Published in final edited form as:

J Clin Psychiatry. 2018 ; 79(3): . doi:10.4088/JCP.17m11718.

Trends in illicit drug use among smokers and non-smokers in the United States, 2002–2014

Scott J. Moeller, PhD, David S. Fink, MPH¹, Misato Gbedemah, MPH², Deborah S. Hasin, PhD³, Sandro Galea, MD, DrPH^{2,4,5}, Michael J. Zvolensky, PhD⁶, and Renee D. Goodwin, PhD, MPH^{7,8,2,3}

¹Department of Psychiatry, Stony Brook University School of Medicine, Stony Brook, NY 11794;

²Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY 10032;

³Department of Epidemiology and Biostatistics, Graduate School of Public Health and Health Policy, City University of New York (CUNY), Queens, NY 11367;

⁴Department of Psychiatry, College of Physicians and Surgeons, Columbia University, New York, NY 10032;

⁵New York State Psychiatric Institute, New York, NY 10032;

⁶Department of Epidemiology, Boston University School of Public Health, Boston, MA;

⁷Department of Psychology, University of Houston, Houston, TX 77004;

⁸Department of Behavioral Sciences, University of Texas MD Anderson Cancer Center, Houston, TX 77004.

Abstract

Objective: Cigarette smoking has declined in the United States (US). Still, identifying prevalent and modifiable barriers to quitting can help inform the next steps for tobacco control. Illicit drug use, which may be increasingly common in the US, could be one such factor. We investigated the relationship between past-month illicit drug use and cigarette smoking status, and estimated trends in the prevalence of past-month illicit drug use by cigarette smoking status from 2002–2014 in the US.

Methods: The 2002–2014 National Survey on Drug Use and Health was used to obtain nationally-representative data on past-month illicit drug use.

Results: From 2002 to 2014, past-month illicit drug use (for all drugs considered) was nearly five times more common among current smokers than among former smokers (adjusted odds ratio=4.79), and nearly twice as prevalent in former smokers as in never smokers (adjusted odds ratio=1.99). Illicit drug use increased linearly over time from 2002–2014 in the entire general

Correspondence: Renee D. Goodwin, PhD, MPH, Department of Epidemiology, Mailman School of Public Health, Columbia University, 722 West 168th Street, Rm 514, New York, NY 10032, rdg66@columbia.edu, 212-304-6554.

Disclosure/Conflict of Interest

None declared.

population (i.e., across and within current smokers, former smokers, and never smokers). This increasing trend in drug use was most rapid among former smokers (relative to current smokers and never smokers) and was largely, but not entirely, driven by increases in cannabis use.

Conclusions: Illicit drug use is most prevalent among current cigarette smokers. Yet, the rate of increase in illicit drug use prevalence was most rapid among former smokers. Because former smokers outnumber current smokers in the general population, it may be important to monitor former smokers into the future for potential negative drug-related outcomes.

Keywords

Smoking; illicit drug use; time trends; National Survey of Drug Use and Health

INTRODUCTION

The prevalence of smoking steeply declined from 42% of adults (52% of men and 34% of women) to 26% of adults (28% for men and 24% for women) in the United States (US) population 1950 to 1990,¹ largely attributed to the effectiveness of public health tobacco control efforts. Since 1990, the prevalence of smoking has continued to decline², and the cessation rate has continued to increase.^{3, 4} Identifying remaining barriers to cessation to further reduce the prevalence would be fruitful in directing and allocating resources for next steps in tobacco control.

One potentially important factor in this regard could be illicit drug use. Illicit drug use is a global public health concern, contributing to substantial morbidity and mortality⁵ and costing billions of dollars per year in crime, lost work productivity, and health care.⁶ Illicit drug use is also strongly associated with cigarette smoking. Cigarette smokers, both adults and adolescents, are more likely than non-smokers to use illicit drugs, including cannabis, alcohol, and cocaine, and to meet criteria for substance use disorders (SUDs).^{7–18} Illicit drug use is also associated with decreased likelihood of smoking cessation,^{19, 20} and illicit drug use disorders are associated with the persistence of nicotine dependence over time.¹⁹ Cannabis use is further associated with increased risk of relapse to cigarette use among former smokers.²¹

The use of illicit drugs, most notably cannabis, has increased in the general population over the last several years.^{22–27} Recent studies also suggest increases in mental health problems in the US, including depression, which is strongly associated with smoking.²⁸ In addition, a growing number of studies have shown that the prevalence of smoking has declined less rapidly among those with mental health problems,^{29, 30} relationships between cigarette smoking and substance misuse or mental health problems have become stronger over time,^{31, 32} mental health problems have increased among cigarette smokers,^{33–35} and quit rates are lower among persons with alcohol use problems³⁶ or mental illnesses.^{37, 38} However, prior studies have not yet examined trends in the prevalence of illicit drug use, nor in the use of specific types of illicit drugs, by cigarette use status over time in recent years.

The current study investigated trends in the prevalence of illicit drug use among current, former, and never smokers in the US from 2002–2014. Four overarching goals guided this

work. First, the study investigated whether the overall prevalence of illicit drug use differs by smoking status (current smokers, former smokers, and never smokers, respectively) overall from 2002–2014. Second, the study examined whether the prevalence of illicit drug use changed (i.e., linearly increased or decreased) in the general US population from 2002–2014. Third, the study investigated trends over time in the prevalence of illicit drug use by cigarette smoking status. Fourth, the study tested whether the prevalence of specific types of illicit drug use changed over time by smoking status from 2002–2014. An understanding of the degree to which drug use is common among cigarette smokers and potentially contributes to the persistence of smoking may be critical knowledge toward decreasing the overall prevalence of smoking in US. Beyond current smokers, additional knowledge of drug use trends in former smokers and never smokers could help identify new vulnerable populations that might benefit from outreach efforts to reduce illicit drug use in the US.

METHODS

Data were analyzed from the National Survey on Drug Use and Health (NSDUH), an annual cross-sectional national survey on the use of tobacco, other substance use, and mental health in the US.^{39–46} A multistage area probability sample for each of the 50 states and the District of Columbia was conducted, which represents the male and female civilian non-institutionalized population of the US aged 12 and older.

Data were obtained from the 2002 ($n=54,079$), 2003 ($n=55,230$), 2004 ($n=55,602$), 2005 ($n=55,905$), 2006 ($n=55,279$), 2007 ($n=55,435$), 2008 ($n=55,739$), 2009 ($n=55,772$), 2010 ($n=57,873$), 2011 ($n=58,397$), 2012 ($n=55,268$), 2013 ($n=55,160$), 2014 ($n=55,271$) NSDUH public use data files, for a combined total sample size of 725,010 individuals. To increase the precision of estimates, African-Americans, Hispanics, and young people were oversampled. Response rates for completed surveys ranged from 73%–79%.

Informed consent was obtained before the start of every interview. Participants were given a description of the study, read a statement describing confidentiality, and were assured that participation was voluntary. Survey questions on tobacco and other drug use were conducted by audio computer-assisted self-interviewing (ACASI), to protect privacy and increase the probability of honest reporting. Respondents were offered US \$30 for participation. Analyses for these de-identified, publicly available data were deemed “exempt” from Institutional Review Board review.

Sampling weights for the NSDUH were computed to control for unit-level and individual-level non-response, and were adjusted to ensure consistency with population estimates obtained from the US Census Bureau. Upon aggregating the 13 datasets, a new weight was created by dividing the original weight by 13.

Measures

Sociodemographic Variables—Sociodemographic variables for this study included sex, race/ethnicity [non-Hispanic White, non-Hispanic Black/African American, Hispanic, Other (i.e., non-Hispanic Native American/Alaska Native; non-Hispanic Native Hawaiian/Other

Pacific Islander; non-Hispanic Asian; non-Hispanic more than 1 race)], age (12–17, 18–25, 26–34, 35+), and annual income (<\$20,000, \$20,000–\$74,000, \$75,000+).

Cigarette Smoking Variables—Current cigarette smoking status was assessed using the following questions: 1) “Have you ever smoked part or all of a cigarette?”; 2) “Have you smoked at least 100 cigarettes in your entire life?”; and 3) “During the past 30 days, have you smoked part or all of a cigarette?” Individuals who reported smoking fewer than 100 cigarettes in their lifetime were classified as never smokers. Individuals who reported smoking at least 100 cigarettes in their lifetime *and* at least 1 cigarette within the past 30 days were classified as current smokers. Individuals who did not meet criteria for classification as never smokers or current smokers were classified as former smokers (i.e., individuals who have smoked 100 lifetime cigarettes but 0 in the past 30 days).

Illicit Drug Use Variables—Participants reported whether they have ever used illicit drugs in their lifetime, and the time since their last use, separately for cannabis, opioids (including heroin and prescription pain medications), cocaine, hallucinogens, and non-cocaine simulants (e.g., methamphetamine). Participants who reported using drugs “Within the past 30 days” were classified as past-month users.

Statistical Analysis

Data were weighted to reflect the complex design of the NSDUH sample and were analyzed with SAS-callable SUDAAN to obtain proper standard error estimates for the cross-tabulations. First, we examined the combined prevalence of past-month illicit drug use by smoking status (current smokers, former smokers, and never smokers) from 2002 to 2014. Second, we examined whether the prevalence of illicit drug use changed from 2002 to 2014. Third, we examined whether prevalence of past-month drug use changed differentially in current smokers, former smokers, and never smokers. Fourth, we examined differential time trends by smoking status separately for each illicit drug.

Linear time trends of past-month drug use were assessed using logistic regression models with continuous year as the predictor. Multivariable logistic regression was then used to adjust for demographics (sex, age, race/ethnicity, income), and these adjusted statistics that were the ones interpreted. Additionally, we tested a two-way interaction term between year and smoking status, for each illicit drug use variable. A significant (at $p < 0.05$) interaction indicates that illicit drug use trends differed by smoking status.

RESULTS

Pooled Prevalence of Illicit Drug Use among Current, Former, and Never Smoking in the US

Between 2002 and 2014, approximately 20.81% of current cigarette smokers used an illicit drug in the past month, compared with 5.56% of former smokers and 5.25% of never smokers (Table 1). After adjusting for demographics, past-month illicit drug use remained more common among current smokers compared with former smokers [adjusted odds ratios (AOR)=2.38], and more common among former smokers compared with never smokers (AOR=1.99). The largest difference in illicit drug use prevalence was between current

smokers and never smokers (AOR=4.79). Similar patterns were observed when examining specific classes of illicit drugs including opioids, cocaine, hallucinogens, and stimulants (Table 1).

Prevalence of Illicit Drug Use in the US: Trends over Time, 2002–2014

From 2002–2014, the prevalence of any past-month illicit drug use increased from 8.31% to 10.30% (AOR=1.03, $p<0.001$) (Table 2). The use of cannabis increased over time (AOR=1.04, $p<0.001$) (Table 3), but the use of other drugs (i.e., examined as a single, non-cannabis aggregate) did not show significant trends over time (AOR=1.00, $p=0.12$) (Table 4). When each drug was examined individually, there was a positive trend over time for use of hallucinogens (AOR=1.01, $p=0.02$), non-significant trends over time for use of opioids (AOR=1.00, $p=0.82$) and stimulants (AOR=1.00, $p=0.95$), and a negative trend over time for use of cocaine (AOR=0.96, $p<0.001$) (Figure 1C–F; Supplemental Tables 1–4).

Prevalence of Illicit Drug Use among Current, Former, and Never Smokers in the US: Trends over Time, 2002–2014

Any Illicit Drugs—From 2002–2014, past-month use of any illicit drugs (i.e., for all drugs considered including cannabis) significantly increased among current, former, and never smokers (Figure 1A; Table 2). The rate of increase was more rapid among former smokers than both current (adjusted $p=0.0003$) and never (adjusted $p<0.00001$) smokers. The comparison between the rate of increase in current versus never smokers did not reach significance (adjusted $p=0.05$).

Cannabis—From 2002–2014, past-month cannabis use increased among current, former, and never smokers (Figure 1B; Table 3). Although the prevalence of cannabis use across years was 3–5 times higher among current versus former and never smokers (Table 1), the rate of increase over time was significantly faster among former smokers than never smokers (adjusted $p=0.0001$) and current smokers (adjusted $p=0.0009$) (Table 3). The rate of increase between current smokers and never smokers did not differ (adjusted $p=0.69$).

Illicit Drugs except Cannabis—After removing cannabis from the “illicit drugs” category, the prevalence of illicit drug use did not change among current (adjusted $p=0.42$) and never smokers (adjusted $p=0.17$) (Table 4). Although these two groups initially showed trends toward a decline in past-month drug use prior to adjusting for demographics, these declines were no longer evident after adjustment (Table 4). In contrast, illicit drug use significantly increased among former smokers, and this trend remained significant after adjustment for demographics (adjusted $p=0.002$). This increasing trend significantly differed from trends among never (adjusted $p=0.008$) and current (adjusted $p=0.002$) smokers.

Opioids—In 2014, 4.12% of current smokers, 1.39% of former smokers, and 1.08% of non-smokers used opioids in the past month (Supplemental Table 1). From 2002–2014, the prevalence of past-month opioid use increased among current (adjusted $p=0.0005$) and former (adjusted $p=0.04$) smokers, but did not change in never smokers (adjusted $p=0.12$) (Figure 1C; Supplemental Table 1). The change in prevalence of opioid use over time

differed significantly between current smokers and never smokers (adjusted $p=0.004$), and between former smokers and never smokers (adjusted $p=0.02$).

Cocaine—In 2014, 1.91% of current smokers, 0.24% of former smokers and 0.26% of non-smokers used cocaine in the past month (Supplemental Table 2). The prevalence of cocaine use declined significantly over time among current (adjusted $p<0.0001$) and never (adjusted $p=0.003$) smokers. There was no change among former smokers (adjusted $p=0.67$) (Figure 1D; Supplemental Table 2). No significant differences emerged among any of the three smoking groups in the rate change of cocaine use (all interaction adjusted $ps>0.23$).

Hallucinogens—In 2014, 1.37% of current smokers, 0.27% of former smokers and 0.24% of non-smokers used hallucinogens in the past month (Supplemental Table 3). The prevalence of hallucinogen use increased over time among current (adjusted $p<0.001$) and former (adjusted $p=0.02$) smokers, but not among never smokers (adjusted $p=0.25$) (Figure 1E; Supplemental Table 3). The rates of changes in hallucinogen use did not significantly differ over time among the three smoking groups (all interaction adjusted $ps>0.07$).

Non-Cocaine Stimulants—In 2014, 1.47% of current smokers, 0.30% of former smokers and 0.41% of non-smokers used non-cocaine stimulants in the past month (Supplemental Table 4). Former smokers showed a decline in non-cocaine stimulant use after adjusting for demographics ($p=0.03$), but this decline was not evident prior to adjustment ($p=0.09$). There were no trends over time in either current (adjusted $p=0.78$) or never (adjusted $p=0.46$) smokers (Figure 1F; Supplemental Table 4). No differences emerged in rates of change over time among the three smoking groups (all interaction adjusted $ps>0.07$).

DISCUSSION

This study has four main findings. First, illicit drug use was more common among current cigarette smokers than among former or never smokers. The prevalence of drug use for all classes of drugs (i.e., cannabis, opioids, cocaine, hallucinogens, and non-cocaine stimulants) was higher among current smokers, relative to former and never smokers. These results are consistent with prior work showing strong linkages between cigarette smoking and illicit drug use/SUDs.^{10–17} Clinical interventions that target the use of cigarettes and illicit drugs could be helpful in reducing use of both substances, as shown in some^{47, 48} but not all⁴⁹ studies.

Second, the prevalence of any illicit drug use increased in the US population from 2002–2014. This trend was largely driven by cannabis use, consistent with recent findings.^{22–25} When cannabis was removed from the analyses (a novel contribution of our study), there was no significant change in prevalence of any illicit drug use from 2002–2014 in the overall population. When each drug was subsequently inspected individually, however, hallucinogen and cannabis use increased, cocaine use declined, and no changes were observed in the prevalence of opioid or stimulant use over this period. Thus, an increase in illicit drug use was observed overall from 2002–2014, yet the direction and strength of these trends differed by drug type.

Third, trends in illicit drug use differed by cigarette use status. While the prevalence of illicit drug use is consistently highest among cigarette smokers, the most rapid increases in drug use were observed among former smokers. For cannabis, one potential explanation of the more rapid escalation in former smokers is that cannabis may partially serve as a substitute for cigarettes.^{50, 51} Recent data also suggest, however, that cannabis use among former smokers is associated with increased risk of relapse to cigarette smoking.²¹ Thus, further work incorporating longitudinal data is needed to understand potential drivers of these increases in former smokers—not just for cannabis, but also for opioids, stimulants, and hallucinogens. It will also be important to determine in former smokers whether and to what degree these increases in illicit drug use may affect physical health or cigarette use status.

Fourth, although former smokers showed the fastest escalation of illicit drug use, an escalating prevalence in the use of cannabis, opioids, and hallucinogens was also observed among current smokers. The escalation in opioid use among current smokers may be especially important, considering the current opioid epidemic in the US,^{52, 53} and especially in light of data that suggest certain smoking cessation medications (e.g., varenicline) may be less efficacious in the presence of opioid use.⁵⁴

Although the “hardening hypothesis” has received mixed support, especially in terms of observed increases in nicotine dependence among smokers over time,^{55–59} our findings are not incongruous with the basic premise of this hypothesis, which is to suggest that today’s remaining smokers may have more trouble quitting because of an increasing preponderance of potential barriers to smoking. Specifically, we found that use of some illicit drugs is increasing among smokers, adding to other recent findings of increases in depression,³³ severe psychological distress,³⁴ and anxiety³⁵ among cigarette smokers. Yet, we also found that the rate of increase in drug use is most rapid among former smokers. If the hardening hypothesis was fully supported, the most rapid increase theoretically would have occurred among current smokers. In sum, the weight of the evidence increasingly suggests that mental health and substance use problems are increasing among smokers, whereas the evidence for increases in nicotine dependence, per se, are less consistent.

Study limitations include the following. First, analyses used a dichotomous assessment of past-month illicit drug use (yes/no), a decision that was based on the distributions of the data (preponderance of zeros, especially for non-cannabis illicit drugs). The study cannot speak to how the frequency or quantity of illicit drug use may have changed over time. Second, retrospective recall or social desirability biases may have influenced the observed effects. Yet, underreporting is unlikely to be differentially problematic among smokers relative to former and never smokers, and even so underreporting would likely strengthen these findings. Third, sample sizes for individual illicit drugs were small in certain cells, especially for former smokers, potentially limiting our ability to significantly detect subtle trends. Cell sizes were also insufficient for examining individual drug use trends stratified by both smoking status and relevant demographic characteristics (e.g., age); and were insufficient for performing analyses that corrected for, or parsed out, the effects of using multiple illicit drugs.

In summary, to our knowledge, this is the first study to investigate trends in the prevalence of illicit drug use by smoking status over time in the general US population. Past-month illicit drug use was highest in current smokers overall, and rates of illicit drug use increased in this group over time. Thus, illicit drug use remains more prevalent, and increasingly so in the case of cannabis and opioids, among persons who use cigarettes, relative to former and never smokers. Yet, the most rapid increase in illicit drug use was observed among former smokers. This finding is potentially consequential both because this group outnumbers current smokers in the general population, and because cannabis use has been shown to be associated with increased risk of relapse to cigarette use.²¹ Future research is needed to uncover: the reasons for this increase in drug use among former smokers, which segments of this population—especially as former smokers tend to be older relative to the overall age distribution—are most affected²⁷, and whether and to what degree illicit drug use may be consequential for tobacco use over time. More broadly, next steps in both research and clinical intervention need to address the increasingly intertwined problems of illicit drug use and cigarette use, especially if these trends continue in the years ahead.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

No additional acknowledgments declared.

Funding: National Institute on Drug Abuse (to SJM: 1K01DA037452; to DSH: T32DA031099; to RDG: 2R01DA20892). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. NIH had no role in the concept, design, analysis, interpretation, or writing of the results.

Previous Presentation of Results, Acknowledgment of Assistance, Disclaimers: None.

References

1. CDC. Surveillance for Selected Tobacco-Use Behaviors — United States, 1900–1994. MMWR Morb Mortal Wkly Rep 1994;43.
2. Jamal A, King BA, Neff LJ, Whitmill J, Babb SD, Graffunder CM. Current Cigarette Smoking Among Adults - United States, 2005–2015. MMWR Morbidity and mortality weekly report 2016 11 11;65(44):1205–1211. [PubMed: 27832052]
3. Babb S, Malarcher A, Schauer G, Asman K, Jamal A. Quitting Smoking Among Adults - United States, 2000–2015. MMWR Morbidity and mortality weekly report 2017 1 06;65(52):1457–1464. [PubMed: 28056007]
4. Mendez D, Tam J, Giovino GA, Tsodikov A, Warner KE. Has Smoking Cessation Increased? An Examination of the US Adult Smoking Cessation Rate 1990 – 2014. Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco 2016 9 15.
5. Degenhardt L, Hall W. Extent of illicit drug use and dependence, and their contribution to the global burden of disease. Lancet 2012 1 7;379(9810):55–70. [PubMed: 22225671]
6. United States Department of Justice NDIC. The Economic Impact of Illicit Drug Use on American Society. Washington, DC: US Department of Justice; 2011.
7. Breslau N, Kilbey M, Andreski P. Nicotine dependence, major depression, and anxiety in young adults. Arch Gen Psychiatry 1991 12;48(12):1069–1074. [PubMed: 1845224]

8. Johnson JG, Cohen P, Pine DS, Klein DF, Kasen S, Brook JS. Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. *JAMA* 2000 11 08;284(18):2348–2351. [PubMed: 11066185]
9. Black DW, Zimmerman M, Coryell WH. Cigarette Smoking and Psychiatric Disorder in a Community Sample. *Annals of Clinical Psychiatry* 1999;11(3):129–136. [PubMed: 10482122]
10. Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH. Smoking and mental illness: A population-based prevalence study. *JAMA* 2000 11 22–29;284(20):2606–2610. [PubMed: 11086367]
11. Richter KP, Ahluwalia HK, Mosier MC, Nazir N, Ahluwalia JS. A population-based study of cigarette smoking among illicit drug users in the United States. *Addiction* 2002 7;97(7):861–869. [PubMed: 12133125]
12. Weinberger AH, Funk AP, Goodwin RD. A review of epidemiologic research on smoking behavior among persons with alcohol and illicit substance use disorders. *Prev Med* 2016 11;92:148–159. [PubMed: 27196143]
13. Grant BF, Hasin DS, Chou SP, Stinson FS, Dawson DA. Nicotine dependence and psychiatric disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. *Arch Gen Psychiatry* 2004 11;61(11):1107–1115. [PubMed: 15520358]
14. Smith PH, Mazure CM, McKee SA. Smoking and mental illness in the U.S. population. *Tob Control* 2014 11;23(e2):e147–153. [PubMed: 24727731]
15. Lawrence D, Mitrou F, Zubrick SR. Smoking and mental illness: results from population surveys in Australia and the United States. *BMC Public Health* 2009 8 07;9:285. [PubMed: 19664203]
16. Higgins ST, Kurti AN, Redner R, et al. Co-occurring risk factors for current cigarette smoking in a U.S. nationally representative sample. *Prev Med* 2016 11;92:110–117. [PubMed: 26902875]
17. Rabin RA, George TP. A review of co-morbid tobacco and cannabis use disorders: possible mechanisms to explain high rates of co-use. *Am J Addict* 2015 3;24(2):105–116. [PubMed: 25662704]
18. Hindocha C, Shaban ND, Freeman TP, et al. Associations between cigarette smoking and cannabis dependence: a longitudinal study of young cannabis users in the United Kingdom. *Drug Alcohol Depend* 2015 3 01;148:165–171. [PubMed: 25622777]
19. Goodwin RD, Pagura J, Spiwak R, Lemeshow AR, Sareen J. Predictors of persistent nicotine dependence among adults in the United States. *Drug Alcohol Depend* 2011 11 01;118(2–3):127–133. [PubMed: 21514748]
20. Goodwin RD, Sheffer CE, Chartrand H, et al. Drug use, abuse, and dependence and the persistence of nicotine dependence. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2014 12;16(12):1606–1612. [PubMed: 25063773]
21. Weinberger AH, Copeland J, Platt JM, Goodwin RD. Is cannabis use associated with increased risk of initiation, persistence and relapse to cigarette smoking? Longitudinal data from a representative sample of US adults. *J Clin Psychiatry* in press.
22. Compton WM, Han B, Jones CM, Blanco C, Hughes A. Marijuana use and use disorders in adults in the USA, 2002–14: analysis of annual cross-sectional surveys. *Lancet Psychiatry* 2016 10;3(10):954–964. [PubMed: 27592339]
23. Hasin DS, Saha TD, Kerridge BT, et al. Prevalence of Marijuana Use Disorders in the United States Between 2001–2002 and 2012–2013. *JAMA Psychiatry* 2015 12;72(12):1235–1242. [PubMed: 26502112]
24. Brown QL, Sarvet AL, Shmulewitz D, Martins SS, Wall MM, Hasin DS. Trends in Marijuana Use Among Pregnant and Nonpregnant Reproductive-Aged Women, 2002–2014. *JAMA* 2017 1 10;317(2):207–209. [PubMed: 27992619]
25. Carliner H, Mauro PM, Brown QL, et al. The widening gender gap in marijuana use prevalence in the U.S. during a period of economic change, 2002–2014. *Drug Alcohol Depend* 2017 1 01;170:51–58. [PubMed: 27875801]
26. Grant BF, Saha TD, Ruan WJ, et al. Epidemiology of DSM-5 Drug Use Disorder: Results From the National Epidemiologic Survey on Alcohol and Related Conditions-III. *JAMA Psychiatry* 2016 1 1;73(1):39–47. [PubMed: 26580136]

27. Salas-Wright CP, Vaughn MG, Cummings-Vaughn LA, et al. Trends and correlates of marijuana use among late middle-aged and older adults in the United States, 2002–2014. *Drug Alcohol Depend* 2017 2 01;171:97–106. [PubMed: 28063338]
28. Weinberger AH, Gbedemah M, Martinez AM, Nash D, Galea S, Goodwin RD. Trends in depression prevalence in the USA from 2005 to 2015: widening disparities in vulnerable groups. *Psychol Med* 2017 10 12:1–10.
29. Cook BL, Wayne GF, Kafali EN, Liu Z, Shu C, Flores M. Trends in smoking among adults with mental illness and association between mental health treatment and smoking cessation. *Jama* 2014 1 08;311(2):172–182. [PubMed: 24399556]
30. Lawrence D, Williams JM. Trends in Smoking Rates by Level of Psychological Distress-Time Series Analysis of US National Health Interview Survey Data 1997–2014. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2016 6;18(6):1463–1470. [PubMed: 26705303]
31. Talati A, Wickramaratne PJ, Keyes KM, Hasin DS, Levin FR, Weissman MM. Smoking and psychopathology increasingly associated in recent birth cohorts. *Drug Alcohol Depend* 2013 12 01;133(2):724–732. [PubMed: 24071570]
32. Talati A, Keyes KM, Hasin DS. Changing relationships between smoking and psychiatric disorders across twentieth century birth cohorts: clinical and research implications. *Mol Psychiatry* 2016 4;21(4):464–471. [PubMed: 26809837]
33. Weinberger AH, Gbedemah M, Wall MM, et al. Depression Among Non-Daily Smokers Compared to Daily Smokers and Never-Smokers in the United States: An Emerging Problem. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2017 9 01;19(9):1062–1072. [PubMed: 28339571]
34. Zvolensky MJ, Jardin C, Wall MM, et al. Psychological distress among smokers in the United States: 2008 to 2014. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2017 5 06.
35. Goodwin RD, Wall MM, Choo T, et al. Changes in the prevalence of mood and anxiety disorders among male and female current smokers in the United States: 1990–2001. *Annals of epidemiology* 2014 7;24(7):493–497. [PubMed: 24935462]
36. Weinberger AH, Gbedemah M, Goodwin RD. Cigarette smoking quit rates among adults with and without alcohol use disorders and heavy alcohol use, 2002–2015: A representative sample of the United States population. *Drug Alcohol Depend* 2017 11 01;180:204–207. [PubMed: 28918239]
37. Forman-Hoffman VL, Hedden SL, Glasheen C, Davies C, Colpe LJ. The role of mental illness on cigarette dependence and successful quitting in a nationally representative, household-based sample of U.S. adults. *Annals of epidemiology* 2016 7;26(7):447–454. [PubMed: 27247163]
38. Glasheen C, Hedden SL, Forman-Hoffman VL, Colpe LJ. Cigarette smoking behaviors among adults with serious mental illness in a nationally representative sample. *Annals of epidemiology* 2014 10;24(10):776–780. [PubMed: 25169683]
39. Center for Behavioral Health Statistics and Quality (CBHSQ). National Survey on Drug Use and Health, 2004–2011 [data files and codebook]. US Dept of Health and Human Services (HHS), Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Behavioral Health Statistics and Quality (CBHSQ), Rockville, MD 2013.
40. Substance Abuse and Mental Health Services Administration. Results from the 2005 National Survey on Drug Use and Health: National Findings. (Office of Applied Studies, NSDUH Series H-30, DHHS Publication No SMA 06–4194) Rockville, MD 2006.
41. Substance Abuse and Mental Health Services Administration. Results From the 2006 National Survey on Drug Use and Health: National Findings. (Office of Applied Studies, NSDUH Series H-32, DHHS Publication No SMA 07–4293) Rockville, MD 2007.
42. Substance Abuse and Mental Health Services Administration. Reliability of Key Measures in the National Survey on Drug Use and Health. (Office of Applied Studies, Methodology Series M-8, HHS Publication No SMA 09–4425) Rockville, MD 2010.
43. Substance Abuse and Mental Health Services Administration. Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-44. HHS

Publication No (SMA) 12–4713 Rockville, MD: Substance Abuse and Mental Health Services Administration 2012.

44. Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings,. NSDUH Series H-48, HHS Publication No (SMA) 14–4863 Rockville, MD: Substance Abuse and Mental Health Services Administration 2014.
45. Harrison LD, Martin SS, Enev T, Harrington D. Comparing drug testing and self-report of drug use among youths and young adults in the general population: Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2007.
46. Hunter S, Feder M, Granger B, Piper L, Chromy J. 2005 National Survey on Drug Use and Health. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2006.
47. Winhusen TM, Brigham GS, Kropp F, et al. A randomized trial of concurrent smoking-cessation and substance use disorder treatment in stimulant-dependent smokers. *J Clin Psychiatry* 2014 4;75(4):336–343. [PubMed: 24345356]
48. McDonell M, McPherson S, Vilardaga R, et al. Preliminary findings: Contingency management targeting psycho-stimulant use results in secondary decreases in smoking for severely mentally ill adults. *Am J Addict* 2014 Jul-Aug;23(4):407–410. [PubMed: 24961363]
49. Reid MS, Fallon B, Sonne S, et al. Smoking cessation treatment in community-based substance abuse rehabilitation programs. *J Subst Abuse Treat* 2008 7;35(1):68–77. [PubMed: 17951021]
50. Schauer GL, Hall CD, Berg CJ, Donovan DM, Windle M, Kegler MC. Differences in the relationship of marijuana and tobacco by frequency of use: A qualitative study with adults aged 18–34 years. *Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors* 2016 5;30(3):406–414. [PubMed: 27099958]
51. Lucas P, Walsh Z. Medical cannabis access, use, and substitution for prescription opioids and other substances: A survey of authorized medical cannabis patients. *Int J Drug Policy* 2017 2 09;42:30–35. [PubMed: 28189912]
52. Gwira Baumblatt JA, Wiedeman C, Dunn JR, Schaffner W, Paulozzi LJ, Jones TF. High-risk use by patients prescribed opioids for pain and its role in overdose deaths. *JAMA Intern Med* 2014 5;174(5):796–801. [PubMed: 24589873]
53. Han B, Compton WM, Jones CM, Cai R. Nonmedical Prescription Opioid Use and Use Disorders Among Adults Aged 18 Through 64 Years in the United States, 2003–2013. *JAMA* 2015 10 13;314(14):1468–1478. [PubMed: 26461997]
54. Miller ME, Sigmon SC. Are Pharmacotherapies Ineffective in Opioid-Dependent Smokers? Reflections on the Scientific Literature and Future Directions. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco* 2015 8;17(8):955–959. [PubMed: 26180219]
55. Goodwin RD, Wall MM, Gbedemah M, et al. Trends in cigarette consumption and time to first cigarette on awakening from 2002 to 2015 in the USA: new insights into the ongoing tobacco epidemic. *Tob Control* 2017 8 10.
56. Hughes JR. The hardening hypothesis: is the ability to quit decreasing due to increasing nicotine dependence? A review and commentary. *Drug Alcohol Depend* 2011 9 01;117(2–3):111–117. [PubMed: 21411244]
57. Kulik MC, Glantz SA. The smoking population in the USA and EU is softening not hardening. *Tob Control* 2016 7;25(4):470–475. [PubMed: 26108654]
58. Bommele J, Nagelhout GE, Kleinjan M, Schoenmakers TM, Willemsen MC, van de Mheen D. Prevalence of hardcore smoking in the Netherlands between 2001 and 2012: a test of the hardening hypothesis. *BMC Public Health* 2016 8 09;16:754. [PubMed: 27506600]
59. Edwards R, Tu D, Newcombe R, Holland K, Walton D. Achieving the tobacco endgame: evidence on the hardening hypothesis from repeated cross-sectional studies in New Zealand 2008–2014. *Tob Control* 2017 7;26(4):399–405. [PubMed: 27382047]

Clinical Points

- Illicit drug use is substantially more common among current smokers, relative to former and never smokers. Addressing illicit drug use as a modifiable barrier to smoking cessation may be needed as a next step toward further reducing the smoking prevalence, especially in remaining smokers who are more likely than in prior years to use select illicit drugs, such as cannabis and opioids.
- Illicit drug use, including cannabis, opioid, stimulant, and hallucinogen use, has increased among current and former smokers, with the most rapid rate of increase observed among former smokers. Insofar as illicit drug use may present a barrier to sustained abstinence among former smokers, both community-based and clinical tobacco control efforts may consider increased screening for illicit drug use.

Figure 1.

Time trends for prevalence of illicit drug use from 2002 to 2014 in the United States general population as a function of smoking status (current smokers, former smokers, never smokers). Data are displayed for (A) any illicit drug use, (B) cannabis, (C) opioids (including heroin and illegally used prescription pain medicine), (D) cocaine, (E) hallucinogens, and (F) non-cocaine stimulants (including amphetamine, methamphetamine, and illegally used prescription stimulants). To ensure readability of the respective panels, y-axes have different values.

a Denotes a difference from current smokers ($p<0.05$).

b Denotes a difference from former smokers ($p<0.05$).

c Denotes a difference from never smokers ($p<0.05$).

d For detailed statistics on panels A-B, see Tables.

e For detailed statistics on panels C-F, see Supplemental Tables.

Abbreviations: AOR=adjusted odds ratio (i.e., adjusted for sociodemographics).

Table 1.

The association between illicit drug use type and cigarette smoking, National Survey on Drug Use and Health 2002–2014 pooled data.

	Unadjusted prevalence of illicit drug use			Current smoker ¹ vs. never smoker ³ (95% CI)	Former smoker ² vs. never smoker ³ (95% CI)	Current smoker ¹ vs. former smoker ² (95% CI)
	Current smokers ¹	Former smokers ²	Never smokers ³			
Past-month illicit drug use	% (SE)	% (SE)	% (SE)	AOR ⁺ (95% CI)	AOR ⁺ (95% CI)	AOR ⁺ (95% CI)
Any illicit drug use	20.8 (0.2)	5.6 (0.1)	5.3 (0.1)	4.79 (4.63 – 4.95)	1.99 (1.88 – 2.12)	2.38 (2.26 – 2.51)
Cannabis	17.1 (0.2)	4.3 (0.1)	3.7 (0.04)	5.58 (5.39 – 5.77)	2.51 (2.36 – 2.68)	2.36 (2.23 – 2.50)
Opioids	4.7 (0.1)	1.1 (0.1)	1.2 (0.03)	3.50 (3.31 – 3.70)	1.34 (1.19 – 1.52)	2.22 (2.00 – 2.46)
Cocaine	2.6 (0.1)	0.3 (0.02)	0.2 (0.01)	8.47 (7.57 – 9.47)	1.56 (1.23 – 2.00)	5.14 (4.15 – 6.37)
Hallucinogens	1.2 (0.03)	0.2 (0.02)	0.3 (0.01)	5.36 (4.81 – 5.97)	1.78 (1.34 – 2.37)	2.49 (1.99 – 3.11)
Stimulants	1.4 (0.04)	0.2 (0.02)	0.3 (0.01)	4.43 (3.96 – 4.95)	1.30 (1.03 – 1.64)	3.17 (2.57 – 3.90)

AOR, adjusted odds ratio; CI, confidence interval; SE, standard error

⁺ Adjusted for sociodemographics (age, sex, marital status, education, income, race/ethnicity), and calendar year (categorical).

¹ Current smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported smoking everyday or some days in the past 30 days.

² Former smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported not smoking any cigarettes during the past 30 days.

³ Never smokers were persons who reported never smoking 100 cigarettes during their lifetime.

Table 2.

Prevalence of and linear trend for any past month illicit drug use and tobacco status National Survey on Drug Use and Health among persons 12 years and older (NSDUH), 2002–2014

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Trends	
	wt% (SE)													OR (95% CI); t-test (p-value); Beta (95% CL)	AOR* (95% CI); t-test (p-value); Beta (95% CL)
Illicit drug users in total sample	7037	7241	6965	7006	6712	6800	6866	7413	7719	7637	7301	7274	7054		1.03 (1.03 – 1.03) t=16.9 (<0.001) 0.03 (0.03, 0.03)
% total NSDUH	8.3	8.3	8.0	8.1	8.2	8.0	8.1	8.8	9.1	8.8	9.2	9.4	10.3		1.02 (1.02 – 1.02) t=11.6 (<0.001) 0.02 (0.01, 0.02)
SE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.	0.2	0.2	0.2		
Current smokers ¹ (n)	3901	3930	3750	3676	3527	3575	3503	3687	3694	3554	3344	3152	3063		1.04 (1.03 – 1.05) t=14.1 (<0.001) 0.04 (0.03, 0.05)
% drug user	18.9	19.4	19.4	19.4	19.7	19.3	19.9	21.8	22.0	21.1	22.3	23.5	24.6		1.03 (1.02 – 1.03) t=9.8 (<0.001) 0.03 (0.02, 0.03)
SE	0.6	0.5	0.4	0.5	0.6	0.5	0.6	0.5	0.6	0.6	0.7	0.7	0.5		
Former smokers ² (n)	460	478	463	460	446	428	446	484	558	514	563	571	785		1.07 (1.06 – 1.08) t=10.6 (<0.001) 0.07 (0.05, 0.08)
% drug user	4.8	4.1	4.4	4.3	5.1	4.5	4.7	5.2	6.2	6.0	7.1	6.6	8.7		1.06 (1.05 – 1.07) t=10.0 (<0.001) 0.06 (0.05, 0.07)
SE	0.4	0.23	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.4		
Never-Smokers ³ (n)	2676	2833	2752	2870	2739	2797	2917	3242	3467	3569	3394	3551	3206		1.03 (1.02 – 1.03) t=8.6 (<0.001) 0.03 (0.02, 0.03)
% drug user	5.1	5.1	4.7	4.8	4.7	4.9	4.9	5.2	5.5	5.6	5.5	5.7	6.3		1.02 (1.02 – 1.03) t=7.4 (<0.001) 0.02 (0.02, 0.03)
SE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
Differential time trend: year as continuous x smoking status (in 3 categories)														F(2)=17.5(0.0000)	F(2)=14.4 (<0.001)
Differential time trend: year as continuous x smoking (current vs. never smokers)														F(1)=1.5 (0.22)	F(1)=3.9 (0.05)
Differential time trend: year as continuous x smoking (former vs. never smokers)														F(1)=35.0 (<0.001)	F(1)=28.8 (<0.001)
Differential time trend: year as continuous x smoking (current vs. former smokers)														F(1)=23.0 (<0.001)	F(1)=14.0 (0.0003)

AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio; SE, standard error; wt, weighted

* Adjusted for sex, age, race, income, education

¹ Current smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported smoking every day or some days in the past 30 days.

² Former smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported not smoking any cigarettes during the past 30 days.

³ Never smokers were persons who reported never smoking 100 cigarettes during their lifetime.

. Prevalence of and linear trend for any past month cannabis use and tobacco status National Survey on Drug Use and Health among persons 12 years and older (NSDUH), 2002–2014

Table 3

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Trends	
	wt% (SE)													OR (95% CI); t-test (p-value); Beta (95% CL)	AOR* (95% CI); t-test (p-value); Beta (95% CL)
Illicit drug users in total sample	5612	5733	5473	5387	5191	5272	5432	5972	6253	6366	6073	6128	5973	1.03 (1.02 – 1.03) t=14.9 (<0.001) 0.03 (0.02, 0.03)	1.04 (1.03 – 1.04) t=19.2 (<0.001) 0.04 (0.03, 0.04)
% total NSDUH	6.2	6.2	6.1	6.0	6.1	5.8	6.1	6.7	7.0	7.0	7.3	7.6	8.5		
SE	0.2	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1		
Current smokers ¹ (n)	3376	3376	3200	3073	2980	2986	2986	3154	3164	3127	2924	2770	2726	1.03 (1.03 – 1.04) t=11.6 (<0.001) 0.03 (0.03, 0.04)	1.04 (1.04 – 1.05) t=15.6 (<0.001) 0.05 (0.04, 0.05)
% cannabis user	15.0	16.0	15.9	15.7	15.7	15.1	16.2	17.7	18.0	17.9	18.7	20.1	21.6		
SE	0.5	0.5	0.4	0.4	0.5	0.4	0.6	0.5	0.6	0.6	0.7	0.7	0.5		
Former smokers ² (n)	373	386	373	354	348	331	348	395	464	422	462	477	677	1.07 (1.05 – 1.08) t=10.1 (<0.001) 0.07 (0.05, 0.08)	1.08 (1.06 – 1.09) t=10.6 (<0.001) 0.07 (0.06, 0.09)
% cannabis user	3.7	3.3	3.5	3.2	3.6	3.4	3.5	4.2	4.8	4.8	5.7	5.3	7.3		
SE	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4		
Never-Smokers ³ (n)	1863	1971	1900	1960	1863	1955	2098	2423	2625	2787	2687	2881	2570	1.04 (1.03 – 1.05) t=11.9 (<0.001) 0.04 (0.03, 0.04)	1.04 (1.04 – 1.05) t=12.7 (<0.001) 0.04 (0.04, 0.05)
% cannabis user	3.3	3.3	3.1	3.1	3.1	3.1	3.3	3.5	3.9	4.2	4.0	4.4	4.8		
SE	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1		
Differential time trend: year as continuous x smoking status (in 3 categories)														F(2)=10.1 (0.0001)	F(2)=7.5 (0.0008)
Differential time trend: year as continuous x smoking (current vs. never smokers)														F(1)=1.7 (0.1940)	F(1)=0.2 (0.6882)
Differential time trend: year as continuous x smoking (former vs. never smokers)														F(1)=15.0 (0.0002)	F(1)=15.2 (0.0001)
Differential time trend: year as continuous x smoking (current vs. former smokers)														F(1)=20.1 (<0.001)	F(1)=11.5 (0.0009)

AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio; SE, standard error; wt, weighted

* Adjusted for sex, age, race, income, education

¹ Current smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported smoking every day or some days in the past 30 days.

² Former smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported not smoking any cigarettes during the past 30 days.

³ Never smokers were persons who reported never smoking 100 cigarettes during their lifetime.

Table 4

. Prevalence of and linear trend for any past month illicit drug use (except for cannabis) and tobacco status National Survey on Drug Use and Health among persons 12 years and older (NSDUH), 2002–2014

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Trends	
	wt% (SE)													OR (95% CI); t-test (p-value); Beta (95% CL)	AOR* (95% CI); t-test (p-value); Beta (95% CL)
Illicit drug use except cannabis in total sample	2990	3108	3040	3146	3033	2977	2910	3030	2999	2766	2574	2388	2201	0.99 (0.98 – 1.00) t=−4.3 (<0.0001) −0.01 (−0.02, −0.007)	1.00 (0.99 – 1.00) t=−1.6 (0.12) −0.005 (−0.01, 0.001)
% total NSDUH	3.8	3.8	3.4	3.6	3.8	3.7	3.5	3.7	3.6	3.1	3.5	3.3	3.3		
SE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1		
Current smokers ¹ (n)	1663	1679	1641	1684	1590	1608	1528	1598	1564	1398	1267	1157	990	0.99 (0.99 – 1.00) t=−1.7 (0.09) −0.006 (−0.01, 0.001)	1.00 (1.00 – 1.01) t=0.8 (0.42) 0.003 (−0.004, 0.01)
% non-cannabis user	8.9	8.7	8.4	8.7	9.1	9.1	8.6	9.3	9.0	7.8	8.5	8.6	7.8		
SE	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.5	0.3		
Former smokers ² (n)	157	178	166	179	159	167	172	150	183	161	176	160	206	1.03 (1.01 – 1.05) t=−2.6 (0.009) 0.03 (0.01, 0.05)	1.03 (1.01 – 1.06) t=−3.2 (0.002) 0.03 (0.01, 0.05)
% non-cannabis user	1.8	1.6	1.4	1.6	1.9	1.9	1.9	1.5	2.1	1.8	2.3	2.0	2.3		
SE	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.2	0.2		
Never-Smokers ³ (n)	1170	1251	1233	1283	1284	1202	1210	1282	1252	1207	1131	1071	1005	0.99 (0.98, 1.00) t=−2.8 (0.005) −0.01 (−0.02, −0.004)	0.99 (0.98, 1.00) t=−1.4 (0.17) −0.007 (−0.02, 0.003)
% non-cannabis user	2.3	2.5	2.2	2.3	2.4	2.3	2.2	2.4	2.1	2.0	2.2	2.0	2.2		
SE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
Differential time trend: year as continuous x smoking status (in 3 categories)														F(2)=6.1 (0.003)	F(2)=5.1 (0.007)
Differential time trend: year as continuous x smoking (current vs. never smokers)														F(1)=1.2 (0.27)	F(1)=1.0 (0.32)
Differential time trend: year as continuous x smoking (former vs. never smokers)														F(1)=12.2 (0.0006)	F(1)=10.4 (0.002)
Differential time trend: year as continuous x smoking (current vs. former smokers)														F(1)=9.2 (0.003)	F(1)=7.2 (0.008)

AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio; SE, standard error; wt, weighted

* Adjusted for sex, age, race, income, education

¹ Current smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported smoking every day or some days in the past 30 days.

² Former smokers were persons who reported smoking 100 cigarettes during their lifetime and who, at the time of interview, reported not smoking any cigarettes during the past 30 days.

³ Never smokers were persons who reported never smoking 100 cigarettes during their lifetime.