

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

Martin Jarvis

Department of Behavioural Science & Health
University College London

martin.jarvis@ucl.ac.uk

Declaration of interests & acknowledgments

This work was unfunded. I have no financial interest to declare, but declare a career-long interest in tobacco harm reduction.

I am grateful to the US government for making datasets so readily available for analysis

November 15th 2018 FDA Press Release & Statement from FDA Commissioner Scott Gottlieb

- “astonishing increases in kids’ use of e-cigarettes, reversing years of favorable trends in our nation’s fight to prevent youth addiction to tobacco products”
- 78% increase in current e-cigarette use in high school students from 2017 to 2018 (11.7% to 20.8%)
- 27.7% of high school current e-cigarette users using the product regularly (20+ days in past month)
- “These data shock my conscience....I will not allow a generation of children to become addicted to nicotine through e-cigarettes”

FDA NEWS RELEASE

Results from 2018 National Youth Tobacco Survey show dramatic increase in e-cigarette use among youth over past year

Sharp rise in e-cigarette use results in uptick in overall tobacco product use; prompts new, forceful steps by FDA to firmly confront and reverse youth epidemic

[f Share](#) [t Tweet](#) [in LinkedIn](#) [✉ Email](#) [🖨 Print](#)

For Immediate Release: November 15, 2018

February 11th 2019 paper published in MMWR & new Statement from FDA Commissioner Scott Gottlieb

- “During 2017–2018, frequent e-cigarette use increased significantly by 38.5% among current e-cigarette users (from 20.0% to 27.7%)” Gentzke MMWR
- “The epidemic use of e-cigarettes among children is one of the biggest public health challenges currently facing the FDA”
- “The kids using e-cigarettes are children who rejected conventional cigarettes, but don’t see the same stigma associated with the use of e-cigarettes. But now, having become exposed to nicotine through e-cigs, they will be more likely to smoke”
- “This is an exploding epidemic. We’ll continue to put the full scope of our regulatory tools against this mounting public health crisis”

Gentzke AS et al Vital Signs: Tobacco Product Use Among Middle and High School Students — United States, 2011–2018. MMWR Morb Mortal Wkly Rep. 2019;68:157-64.

Claims advanced by the FDA

- Epidemic of youth nicotine addiction from e-cigarettes
- Gateway effects – e-cigs will lead to cigarettes
- Reversal of favourable trends in youth tobacco use

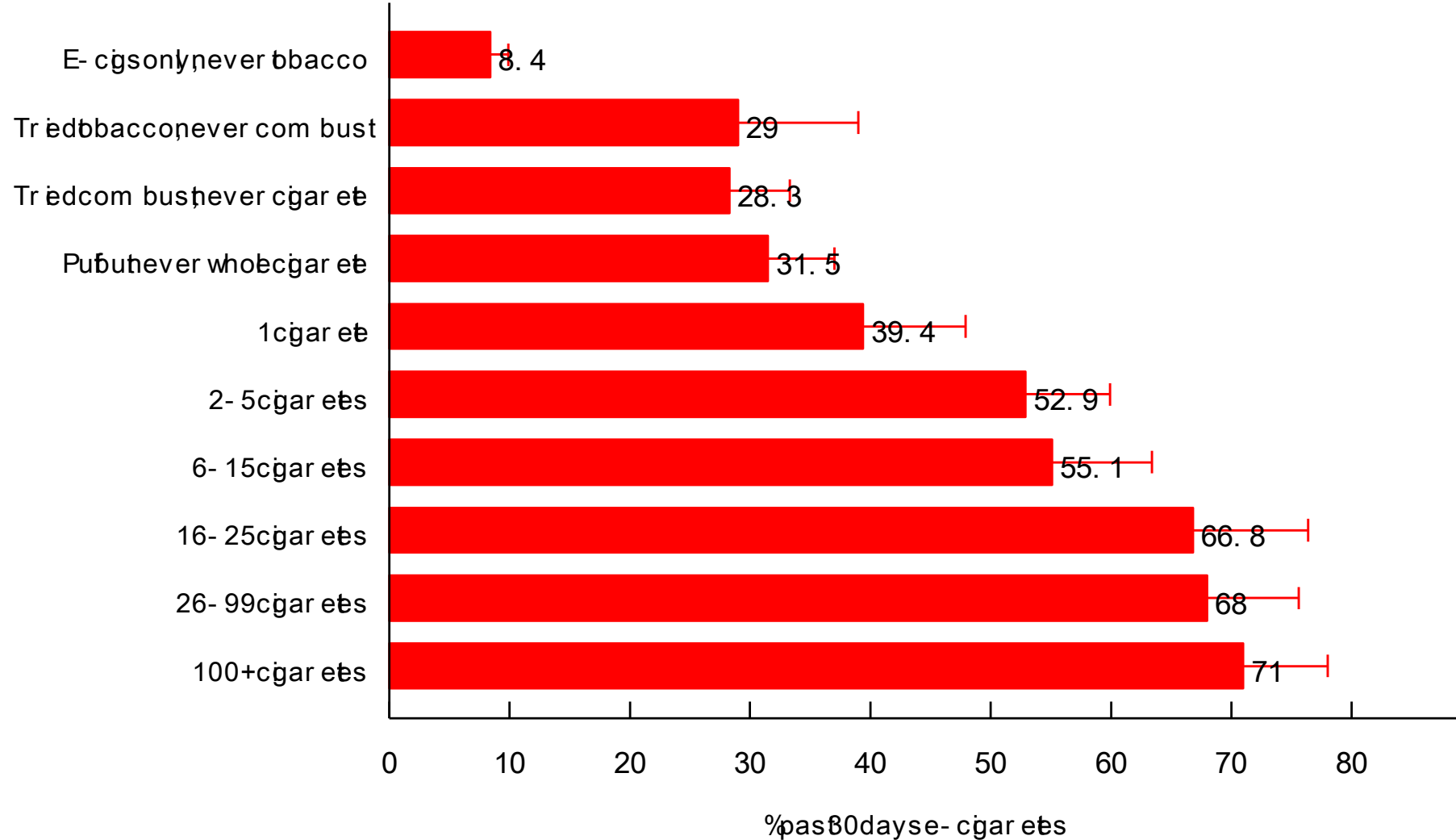
Issues requiring clarification

- What does the NYTS show about e-cigarette use placed in the context of use of other tobacco products?
- Does the NYTS provide evidence supporting the claim of gateway effects from e-cigarettes to cigarettes ?
- How well do detailed data from NYTS support the ‘exploding epidemic’ story?
- Do trend prevalence data support the claim of reversal of favourable trends in youth tobacco use?

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

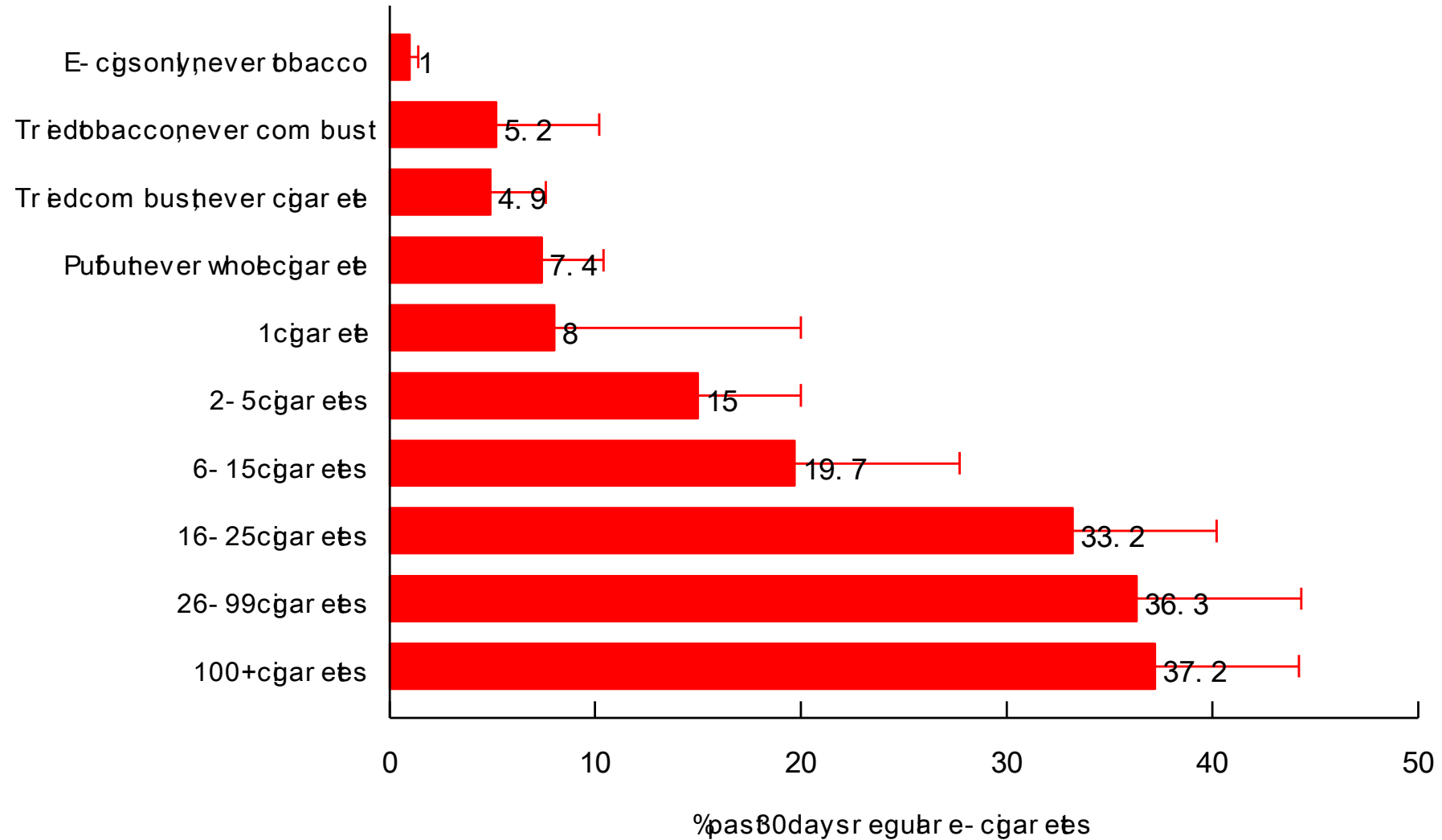
NYTS 2018

E-cigarette use was strongly related to lifetime tobacco use history, rising in graded fashion from 8% in those who had never used any tobacco product, non-combustible or combustible, through to 71% in those who had smoked more than 100 cigarettes.



Regular (20+ days in past 30 days) e-cigarette use
by lifetime tobacco use history. NYTS 2018

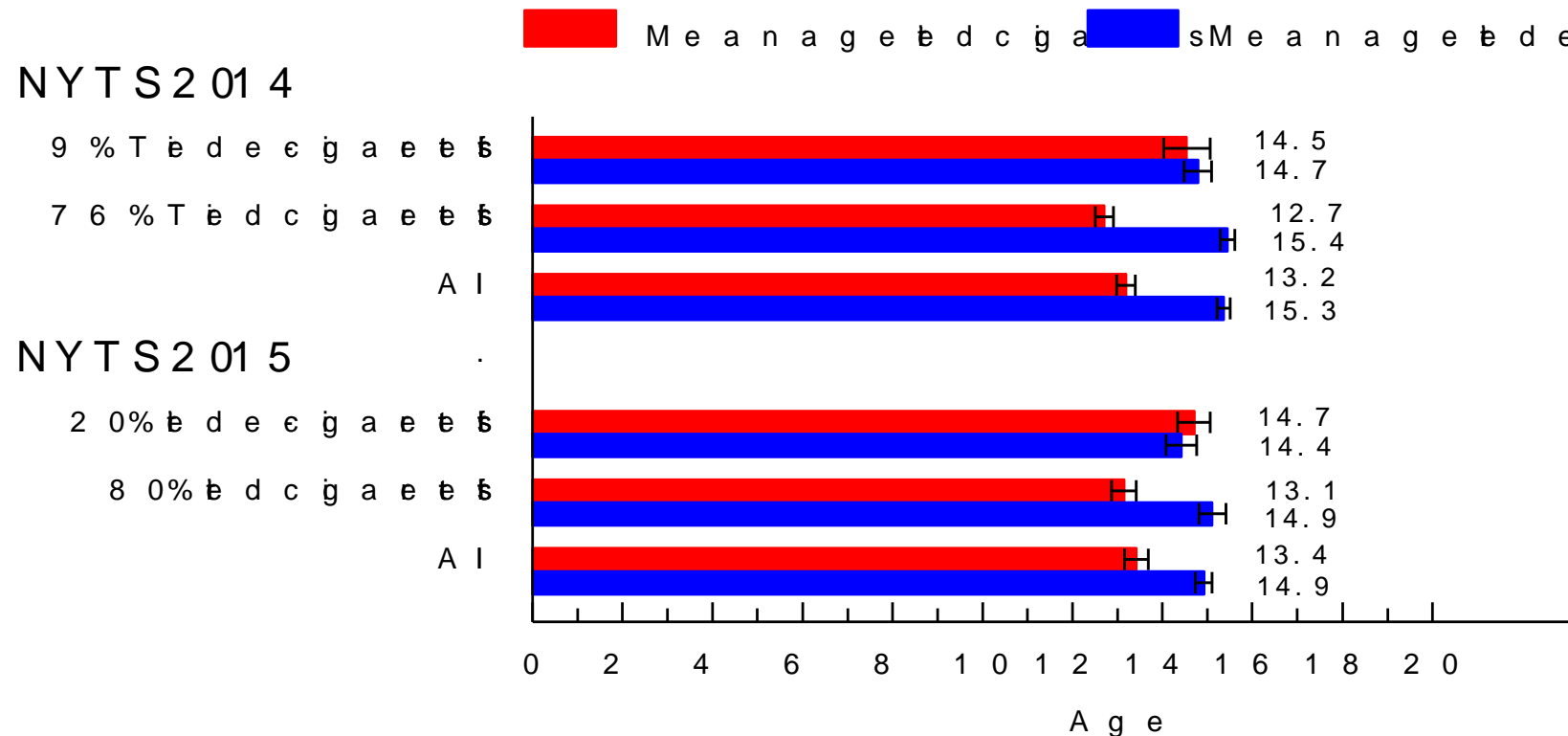
1% of high school students who had never used any tobacco product used e-cigarettes on 20+ days in the past month, rising with extent of lifetime tobacco experience to 37% in those who had smoked more than 100 cigarettes



Addressing gateway issues: Which product tried first?

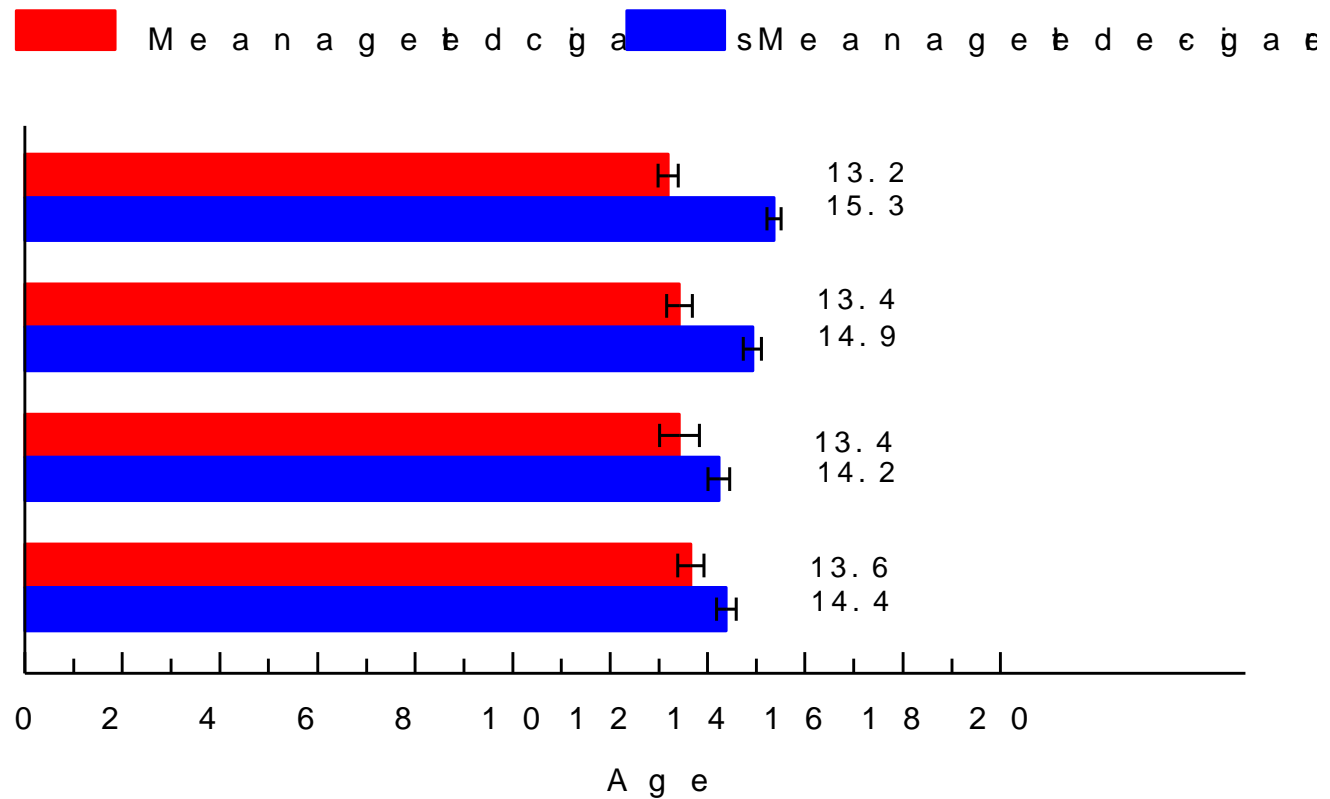
- In 2014 & 2015 respondents were explicitly asked which product they had first tried, and also their age at first trying each product
- In 2014 9% had tried e-cigarettes, first and 76% combustibles.
- In 2015, 20% had tried e-cigarettes first, 80% cigarettes.
- Reported age at first trying e-cigs and cigarettes validated these reports.
- Across all respondents, cigarettes were the first product used, by 2 years in 2014, 1.5 years in 2015.

Which tobacco product first?



Addressing gateway issues: Which product tried first?

Age at first cigarette and age at first e-cigarette

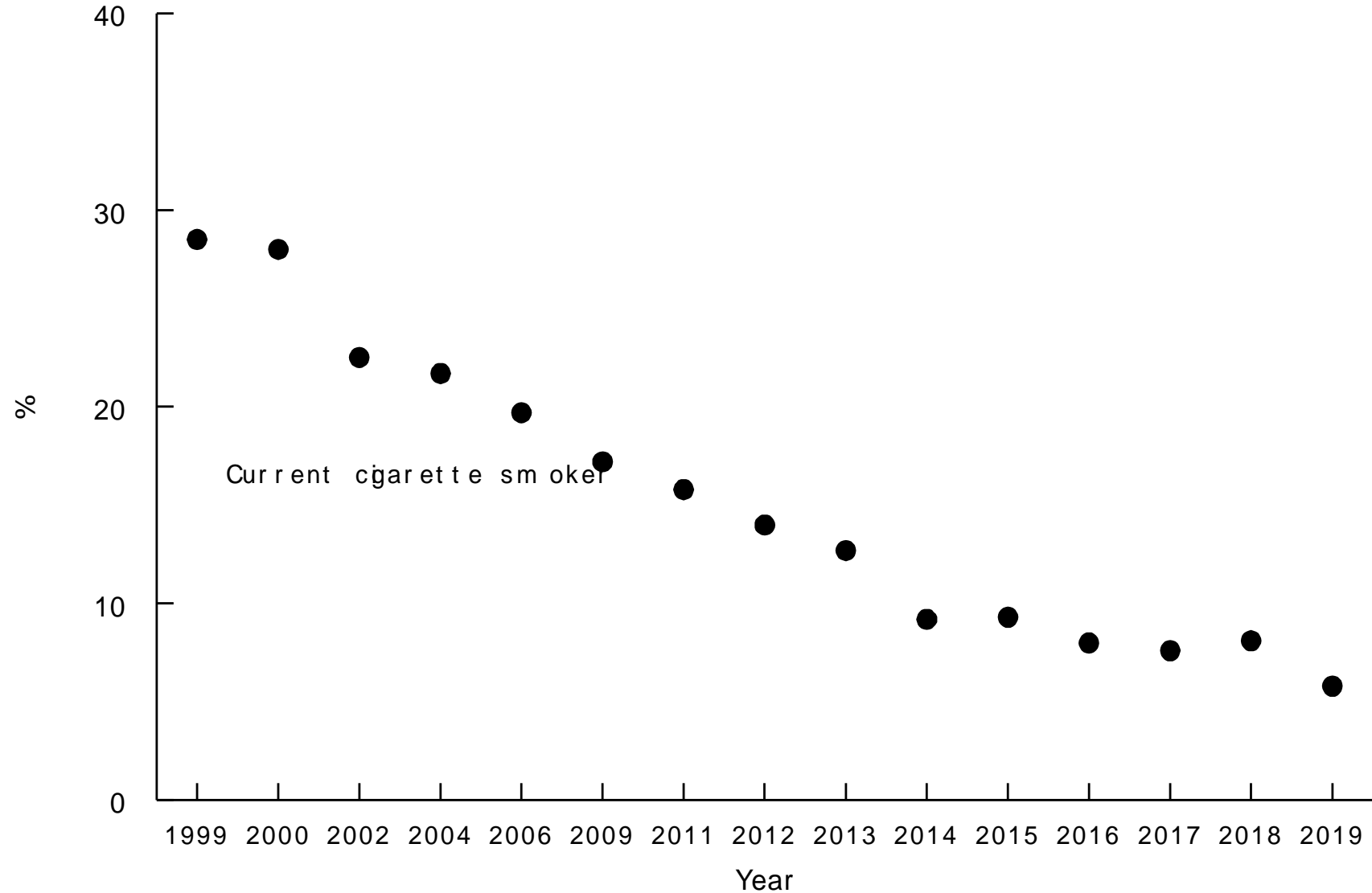


From 2016 onwards, the question on which product was first tried was dropped, but respondents continued to be asked their age at first smoking each product.

In each year from 2014-2018, on average, cigarettes were tried at an earlier age than e-cigarettes

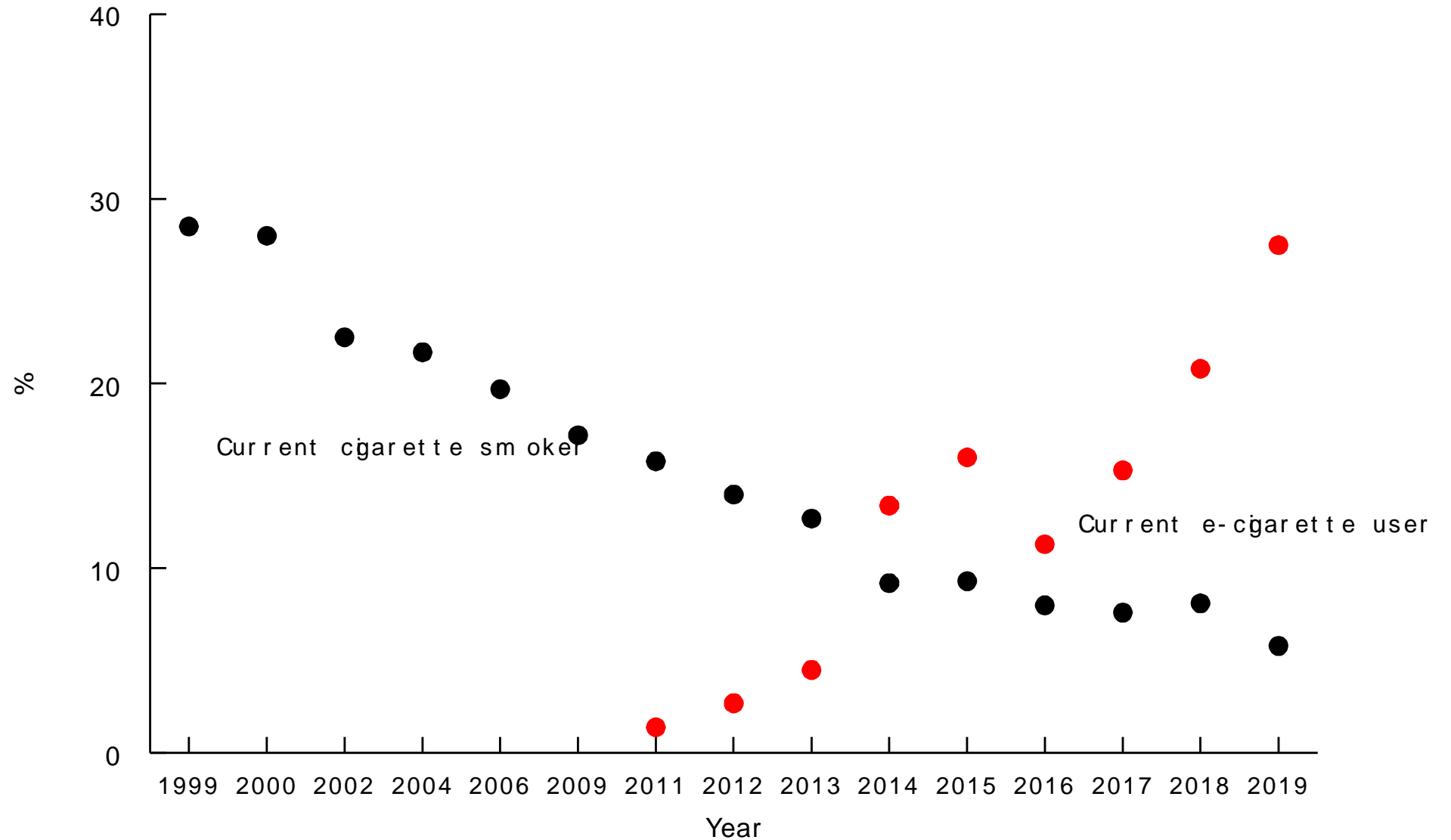
Gateway 2: what do prevalence trends show?

Youth cigarette smoking has been on a sharp declining trend for the past 20 years and is now at a historical low

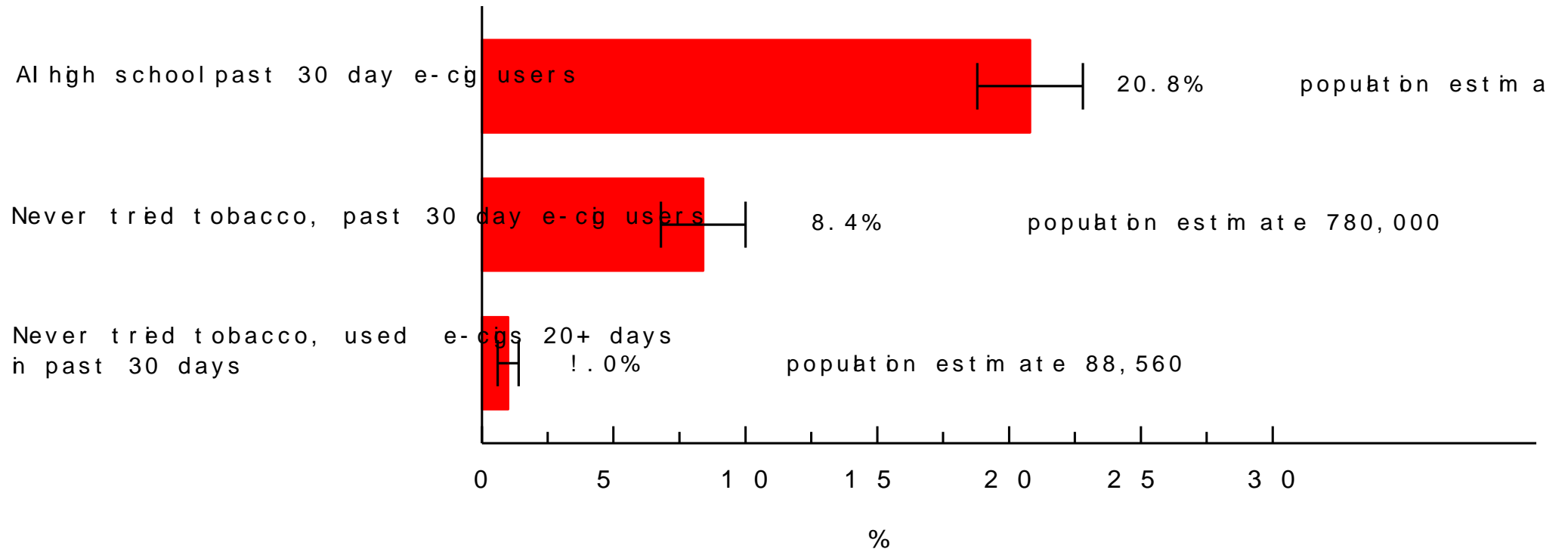


Gateway 2: what do prevalence trends show?

No sign of reversal
of declining trend
from increasing e-
cigarette use



Enbridge



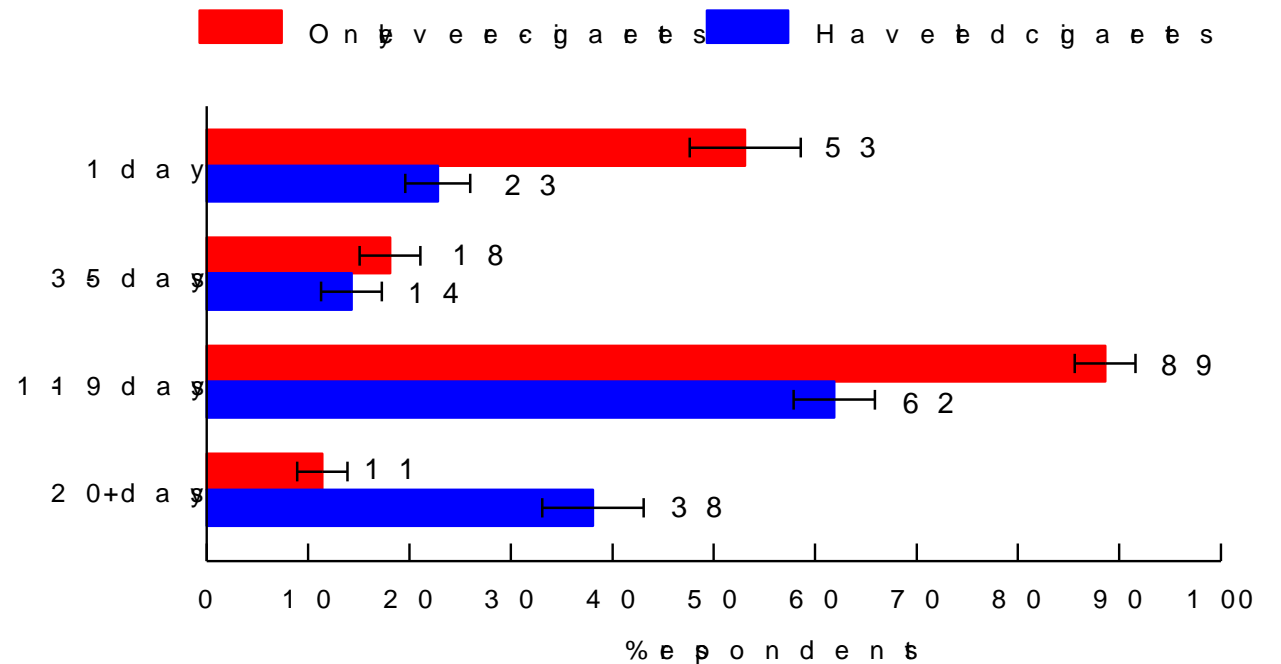
Past month e-cigarette use

Over half (53%) of past month e-cigarette users who had never used other tobacco products had used e-cigarettes on 1 day only in the past month, and only 18% had used on 20 or more days.

Among those who had ever tried cigarettes, 23% had used e-cigarettes on 1 day only, and 38% on 20 or more days

Dependence in past 30 days e-cigarettes

Duration in past 30 days how many days used e-cigarettes

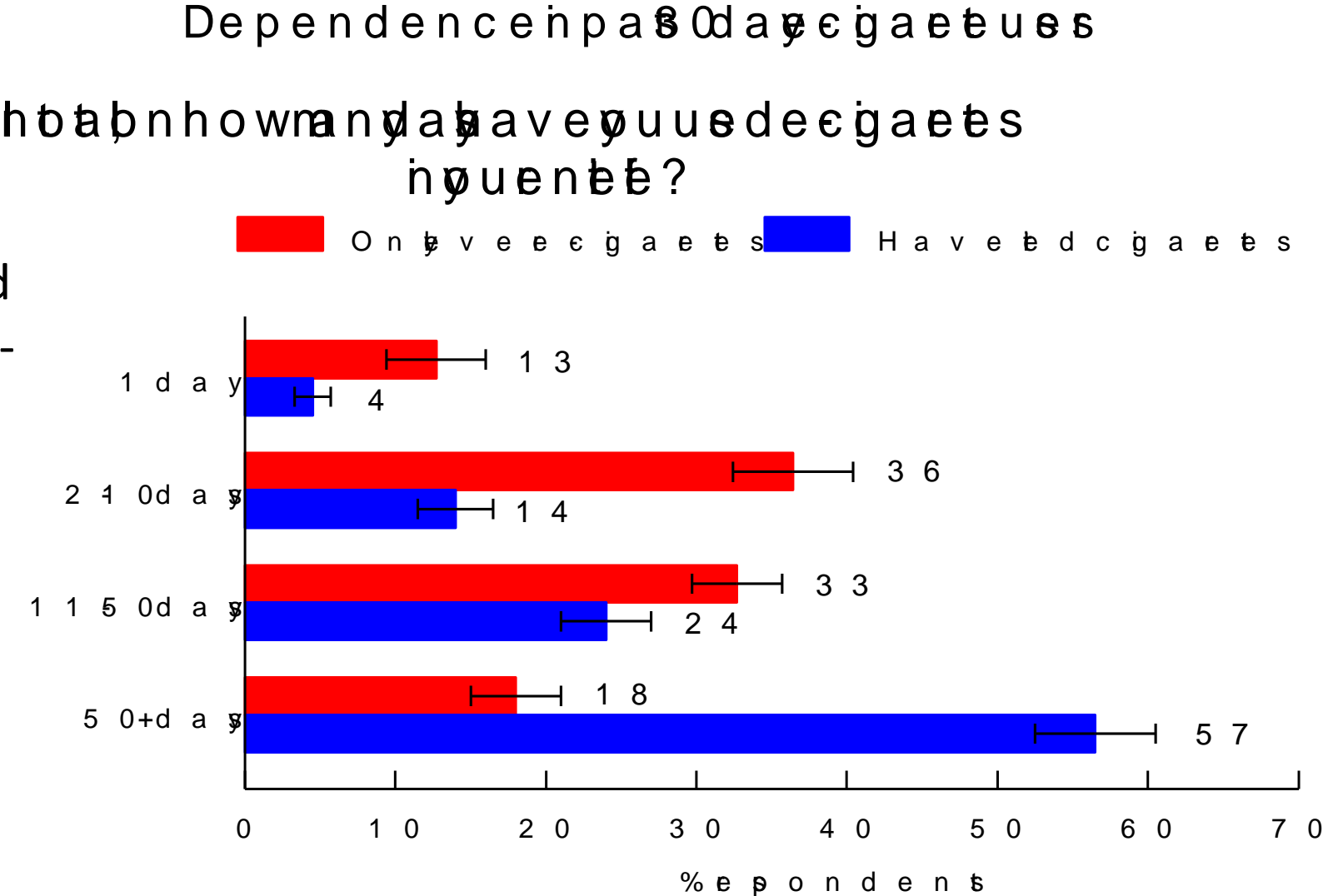


NY T S 2 0 1 8

Lifetime e-cigarette use

Almost 50% of past month e-cigarette users who had never used other tobacco products had used e-cigarettes on 10 days or fewer in their lifetime, and only 18% had used on 50 or more days.

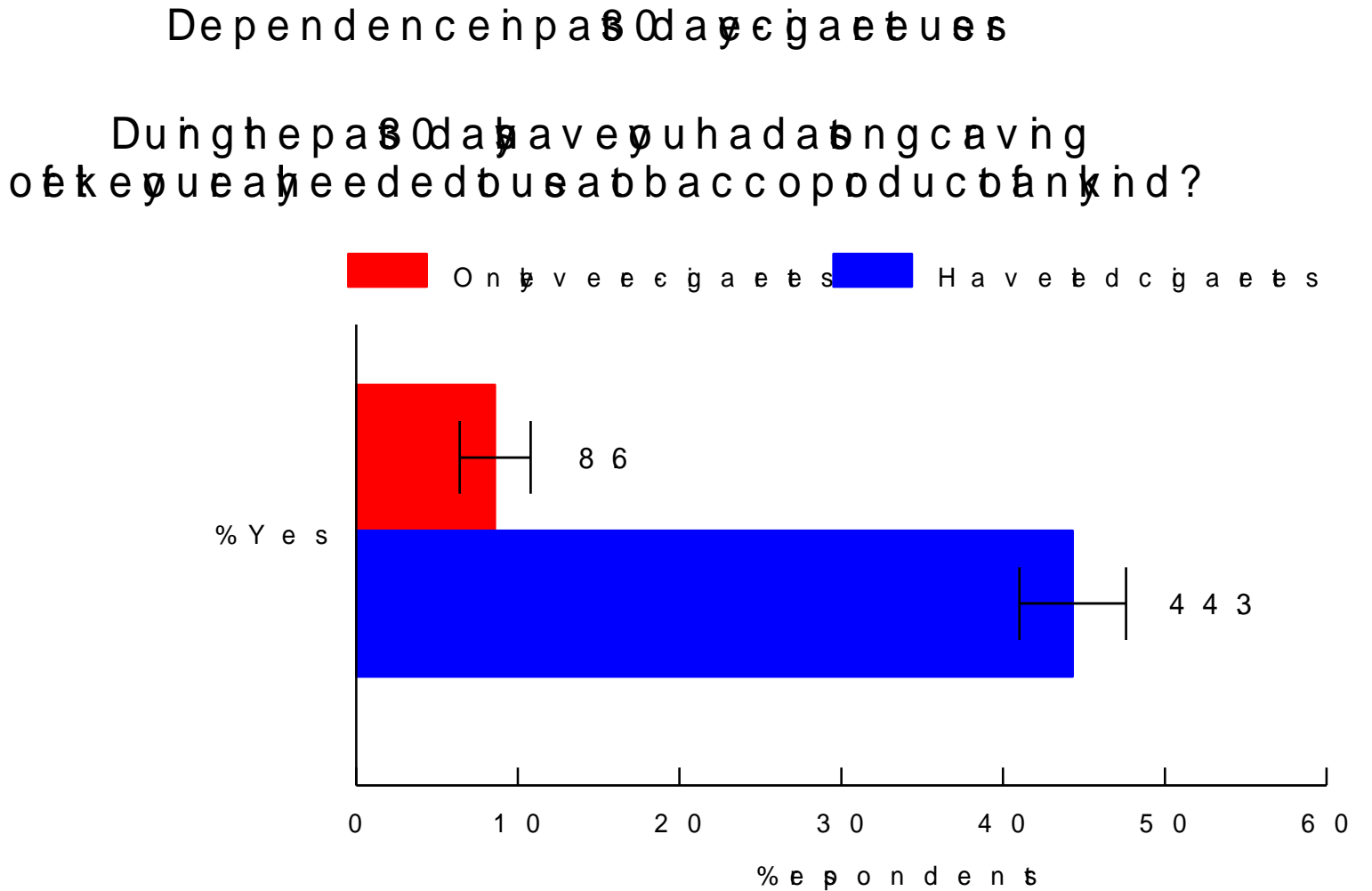
Among those who had ever tried cigarettes, 18% had used e-cigarettes on 10 or fewer days, and 57% on 50 or more days



Craving

Craving to smoke is a prototypical sign of addiction to cigarettes

44% of past month e-cigarette users with a lifetime history of having smoked cigarettes (a few puffs or more) reported craving, compared with 9% of those who had only ever used e-cigarettes



NYTS 2018

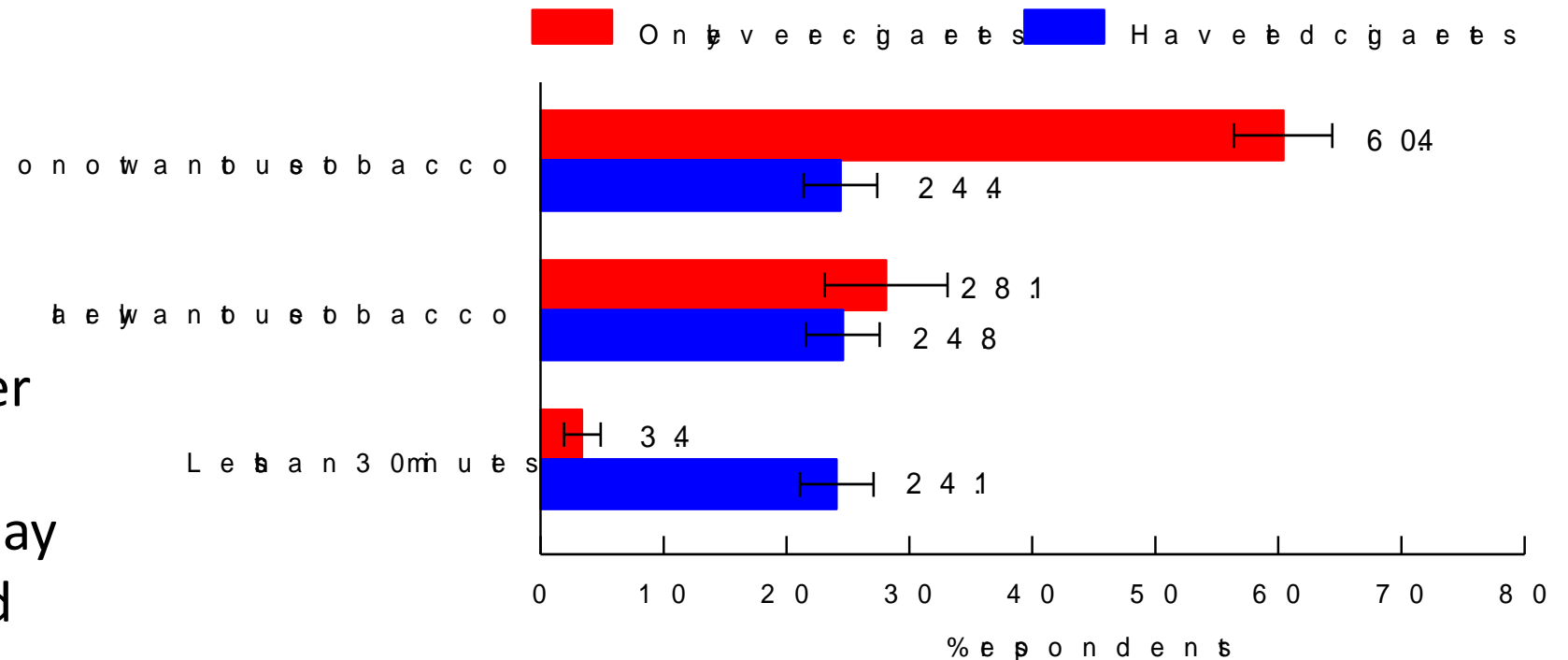
Time to first use

Smoking the first cigarette of the day within 30 minutes of waking is a widely used indicator of cigarette dependence.

Only 3% of past month e-cigarette users who had never used tobacco products used their first e-cigarette of the day within 30 minutes, compared with 24% of those who had a history of cigarette use

Dependence in past 30 days e-cigarette users

How soon after you wake up do you want to use a tobacco product?



NYTS 2018

How do FDA's claims stand up?

- Most current e-cigarette users had started on their tobacco career with cigarettes
- Regular e-cigarette use was rare (1.0%) in high school students who had never tried tobacco products.
- No convincing evidence of an epidemic of youth nicotine addiction attributable to e-cigarettes
- Symptoms of nicotine dependence were rare in e-cigarette users who had never tried tobacco products – 3% first use of the day within 30 minutes, 9% reported craving in the past month, half had used e-cigs only 1 day in the past month and half on 10 or fewer days in their lifetime
- No clear evidence that secular decline in youth cigarette smoking has been slowed by e-cigarettes – rather they seem to be displacing them

Conclusion

- We find a gaping chasm between the vision of an epidemic of e-cigarette use threatening to engulf a new generation in nicotine addiction and the reality of the evidence contained in the NYTS

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

Martin J Jarvis, Robert J West, Jamie Brown

Paper available as a preprint at:

<https://www.qeios.com/read/article/391>

STOP PRESS

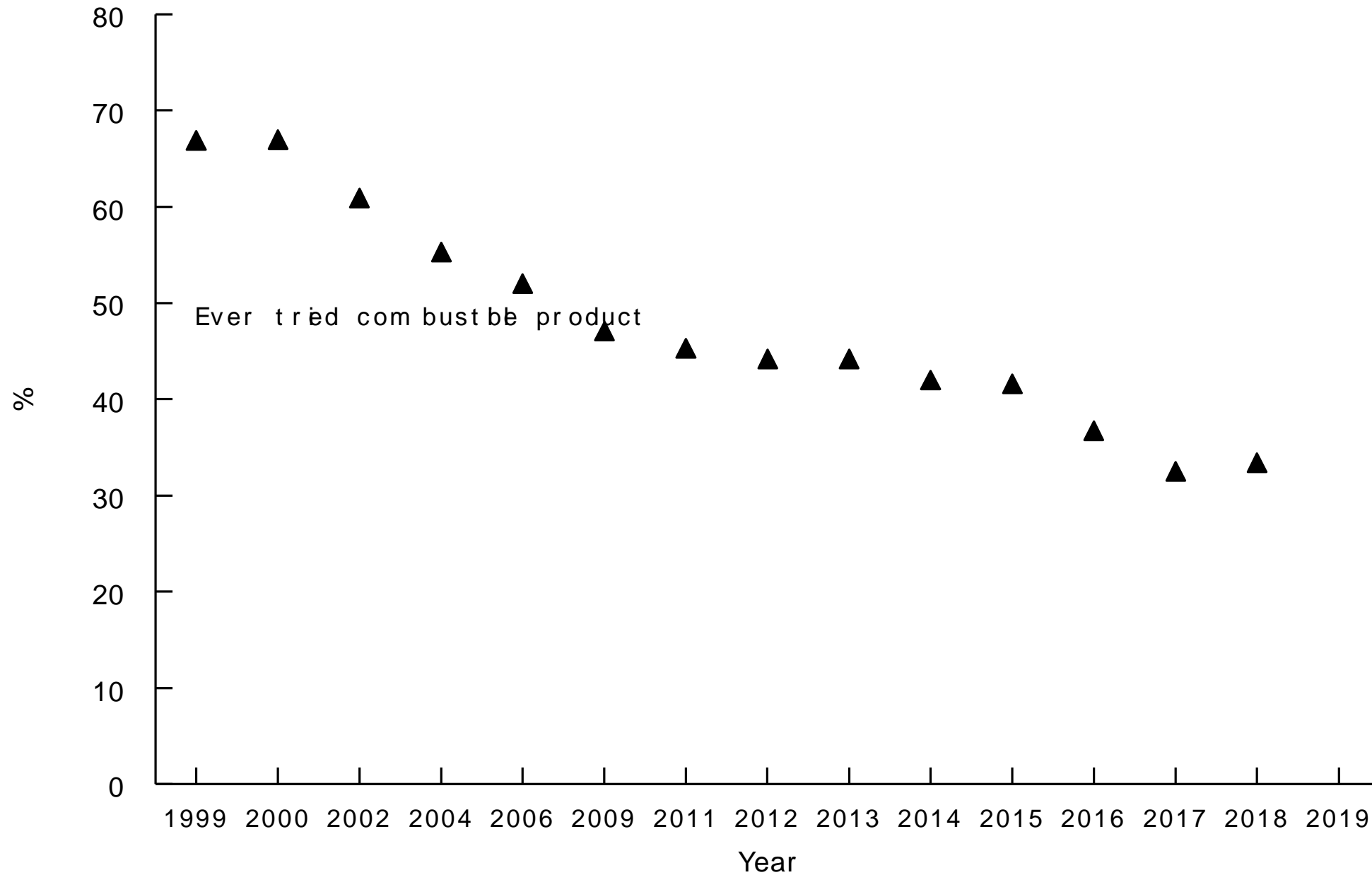
JAMA | Original Investigation

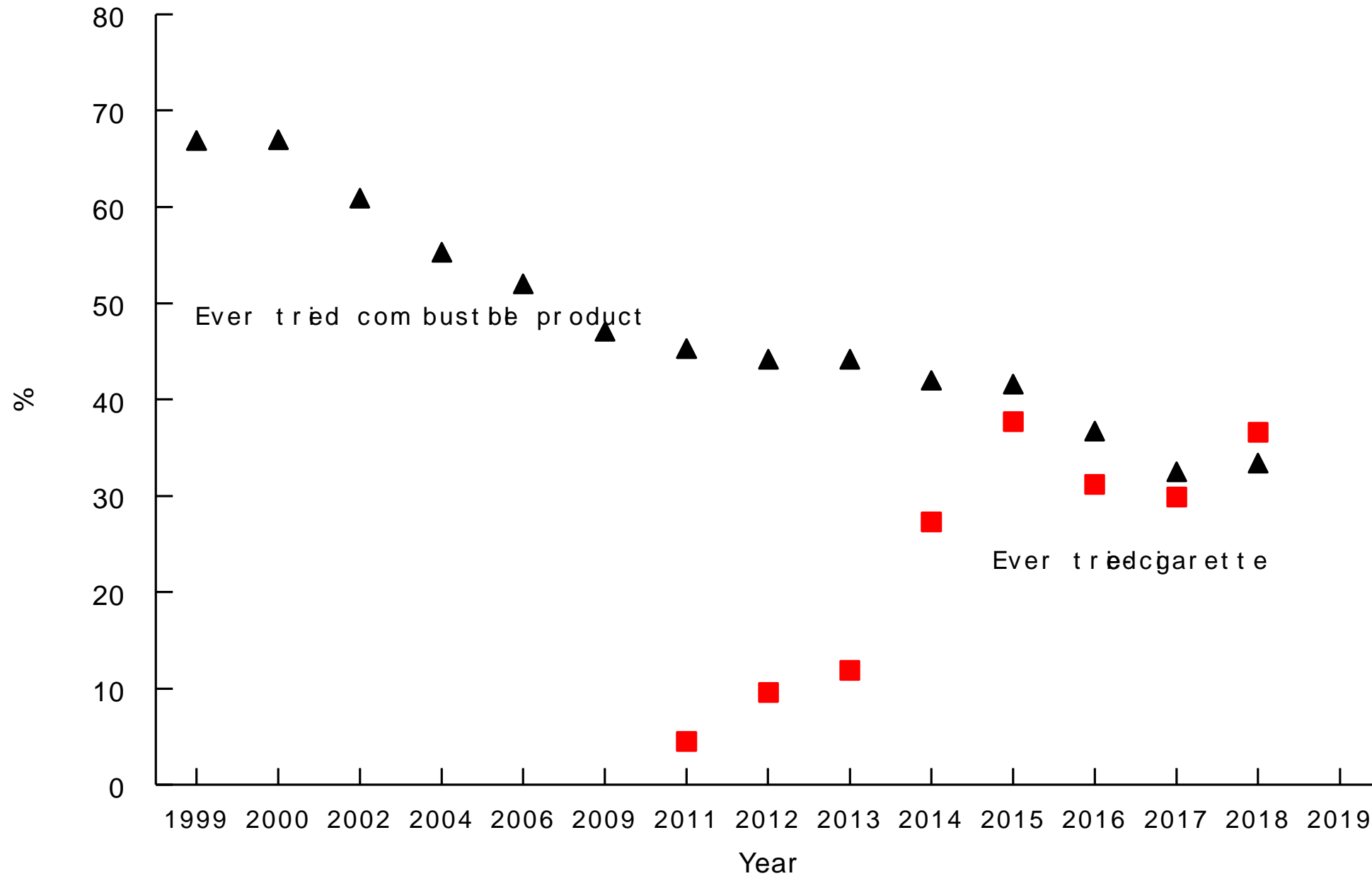
Cigarette Use Among Youth in the United States, 2019

Karen A. Cullen; Gentzke AS, Sawdey MD, Chang JT, Anic GM, Wang TW, Creamer MR, Jamal A, Ambrose BK, King BA. Published online November 5th 2019

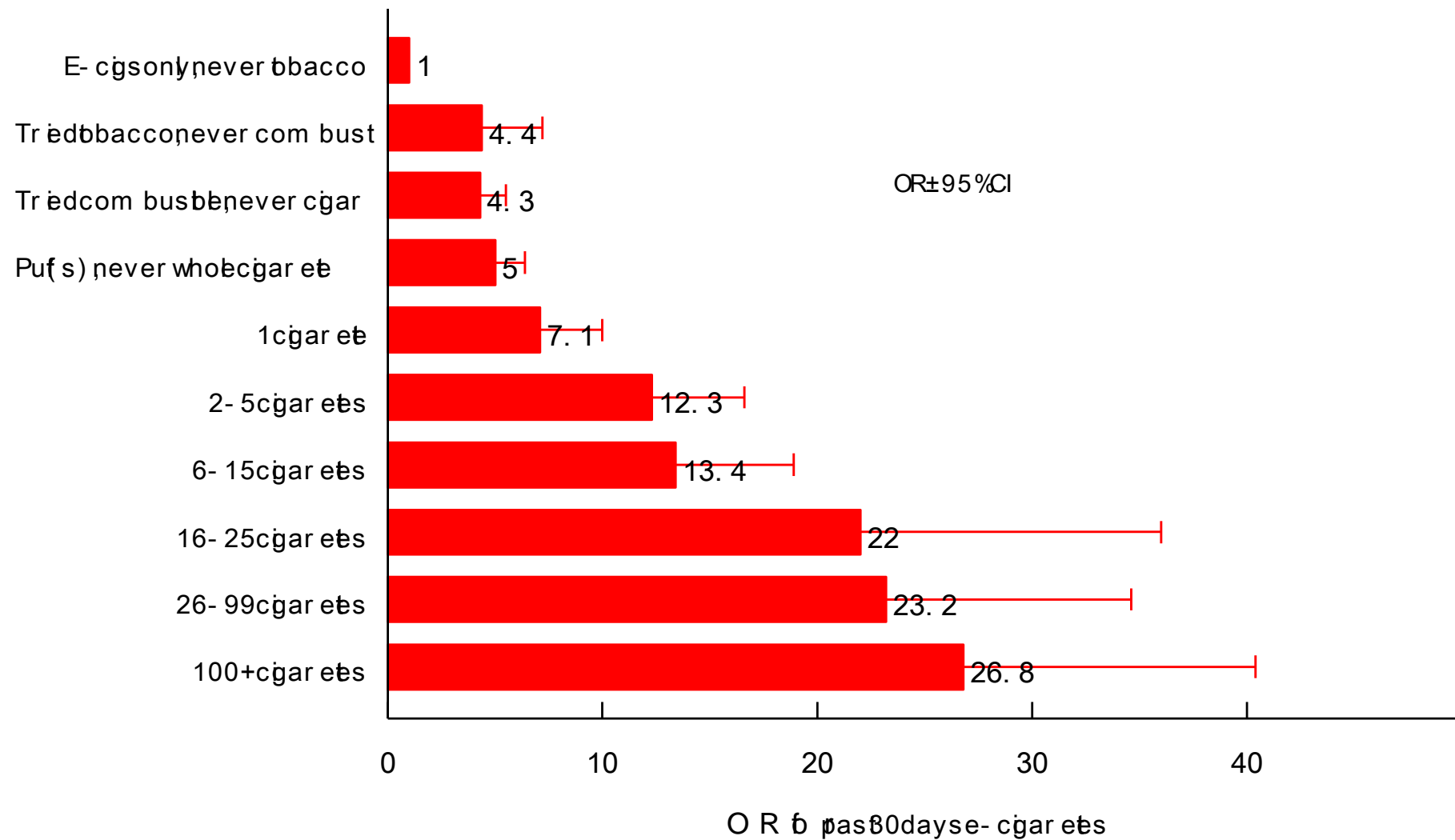
- First publication of NYTS 2019 data
- Shift from paper-and-pencil to electronic
- No analysis by tobacco use history, putting e-cigarette use in context of use of other tobacco products
- No data on dependence indicators, other than frequency of use in past month

	NYTS 2018	NYTS 2019
Past month high school e-cigarette use %	20.8	27.5
20+ days past month HS e-cigarette use %	5.8	9.4
Daily past month HS e-cigarette use %	3.8	5.9
Past month cigarettes %	8.1	5.8

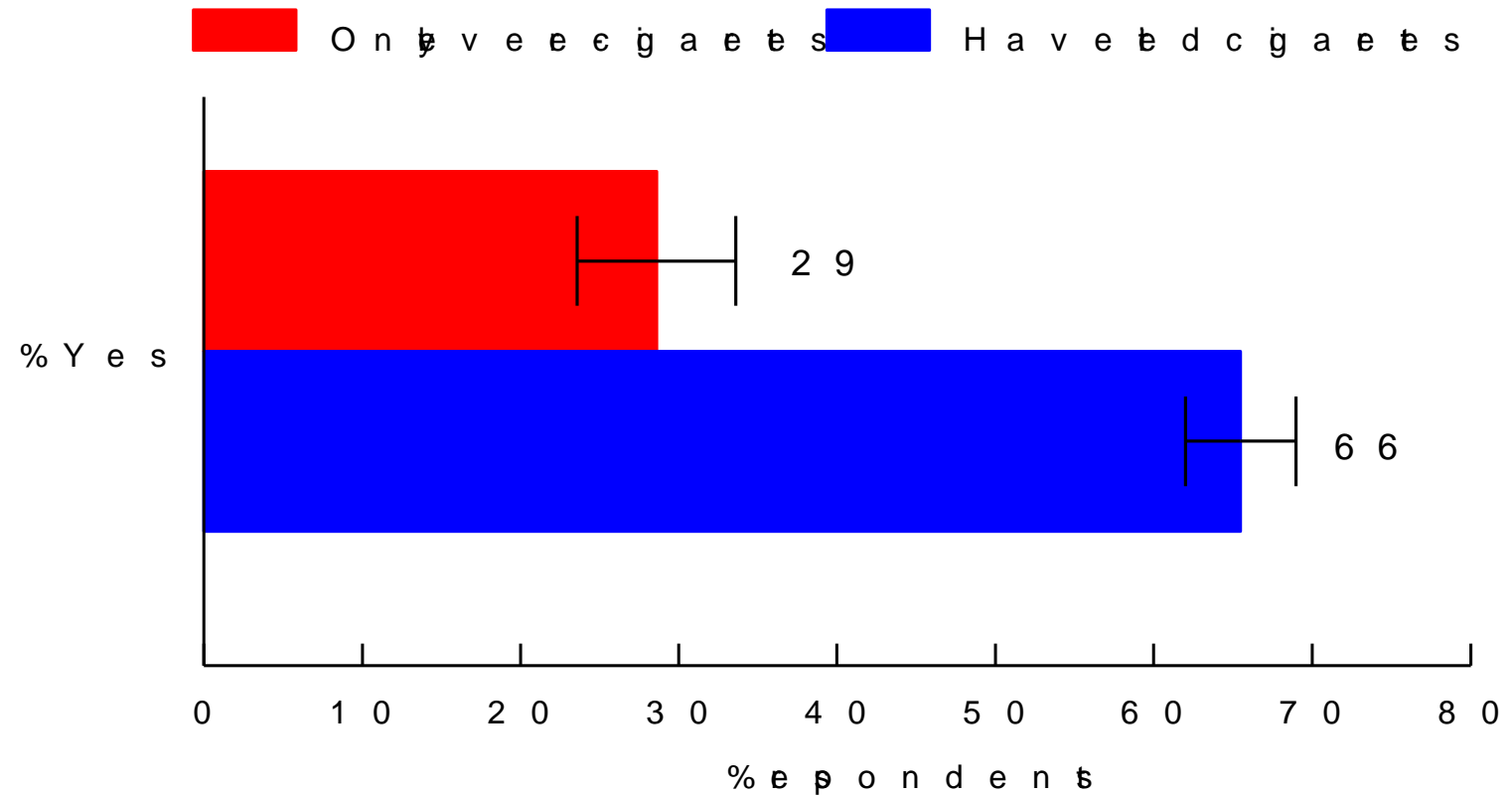




Odds ratios for past 30 day e-cigarette use
by lifetime tobacco use history: NYTS 2018



Have you ever used marijuana, marijuana concentrates,
marijuana wax, THC hash, or hashane -cigarettes?



NYTS 2018