

Perceptions of the Relative Harm of Electronic Cigarettes Compared with Smoking in the USA: Analysis of the PATH Study Data, 2013-2016

Grant O'Connell, Tanvir Walele, Xavier Cahours, Joseph Thompson & Thomas Verron

Imperial Brands plc, 121 Winterstoke Road, Bristol, UK



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1. Introduction

- Electronic cigarettes (e-cigarettes) have been characterised as significantly less harmful than smoked tobacco by an increasing number of public health authorities, including the American Cancer Society and US National Academies of Sciences, Engineering, and Medicine. Recent clinical research suggests that e-cigarettes are almost twice as effective at helping smokers give up tobacco than medically licensed nicotine replacement therapies [1].
- The prevalence of current cigarette smoking among U.S. adults declined from 20.8% in 2006 to 13.9% in 2018 [2]. In 2017, the Centres for Disease Control and Prevention reported that 2.8% of U.S. adults were current e-cigarette users, the majority of whom were current or former smokers who used e-cigarettes every day or some days [3].
- The rise in e-cigarette use has been associated with a statistically significant increase in smoking cessation rate at the population level among U.S. adult smokers [4].
- In the present study, we examined whether and to what extent the perceived relative harm of e-cigarettes compared with cigarettes has evolved in the U.S. over time. We analysed the recently released Population Assessment of Tobacco and Health (PATH) study adult interview data from Wave 3 (October 2015 to October 2016) [5].
- This study builds on our previous research presented at the Global Forum on Nicotine (Warsaw, 2018) where we showed that in Wave 2 (2014/15), only 32% of all adults identified that e-cigarettes were less harmful than smoking compared to 41% in Wave 1 (2013/14). Among adult current smokers the proportion who believed e-cigarettes were just as, or more, harmful than smoking increased substantially from 44% in Wave 1 (2013/14) to 57% in Wave 2 (2014/15) [6].

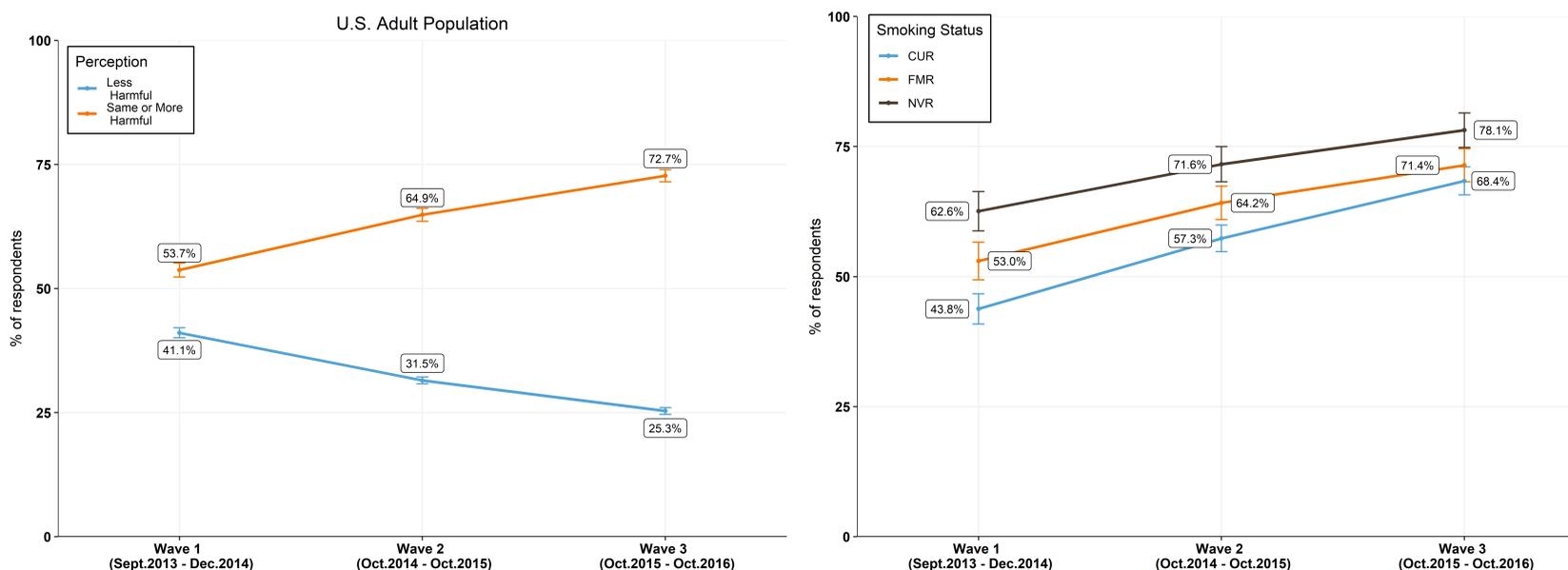
2. Data Analysis

- The PATH study is a national longitudinal study of tobacco use among youth and adults in the USA. The first wave contains baseline information for the study population. Continued follow up data become available as the consortium collects subsequent waves of data in future years. PATH study data collection involves rigorous, multi-layered sampling and weighing scheme to ensure that data are representative nationwide.
- The present study focussed on the PATH data contained in the adult interviews obtained in Wave 1 (2013/14), Wave 2 (2014/15) and again in Wave 3 (2015/16). The latest data was downloaded from the study's Public-Use Files [5].
- A sensitivity analysis was performed to ensure only those adults who answered question AE1099, "Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?", in Wave 1, 2 and 3 was analysed.
- Smoking status for each adult respondent was coded. The responses to PATH question AE1099 in different waves of the PATH study was assessed based on smoking status.

3. "Is Using An E-cigarette Less Harmful, About the Same, or More Harmful Than Smoking Cigarettes?"

- As depicted here, during Wave 3 (2015/16) the perception of harm from e-cigarettes has not improved. Over time, a growing proportion of the U.S. public and adult smokers still do not recognise that e-cigarettes are less harmful than cigarettes.
- The proportion of all U.S. adults who perceived e-cigarettes as less harmful than cigarettes declined further in Wave 3 (2015/16) to 25% compared to Wave 2 (2014/15) (Figure 1). During the same time, the proportion of the adult population believing that e-cigarettes were as harmful, or more harmful, than smoking increased by 12% to 73%.
- The proportion of adult current smokers who believed e-cigarettes were just as, or more, harmful than smoking increased substantially from 57% in Wave 2 (2014/15) to 68% in Wave 3 (2015/16) (Figure 1). The poor understanding among smokers, of all smoking statuses, about the relative harms of e-cigarettes compared to smoking is of concern. Between 2013 and 2016, the independent scientific evidence-base has grown, supporting e-cigarettes as a less harmful alternative to combustible tobacco.

Figure 1. Adult population and adult smokers' perception of harm from e-cigarettes relative to smoking.



Legend: *current smoker* is someone who ever smoked a cigarette, has smoked 100 cigarettes (lifetime), and now smokes every day or some days; *someday smoker* is someone who has smoked at least 100 cigarettes in his or her lifetime, who smokes now, but does not smoke every day; *experimental smoker* is someone who has ever smoked a cigarette, has NOT smoked 100 cigarettes (lifetime) and now smokes every day or some days OR has ever smoked a cigarette, has NOT smoked 100 cigarettes (lifetime) and now does not smoke at all; *never smoker* is someone who has not ever smoked a cigarette, even one or two puffs.

4. Discussion

- At the 2013 baseline, there was significant confusion among U.S. smokers and adults in general about the relative harms of e-cigarettes. Misperceptions have increased over time and, as evidence by the further increase in the number believing e-cigarettes as equally or more harmful than cigarettes in Wave 3 (2015/16), even more adults hold negative opinions about the relative harms of e-cigarettes.
- Due to the longitudinal nature of the PATH study design, it is clear that a substantial number of respondents who identified e-cigarettes as being less harmful than cigarettes in Wave 1 (2013/14) subsequently believed that e-cigarettes were at least as harmful or more harmful than cigarettes in Wave 2 (2014/15) and more again in Wave 3 (2015/16).
- Our findings, that most US adults and current smokers perceive e-cigarettes to be equally or more harmful than cigarettes, are consistent with a recent study that analysed U.S. nationally representative data from the Tobacco Products and Risk Perceptions Surveys (TPRPS) and the Health Information National Trends Surveys (HINTS) [7].
- Among current U.S. adult smokers, who may benefit most by switching to e-cigarettes, the growing misperceptions of e-cigarette relative harms may in fact deter them from trying or continuing use of e-cigarettes. As such, the further upward trend of perceiving e-cigarettes as equally or more harmful than cigarettes in Wave 3 (2015/16) warrants heightened consideration and should be urgently addressed.
- The misperceptions about the relative risks of e-cigarettes and nicotine in general may be driven by confusion between relative and absolute risk of e-cigarettes in communications where scientific studies are misrepresented in media publications and university press releases. A lack of consistent, accurate and proactive tobacco harm reduction communications to adult smokers by public health bodies may also contribute to the confusion about the health risks of e-cigarettes in the U.S. In the UK, public health bodies have active campaigns to communicate e-cigarette messages to the public and adult smokers which could serve as a model for policy makers worldwide.