

## Epidemic of youth nicotine addiction? What does the National Youth Tobacco Survey 2017-2019 reveal about high school e-cigarette use in the USA?

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### BACKGROUND

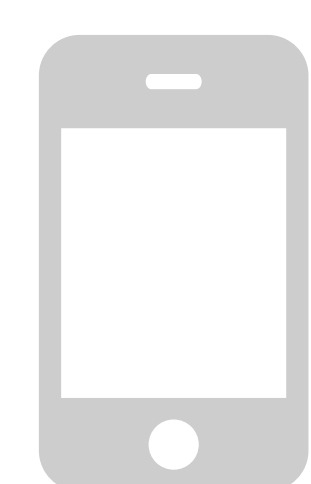
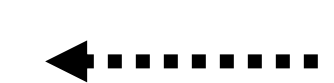
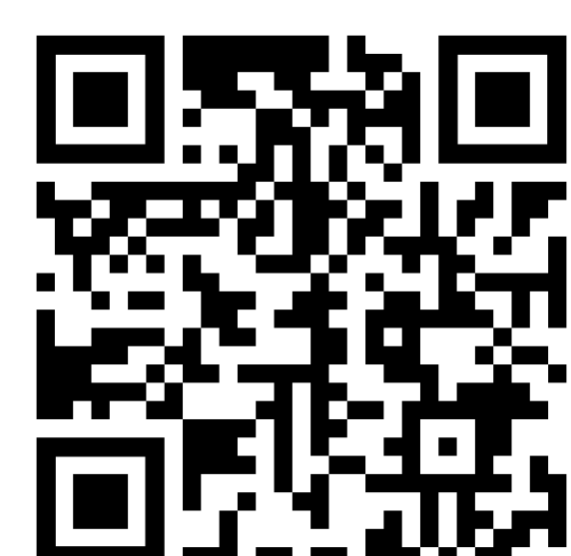
Between 2018 and 2020, the US Food and Drug Administration announced various restrictions on e-cigarette manufacturers in response to a perceived epidemic of e-cigarette use and nicotine dependence among high school students. The stimulus came from headline figures from the 2018 and 2019 National Youth Tobacco Survey (NYTS). We analysed e-cigarette use and dependence in the NYTS in relation to lifetime history of use of tobacco products.

### METHODS

**Design & setting:** Nationally representative annual survey of high school students 2017 to 2019 in the USA.

**Participants:** 10,186 students in 2017, 10,991 in 2018 and 10,097 in 2019.

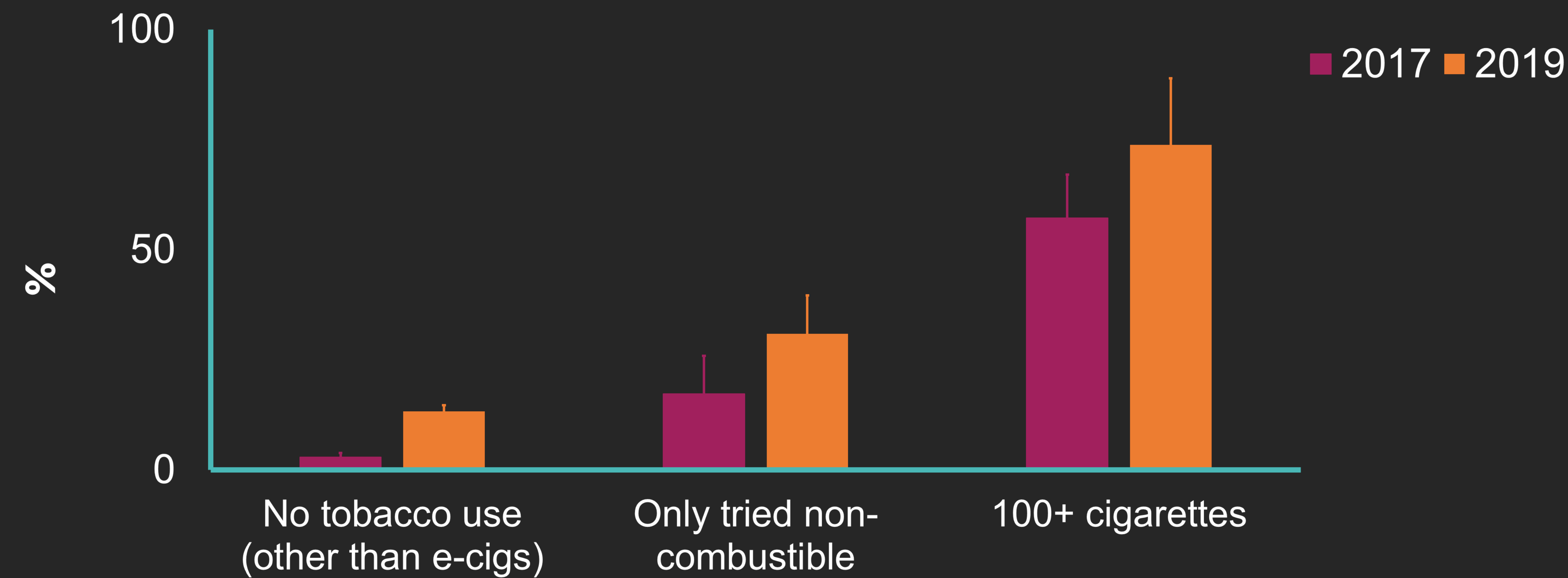
**Measurements:** Any use of e-cigarettes in past 30 days, frequent use ( $\geq 20$  of past 30 days) and indicators of tobacco or nicotine dependence (strong craving in past 30 days; wanting to use within 30 minutes of waking) were analysed by lifetime tobacco product use history, ranging from never use through to lifetime smoking of  $>100$  cigarettes.



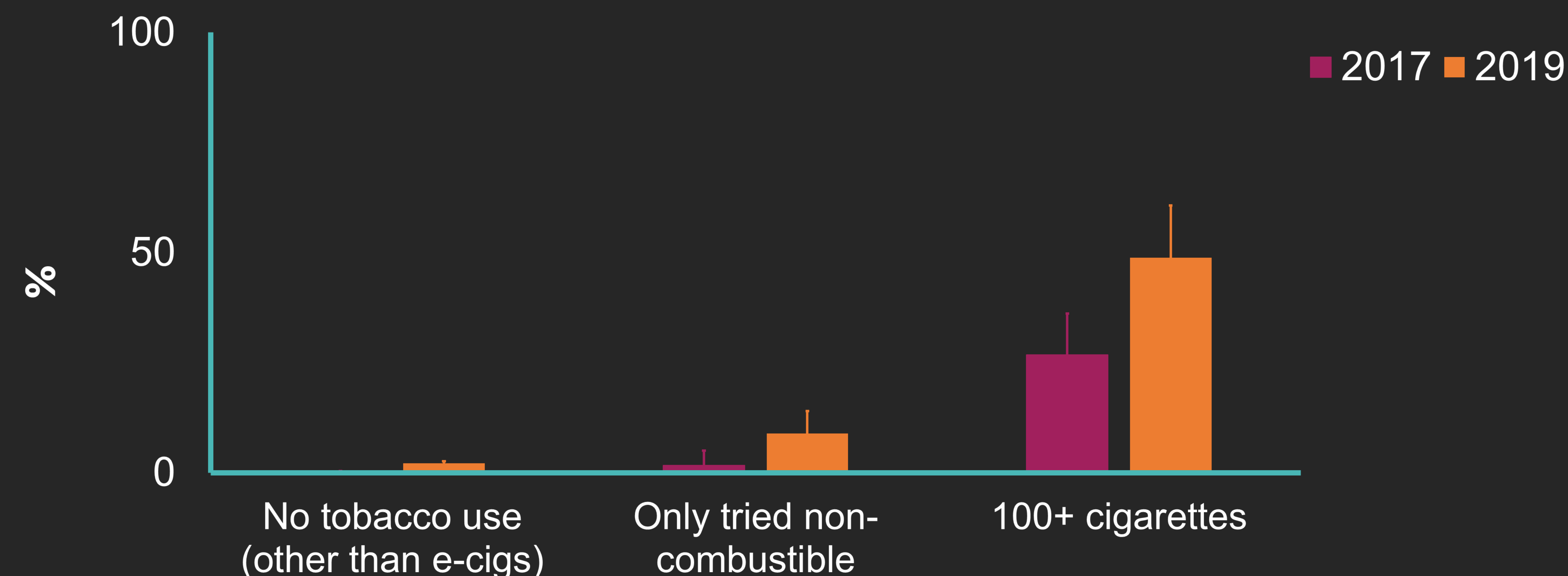
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# While use of e-cigarettes in US high-school students increased sharply between 2017 and 2019, frequent use and signs of e-cigarette dependence remained rare in students who had only ever used e-cigarettes and never any other tobacco product.

Past-30-day e-cigarette use by lifetime tobacco history 2017-2019



Frequent ( $\geq 20$  of past 30 days) e-cigarette use by lifetime tobacco history 2017-2019



### RESULTS

Past-30-day e-cigarette use increased from 11.7% in 2017 to 20.8% in 2018, and 27.5% in 2019 among all high school students in the USA.

In 2019, 13.3% of those who had never tried any other tobacco product, 30.9% of those who had tried only a non-combustible product (OR 2.9, CI 1.9-4.5), and in 73.8% of those who had smoked more than 100 cigarettes in their lifetime (OR 18.3, CI 8.4-40.1). Similar associations with lifetime tobacco use history were observed in 2017 and 2018.

Frequent use occurred in 0.2% of otherwise tobacco naive users in 2017, 1.0% in 2018 and 2.1% in 2019.

Among tobacco naive past-30-day e-cigarette users in 2019, 8.7% reported craving and 2.9% reported wanting to use within 30 minutes of waking. This pattern contrasted with that seen in e-cigarette users with a lifetime history of smoking more than 100 cigarettes: 65.0% of these reported experiencing craving; 48.7% wanted to use within 30 minutes of waking. The contrast for reporting a craving was similar in 2017 (3.8% vs 66.7%) and 2018 (8.6% vs 74.5%).

### Conflict of Interest

JB receives unrestricted research funding from and RW undertakes research and consultancy for and receives travel funds and hospitality from manufacturers of smoking cessation medications. All authors declare no financial links with tobacco or e-cigarette manufacturers or their representatives.

