

Supplemental Information

COMPARING RATES OF INITIATION OF TOBACCO USE BETWEEN 2017–19 WITH RATES FROM THE EARLY 1990S

The Monitoring the Future Study has reported on the prevalence of cigarette smoking in US high school seniors in annual surveys since 1976.³⁸ The prevalence of last 30-day cigarette smoking among high school seniors was 28.3% in 1991 and peaked at 35.1% in 1998, the year of the Master Settlement Agreement between US state attorney generals and the major tobacco companies, which included restrictions on advertising and promotions of tobacco products. Since that peak year, the prevalence of last 30-day cigarette smoking has declined consistently to 31.4% in 2000, to 19.2% in 2010 and 7.5% in 2020. They have reported last 30-day vaping since 2015 when it was 16.3%; it was 16.8% in 2017 and then rose very rapidly to 30.9% in 2019. This rapid increase in use reflects the large surge in e-cigarette sales in the United States and corresponds to the timing of our 2-year follow-up of the 2017 cohort.

There was a large longitudinal study of teenage smoking behavior in the early 1990s, before the major decline in adolescent cigarette smoking. The Teenage Attitudes and Practices Survey interviewed adolescents from households that had responded to the 1988 and 1989 National Health Interview Survey, an annual household

interview survey of the civilian noninstitutional population of the United States. In 1993, participants of the 1989 Teenage Attitudes and Practices Survey were reinterviewed, with a response rate of 87% and a sample size of 7960.³⁹ Gilpin et al⁴⁰ calculated the number of new established smokers (defined as lifetime smoking of 100-plus cigarettes) each day during the follow-up period, using the 1991 population census estimates. For those aged 11 to 20 years at baseline, there was an estimated daily addition of 2933 (95% CI 2599–3266) new established smokers over the 4-year period.

In the 2017 cohort, there were 1 667 826 new daily tobacco users among those aged <21 years in 2019. Over the 2 years of follow-up, this translates to an average of 2284 new daily tobacco users each day. Daily tobacco use is a subset of lifetime 100-plus cigarette smokers. Nevertheless, between 2017 and 2019, the daily average of new daily users was 78% of the number of lifetime 100-plus cigarette smokers from the Teenage Attitudes and Practices Survey longitudinal study. Thus, the rapid rise in e-cigarette vaping from 2017 to 2019 has resulted in tobacco use rates that appear similar to those seen in the early 1990s, before the tobacco control interventions implemented by the Master Settlement Agreement.⁴¹

COMPARISON OF DEPENDENCE SCORES FOR NEW DAILY E-CIGARETTE VAPERS AND NEW DAILY CIGARETTE SMOKERS

The PATH Study uses the Wisconsin Inventory of Smoking Dependence Motives framework to assess dependence scores for each tobacco product (see methods section of main article). The scales from the 7 items used in both the adolescent and the adult file have high internal consistencies (e-cigarettes: Cronbach's $\alpha = 0.89$, SE = 0.23; cigarettes: Cronbach's $\alpha = 0.86$, SE = 0.14). Using a conservative criterion for assessing significantly different scores (nonoverlapping CIs), there was no difference in dependence scores for e-cigarettes or cigarettes for either of the 2 youngest age groups (Supplemental Table 5). Daily cigarette smokers had marginally higher dependence scores for those aged 22 to 25 years at baseline and higher dependence scores for those aged 26 to 29 years at baseline. Over the whole 14 to 34 years age group, daily cigarette smokers had higher dependence scores than daily e-cigarette vapers.

SUPPLEMENTAL 1 REFERENCES

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SUPPLEMENTAL TABLE 5 2019 Dependence Scores Among New Daily Vapers or Smokers in the 2017 Cohort By Age

Age in Years in 2017	Daily E-Cigarette Vapers		Daily Cigarette Smokers	
	Score	95% CI	Score	95% CI
14–17	17.4	16.5–18.3	19.2	17.7–20.7
18–21	16.9	15.9–18.8	16.9	15.5–18.4
22–25	16.4	14.8–17.9	19.8	17.8–21.8
26–29	13.9	11.2–16.2	17.9	16.6–19.1
30–34	15.4	11.8–18.9	17.7	15.7–19.7
14–34	16.7	16.0–17.3	18.3	17.5–19.0

- Data Estimates From the Teenage Attitudes and Practices Survey, United States, 1989. Advance Data From Vital and Health Statistics; No. 224:1–20.* Hyattsville, MD: National Center for Health Statistics; 1993
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41. Gilpin EA, Distefan JM, Pierce JP. Population receptivity to tobacco advertising/promotions and exposure to anti-tobacco media: effect of Master Settlement Agreement in California: 1992-2002. *Health Promot Pract.* 2004;5(3 Suppl):91S–98S