

# Perceptions of the Relative Harm of Electronic Cigarettes Compared with Combustible Cigarette in the USA: Analysis of the Population Assessment of Tobacco and Health (PATH) Study Data, 2013-2019

Mengran Guo<sup>1</sup>, Thomas Verron<sup>1</sup>, Grant O'Connell<sup>2</sup>, Xavier Cahours<sup>1</sup>

<sup>1</sup>SEITA – An Imperial Brands PLC Company, 216 Rue Raymond Losserand – 75014 Paris, France  
<sup>2</sup>Imperial Brands PLC, 121 Winterstoke Road, Bristol, BS3 2LL, UK

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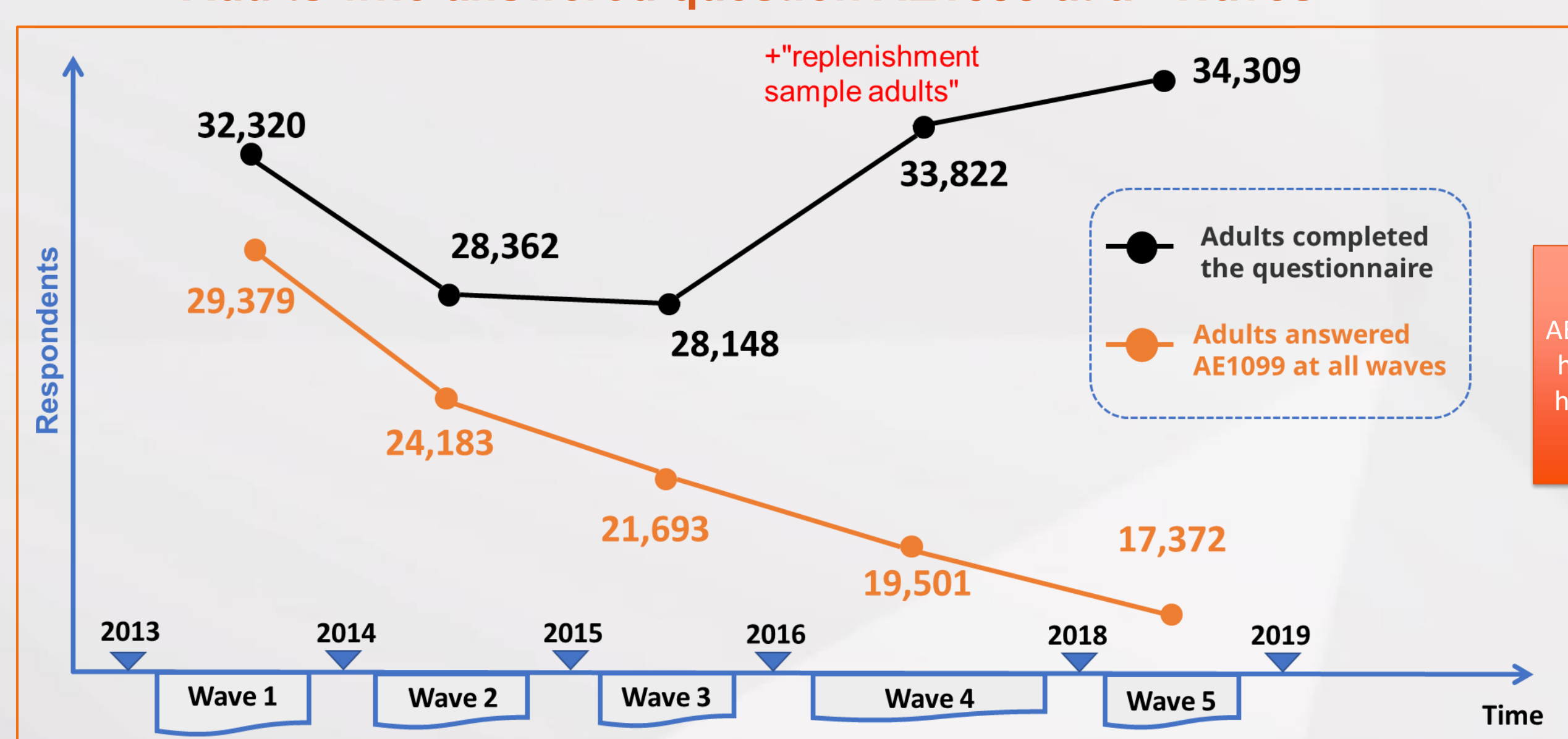
## 1. Introduction

- Electronic cigarettes (e-cigarettes) have been characterised as potentially 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. Recently, a comprehensive Cochrane Review found e-cigarettes are an effective tool in enabling smoking cessation in adult smokers, even among those who do not intend to quit smoking, with no serious unwanted effects or harm with up to 2 years of usage [1].
- In 2021, the Centres for Disease Control and Prevention reported that the prevalence of current cigarette smoking among U.S. adults declined from 20.8% in 2006 to 12.6% in 2021, and 4.7% 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 [2].
- 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 [3,4]. Studies show that e-cigarette use is becoming common among current smokers who want to quit, and that e-cigarette risk perception is related to e-cigarette status [5,6].
- In the present study, we analyzed the data from the longitudinal and nationally representative Population Assessment of Tobacco and Health Study (PATH) to assess the relative perceived harm of e-cigarettes amongst US adults between 2013 (Wave 1) and 2019 (Wave 5) [7].

## 2. Materials & Methods

- The Population Assessment of Tobacco and Health (PATH) Study is a collaboration between the National Institute on Drug Abuse (NIDA), National Institutes of Health (NIH), and the Center for Tobacco Products (CTP), Food and Drug Administration (FDA). It was launched in 2011 to inform FDA's regulatory activities under the Family Smoking Prevention and Tobacco Control Act. The PATH Study is an ongoing longitudinal cohort study on tobacco use behavior, attitudes and beliefs, and tobacco-related health outcomes. Data collection is planned through 2024.
- The PATH Study collects data from adults and youth. The first wave of data collection (baseline) included responses from over 32,000 adults and 13,000 youth. The number of cases will vary from wave to wave due to a variety of factors. 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 focused on the PATH data contained in the adult interviews obtained in Wave 1 (Sep2013-Dec2014), Wave 2 (Oct2014-Oct-2015), Wave 3 (Oct2015-Oct2016), Wave 4 (Dec2016-Jan-2018) and Wave 5 (Dec2018-Nov2019). The latest data was available in Fall 2022 and downloaded from the study's Public-Use Files [7].
- A sensitivity analysis was performed to ensure only adults who answered question AE1099, "Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?" at all Waves (n=17,372) were included. The responses to PATH question AE1099 was assessed based on smoking status.

Adults who answered question AE1099 at all Waves



All calculations of percentages required the use of weights provided by PATH Study

AE1099: "Is using an e-cigarette less harmful, about the same, or more harmful than smoking cigarettes?"

## 3. Results and Discussion

- Analysis showed that in Wave 1, over half of all participants believed e-cigarettes to be "about the same or more harmful" than combustible cigarettes which increased further over time:



- Among exclusive current adult smokers, the percentage who believed that e-cigarettes are "about the same or more harmful" than combustible cigarettes increases over time. The proportion of current smokers who believed e-cigarettes were just as, or more harmful than smoking increased substantially from 43.1% in Wave 1 to 81.6% in Wave 5 (+38.5%):



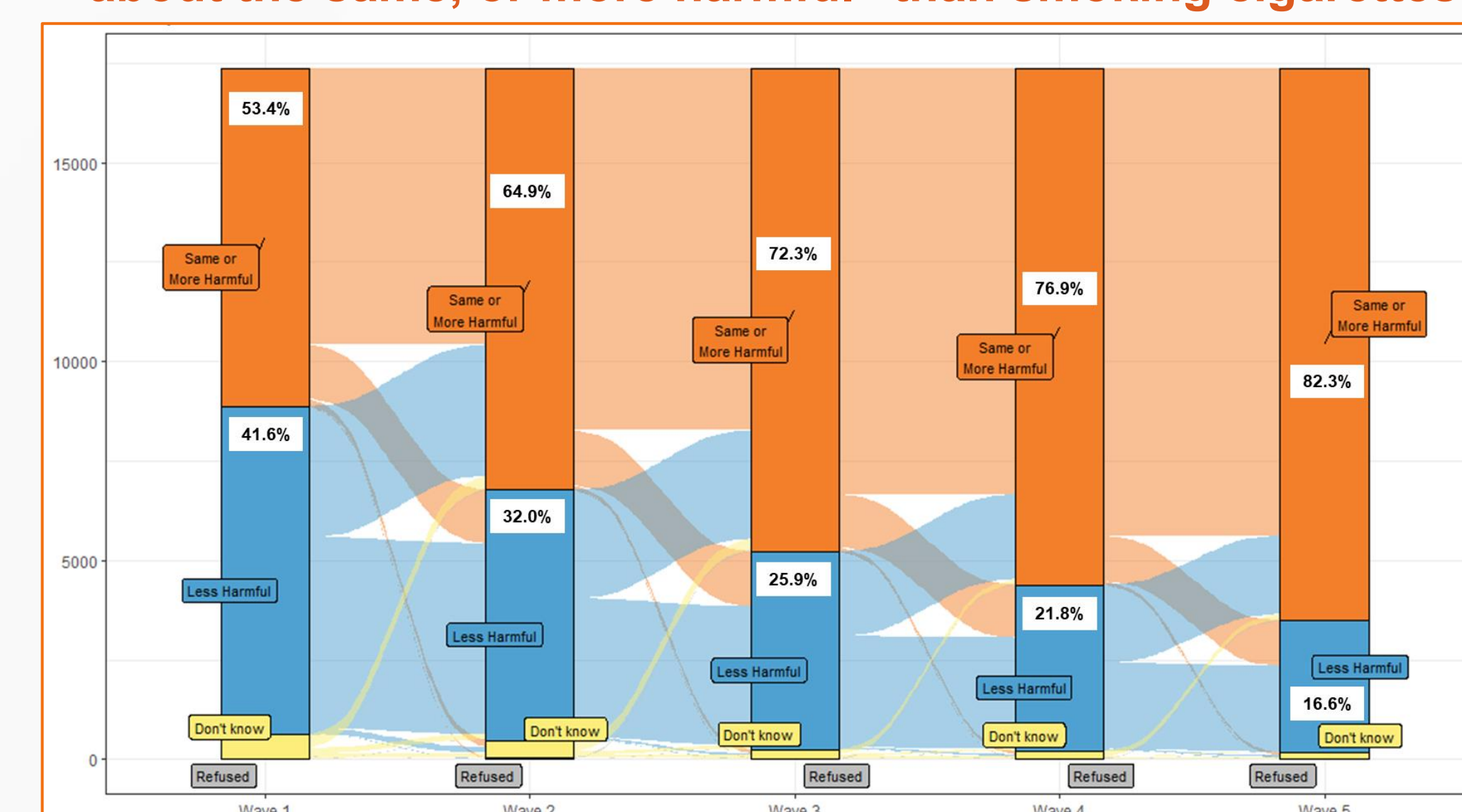
- Analysis showed a significant increase, between Wave 1 and Wave 5, in the perception of e-cigarettes being "about the same" or "more harmful" than combustible regardless of the vaping/smoking status.

- For never vapers, at the baseline (Wave 1), a higher proportion of current smokers, perceived e-cigarettes as being less harmful than cigarettes compared to never and former smokers: 43.4% vs 33.2% and 38.7%. Five years later, at Wave 5, a lower proportion of current smokers perceived e-cigarettes as being less harmful than cigarettes compared to never and former smokers: 9% vs 12.6% and 14.5%.

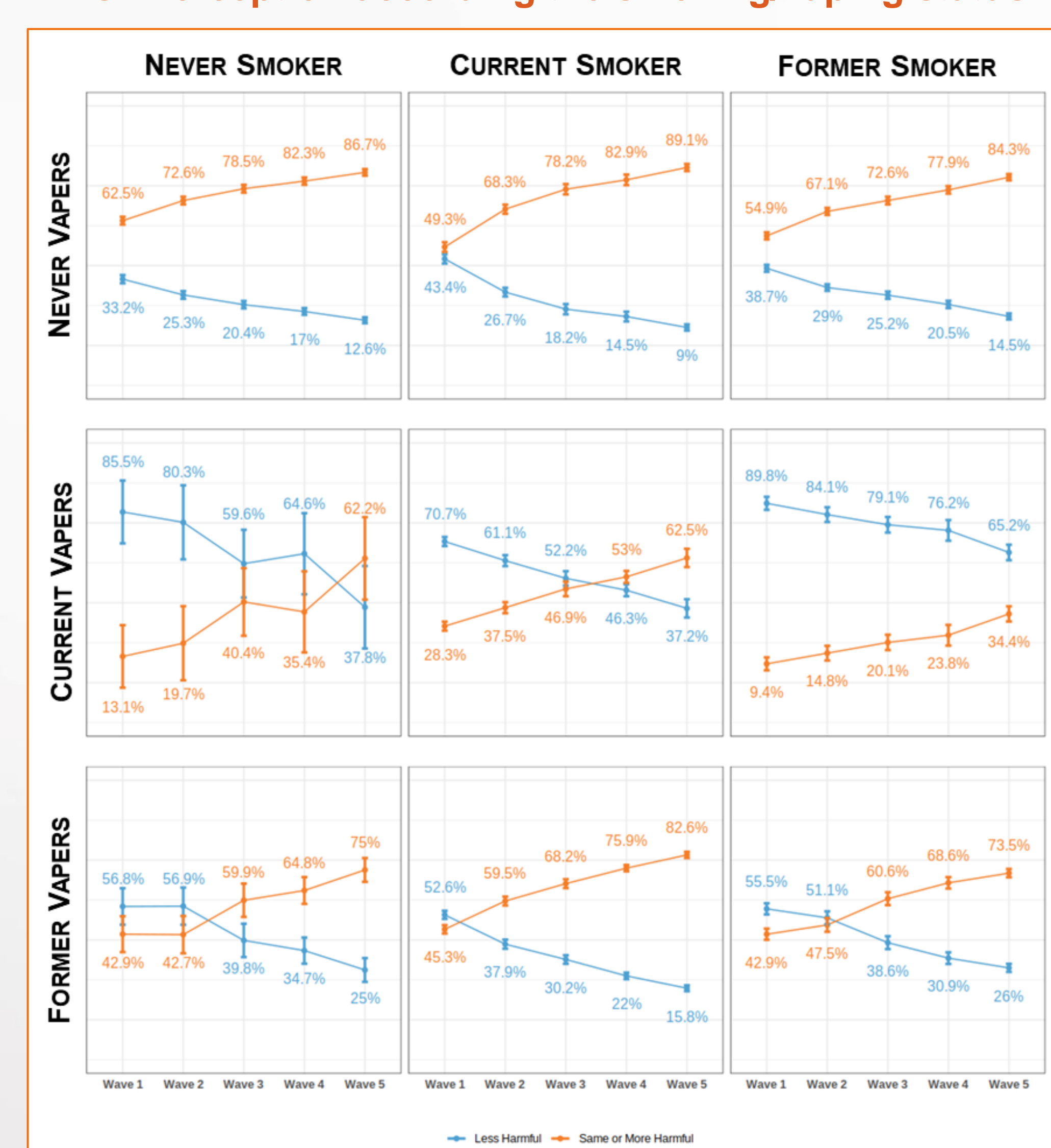
- The proportion of current vapers (never + current + former smokers) who believed e-cigarettes were "about the same", or "more harmful" than smoking increased substantially from 24.4% in wave 1 to 50.9% in wave 5 (+26.5%).

- There was an inversion of perception, between Wave 1 and Wave 5, for current and former vapers.

Adults who answered e-cigarettes are "less harmful" or "about the same, or more harmful" than smoking cigarettes



Risk Perception according the smoking/vaping status



## 4. CONCLUSIONS

- The longitudinal nature of the PATH study shows perceptions of the relative harm of e-cigarettes compared with cigarettes has worsened in the U.S. and are particularly strong in current adult smokers. It is likely that adult smokers may not even try an e-cigarette due to inaccurate beliefs about their relative harmfulness. Correcting these misperceptions with one clear, consistent, public health message may help more U.S. adult smokers, who would otherwise continue to smoke, to transition away from combustible cigarettes to potentially less harmful e-cigarette products, and to accelerate tobacco harm reduction strategies.
- The outbreak of EVALI, which received extended news coverage worldwide in late 2019/early 2020, was associated with the inhalation of the thickening agent vitamin E acetate added to illicit tetrahydrocannabinol (THC)-containing vaping devices. However, many public health bodies and media communications failed to distinguish these facts from well regulated nicotine-containing e-cigarettes. Consequently, post-EVALI, this may have increased confusion about the relative harms of nicotine-containing e-cigarettes, and vaping as a potentially less harmful alternative to smoking more generally, which will not be apparent until future waves of the PATH study have been published and data analyzed.
- The PATH study was not originally designed to assess relative harm perception in the US adult population, and the current study design only provides a single item for such assessments which may somewhat limit the reliability of the findings. In addition, the generic question in the PATH survey to assess relative harm may not have captured various aspects of harm with regards to perceived health risks associated with use. Those limitations notwithstanding, the findings from this study are consistent with others who have found that the relative harm perception of e-cigarettes compared to cigarettes is continuing to deteriorate over time.

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