

# Cessation Outcomes Among Treatment-Seeking Menthol and Nonmenthol Smokers

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**Background:** Menthol cigarettes account for 25% of the market in the U.S. The Food and Drug Administration currently is considering regulatory action on tobacco products, including a ban on menthol cigarettes. With 39% of menthol smokers reporting that they would quit smoking if menthol cigarettes were banned, there is a need to better understand whether existing cessation programs, such as quitlines, are serving menthol smokers.

**Purpose:** This study compared baseline characteristics and cessation outcomes of menthol and nonmenthol smokers who were seeking treatment through a quitline.

**Methods:** Data were collected between September 2009 and July 2011 on 6257 participants. A random sample of eligible participants who registered for services between March 2010 and February 2011 was contacted for a follow-up survey 7 months post-registration ( $n=1147$ ). Data were analyzed in 2011.

**Results:** Among participants, 18.7% of smokers reported using menthol cigarettes. Menthol smokers were more likely to be female, younger, African-American, and have less than a high school education. Menthol smokers who called the quitline were slightly less likely to enroll in services than nonmenthol smokers (92.2% vs 94.8%,  $p<0.001$ ). However, for those that did enroll, there were no significant differences in self-reported intent-to-treat 30-day point prevalence abstinence rates between menthol and nonmenthol smokers (17.3% vs 13.8%,  $p=0.191$ ).

**Conclusions:** Quitlines appear to be adequately serving menthol smokers who call for help. Cessation outcomes for menthol smokers are comparable to nonmenthol smokers. However, if a menthol ban motivates many menthol smokers to quit, quitlines may have to increase their capacity to meet the increase in demand.

(Am J Prev Med 2012;43(5S3):S242–S248) © 2012 American Journal of Preventive Medicine

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## Introduction

Menthol cigarettes account for one quarter of the market in the U.S.<sup>1</sup> Menthol-flavored cigarettes pose additional harm when compared to regular (nonmenthol) cigarettes by promoting initiation among youth, inhibiting cessation among certain groups, and target-marketing to vulnerable populations.<sup>2</sup> Under the Family Smoking Prevention and Control Act, the U.S. Food and Drug Administration (FDA) has the authority to regulate tobacco products. This includes the authority

to remove all menthol cigarettes from the marketplace, as recommended by the FDA's Tobacco Products Scientific Advisory Committee, to benefit public health.<sup>3</sup> A study also found that 39% of smokers reported that they would quit smoking if menthol cigarettes were banned.<sup>4</sup> Given the impending regulatory decision on menthol cigarettes, there is a need to better understand whether current cessation programs are adequately serving this population of smokers.

Telephone-based tobacco dependence treatment is widely available through quitlines in the U.S. This population-based approach has been shown to be effective at increasing cessation among several demographic subgroups,<sup>5–7</sup> yet no studies to date have examined the response of menthol smokers to treatment provided through a quitline. Despite the substantiated evidence of quitline effectiveness, especially those that combine free counseling with nicotine replacement therapy (NRT),<sup>8</sup> quitlines across the country remain severely underutilized and are estimated

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0749-3797/\$36.00

<http://dx.doi.org/10.1016/j.amepre.2012.07.033>

to be reaching only 1% of their target population annually.<sup>9</sup>

Higher rates of menthol cigarette use have been found within racial and ethnic minority populations that suffer disproportionately from tobacco-related death and disease.<sup>10</sup> Recent studies<sup>11-13</sup> have demonstrated that menthol smokers, particularly African Americans, are more likely to consider quitting than nonmenthol smokers but were less likely to successfully quit smoking. In addition, African-American menthol smokers are less successful in long-term abstinence compared to nonmenthol smokers.<sup>14,15</sup> Even so, in a study by Fernander et al.,<sup>16</sup> menthol smoking was not related to any difference in knowledge of cessation services, including the existence of the quitlines. Stahre et al.<sup>12</sup> also found no difference in utilization of quit aids between menthol and nonmenthol smokers in a nationally representative sample.

In Minnesota, 22.2% of current smokers reported using menthol cigarettes.<sup>17</sup> The Minnesota QUITPLAN® Helpline (referred to hereafter as the quitline) continually is making efforts to engage a broader array of smokers, with particular attention being paid to subgroups, such as menthol smokers. A federal ban on menthol cigarettes could present a tremendous opportunity to provide cessation assistance if smokers are motivated to quit. Therefore, the primary objective of the current study was to compare menthol and nonmenthol smokers calling into the quitline. This observational study describes the results of an ongoing evaluation of the quitline which enables an examination of baseline characteristics and cessation outcomes of treatment-seeking menthol and nonmenthol smokers.

## Methods

### Setting

Since 2001, ClearWay Minnesota<sup>SM</sup>, an independent nonprofit created as part of the Minnesota settlement with the tobacco industry, has been providing telephone-based treatment through the quitline. To ensure access for all Minnesotans, the quitline provides free telephone counseling services (of up to four sessions) to under- and un-insured Minnesotans. "Under-insured" describes those callers with health insurance that does not cover both counseling and NRT. Callers who have health insurance that provides both counseling and NRT benefits are transferred to their health plans for services. The free NRT provided by the quitline includes a 4-week supply of the patch, gum, or lozenge and is available to all eligible callers (i.e., 18 years or older, planning to quit in the next 30 days, and without medical contraindications).

### Data Sources

Participants were cigarette smokers who called the quitline between September 2009 and July 2011, registered for counseling services, and responded to a question about smoking menthol cigarettes. Callers to the quitline who did not register for services

were not included since registration data were unavailable. The total number of participants in the present study period was 6257. These 6257 participants were used to compare the demographic, smoking, and clinical characteristics of menthol and nonmenthol smokers who called the quitline.

## Evaluation

ClearWay Minnesota partnered with Professional Data Analysts, Inc. to conduct an outcome evaluation of the quitline. A random sample of adult smokers who registered for counseling services between March 2010 and February 2011 and consented to participate in the evaluation (consent rate = 93%), were followed up via phone 7 months post-registration. The American Recovery and Reinvestment Act of 2009 (ARRA) provided funding for 800 completed surveys; a random number generated sample ( $n=1147$ ) was selected to achieve this target.

The surveys were conducted between October 2010 and October 2011. The mixed-mode survey protocol called for 15 phone attempts. Mail surveys were sent to nonrespondents after three days of calling a nonworking number or 10 days of calling a working number with an unreachable participant. Phone survey respondents ( $n=645$ ) were offered a \$10 check for participating and a \$2 incentive was provided with all mail surveys ( $n=70$ ). Seven hundred fifteen smokers responded to the survey (response rate = 62%). Survey responses were used to compare treatment effectiveness for menthol versus nonmenthol smokers. The present study is a sub-analysis of a larger evaluation of the quitline that was granted exempt status by the IRB at the Minnesota Department of Health.

## Measures

Demographic data were obtained from quitline registration records including race, Hispanic ethnicity, gender, age, education, insurance, and marital status. Smokers were asked to report their race by selecting one or more of the following categories: white, black/African-American, Asian, Native American/Alaska Native, Native Hawaiian/Other Pacific Islander, or other. Because of small numbers in some of the race categories, the data were analyzed after collapsing these categories to white, black/African-American, and other. Menthol smoking status was defined with the question *What type of cigarettes do you smoke?* with smokers asked to select one of the following response categories: full, medium, light, ultra-light, menthol, nonfilter, and don't know/not sure. In subsequent analyses, those answering *don't know/not sure* ( $n=128$ ) were excluded and those answering *menthol* were contrasted with all others.

Smoking and clinical characteristics also were measured at registration. Smoking frequency was assessed with the question *Do you currently smoke cigarettes every day, some days, or not at all?* Those who reported smoking every day or some days were then asked how many cigarettes a day they typically smoked; this is reported as cigarettes per day and categorized into daily cigarette consumption (low, medium, and high). Participants also were asked how soon after waking they typically smoked their first cigarette; this is reported as time to first cigarette in the analysis. Mental health status was defined with the registration question *In the past 12 months, have you received counseling, treatment, or medication for a mental health, emotional, or behavioral problem?* To assess quit confidence, smokers were asked to rate their confidence in quitting tobacco on a scale from 1 (not at all confident) to 10 (completely confident). Quit at registration was defined by the question *Are you currently smoking or using tobacco?* Quitline

administrative records were used to gather utilization data on counseling received and medication shipped to participants.

Cessation outcomes data were collected via survey at 7 months after initial registration. Participants self-reported 24-hour abstinence (quit for 24 hours or more); 30-day point prevalence (quit for the past 30 days); prolonged abstinence (quit for 30 days or more sometime during the 7-month follow-up period); and relapse (achieved prolonged abstinence but used tobacco in the past 30 days) from all tobacco products at follow-up. Satisfaction, also assessed at 7-month follow-up, was measured by participants' response to the question: *Overall how satisfied were you with the service you received from the [quitline]?* with response categories of very satisfied, mostly satisfied, somewhat satisfied, and not at all satisfied. Participants self-reported use of cessation medications, including nicotine patch/gum/lozenge, Chantix, Zyban, and other. Finally, participants were asked if they used any other assistance in their cessation attempt including categories such as advice from a physician, a web program, a telephone program other than the quitline, an in-person program, a text messaging program, support from family/friends, self-help materials, a quit-and-win contest, the QUITPLAN Services page on Facebook, and/or something else.

## Data Analysis

Statistical analyses were conducted in 2011 using SPSS, version 19.0. To test potential differences by demographic and smoking characteristics, chi-square tests were conducted for categorical variables and *t*-tests for continuous variables. Comparisons of satisfaction, utilization, and abstinence by menthol status were made using chi-square tests. Abstinence measures (24-hour abstinence, 30-day point prevalence, prolonged abstinence, and relapse) were calculated using both responder and intent-to-treat quit rates. The intent-to-treat quit rate calculation considers participants who were unable to be reached at follow-up to be current smokers. Confidence intervals for all quitline population proportions were calculated using the Wilson estimate of sample proportion with a correction for continuity.

A response bias analysis was conducted comparing demographics and smoking characteristics of survey responders ( $n=715$ ) to nonrespondents ( $n=432$ ). Although the response rate of menthol smokers (59.4%) was similar to nonmenthol smokers (63%), responders were more likely to be female (66% vs 58%); older (average age=45 years vs 40 years); white (64% vs 52%); non-Hispanic (64% vs 34%); and married (67% vs 60%).

Logistic regression analyses were conducted to test menthol status as a predictor of 30-day point prevalence while controlling for other covariates. Potential predicting covariates that were tested prior to including menthol status included race (black/African-American versus white/other), and the interaction of menthol status by race in the models. Covariates were used in the model if they had a significant association to menthol status or 30-day point prevalence. Separate models were fit for three blocks of potential predictors: demographics (gender, age, education level, marital status, and insurance status); smoking and clinical characteristics (mental health status, quit confidence, quit status at registration, cigarettes per day, time to first cigarette); and cessation methods (one or more coaching sessions, self-reported use of cessation medications at 7-month follow-up, support of family/friends, use of QUITPLAN Facebook page, and other assistance). A fourth model tested the

main effects of race and menthol status and a fifth model tested the interaction of race by menthol status. In each model, potential covariates were entered in a stepwise fashion. After each model, nonsignificant predictors were removed from future models to minimize sample size reduction due to missing data. Covariates that were significant in a prior model were forced into future models. The dependent variable was 30-day point prevalence.

## Results

### Demographics

Frequency distributions for each of the demographic variables are presented in Table 1 stratified by menthol status. Menthol smokers who called the quitline were more likely to be female; younger (aged 18–24 years); and African-American than nonmenthol smokers. Menthol smokers were also more likely to have less than a high school education and to be unmarried.

### Smoking and Clinical Characteristics

A total of 18.7% of participants reported using menthol cigarettes. Frequency distributions for smoking and clinical characteristics of participants are presented in Table 2. Menthol smokers were more likely than nonmenthol smokers to be light smokers and to report smoking within 5 minutes of waking.

### Utilization

Among callers to the quitline, 92.2% of menthol smokers and 94.8% of nonmenthol smokers enrolled, that is, received services, following program registration. Of those that enrolled, 83.3% of menthol smokers and 86.7% of nonmenthol smokers requested and were shipped some form of NRT (patch, gum, or lozenge). These differences in enrollment and NRT, while modest, were found to be significant ( $p<0.001$  and  $p=0.004$ , respectively).

### Satisfaction

Over three quarters (78.1%) of all survey respondents said that they were very satisfied or mostly satisfied with the service they received from the quitline. There was no difference in the proportion of menthol and nonmenthol smokers who reported being satisfied with the services received.

### Cessation Outcomes

Using both responder and intent-to-treat analyses, there were no significant differences in cessation outcomes reported between menthol and nonmenthol smokers. There was no difference in the 30-day point prevalence intent-to-treat cessation rates between menthol smokers (17.3%) and nonmenthol smokers (13.8%) ( $p=0.191$ ). Using a responder calculation, the 30-day point prevalence

**Table 1.** Demographics of smokers calling the quitline by menthol cigarette use, 2009–2011, % (95% CI)

Characteristics	Menthol (n=1172)	Nonmenthol (n=5085)
<b>Gender*</b>		
Male	30.5 (27.9, 33.3)	40.7 (39.4, 42.1)
Female	69.5 (66.7, 72.1)	59.3 (57.9, 60.6)
<b>Race*</b>		
White	67.4 (64.6, 70.1)	91.2 (90.4, 92.0)
Black or African-American	25.0 (22.5, 27.6)	3.2 (2.7, 3.7)
Other	7.6 (6.2, 9.4)	5.6 (4.9, 6.2)
<b>Hispanic</b>		
Yes	3.5 (2.6, 4.8)	3.3 (2.8, 3.8)
No	96.5 (95.2, 97.4)	96.7 (96.2, 97.2)
<b>Age (years)*</b>		
18–24	14.4 (12.5, 16.6)	8.9 (8.1, 9.7)
25–44	35.1 (32.4, 38.0)	38.4 (37.0, 39.7)
45–64	46.3 (43.4, 49.2)	46.7 (45.3, 48.1)
≥65	4.2 (3.1, 5.6)	6.1 (5.4, 6.8)
<b>Education*</b>		
Less than high school	14.4 (12.4, 16.6)	9.9 (9.1, 10.8)
High school graduate	36.6 (33.8, 39.4)	38.3 (36.9, 39.7)
Some college or technical school	35.9 (33.2, 38.8)	36.9 (35.5, 38.2)
College graduates or beyond	13.1 (11.3, 15.3)	14.9 (13.9, 15.9)
<b>Insurance status</b>		
Uninsured	43.4 (40.5, 46.3)	39.6 (38.3, 41.0)
Medicaid	16.1 (14.0, 18.4)	10.7 (9.8, 11.6)
Medicare	12.3 (10.5, 14.3)	13.1 (12.2, 14.1)
Other	28.3 (25.7, 31.0)	36.6 (35.3, 38.0)
<b>Marital status*</b>		
Married	25.2 (22.6, 27.9)	35.9 (34.5, 37.3)
Other	74.8 (72.1, 77.4)	64.1 (62.7, 65.5)

\* $p < 0.05$ 

lence abstinence rates were 29.2% for menthol smokers and 21.9% for nonmenthol smokers ( $p = 0.084$ ). Additionally, there were no differences in 24-hour abstinence, prolonged abstinence, or relapse rates between menthol

and nonmenthol smokers (responder and intent-to-treat rates presented in Table 3).

### Predictors of 30-Day Point Prevalence Abstinence

The interaction term of race by menthol status ( $p = 0.710$ ) was not a significant predictor of 30-day abstinence. The final reduced model excluded the interaction term but retained race and menthol status as variables of interest along with demographics, smoking characteristics, and cessation method covariates that were significant in earlier models of the analysis. Table 4 presents the final logistic regression model summary. In the final model, the odds of quitting for menthol smokers was not significantly different from nonmenthol smokers (OR = 1.29, 95% CI = 0.77, 2.15) after controlling for the other covariates.

**Table 2.** Tobacco use and clinical characteristics of callers to the quitline by menthol cigarette use, 2009–2011, % (95% CI)

Characteristics	Menthol (n=1172)	Nonmenthol (n=5085)
<b>Smoking frequency</b>		
Every day	97.3 (96.1, 98.1)	97.2 (96.7, 97.7)
Some days	0.9 (0.4, 1.6)	0.6 (0.4, 0.9)
Not at all	1.9 (1.2, 2.9)	2.2 (1.8, 2.6)
<b>Daily cigarette consumption*</b>		
<10	12.7 (10.8, 14.8)	9.6 (8.8, 10.5)
10–20	68.2 (65.4, 70.9)	66.5 (65.1, 67.8)
≥21	19.1 (16.9, 21.6)	23.9 (22.7, 25.1)
<b>Time to first cigarette*</b>		
Within 5 minutes	46.3 (43.5, 49.2)	43.1 (41.7, 44.5)
>5 minutes	53.7 (50.8, 56.5)	56.9 (55.5, 58.3)
<b>Mental health treatment in past 12 months*</b>		
Yes	27.3 (24.8, 29.9)	24.3 (23.1, 25.5)
No	72.7 (70.1, 75.2)	75.7 (74.5, 76.9)
<b>Confidence in quitting tobacco at registration*</b>		
Low (1–5)	15.4 (13.4, 17.7)	17.8 (16.8, 18.9)
Medium (6–8)	42.1 (39.2, 45.0)	44.8 (43.5, 46.2)
High (9–10)	42.5 (39.6, 45.4)	37.4 (36.0, 38.7)
<b>Quit status at registration</b>		
Quit	4.4 (3.3, 5.7)	4.7 (4.2, 5.3)
Not quit (currently using tobacco at registration)	95.6 (94.3, 96.7)	95.3 (94.7, 95.8)

\* $p < 0.05$

**Table 3.** Cessation outcomes of smokers at 7-month follow-up by menthol cigarette use, % (95% CI)

Outcomes	Menthol (n=120)	Nonmenthol (n=595)
<b>Response rate</b>	59.4 (52.3, 66.2)	63.0 (59.8, 66.0)
<b>Intent-to-treat quit rates</b>		
24-hour abstinence	52.5 (45.4, 59.5)	55.6 (52.3, 58.7)
Prolonged abstinence	33.7 (27.3, 40.7)	30.3 (27.7, 33.7)
30-day point prevalence	17.3 (12.5, 23.5)	13.8 (11.7, 16.2)
<b>Responder quit rates</b>		
24-hour abstinence	88.3 (80.8, 93.4)	88.2 (85.3, 90.7)
Prolonged abstinence	56.7 (47.3, 65.6)	48.2 (44.1, 52.3)
30-day point prevalence	29.2 (21.4, 38.3)	21.9 (18.7, 25.5)
Relapse	48.5 (36.3, 60.9)	54.4 (48.4, 60.2)

Note: The intent-to-treat quit rate calculation considers participants who were unable to be reached at follow-up to be current smokers. The responder rate includes only participants who were reached at follow-up.

## Discussion

The present study examined the baseline characteristics and cessation outcomes of menthol and nonmenthol smokers who were seeking treatment through a quitline in Minnesota. Menthol smokers who called the quitline were more likely to be female, younger, African-American, and have less than a high school education than nonmen-

thol smokers. Additionally, menthol smokers, despite smoking fewer cigarettes per day, were more likely to report smoking within 5 minutes of waking—a marker used to define dependence. These demographic and smoking characteristics of menthol smokers are consistent with other reported studies.<sup>1,10,18</sup>

Treatment-seeking menthol smokers who called the quitline reported high levels of satisfaction and enrollment in services. The majority (78%) of menthol smokers who called the quitline reported being satisfied with the services received. More than 92% of menthol smokers enrolled in services, suggesting that quitlines are engaging a high proportion of menthol smokers who call. Even though menthol smokers were significantly less likely to enroll than nonmenthol smokers, these findings are likely due to the size of the sample and may be of limited importance from a clinical perspective. However, this finding, along with fewer menthol smokers asking for and receiving medication, should be the focus of future research.

Overall, menthol smokers appear to successfully achieve abstinence at rates comparable to nonmenthol smokers despite being less likely to receive NRT. Findings at 7-month follow-up indicate that self-reported abstinence outcomes for menthol smokers were comparable to nonmenthol smokers. The 30-day-point prevalence intent-to-treat rate for menthol smokers was 17.3%, consistent with the reported intent-to-treat rates of other U.S. quitlines, which range from 14% to 24%.<sup>19</sup> Although these differences were not significant, it is interesting to note that higher rates of 30-day point prevalence abstinence were found among menthol smokers (17.3% vs 13.8% intent-to-treat; 29.2% vs 21.9% responder rate).

**Table 4.** Predictors of 30-day point prevalence abstinence at 7-month follow-up among survey responders

Variable (ref)	Response option	p	OR (95% CI)
Mental health treatment (medications or counseling) during past 12 months (yes)	No	<b>0.012</b>	<b>1.85 (1.14, 2.99)</b>
Quit confidence (low: 1–5)		0.002	
	Medium: 6–8	0.254	1.42 (0.78, 2.61)
	<b>High: 9–10</b>	<b>0.003</b>	<b>2.53 (1.38, 4.63)</b>
Quit at registration (no)	Yes	<b>0.020</b>	<b>2.31 (1.14, 4.69)</b>
Other assistance: support from family and friends (no)	Yes	<b>&lt;0.001</b>	<b>2.56 (1.58, 4.13)</b>
Other assistance: Facebook (no)	Yes	<b>0.025</b>	<b>2.83 (1.14, 7.06)</b>
Other assistance: something else (no)	Yes	<b>0.001</b>	<b>3.47 (1.68, 7.14)</b>
Menthol (no)	Yes	0.332	1.29 (0.77, 2.15)
Race (white or other)	Black/African-American	0.442	1.43 (0.58, 3.53)

Note: n=640; missing n=75. Hosmer–Lemeshow p=0.798; Nagelkerke R<sup>2</sup> = 0.140. Significant findings are indicated in bold.

Further research is needed to explore the effectiveness of quitline services for other populations of menthol smokers.

The comparability of outcomes between menthol and nonmenthol smokers in the present study differs from the differential quit rates reported by previous research. Delnevo et al.<sup>11</sup> reported decreased cessation among menthol smokers. In a review by Foulds et al.,<sup>20</sup> poorer cessation outcomes for menthol smokers were found in half of the studies reviewed but these effects were highlighted only in racial/ethnic minority subgroups. Yet, logistic regression analysis found that race and menthol status were not significant predictors of 30-day abstinence. It should be noted that the present study highlighted outcomes among a group of smokers that were motivated to seek treatment through a state quitline whereas the Delnevo study<sup>11</sup> examined a population of current and former smokers from a national sample. Future research is needed to explore how to expand the reach of quitlines to all menthol smokers and to help illuminate aspects of the quitline that are contributing to successful cessation outcomes.

Another noteworthy finding from the regression analysis was that respondents who did not report receiving mental health treatment were 1.85 times more likely to achieve 30-day point prevalence abstinence at follow-up. Although self-report of mental health treatment was used as a proxy for mental health status, there is some evidence that supports the use of tailored quitline treatment for smokers with mental illness,<sup>21</sup> and further research is needed to explore the effectiveness of quitlines in this priority population.

The potential implementation of a ban of menthol cigarettes by the FDA poses a unique and unprecedented opportunity to promote cessation within a specific subgroup of tobacco users. In addition to the pending regulatory action on menthol cigarettes, the FDA announced in July 2011 that in addition to graphic warning labels, the 1-800-QUIT-NOW number, the nationwide toll free number that connects users to their local state quitlines, will be placed on all cigarette packaging effective September 2012 (pending the outcome of current legal challenges). This undoubtedly will increase the visibility of quitlines and have implications for state quitlines that will need to meet the increased demand for cessation services. These implications are especially pertinent as funding for state quitlines has seen declines in recent years.<sup>22</sup>

There are several limitations to consider in interpreting the findings of this study. First, the results relied on self-report and there was no biochemical verification of abstinence. Second, menthol status also was self-reported, which could have resulted in misclassification. Third, approximately 40% of the sample did not respond

to the follow-up survey. All nonrespondents were assumed to be smokers as reflected in the intent-to-treat analysis. Longer follow-up periods also could be considered in future research. Lastly, the study was specific to uninsured and underinsured smokers who called the quitline in Minnesota, and the results may not be generalizable to other populations.

This study adds important information regarding the effectiveness of telephone-based tobacco treatment for menthol smokers. The quitline appears to be adequately serving menthol smokers who call for help. However, if an FDA menthol ban motivates many menthol smokers to try to quit, state quitlines may have to increase their capacity to meet the anticipated increase in demand.

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The authors acknowledge the staff at National Jewish Health and Professional Data Analysts, Inc., for their work with the QUITPLAN Helpline. They also thank Dr. Jeong Kyu Lee for his contributions to data analysis. A federal grant from the American Recovery and Reinvestment Act Communities Putting Prevention to Work initiative (CDC-RFA-DP09-90101ARRA09) to the Minnesota Department of Health provided funding for the evaluation of QUITPLAN Helpline participants described in this study.

Publication of this article was supported by ClearWay Minnesota<sup>SM</sup>.

No financial disclosures were reported by the authors of this study.

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