

Epidemiology of menthol cigarette use

Gary A. Giovino, Stephen Sidney, Joseph C. Gfroerer, Patrick M. O'Malley, Jane A. Allen, Patricia A. Richter, K. Michael Cummings

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Approximately one-fourth of all cigarettes sold in the United States are mentholated. An understanding of the consequences, patterns, and correlates of menthol cigarette use can guide the development and implementation of strategies to reduce smoking prevalence and smoking-attributable morbidity and mortality. This paper summarizes the literature on the health effects of mentholated cigarettes and describes various patterns of use as indicated by consumption and survey data from the United States and other nations. The epidemiological literature on menthol cigarettes and cancer risk is inconclusive regarding whether these cigarettes confer a risk for cancer above that of nonmentholated varieties. Available data indicate that mentholated cigarettes are at least as dangerous as their nonmentholated counterparts. In addition, because mentholation improves the taste of cigarettes for a substantial segment of the smoking population and appears to mask disease symptoms, this additive may facilitate initiation or inhibit quitting. Menthol market share is high in the Philippines (60%), Cameroon (35%–40%), Hong Kong (26%), the United States (26%), and Singapore (22%). Newport has become the leading menthol brand in the United States. Surveys from four nations indicate that menthol use among adult smokers is more common among females than males. Among U.S. smokers, 68.9% of Blacks, 29.2% of Hispanics, and 22.4% of Whites reported smoking a mentholated variety. Research is needed to better explain factors that may influence menthol preference, such as marketing, risk perceptions, brand formulation, and taste preferences. Such research would guide the development of potentially more effective programs and policies.

Introduction

Menthol, a monocyclic terpene alcohol, is a stimulant of cold receptors (Eccles, 1994; Gelal, Jacob, Yu, & Benowitz, 1999). Frequently derived from the oils of the peppermint and cornmint plants, menthol is added to about 90% of commercial cigarettes sold in the United States (“The situation on the world menthol market,” 1984; Eccles, 1994). Brands marketed as

menthol cigarettes contain from 0.1% to 1.0% of their tobacco weight in menthol (“The situation on the world menthol market,” 1984; Reid, 1994). In most other brands, however, the amount of menthol is so low (approximately 0.03% of the tobacco weight) that the mint flavor and cooling sensations are not perceptible. Concern has been raised that mentholated cigarettes may pose a relatively greater health risk because the menthol makes them more addictive or because of direct adverse effects of this additive in cigarette smoke (Henningfield et al., 2003). Menthol may facilitate initiation or prevent quitting by making the smoke taste less harsh (Hymowitz, Mouton, & Edkholdt, 1995; Stratton, Shetty, Wallace, & Bondurant, 2001). It also may mask symptoms of respiratory disease, potentially leading to delays in seeking medical attention and suppressing motivation to quit (Garten & Falkner, 2003).

Epidemiological data on menthol cigarette use can help researchers and policy makers to understand the consequences of using menthol cigarettes, identify high-risk groups and correlates of risk, justify and evaluate policies and programs meant to curtail use,

Gary A. Giovino, Ph.D., M.S. and K. Michael Cummings, Ph.D., M.P.H., Division of Cancer Prevention and Population Sciences, Roswell Park Cancer Institute, Buffalo, NY; Stephen Sidney, M.D., M.P.H., Kaiser Permanente Medical Care Program, Division of Research, Oakland, CA; Joseph C. Gfroerer, B.A., Office of Applied Studies, Substance Abuse and Mental Health Services Administration, Rockville, MD; Patrick M. O'Malley, Ph.D., Institute for Social Research, University of Michigan, Ann Arbor; Jane A. Allen, M.A., American Legacy Foundation, Washington, DC; Patricia A. Richter, Ph.D., M.P.H., Office on Smoking and Health, Centers for Disease Control and Prevention, Atlanta, GA.

Correspondence: Gary A. Giovino, Ph.D., M.S., Senior Research Scientist and Director, Tobacco Control Research Program, Division of Cancer Prevention and Population Sciences, Roswell Park Cancer Institute, Elm & Carlton Streets, Buffalo, New York 14263 USA. Tel.: +1 (716) 845-4402; Fax: +1 (716) 845-8487; E-mail: gary.giovino@roswellpark.org

and justify research initiatives. To facilitate these objectives, we first briefly review the literature on the health consequences of smoking mentholated cigarettes, describe the menthol composition of 140 U.S. cigarette brands, and review the results of previous surveys on brand preference. Then we provide a brief overview of market share data in 55 countries and Hong Kong, followed by population estimates from analyses of four national surveys on brand preference.

Health consequences of menthol cigarettes

The three leading causes of mortality in the United States are diseases of the heart (predominantly coronary heart disease), accounting for 30% of all deaths in 2000; cancer (23%), and cerebrovascular diseases (7%) (Anderson, 2002). Epidemiological studies on menthol cigarettes have examined their influence on tobacco-attributable cancers. A prospective study in the Kaiser Permanente Medical Care Program found that mentholation was associated with an increased risk of lung cancer in men but not in women among current smokers who had smoked at least 20 years (relative risk = 1.45 for men, 95% *CI* = 1.03–2.02; and 0.75 for women, 95% *CI* = 0.51–1.11). The data were adjusted for age, race, education, number of cigarettes smoked per day, and duration of smoking (Sidney, Tekawa, Friedman, Sadler, & Tashkin, 1995). Two case-control studies in the United States, however, found similar risks for lung cancer in current smokers regardless of preference for menthol cigarettes (Carpenter, Jarvik, Morgenstern, McCarthy, & London, 1999; Kabat & Hebert 1991). Stellman and colleagues (2003) recently updated the 1991 American Health Foundation study of Kabat and Hebert (1991), using more than three times as many cases. Although Stellman and colleagues used a different analytical approach, they also found similar lung cancer risks for smokers of menthol and nonmenthol cigarettes.

Another Kaiser Permanente study showed similar risks for nonlung smoking-related cancers (upper aerodigestive, pancreas, renal adenocarcinoma, other urinary tract, and uterine cervix) across menthol use categories (Friedman, Sadler, Tekawa, & Sidney, 1998). Other case-control studies have shown similar risks, among menthol and nonmenthol smokers, for esophageal cancer (Hebert & Kabat, 1989) and oropharyngeal cancer (Kabat & Hebert, 1994), although the earlier study showed a marginally significant increased risk of esophageal cancer associated with longer menthol use in women.

What is it about menthol that might alter the adverse health effects of cigarette smoking? One theory suggests that menthol smokers may get greater exposure to the toxins in tobacco smoke, because menthol masks the harshness of the smoke, thereby facilitating greater inhalation. For example, menthol

may desensitize the tongue to nicotine, which can produce a burning, painful sensation (Dessrier, O'Mahoney, & Carstens, 2001). Several studies have examined differences in puffing behavior between menthol and nonmenthol smokers. In one study of 95 women, menthol smokers had significantly larger puff volumes and higher plasma cotinine levels than nonmenthol smokers (Ahijevych & Parsley, 1999). In other studies, mentholated cigarette smoking was associated with lower individual puff volumes and cigarette smoke exposure (cumulative puff volumes) than nonmentholated cigarette smoking (Ahijevych, Gillespie, Demirci, & Jagadeesh, 1996; Jarvik, Tashkin, Caskey, McCarthy, & Rosenblatt, 1994; McCarthy et al., 1995). In those and other studies, smoking mentholated cigarettes resulted in comparable (McCarthy et al., 1995) or higher (Ahijevych et al., 1996; Clark, Gautam, & Gerson, 1996; Jarvik et al., 1994) levels of carbon monoxide (CO) exposure, as measured by expired CO or carboxyhemoglobin. The higher CO content of mainstream smoke from mentholated cigarettes may contribute to this result (Jarvik et al., 1994). Other speculative mechanisms included increase in diffusivity of the alveolar capillary membrane for CO transfer or in the affinity of hemoglobin for carbon monoxide (Jarvik et al., 1994), as well as increased breath holding (Clark et al., 1994; Henningfield et al., 2003) and increased oral absorption (Clark et al., 1995). Further research is needed to resolve apparent discrepancies in findings to date and to clarify mechanisms.

D,L-Menthol was not carcinogenic when administered in food to rats and mice (National Cancer Institute, 1979). However, two recent studies suggest that menthol may enhance the uptake and metabolism of polycyclic aromatic hydrocarbons from mainstream smoke (Melikian et al., 2002; Zhang et al., 2003). Zhang et al. found an effect only in males. These studies, however, cannot rule out racial differences in carcinogen metabolism. In contrast, one experiment indicated that menthol does not increase tobacco-specific nitrosamine-induced DNA adduct formation in rats that were administered menthol via drinking water (Richie et al., 1997). Tobacco-specific nitrosamines produced adenocarcinoma of the lung in mice, rats, and hamsters when administered orally, topically, or by injection (Hecht & Hoffman, 1988).

Cotinine is the primary metabolite of nicotine. Mentholated cigarette smoking may result in higher cotinine concentrations than smoking nonmentholated cigarettes (Ahijevych & Parsley, 1999; Clark et al., 1994), and duration of mentholated cigarette smoking is associated with a nonsignificant trend toward increased cotinine values (Wagenknecht, Haley, & Jacobs, 1992). Both CO and nicotine may be causally related to the development or triggering of cardiovascular events (U.S. Department of Health and Human Services [USDHHS], 1983).

The observation of higher cotinine values in menthol smokers has led to speculation that these smokers may have more difficulty quitting. The observation that quit ratios are higher in Whites, who smoke predominately nonmenthol brands, than in Blacks, who smoke predominately mentholated brands (USDHHS, 1998), supports the hypothesis that menthol may increase level of nicotine addiction and hinder smoking cessation. Furthermore, a national retrospective cohort study suggested that Black smokers were more likely than White smokers to try to quit in a given year but were less likely to remain abstinent (Centers for Disease Control and Prevention [CDC], 1993). However, a prospective study of 13,000 smokers over a 5-year period failed to detect a difference in cessation rates between smokers of mentholated and nonmentholated cigarettes (Hyland, Garten, Giovino, & Cummings, 2002), a finding also reported by Muscat, Richie, & Stellman (2002). Neither study, however, measured actual menthol delivery by brand, slight variations in which may influence the likelihood of quitting.

We are unaware of any studies regarding mentholation and cardiovascular disease or any other non-cancer disease endpoints, and only a few small studies have examined the cardiovascular effects of menthol or mentholated cigarettes. In a study of 22 young adult volunteers, the pre- to postsmoking heart rate increase was greater in smokers of mentholated cigarettes than in other cigarette smokers (Pritchard, Houlihan, Guy, & Robinson, 1999). In an earlier study of 29 adult volunteers, baseline heart rate was higher in those who preferred mentholated cigarettes than in those preferring nonmentholated brands; no difference in blood pressure was found (McCarthy et al., 1995). The blood pressure response to rapid smoking did not differ by the two types of cigarettes. Finally, in a study of 12 healthy adult volunteers, oral administration of menthol and of placebo capsules produced a decrease in heart rate that was less in those who received menthol than in those given the placebo (Gelal et al., 1999). No significant difference in blood pressure response was seen between the two preparations.

In summary, although physiological reasons exist that could explain why mentholation of cigarettes might increase risk for disease, available data are inconclusive. Still, the data are consistent with the notion that mentholated cigarettes are at least as dangerous as their nonmentholated counterparts and these data indicate a need for further studies, including some to determine if mentholated cigarettes increase the risk for cardiovascular disease. Ideally, future studies of cancer risk would include analyses stratified by sex, race, and tumor histology and include a sufficient number of observations to adequately assess the effects of long-term menthol exposure. Research is needed to determine whether

menthol alters the toxicity and carcinogenicity of smoke constituents, how smokers smoke the cigarettes, the acceptability of the cigarettes, and long-term and short-term health outcomes. Additionally, research is needed to understand how different brands and brand varieties differ in their menthol content and how these differences might relate to health outcomes.

Consumption and brand data

Federal Trade Commission (FTC) data indicate that menthol market share increased from 1963 (16%) to 1979 (29%) and declined slightly from 1982 (29%) to 1994 (25%); menthol share was 26% from 1998 to 2001 (FTC, 2003). The FTC requires manufacturers of domestically sold cigarettes to report tar, nicotine, and CO values using a standardized protocol. A total of 1,294 varieties of cigarettes were listed for 1998, the commission's most recent report at the time of this writing (FTC, 2000). (Varieties are determined by characteristics such as brand name, filter status, length, menthol status, package style, and FTC tar yield.) A total of 140 separate brands (e.g., Marlboro, Newport) were listed for 1998. Thus, each brand had, on average, 9.24 (range = 1–44) varieties (also known as subbrands or line extensions). Of the 129 brands available in more than one variety, 4 were exclusively mentholated (the number of varieties follows each brand name): Alpine (6), Belair (2), Kool (18), and Salem (14). Another 18 brands were available only in nonmentholated varieties: American (6), Barclay (3), Bee (2), Bucks (2), Canadian Players (8), Chesterfield (5), Gridlock (5), House Blend (2), Jumbos (2), Lark (8), Lucky Strike (4), Magna (4), Pall Mall (7), Rothmans (5), State (4), Tareyton (4), Viceroy (11), and Winston (19). Of the 1,294 total varieties, 418 (32.3%) were mentholated.

FTC reports on tar, nicotine, and CO in cigarette brands sold in the United States indicate that 11 (of 44) varieties of Marlboro cigarettes were mentholated in 1998 (FTC, 2000), more than twice the number in 1997 (5 out of 23) (FTC, 1999b). At least as far back as 1981, Marlboro had offered no more than five mentholated varieties in any one year (FTC, 1983, 1985, 1988, 1990, 1991, 1993, 1995, 1997, 1999a, 1999b). Newport, on the other hand, which previously had sold only one or two nonmenthol varieties, sold five (of a total of 21) in 1998 (FTC, 1983, 1985, 1988, 1990, 1991, 1993, 1995, 1997, 1999a, 1999b, 2000). These developments suggest that competition has occurred based on menthol status. Unfortunately, the FTC report on 1998 brands is the latest one available, and the commission's reports do not indicate how relevant brands were marketed.

Market share and survey data

As of 2001, Marlboro dominated the overall U.S. cigarette market, with 38.8% market share (Maxwell, 2002). Newport was second (7.8%), followed by Doral (5.8%), Winston (5.6%), Basic (5.0%), Camel (4.8%), GPC (3.2%), Kool (2.8%), and Salem (2.6%). In 1999, National Household Survey on Drug Abuse data indicated that three brands dominated the adolescent (ages 12–17 years) and young adult (ages 18–25 years) markets: Marlboro (54.5% of adolescent smokers and 56.6% of young adult smokers), Newport (21.6% and 15.6%, respectively), and Camel (9.8% and 11.3%, respectively) (Kopstein, 2001). Among persons aged 26 years or older, the top seven brands were preferred by two-thirds of smokers: Marlboro (35.3%), Newport (6.5%), Basic (6.1%), Doral (5.7%), Winston (5.0%), GPC (4.6%), and Camel (4.3%).

Among adolescent smokers in 1999, the figures for Marlboro and Newport, respectively, were as follows by race or ethnicity: Whites, 58.4%, 16.5%; Blacks, 8.1%, 73.9%; Hispanics, 59.7%, 18.6% (Kopstein, 2001). Thus, Marlboro and Newport were the top two brands smoked by White, Black, and Hispanic adolescent smokers. Camel was third for both White (11.2%) and Hispanic (7.1%) adolescents. Kool (5.4%) was third among Blacks.

According to the 1989 Teenage Attitudes and Practices Survey, 5.6% of White smokers and 61.3% of Black smokers used Newport, 71.4% of White smokers and 8.7% of Black smokers used Marlboro, 1.0% of White smokers and 9.7% of Black smokers used Salem, and 0.6% of White smokers and 10.9% of Black smokers used Kool (CDC, 1992).

The 1986 Adult Use of Tobacco Survey found that 76% of adult Black smokers and 23% of White smokers smoked mentholated brands (USDHHS, 1989), with Salem, Kool, and Newport most commonly used (CDC, 1990). Other studies have consistently shown Black smokers to be significantly more likely than smokers in other racial or ethnic groups to use menthol cigarettes (Carpenter et al., 1999; Cummings, Giovino, & Mendicino, 1987; Kabat & Hebert 1991; Kopstein, 2001; Sidney et al., 1995; USDHHS, 1998). In 1986, 34.0% of male and 24.9% of female adult smokers selected mentholated brands, according to the Adult Use of Tobacco Survey (USDHHS, 1989), a pattern reported elsewhere (Kabat & Hebert, 1991; Sidney et al.).

We expand upon and update this literature in the remainder of this paper.

Method

International market share data

Market share data of menthol brands in 55 countries and Hong Kong were drawn from *World Cigarettes 1*

and 2: The 2001 Survey (ERC Group, 2001). Profiles were developed for key world cigarette markets, including menthol market share in most of these nations. When necessary, data from *World Cigarette Market—The 1999 Survey* (ERC Group, 1999) were incorporated, as were data from *The World Tobacco File* (4th edition) (DMG World Media, 2001).

Survey data

The survey data for this report come from four national surveys: the National Household Survey on Drug Abuse, the Monitoring the Future surveys, and the National Youth Tobacco Survey (all U.S. surveys), as well as the International Tobacco Control Policy Evaluation Survey (conducted in the United States, Canada, the United Kingdom, and Australia).

National Household Survey on Drug Abuse. The Substance Abuse and Mental Health Services Administration (SAMHSA) sponsored the 2000 National Household Survey on Drug Abuse. Details are provided elsewhere (SAMHSA, 2001). Briefly, the survey collects information on alcohol, tobacco, and other substance use (the major focus of the survey) as well as on correlates of use from residents of households, noninstitutional group quarters, and civilians living on military bases. Since 1999, the survey has used independent, multistage area probability sampling for each state and the District of Columbia. Data in 2000 were collected via computer-assisted interviewing, primarily in the form of audio computer-assisted self-interviews. There were 71,764 respondents in 2000: 25,717 aged 12–17 years, 22,613 aged 18–25 years, and 23,434 aged 26 years or older. Current smokers (18,359 respondents) were those who had smoked during the previous 30 days. These respondents were asked, “During the past 30 days, what brand of cigarettes did you smoke most often?” and “During the past 30 days, did you smoke (name of brand) menthol or regular cigarettes most often?” Data were weighted to provide nationally representative estimates, and standard errors for 95% confidence intervals were calculated in a way that reflected the complex survey design. As with the other two surveys in this study, differences between prevalence estimates were considered significant if the 95% confidence intervals did not overlap.

To test the accuracy of responses to the menthol question, we assessed responses for smokers of brands that were available in 1998 only as mentholated varieties (i.e., Alpine, Belair, Kool, and Salem) or nonmentholated varieties (i.e., Barclay, Lark, Lucky Strike, Magna, Pall Mall, Tareyton, Viceroy, and Winston; these were the only nonmentholated brands from the 18 listed above that were used by 2000 survey

respondents). Overall, 7.9% of respondents who reported smoking brands that were available only in mentholated varieties reported smoking “regular” cigarettes. Among smokers who reported smoking brands that were available only in nonmentholated varieties, 4.2% reported smoking mentholated brands. Discrepancies were higher among adolescents (aged 12–17 years) and young adults (aged 18–25 years) than among persons aged 26 years or older. Because of these discrepancies, we do not report data on brand-specific menthol status (e.g., mentholated Marlboro, nonmentholated Newport). However, we do present data on menthol status by sociodemographic status, because the estimated effects of response bias were relatively small. For example, when we assumed that the true overall prevalence of menthol use was 28% (as in Table 2) and applied misclassification rates that were observed for the brands listed above, we found that the adjusted prevalence of menthol use was 29%. The age-specific differences in observed and adjusted prevalences also were relatively small: 32% vs. 31% for persons aged 12–17 years, 26% vs. 24% for persons aged 18–25 years, and 29% vs. 30% for persons aged 26 years or older.

Monitoring the Future surveys. Funded by grants from the National Institute on Drug Abuse, Monitoring the Future (Johnston, O’Malley, & Bachman, 2002) is conducted by the Survey Research Center in the University of Michigan’s Institute for Social Research. Annual school-based surveys of 12th-grade students have been conducted since 1975 and of 8th and 10th graders since 1991. Focusing primarily on illicit drug use, the surveys also collect information on tobacco and alcohol use as well as correlates of the use of all substances. Data are collected via self-administered questionnaire in about 420 public and private schools, using a multistage random sampling procedure. A question on cigarette brand preference (“What brand of cigarettes do you usually smoke?”) was added in 1998 and asked of persons who had smoked during the previous 30 days (current smokers). The 23 top brands by overall market share were listed along with “other” and “no usual brand.” Data reported here are from the 1998, 1999, and 2000 surveys, which in total had approximately 136,000 participants. The cigarette brand questions were asked only of cigarette smokers on selected modules for each grade, however, and the data presented here are for 16,313 students. All data were weighted to provide national estimates and calculation of 95% confidence intervals took into account the complex survey design.

National Youth Tobacco Survey. The National Youth Tobacco Survey (CDC, 2001; Farrelly,

Vilsaint, Lindsey, Thomas, & Messeri, 2001) focuses on the tobacco-related beliefs, attitudes, and behaviors of youth. It is sponsored by the American Legacy Foundation and conducted by the CDC Foundation (Atlanta, Georgia) and MACRO International, Inc., with technical support from the CDC’s Office on Smoking and Health. The 2000 survey used a three-stage cluster sample involving 324 public and private middle and high schools. Data were collected via self-administered questionnaire (35,828 participants in 2000). Current smokers (had smoked during the previous 30 days) were asked, “During the past 30 days, what brand of cigarette did you usually smoke?” and “Is the brand of cigarettes that you usually smoked during the past 30 days mentholated?” Data were weighted to adjust for nonresponse and probability of selection. The 95% confidence intervals were calculated using sample weights and controlling for the complex survey design. Because 11.2% of smokers of Kool cigarettes reported that they didn’t smoke a mentholated brand, we do not report brand-specific data on menthol status.

International Tobacco Control Policy Evaluation Survey. The International Tobacco Control Policy Evaluation Survey is a cohort survey of adult smokers (aged 18 years or older who report having smoked at least 100 cigarettes in their lifetime and who have smoked at least once in the past 30 days) in each of four countries: Canada, the United States, the United Kingdom, and Australia. Respondents participate every 6 months in the two-part telephone survey (10-minute recruitment survey, followed by a 40-minute main survey usually conducted 1 week after the recruitment survey). The cohort was constructed from probability sampling methods (random-digit dialing methods from list-assisted phone numbers) with numbers selected at random from the population of each country within strata defined by geographic region and community size. The research team obtained samples of phone numbers for three of the countries (United States, Canada, and United Kingdom) from Survey Sampling International, which uses a random-digit dialing methodology in which each exchange and working block of numbers has a probability of selection equal to its share of listed telephone households (RDD B methodology). Because no comparable source was available for number banks generated from such methods in Australia, the research team developed its own comparable probability sampling methods to generate number banks in that country. The next birthday method (Binson, Canchola, & Catania, 2000) was used to select the respondent in households with multiple smokers. Cooperation rates were high for a survey of this

kind: United States, 77.0%; Canada, 78.5%; United Kingdom, 78.7%; and Australia, 78.8%. The data reported in this article are from the baseline recruitment survey, which was conducted during October–December 2002, with sample sizes as follows: Canada ($N=2,507$), United States ($N=2,500$), United Kingdom ($N=2,728$), and Australia ($N=2,562$).

In the United States, the relevant questions were “What is the brand of cigarettes that you smoke more than any other?” and “Are they menthol, plain, or some other flavor?” In Canada, respondents were asked, “What brand of [cigarettes/roll-your-own cigarettes] do you smoke more than any other?” Respondents from the United Kingdom and Australia were asked, “What brand do you smoke most?” Researchers from Canada, the United Kingdom, and Australia identified menthol brands based on the detailed brand names provided by respondents.

Results

International market share patterns

As shown in Table 1, mentholated brands accounted for fewer than 5% of market share in half the countries with data. Relatively high shares were observed in the Philippines (60%), Cameroon (35%–40%), Hong Kong (26%), the United States (26%), and Singapore (22%). Varieties of mentholated Marlboro brands are listed for 12 countries; varieties of Salem are listed for 9. In the United States (data not shown in a table), Newport brands accounted for 29.7% of all menthol sales, with Kool (10.8%), Marlboro menthol (10.5%), and Salem (10.3%) about equally distributed (ERC Group, 2001).

Patterns of brand preference in the United States

Data from the 2000 National Household Survey on Drug Abuse indicated that Newport was by far the most popular brand among Blacks and that Marlboro was most popular among Hispanics and Whites (Table 2). Among Black smokers, more than three-fourths of adolescents (aged 12–17 years) and young adults (aged 18–25 years) used Newport; less than one-third of those aged 26 years or older did so. Kool and Salem were more common among Black smokers aged 26 years or older than among those of other ages. Among White smokers, about three of every five adolescents and young adults used Marlboro; less

than two of every five of those aged 26 years or older did so. Nearly one of every five White adolescent smokers used Newport. Among Hispanic smokers, young adults were most likely to use Marlboro. About one of three adolescents and one of every six young adults used Newport.

Data from the 2000 National Youth Tobacco Survey confirmed that Newport was by far the leading brand among Black adolescents and that Marlboro dominated among Asians, Hispanics, and Whites (Table 3). Newport was the second most popular brand among Asian, Hispanic, and White adolescents, although among Whites, Camel was statistically similar to Newport. Marlboro was the second most popular brand among Black adolescents.

Patterns of menthol cigarette use

According to National Household Survey on Drug Abuse data, Black smokers were generally more likely to report smoking mentholated cigarettes than Hispanic or White smokers, when stratified by age, age and sex, region, and educational status (Table 4). Among Whites, adolescents were more likely to report using mentholated brands than adults; the opposite pattern was observed among Black smokers.

Baseline data gathered in 2002 for the International Tobacco Control Policy Evaluation Survey indicated that, among adult smokers from the United States, Blacks (78.4%) were more likely to smoke mentholated brands, compared with Hispanics (38.8%) or Whites (19.6%) ($p < .001$). Menthol preference among Black smokers surveyed in Canada and the United Kingdom was not as strong. In Canada, 4 (9.8%) of 41 Black smokers and 72 (3.2%) of 2,236 White smokers used mentholated brands ($p < .05$). In the United Kingdom, 117 (4.6%) of 2,567 White smokers and 1 (3.0%) of 33 Black smokers used a mentholated brand (not significant).

Although reported menthol use was generally more prevalent for females than males across race and age strata, differences were significant only for persons aged 26 years or older, particularly for Whites (see Table 4). Baseline data from the International Tobacco Control Policy Evaluation Survey indicated that among adult smokers, females were more likely than males to use mentholated brands in the United States (31.8% vs. 22.1%), Canada (4.7% vs. 1.5%), the United Kingdom (3.7% vs. 2.0%), and Australia (5.4% vs. 1.8%). All differences were statistically significant.

Table 1. *footnote*

Notes. ^aIn 1998 or a more recent year, depending on data availability. Estimates are for all cigarettes, including both mentholated and nonmentholated varieties. ^bInferred from market share of leading menthol brand. (-)=marginal or negligible sales or market share; N/A=not available.

Sources. For menthol market share and menthol brand data: ERC Group, 1999, 2001 (with permission); for per capita consumption data: Mackay & Eriksen, 2002. ^cFrom ERC Group, 2001 (with permission).

Table 1. Menthol cigarette market share, leading menthol brands, and per capita cigarette consumption in 55 countries and Hong Kong.

Region or country	Menthol market share (percent)	Leading menthol brands	Per capita cigarette consumption (sticks) ^a
Africa			
Cameroon	35–40	Aspen Menthol, Delta Menthol	652
Democratic Republic of Congo	(-)	Ambassade Filter King Size Mentholée	135
Ghana	5	London Menthol, Bond Menthol	161
Ivory Coast	(-)	Fine, St. Moritz	580
Kenya	9	Sweet Menthol	200
Nigeria	13+ ^b	Sweet Menthol	189
Senegal	<5	St. Moritz, Excellence Menthol	340
South Africa	4.1		1,516
Tanzania	10+ ^b	Sweet Menthol	177
Zimbabwe	14	Everest	399
Americas			
Argentina	(-)	L&M Menthol	1,495
Canada	4	Craven 'A' Menthol	1,976
Costa Rica	19	Marlboro Light Menthol, Belmont Extra Light Menthol, Delta Menthol, Derby Menthol	690
Dominican Republic	9.4	Nacional Menthol, Marlboro Menthol, Marlboro Lights Menthol, Constanza	754
Guatemala	15	Rubios Menthol, Casino Menthol	609
Honduras	N/A	Belmont Menthol, Pinares	595
United States	26	Newport, Salem, Kool, Marlboro Menthol	2,255
Venezuela	(-)	Kool, Salem	1,079
Australia/Asia			
Australia	9–10	Alpine	1,907
China	N/A	Salem, More, Yves St. Laurent	1,791
Hong Kong	26	Marlboro Menthol, Salem	N/A
India	<1	N/A	129
Japan	6–7	Marlboro Lights Menthol, Salem Pianissimo	3,033
Korea, Republic of	5–6	N/A	2,918
Malaysia	9	Salem, A-Mild Menthol	910
New Zealand	10–14	N/A	1,213
Pakistan	(-)	N/A	564
Philippines	60	Hope, Salem	1,849
Singapore	22 ^c	Salem	1,230
Taiwan	2–3	N/A	N/A
Thailand	18+ ^b	Falling Rain 90, Wonder Menthol	1,067
Vietnam	1 ^c	Bastos Menthol	1,025
Eastern Mediterranean			
Cyprus	(-)	N/A	>2,500
Egypt	1	Marlboro Menthol, Kool, Vogue, Karelia Slims	1,275
Israel	2–3	Montana Menthol, Vogue Menthol, Cartier Vendôme Menthol, Yves St. Laurent	2,162
Lebanon	1–2	Kim, More	N/A
Tunisia	5	Mentha, 20 Mars Inter Mentholated, Royale Mentholated	1,341
Europe			
Bulgaria	1.9	Gorna Djurnaya Menthol, Vector, Salem	2,574
Czech Republic	4.9	N/A	2,306
Denmark	5+ ^b	Look Menthol, Prince Light Menthol	1,919
Estonia	15–20	Ekstra Royal Menthol, Barclay Menthol, Prince Menthol, Quattro Menthol, Marlboro Menthol, L&M Menthol	1,983
Finland	18.2	L&M Lights Menthol, Marlboro Lights Menthol, Marlboro Menthol, Barclay Menthol, Belmont 2002 Menthol, Pall Mall Lights Menthol	1,351
France	<3 ^c	N/A	2,058
Germany	1.3	Marlboro Menthol	1,702
Hungary	1	N/A	3,265
Italy	<1	Pack	1,901
Latvia	<2	Barclay, Prince, Quattro	N/A
Lithuania	5–10	Marlboro Menthol, Barclay Menthol, Elita, Quattro, Prince	N/A
Norway	3.1	N/A	725
Poland	11.7	Marlboro Menthol Light, Cristal Lights Menthol, Cristal Menthol Super Lights, Caro Lights Menthol	2,061
Romania	15.4	N/A	1,676
Slovakia	(-)	Petra, Trussardi	2,282
Sweden	12	Blend Menthol, Blend Ultra Menthol, Right Menthol	1,202
Switzerland	1.8	N/A	2,720
Turkey	(-)	Marlboro Menthol	2,394
United Kingdom	3.9	Berkeley Superkings Menthol, John Player Superkings Menthol, Lambert & Butler Menthol, Consulate Menthol, Mayfair Menthol, Dickens & Grant Superkings Menthol	1,748

Table 2. Cigarette brands used most often among current smokers by race or ethnicity and age: National Household Survey on Drug Abuse—United States, 2000.

Race or ethnicity and cigarette brand	Age group (years)							
	Total		12–17		18–25		26 or Older	
	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>
Black								
Newport	40.9	(36.6–45.4)	79.2	(72.2–84.7)	76.7	(72.3–80.5)	31.5	(26.7–36.7)
Kool	12.1	(8.9–16.1)	2.1	(0.8–5.1)	4.6	(2.7–7.5)	14.1	(10.2–19.2)
Marlboro	6.7	(4.7–9.5)	5.3	(2.9–9.7)	7.3	(5.1–10.4)	6.6	(4.2–10.1)
Salem	5.8	(4.2–7.9)	1.6	(0.5–5.1)	1.6	(0.8–3.2)	6.9	(4.9–9.5)
Basic	4.8	(2.8–8.4)	1.9	(0.5–6.5)	1.9	(0.9–3.8)	5.6	(3.1–10.0)
Benson & Hedges	4.5	(2.5–7.9)	0.7	(0.2–3.2)	0.6	(0.2–1.6)	5.5	(3.0–9.8)
Virginia Slims	3.9	(1.9–7.7)	–	–	0.4	(0.1–1.4)	4.8	(2.3–9.6)
Doral	3.6	(2.1–6.2)	–	–	0.5	(0.2–1.3)	4.4	(2.5–7.6)
Winston	3	(1.6–5.4)	–	–	–	–	3.7	(2.0–6.7)
GPC	2.6	(1.5–4.6)	–	–	0.5	(0.2–1.6)	3.2	(1.8–5.7)
Camel	1.5	(0.7–3.4)	2.9	(1.1–7.7)	1.9	(0.9–3.8)	1.4	(0.5–4.1)
Unknown	1.3	(0.7–2.4)	3.1	(1.2–7.8)	2.3	(1.1–4.8)	1	(0.4–2.4)
Hispanic								
Marlboro	57.1	(52.4–61.7)	52.5	(45.3–59.6)	67.7	(63.8–71.4)	54	(47.5–60.4)
Newport	11.0	(8.9–13.5)	31.4	(24.9–38.7)	16.7	(13.6–20.3)	7.1	(4.8–10.3)
Camel	4	(2.3–7.0)	5.3	(3.1–8.8)	4.7	(3.2–6.9)	3.7	(1.6–8.3)
GPC	3.7	(2.3–5.9)	0.7	(0.3–1.4)	1	(0.6–1.8)	4.9	(3.0–8.0)
Basic	2.9	(1.9–5.6)	0.3	(0.1–1.3)	1.5	(0.8–2.7)	3.7	(1.7–7.7)
Winston	2.9	(1.7–5.0)	0.7	(0.2–3.1)	0.3	(0.1–1.0)	4	(2.3–6.9)
Benson & Hedges	2.8	(1.6–4.9)	1	(0.4–2.7)	1.8	(0.9–3.3)	3.4	(1.7–6.4)
Kool	2.8	(1.3–5.9)	0.3	(0.1–1.2)	0.9	(0.3–2.3)	3.6	(1.6–8.2)
Salem	2.5	(1.1–5.5)	–	–	0.2	(0.0–0.7)	3.4	(1.5–7.7)
Doral	2.2	(1.1–4.4)	0.2	(0.0–1.7)	0.5	(0.1–1.5)	3	(1.4–6.2)
Virginia Slims	1.4	(0.7–2.9)	0.3	(0.1–1.4)	0.6	(0.2–1.6)	1.8	(0.8–4.0)
Unknown	1	(0.5–2.2)	3.4	(1.9–6.1)	0.7	(0.3–2.0)	0.9	(0.3–2.9)
White								
Marlboro	43.8	(42.4–45.3)	58.8	(56.4–61.2)	61.4	(59.8–63.0)	37.9	(35.9–39.8)
Camel	7.1	(6.5–7.8)	11.6	(10.1–13.2)	14.3	(13.2–15.6)	4.8	(4.1–5.6)
Basic	5.3	(4.7–6.1)	1.8	(1.3–2.5)	2.1	(1.7–2.5)	6.5	(5.6–7.5)
Doral	5.3	(4.4–6.2)	0.7	(0.4–1.3)	0.8	(0.6–1.1)	6.8	(5.7–8.1)
Newport	5.0	(4.5–5.6)	18	(16.2–20.0)	9.3	(8.4–10.3)	2.9	(2.3–3.6)
Winston	4.8	(4.1–5.7)	1	(0.7–1.6)	1.8	(1.4–2.3)	5.9	(4.9–7.1)
Virginia Slims	2.9	(2.4–3.6)	0.4	(0.2–0.7)	0.4	(0.3–0.6)	3.8	(3.1–4.7)
GPC	2.8	(2.4–3.4)	0.4	(0.2–0.8)	0.6	(0.5–0.9)	3.6	(3.0–4.4)
Salem	2.3	(1.9–2.9)	0.3	(0.1–0.7)	0.4	(0.3–0.6)	3	(2.4–3.7)
Merit	1.6	(1.2–2.1)	0.3	(0.1–0.6)	0.1	(0.1–0.3)	2.1	(1.6–2.8)
Kool	1.6	(1.2–2.0)	0.7	(0.4–1.1)	0.8	(0.6–1.2)	1.8	(1.4–2.4)
Unknown	1	(0.7–1.4)	1.9	(1.4–2.6)	0.5	(0.4–0.8)	1	(0.7–1.5)

Notes. Current smokers had smoked during the previous 30 days. Because of low precision, estimates for American Indians and Alaska Natives and for Asians, Native Hawaiians, and Other Pacific Islanders are not presented. Differences between column totals and 100% represent the percentage of smokers who smoked some brand other than one listed. Dashes indicate low precision, no estimate reported.

Source. Substance Abuse and Mental Health Services Administration, Rockville, MD.

Table 3. Cigarette brands use most often among current smokers by race or ethnicity: National Youth Tobacco Survey, middle and high school students, combined—United States, 2000.

Usual brand	Black		Asian ^a		Hispanic		White	
	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>
Marlboro	10.4	7.4–14.4)	52.1	(44.1–59.9)	51.5	(46.2–56.8)	58.5	(55.2–61.7)
Newport	68.5	(62.1–74.2)	28.3	(21.2–36.7)	21.3	(15.8–28.1)	13.7	(11.1–16.7)
Camel	2.5	(1.5–4.1)	5.4	(2.7–10.8)	5.5	(3.9–7.8)	11.7	(9.4–14.3)
No usual brand	5.5	(3.8–8.0)	4.2	(2.0–8.6)	9.6	(7.5–12.2)	7.6	(6.8–8.5)
Some other brand	6.7	(5.0–8.9)	5.4	(2.7–10.5)	7.2	(5.2–9.9)	4.9	(3.9–6.2)
Kool	2.6	(1.6–4.0)	3.1	(.9–10.2)	1.2	(.6–2.4)	0.9	(.6–1.4)
Major discount brand ^b	2.1	(1.0–4.0)	0.6	(.2–2.2)	1.1	(.6–2.2)	1.5	(1.0–2.3)
Virginia Slims	1.4	(.6–3.0)	0.4	(.1–1.7)	1.8	(1.0–3.5)	0.8	(.6–1.1)
Lucky Strike	0.5	(.2–1.7)	0.5	(.0–3.7)	0.7	(.3–1.7)	0.4	(.3–.7)

Notes. Current smokers are those who smoked during the previous 30 days. Because of low precision, estimates for American Indians and Alaska Natives are not presented. ^aAsian, Native Hawaiian and Other Pacific Islanders. ^bGPC, Basic, or Doral.

Source. American Legacy Foundation, Washington, DC.

Table 4. Percentages of current smokers who most often smoked menthol cigarettes by age, age and sex, region, education, and race or ethnicity: National Household Survey on Drug Abuse, ages 12 years or older—United States, 2000.

Demographic characteristic	Black		Hispanic		White		Overall ^a	
	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>
Age (years) and sex								
12–17	55.7	(48.1–63.1)	35.7	(29.1–42.8)	28.4	(26.3–30.7)	31.6	(29.6–33.7)
Male	59.7	(49.7–68.9)	32.9	(23.8–43.5)	26.5	(23.4–29.9)	30.3	(27.4–33.4)
Female	49.5	(38.5–60.6)	38.9	(30.2–48.4)	30.2	(27.3–33.2)	32.9	(30.3–35.7)
18–25	68.6	(64.1–72.7)	25.9	(22.1–30.1)	20.1	(18.8–21.5)	25.8	(24.5–27.1)
Male	70.7	(65.1–75.8)	22.8	(18.5–27.9)	18.4	(16.8–20.2)	24.9	(23.2–26.6)
Female	65.7	(58.9–71.8)	31.6	(25.2–38.7)	21.9	(20.1–23.8)	26.8	(25.1–28.6)
26+	69.5	(64.3–74.3)	29.7	(24.1–35.9)	22.5	(20.8–24.3)	28.6	(27.0–30.2)
Male	65.8	(58.4–72.6)	25.3	(18.9–33.1)	17.7	(15.6–20.0)	24	(21.8–26.4)
Female	73.3	(65.6–79.8)	36.3	(26.8–47.1)	27.4	(24.9–30.1)	33.4	(31.0–35.9)
Region								
Northeast	64.0	(54.4–72.6)	50.5	(39.5–61.4)	28.1	(25.3–31.1)	33.4	(30.6–36.3)
South	74.4	(65.7–81.5)	33.8	(25.5–43.2)	22.9	(20.8–25.1)	28.6	(26.6–30.6)
North Central	67.0	(61.0–72.5)	29.5	(22.3–37.9)	22.3	(20.0–24.8)	29.2	(27.1–31.4)
West	73.9	(57.9–85.3)	19.1	(13.6–26.3)	15.6	(12.6–19.0)	21.2	(18.3–24.5)
Education^b								
< High school	64.2	(52.2–74.6)	29.5	(21.6–38.9)	18.8	(15.0–23.2)	26.7	(23.3–30.4)
High school	69.8	(62.2–76.4)	22.4	(14.6–32.8)	22.4	(20.0–25.1)	28.0	(25.7–30.5)
Some college	74.4	(63.9–82.7)	39.6	(26.7–54.0)	25.9	(22.4–29.7)	33.6	(30.0–37.4)
College graduate	69.3	(53.2–81.8)	30.0	(13.4–54.2)	21.7	(18.1–25.8)	24.2	(20.4–28.5)
Total	68.9	(64.6–72.9)	29.2	(25.0–33.7)	22.4	(21.1–23.7)	28.2	(27.0–29.4)

Notes. Current smokers had smoked during the previous 30 days. Because of low precision, estimates for American Indians and Alaska Natives and for Asians, Native Hawaiians, and Other Pacific Islanders are not presented. Estimates are based on respondents answers to the question of whether their usual brand was menthol or regular. See text for discussion of misclassification bias on this item. ^aIncludes American Indians and Alaska Natives; Asians, Native Hawaiians, and Other Pacific Islanders; other; multiple; and unknown races. ^bFor those aged > 25 years.

Source. Substance Abuse and Mental Health Services Administration, Rockville, MD.

Among White U.S. smokers, those residing in the Northeast were more likely to report smoking mentholated brands than were those in any other region (see Table 4). Overall, reports of menthol smoking were least common among smokers residing in the West, and smokers with some college were more likely to report smoking mentholated brands than were smokers who had graduated from college.

Although low precision did not permit presentation of estimates for Asians, Native Hawaiians, and Other Pacific Islanders and for American Indians or Alaska

Natives for all categories in Table 4, we report estimates overall and by age. Among Asian, Native Hawaiian, and Other Pacific Islander smokers, 31.1% (95% *CI* = 19.3%–46.1%) of those aged 12 years or older, including 48.7% (95% *CI* = 31.2%–66.5%) of 12–17 year olds, 37.7% (95% *CI* = 29.1%–47.0%) of 18–25 year olds, and 28.5% (95% *CI* = 14.5%–48.3%) of those aged 26 years or older reported using mentholated brands. Among American Indian or Alaska Native smokers, 14.3% (95% *CI* = 8.6%–22.9%) of those aged 12 years or older, including

Table 5. Percentages of current smokers who smoked Newport, Kool, or Salem, by grade and race or ethnicity: Monitoring the Future surveys, grades 8, 10, and 12—United States, 1998–2000.

Race or ethnicity and grade	1998		1999		2000	
	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>	Percent	95% <i>CI</i>
Black						
8th	72.5	(63.4–81.6)	79.4	(71.0–87.8)	74.5	(64.0–85.0)
10th	76.4	(68.0–84.8)	80.1	(70.4–89.8)	82.1	(71.5–92.7)
12th	83.9	(74.5–93.3)	77.8	(66.6–89.0)	70.4	(57.8–83.0)
Hispanic						
8th	22.4	(14.8–30.0)	24.5	(16.6–32.4)	24.5	(13.5–35.5)
10th	20.1	(12.6–27.6)	17.9	(10.3–25.5)	31.6	(21.2–42.0)
12th	24.6	(14.6–34.6)	19.3	(9.4–29.2)	23.9	(12.5–35.3)
White						
8th	15.6	(12.3–18.9)	20.1	(16.1–24.1)	18.0	(13.9–22.1)
10th	13.7	(11.2–16.2)	15.4	(12.5–18.3)	13.1	(10.3–15.9)
12th	8.1	(6.0–10.2)	9.9	(7.5–12.3)	9.3	(6.7–11.9)

Notes. Current smokers had smoked during the previous 30 days. Because of low precision, estimates for Native Americans and for Asians and Pacific Islanders are not presented.

Source. Institute for Social Research, University of Michigan, Ann Arbor.

32.4% (95% *CI*=17.2%–52.4%) of 12–17 year olds, 16.7% (95% *CI*=8.0%–31.7%) of 18–25 year olds, and 11.5% (95% *CI*=5.3%–22.9%) of those aged 26 years or older reported using mentholated brands.

Although Monitoring the Future questions do not assess menthol use in particular, we decided to examine it by using the three leading brands of primarily mentholated varieties (i.e., Newport, Kool, and Salem). Monitoring the Future data confirmed that Black adolescent smokers were more likely to smoke one of these three brands than were White or Hispanic smokers (Table 5). The survey data allowed comparison of Newport, Kool, and Salem use among grade cohorts over a 3-year period. For example, among Whites in 1998, 15.6% of 8th-grade smokers smoked one of these brands; in 2000, 13.1% of 10th-grade smokers did so. Similarly, in 1998, 13.7% of 10th-grade smokers chose one of these brands; in 2000, 9.3% of 12th-grade smokers did so. These point estimates were not significantly different and must be interpreted carefully, given that some 8th grade students will drop out of school before they reach 12th grade.

Daily cigarette consumption

Because of the high preference for mentholated brands among Blacks and because White smokers smoke more cigarettes each day than do Blacks (USDHHS, 1998), differences in daily cigarette consumption were investigated separately for each racial group. In 2002, as indicated by data from the U.S. component of the International Tobacco Control Policy Evaluation Survey, White smokers of mentholated brands smoked slightly fewer cigarettes each day than did White smokers of nonmentholated brands (18.1 vs. 19.8; $p < .01$). Among Black smokers, the difference was not significant (12.1 cigarettes per day for menthol smokers vs. 13.2 cigarettes per day for smokers of nonmentholated brands).

Menthol cigarette preference and use of blunts and Ecstasy

Further analysis of the 2000 National Household Survey on Drug Abuse indicated a relationship between menthol use and the use of blunts (cigars with some of the tobacco replaced by marijuana) for adolescent Black and White smokers. Specifically, among Whites, 34.2% (95% *CI*=30.9%–37.7%) who had ever used blunts reported smoking mentholated cigarettes, vs. 23.8% (95% *CI*=21.5%–26.4%) of those who had never used blunts. Among Black adolescent smokers, reports of menthol cigarette use were more common among those who had ever used blunts (66.3%; 95% *CI*=57.0%–74.5%) than among those who had never used them (41.1%; 95% *CI*=29.2%–54.1%).

Finally, to check a potential relationship between menthol cigarette preference and the use of Ecstasy (the “club drug” methylenedioxymethamphetamine [MDMA]), Monitoring the Future data were analyzed for 12th-grade cigarette smokers in 2000 and 2001. Of 1,001 smokers, 14.9% of those who smoked mostly mentholated brands (i.e., Newport, Kool, or Salem) and 20.8% of those who smoked other brands had used Ecstasy during the previous year. The difference was not significant.

Discussion

Blacks

For the past three decades, menthol cigarettes have accounted for about one-fourth (ranging from 23% to 29%) of cigarette sales in the United States (FTC, 2003). The ongoing predominance of menthol cigarette use among Blacks suggests that interventions to reduce smoking in this group should address the reasons for menthol use and attempt to counter any misperceptions about menthol cigarettes. Evidence indicates that smokers of mentholated cigarettes, including Blacks, perceive them to be less hazardous than nonmenthol cigarettes. In Project Y, conducted in 1977 for the R. J. Reynolds Tobacco Company, menthol smokers were classified as more “concerned”¹ than smokers of nonmentholated varieties (R. J. Reynolds, 1977). According to a 1968 report for Philip Morris on focus group work done to assess the attitudes of Black smokers about mentholated cigarettes,

There are indications that menthols tend to be considered generally “better for one’s health.” That impression refers not only to the health of the respiratory tract, but the whole organism. The majority view is that menthols are “less strong” than regular cigarettes, and that a cigarette which is “less strong” is better for a person’s health. (Tibor Koeves, 1968)

This report also noted that individual sampling of menthol cigarettes often occurred because of a cold or sore throat (Tibor Koeves, 1968), a finding consistent with a 1973 report that menthol use was more common during the winter months (R. J. Reynolds, 1973). It also is consistent with earlier marketing of Kool cigarettes (Stratton et al., 2001). The back of a 1946 pack of Kool cigarettes, for example, read, “Head stuffed up? Got the sneezes? Switch to Kools... The flavor pleases!” (Brown & Williamson, 1946).

¹According to industry documents, “concerned” smokers are concerned about the effects of smoking on their health. Smokers of low-tar cigarettes are often referred to in industry documents as “concerned smokers” (Pollay, 2000).

An R. J. Reynolds document on the Black consumer market reported that Blacks were more likely than Whites to believe that menthol cigarettes were “better if you smoke a lot,” “lower in tar and nicotine,” “less likely to make you cough,” “better when you have a cold,” and “less irritating to the throat” (R. J. Reynolds, 1979). In a more recent survey of 213 smokers of menthol cigarettes attending a smoking cessation clinic, 83% of 174 Blacks and 74% of 39 Whites reported that they smoked menthol cigarettes because they preferred the taste (Hymowitz et al., 1995). Additional reasons were that they were soothing to the throat (51% of Whites, 52% of Blacks), easier to inhale (21% of Whites, 48% of Blacks), and could be inhaled more deeply (10% of Whites, 33% of Blacks). Only 2 (5%) Whites and 13 (7%) Blacks reported they smoked menthol cigarettes because they were “better for you than regular non-menthol cigarettes.” Not surprisingly, few respondents openly asserted that menthol cigarettes provide any health advantage over nonmenthol varieties. As Kozlowski (2000) pointed out, however, concepts like “smooth” and “mild” also serve as indicators of the perception of a less hazardous cigarette. Thus, reports that mentholated varieties were more soothing and easier to inhale could indicate a perception of a lower health risk.

Further research is needed to determine exactly how current smokers of mentholated brands cognitively process the soothing sensations provided by menthol cigarettes and how these sensations relate to perceived taste. More research also is needed to understand how consumers perceive the health risks of mentholated cigarettes and marketing terminology (e.g., cool, refreshing, mild, and smooth) used to promote these brands. We also suggest research on different approaches to measuring perceived risk. For example, cognitive work should be done comparing various ways to assess relative health effects (e.g., “they are better for you” vs. “they are not as bad for you”). Such research could inform media messages to counter misperceptions about smoking mentholated cigarettes and perhaps guide future regulatory efforts. In the interim, messages that portray the suffering caused by cigarette smoking may counter the “Alive With Pleasure” Newport theme. Informing consumers that menthol cigarettes are just as dangerous as other varieties, even though they taste better and are easier to smoke, could motivate quitting (Kozlowski & Pillitteri, 2001; Shiffman, Burton, et al., 2001; Shiffman, Pillitteri, Burton, Rohay, & Gitchell, 2001).

Patterns among youth

Industry documents indicate that the brand that dominates the youth market eventually makes significant inroads into overall market share as adolescents age and become adults (Cummings, Morley,

Horan, Steger, & Leavell, 2002; U.S. Food and Drug Administration, 1996; Wayne & Connolly, 2002). In the menthol market, Kool displaced Salem as the dominant brand in the 1960s and early 1970s, in part by capturing the youth market. Newport did the same to Kool in the mid- to late 1970s (R. J. Reynolds, 1985). A 1984 industry document made clear the concern that Philip Morris had about the threat posed to Marlboro by Newport (Johnston, 1984) and recommended competing with that cigarette by strengthening Marlboro’s presence in the menthol arena. In recent years, Marlboro has increased its mentholated varieties (FTC, 1999b, 2000), and in 2000 it introduced Marlboro Milds to further compete for the menthol market (Teinowitz, 2000). However, 1989–2000 trend data on adolescent brand preference from national surveys indicate that Marlboro has lost share among Whites and remained constant among Blacks, whereas Newport has gained substantially among Whites and maintained its substantial share among Blacks (CDC, 1992, 1994; Kopstein, 2001; see Table 4).

Other sociodemographic comparisons

We found that menthol cigarettes are used among adult women more commonly than among men in the United States; the same pattern was found in Canada, Australia, and the United Kingdom, countries with substantially smaller menthol market shares. This finding has been observed in the United States since the mid-1980s (Kabat & Hebert 1991; Sidney et al., 1995; USDHHS, 1989). By improving taste and facilitating inhalation, mentholated cigarettes may have promoted initiation among girls, a mechanism similar to one postulated for low-tar cigarettes (Silverstein, Feld, & Kozlowski, 1980).

Our finding that, among Whites, menthol use was more common in the northeastern United States reflects a pattern previously seen for Newport in the Teenage Attitudes and Practices Survey data (CDC, 1994). In that study, Newport was least popular in the West. A 1984 industry document described the West as a low menthol area and recounted the rapid growth of menthol smoking (particularly of Newport) among young people in New York, New Jersey, and southern New England (Johnston, 1984). Tobacco industry marketing practices may account for these differences.

Daily cigarette consumption

The finding that White smokers of mentholated cigarettes smoke slightly fewer cigarettes each day seems consistent with the notion that smoke constituents are more readily absorbed from mentholated brands, an interpretation suggested by the work of

several authors (Ahijevych et al., 1996; Ahijevych & Parsley, 1999; Clark et al., 1996; Jarvik et al., 1994). Further work is needed to determine if the patterns we found are observed consistently.

Menthol preference and use of blunts and Ecstasy

Using data from the National Household Survey on Drug Abuse, we found that adolescent smokers who reported using a mentholated brand were more likely to smoke blunts, compared with adolescents who reported using a regular brand. One 1974 industry document indicated that Black smokers of Kool cigarettes reported that Kools tasted like a “joint” and that Kools were the best cigarette to “keep a high going” (R. J. Reynolds, 1974). A similar focus group conducted in 2003 would have to assess the relationship, if any, between Newport smoking and blunt use.

We inquired about a possible association of menthol cigarettes and the use of Ecstasy because of the observation that mentholated products such as Vicks VapoRub are frequently used at raves (huge, all-night dance parties, characterized by fast, high-energy dance music and at which Ecstasy use is common) (“Raves, Ecstasy, and menthol,” n.d.). Menthol smoking was not, however, associated with Ecstasy use in the 2001 and 2002 Monitoring the Future data. The relationship between menthol cigarette use and use of Ecstasy should be assessed in the National Household Survey on Drug Abuse data.

International market share data

Internationally, menthol cigarettes account for a minimal amount of sales in about half of countries with data. Still, some patterns are intriguing and potentially illustrative. Why, for example, do the majority of smokers in the Philippines smoke mentholated brands? Smoking prevalence is high among Filipino adults: 75% among males and 18% among females (CDC, 2003). The experimental growth of a plant from which menthol used in cigarettes is extracted has been cited as one factor contributing to the “remarkable recovery” in 1981 of the Philippine cigarette industry (Palacpac, 1982). We do not know, however, whether this development contributed to the substantial menthol market share in the Philippines.

Also, menthol market share in all the African countries was substantially less than we observed among Blacks in the United States, as was menthol preference among Black smokers surveyed in Canada and the United Kingdom, suggesting that social or marketing influences play an important role. We speculate that the various cigarette companies might make and market different products in different

countries. Taste preferences may vary, perhaps due to genetic reasons or sociocultural conditioning. International cigarette menthol share may be related to nation-specific preferences for mentholated candies. Also, menthol use may vary with tar level: As manufacturers lower the average tar yields of their products (FTC, 2000), they may perceive a need to compensate for low flavor by adding extra menthol. These hypotheses should be investigated.

Misclassification bias

This study is limited by misclassification of self-reported menthol status. We estimated the extent of misclassification in the National Household Survey on Drug Abuse based on the findings with purely mentholated and purely nonmentholated brands and determined that the effects were relatively small for the overall population. However, we are not at all certain that the findings for the overall population apply to various subgroups. An extreme example appears to exist for Black adolescent smokers, 55.7% of whom reported smoking mentholated brands in 2000 (see Table 4). But 79.2% used Newport, and another 3.7% used Kool or Salem (see Table 2). Kool and Salem are exclusively mentholated. A. C. Nielsen data on sales of Newport in stores with scanners that detect the Universal Product Code (UPC) indicate that more than 99% of packs of Newport sold in 2000 were mentholated (John Tauras, personal communication).

Smokers in the National Household Survey on Drug Abuse were asked if they smoked “menthol or regular” cigarettes. Some smokers of menthol cigarettes may have confused *regular* with *full flavor* or some other factor and indicated that they smoked regular cigarettes. More than 11% of all survey respondents who smoked Newport reported that they smoked regular varieties of the brand (data not shown). Similarly, some middle and high school students may have misunderstood the word *mentholated*, which was used in the 2000 National Youth Tobacco Survey question on menthol status. Alternative approaches to collecting this information include incorporation of the UPC classification system, which provides information at the subbrand level, as well as simply changing the question to ask if the brand smoked most often is a menthol or nonmenthol (i.e., plain) variety. The results of this work would likely inform future epidemiological studies on the health effects of mentholated products.

Conclusion

Adding menthol to cigarettes appears to “sweeten the poison.” We question whether it makes sense to permit tobacco manufacturers to continue to add

menthol flavoring to an admittedly toxic product to make it more palatable. Public health researchers and practitioners would have a far greater understanding of the many components of the risks posed by mentholated cigarettes if a comprehensive surveillance system, as recommended by the Institute of Medicine (Stratton et al., 2001) and elsewhere (Giovino, 2000, 2002) were established. An optimal system would assess far more than simple prevalence of use. It also would assess whether products have changed over time in ways that make them more appealing, addictive, or toxic. It also would facilitate our understanding of how various marketing strategies (e.g., “Alive With Pleasure”) might influence health beliefs and motivation to quit. We lack information on the reach and styles of marketing strategies used to promote various menthol and nonmenthol cigarettes. Such information would provide important contextual information for program planners and policy makers.

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