Under-Use of Smoking-Cessation Treatments
Results from the National Health Interview Survey, 2000

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Objective: To describe the use of treatment for tobacco dependence in relation to insurance status and advice from a healthcare provider in a population-based national sample interviewed in 2000.

Methods: Analyses are based on 3996 adult smokers who participated in the National Health Interview Survey in 2000, and who provided information on tobacco-cessation treatments used at their most recent quit attempt occurring in the last year. Age-adjusted and weighted categorical analysis was used to compute prevalence estimates of self-reported treatments (pharmacotherapy and behavioral counseling) for tobacco dependence. Multivariate logistic regression analyses were used to examine factors associated with use of treatments.

Results: Overall, 22.4% of smokers who tried to quit in the previous year used one or more types of cessation aid compared to 15% in 1986. Treatment usually involved pharmacotherapy (21.7%) rather than behavioral counseling (1.3%). Smokers attempting to quit were more likely to use cessation aids if covered by private (25.4%) or military (25.0%) insurance than by Medicare (17.8%), Medicaid (15.5%), or no insurance (13.2%). In a multivariate analysis of factors related to use of cessation aids, advice from a healthcare provider to quit smoking and the number of cigarettes smoked per day were significant predictors of treatment use, regardless of insurance status.

Conclusions: Cessation aids are under-used across insurance categories. Advice by a healthcare provider to quit is associated with increased use of effective therapies for tobacco dependence. Systematic efforts are needed to eliminate barriers to appropriate treatment.

Introduction
Despite significant progress in reducing smoking prevalence and per capita cigarette consumption in the United States, the percentage of smokers who succeed in any given quit attempt remains low.1,2 Treatment using a combination of behavioral counseling and pharmacotherapy can increase long-term cessation rates from ≤11% to between 15% and 25%.3 Current treatment guidelines recommend that every patient who uses tobacco should be counseled by a healthcare provider to quit smoking and should be offered tobacco dependence treatments in the absence of contraindications.3 Despite the demonstrated efficacy and safety of such treatments,4 and their increased availability in the 1990s,5,6 the prevalence of treatment for tobacco dependence remains low, ranging from 8.5% to 21% in four recent state-based surveys.7-11

The last national prevalence estimate of the use of cessation aids at the last quit attempt (15%) were based on data collected in 1986.12 This report provides national estimates of treatments for smoking cessation used at the last quit attempt among smokers, using data collected in 2000 in the National Health Interview Survey (NHIS).

Subjects and Methods
Data Source
Data were used from the 2000 NHIS, Cancer Control Supplement (CCM), to describe the prevalence of treatment for smoking cessation among smokers who attempted to stop for at least 1 day. The NHIS is a cross-sectional, annual, household interview survey of the civilian noninstitutionalized household population of the United States, conducted by the National Center for Health Statistics. Methodologic details of NHIS 2000 can be found elsewhere.13,14 A total of 32,374 individuals aged ≥18 were surveyed (adult core sample) yielding a response rate of 72%. For current smokers, the CCM included an expanded section about smoking cessation inquiring about healthcare provider advice to quit and use of cessation aids at the last serious attempt to quit smoking.15

Analytic Sample
Among the 32,374 adult respondents, 4091 were smokers (ever smoked ≥100 cigarettes in their lifetime) who had tried
to quit for ≥1 day during the last year. Of these, 890 no
longer smoked at the time of the survey (former smokers)
and 3201 had relapsed (current smokers). All provided
information on health insurance status. The analyses ex-
cluded those with missing information on use of cessation
aids at the last quit attempt (n = 95, 2.3%).

Measures

Cessation aids used. Current and former smokers who had
attempted to quit were asked about the use of nicotine
replacement pharmacotherapy (patch, gum, nasal spray, or
inhaler), antidepressant therapy (Buproprion, Zyban®, or
Wellbutrin®), and behavioral counseling (one-on-one coun-
seling, stop-smoking clinic or program, or self-help cessation
guide book or pamphlet) during the last quit attempt of ≥1
day during the past year.

Healthcare provider advice to quit smoking. Among the
smokers in the analytic sample, 3010 had seen a healthcare
provider during the past year. These were asked whether a
healthcare provider had advised them to quit smoking or stop
using other forms of tobacco during the last year.

Health insurance. Health insurance status categories were
private (including health maintenance organization or pre-
ferred provider organization), military (including Veterans
Administration, CHAMPUS, or Tricare), Medicaid, Medicare,
and uninsured.

Statistical analysis. The NHIS has a complex survey design
involving stratification, clustering, and multistage sampling,
which required use of weights for appropriate statistical
analysis.14 Weighted percentages were age adjusted using the
2000 Census standard population. SUDAAN, version 8.0
(Research Triangle Institute, Research Triangle NC, 1997)
was used to calculate appropriate standard errors and 95%
confidence intervals (CIs), while taking into account the
sample design of the NHIS survey. Multivariate logistic regres-
sion analyses were conducted to determine whether predic-
tors of interest (e.g., healthcare provider advice to quit
smoking, number of cigarettes smoked per day, and number
of lifetime previous quit attempts) were independently asso-
ciated with use of cessation aids among smokers trying to quit
during the last year. Statistical significance testing employed
the Wald test statistic with degrees of freedom adjusted to
reflect survey design. Sample size considerations limited the
multivariate analyses to all current smokers combined and to
those with private health insurance, Medicaid, and no
insurance.

Results

Overall, only 22.4% of smokers in the survey who tried
to quit in the last year had used any type of cessation
aids. The use of any cessation aids was low across all
categories of health insurance but was lowest for the
uninsured (13.2%) and for smokers with Medicaid
(15.5%) and Medicare (17.8%) insurance. Use of phar-
macotherapy was more common (21.7%) than use of
behavioral counseling (1.3%) (Table 1).

Among 3010 current smokers and former smokers
who tried to quit and had seen a healthcare pro-
fessional in the past year, 61.8% received advice
from a physician to quit smoking; the proportion
slightly varied from 58.1% among those with no
insurance to 72% among those with military insur-
ance (Table 1).

The multivariate analyses found strong relationships
between use of cessation aids and receipt of advice to
quit by a healthcare provider in the past year. Use of
cessation aids was also strongly related to the number of
cigarettes smoked per day (Table 2). The association
between provider advice to quit smoking and use of
cessation aids was stronger for people with Medicaid
insurance and the uninsured than for those with private
health insurance.

Table 1. Prevalence of use of cessation aidsa and provider advice to quitb by health insurance status

<table>
<thead>
<tr>
<th>Healthcare insurance typec</th>
<th>Characteristic</th>
<th>Total % (95% CI)</th>
<th>Private % (95% CI)</th>
<th>Military % (95% CI)</th>
<th>Medicaid % (95% CI)</th>
<th>Medicare % (95% CI)</th>
<th>Uninsured % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=3996</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Used any aids</td>
<td>22.4 (20.8–24.0)</td>
<td>25.4 (20.7–30.1)</td>
<td>25.0 (15.4–34.6)</td>
<td>15.5 (11.2–19.8)</td>
<td>17.8 (12.9–22.7)</td>
<td>13.2 (10.5–15.9)</td>
<td></td>
</tr>
<tr>
<td>Used any pharmacotherapyd</td>
<td>21.7 (20.1–23.3)</td>
<td>23.4 (19.3–27.5)</td>
<td>24.2 (14.5–34.6)</td>
<td>14.9 (10.6–19.2)</td>
<td>17.5 (12.6–22.4)</td>
<td>12.5 (9.8–15.2)</td>
<td></td>
</tr>
<tr>
<td>Used any behavioral counselinge</td>
<td>1.3 (0.9–1.7)</td>
<td>2.6 (–0.1–5.3)</td>
<td>1.4 (–1.1–3.9)</td>
<td>0.9 (–0.1–1.9)</td>
<td>0.9 (–0.5–2.3)</td>
<td>0.9 (–0.3–1.5)</td>
<td></td>
</tr>
<tr>
<td>Provider advicet</td>
<td>61.8 (59.6–64.0)</td>
<td>59.1 (54.2–64.0)</td>
<td>72.0 (60.7–83.1)</td>
<td>58.8 (50.8–66.8)</td>
<td>66.8 (60.1–73.5)</td>
<td>58.1 (50.1–66.1)</td>
<td></td>
</tr>
</tbody>
</table>

aPrevalence of cessation aids used in smokers who attempted to quit for ≥1 day within the last year.
bPrevalence of provider advice to quit using tobacco products among smokers who attempted to quit during the last year, and had seen a
healthcare provider in the past year.
cPrevalence of use of cessation aids used in smokers who attempted to quit for ≥1 day during the last year. Of these, 890 no
longer smoked at the time of the survey (former smokers) and 3201 had relapsed (current smokers). All provided
information on health insurance status. The analyses ex-
cluded those with missing information on use of cessation
aids at the last quit attempt (n = 95, 2.3%).

dPharmacotherapy methods include nicotine replacement therapy (gum, patch, inhaler, spray) or antidepressants (Buproprion, Zyban®, or
Wellbutrin®).

eBehavioral counseling therapies include booklet, counseling, or smoking clinic.

CI, confidence interval.
Table 2. Factors associated with use of cessation aids at last quitting, stratified by health insurance type

<table>
<thead>
<tr>
<th>Factors</th>
<th>Totalb</th>
<th>Private</th>
<th>Medicaid</th>
<th>Uninsured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (95% CI)</td>
<td>Adjusted ORc (95% CI)</td>
<td>% (95% CI)</td>
<td>Adjusted ORc (95% CI)</td>
</tr>
<tr>
<td>Advised to quit smoking</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Yes</td>
<td>31 (29–34)</td>
<td>1.90 (1.4–2.5)</td>
<td>36 (29–42)</td>
<td>1.77 (1.3–2.5)</td>
</tr>
<tr>
<td>No</td>
<td>16 (14–19)</td>
<td>1.00</td>
<td>16 (13–19)</td>
<td>1.00</td>
</tr>
<tr>
<td>Cigarettes per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>≥21</td>
<td>35 (29–41)</td>
<td>3.83 (2.5–5.7)</td>
<td>40 (32–48)</td>
<td>3.78 (2.6–6.1)</td>
</tr>
<tr>
<td>16–20</td>
<td>29 (26–32)</td>
<td>2.86 (2.0–4.1)</td>
<td>39 (30–50)</td>
<td>2.55 (1.6–4.0)</td>
</tr>
<tr>
<td>8–15</td>
<td>22 (18–25)</td>
<td>2.34 (1.6–3.3)</td>
<td>27 (22–31)</td>
<td>2.24 (1.5–3.4)</td>
</tr>
<tr>
<td>1–7</td>
<td>13 (10–16)</td>
<td>1.00</td>
<td>19 (11–26)</td>
<td>1.00</td>
</tr>
<tr>
<td>Quit attempts in lifetime</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>≥5</td>
<td>26 (23–29)</td>
<td>1.27 (0.9–1.7)</td>
<td>26 (20–32)</td>
<td>1.19 (0.8–1.8)</td>
</tr>
<tr>
<td>2–4 times</td>
<td>29 (25–33)</td>
<td>1.33 (0.9–1.9)</td>
<td>44 (40–48)</td>
<td>1.33 (0.7–2.1)</td>
</tr>
<tr>
<td>1–2 times</td>
<td>18 (15–20)</td>
<td>1.00</td>
<td>30 (21–41)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Quit attempt for ≥1 day within the last year in current smokers.

b = 3123 current smokers; excludes 873 former smokers.

Adjusted multivariate models adjusted for age (18–34, 35–44, 45–64, ≥65 years), gender, race/ethnicity (white, black, and other), education (less than high school, high school graduate, college level or greater), family household income (<$20,000 per year, ≥$20,000), and usual source of care (yes vs no).

c Multivariate models adjusted for age (18–34, 35–44, 45–64, ≥65 years), gender, race/ethnicity (white, black, and other), education (less than high school, high school graduate, college level or greater), and usual source of care (yes vs no).

CI, confidence interval.

Discussion

This report shows that based on the national 2000 NHIS survey, the reported use of recommended treatments for smoking cessation was low across insurance categories. Less than 18% of smokers with Medicare, Medicaid, or no health insurance, and only 25% of those with private or military insurance used appropriate treatment. The low overall prevalence observed nationally is consistent with previous state-based reports.8–11 The reported use of cessation aids by smokers trying to quit was only seven points higher in the 2000 NHIS survey than in the 1986 national study12 (22% vs 15%, respectively), despite increases in coverage for treatments not covered (or only partially reimbursed) by insurance plans.

Although recommendations for smoking-cessation therapies were not specifically assessed in the 2000 NHIS-CCM, advice to quit was an important predictor of cessation aids use, particularly in the Medicaid and uninsured group. Only 61.8% of smokers reported that their physician had advised them to quit, despite strong evidence of the effectiveness of this intervention. Several barriers to healthcare providers’ compliance with recommendations regarding smoking-cessation counseling have been identified.24,25 Healthcare providers’ compliance may be enhanced by clinic-based strategies, such as office-based reminder systems, and incorporation of performance accountability and quality measures in evaluation systems, such as HEDIS 3.0.4,26,27

The limitations of this study include the reliance on self-reported information. Other important variables were unavailable in the 2000 NHIS-CCM, such as the duration of abstinence or whether tobacco-dependence treatments are covered by an individual’s health insurance plan. Also unavailable were data about behavioral counseling via telephones (i.e., quit-line services for cessation); thus, this lack of information may have led to underestimation of behavioral counseling.

Encouraging smokers to quit is one of the most effective measures available to improve health and longevity in the population.2 Effective treatments for tobacco dependence are still widely underused. Systematic efforts are needed to eliminate the barriers that prevent the delivery of appropriate treatment,28 and to incorporate such treatment into standard medical practice.

No financial conflict of interest was reported by the authors of this paper.

References

Tobacco-dependence treatment can improve long-term cessation rates. A national survey in 1986 showed low utilization of tobacco-dependence treatments (15%) among smokers trying to quit. 

Data were used from the 2000 National Health Interview Survey to assess current patterns of cessation treatment use. It was found that use of cessation treatments remains low (22.4%), varies by insurance type, and is associated with advice to quit by a health-care provider.