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Differences by Race/Ethnicity in Smoking Behavior and Smoking Cessation of the Medicare Population

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ABSTRACT

The patterns of smoking, being counseled to quit, success in quitting, and associated health problems for the total U.S. population vary across various demographic groups. Other than blacks and Hispanics, however, little is known about how racial/ethnic groups compare with the white majority.

This study uses data from the Medicare managed care Consumer Assessment of Health Plans Study (CAHPS™) survey to examine disparities in smoking behavior, being counseled to quit, and success in quitting and how these measures are related to health conditions for smaller racial/ethnic groups such as Asians, American Indians/Alaska Natives, and Native Hawaiians/other Pacific Islanders.

Males are more likely to be current smokers than females are, and there are clear differences across racial/ethnic groups. Smoking is found to be associated with worse health and the presence of a serious health condition is found to be associated with the likelihood of quitting. Advice to quit smoking is found to differ by race/ethnicity only under certain specifications, such as for persons with serious health conditions.

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I. BACKGROUND AND PURPOSE

Background

The Surgeon General in 1964 first warned that cigarette smoking poses a health risk. Required labeling on cigarette packages warning of health hazards soon followed. Cigarette advertising has been banned from the airwaves for three decades.

In spite of all this, around one-quarter of Americans currently smoke. Smoking rates are about four percentage points higher for men than for women. By age, smoking is highest for persons 18 to 44 years old, drops slightly for persons 45 to 64 years, and then falls dramatically for persons 65 years and over. As people age, the likelihood that they have ever smoked rises—the percentage of persons that ever smoked is about 75% for persons 35 years old and over. Conversely, the percentage of persons who never smoked falls with age. The percentage of persons that quit smoking also rises with age—to about 50% for persons 35 years old and over.[1]

The patterns of smoking, being counseled to quit, success in quitting, and associated health problems for the total U.S. population vary across various demographic groups. Many racial/ethnic studies compare the smoking behavior of non-white groups to that of whites. For example, elderly blacks are more likely to smoke than elderly whites.[2] Current smoking prevalence among Hispanic adults is less than that of non-Hispanic white adults.[3] American Indian/Alaska Native adults have a higher prevalence of smoking compared with white adults.[4]

The Surgeon General has documented that cigarette smoking is a major cause of disease and death. Differences in the magnitude of disease risk are directly related to differences in patterns of smoking. Smoking is responsible for 87% of lung cancers. Lung cancer is the leading cause of cancer death for each of the racial/ethnic groups considered in this study. Forms of cancer other than lung cancer are also related to tobacco use. Cigarette smoking increases the risk of delivery of a low-birth-weight infant.[5]

Lung cancer incidence and death rates vary widely among the nation's racial/ethnic groups, with blacks currently bearing the greatest health burden. Black men are at least 50% more likely to develop lung cancer and have a higher mortality rate of cancer of the lung and bronchus compared with white men.[6]

The manufacture and distribution of cigarettes and other tobacco products is a $30 billion a year industry. Advertising of cigarettes is in excess of $300 million annually. Treating smoking-related illnesses and other costs associated with smoking are substantial. According to one source, the U.S. spends about $60 billion each year treating smoking-related illnesses; fires caused by smokers cost another $500 million; and smokers with group life insurance raise the premiums of the nonsmokers in their insurance pool by about $4 billion per year.[7] Clearly, more economic resources could be devoted to other endeavors if smoking were reduced. There are health benefits from quitting smoking as well. These health benefits include: (1) people who quit live longer than those who continue to smoke (over 400,000 Americans die each year of tobacco-related diseases); (2) quitting substantially decreases the risk of lung, laryngeal, esophageal, oral,

pancreatic, bladder, and cervical cancers; and (3) cessation reduces the risk for other major diseases, including coronary heart disease and cardiovascular disease.[8]

Use of cigarettes and advice to quit are not spread equally across demographic groups. Barriers to ethnic group participation include limited cultural competence of health care providers and a lack of transportation, money, and access to health care. For example, black adult smokers are less likely to be encouraged to quit by their physicians than white adult smokers are.[9] Black adult smokers are less successful in quitting than white adults.[10] Hispanic adults smoke less than non-Hispanic white adults do.[11] Hispanic adult smokers are less likely to be encouraged to quit by their physician than White adult smokers.[12] Members of other minority racial/ethnic groups are less likely than the general population to participate in smoking cessation programs and to receive cessation advice from health care providers. This evidence is thin, however, from some of the smaller racial/ethnic groups, which is one of the motivations for this paper.

Managed care organizations (MCOs) are intended to provide preventive and managed health care. Therefore, whether and how often smoking cessation advice is given is an important issue. Furthermore, it is of interest to know if MCO doctors provide preventive health advice consistently and how it differs by racial/ethnic group.

Purpose

The purposes of this paper are several. (1) To examine the prevalence of smoking and former smoking in the Medicare managed care population to determine whether there are differences by race/ethnicity, and by gender within race/ethnicity. (2) To assess the extent to which doctors counsel Medicare beneficiaries to quit smoking and whether there are racial/ethnic disparities in counseling. (3) To examine differences by race, ethnicity, and gender in success in quitting. (4) To examine how smoking, being counseled to quit, and success in quitting are related to several serious health conditions in the Medicare managed care population.

The primary data source for this study is a survey of Medicare managed care enrollees. The Centers for Medicare & Medicaid Services are giving increased attention to the measurement of Medicare managed care health plan performance. The Medicare Managed Care (MMC) Consumer Assessment of Health Plans Study (CAHPS™) surveys were created to obtain information from enrollees in Medicare managed care plans. The surveys include questions concerning respondents' assessment of their plans and providers, their overall health status, health conditions, and health system utilization in the last six months. Also included are questions on current and former smoking behavior and whether the respondent had been counseled to quit smoking.

Survey respondents were allowed to choose from five race and two ethnicity categories, which allows for the study of several racial/ethnic subgroups. The subgroups examined in this study are: non-Hispanic whites, non-Hispanic blacks, non-Hispanic Asians, non-Hispanic American Indians or Alaska Natives, non-Hispanic Native Hawaiians or other Pacific Islanders, and Hispanics/Latinos.[13] (For brevity of exposition, "non-Hispanic" is henceforth omitted.)

Some of these subgroups, such as Native Hawaiians/Pacific Islanders, are of such small relative size that random sample surveys might fail to capture enough respondents to allow detailed quantitative analysis. This study uses MMC CAHPS™ data for 1998 and 1999. Because the survey questions are identical across surveys, combining two years of data is feasible as well as desirable in order to increase sample size for the subgroups. A few individuals were surveyed in more than one year; in such cases only records for the latest year were kept. The analysis files are large enough so that MMC CAHPS™ survey results for a racial/ethnic/gender group can be generalized to the MMC enrollee population for that group.

The remainder of the paper is organized as follows. The next section presents statistics on past and current smoking behavior by race and ethnicity in the MMC CAHPS™ population. Section III discusses the relation between smoking behavior and the presence of five health conditions. Section IV presents descriptive and analytical statistics on the relation between smoking cessation counseling and the propensity to quit smoking. The final section discusses and policy implications.

II. DIFFERENCES IN SMOKING BEHAVIOR BY RACE, ETHNICITY, AND GENDER

Table 1 shows rates of current smoking, former smoking, and never having smoked by several racial/ethnic groups in the Medicare managed care population. Smoking is defined in the CAHPS™ surveys as having ever smoked at least 100 cigarettes in one's entire life. A *current* smoker is a person who smokes every day or some days. A *former smoker* is a person who has been a smoker but does not smoke at all now. A *nonsmoker* has never been a smoker at any time.

Table 1. Distribution of Smoking Behavior by Race, Ethnicity and Gender Among Medicare Managed Care Enrollees (percent)

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	11.9	10.4 [b]	20.5 [a]	11.3 [a b]	6.9 [a]	3.8 [a b]
Former smoker	59.8	34.0 [b]	47.3 [a]	29.0 [a b]	46.2 [a]	16.9 [a b]
Nonsmoker	28.3	55.7 [b]	32.3 [a]	59.7 [a b]	46.8 [a]	79.3 [a b]
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	9.3	8.2	21.6 [a]	16.1 [a]	12.7	6.6 [a b]
Former smoker	52.7	27.4 [b]	54.5 [a]	31.8 [b]	49.2 [a]	22.1 [a b]
Nonsmoker	38.0 [a]	64.4 [a b]	23.9	52.1 [b]	38.1 [a]	71.3 [a b]

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.

[a] $p < .05$ for difference between White and non-White for same gender.

[b] $p < .05$ for difference between genders for same racial/ethnic group.

Separate results are presented in Table 1 for males and females. The percentages sum to 100 for a particular racial/ethnic/gender group. Among white male MMC CAHPS™ respondents, for example, 11.9% are current smokers, 59.8% used to smoke, and the remainder has never smoked. The display facilitates comparisons across groups. Most of the differences between whites and non-white groups are statistically significant. Similarly, the majority of differences between males and females of a given racial/ethnic group are statistically significant.

In the MMC population, American Indians and Alaska Natives are most likely to be current smokers, followed by blacks. Asians and Native Hawaiians/Other Pacific Islanders are the least likely to smoke currently. Whites and Hispanics fall in the middle range with respect to current smokers. For every racial/ethnic group, males are more likely to smoke currently than females are. The greatest difference between the genders occurs for Hispanics, followed by Asians, and blacks. Smaller or statistically insignificant differences in smoking exist between men and women for whites and Native Hawaiians/Other Pacific Islanders.

Whites have the greatest proportion of former smokers; this holds for both white men and white women compared with their counterparts in other racial/ethnic groups. At the other extreme, Asian men and women have the lowest proportion of persons that are ex-smokers, in part

because so few of them ever take up smoking in the first place. Men in every racial/ethnic group have a much higher representation among former smokers than females do.

Asians and Hispanics are most likely never to have smoked, while American Indians/Alaska Natives are least likely never to have smoked. Females of every group are much more likely than males to be in the nonsmoker category.

III. SMOKING AND HEALTH

It is generally understood that smoking is associated with worse health. The data should show, therefore, that those who currently smoke or used to smoke tend to have poorer health than those who have never smoked. One cannot make a straightforward prior prediction, however, of how former smokers' health compares with that of current smokers. Former smokers might have been influenced to quit because of bad health and still might be in bad health, whereas current smokers may not have seen their health deteriorate to such a stage that would influence them to quit (assuming quitting is a function of poor health). On the other hand, former smokers who quit a long time ago might have recovered from the ill effects of smoking and so might be in better health than the average current smoker.

Tables 2 through 6 present statistics on the association between smoking status and health in the MMC population. The statistics represent the percentages of persons who currently smoke, used to smoke, and never smoked who report each of five health conditions: heart disease, cancer, stroke, chronic obstructive pulmonary disease (COPD), and diabetes.[14] The results are segmented by health condition, race/ethnicity, and gender. Sample sizes are very small for some groups—most notably, Native Hawaiians/Pacific Islanders—and that is partially responsible for large standard errors and a lower likelihood of statistically significant differences in comparison with other groups.

Table 2. Percentage of Current, Former, and Non-smoker Medicare Managed Care Enrollees Who Have Heart Disease, by Race/Ethnicity and Gender

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	26.0	17.7 [b]	20.6 [a]	20.3 [a]	12.6 [a]	11.3
Former smoker	33.1	23.3 [b]	25.5 [a]	25.4 [a]	23.1 [a]	13.9 [a b]
Nonsmoker	26.3	19.9 [b]	17.5 [a]	18.7	19.9 [a]	12.5 [a b]
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	18.2	8.3	29.3	18.5	23.6	18.6
Former smoker	32.8	32.5	36.1	31.7 [a]	28.8 [a]	25.1 [b]
Nonsmoker	25.0	17.0	21.1	17.3	21.2 [a]	17.4 [a b]

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.

[a] $p < .05$ for difference between White and non-White for same gender.

[b] $p < .05$ for difference between genders for same racial/ethnic group.

Table 3. Percentage of Current, Former, and Non-smoker Medicare Managed Care Enrollees Who Have Cancer, by Race/Ethnicity and Gender

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	14.8	13.2 [b]	11.9 [a]	8.2 [a b]	7.8 [a]	2.8 [a]
Former smoker	18.5	16.8 [b]	14.9 [a]	10.9 [a b]	11.6 [a]	9.6 [a]
Nonsmoker	16.3	13.9 [b]	12.5 [a]	8.1 [a b]	7.5 [a]	7.6 [a]
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	9.1	16.7	13.3	5.6	10.4 [a]	7.1 [a]
Former smoker	14.9	17.5	17.8	11.3	12.8 [a]	12.0 [a]
Nonsmoker	12.2	8.5	6.5 [a]	8.7 [a]	10.0 [a]	8.1 [a b]

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.

[a] $p < .05$ for difference between White and non-White for same gender.

[b] $p < .05$ for difference between genders for same racial/ethnic group.

Table 4. Percentage of Current, Former, and Non-smoker Medicare Managed Care Enrollees Who Have Stroke, by Race/Ethnicity and Gender

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	10.8	7.5	12.5	11.3 [a]	6.8	8.5
Former smoker	9.3	7.9	12.5 [a]	11.3 [a]	9.5	5.5 [b]
Nonsmoker	7.9	7.0	10.0 [a]	9.4 [a]	7.1	6.7
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	9.1	0.0	18.1 [a]	16.7 [a]	11.0	9.0
Former smoker	11.9	12.5	13.9 [a]	10.3	9.7	10.1 [a]
Nonsmoker	8.2	6.4	13.0	9.2	9.0	6.8 [b]

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.

[a] $p < .05$ for difference between White and non-White for same gender.

[b] $p < .05$ for difference between genders for same racial/ethnic group.

Table 5. Percentage of Current, Former, and Non-smoker Medicare Managed Care Enrollees Who Have COPD, by Race/Ethnicity and Gender

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	9.8	8.2 [b]	5.1 [a]	4.9 [a]	2.0 [a]	4.2
Former smoker	8.1	8.3	5.0 [a]	5.4 [a]	5.2 [a]	5.2 [a]
Nonsmoker	2.9	2.4 [b]	2.8	2.1	2.2	1.5 [a]
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	8.3	0.0	13.8	5.6	7.8	6.5
Former smoker	10.5	7.7	10.7	12.8	6.1 [a]	6.0 [a]
Nonsmoker	8.3 [a]	8.5 [a]	5.6	2.3	2.5	1.9

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.
[a] $p < .05$ for difference between White and non-White for same gender.
[b] $p < .05$ for difference between genders for same racial/ethnic group.

Table 6. Percentage of Current, Former, and Non-smoker Medicare Managed Care Enrollees Who Have Diabetes, by Race/Ethnicity and Gender

	White		Black		Asian	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	14.5	10.3 [b]	22.1 [a]	22.0 [a]	21.4	10.0 [b]
Former smoker	17.7	13.2 [b]	29.6 [a]	31.2 [a]	19.1	19.6 [a]
Nonsmoker	15.4	12.7 [b]	27.6 [a]	26.9 [a]	16.5	14.9 [a]
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Smoking Behavior	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Current smoker	25.0	16.7	13.3	27.8 [a b]	19.2 [a]	16.7 [a]
Former smoker	23.5	30.0 [a]	26.9 [a]	26.2 [a]	27.3 [a]	23.9 [a b]
Nonsmoker	24.5	27.2 [a]	27.2 [a]	27.2 [a]	23.8 [a]	22.1 [a]

Source: Medicare Managed Care CAHPS™ for 1998 and 1999.
[a] $p < .05$ for difference between White and non-White for same gender.
[b] $p < .05$ for difference between genders for same racial/ethnic group.

Before discussing Tables 2-6 in detail, we first generalize the findings. Table 7 summarizes the order rankings of the percentage of persons that has each illness shown in Tables 2-6. Former smokers are much more likely to have a health condition than are current smokers or nonsmokers. For example, former smokers had the highest incidence of disease 46 times out of 60 possibilities (i.e., six racial/ethnic groups times two genders times five diseases). By comparison, current smokers had the highest incidence 13 times and nonsmokers just once. Moreover, former smokers had the least incidence of disease just once, compared with 31 times

for nonsmokers and 26 times for current smokers. *Clearly, current or past use of cigarettes is a health risk factor for Medicare managed care enrollees*. Age might account for some of these differences. The average age of current smokers, former smokers, and nonsmokers is 70.0, 73.0, and 74.2 years, respectively. If serious illness is directly associated with age, that would help explain why former smokers are more likely to fall in the first column than current smokers are. Age is one of the variables controlled for in multivariate analyses that are presented below.

Table 7. Summary of Order Rankings of Smoking Status Variables for Five Health Conditions

Smoking Behavior	Rank Order		
	First	Second	Third
Current smoker	13	21	26
Former smoker	46	12	2
Nonsmoker	1	28	31

Source: Medicare Managed Care CAHPS™ for 1998 and 1999

The results in Tables 2-6 lead to a variety of conclusions. Following are a few of the more obvious and pertinent ones.

- American Indians have the highest incidence of the five health conditions, irrespective of smoking behavior, followed by blacks and Hawaiians/Pacific Islanders. Hispanics have about the same incidence as whites. Asians are much less likely than any other group to incur one of these health conditions. These disparities suggest that MMC plans could do more for the higher-incidence groups.

- Males are more likely than females to have a health condition. The difference is much more pronounced for current smokers than it is for former smokers and nonsmokers, which implies that women smokers who contract disease are more likely to quit than are men who contract disease. The difference between genders is greatest for Asians and whites and lowest for blacks.

- Heart disease and diabetes are the most common diseases for most racial/ethnic groups in the Medicare managed care population, regardless of smoking behavior. COPD and stroke are the least common.

- As expected, former smokers are much more likely than nonsmokers to have each of the five health conditions. The greatest difference is for heart disease, followed by COPD and cancer.

- Former smokers are more likely to have a health condition compared with current smokers. This holds for every racial/ethnic group and both genders, although not for every disease. This strongly suggests that incurrence of disease—especially heart disease, cancer, and diabetes—influences smokers to quit.

- Surprisingly, current smokers have virtually the same incidence of disease as nonsmokers when generalizing over all conditions, racial/ethnic groups, and genders. But there are considerable variations across conditions. Current smokers incur a higher incidence of COPD and stroke than is the case for nonsmokers. On the other hand, current smokers are much *less* likely to have diabetes and somewhat less likely to have heart disease, compared with nonsmokers. Taken with other findings, this implies that smokers tend not to quit until they get a disease and suggests a direction that smoking cessation counseling could take.

- Diabetes is an unusual case. The incidence of disease is less for current smokers than it is for nonsmokers, a finding that holds for nine of twelve racial/ethnic/gender groups. It is not clear why this is the case. It is unlikely that taking up smoking somehow lessens the likelihood of contracting diabetes. Perhaps unobserved factors that differentiate persons on the basis of susceptibility for diabetes—and are associated with the propensity for starting to smoke—operate more strongly for diabetes than they do for other health conditions.

IV. DIFFERENCES IN PHYSICIAN COUNSELING TO QUIT SMOKING, BY RACE, ETHNICITY, AND GENDER

Descriptive Analysis

Table 8 shows the percentage of smokers that has been advised to quit by a doctor or other provider in the health plan in the last six months, the average number of times that a smoker was advised to quit in the last six months, and the mean percentage of doctor visits during which the individual was advised to quit in the last six months. Being advised to quit (or not) is derived from an MMC CAHPS™ survey question that is asked of current smokers only: "In the last 6 months, on how many visits were you advised to quit smoking by a doctor or other health provider in your plan?" Persons that answered one or more visits were coded as having been advised to quit; persons that answered "None" were coded as not having been advised to quit; persons that responded "I had no visits in the last six months" were excluded in the creation of the "advised to quit" variable.

Table 8. Smoking Cessation Counseling in the Last 6 Months For Current Smokers

	White		Black		Asian	
Cessation Counseling	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Percentage of persons advised to quit, all*	62.2	63.2	62.5	65.0	58.3	50.7[a]
Percentage of persons advised to quit, saw a doctor*	71.6	71.0	72.9	72.6	66.7	63.2
Mean percentage of visits advised to quit, unadjusted	52.8	50.6[b]	55.9	53.1	54.2	45.4
Mean percentage of visits advised to quit, adjusted†	46.7	44.4[b]	47.3	43.8	48.2	38.3
Average number of times advised to quit‡	2.2	2.2	2.9	3.0	1.5	1.7
	Native Hawaiian/ Pacific Islander		**American Indian/ Alaska Native**		**Hispanic**	
Cessation Counseling	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Percentage of persons advised to quit*	§	§	57.8	53.7	59.2	57.4[a]
Percentage of persons advised to quit, saw a doctor*	§	§	62.2	66.7	69.9	68.7
Mean percentage of visits advised to quit, unadjusted	§	§	56.2	47.6	49.6	46.2
Mean percentage of visits advised to quit, adjusted†	§	§	46.5	38.7	41.7[a]	37.4[a]
Average number of times advised to quit‡	§	§	2.9	2.9	2.7	2.6

Source: MMC CAHPS™ surveys for 1998 and 1999

* Some respondents indicated they were advised to quit but did not report seeing a doctor. Therefore, the denominator for line 2 is smaller than that for line 1. The numerator is the same for both line 1 and line 2.

† A value of missing was assigned to individuals for whom the percentage of visits in which they were advised to quit exceeded 100.

‡ An approximation based on midpoints of intervals.

§ Insufficient observations.

[a] $p < .05$ for difference between White and non-White for same gender.

[b] $p < .05$ for difference between genders for same racial/ethnic group.

The percentage of visits in which the individual was advised to quit was calculated by dividing the number of times in the last six months that the person was advised to quit by the number of

times in the last six months the person went to a doctor's office or clinic to get care for themselves.[15]

The most immediate and startling statistic is that 35% to 49% of smokers did not receive smoking cessation advice even once in the last six months. Even if they did not see a doctor in that time, it suggests that Medicare managed care organizations are not doing enough to give smokers badly needed advice. For smokers that did see a doctor the picture is not much better—between 27% and 38% were not advised to quit, even though they had at least one and possibly multiple doctor visits.

Black smokers are the most likely racial/ethnic group to be advised to quit, followed closely by whites. Asian and American Indians/Alaska Native smokers are least likely to be advised to quit. Female blacks and female whites are counseled to quit slightly more frequently than their male counterparts, whereas the opposite is the case for the other racial/ethnic groups.[16] However, the differences between genders for a given racial/ethnic group are small.

Differences between individuals in the average number of times they were advised to quit are greater across racial/ethnic groups than they are across genders.[17] Women of all races and ethnicities tend to see a doctor more frequently than there male counterparts. Therefore, the differences between genders are greater when looking at the percentage of visits that a person was advised to quit (with females having lower percentages) compared with the average number of visits that they were advised to quit. Blacks, American Indians/Alaska Natives, and Hispanics have higher advice frequency average than Whites do. Asian smokers, however, receive substantially fewer smoking cessation messages than their White counterparts do. Few of these differences are statistically significant at the 5 percent level.

The frequency of being advised to quit may be at least partly related to the number of opportunities for being advised as reflected in the number of doctor visits. This can be accounted for by looking at the percentage of visits during which the person received cessation counseling. In terms of the likelihood of a smoker being advised to quit during a doctor visit, American Indian males, black males, and Asian males were the most likely to be so advised. Asian, Hispanic, and American Indian females were the least likely to receive cessation advice during a doctor visit. Males had higher likelihood percentages than females for all racial/ethnic groups. Differences between the genders were higher for Asians and American Indians, but much lower for whites, blacks, and Hispanics, suggesting a greater degree of possible gender bias among Asians and American Indians than for the other groups.

Multivariate Analysis

Besides race/ethnicity and gender, other factors undoubtedly are associated with the likelihood of being counseled to quit. Multivariate analysis disentangles and isolates the influence of the several measurable factors that might be associated with whether or not a smoker is advised to quit. The following model is specified:

(1) $ADVISED = f\ (RACE_i,\ GENDER,\ AGE,\ EDUCATION_j,\ MEDICAID,\ REGION_k,\ PROFIT,\ CONDITION_l,\ NVISITS),$

where ADVISED = 1 if advised to quit smoking in last 6 months, = 0 otherwise
RACE = racial/ethnic group (white, black, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, Hispanic)
GENDER = 1 for females, = 0 for males
AGE = 1 for 64 years or fewer, = 2 for 65 to 69, = 3 for 70 to 74, = 4 for 75 to 79, = 5 for 80 or more.
EDUCATION = educational attainment group (less than 8 years, some high school, high school graduate, some college, 4-year college graduate)
MEDICAID = 1 for Medicaid buy-in enrollees, = 0 otherwise
REGION = census region (Northeast, Midwest, South, West)
PROFIT = 1 for for-profit Medicare managed care organizations, = 0 otherwise
CONDITION = 1 for the presence of a serious health condition (heart disease, cancer, stroke, COPD, diabetes), = 0 otherwise
NVISITS = Number of visits in last 6 months to doctor's office or clinic.

Equation (1) was estimated for current smokers by probit techniques. To avoid multicollinearity, the following groups were excluded: whites, persons with fewer than 8 years of education, and persons in the Northeast.

Results

A summary of results of estimation of equation (1) is shown in Table 9. All of the racial/ethnic group variables' coefficients are not statistically significant. The signs of the coefficients are what one would expect given the statistics shown in Table 8; i.e., positive for black and negative for the other groups. However, the standard errors are too large to lend statistical significance. This means that, when other measurable factors are controlled for, nonwhite smokers are neither more nor less likely to receive advice about quitting smoking than white smokers are. Moreover, one can deduce from the signs and magnitudes of coefficients and standard errors that none of the nonwhite groups differ from the others. The conclusion is that race/ethnicity is not a causal factor in explaining differences in whether a smoker is advised to quit or not.[18]

Gender is seen in Table 9 not to be a significant factor in accounting for whether a smoker is advised to quit. That is, the small differences between the genders shown in Table 8 are not significant in a statistical sense. Another insignificant factor is Medicaid buy-in status. The implied poverty signaled by dual-eligible status is apparently not an impediment to equal treatment for smoking cessation counseling. Compared with the omitted educational group of persons with eight or fewer years of schooling, none of the higher educational attainment groups is more or less likely to receive smoking cessation counseling, and neither are any of these higher education groups statistically different from one another.

Table 9. Results of Estimation of Advised to Quit Smoking
Dependent Variable: ADVISED

Explanatory Variable	Coefficient	Standard Error
Black	.0021	.0205
Asian	–.0201	.0711
Hawaiian	–.1915	.2390
American Indian	–.0338	.0730
Hispanic	–.0384	.0286
Gender	.0017	.0109
Age	–.0151***	.0049
Some HS	.0215	.0197
High school grad	–.0004	.0186
Some college	.0183	.0197
College grad	.0165	.0229
Medicaid	–.0157	.0274
South	–.0591****	.0155
Midwest	–.0635****	.0178
West	–.0688****	.0155
For-profit HMO	–.0208*	.0114
Heart condition	.1002****	.0133
Cancer	.0258***	.0156
Stroke	.0592***	.0184
COPD	.1953****	.0168
Diabetes	.0615****	.0158
Number of visits	.0299****	.0021

Pseudo R^2 = .0515
N = 8833
*p < .10 **p < .05 ***p < .01 ****p < .001
Source: MMC CAHPS™ surveys for 1998 and 1999
Notes: The excluded groups are whites, persons with 8 or fewer years of schooling, and persons in the Northeast region.

The age variable is negative and statistically significant, suggesting that older smokers in the MMC population are less likely to be advised to quit, holding other factors constant. If there is a plausible explanation for this finding, it may lie in the fact that older MMC enrollees have fewer years of life remaining over which to could reap the health and other benefits of having quit smoking.

The region coefficients are negative and highly significant, which means that there is a stronger emphasis on smoking cessation and prevention in the Northeast than in other parts of the country. The public policy implication is that CMS and the PROs might want to consider some projects to increase smoking cessation counseling in other regions.

The Medicare managed care organization (MCO) profit variable is negative and significant, i.e., for-profit Medicare MCOs do less smoking cessation counseling than other organizational forms. It might reflect a lower emphasis on prevention in for-profit MCOs. Or, it could be capturing

some other unobserved effect. Whatever the reason, CMS might want to consider sending a stronger message to Medicare managed care plans that smoking cessation counseling should be part of every routine visit. It is not an indicator of good medical practice if doctors are not counseling one-third to one-half of their smoking patients against smoking.

All health conditions coefficients are positive and highly significant in Table 9. Smokers who have been told by a doctor that they have a heart condition, cancer, stroke, COPD, or diabetes are significantly more likely to be advised to quit than are persons without those illnesses. The strongest effect is for COPD—smokers so afflicted are 21% more likely to receive cessation counseling than persons without COPD. The percentage differences for the other conditions are: heart condition (11%), diabetes (8%), stroke (7%) and cancer (5%). These effects are what one would expect, given the relationship between smoking and illness, and shows that Medicare MCO providers are at least giving preferential advice to their smoking patients that actually have one of these serious conditions.[19]

A positive and statistically significant coefficient on the number of doctors office visits variable was to be expected, because the number of times an individual is advised by a doctor to quit is directly related to the number of visits with a doctor.

By Health Condition

In order to delve more deeply into the relationship between smoking, illness, and cessation advice, an alternative specification was also estimated. The sample was divided by health condition and the estimate was repeated for each condition, omitting the health condition variables. The model specification is:

(2) $ADVISED = f\ (RACE_i,\ GENDER,\ AGE,\ EDUCATION_j,\ MEDICAID,\ REGION_k,\ PROFIT,\ NVISITS)$

Summary results are shown in Table 10. (Detailed results are available from the authors.) The results are not substantially different from those for equation (1), but there are a few differences.

- Heart condition: Blacks and Asians with heart disease are less likely than whites with the disease to be advised to quit smoking. Persons with heart disease in the South are not advised differently than those in the Northeast. Persons with heart disease enrolled in a for-profit MCO are not advised differently than those in other forms of managed care plans.
- Cancer: Blacks with cancer are less likely than whites with cancer to be advised to quit smoking. The same is true for females with cancer compared with males. Cancer patients with 8 or fewer years of schooling are less likely to receive cessation advice than are most of those with more schooling. There are no regional differences in being advised to quit for persons with cancer. Persons with cancer enrolled in a for-profit MCO are not advised differently than those in other forms of managed care plans.
- Stroke: Hispanics with stroke are more likely to receive smoking cessation counseling than are whites with stroke. Age is not a significant factor in explaining differences in smoking cessation advice. Persons with stroke who live in the South and Midwest are not advised

more or less frequently than those in the Northeast. Persons with stroke enrolled in a for-profit MCO are not advised differently than those in other forms of managed care plans.

- COPD: Age is not a significant factor in explaining differences in smoking cessation advice. Persons with COPD in the South and West are less likely than those in the Northeast to receive smoking cessation advice The for-profit HMO effect is not significant for persons with COPD, in contrast to the findings for the entire sample.
- Diabetes: None of the REGION effects is significant for persons with diabetes, in contrast to the findings for the entire sample.

Table 10. Summary Results of Estimation of Advised to Quit Smoking, by Health Condition
Dependent Variable: ADVISED

	(1)	(2)	(3)	(4)	(5)
Explanatory Variable	Heart Condition	Cancer	Stroke	COPD	Diabetes
Black	–	–			
Asian	–				
Hawaiian					
American Indian					
Hispanic			+		
Gender		–			
Age	–	–			–
Some HS		+			
High school grad		+			
Some college					
College grad		+			
Medicaid		+			
South				–	
Midwest	–		–		
West	–			–	
For-profit HMO					–
Number of visits	+	+	+	+	+
Pseudo R^2	.0350	.0303	.0464	.0578	.0346
N	1863	1227	847	761	1142

+ Positive and statistically significant at the 90% level or better.
– Negative and statistically significant at the 90% level or better.
Source: MMC CAHPS™ surveys for 1998 and 1999.
Notes: An empty cell indicates a not-statistically-significant coefficient estimate at the 90% level or better. The excluded groups are whites, persons with 8 or fewer years of schooling, and persons in the Northeast region.

In summary, we see that there are a few differences across racial/ethnic subgroups compared with whites in being advised to quit when we look at persons with each health condition separately, in contrast to what was found when all health conditions were combined. Also, some of the regional differences disappear, as does the significance of being in a for-profit HMO for all conditions other than diabetes.

By Racial/Ethnic and Gender Group

Another approach to learning more about the relation between smoking and being advised to quit is to segment the sample by racial/ethnic group and gender and perform the estimates on each subgroup separately. The model is:

(3) ADVISED = f (AGE, $EDUCATION_j$, MEDICAID, $REGION_k$, PROFIT, $CONDITION_l$, NVISITS),

Table 11 presents highlights of results of probit estimates of equation (3) for each subgroup. Several racial/ethnic groups could not be estimated because of small sample sizes, so the analysis is limited to whites, blacks, and Hispanics.

Table 11. Summary Results of Estimation of Advised to Quit Smoking, by Race/Ethnicity and Gender
Dependent Variable: ADVISED

Explanatory Variable	Males			Females		
	White	Black	Hispanic	White	Black	Hispanic
Age	–			–	–	
Some HS						
High school graduate						
Some college						
College graduate						
Medicaid						
South	–		+	–		
Midwest	–		+	–		
West	–			–		
For-profit HMO		–				
Heart condition	+		+	+		
Cancer	+	–				
Stroke	+		+			+
COPD	+			+		+
Diabetes		+	+	+	+	
Number of visits	+	+	+	+		+
Pseudo R^2	.0619	.0689	.1415	.0455	.0602	.1572
N	3645	362	215	3996	284	117

+ Positive and statistically significant at the 90% level or better.

– Negative and statistically significant at the 90% level or better.

Source: MMC CAHPS™ surveys for 1998 and 1999.

Notes: An empty cell indicates a not-statistically-significant coefficient estimate at the 90% level or better. Excluded groups are 1) 8th grade or less of schooling and 2) Northeast region. The following racial/ethnic groups are excluded because of insufficient observations: Asian, Native Hawaiian/Pacific Islander, and American Indian/Alaska Native.

There are some differences as well as similarities regarding factors that are or are not associated with smoking cessation counseling for each race/ethnicity/gender group compared with those for the full sample.

- There are differences with respect to health conditions across male racial/ethnic groups. White male smokers with any of the five health conditions except diabetes are more likely to receive cessation advice (relative to persons without those conditions), which agrees with the findings for the entire sample. In contrast, this is true for only three conditions for Hispanics and just one for blacks. In fact, black male smokers with cancer are less likely to be advised to quit than those without cancer.
- Age is negatively associated with advice to quit smoking for white males, but not black or Hispanic males. Age is negatively associated with advice to quit smoking for white and black females, but not Hispanic females.
- Black male smokers in a for-profit MMC plan are less likely to receive cessation advice than persons in the excluded group. MMC plan profit status is not a significant factor for any of the other racial/ethnic/gender groups.
- There are a few region effects for male smokers: Southern and Midwestern Hispanics are more likely to receive cessation counseling compared with those in the Northeast, whereas whites in the South, Midwest, or West are less likely to be so advised than Northeastern whites. There are no region effects for blacks.
- White female smokers with a heart condition, COPD or diabetes are more likely to be advised to quit than those without such conditions. This pattern is similar to that for white male smokers.
- Hispanic female smokers with diabetes is one of only two racial/ethnic gender group with that condition that is not more likely to be advised to quit smoking compared with those without diabetes. Stroke and COPD, however, are two other conditions for which cessation advice is more likely than for those without the condition among the female Hispanic smoker population. These findings are mostly different than those for Hispanic male smokers.
- Among black female smokers, the only significant condition associated with smoking cessation counseling is diabetes. Notably, black females do not share the negative relation between cancer and quit advice that was found for black males.
- White women in the Northeast are more likely to be advised to quit smoking than those in the rest of the country. There are no regional differences in such advice for other female racial/ethnic groups, however.
- As expected, the number of doctor visits is positively and highly significantly related to the number of times a person is advised by a doctor to quit. The only exception is for black women.
- A seemingly anomalous result regarding PROFIT (the for-profit-HMO variable) deserves some explanation. The results in Table 9 for the full sample show a negative and statistically significant relation between PROFIT and ADVISED. But the coefficient estimate is small in value and statistically significant at only the .10 level, so the association is somewhat tenuous. Nevertheless, it is surprising to find that PROFIT is statistically significant for only one racial/ethnic/gender group. The explanation lies partly in the fact that a sizable portion (15%) of the females in the sample did not indicate a race and only for these individuals is the coefficient estimate negative and statistically significant (.05 level). This result together

with the mixed signage and insignificance of the PROFIT coefficient for the other groups was apparently enough to produce the marginally significant result for the entire sample.

To summarize the comparisons between Table 9 and Table 11, the negative regional effects in Table 9 are seen to be mainly attributable to white females. The positive association between heart disease and cancer and being advised to quit is also principally a white effect; for the other health conditions the positive association is more equally spread across all three racial/ethnic groups.

V. DISCUSSION AND POLICY IMPLICATIONS

Among Medicare managed care enrollees, differences were found in smoking behavior that generally mirrors those found in the literature for adults—and extends those findings for several additional racial/ethnic groups. Current smoking is most prevalent among American Indians/Alaska Natives and blacks and least prevalent among Asians and Native Hawaiians. Males are more likely to currently smoke than females. These disparities in the propensity smoke suggest groups that should be targeted for cessation efforts by managed care organizations.

Smoking behavior is also associated with health condition. Generally speaking, former smokers are much more likely to have a serious health condition than even current smokers are, which suggests that smokers do not quit until they develop a disease that may be smoking related. Apparently, education efforts aimed at smokers are less successful in getting them to quit than is the onset of disease.

American Indians have the highest incidence of all five serious health conditions, regardless of their smoking status. The numbers are also above average for blacks and Native Hawaiian/other Pacific Islanders. This poses additional challenges for managed health plans beyond just education about the health risks of smoking.

The findings on smoking cessation counseling from multivariate analysis are mixed. Sociodemographic characteristics are not generally associated with whether a smoker is advised to quit. That is, non-white Medicare managed care enrollees that smoke are not systematically counseled to quit more or less than whites are. Neither are there statistically significant differences among the nonwhite groups. Further, female smokers are not counseled to a greater or lesser extent than male smokers are. As expected, smokers with any of five serious health conditions are much more likely to be advised to quit compared with persons without the condition.

When we look at health conditions and racial/ethnic/gender groups separately, some additional aspects of being advised to quit or not are brought into clearer focus. For persons that have a health condition, a few differences between white and nonwhite groups are found. Similarly, when we considered each race/ethnic/gender group separately, it was found that whites with health conditions were more likely to get cessation counseling than blacks and Hispanics with those conditions were. These more detailed analyses did not reveal any additional differences between how men and women were treated with respect to being advised to quit. Had some significant differences along these lines been found, it might have indicated that public policy measures be undertaken to redress cultural differences in how some patients are treated by health care professionals.

Persons with more than 8 years of education are generally not advised differently than persons with 8 or fewer years. The one exception to this was for smokers with cancer, for whom it was found that person with 8 or fewer years of schooling are less likely to receive counseling than those with more education. Medicare/Medicaid dual eligibles are not advised differently than non-dual eligibles.

Smokers in the Northeast are more likely to be advised to quit than those located in other regions. And there is no significant difference among the other three regions. There is no apparent reason for the Northeast to stand out like this. It suggests finding out why physicians in the Northeast do more than those in other areas. Are they trained differently? Are they more aware of the dangers of smoking to patients? Are Northeast physicians more proactive with respect to patients on other public health issues besides smoking? Do they believe smokers in Northeast are more receptive to antismoking messages?

Smokers in for-profit Medicare managed care plans are less likely to be advised to quit. Are these patients (who are smokers) perceived to be healthier or more health conscious and less in need of professional advice? Are plans trying to save money by providing fewer services to these patients?

A smoker with a particular health condition is more likely to be advised to quit than a person without that condition. These findings are not surprising given the expected relationship between smoking and illness and suggest that doctors are doing the right thing. The strongest relationship is for COPD; smokers with this condition are 21% more likely to receive cessation advice than smokers without COPD.

The overall frequency of counseling is surprisingly low for all racial/ethnic/gender groups. In a 6-month period, one-third to one-half of smokers that saw a physician were not advised to quit even once. This suggests a breach of good medical practice, given the widely recognized adverse health and cost consequences of smoking. Some evidence of racial/ethnic differences in frequency of counseling was found, with whites being toward the lower end of the frequency distribution.

Assuming race, ethnicity, gender aren't significant, there are still some interesting findings and policy implications. The Region effect suggests that there's a stronger emphasis on smoking cessation and prevention in the Northeast than in other parts of the country, and this suggests that CMS and the PROs might want to consider some projects to increase smoking cessation counseling in other regions. The “Profit” status of the HMO associated with less counseling is also interesting—does it reflect a lower emphasis on prevention in for-profit HMOs? Whatever the reason, CMS might want to consider sending a stronger message to M+C plans that smoking cessation counseling should be part of every routine visits. It’s not good medical practice if their physicians never counsel one-third to one-half against smoking.

There are some limitations of findings that should be kept in mind. The survey data are based on self-reports, which raises the issue of accuracy of recall—especially a concern in an older population. The findings have limited generality because they are for a small segment of population (i.e. more elderly) and of Medicare population. Some smoking definitions are subject to criticism. For instance, for current smokers, the analyst doesn’t know how many days they smoke or how many cigarettes per day. In the case of former smokers, one doesn’t know how long it has been since they quit. For nonsmokers, we don’t know whether they use other forms of tobacco.

NOTES

[1] U.S. Census Bureau, *Statistical Abstract of the United States: 2000* (120th edition) Washington, DC, 1999, www.census.gov/statab.
[2] National Center for Health Statistics, *Current Cigarette Smoking by Sex, Age, and Race*, National Health Information Survey, <www.cdc.gov/nchs/about/otheract/aging/trenddata.htm>.
[3] MMWR, Cigarette smoking adults- United States, 1997 in Centers for Disease Control and Prevention, *Hispanics and Tobacco*; American Cancer Society, 1998.
[4] Centers for Disease Control and Prevention, *American Indians and Alaska Natives and Tobacco*, 2/05/01.
[5] U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. *Tobacco Use Among U.S. Racial/Ethnic Minority Groups: A Report of the Surgeon General*, 1998.
[6] U.S. Department of Health and Human Services. Centers for Disease Control and Prevention, *African Americans and Tobacco*.
[7] Testimony of Treasury Deputy Secretary Lawrence H. Summers. Senate Committee on Commerce, Science and Transportation, March 24, 1998.
[8] American Cancer Society. *Cancer Facts and Figures 1999: Tobacco Use*. www.cancer.org/statistics/cff99/tobacco.html.
[9] Hargraves, J.L., *Race, ethnicity, and preventive services: No gains for Hispanics*. Center for Studying Health System Change, 34 (2001).
[10] Centers for Disease Control and Prevention, *African Americans and Tobacco,* <www.cdc.gov/tobacco/sgr/sgr_1998/sgr-min-fs-afr.htm>.
[11] American Cancer Society, 1998.
[12]Hargraves, J.L., *Race, ethnicity, and preventive services: No gains for Hispanics*. Center for Studying Health System Change, 34 (2001).
[13] Respondents were allowed to indicate more than one choice for race and 2% selected two or more races. For the purposes of this study, self-indicated multiracial persons were dropped, but this topic deserves further investigation.
[14] The presence of a health condition represents an affirmative response to the survey question, "Has a doctor ever told you that you had …"
[15] This variable, PCTADV1, was greater than one for some individuals, implying that they were advised to quit by a doctor more times than they saw a doctor, which is a logical impossibility. An alternative variable was tried, PCTADV2, which is PCTADV1, except that a value of missing was coded for individuals for whom PCTADV1 was greater than one. The means for PCTADV2 are 6 to 10 percentage points lower than for PCTADV1.The qualitative results by race/ethnicity and gender, however, are the same for the two variables.
[16] There were too few Native Hawaiian/Pacific Islander current smokers in the sample to report smoking cessation advice statistics.
[17] The quit advice frequency variable is categorical and contains some ranges (e.g., zero, one, two to four, etc.). Therefore, the average number of times a smoker was advised to quit is an approximation based on the frequency distribution of responses across categories, using midpoints of ranges.
[18] Another specification was also estimated. All non-White groups were coded into a MINORITY variable. MINORITY was substituted in place of all of the non-White dummy variables in an alternative version of equation (1). The sign of the estimated coefficient on MINORITY was negative but not statistically significant at the .10 level.
[19] An alternate specification not reported here was also tried. A variable ANYILL was created that took a value of one for individuals who had any of the five health conditions and zero otherwise. Not surprisingly, the coefficient estimate for ANYILL was positive and highly statistically significant. Moreover, the estimates for the non-health-condition variables in the model were essentially the same.