



MEDICARE HEALTH OUTCOMES SURVEY

**REPORT ON THE HEALTH STATUS OF
DISADVANTAGED MEDICARE BENEFICIARIES**

Cohorts II and III

**FINAL REPORT
DELIVERABLE FOR TASK 9.20**

**PREPARED BY HEALTH SERVICES ADVISORY GROUP
JUNE 2005**



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EXECUTIVE SUMMARY

In this report, Health Services Advisory Group (HSAG) examines disparities in health outcomes for beneficiaries in *Cohorts II* and *III* of the Medicare Health Outcomes Survey (HOS). *Cohort II Baseline* data were collected in 1999 and *Cohort II Follow Up* data were collected in 2001. *Cohort III Baseline* data were collected in 2000 with *Cohort III Follow Up* data collected in 2002. This report presents demographic information, self-reported health status, mean scores for physical and mental health status as measured by the SF-36¹, prevalence of chronic conditions, activities of daily living and negative symptoms. Additional analyses in this report examine the predictors of disparities in health outcomes for African Americans, Hispanics, Asians, American Indians/Alaskan Natives, and Other Race/Multiracial groups as compared to Whites.

Descriptive analyses indicate that African Americans, American Indians/Alaskan Natives, and Hispanics report lower levels of education and lower income levels than Whites. Lower proportions of these racial groups owned their home, and larger proportions were recipients of Medicaid than Whites. Differences between American Indians/Alaskan Natives and Whites were found for physical and mental health status. Additionally, differences between Hispanics and Whites were found for physical health status only. Overall, Asians had better health status, had the lowest mean number of impaired Activities of Daily Living, a greater proportion of this group had a household income of over \$50,000, and a greater proportion had higher educational levels compared to the other groups (including Whites). Asians also had the highest scores on a measure of physical health status compared to all groups (Figures 1 and 2).

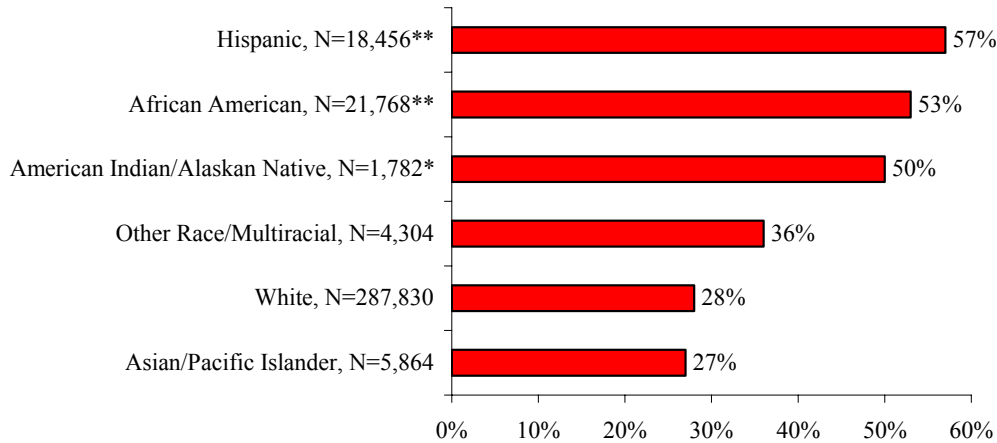
This report differs from many analyses of health-related quality of life by incorporating results for deceased beneficiaries as well as survivors. Generally speaking, the healthier beneficiaries are more likely to be included in the follow up phase in a longitudinal analysis. Attrition of the less healthy beneficiaries over time may bias the results of longitudinal analyses. This study accounts for the deceased beneficiaries by including them in the modeling of physical health status at follow up.

The predictive modeling showed that racial/ethnic group membership was not the strongest predictor of decreased physical health status. The strongest predictors were income and educational level. Other predictors of decreased physical health status at follow up included the presence or absence of a positive depression screen, proxy status, and the number of comorbid chronic medical conditions.

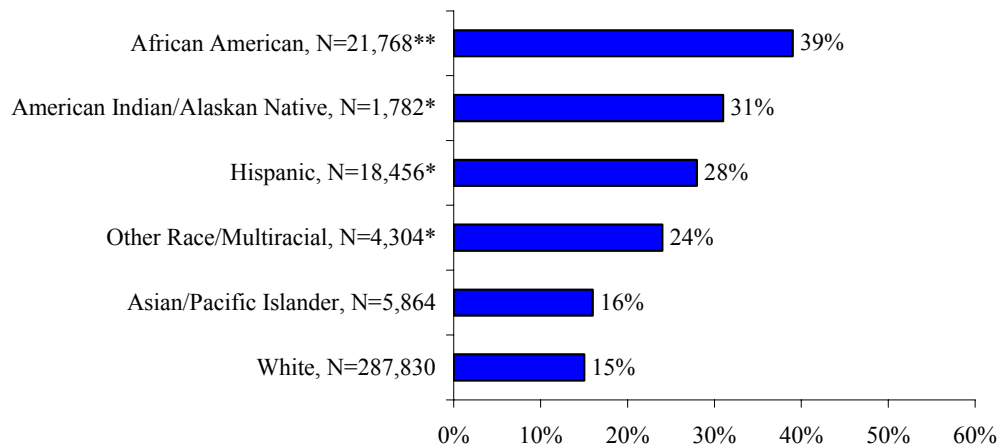
Medicare managed care plans should focus on beneficiaries with low income and low educational levels for specific interventions. Depressed beneficiaries and beneficiaries with multiple chronic conditions should also be high priorities for preventive care.

¹ The HOS evaluates physical and mental health using a set of survey questions known as the RAND 36-Item Health Survey 1.0 (RAND SF-36). The RAND SF-36 is a multipurpose, short form health survey with 36 questions. These 36 items are identical to the MOS SF-36 described in Ware and Sherbourne (1992).

**FIGURE 1
 SELECTED DEMOGRAPHICS
 AT BASELINE FOR RACIAL/ETHNIC GROUPS**



Percentage with Less than a High School Education



Percentage with Household Income Less than \$10,000

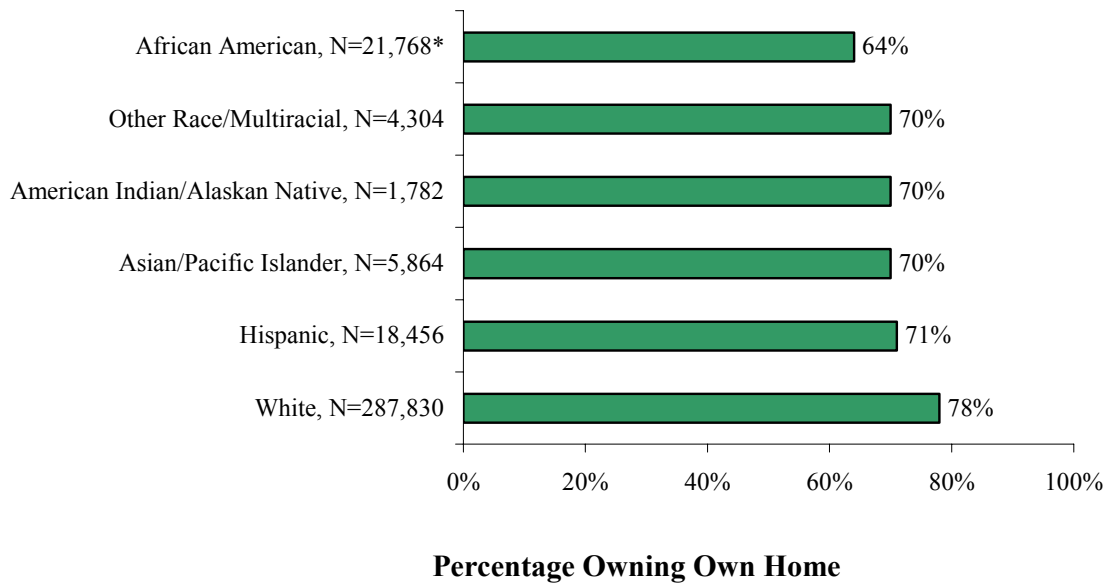
* Differs from Whites; $0.20 \leq \text{Effect Size} < 0.50$.

** Differs from Whites; $0.50 \leq \text{Effect Size} < 0.80$.

Source: Cohorts II and III from the Medicare Health Outcomes Survey Database
 Cohort II Baseline, 1999 and Follow Up, 2001
 Cohort III Baseline, 2000 and Follow Up, 2002

FIGURE 1, continued

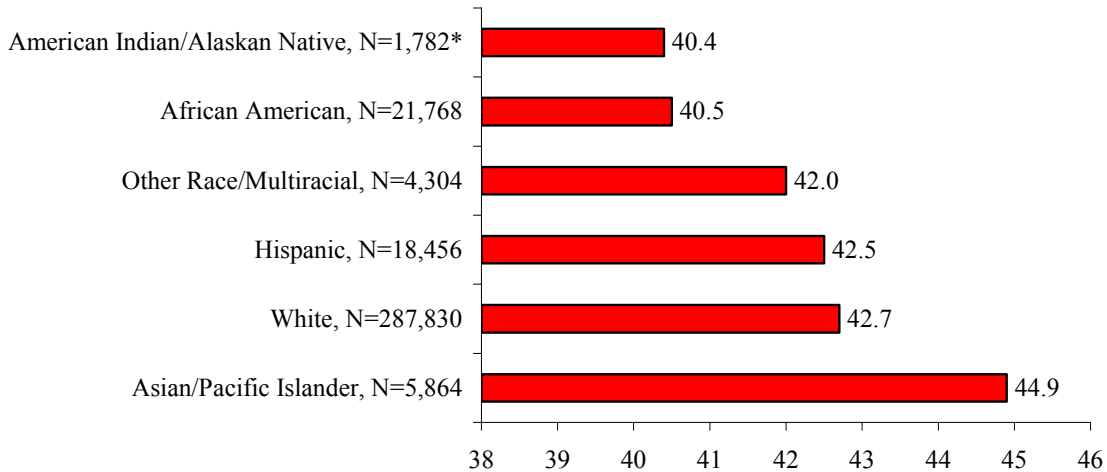
**FIGURE 1, CONTINUED
SELECTED DEMOGRAPHICS
AT BASELINE FOR RACIAL/ETHNIC GROUPS**



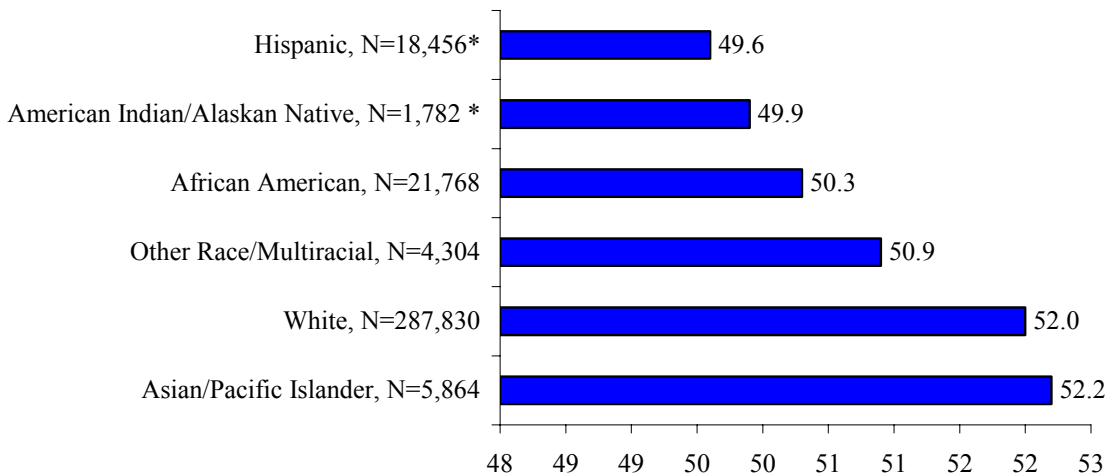
* Differs from Whites; $0.20 \leq \text{Effect Size} < 0.50$.

Source: Cohorts II and III from the Medicare Health Outcomes Survey Database
Cohort II Baseline, 1999 and Follow Up, 2001
Cohort III Baseline, 2000 and Follow Up, 2002

FIGURE 2
MEAN UNADJUSTED SF-36 SCORES AT BASELINE
FOR RACIAL/ETHNIC GROUPS



Mean Physical Component Summary Score



Mean Mental Component Summary Score

* Differs from Whites; $0.20 \leq \text{Effect Size} < 0.50$.

Source: Cohorts II and III from the Medicare Health Outcomes Survey Database
 Cohort II Baseline, 1999 and Follow Up, 2001
 Cohort III Baseline, 2000 and Follow Up, 2002

1

INTRODUCTION

According to the National Healthcare Disparities Report (Agency for Healthcare Research and Quality, 2003), “disparity” is defined as “the condition or fact of being unequal, as in age, rank, or degree” (p. 1). Inequity in health has been defined as “systematic and potentially remediable differences in one or more aspects of health across populations or population groups defined socially, economically, demographically, or geographically” (International Society for Inequity in Health, 2004). Racial and ethnic disparities in health and health care quality are an important issue for the Centers for Medicare & Medicaid Services (CMS). Tommy Thompson, the former Secretary of the U.S. Department of Health and Human Services (HHS), stated: “Communities of color suffer disproportionately from diabetes, heart disease, HIV/AIDS, cancer, stroke and infant mortality. Eliminating these and other health disparities is a priority of HHS” (U.S. Department of Health and Human Services, 2003). Congress is also concerned with racial/ethnic healthcare disparities. On January 27, 2005, forty-three members of the Congressional Black Caucus met with President Bush to discuss reducing racial disparities in health care (Kaiser Family Foundation, 2005).

The Eighth Scope of Work (8SOW) for Quality Improvement Organizations (QIOs) places a strong emphasis on disparities in health care. Task 1d2 focuses specifically on “Underserved Populations.” The 8SOW mandates that QIOs should promote cultural competency and improve the quality of primary care received by underserved populations (CMS, 2005b).

In addition to racial/ethnic disparities, the Seventh Scope of Work (7SOW) included a focus on reducing disparities in health care for rural beneficiaries (CMS, 2005a). However, rural beneficiaries were not examined in this report. Preliminary analyses for urban and rural beneficiaries revealed few substantive differences between these groups. This may be because the rural-urban indicator that was available is assigned at the county level, and does not adequately distinguish between urban and rural beneficiaries. For example, many counties have large, urban populations as well as smaller, rural populations. Another reason is that most managed care plans are located in urban areas. Therefore, the current report focuses on other potential indicators of underserved status.

Medicare does provide significant coverage to qualified beneficiaries; however, there are still numerous out-of-pocket costs to a beneficiary in the traditional Fee-For-Service (FFS) Medicare program. With the advent of Medicare managed care (now known as Medicare Advantage), enrolled beneficiaries may potentially have lower out-of-pocket costs, and better coordinated care through a single source of care. If access, coordination, and cost affect racial disparities in health status (National Healthcare Disparities Report, 2003), this type of Medicare service delivery *should* further reduce the disparities in health care and resultant health outcomes between White and non-White beneficiaries. However, recent research suggests that racial

differences in preventive care were found in managed care (Lin, Musa, Silverman, & Degenholtz, 2005). Additionally, recent reductions in benefits, as well as increased co-payments and premiums may potentially have a disproportionate impact on some enrollee subgroups.

A variety of recent studies have shown that disparities still exist in managed care plans serving Medicare beneficiaries. Recently Schneider, Zaslavsky, and Epstein (2002) utilized the 1998 Health Plan Employer Data and Information Set (HEDIS^{® 2}) measures of quality of care to evaluate the quality of care provided to Medicare beneficiaries in managed care plans. A total of 305,574 Medicare beneficiaries over the age of 65 were evaluated for breast cancer screening, eye examinations for diabetes, the use of beta-blockers following a myocardial infarction, and follow up after hospitalization for mental illness. African Americans were less likely than Whites to receive breast cancer screening, eye examinations for diabetes, beta-blockers following myocardial infarction, and follow up after hospitalization for mental illness. Even when adjustment for potential confounders was included, all the measures except breast cancer screening remained significant. Disparities also continue to exist in Medicaid managed care settings. For example, African Americans' use of physician and inpatient services has been shown to lag behind the utilization rates of White beneficiaries (Tai-Seale, Freund, & LoSasso, 2001). However, managed care has the potential to reduce disparities. A recent five-year study on the impact of quality improvement (QI) on depression in managed care organizations indicates that programs for QI can reduce health outcome disparities for depressed primary care patients (Wells et al., 2004).

While it appears that universal coverage may mitigate some of the disparities, differential access to coverage is not the only cause of disparities. Cultural and language differences between patients and providers can affect outcomes. For example, a recent study found that Hispanic cancer survivors need culturally sensitive cancer prevention education to prevent cancer recurrence (Aparicio-Ting & Ramirez, 2003). Native Hawaiians have historically had difficulty using Western health care services, and this difficulty has negatively impacted their health-related behaviors (Ka'opua & Mueller, 2004). Additionally, significant differences were found between African Americans and Caucasian Americans regarding health care utilization, access, and attitudes toward chronic pain management (Green, Baker, & Ndao-Brumblay, 2004).

There is also evidence that characteristics of provider/patient interactions can negatively impact patient outcomes. An Institute of Medicine ([IOM], 2002a) report concluded, "(al)though myriad sources contribute to these disparities, some evidence suggests that bias, prejudice, and stereotyping on the part of health care providers may contribute to differences in care." Recent studies confirm this claim. Using an experimental design in which volunteer physicians watched videotapes of actor-patients with significant symptoms of heart disease who were being interviewed by a doctor, and who then were asked to prescribe further interventions—the physicians referred African American women for cardiac catheterization 60% less often than White women, White men, and African American men. Besides having the same scripted medical history, all of the "patients" had the same insurance coverage and occupations. The researchers concluded that the combination of the patient's race and sex did affect the physician's decision to refer patients with chest pain for a more definitive diagnostic work-up

² HEDIS[®] is a registered trademark of the National Committee for Quality Assurance (NCQA).

(Schulman et al., 1999). Recent research also indicates that an individual's county of residence may impact barriers to health care. Haas et al. (2004) found that African Americans and Latinos who reside in counties that have a high prevalence of people with the same race/ethnicity perceive fewer barriers to care.

Culture, language, provider behaviors, and geography can impact the delivery of health care. Consequently, the problem of health disparities may become exacerbated as minority populations continue to grow. An estimated one in four Americans (about 67 million) were classified by the U.S. Census in 1999 as a member of one of the four major racial or ethnic minority population groups: African American, Hispanic, American Indian/Alaskan Native, or Asian. By the year 2050, the U.S. Census estimates that people of color will represent one in three Americans (Kaiser Family Foundation, 2001). This increase in non-White minorities is very evident in the Medicare population. The Bureau of the Census projects that by 2025, racial/ethnic minority representation among the elderly will more than double, rising from 14% to 35%, or one in three seniors (Kaiser Family Foundation, 2001).

The Medicare HOS provides an opportunity to examine the health status of non-White minority and White managed care enrollees without the confounding effects of differential access and cost. The data presented here will provide information to assist policy makers in modifying the Medicare program over the coming decades to accommodate the increase in minority beneficiaries.

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METHODOLOGY

BACKGROUND

The Medicare HOS assesses the physical and mental health status of Medicare beneficiaries enrolled in managed care in the United States. Beginning in 1998 and continuing annually, a new baseline cohort is created from a randomly selected sample of 1,000 Medicare managed care enrollees from each applicable Medicare contract market area. In plans with fewer than 1,000 Medicare beneficiaries, the sample includes the entire enrolled Medicare population that meets the inclusion criteria. Both seniors (aged 65 and older) and the disabled (younger than 65 years) are included in the sample. Medicare beneficiaries who are continuously enrolled in the health plans for at least six months are eligible for sampling. Each baseline cohort is surveyed again two years later (the follow up cohort).

The data collection protocol includes a combination of mail and telephone surveys. Multiple mailings, standardized telephone interviews, interviewer training, and methods for maximizing response rates are well established in the HEDIS[®] specifications (NCQA, 2000).

MEDICARE HOS INSTRUMENT

The Medicare HOS instrument includes the SF-36 health survey, which is a widely used multi-purpose, short-form health survey. Reliability and validity of the SF-36 have been well established (McHorney, Ware, Lu, & Sherbourne, 1994). The SF-36 yields an eight-scale profile of scores and is a generic measure as opposed to one that targets a specific age, disease, or treatment group. The eight scales form two distinct higher ordered clusters that are the basis for scoring the Physical Component Summary (PCS) measure and Mental Component Summary (MCS) measure. For this analysis, the SF-36 individual scale scores, as well as the PCS and MCS scores, have been normed to the values for the 1998 general U.S. population, so that a score of fifty represents the national average for a given scale or summary score. Higher scores on the SF-36 measures represent better physical and/or mental health status. In addition to the SF-36, demographic data; activities of daily living (ADLs); 13 chronic conditions; three depression-screening questions; current smoking history; 12 negative symptoms relating to chest pain, shortness of breath (SOB), and peripheral neuropathy; and 6 medical problems were examined for differences between the various racial/ethnic groups. All comparisons were between the White population (the reference population) and each of the identified racial/ethnic minorities, hereafter defined as the disadvantaged population.

SAMPLE

The respondents included in this study were beneficiaries in *Cohorts II and III Baseline and Follow Up*; the data sets represented baseline survey results for 1999 and 2000, respectively, and follow up results for 2001 and 2002, respectively. *Cohort II Baseline* consisted of 301,184 Medicare beneficiaries from 283 Medicare Advantage plans, and *Cohort III Baseline* consisted of 298,883 Medicare beneficiaries from 275 Medical Advantage plans. Several exclusion criteria were applied to these 600,067 beneficiaries to create the final analytic sample.

The exclusion criterion and the number of beneficiaries eliminated at each sequential step are outlined below. Based on these criteria, the total size of the final analytic sample was 340,004 beneficiaries, representing 167 Medicare Advantage plans (see table).

Impact of Sequential Exclusion Criteria		
Exclusion Criteria	Number Excluded	Sample Size
Starting Sample Size		600,067
Age < 65 years	42,843	557,224
ESRD diagnosis at baseline	76	557,148
Missing PCS and MCS scores at baseline	194,969	362,179
Missing race at baseline	18,308	343,871
Sampled in both <i>Cohort II</i> and <i>Cohort III</i>	3,867	340,004
Final analytic sample		340,004

ANALYSES

Traditional statistical measures produce numerous significant p values when large samples are compared. The question becomes, which of these statistically significant differences are really important in differentiating between populations or hypotheses? *Effect size*, which refers to the degree of departure from a null hypothesis, offers a way to judge the importance of a result. Cohen's (1998) definitions of small, medium and large effect sizes were employed. A small effect size was defined as greater than or equal to 0.20 but less than 0.50, a medium effect size is greater than or equal to 0.50 but less than 0.80, and a large effect size is greater than or equal to 0.80 for both the difference between proportions and the difference between means (Rosenthal & Rosnow, 1991). Cohen's effect size for the difference between the proportions p_1 and p_2 was calculated as:

$$h = |\varphi_1 - \varphi_2|$$

$$\text{where: } \varphi_1 = 2\arcsin(\sqrt{p_1}) \text{ and } \varphi_2 = 2\arcsin(\sqrt{p_2})$$

The effect size for the difference between the means, x_1 and x_2 , was calculated utilizing Hedges' g , (Rosenthal & Rosnow, 1991) and utilizes the pooled standard deviation:

$$g = \frac{x_1 - x_2}{s^2 \text{ pooled}}$$

The effect size for the regression models following was set a 0.5% variance, or a partial R^2 of 0.005 (Menard, 1995).

The analytic plan required the resolution of two major issues. First, we wanted to limit the bias that results from analyses based only on survivors by including the deceased in predictive modeling. There were 16,116 beneficiaries who were deceased at follow up in the current study. Though the published literature contains various methods of how to incorporate the deceased in health outcomes research, we have employed the methodology proposed by Diehr et al. (2001). These authors propose a definition of "healthy" as a response of "excellent", "very good", or "good" to the question, "In general, would you say your health is...". The probability of being healthy at follow up is estimated from baseline. A logistic model was fit where the logit of the probability of being healthy at follow up was the dependent variable, and the following equation was used to transform all values of X to Y, where the deceased are assigned a value of zero:

$$y = \frac{\exp(a + bX)}{1 + \exp(a + bX)} \times 100$$

Thus, the outcome variable for these analyses was the probability of being healthy at follow up.

A second analytic issue that arises with the HOS data is the inherent nested design of the data; beneficiaries are members of managed care plans. Beneficiaries within plans may be more similar to one another than are beneficiaries from different plans. Ordinary least squares (OLS) and generalized linear models assume that observations are independent of one another, which is not the case with the nested design. Dependency that arises among subsets of this type of data is referred to as clustering (Cohen, Cohen, West, & Aiken, 2003). OLS regression used with clustered data produces results in which the standard errors are negatively biased (i.e., too small) and can lead to alpha inflation. Clustering was assessed with the current data and the intraclass correlation coefficient (ICC, which measures the degree of clustering) was found to be 0.02, which suggests the presence of clustering among plans (Cohen et al., 2003). Since we assessed significance using effect size, the possible alpha inflation was not problematic. However, the negative bias possibly produced with OLS regression may be a source of error. Generally, the presence of clustering suggests that random coefficient regression be used for the analyses (Cohen et al., 2003; Singer, 1998). To assess standard errors we examined both the random coefficient regression model and an OLS model. Using the PROC GLM procedure (least

squares solution) in SAS^{® 3} (2000) with plan as the class variable, we compared the parameter estimates and standard errors with the output from PROC MIXED (random coefficient regression) in SAS[®]. No substantial differences were found between the models. For example, the parameter estimate for Hispanic using the PROC GLM output was 2.3956 with a standard error of 0.3191. The parameter estimate for Hispanic using the PROC MIXED output was 2.3649 with a standard error of 0.3140. The variable Smoker had a parameter estimate of -2.2188 with a standard error of 0.1943 in PROC GLM, and a parameter estimate of -2.2230 with a standard error of 0.1942 in PROC MIXED. All of the predictor variables followed this same pattern. We therefore felt confident proceeding with an OLS model, so that the partial R^2 could easily be assessed.

The analytic sample used for regression analyses was reduced due to 1,764 beneficiaries with invalid surveys at follow up, 114,331 beneficiaries whose plans did not exist at follow up (involuntarily disenrolled), 63,715 beneficiaries who voluntarily disenrolled prior to follow up, and 28,359 beneficiaries who did not respond at follow up (non-respondents). With the inclusion of the deceased beneficiaries (16,116) in the modeled sample, the final sample size used in the modeling was 131,835 beneficiaries representing 167 different Medicare Advantage plans. These 167 plans represented 61% of the 275 plans at baseline.

PREDICTOR VARIABLES

In order to conduct the regression analyses, a number of the variables were subjected to dummy coding. In dummy coding, each level of the variable (except one level, known as the reference group), is assigned the value of 1 if present, and 0 if absent. The reference group is always assigned a value of zero. This allows us to test the effects of specific racial and ethnic groups, income levels, etc., in comparison with the reference level.

Educational level, gender, race/ethnicity, income, marital status, Medicaid status, smoking status, the number of comorbid chronic medical conditions, and depressed mood were coded as indicated on the following page.

³ SAS[®] is a registered trademark of the SAS Institute.

CODING OF PREDICTOR VARIABLES

	PREDICTOR VARIABLE	CODING
DEMOGRAPHIC FACTORS	Race African American Hispanic Asian American Indian/Alaskan Native Other Race/Multiracial White (Reference Group)	1 if African American, 0 otherwise 1 if Hispanic, 0 otherwise 1 if Asian, 0 otherwise 1 if American Indian/Alaskan Native, 0 otherwise 1 if Other Race/Multiracial, 0 otherwise 0 if White
	Income Poor (Less than \$10,000) Low Income (\$10,000 - \$19,999) Middle Income (\$20,000 - \$29,999) Upper Middle Income (\$30,000 - \$49,999) High Income (\$50,000 and over; Reference Group)	1 if Poor, 0 otherwise 1 if Low Income, 0 otherwise 1 if Middle Income, 0 otherwise 1 if Upper Middle Income, 0 otherwise 0 if High Income
	Gender Female Male (Reference Group)	1 if Female, 0 otherwise 0 if Male
	Marital Status Divorced/Separated Widowed Never Married Married (Reference Group)	1 if Divorced/Separated, 0 otherwise 1 if Widowed, 0 otherwise 1 if Never Married, 0 otherwise 0 if Married
	Medicaid Status Recipient of Medicaid Not Recipient of Medicaid (Reference Group)	1 if Recipient of Medicaid, 0 otherwise 0 if Not Medicaid Recipient
	RISK FACTORS	Comorbidity Number of Comorbid Chronic Medical Conditions
Smoking Status Current Smoker Non Smoker (Reference Group)		1 if Current Smoker, 0 otherwise 0 if Non Smoker
Depressed Mood Affirmative response to any one of the three Depression Screening Questions Not Depressed Mood (Reference Group)		1 if Yes, 0 otherwise 0 if No affirmative responses
Educational Level 8th Grade or less education Some high school education High school graduate Some college education College graduate (Reference Group)		1 if 8th Grade or less, 0 otherwise 1 if Some high school, 0 otherwise 1 if High school graduate; 0 otherwise 1 if Some college education; 0 otherwise 0 if College graduate

3

RESULTS

DEMOGRAPHICS

The demographic results are compared in Table 1 for each of the racial/ethnic groups. Comparisons were made between each racial/ethnic group utilizing an effect size comparison. In general, these effect size comparisons revealed only a small effect size difference ($0.20 \leq ES < 0.50$). For the demographic results, Cohen's effect size for proportions (h) was calculated.

There were no differences in age that met the effect size criterion. The mean age for Whites (74.5) was the same as for the beneficiaries in the Other Race/Multiracial group (74.5). American Indians/Alaskan Natives were nearly the same with a mean age of 74.3. African Americans and Asians had the same mean age of 73.8, while Hispanics had a mean age of 73.4. The highest proportion of married respondents was found among the Asian members (65%), followed by White and Hispanic members (60% in both groups). African American beneficiaries were less likely to be currently married than Whites (40% and 60%, respectively, $h = 0.4$), and more likely to be divorced/separated (16% African American, and 8% White, $h = 0.2$) and widowed (40% African American, and 29% White, $h = 0.2$).

There were substantial differences among the racial/ethnic groups on educational level attained. In general, Hispanics, African Americans, and American Indians/Alaskan Natives had the lowest educational levels. Fifty-seven percent of Hispanics, 53% of African Americans, and 50% of American Indians/Alaskan Natives had less than a high school education. Hispanics ($h = 0.6$) and African Americans ($h = 0.5$) were less likely to graduate from high school compared to Whites. American Indians/Alaskan Natives were also overrepresented in this less than high school education stratum when compared to Whites ($h = 0.4$). Additionally, American Indians/Alaskan Natives ($h = 0.2$), African American ($h = 0.2$), and Hispanic ($h = 0.2$) beneficiaries were less likely to have a college degree or higher level of education compared to Whites. However, Asian/Pacific Islanders were more likely to have a college degree or higher level of education compared to Whites ($h = 0.2$).

Asian and White beneficiaries had higher incomes followed by Other Race/Multiracial, Hispanic, American Indian/Alaskan Native, and African American beneficiaries. Less than 20% of the American Indian/Alaskan Native, African American, and Hispanic beneficiaries reported incomes of more than \$30,000 per year (all met the small effect size criterion). African Americans ($h = 0.5$), American Indians/Alaskan Natives ($h = 0.3$), Hispanics ($h = 0.3$), and Other/Multiracial ($h = 0.2$) beneficiaries had higher proportions of beneficiaries reporting annual household incomes less than \$10,000 than did White beneficiaries.

Lower proportions of African Americans owned their home ($h = 0.3$) compared to Whites. Additionally, African Americans (10%), Hispanics (9%), and American Indians/Alaskan Natives (8%) had a higher proportion of beneficiaries who reported that they were Medicaid recipients

compared to Whites (2%). All differences met the effect size criterion. There were no differences for institutional status among the groups, with approximately 99% of all beneficiaries in all groups not institutionalized.

Whites were more likely to complete the Medicare HOS instrument themselves (90%) than were African Americans (78%, $h = 0.3$), Hispanics (70%, $h = 0.5$), and Asians (77%, $h = 0.3$).

ACTIVITIES OF DAILY LIVING

For the ADL results, the effect size for means was calculated using Hedge's g . The mean number and percentage of impaired ADLs in each of the racial/ethnic groups at baseline and follow up is presented in Table 2. African American (1.3) and American Indian/Alaskan Native (1.4) beneficiaries had the highest mean number of impaired ADLs at baseline, and were different than Whites (1.0; $g = 0.2$). Approximately 73% of Asians had *no* impaired ADLs at baseline; this was the highest percentage for beneficiaries in all groups.

CHRONIC MEDICAL CONDITIONS

The three most frequently reported chronic conditions were the same in all of the groups; high blood pressure was most prevalent in all of the groups, followed by either arthritis of the hip/knee or arthritis of the hand/wrist (Table 3). African Americans had a higher prevalence of high blood pressure (73%; $h = 0.2$), arthritis of the hip/knee (49%, $h = 0.2$) and diabetes (29%, $h = 0.3$) than did Whites (53%, 38%, and 16%, respectively). Asians had lower proportions of beneficiaries who reported angina/coronary artery disease (10%, $h = 0.2$) and arthritis of the hip/knee (26%, $h = 0.2$) compared to Whites.

Several of the racial/ethnic groups had higher mean numbers of chronic conditions at baseline than Whites: American Indians/Alaskan Natives (3.0), African American (2.9), and Other Race/Multiracial (2.7) beneficiaries. However, these comparisons did not meet the criterion for a small effect size. Asian beneficiaries had the lowest mean number of chronic conditions (2.0), which was lower than the mean number for Whites ($h = 0.3$). Whites did not differ from Hispanics (2.5) on the mean number of chronic conditions at baseline (results not shown).

Question number 35 in the HOS asks beneficiaries "Are you currently under treatment for colon/rectal cancer, lung cancer, breast cancer, or prostate cancer?" No differences were found among the groups for current cancer treatment. The highest prevalence of breast cancer was found in Whites, Asians, and Other Race/Multiracial beneficiaries (4%). African Americans had the highest prevalence of prostate cancer (8%), and American Indians/Alaskan Natives had the highest prevalence of lung cancer (2%). The highest prevalence of colon/rectal cancer was found in Whites, African Americans, American Indians/Alaskan Natives, and Other Race/Multiracial beneficiaries (all approximately 3%; results not shown).

RISK FACTORS

Three risk factors were included in the analysis: smoking status, depressive mood, and various types of clinical symptoms including pain. The proportions of each group reporting the presence of these risk factors at baseline are presented in Table 4.

Smoking

There were no differences found for current smoking status among the groups that met the effect size criterion. Whites were more likely to be ex-smokers than Asians or Hispanics ($h = 0.2$). Asians had a higher proportion of non-smokers than did Whites (60% versus 43%, $h = 0.3$). American Indians/Alaskan Natives had a lower proportion of non-smokers than did Whites (41% versus 43%), though this did not meet the effect size criterion.

Depression

Depressed mood was defined as a “Yes” answer to any of the three depression screening questions. African Americans, Hispanics, American Indians/Alaskan Natives, and Other Race/Multiracial groups were more likely to endorse at least one of the depression questions than were Whites ($h = 0.2$).

Clinical Symptoms

Table 4 also indicates that African Americans and American Indians/Alaskan Natives were the two racial/ethnic groups with the highest number of clinical symptoms as compared to Whites. Both groups differed from Whites on chest pain when exercising, chest pain when resting, shortness of breath when lying down flat, shortness of breath when sitting or resting, shortness of breath when walking less than one block, numbness in the feet, and decreased feeling in the feet to hot and cold. African Americans also differed from Whites in ankles/legs that swell and tingling/burning in the feet (all peripheral neuropathy symptoms except sores/wounds that do not heal). Hispanics and Other Race/Multiracial beneficiaries did not differ from Whites on any clinical symptoms. Asians differed from Whites for shortness of breath when walking less than one block, and shortness of breath when climbing stairs; Asians had fewer beneficiaries with these clinical symptoms than Whites (all differences met the small effect size criterion).

SF-36 SCORES

The mean scores for each of the SF-36 scales, as well as the summary measures, are compared in Table 5 for each racial/ethnic group. Each scale and summary measure was scored using the norms for the 1998 general population (Ware, Snow, Kosinski, & Gandek, 1993). The general U.S. population has a mean of 50 and a standard deviation of 10.

Only American Indians/Alaskan Natives had a lower mean PCS score (40.4) and MCS score (49.9) than Whites (42.7, and 52.0, respectively; $g = 0.2$). Whites also had a higher mean MCS score than the Hispanic group (49.6, $g = 0.2$).

The rank ordering of the mean scores on all of the scales revealed a fairly similar pattern. Asians typically had the highest mean scores followed by White and Other Race/Multiracial beneficiaries on all of the measures. Asians had higher scores than Whites on the Vitality and Bodily Pain scales ($g = 0.2$). Whites had higher mean scores than African Americans on the Physical Functioning ($g = 0.2$), General Health ($g = 0.3$), Social Functioning ($g = 0.2$), and Role-Emotional scale ($g = 0.2$). American Indians/Alaskan Natives had lower scores than Whites on the Physical Functioning ($g = 0.2$), General Health ($g = 0.2$), Social Functioning ($g = 0.2$), Role-Emotional ($g = 0.2$), and Mental Health ($g = 0.2$) scales than Whites. Hispanics also had lower scores than Whites on the Role-Emotional and Mental Health scales ($g = 0.2$).

SF-36 CHANGE SCORES

There were declines in all of the measures of the SF-36 for all of the groups; however none of the declines met the effect size criterion. Table 6 indicates that American Indians/Alaskan Natives had the largest decline for PCS scores and Hispanics had the largest decline for MCS scores. American Indians/Alaskan Natives also had the largest decline for the Physical Functioning and Role-Physical scales. Hispanic beneficiaries had the largest decline for the Bodily Pain scale, and Whites had the largest decline for the General Health scale. Whites had the largest decline for the Vitality scale, and American Indians/Alaskan Natives had the largest decline for the Social Functioning scale. Other Race/Multiracial beneficiaries had the largest decline for the Role-Emotional scale, and Hispanics had the largest decline for the Mental Health scale.

REGRESSION MODELING RESULTS

Two models were created to examine the predictors of the probability of being healthy at follow up. The first model included demographics only. Race; income categories (less than \$10,000, \$10,000 to \$19,999, \$20,000 to \$29,999, and \$30,000 to \$49,999), missing income; educational level (eighth grade or less, some high school, high school graduate, and some college); age (continuous variable); female gender; proxy status; marital status (divorced/separated, widowed, and never married); and Medicaid recipient were used as predictors of the probability of being healthy at follow up.

Interestingly, none of the race variables strongly predicted the probability of being healthy at follow up (Table 7). However, African American race had a negative parameter estimate (-1.621), as did American Indian/Alaskan Native (-2.822) and Other Race/Multiracial groups (-0.953), indicating that the probability of being healthy at follow up was smaller for these three

groups. Hispanic race and Asian race both had a positive parameter estimate (2.953 and 5.520, respectively), indicating that the probability of being healthy at follow up was greater for these two groups. Several income categories did meet the criterion for a small effect size. These were a household income of less than \$10,000 (parameter estimate = -10.089), household income of \$10,000 - \$19,999 (parameter estimate = -8.747), and household income of \$20,000 to \$29,999 (parameter estimate = -5.826). Three final demographic characteristics attained a small effect size; educational level of eighth grade or less had a parameter estimate of -4.851, age had a parameter estimate of -0.783, and proxy respondent had a parameter estimate of -10.923. The total adjusted R^2 for this model was 0.13.

In addition to the demographic characteristics, the second model included three risk factors: smoking status, presence or absence of a positive depression screen, and an individual's sum of twelve potential comorbidities (Table 8). None of the racial/ethnic categories met the effect size criterion. However, the same demographic characteristics attained significance, and the parameter estimates were in the same direction in the second model as in they were in the first model (less than \$10,000, \$10,000 - \$19,999, \$20,000 to \$29,999, educational level of eighth grade or less, age, and proxy respondent). Smokers had a negative parameter estimate of -2.082; however, this did not meet the effect size criterion. A positive depression screen had a negative parameter estimate of -4.637, and the number of comorbidities had a negative parameter estimate of -6.221 (both met the effect size criterion). Interestingly, though American Indians/Alaskan Natives had a negative parameter estimate of -2.822 in the demographic only model (Table 7), this same variable had a positive 0.058 parameter estimate in the second model (Table 8). This change in the direction of the parameter estimates indicates that when smoking status, depression, and comorbidities are controlled for, American Indians/Alaskan Natives' health status improves. The total adjusted R^2 for the second model was 0.32.

COMPARISONS OF EXCLUDED GROUPS

As noted previously in this report, several groups were excluded from the final analytic sample: non-respondents, invalid surveys, and the voluntarily and involuntarily disenrolled. Baseline demographics, mean age, mean PCS and MCS scores, the mean number of impaired ADLs, and the mean number of comorbidities were compared among these groups and the analytic sample. Invalid surveys were defined as surveys from beneficiaries who were not enrolled in a Medicare Advantage plan, those who had an incorrect address and phone number, beneficiaries who had end stage renal disease, or those who had a language barrier at follow up (results not shown).

A medium effect size was found for Hispanics; a higher proportion of Hispanics was in the invalid surveys group. Whites were also underrepresented in the invalid surveys group (medium effect size). A small effect size was found for eighth grade education or less, with higher proportions of beneficiaries in the invalid surveys group represented. A small effect size was also found for beneficiaries who had a household income of less than \$10,000, with higher proportions of beneficiaries in this income bracket in the invalid surveys group. A medium effect size was found for proxy-completed surveys with higher proportions of these beneficiaries

also in the invalid surveys group. More beneficiaries in the invalid surveys group received Medicaid compared to the analytic sample (small effect size), and greater proportions of beneficiaries in the invalid surveys group had a positive depression screen (small effect size). The mean age for the beneficiaries in the invalid surveys group was higher compared to the analytic sample (small effect size), and the mean MCS score for these beneficiaries was lower (small effect size) than the analytic sample. Finally, the beneficiaries in the invalid surveys group had more impaired ADLs than the analytic sample (small effect size).

4

CONCLUSIONS

The results discussed in this report paint a somewhat non-traditional picture of the racial/ethnic populations included in the Medicare HOS. For example, Hispanic race did not emerge in the regression analyses as a predictor of poor health at follow up. Indeed, this variable had a positive parameter estimate. This result is consistent with research regarding the “Hispanic/Latino Paradox” (e.g., Morales, Lara, Kington, Valdéz & Escaree, 2002). Despite a wealth of research indicating that socioeconomic factors are important determinants of health status, many Hispanics living in the U.S. have lower educational levels and higher poverty rates, but have physical health equal to or better than non-Hispanic Whites. The findings in the current report indicating that Hispanic race was not a predictor of poor health may also reflect a selection effect into managed care.

Though the racial/ethnic groups were, unexpectedly, not strong predictors of decreased physical health status at follow up, the results were robust for education and income. In both regression models, poor beneficiaries and those with an eighth grade education or less were clearly less likely to be physically healthy at follow up. Thus, “disadvantaged” in the Medicare managed care population best describes beneficiaries with low educational levels and low-income status. These results support the findings by Williams (1999) that socioeconomic status accounts for a large portion of the racial/ethnic disparities in health.

Consistent with other populations and other literature, proxy respondents were less healthy at follow up. Additionally, and not surprisingly, beneficiaries with a depressed mood, and those who have comorbid chronic conditions were much less healthy at follow up. Interestingly, however, the parameter estimate was higher for beneficiaries with a depressed mood than for beneficiaries who were current smokers, suggesting that depressed mood should receive as much attention as smoking has received in recent years. An analysis of the Medicare Current Beneficiary Survey for community dwelling beneficiaries aged 66 and older found that as the number of depressive symptoms increased, health status also became worse (Waldo, 2002).

A hypothesis that health-risk behaviors were the explanatory mechanism for socioeconomic health differences was not supported in an empirical test. In a longitudinal study of non-institutionalized adults using data from the Americans’ Changing Lives study, Lantz et al. (2001) found that a higher prevalence of health-risk behaviors among individuals in lower socioeconomic strata did not explain health disparities.

The current results suggest that the probability of “excellent”, “very good”, or “good” physical health after a two-year interval for racial/ethnic minority groups does not appear to differ from that of Whites, after controlling for chronic conditions and socioeconomic status. However, prior to drawing solid conclusions, the findings in the current research should be validated on

other cohorts of managed care beneficiaries. Second, the current results suggest that depressed mood, comorbidities, and low socioeconomic status negatively affect physical health status after two years.

Improved health status for beneficiaries with low-income levels and low educational levels depends on removing barriers to care, both financial and non-financial. As stated previously in this report, recent reductions in benefits, increased co-payments, and premiums may potentially have a disproportionate impact on low-income beneficiaries and those with low educational levels. These beneficiaries' inability to pay for health care will put increased pressure on the United States health care system.

In addition to removing financial barriers, the elimination of non-financial barriers can reduce socioeconomic disparities. Langwell and Moser (2002) suggest the following methods to improve performance for health plans: develop effective cultural competency training programs, increase the use of preventive care, and develop and disseminate best practices guidelines. Taylor and Lurie (2004) provide specific steps that will improve culturally competence communication. Communication strategies are also featured in the IOM book, "The Committee on Communication for Behavior Change in the 21st Century: Improving the Health of Diverse Populations." The Committee has published a book that identifies communication interventions that can prompt health related behavior change (IOM, 2002b). The recommendations include a focus on ethical communication, infrastructure change, communication campaigns, and new communication technologies. Finally, Baquet, Carter-Pokras, and Bengen-Seltzer (2004) discuss specific models of change to eliminate healthcare disparities and provide examples from managed care organizations.

The factors identified as important predictors of health status at follow up may vary from plan to plan. The analytic methods discussed here can be applied by plans to their individual beneficiary populations to develop a plan-specific profile of the disadvantaged. This profile can then be used by plan administrators to target those beneficiaries most likely to experience health care disparities.

5

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APPENDIX

Table 1
Demographics at Baseline

	White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/Multiracial N=4,304
Gender						
Male	122,990 (42.9%)	7,942 (36.7%)	8,090 (44.1%)	2,480 (42.4%)	793 (44.6%)	1,871 (43.8%)
Female	163,920 (57.1%)	13,720 (63.3%)	10,264 (55.9%)	3,383 (57.6%)	984 (55.4%)	2,404 (56.2%)
	Missing/Total	0 / 21,768	0 / 18,456	0 / 5,864	0 / 1,782	0 / 4,304
Age Group						
65 to 69 years	86,791 (30.2%)	7,426 (34.1%)	6,470 (35.1%)	2,003 (34.2%)	581 (32.6%)	1,354 (31.5%)
70 to 74 years	81,153 (28.2%)	6,532 (30.0%)	5,793 (31.4%)	1,754 (29.9%)	509 (28.6%)	1,197 (27.8%)
75 to 79 years	62,124 (21.6%)	4,213 (19.4%)	3,585 (19.4%)	1,152 (19.6%)	330 (18.5%)	871 (20.2%)
80 to 85 years	35,902 (12.5%)	2,240 (10.3%)	1,632 (8.8%)	584 (10.0%)	213 (12.0%)	495 (11.5%)
85 years or older	21,860 (7.6%)	1,357 (6.2%)	976 (5.3%)	371 (6.3%)	149 (8.4%)	387 (9.0%)
	Missing/Total	0 / 21,768	0 / 18,456	0 / 5,864	0 / 1,782	0 / 4,304
	Mean Age (SD)	74.5 (6.5)	73.8 (6.2)	73.8 (6.3)	74.3 (6.7)	74.5 (6.7)
Marital Status						
Married	171,793 (59.9%)	8,678 (40.1%)*	11,050 (60.2%)	3,770 (64.5%)	909 (51.3%)	2,282 (53.6%)
Divorced/Separated	24,198 (8.4%)	3,501 (16.2%)*	1,907 (10.4%)	397 (6.8%)	201 (11.3%)	487 (11.4%)
Widowed	83,730 (29.2%)	8,599 (39.7%)*	4,850 (26.4%)	1,439 (24.6%)	620 (35.0%)	1,363 (32.0%)
Never Married	7,046 (2.5%)	859 (4.0%)	560 (3.0%)	243 (4.2%)	41 (2.3%)	128 (3.0%)
	Missing/Total	131 / 21,637	89 / 18,367	15 / 5,849	11 / 1,771	44 / 4,260
Education						
Did Not Graduate HS	78,195 (27.5%)	11,280 (52.9%)**	10,180 (56.7%)**	1,548 (26.7%)	878 (50.1%)*	1,534 (36.4%)*
High School Graduate/GED	104,797 (36.8%)	5,599 (26.2%)*	4,118 (22.9%)*	1,906 (32.9%)	485 (27.7%)*	1,253 (29.7%)*
Some College	61,055 (21.4%)	3,042 (14.3%)	2,339 (13.0%)*	1,032 (17.8%)	267 (15.2%)	880 (20.9%)*
4 Year College & Beyond	40,665 (14.3%)	1,416 (6.6%)*	1,322 (7.4%)*	1,309 (22.6%)*	123 (7.0%)*	546 (13.0%)*
	Missing/Total	3,118 / 284,712	431 / 21,337	497 / 17,959	69 / 5,795	91 / 4,213
Annual Household Income						
Less than \$10,000	35,115 (15.0%)	6,445 (39.4%)**	4,318 (28.7%)*	770 (16.1%)	419 (31.3%)*	734 (23.5%)*
\$10,000 to \$29,999	124,177 (53.1%)	7,428 (45.4%)	7,887 (52.4%)	1,963 (41.1%)*	690 (51.5%)*	1,618 (51.9%)*
\$30,000 to \$50,000	48,161 (20.6%)	1,726 (10.5%)*	1,976 (13.1%)*	1,125 (23.5%)*	156 (11.7%)*	488 (15.7%)*
\$50,000 or More	26,575 (11.4%)	769 (4.7%)*	870 (5.8%)*	922 (19.3%)*	74 (5.5%)*	277 (8.9%)*
	Missing/Total	53,802 / 234,028	5,400 / 16,368	3,405 / 15,051	443 / 1,339	1,187 / 3,117

* small effect size $0.20 \leq h < 0.50$; ** medium effect size $0.50 \leq h < 0.80$.

MEDICARE HEALTH OUTCOMES SURVEY
 FINAL REPORT ON THE HEALTH STATUS OF THE DISADVANTAGED
 COHORTS II AND III

Table 1, continued
Demographics at Baseline

	White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/Multiracial N=4,304	
Home Ownership	Owned or being bought by you	218,757 (77.9%)	13,464 (63.9%)*	4,038 (70.7%)	1,197 (69.8%)	2,889 (69.6%)	
	Owned or being bought by someone in your family other than you	17,408 (6.2%)	2,021 (9.6%)	1,864 (10.4%)*	761 (13.3%)*	142 (8.3%)	380 (9.2%)
	Rented for money	39,527 (14.1%)	5,221 (24.8%)*	3,022 (16.8%)	760 (13.2%)	333 (19.4%)	772 (18.6%)
Medicaid Status	Not owned and one in which you live without payment of rent	5,006 (1.8%)	349 (1.7%)	361 (2.0%)	184 (3.2%)	108 (2.6%)	
	Missing/Total	7,132 / 280,698	713 / 21,055	521 / 17,935	121 / 5,743	68 / 1,714	155 / 4,149
	Out of Medicaid	281,968 (98.0%)	19,563 (89.9%)	16,736 (90.7%)	5,580 (95.2%)	1,646 (92.4%)	4,088 (95.0%)
Institutional Status	In Medicaid	5,862 (2.0%)	2,205 (10.1%)*	1,720 (9.3%)*	284 (4.8%)*	136 (7.6%)*	216 (5.0%)
	Missing/Total	0 / 287,830	0 / 21,768	0 / 18,456	0 / 5,864	0 / 1,782	0 / 4,304
	Out of institution	286,602 (99.6%)	21,719 (99.8%)	18,400 (99.7%)	5,857 (99.9%)	1,773 (99.5%)	4,282 (99.5%)
Who Completed Survey	Institutionalized	670 (0.2%)	30 (0.1%)	32 (0.2%)	3 (0.1%)	6 (0.3%)	9 (0.2%)
	Eligible for nursing home care	558 (0.2%)	19 (0.1%)	24 (0.1%)	4 (0.1%)	3 (0.2%)	13 (0.3%)
	Missing/Total	0 / 287,830	0 / 21,768	0 / 18,456	0 / 5,864	0 / 1,782	0 / 4,304
Who Completed Survey	Person to whom survey was addressed	240,294 (89.8%)	14,384 (77.8%)*	11,375 (70.4%)*	4,092 (76.7%)*	1,330 (85.5%)	3,212 (83.8%)
	Family member or relative	25,141 (9.4%)	3,464 (18.7%)*	4,318 (26.7%)*	1,163 (21.8%)*	204 (13.1%)	553 (14.4%)
	Friend	1,336 (0.5%)	427 (2.3%)	352 (2.2%)	54 (1.0%)	15 (1.0%)	50 (1.3%)
	Professional Caregiver	847 (0.3%)	215 (1.2%)	121 (0.7%)	23 (0.4%)	6 (0.4%)	19 (0.5%)
	Missing/Total	20,212 / 267,618	3,278 / 18,490	2,290 / 16,166	532 / 5,332	227 / 1,555	470 / 3,834

* small effect size 0.20 ≤ h < 0.50; ** medium effect size 0.50 ≤ h < 0.80.

MEDICARE HEALTH OUTCOMES SURVEY
 FINAL REPORT ON THE HEALTH STATUS OF THE DISADVANTAGED
 COHORTS II AND III

**Table 2
 Number of Impaired Activities of Daily Living at Baseline**

	White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/ Multiracial N=4,304
Number at Baseline						
None	172,000 (60.0%)	11,488 (53.0%)	10,965 (59.6%)	4,266 (73.2%)*	898 (50.6%)	2,384 (55.6%)
One	41,899 (14.6%)	3,289 (15.2%)	2,440 (13.3%)	626 (10.7%)	262 (14.8%)	611 (14.2%)
Two	33,455 (11.7%)	2,565 (11.8%)	1,822 (9.9%)	358 (6.1%)*	221 (12.5%)	515 (12.0%)
Three	13,461 (4.7%)	1,358 (6.3%)	885 (4.8%)	140 (2.4%)	116 (6.5%)	211 (4.9%)
Four	10,286 (3.6%)	1,170 (5.4%)	709 (3.9%)	109 (1.9%)	100 (5.6%)	226 (5.3%)
Five	8,272 (2.9%)	984 (4.5%)	668 (3.6%)	124 (2.1%)	88 (5.0%)	175 (4.1%)
Six	7,331 (2.6%)	839 (3.9%)	897 (4.9%)	205 (3.5%)	88 (5.0%)	167 (3.9%)
Missing/Total	1,126 / 286,704	75 / 21,693	70 / 18,386	36 / 5,828	9 / 1,773	15 / 4,289
Mean Number (SD) Impaired ADLs at Baseline	1.0 (1.5)	1.3 (1.7)*	1.1 (1.7)	0.7 (1.5)	1.4 (1.8)*	1.2 (1.7)

* small effect size $0.20 \leq h < 0.50$; ** medium effect size $0.50 \leq h < 0.80$.

MEDICARE HEALTH OUTCOMES SURVEY
 FINAL REPORT ON THE HEALTH STATUS OF THE DISADVANTAGED
 COHORTS II AND III

Table 3
 Chronic Conditions at Baseline

		White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/Multiracial N=4,304
Angina	Yes	46,625 (16.6%)	2,513 (12.0%)	2,342 (13.0%)	560 (9.8%)*	327 (18.9%)	684 (16.4%)
	No	234,262 (83.4%)	18,421 (88.0%)	15,607 (87.0%)	5,152 (90.2%)	1,401 (81.1%)	3,485 (83.6%)
Artery Disease	Missing/Total	6,943 / 280,887	834 / 20,934	507 / 17,949	152 / 5,712	54 / 1,728	135 / 4,169
	Yes	40,683 (14.3%)	2,463 (11.5%)	1,776 (9.8%)	576 (10.0%)	233 (13.4%)	532 (12.6%)
Any Cancer	No	242,841 (85.7%)	18,894 (88.5%)	16,349 (90.2%)	5,192 (90.0%)	1,512 (86.6%)	3,700 (87.4%)
	Missing/Total	4,306 / 283,524	411 / 21,357	331 / 18,125	96 / 5,768	37 / 1,745	72 / 4,232
Arthritis of the Hand/Wrist	Yes	94,511 (33.5%)	7,717 (36.4%)	6,289 (34.9%)	1,593 (27.7%)	672 (38.5%)	1,381 (32.7%)
	No	187,936 (66.5%)	13,497 (63.6%)	11,738 (65.1%)	4,165 (72.3%)	1,075 (61.5%)	2,837 (67.3%)
Arthritis of the Hip/Knee	Missing/Total	5,383 / 282,447	554 / 21,214	429 / 18,027	106 / 5,758	35 / 1,747	86 / 4,218
	Yes	107,514 (38.0%)	10,523 (49.2%)*	6,998 (38.7%)	1,473 (25.6%)*	769 (44.0%)	1,637 (38.9%)
Congestive Heart Failure	No	175,439 (62.0%)	10,862 (50.8%)	11,077 (61.3%)	4,288 (74.4%)	978 (56.0%)	2,573 (61.1%)
	Missing/Total	4,877 / 282,953	383 / 21,385	381 / 18,075	103 / 5,761	35 / 1,747	94 / 4,210
COPD†	Yes	20,648 (7.3%)	1,774 (8.4%)	1,217 (6.8%)	228 (4.0%)	211 (12.2%)	357 (8.5%)
	No	260,315 (92.7%)	19,328 (91.6%)	16,730 (93.2%)	5,510 (96.0%)	1,514 (87.8%)	3,839 (91.5%)
	Missing/Total	6,867 / 280,963	666 / 21,102	509 / 17,947	126 / 5,738	57 / 1,725	108 / 4,196
	Yes	36,962 (13.1%)	2,476 (11.7%)	1,753 (9.7%)	517 (9.0%)	320 (18.5%)	617 (14.7%)
	No	245,316 (86.9%)	18,715 (88.3%)	16,280 (90.3%)	5,231 (91.0%)	1,410 (81.5%)	3,583 (85.3%)
	Missing/Total	5,552 / 282,278	577 / 21,191	423 / 18,033	116 / 5,748	52 / 1,730	104 / 4,200

* small effect size $0.20 \leq h < 0.50$; ** medium effect size $0.50 \leq h < 0.80$.

†Chronic obstructive pulmonary disease.

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Table 3, continued
Chronic Conditions at Baseline

		White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/Multiracial N=4,304
Diabetes	Yes	44,903 (15.9%)	6,247 (29.3%)*	4,622 (25.5%)*	1,148 (19.9%)	390 (22.4%)	927 (21.9%)
	No	238,317 (84.1%)	15,086 (70.7%)	13,508 (74.5%)	4,622 (80.1%)	1,351 (77.6%)	3,309 (78.1%)
	Missing/Total	4,610 / 283,220	435 / 21,333	326 / 18,130	94 / 5,770	41 / 1,741	68 / 4,236
GI Problems†	Yes	14,540 (5.2%)	747 (3.6%)	1,034 (5.8%)	166 (2.9%)	119 (6.9%)	231 (5.5%)
	No	266,371 (94.8%)	20,224 (96.4%)	16,840 (94.2%)	5,547 (97.1%)	1,607 (93.1%)	3,960 (94.5%)
	Missing/Total	6,919 / 280,911	797 / 20,971	582 / 17,874	151 / 5,713	56 / 1,726	113 / 4,191
High Blood Pressure	Yes	151,030 (53.3%)	15,526 (72.6%)*	9,611 (53.1%)	3,189 (55.3%)	989 (56.6%)	2,392 (56.4%)
	No	132,359 (46.7%)	5,862 (27.4%)	8,502 (46.9%)	2,580 (44.7%)	759 (43.4%)	1,849 (43.6%)
	Missing/Total	4,441 / 283,389	380 / 21,388	343 / 18,113	95 / 5,769	34 / 1,748	63 / 4,241
Myocardial Infarction	Yes	31,462 (11.2%)	1,955 (9.3%)	1,616 (9.0%)	327 (5.7%)*	286 (16.6%)	506 (12.0%)
	No	248,855 (88.8%)	19,074 (90.7%)	16,316 (91.0%)	5,408 (94.3%)	1,435 (83.4%)	3,699 (88.0%)
	Missing/Total	7,513 / 280,317	739 / 21,029	524 / 17,932	129 / 5,735	61 / 1,721	99 / 4,205
Other Heart Conditions	Yes	62,102 (22.1%)	4,503 (21.4%)	2,930 (16.3%)	805 (14.1%)*	422 (24.5%)	894 (21.4%)
	No	219,052 (77.9%)	16,574 (78.6%)	15,037 (83.7%)	4,914 (85.9%)	1,302 (75.5%)	3,288 (78.6%)
	Missing/Total	6,676 / 281,154	691 / 21,077	489 / 17,967	145 / 5,719	58 / 1,724	122 / 4,182
Sciatica	Yes	61,392 (21.8%)	4,864 (23.1%)	4,048 (22.6%)	834 (14.6%)	405 (23.3%)	880 (21.0%)
	No	220,100 (78.2%)	16,207 (76.9%)	13,880 (77.4%)	4,879 (85.4%)	1,333 (76.7%)	3,309 (79.0%)
	Missing/Total	6,338 / 281,492	697 / 21,071	528 / 17,928	151 / 5,713	44 / 1,738	115 / 4,189
Stroke	Yes	22,955 (8.2%)	2,231 (10.5%)	1,482 (8.2%)	386 (6.7%)	232 (13.4%)	438 (10.4%)
	No	258,503 (91.8%)	18,954 (89.5%)	16,507 (91.8%)	5,357 (93.3%)	1,501 (86.6%)	3,769 (89.6%)
	Missing/Total	6,372 / 281,458	583 / 21,185	467 / 17,989	121 / 5,743	49 / 1,733	97 / 4,207

* small effect size $0.20 \leq h < 0.50$; ** medium effect size $0.50 \leq h < 0.80$.

† Crohn's disease, ulcerative colitis, inflammatory bowel disease.

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**Table 4
 Risk Factors at Baseline**

	White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/ Multiracial N=4,304
Smoking Status						
Smoker	31,494 (11.4%)	3,014 (13.8%)	1,821 (10.7%)	442 (8.0%)	287 (16.1%)	511 (12.5%)
Non-Smoker	119,213 (43.3%)	9,620 (44.2%)	9,200 (54.2%)*	3,337 (60.2%)*	684 (41.0%)	1,857 (45.6%)
Ex-Smoker	124,806 (45.3%)	7,301 (36.6%)	5,958 (35.1%)*	1,761 (31.8%)*	698 (41.8%)	1,705 (41.9%)
Missing/Total	12,317 / 275,513	1,833 / 19,935	1,477 / 16,979	324 / 5,540	113 / 1,669	231 / 4,073
Depression Screen						
Negative	210,293 (74.3%)	13,773 (64.8%)	11,593 (64.1%)	4,470 (77.6%)	1,100 (63.2%)	2,741 (65.3%)
Positive	72,573 (25.7%)*	7,466 (35.2%)*	6,487 (35.9%)*	1,288 (22.4%)*	641 (36.8%)*	1,459 (34.7%)*
Missing/Total	4,964 / 282,866	529 / 21,239	376 / 18,080	106 / 5,758	41 / 1,741	104 / 4,200
Clinical Symptoms§						
Back Pain	76,393 (26.5%)	7,357 (33.8%)	5,991 (32.5%)	1,367 (23.3%)*	649 (36.4%)*	1,316 (30.6%)
Chest Pain/Exercise	4,824 / 287,830	430 / 21,768	394 / 18,456	126 / 5,864	37 / 1,782	69 / 4,304
Chest Pain/Resting	29,635 (10.3%)	3,874 (17.8%)*	2,970 (16.1%)	545 (9.3%)*	337 (18.9%)*	639 (14.9%)
Missing/Total	4,307 / 287,830	476 / 21,768	281 / 18,456	75 / 5,864	26 / 1,782	92 / 4,304
SOB †† /Lying Down Flat	15,126 (5.3%)*	2,570 (11.8%)*	1,819 (9.9%)*	291 (5.0%)*	213 (12.0%)*	381 (8.9%)
SOB/Sitting or Resting	2,867 / 287,830	323 / 21,768	205 / 18,456	28 / 5,864	28 / 1,782	58 / 4,304
Missing/Total	23,101 (8.0%)*	3,509 (16.1%)*	2,334 (12.7%)*	356 (6.1%)*	332 (18.6%)*	541 (12.6%)*
SOB/Walking < One Block	19,317 (6.7%)*	2,822 (13.0%)*	1,811 (9.8%)*	289 (4.9%)*	33 / 1,782	75 / 4,304
Missing/Total	3,511 / 287,830	452 / 21,768	294 / 18,456	66 / 5,864	34 / 1,782	67 / 4,304
SOB/Climb Stairs	50,062 (17.4%)*	5,612 (25.8%)*	3,536 (19.2%)*	617 (10.5%)*	499 (28.0%)*	934 (21.7%)*
Missing/Total	4,348 / 287,830	449 / 21,768	287 / 18,456	67 / 5,864	33 / 1,782	91 / 4,304
Numbness in Feet	67,840 (23.6%)*	6,811 (31.3%)*	4,928 (26.7%)*	879 (15.0%)*	571 (32.0%)*	1,115 (25.9%)*
Missing/Total	5,652 / 287,830	488 / 21,768	372 / 18,456	86 / 5,864	58 / 1,782	135 / 4,304
Ankles/Legs that Swell	44,366 (15.4%)*	5,967 (27.4%)*	3,989 (21.6%)*	792 (13.5%)*	437 (24.5%)*	901 (20.9%)*
Missing/Total	3,106 / 287,830	336 / 21,768	219 / 18,456	59 / 5,864	31 / 1,782	65 / 4,304
Tingling/Burning in Feet	61,887 (21.5%)*	6,923 (31.8%)*	4,526 (24.5%)*	825 (14.1%)*	528 (29.6%)*	1,107 (25.7%)*
Missing/Total	2,319 / 287,830	244 / 21,768	204 / 18,456	54 / 5,864	28 / 1,782	46 / 4,304
Decreased feeling to Hot/Cold	45,932 (16.0%)*	5,524 (25.4%)*	4,055 (22.0%)*	778 (13.3%)*	422 (23.7%)*	826 (19.2%)*
Missing/Total	2,925 / 287,830	341 / 21,768	246 / 18,456	73 / 5,864	30 / 1,782	62 / 4,304
Sores/Wounds don't Heal	24,080 (8.4%)*	3,534 (16.2%)*	2,603 (14.1%)*	475 (8.1%)*	283 (15.9%)*	588 (13.7%)*
Missing/Total	3,478 / 287,830	457 / 21,768	319 / 18,456	81 / 5,864	45 / 1,782	89 / 4,304
Shortness of Breath	7,039 (2.5%)*	788 (3.6%)*	839 (4.6%)*	221 (3.8%)*	95 (5.3%)*	183 (4.3%)*
Missing/Total	2,441 / 287,830	292 / 21,768	208 / 18,456	60 / 5,864	20 / 1,782	49 / 4,304

* small effect size 0.20 ≤ h < 0.50; ** medium effect size 0.50 ≤ h < 0.80.
 § Percentage of beneficiaries who reported some of the time, most of the time, or all of the time to pain, shortness of breath and peripheral neuropathy questions.
 †† Shortness of Breath.

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Table 5
Mean Unadjusted SF-36® Scores at Baseline

	White	African American	Hispanic	Asian/Pacific Islander	American Indian/Alaskan Native	Other/ Multiracial
	N=287,830 Mean (SD)	N=21,768 Mean (SD)	N=18,456 Mean (SD)	N=5,864 Mean (SD)	N=1,782 Mean (SD)	N=4,304 Mean (SD)
Physical Component Summary Score (PCS)	42.7 (11.5)	40.5 (11.1)	42.5 (11.3)	44.9 (10.5)	40.4 (11.9) *	42.0 (11.5)
Mental Component Summary Score (MCS)	52.0 (10.3)	50.3 (10.9)	49.6 (11.5) *	52.2 (9.6)	49.9 (11.6) *	50.9 (10.9)
Scale Scores						
Physical Functioning Scale	41.5 (12.3)	38.5 (12.5) *	40.8 (12.5)	43.3 (11.8)	38.5 (12.9) *	40.6 (12.7)
Role-Physical Scale	44.0 (12.3)	42.4 (12.4)	43.4 (12.5)	46.1 (12.1)	42.1 (12.3)	43.4 (12.2)
Bodily Pain Scale	46.9 (11.1)	45.2 (11.9)	45.9 (12.0)	49.2 (10.7) *	45.0 (12.2)	46.1 (11.9)
General Health Scale	46.9 (10.3)	43.6 (10.3) *	45.0 (10.9)	47.0 (9.8)	44.0 (11.3) *	45.6 (10.5)
Vitality Scale	49.5 (10.8)	49.3 (10.4)	50.0 (11.0)	52.3 (9.3) *	48.0 (11.4)	49.5 (11.1)
Social Functioning Scale	48.1 (11.4)	45.6 (12.0) *	45.9 (12.1)	48.3 (10.7)	45.4 (12.5) *	46.6 (11.9)
Role-Emotional Scale	47.8 (12.0)	44.5 (13.2) *	45.0 (13.4) *	48.2 (12.1)	45.2 (13.1) *	46.5 (12.6)
Mental Health Scale	51.1 (10.2)	49.7 (10.9)	48.9 (11.6) *	51.4 (9.4)	48.9 (11.9) *	50.0 (11.1)

Note: Normed to the 1998 general population. Ware, Snow, Kosinski and Gandek (1993).

* small effect size $0.20 \leq g < 0.50$; ** medium effect size $0.50 \leq g < 0.80$.

Table 6
Mean Unadjusted SF-36® Change Scores From Baseline to Follow Up

	White N=287,830	African American N=21,768	Hispanic N=18,456	Asian/Pacific Islander N=5,864	American Indian/ Alaskan Native N=1,782	Other/ Multiracial N=4,304
Physical Component						
Summary Score (PCS)	-1.81	-1.43	-1.57	-1.48	-2.00	-1.55
Mental Component						
Summary Score (MCS)	-0.80	-0.82	-1.01	-0.84	-0.48	-0.94
Scale Scores						
Physical Functioning Scale	-2.17	-1.75	-1.82	-1.82	-2.25	-2.12
Role-Physical Scale	-1.78	-1.65	-1.66	-1.71	-2.06	-1.92
Bodily Pain Scale	-1.05	-0.93	-1.15	-1.02	-0.92	-0.66
General Health Scale	-1.37	-0.95	-1.35	-1.00	-0.96	-0.77
Vitality Scale	-1.46	-1.05	-1.35	-1.40	-1.44	-1.39
Social Functioning Scale	-1.60	-1.31	-1.42	-1.26	-1.86	-1.71
Role-Emotional Scale	-1.32	-1.38	-1.43	-1.48	-1.37	-1.49
Mental Health Scale	-0.67	-0.75	-0.96	-0.63	-0.91	-0.64

Note: Normed to the 1998 general population. Ware, Snow, Kosinski and Gandek (1993).
 * small effect size $0.20 \leq g < 0.50$; ** medium effect size $0.50 \leq g < 0.80$.

Table 7
Predictive Model of Probability of Being Healthy at Follow Up ‡‡
Demographics Only
N=131,835

	DF	Parameter Estimate	Standard Error	t Value	p Value	Partial R ²
Intercept	1	131.21	0.856	153.23	<0.0001	
African American	1	-1.621	0.322	-5.03	<0.0001	0.00158
Hispanic	1	2.953	0.326	9.02	<0.0001	0.00005
Asian	1	5.520	0.475	11.61	<0.0001	0.00082
American Indian/Alaskan Native	1	-2.822	1.011	-2.79	0.005	0.00015
Other Race/Multiracial	1	-0.953	0.633	-1.50	0.132	0.00007
Missing Income	1	-4.245	0.284	-14.92	<0.0001	0.00012
<\$10,000	1	-10.089	0.321	-31.39	<0.0001	0.01536 *
\$10,000 - \$19,999	1	-8.747	0.275	-31.76	<0.0001	0.01674 *
\$20,000 to \$29,999	1	-5.826	0.277	-21.02	<0.0001	0.00586 *
\$30,000 to \$49,999	1	-2.931	0.274	-10.69	<0.0001	0.00173
8th Grade or Less	1	-4.851	0.294	-16.51	<0.0001	0.00791 *
Some High School	1	-5.215	0.247	20.26	<0.0001	0.00345
High School Graduate	1	-3.136	0.221	-14.17	<0.0001	0.00093
Some College	1	-2.612	0.233	-11.21	<0.0001	0.00114
Age	1	-0.783	0.011	-69.59	<0.0001	0.0507 *
Female	1	-1.689	0.146	-11.59	<0.0001	0.00051
Proxy Respondent	1	-10.923	0.223	-48.88	<0.0001	0.01892 *
Divorced/Separated	1	0.252	0.251	1.01	0.3144	0.00005
Widowed	1	1.320	0.174	7.60	<0.0001	0.00029
Never Married	1	2.343	0.418	5.61	<0.0001	0.00018
Receive Medicaid	1	-9.291	0.424	-21.91	<0.0001	0.00349

‡‡ deceased included.

*effect size criterion ≥ 0.005 ; adjusted R^2 for entire model = 0.13.

Table 8
Predictive Model of Probability of Being Healthy at Follow Up ††
Demographics, Smoking, Depression, and Comorbidities
N=131,835

	DF	Parameter Estimate	Standard Error	t Value	p Value	Partial R ²
Intercept	1	126.718	0.789	160.47	<0.0001	
African American	1	-0.026	0.297	-0.09	0.931	0.00151
Hispanic	1	2.231	0.301	7.41	<0.0001	0.00006
Asian	1	2.962	0.433	6.84	<0.0001	0.00086
American Indian/Alaskan Native	1	0.058	0.928	0.06	0.9501	0.00013
Other Race/Multiracial	1	-0.018	0.577	-0.03	0.9745	0.00008
Missing Income	1	-3.248	0.257	-12.63	<0.0001	0.00013
<\$10,000	1	-6.922	0.292	-23.68	<0.0001	0.01540 *
\$10,000 - \$19,999	1	-5.713	0.249	-22.94	<0.0001	0.01679 *
\$20,000 to \$29,999	1	-3.974	0.249	-15.91	<0.0001	0.00609 *
\$30,000 to \$49,999	1	-1.828	0.247	-7.41	<0.0001	0.00170
8th Grade or Less	1	-2.685	0.268	-10.01	<0.0001	0.00821 *
Some High School	1	-2.983	0.234	-12.74	<0.0001	0.00344
High School Graduate	1	-2.202	0.199	-11.01	<0.0001	0.00097
Some College	1	-1.426	0.219	-6.78	<0.0001	0.00120
Age	1	-0.553	0.010	-52.75	<0.0001	0.05053 *
Female	1	-1.798	0.133	-13.56	<0.0001	0.00053
Proxy Respondent	1	-6.093	0.207	-29.45	<0.0001	0.01891 *
Divorced/Separated	1	1.094	0.229	4.78	0.3144	0.00005
Widowed	1	1.981	0.159	12.48	<0.0001	0.00026
Never Married	1	1.255	0.381	3.27	0.0011	0.00018
Receive Medicaid	1	-4.998	0.390	-12.81	<0.0001	0.00349
Smoker	1	-2.082	0.194	-10.73	<0.0001	0.00045
Positive Depression Screen	1	-4.637	0.146	-31.66	<0.0001	0.02871 *
Sum of 12 Comorbidities	1	-6.221	0.038	-162.67	<0.0001	0.15868 *

†† deceased included.

*effect size criterion ≥ 0.005 ; adjusted R^2 for entire model = 0.32.