NVPs) is compared with a 2012–2019 counterfactual No-NVP scenario (without NVPs) to estimate the impact of NVPs on smoking and smoking-attributable deaths. **Setting:** England, 2000–2019. **Participants:** Nationally representative sample of population. **Measurements:** England's population, mortality rates and smoking prevalence estimates from three national surveys and tobacco control policies. **Findings:** Between 2000 and 2012, SimSmoke projected a decline in age 18+ smoking prevalence of 23.5% in men and 27.0% in women. These projections, as well as those by specific age groups, were generally consistent with findings from the three national surveys. Comparing 2012–2019 relative reduction in age 18+ prevalence from the Annual Population Survey (males, 27.5%) with the model-predicted No-NVP reduction (males, 7.3%), the implied NVP-attributable relative reduction in adult smoking prevalence was 20.2% (95% CI, 18.8%–22.0%) for males and 20.4% (18.7%–22.2%) for females. The NVP-attributable reduction was 27.2% (22.8%–31.6%) for males and 31.7% (27.4%–36.5%) for females ages 18–24 and 18.6% (15.2%–21.8%) for males and 15.0% (11.1%–18.8%) for females ages 25–34, with similar reductions for ages 35+. The implied reduction in smoking prevalence between 2012 and 2019 equates to 165 660 (132 453–199 501) averted deaths by 2052. Other surveys yielded smaller, but relatively consistent results. **Conclusions:** An indirect method of simulation modelling indicates that substantial reductions in smoking prevalence occurred in England from 2012–2019 coinciding with the growth in nicotine vaping product use.