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RESEARCH ARTICLE

Cessation Behaviors and Treatment Use Among U.S. Smokers by Insurance Status, 2000–2015

Lei Zhang, PhD,[1] Stephen Babb, MPH,[1] Gillian Schauer, PhD,[2,3] Kat Asman, MSPH,[4] Xin Xu, PhD,[1] Ann Malarcher, PhD[2]

Introduction: Variations exist in insurance coverage of smoking-cessation treatments and cigarette smokers' use of these treatments. Recent trends in cessation behaviors by health insurance status have not been reported. This study examines trends in quit attempts, provider advice to quit, and use of cessation counseling and/or medications among adult cigarette smokers by insurance status. Demographic correlates of these cessation behaviors are also identified.

Methods: Data from the 2000–2015 National Health Interview Surveys were used to estimate the prevalence of and trends in past-year quit attempts, receipt of health professional advice to quit, and use of counseling and/or medication among cigarette smokers aged 18–64 years by insurance status (private, Medicaid, or uninsured). Multivariable logistic regression models were used to identify demographic correlates. The analysis was conducted in 2017.

Results: Past-year quit attempts increased linearly among all insurance groups ($p<0.05$), whereas provider advice to quit remained unchanged. Use of cessation treatment increased linearly among smokers with Medicaid (18.1% [95% CI=13.4%, 22.8%] in 2000 to 34.9% [95% CI=28.5%, 40.5%] in 2015, $p<0.05$), whereas nonlinear increases were observed among those with private insurance (26.2% [95% CI=24.0%, 28.4%] in 2000 to 32.3% [95% CI=29.0%, 35.6%] in 2015; quadratic trend, $p<0.05$) and uninsured smokers (13.9% [95% CI=11.0%, 16.8%] in 2000 to 21.8% [95% CI=17.1%, 26.5%] in 2015; quadratic trend, $p<0.05$). Regardless of insurance status, adults aged 18–24 years had lower odds than older adults of receiving advice to quit and using cessation treatments.

Conclusions: Despite increased use of cessation treatments among Medicaid enrollees, disparities by insurance status persist in adult cessation behaviors. Opportunities exist to increase cessation by making comprehensive, barrier-free cessation coverage available to all smokers.

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INTRODUCTION

Cigarette smoking is the leading cause of preventable death and disease in the U.S.,[1,2] with higher prevalence among certain groups, including adults enrolled in Medicaid and adults without health insurance.[3–5] Disparities also persist in cigarette smokers' access to and use of evidence-based cessation treatments, including counseling and U.S. Food and Drug Administration (FDA)-approved cessation medications.[3,6] For example, among cigarette smokers who have visited a healthcare provider in the past year, those aged 18–24 years, Hispanic and Asian smokers, and those without health insurance are less likely to receive advice from health professionals to quit smoking and to use cessation counseling and/or medication than older, white, and privately insured smokers, respectively.[3]

These disparities in smoking- and cessation-related behaviors may stem partly from differences in coverage

From the [1]Office on Smoking and Health, Centers for Disease Control and Prevention, Atlanta, Georgia; [2]Consultant to McKing Consulting Corporation, Atlanta, Georgia; [3]Department of Health Services, School of Public Health, University of Washington, Seattle, Washington; and [4]Research Triangle Institute, Research Triangle Park, North Carolina

Address correspondence to: Lei Zhang, PhD, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 4770 Buford Highway, NE Mailstop, S107-7, Atlanta GA 30341. E-mail: lzhang2@cdc.gov.

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of evidence-based cessation treatments across health insurance types. Coverage of proven cessation treatments with minimal barriers makes it easier for smokers to access these treatments and to obtain cessation assistance from health professionals.[7] Cessation treatment coverage has changed in the past decade because of the 2010 Patient Protection and Affordable Care Act (ACA).[8] For example, the ACA requires most private insurance plans and plans offered to newly eligible Medicaid enrollees in Medicaid expansion states to cover tobacco cessation as a preventive service with an "A"-level recommendation from the U.S. Preventive Services Task Force.[8,9] The ACA also requires state Medicaid programs to cover the 7 FDA-approved cessation medications for all Medicaid enrollees, starting in January 2014, and to cover a comprehensive cessation benefit for pregnant women, without cost sharing, starting in October 2010.[9] In addition to changes in cessation treatment coverage, changes in the demographic characteristics of cigarette smokers within health insurance groups because of the ACA might also affect cessation behaviors. For example, from 2014 to 2015, decreases in the percentage of uninsured individuals were greater among younger adults (aged 18–24 years), adults with no high school diploma, and Hispanic adults.[10]

To date, no study has examined trends in adult smokers' cessation behaviors by health insurance.[5,11] Accordingly, this study examines trends in demographic characteristics, quit attempts, receipt of a health professional's advice to quit, and use of cessation treatments from 2000 to 2015 among adult cigarette smokers aged 18–64 years, by insurance status. In addition, demographic correlates of these cessation behaviors are examined.

METHODS

Study Sample

Data came from the 2000–2015 National Health Interview Surveys (NHIS), an annual, nationally representative, in-person household survey of the non-institutionalized U.S. civilian population. The NHIS adult core questionnaire is administered to a randomly selected adult in each sampled family. The 2015 NHIS adult core questionnaire included 33,672 respondents aged ≥18 years; the response rate was 55.2%. Sample sizes and response rates for the 2000–2014 NHIS ranged from 21,781 to 36,697 and from 58.9% to 74.3%, respectively.[12] Current smoking and quit attempts were assessed annually as part of the NHIS adult core questionnaire during 2000–2015. Additionally, in 2000, 2005, 2010, and 2015, adult respondents were also administered a supplemental questionnaire containing questions on cigarette smokers' receipt of a health professional's advice to quit and use of cessation counseling and/or medications. The analyses in this study are limited to adults aged 18–64 years who reported having Medicaid coverage, private insurance, or being uninsured.

Measures

Current smokers were those who had smoked ≥100 cigarettes during their lifetime and, at the time of interview, reported smoking every day or some days. Former smokers were those who reported smoking ≥100 cigarettes during their lifetime but did not currently smoke. A quit attempt was defined as (1) current smokers who reported stopping smoking for >1 day during the 12 months before the interview because they were trying to quit smoking and (2) former smokers who had quit in the past year.

Current cigarette smokers and former smokers who had quit in the past year were asked whether they had received advice to quit smoking from a health professional; these analyses were limited to adults who had seen a health professional in the past year. Separate questions were asked of current smokers who had made a past-year quit attempt and former smokers who had quit within the past 2 years to assess use of cessation counseling (one-on-one counseling; a stop smoking clinic, class, or support group; or a telephone help line or quitline) and cessation medications (2010 and 2015 response options included a nicotine patch, nicotine gum or lozenge, nicotine nasal spray or inhaler, varenicline, or bupropion; 2005 response options were similar but also included a nicotine tablet and excluded varenicline as it was not FDA approved until 2006; 2000 response options were similar to 2005, except they excluded nicotine lozenge, which was not FDA approved until 2002).

Respondents reported their current healthcare coverage (Medicare, Medicaid, military, other state-sponsored health plans, Indian Health Service, other government programs, private insurance, and single service plans) at the time of the interview. Health insurance status was categorized as Medicaid, private, or uninsured. Individuals with other types of health insurance were excluded from the analyses owing to limited sample size. Demographic characteristics included sex, age, race/ethnicity (white, non-Hispanic [referred to as white]; black, non-Hispanic [referred to as black]; Hispanic; and non-Hispanic individuals of other races), and education.

Statistical Analysis

All data were adjusted for differences in the probability of selection and nonresponse and weighted to provide nationally representative estimates using NHIS-provided variables. Analyses were conducted using SUDAAN, version 9.2 to account for the complex survey design. Past-year quit attempts were examined by insurance status annually for 2000–2015. Testing for trends over time (2000–2015) was conducted using logistic regression modeling, with the binary outcome of having a past-year quit attempt regressed on linear and quadratic time variables while controlling for age, sex, race/ethnicity, and education. A Wald statistic was used to determine the statistical significance ($p<0.05$) of the quadratic time variable in the model. Quadratic terms that were not statistically significant were removed from the model, and the statistical significance of the linear time variable was assessed.

Linear and quadratic trends in the distributions of demographic characteristics were examined among current cigarette smokers. The prevalence of receipt of health professional advice to quit and use of cessation counseling and/or medications by health insurance status was estimated among current smokers and recent quitters as defined previously. Similar to the analysis for quit attempts, multivariable logistic regression models were

used to analyze linear and quadratic trends in receipt of advice to quit and use of cessation treatments. Separate logistic regression models were used to estimate ORs and 95% CIs for the relationship between demographic characteristics and each cessation behavior by health insurance status.

RESULTS

The proportion of female Medicaid smokers declined from 2000 to 2015 (Table 1). Among those with private insurance, there was an increase in the proportion of smokers aged 45–64 years during 2000–2015, and a decrease among those aged 35–44 years. Among the uninsured, the proportion of smokers aged 25–34 increased, whereas the proportion of those aged 18–24 years decreased. Among those with insurance coverage, the percentage of smokers with more than a high school education increased over time (all $p<0.05$).

During 2000–2015, past-year quit attempts increased among Medicaid enrollees (53.0% to 56.0%), people with private insurance (50.5% to 57.8%), and the uninsured (45.8% to 53.5%) (all $p<0.05$ for linear time trend from logistic regression models controlling for age, sex, race/ethnicity, and education) (Figure 1). No differences were observed in trends by insurance status during this period ($p=0.9061$).

During 2000–2015, there was no significant change in the prevalence of receiving a health professional's advice to quit ($p>0.05$ for all linear and quadratic trend tests, after controlling for age, sex, race/ethnicity, and education) (Table 2). A higher proportion of people with insurance (versus those without insurance) and those with Medicaid (versus those with private insurance) reported receiving advice to quit. Trends in cessation treatment use varied by insurance status during this period. Significant nonlinear increases were observed among privately insured and uninsured smokers ($p<0.05$ for quadratic trends after controlling for age, sex, race/ethnicity, and education); a significant linear increase ($p<0.05$) was observed for Medicaid smokers (Table 2). Similar trends were also observed across the insurance categories for use of counseling, use of nicotine replacement therapy, and use of nicotine gum. During 2000–2010, use of counseling and/or medication was higher among smokers with private insurance than among Medicaid and uninsured smokers. In 2015, use of counseling and/or medications among Medicaid smokers was the highest, followed by use among privately insured smokers and smokers who were uninsured.

In 2015, demographic correlates of quit attempts were generally similar across insurance categories. The odds of making a past-year quit attempt were lower among those aged 45–64 years than those aged 18–24 years, and higher among black than white smokers (Table 3). Among Medicaid enrollees, those with greater than a high school education had higher odds of making a quit attempt than those with less than a high school education (OR=1.78, 95% CI=1.18, 2.68). Age was associated with receipt of advice to quit from a healthcare professional across all 3 insurance groups, with higher odds of receiving advice to quit among those aged 35–44 and 45–64 years than those aged 18–24 years. Race/ethnicity was also associated with receiving advice to quit across insurance groups, with Hispanics having lower odds of receiving advice to quit than whites among Medicaid enrollees (OR=0.43, 95% CI=0.26, 0.73) and the privately insured (OR=0.45, 95% CI=0.30, 0.69), and blacks having lower odds of receiving advice to quit than whites among the uninsured (OR=0.35, 95% CI=0.19, 0.64). Among individuals with private insurance, those with a high school education or GED or higher had lower odds of receiving advice to quit than those with less than a high school education. Age was associated with cessation treatment use across all 3 insurance categories, with increased odds of treatment use among older smokers compared with younger smokers. In addition, Hispanic smokers with private insurance had lower odds of using treatments than privately insured white smokers (OR=0.45, 95% CI=0.30, 0.69).

DISCUSSION

This is, to the authors' knowledge, the first study to explore trends in smoking-cessation behaviors among U.S. adults by health insurance status. From 2000 to 2015, quit attempts increased linearly across all insurance groups, and no changes were observed in the proportion of smokers who reported receiving cessation advice from a health professional for any of the insurance groups. However, trends in cessation treatment use differed by insurance status; among Medicaid enrollees, treatment use increased linearly, whereas the privately insured and uninsured experienced nonlinear trends with peak prevalence for both groups in 2010. Large disparities in cessation behaviors by insurance status continue to exist; in 2015, uninsured smokers had a lower prevalence of receiving a healthcare professional's advice to quit and using cessation treatment than Medicaid enrollees and privately insured smokers.

The increase in the use of evidence-based cessation treatments among Medicaid smokers observed in this study may reflect improved state Medicaid coverage of cessation treatments over time. State Medicaid coverage of cessation medications has improved following 1 of the ACA cessation-related provisions: effective January

Table 1. Demographic Characteristics of Adult Smokers[a] by Insurance Status[b] and Year: National Health Interview Survey, 2000–2015

	Medicaid				Private				Uninsured			
Demographic characteristics	**2000 %[c] (SE)**	**2005 % (SE)**	**2010 % (SE)**	**2015 % (SE)**	**2000 % (SE)**	**2005 % (SE)**	**2010 % (SE)**	**2015 % (SE)**	**2000 % (SE)**	**2005 % (SE)**	**2010 % (SE)**	**2015 % (SE)**
N	730	857	800	1,305	4,479	3,558	2,412	2,475	1,945	1,810	1,607	1,089
Weighted *n* (millions)	3.58	5.05	5.86	8.13	30.50	26.72	22.58	18.96	11.94	12.83	14.08	7.48
Sex (% female)	67.7 (2.3)	62.4(2.1)	63.0(1.9)	56.3 (2.3)	47.2 (0.8)	44.5 (0.9)	45.7 (1.1)	46.3 (1.3)	41.5 (1.3)	37.7 (1.4)	38.0 (1.3)	39.6 (2.0)
Age group, years												
18–24	19.3 (1.7)	22.5 (2.0)	17.8 (1.8)	13.8 (1.6)	14.6 (0.7)	12.9 (0.7)	11.8 (0.9)	11.8 (1.0)	23.7 (1.4)	23.7 (1.4)	19.9 (1.4)	12.5 (1.3)
25–34	21.4 (1.7)	24.6 (1.8)	26.8 (1.9)	24.4 (1.8)	21.4 (0.7)	21.5 (0.8)	22.4 (0.9)	22.9 (1.3)	26.1 (1.2)	28.3 (1.4)	28.6 (1.5)	35.1 (2.0)
35–44	26.8 (2.1)	24.9 (1.8)	20.8 (1.9)	21.8 (1.7)	28.8 (0.7)	24.4 (0.9)	21.9 (1.0)	20.4 (1.0)	27.0 (1.2)	22.0 (1.2)	19.2 (1.2)	24.7 (1.8)
45–64	32.5 (2.2)	28.0 (1.8)	34.6 (1.9)	40.1 (2.0)	35.2 (0.7)	41.2 (1.0)	43.9 (1.2)	44.9 (1.5)	23.1 (1.1)	26.0 (1.3)	32.3 (1.5)	27.8 (1.8)
Race/ethnicity												
White, non-Hispanic	60.7 (2.4)	65.2 (2.1)	61.6 (2.2)	61.6 (2.0)	81.4 (0.7)	80.0 (0.8)	80.0 (0.8)	76.9 (1.1)	67.0 (1.3)	65.0 (1.6)	67.7 (1.5)	61.7 (2.0)
Black, non-Hispanic	21.8 (1.9)	17.9 (1.6)	23.8 (2.0)	20.1 (1.6)	8.2 (0.5)	8.2 (0.5)	7.7 (0.6)	8.3 (0.7)	13.6 (0.9)	13.3 (1.1)	13.0 (0.9)	13.9 (1.3)
Hispanic	11.6 (1.1)	11.9 (1.2)	9.9 (1.0)	12.2 (1.2)	6.4 (0.4)	7.9 (0.5)	7.1 (0.6)	8.3 (0.7)	14.6 (1.0)	16.2 (1.0)	14.4 (0.9)	17.9 (1.4)
Other, non-Hispanic	6.0 (1.4)	5.1 (1.0)	4.6 (0.7)	6.1 (1.0)	4.0 (0.4)	3.9 (0.4)	5.1 (0.5)	6.5 (0.6)	4.7 (0.6)	5.5 (0.8)	4.9 (0.7)	6.5 (0.8)
Education												
Less than high school	42.4 (2.1)	38.3 (2.1)	33.4 (1.9)	30.6 (1.8)	12.7 (0.6)	10.7 (0.6)	8.6 (0.7)	8.9 (0.8)	32.0 (1.3)	29.9 (1.6)	25.6 (1.3)	27.6 (1.9)
High school/GED	35.4 (2.2)	37.9 (2.1)	36.0 (2.1)	34.4 (1.8)	38.1 (0.9)	37.3 (0.9)	34.4 (1.2)	31.0 (1.3)	39.2 (1.4)	39.4 (1.5)	38.4 (1.5)	38.5 (2.1)
More than high school	22.2 (1.6)	23.8 (1.6)	30.6 (2.0)	35.0 (1.9)	49.2 (0.9)	52.0 (0.9)	57.1 (1.2)	60.0 (1.4)	28.8 (1.3)	30.8 (1.6)	36.0 (1.3)	33.9 (1.8)

[a]People who reported smoking ≥100 cigarettes in their lifetime and currently smoke every day or some days; also includes those who made a quit attempt in the past year as well as former smokers who quit in the past year.
[b]Health insurance coverage was from National Health Interview Survey-recoded data using a hierarchal assignment.
[c]Percentages are weighted to the U.S. population.

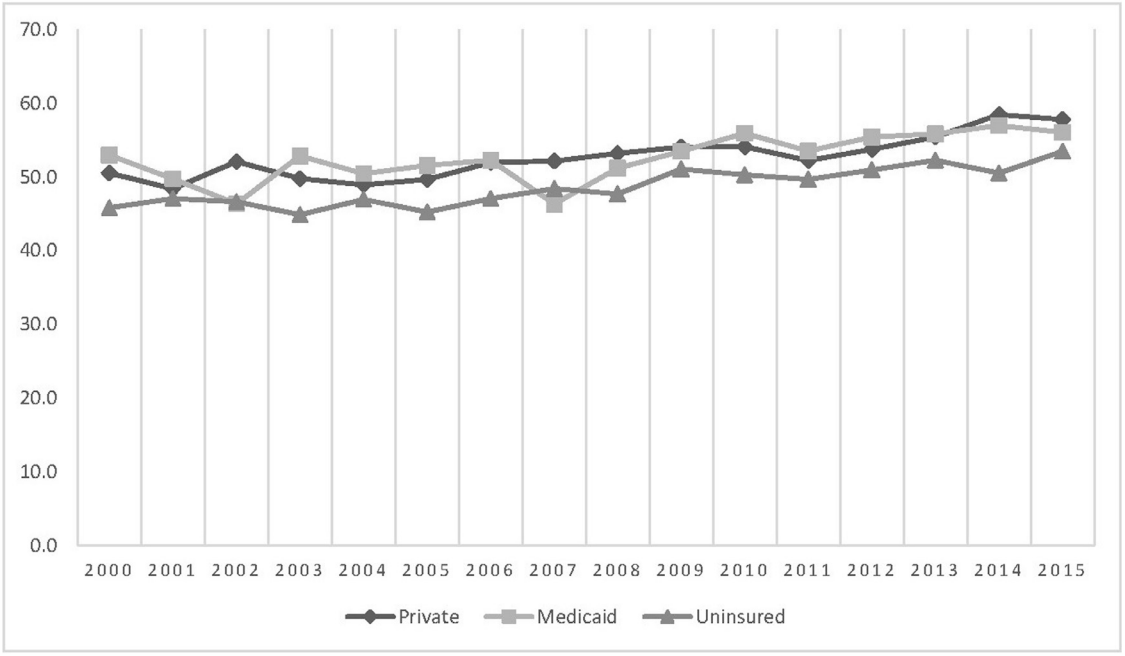

Figure 1. Past-year quit attempt prevalence by health insurance status among adult smokers[a] aged 18–64 years: NHIS, 2000–2015.

Note: all trends are significant ($p<0.0001$) controlling for age, sex, race/ethnicity and education.

[a]Current smokers who reported that they stopped smoking for >1 day in the past 12 months because they were trying to quit smoking and former smokers who quit in the past year.

NHIS, National Health Interview Survey.

2014, state Medicaid programs cannot exclude from coverage any FDA-approved cessation medications.[8] From 2000 to 2017, the number of states covering all FDA-approved cessation medications increased from 16 to 32.[13] Kahende et al.[14] observed that the likelihood of having a claim for an FDA-approved cessation medication among smokers enrolled in fee-for-service Medicaid increased with the number of cessation medications a state covered. Similarly, in a state-level analysis using Medicaid drug rebate data from 2010 to 2014, Ku and colleagues[15] found that utilization of cessation medications among Medicaid enrollees increased when state Medicaid programs covered all FDA-approved cessation medication classes. In another analysis of Medicaid drug rebate data from 2013, Ku et al.[4] observed a lower cessation medication utilization rate among Medicaid enrollees in states that had not expanded Medicaid eligibility compared with Medicaid enrollees in expansion states. However, in a study using combined 2010 and 2015 NHIS data, Brantley and colleagues[16] found no relation between Medicaid expansion and use of cessation treatment among Medicaid enrollees. Medicaid cessation benefit coverage also varies widely across states and, in most states, falls short of a comprehensive, barrier-free benefit. States often impose barriers such as copayments and prior authorization requirements that can impede access to covered treatments.[17] Removing these barriers may further improve access to cessation services among this population.

Increases in treatment use also were observed among smokers with private insurance and the uninsured; however, these increases primarily occurred from 2000 to 2005, with no further significant changes through 2015. In 2015, although the prevalence of cessation treatment use did not differ between Medicaid enrollees and privately insured smokers (with the previous difference in cessation treatment use between Medicaid enrollees and privately insured smokers disappearing), uninsured smokers continued to be less likely to use cessation treatments than Medicaid enrollees and privately insured smokers. Uninsured smokers also had the lowest prevalence of receiving a health professional's advice to quit smoking throughout the study period. There are a number of possible explanations for these findings, including number and type of doctor visits and costs. People with health insurance make more healthcare visits than uninsured individuals,[18] and may therefore have a greater chance of receiving cessation advice.[15,19] Uninsured smokers may also lack a usual source of care,[20] where cessation treatments are more likely to be provided.[21]

Table 2. Receipt of Advice to Quit[a] and Counseling and/or Medication[b] Use by Insurance[c] Among Smokers: 2000–2015

Cessation measures	Medicaid				Private				Uninsured			
	2000 % (SE)	2005 % (SE)	2010 % (SE)	2015 % (SE)	2000 % (SE)	2005 % (SE)	2010 % (SE)	2015 % (SE)	2000 % (SE)	2005 % (SE)	2010 % (SE)	2015 % (SE)
n for advice to quit	641	726	684	1,112	3,448	2,967	2,037	2,040	1,039	996	949	653
Weighted *n* (millions)	3.13	4.28	5.04	6.76	23.50	22.30	18.93	15.60	6.42	6.94	8.39	4.35
Received advice to quit	59.9 (2.5)	65.0 (2.4)	53.5 (2.3)	60.0 (2.2)	52.5 (1.0)	56.4 (1.1)	49.9 (1.3)	55.7 (1.5)	44.5 (2.0)	48.8 (1.9)	35.4 (1.9)	44.0 (2.7)
n for treatment use	378	417	435	679	2,181	1,670	1,216	1,320	864	784	777	537
Weighted *n* (millions)	1.83	2.53	3.07	4.15	14.91	12.76	11.32	10.08	5.37	5.49	6.76	3.67
Used counseling and/or medication	18.0 (2.4)	23.6 (2.3)	29.8 (2.8)	34.9 (3.0)	25.6 (1.1)	34.4 (1.4)	38.4 (1.6)	32.4 (1.7)	13.9 (1.5)	20.5 (1.8)	22.4 (1.8)	21.8 (2.4)
Counseling	[d]	3.4 (0.8)	6.2 (1.2)	7.6 (1.4)	1.2 (0.3)	4.9 (0.6)	6.9 (0.9)	7.5 (0.9)	[d]	3.0 (0.8)	4.2 (1.0)	3.9 (1.0)
Medication	17.5 (2.4)	22.6 (2.3)	27.8 (2.8)	32.7 (2.9)	24.9 (1.1)	33.2 (1.4)	36.5 (1.6)	29.8 (1.6)	13.5 (1.4)	19.2 (1.7)	20.6 (1.8)	21.2 (2.4)
NRT[e]	13.5 (1.9)	20.4 (2.2)	18.7 (2.3)	28.8 (2.9)	17.3 (0.8)	29.8 (1.4)	25.2 (1.5)	23.1 (1.7)	11.4 (1.1)	18.0 (1.7)	16.4 (1.6)	19.0 (2.4)
NRT-patch	11.2 (1.6)	16.3 (2.1)	13.2 (1.8)	22.0 (2.7)	14.3 (0.8)	19.8 (1.2)	16.8 (1.3)	16.4 (1.5)	9.1 (1.0)	12.6 (1.4)	11.5 (1.4)	11.3 (1.8)
NRT-gum	—	6.3 (1.3)	7.2 (1.5)	13.8 (2.6)	4.4 (0.4)	12.8 (1.0)	12.1 (1.2)	12.7 (1.2)	2.9 (0.6)	7.5 (1.1)	7.9 (1.1)	9.4 (1.6)
Bupropion	4.6 (1.0)	5.2 (1.1)	3.9 (1.2)	1.7 (0.5)	7.2 (0.5)	9.4 (0.8)	3.9 (0.6)	3.2 (0.6)	2.7 (0.6)	3.2 (0.7)	1.1 (0.5)	1.9 (0.7)
Varenicline	—	—	10.7 (1.7)	8.2 (1.6)	—	—	14.3 (1.1)	9.1 (1.1)	—	—	5.3 (1.0)	3.0 (0.8)
Combination therapy[f]	2.2 (0.7)	6.4 (1.2)	7.6 (1.4)	11.4 (2.2)	3.3 (0.4)	11.4 (0.9)	8.8 (0.9)	9.1 (1.1)	1.7 (0.4)	5.2 (0.9)	4.3 (0.9)	5.0 (1.1)

[a]Among current smokers and former smokers who quit in the past year who also saw a doctor or other health professional in the past year.
[b]For 2010 and 2015, used one-on-one counseling, a stop smoking clinic, class, or support group, and/or a telephone help line or quitline; and/or the nicotine patch, nicotine gum or lozenge, nicotine-containing nasal spray or inhaler, varenicline (U.S. trade name Chantix), and/or bupropion (including trade names Zyban and Wellbutrin) in the past year among current smokers who tried to quit in the past year or used when stopped smoking among former smokers who quit in the past 2 years. For 2005, the list included a nicotine tablet and excluded varenicline, as it was not approved by the Food and Drug Administration until 2006. For 2000, the list included a stop smoking program and excluded a stop smoking class or support group, nicotine lozenge (not approved by the Food and Drug Administration until 2002), and varenicline.
[c]Health insurance coverage was from National Health Interview Survey-recoded data using a hierarchal assignment.
[d]Data not reported because relative SE ≥30%.
[e]Data were not reported separately for nicotine inhaler and nicotine spray because relative SE ≥30%.
[f]Used 2 or more medications.
NRT, nicotine replacement therapy.

Table 3. ORs for Demographics, Quit Attempt,[a] Advice to Quit,[b] and Treatment Use[c] by Insurance[d]: 2015

	Medicaid			Private			Uninsured		
Demographics	**Quit attempt OR (95% CI)**	**Advice to quit OR (95% CI)**	**Treatment use OR (95% CI)**	**Quit attempt OR (95% CI)**	**Advice to quit OR (95% CI)**	**Treatment use OR (95% CI)**	**Quit attempt OR (95% CI)**	**Advice to quit OR (95% CI)**	**Treatment use OR (95% CI)**
n	1,297	1,106	729	2,468	2,037	1,534	1,078	649	589
Weighted *n* (millions)	8.07	6.70	4.55	18.90	15.57	11.82	7.38	4.30	4.08
Sex									
Men (ref)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Women	1.11 (0.80, 1.54)	0.98 (0.65, 1.46)	1.06 (0.67, 1.70)	1.11 (0.88, 1.41)	1.13 (0.88, 1.46)	1.08 (0.84, 1.41)	0.90 (0.65, 1.23)	1.43 (0.95, 2.17)	1.13 (0.67, 1.90)
Age group, years									
18–24	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
25–34	0.62 (0.34, 1.10)	0.82 (0.42, 1.60)	1.25 (0.44, 3.54)	0.90 (0.59, 1.35)	0.96 (0.56, 1.64)	2.45 (1.19, 5.02)	1.08 (0.62, 1.87)	0.66 (0.30, 1.43)	0.68 (0.26, 1.77)
35–44	0.62 (0.33, 1.19)	1.88 (1.01, 3.48)	3.56 (1.33, 9.55)	0.71 (0.46, 1.08)	1.76 (1.05, 2.95)	4.05 (2.08, 7.90)	0.93 (0.52, 1.67)	1.15 (0.51, 2.61)	1.63 (0.64, 4.10)
45–64	0.55 (0.32, 0.94)	2.55 (1.40, 4.56)	2.73 (1.06, 7.02)	0.49 (0.33, 0.72)	1.96 (1.23, 3.11)	5.58 (2.92, 10.7)	0.54 (0.32, 0.92)	2.18 (0.98, 4.84)	2.06 (0.89, 4.77)
Race/ethnicity									
White NH	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Black NH	1.56 (1.06, 2.30)	0.64 (0.40, 1.01)	0.97 (0.50, 1.88)	1.68 (1.14, 2.46)	1.26 (0.87, 1.84)	0.62 (0.38, 1.02)	1.66 (1.01, 2.73)	0.35 (0.19, 0.64)	0.41 (0.18, 0.94)
Hispanic	0.99 (0.60, 1.65)	0.43 (0.26, 0.73)	0.59 (0.27, 1.29)	1.31 (0.85, 2.02)	0.45 (0.30, 0.69)	0.38 (0.22, 0.67)	0.92 (0.59, 1.42)	0.61 (0.34, 1.09)	0.60 (0.26, 1.40)
Other NH	0.78 (0.39, 1.56)	0.52 (0.28, 0.95)	0.55 (0.21, 1.43)	1.48 (0.98, 2.24)	0.61 (0.37, 1.02)	0.44 (0.24, 0.80)	1.27 (0.73, 2.23)	0.70 (0.33, 1.49)	0.91 (0.35, 2.38)
Education									
Less than high school	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
High school/GED	1.44 (0.95, 2.19)	1.14 (0.73, 1.78)	0.95 (0.48, 1.89)	1.36 (0.91, 2.02)	0.57 (0.36, 0.91)	1.31 (0.72, 2.41)	0.72 (0.45, 1.16)	1.01 (0.54, 1.89)	0.69 (0.30, 1.57)
More than high school	1.78 (1.18, 2.68)	1.04 (0.67, 1.62)	0.96 (0.53, 1.74)	1.38 (0.94, 2.03)	0.58 (0.36, 0.92)	1.37 (0.76, 2.47)	1.05 (0.68, 1.62)	0.70 (0.39, 1.24)	1.61 (0.82, 3.16)

[a]Current smokers who reported that they stopped smoking for >1 day in the past 12 months because they were trying to quit smoking and former smokers who quit in the past year.
[b]Received advice from a medical doctor, dentist, or other health professional to quit smoking or quit using other kinds of tobacco among current smokers and those who quit in the last year who saw a doctor or other health professional in the past year.
[c]Used one-on-one counseling; a stop smoking clinic, class, or support group; and/or a telephone help line or quitline and/or used nicotine patch, nicotine gum or lozenge, nicotine-containing nasal spray or inhaler, varenicline (U.S. trade name Chantix), and/or bupropion (including trade names Zyban and Wellbutrin) in the past year among current smokers who tried to quit in the past year or used when stopped smoking among former smokers who quit in the past year.
[d]Health insurance coverage was from National Health Interview Survey-recoded data using a hierarchal assignment.
NH, non-Hispanic.

An analysis of 2005–2009 data from the National Ambulatory Medical Care Survey found that visits to the patient's primary care physician were more likely to include counseling than those to nonprimary care doctors.[21] An analysis of data on hospital outpatient visits from the 2005–2010 National Hospital Ambulatory Care Surveys had similar findings.[22] Finally, uninsured smokers likely face higher costs for cessation treatment than smokers with health insurance. These findings underscore the importance of extending healthcare coverage to the uninsured.

Other findings worth noting include an increase in the prevalence of making a quit attempt across all insurance categories from 2000 to 2015. A number of factors may explain this trend, including changing social norms about smoking, comprehensive public policy interventions, and increased exposure to anti-smoking media campaigns.[23,24] Additionally, recent changes in federal health insurance coverage requirements have placed more emphasis on preventive care, including tobacco cessation.[8]

In addition, it is important to note that, within insurance groups, some demographic characteristics are also correlated with cessation measures. Similar to other studies,[11,14] younger adults (aged 18–24 years) were more likely than older adults to try to quit, but less likely to receive advice to quit and to use treatment. Health professionals may be less likely to advise younger smokers to quit than older smokers, in part because the former may present with fewer smoking-related health effects than the latter, as they have not been smoking for as long.[25] Relative to white smokers, Hispanic smokers were less likely to have received a health professional's advice to quit among those with Medicaid or private insurance or to use cessation counseling or medications among those with private insurance. These may reflect differences in cessation treatment coverage or cultural beliefs among Hispanics that may make them skeptical about treatment effectiveness.[26–28]

Limitations

Some limitations of this study should be noted. First, cigarette smoking and cessation behaviors were self-reported and might be subject to social desirability bias. However, studies have found self-reported smoking status to be strongly correlated with objective biomarkers.[29] Second, information on coverage of cessation services by health insurance type was not available. Wide variation in coverage of cessation treatments and barriers to accessing treatments exist in both Medicaid and private insurance, and this variation could help explain variations in treatment use by insurance. Third, type of insurance was collected at the time of the interview and may not have reflected the type of insurance the individual had when trying to quit. Fourth, examination of the relation between insurance and receipt of advice to quit was limited to smokers who had seen a health professional in the past year; this study did not examine the association between insurance and whether, or how many times, a smoker had seen a provider in the past year. Finally, sample sizes were small for counseling and medication use for some insurance categories, which prevented the analysis from examining the relationships in these populations.

CONCLUSIONS

Quit attempts and use of effective cessation treatments have increased over the past 15 years across all 3 insurance categories, and, in 2015, more than half of cigarette smokers reported making a past-year quit attempt. However, this prevalence of past-year quit attempts falls well below the *Healthy People 2020* target of 80% (Tobacco Use Objective 4.1: increase smoking-cessation attempts by adult smokers),[19] and only one fifth of uninsured smokers and one third of smokers with private insurance or Medicaid coverage used proven cessation treatments when trying to quit as of 2015. Furthermore, uninsured smokers were less likely to receive advice to quit or to use cessation treatment than smokers with insurance. This pattern has existed since 2000 and is likely due in part to uninsured smokers having less access to health care in general and to cessation treatments, as discussed previously. Before 2015, both smokers enrolled in Medicaid and uninsured smokers were less likely to report using cessation treatments than smokers with private insurance; the convergence in cessation treatment use between Medicaid smokers and privately insured smokers in 2015 is most likely because of improved state Medicaid coverage of cessation treatments, as described herein. This finding underlines the important role that cessation insurance coverage can play in contributing to increased use of cessation treatments by smokers. Therefore, public healthcare organizations can consider working to expand health insurance coverage. Insurers can consider covering all evidence-based cessation treatments, removing barriers to accessing these treatments, and promoting the covered treatments to tobacco users and providers so that they are aware of and use these treatments.[6,7,24,30] Health systems and providers can help more tobacco users quit by screening all patients for tobacco use, advising patients who use tobacco products to quit, providing these patients with cessation counseling and (unless contraindicated) FDA-approved cessation medications, and

referring them to other resources such as state quitlines for additional cessation assistance.[6,24,30]

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