Electronic Cigarettes and Nicotine Use Trends among US Adolescents

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Introduction

-E-cigarettes became widely available in around 2010[1]

-There are three major hypotheses[1] concerning the effects of e-cigarette smoking on conventional smoking behaviour in adolescents (12-17 year olds)

1. The gateway hypothesis suggests that e-cigarettes lead adolescents to conventional smoking, e.g. by developing nicotine dependence
2. The diversion hypothesis suggests that e-cigarettes divert adolescents from conventional smoking, e.g. by offering a method to quit which reduces harm
3. The common liability hypothesis suggests that those adolescents that would smoke conventional cigarettes would do so regardless of the availability of e-cigarettes

-Studies so far have been inconclusive and contradictory[1]. No current research models the counterfactual scenario of no e-cigarettes with regression

Methods

Data

-Adolescent population figures across 1999-2018 from US Census Bureau

-National Youth Tobacco Survey responses across 1999-2018

Variables

-Cigarette use prevalence (100 lifetime cigarettes)

-E-cigarette use prevalence (100 days vaped)

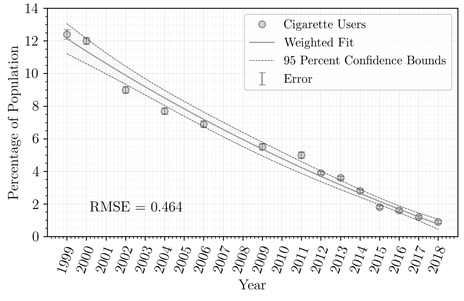
-Dual use prevalence (100 lifetime cigs + 100 days vaped)

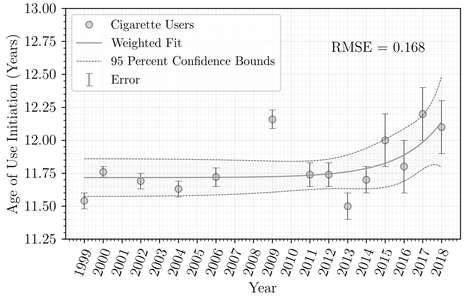
-Age of use initiation

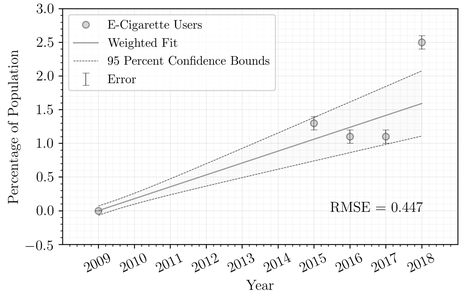
Analyses

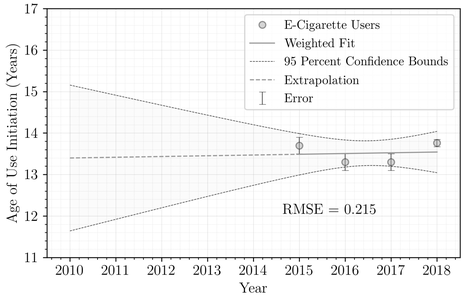
Weighted non-linear regression, RMSE, interpolation + extrapolation, Theil statistics, Gaussian statistics

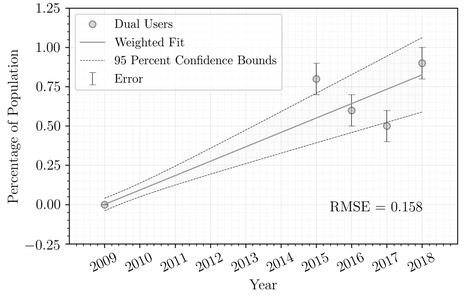
Results

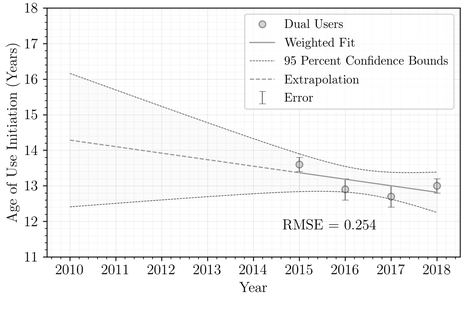


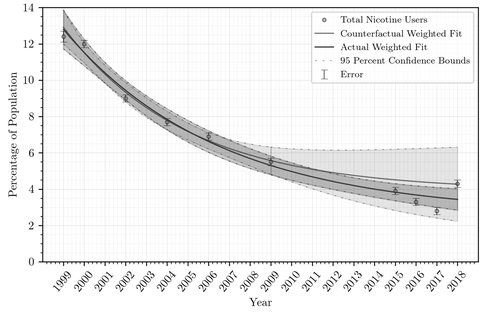


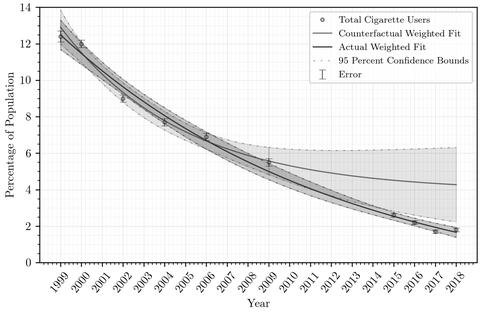












Conclusions

-Cigarette use among adolescents is at an all time minimum

-The age at which adolescents initiate cigarette use is increasing

-E-cigarette use among adolescents is at an all time maximum

-The age at which adolescents initiate e-cigarette use is approximately constant, and higher than that of cigarettes

-Dual use among adolescents is at an all time maximum

-The age at which adolescents initiate dual-use is decreasing

-E-cigarettes do not appear to have increased the total number of adolescent nicotine users

-E-cigarettes appear to have diverted adolescents from cigarette use

Future Research

-Manuscript under revision at Addiction

-System dynamics model (Arielle Selya)

-Follow-up papers planned (disaggregating for demographic criteria, use of UK ASH data)

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References

1. National Academies of Sciences, Engineering, and Medicine 2018. *Public Health Consequences of E-Cigarettes*. Washington, DC: The National Academies Press. https://doi.org/10.17226/24952.