



## **MEDICARE HEALTH OUTCOMES SURVEY**

# **THE RELATIONSHIP BETWEEN HEALTH STATUS, UTILIZATION, AND EXPENDITURES: COMPARISON BETWEEN MEDICARE MANAGED CARE AND FEE-FOR-SERVICE BENEFICIARIES**

**FINAL REPORT**  
**Deliverable for Task 5.30a**

**PREPARED BY HEALTH SERVICES ADVISORY GROUP**  
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## TABLE OF CONTENTS

	<b><u>PAGE</u></b>
EXECUTIVE SUMMARY.....	1
1. INTRODUCTION .....	4
2. METHODOLOGY .....	7
3. RESULTS .....	13
4. DISCUSSION .....	28
5. LIMITATIONS.....	33
6. REFERENCES .....	35
7. APPENDIX .....	39

## LIST OF TABLES AND FIGURES

		<u>PAGE</u>
TABLE 1	MEAN PCS AND MCS SCORES BY DEMOGRAPHIC, SELF-REPORTED UTILIZATION, AND RATINGS OF CARE AMONG FFS AND MANAGED CARE MEDICAL SAMPLE BENEFICIARIES .....	40
FIGURES 1-30	DEMOGRAPHIC INFORMATION BY MEAN PCS AND MCS SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	42
TABLE 2	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND PIP-DCG RISK SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	50
FIGURES 31-33	PIP-DCG RISK SCORES AND PCS AND MCS SCORE COMPARISONS BETWEEN MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	53
TABLE 3	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND LIKELIHOOD OF ANY HOSPITALIZATIONS IN THE LAST 12 MONTHS FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	54
FIGURES 34-36	HOSPITALIZATIONS AND PCS AND MCS SCORE COMPARISONS BETWEEN MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	56
TABLE 4	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND THE FREQUENCY OF VISITS TO DOCTOR’S OFFICE OR CLINIC FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	57
FIGURES 37-39	DOCTOR OR CLINIC OFFICE VISITS AND PCS AND MCS SCORE COMPARISONS BETWEEN MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	60
TABLE 5	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND THE FREQUENCY OF SPECIALIST VISITS FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	61

FIGURES 40-41	SPECIALIST VISITS AND PCS AND MCS SCORE COMPARISONS BETWEEN MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	64
TABLE 6	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND THE RATING OF DOCTOR OR NURSE FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	65
FIGURES 42-48	RATING OF DOCTOR OR NURSE AND PCS AND MCS SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	68
TABLE 7	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND THE RATING OF SPECIALIST FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	70
FIGURES 49-55	RATING OF SPECIALIST AND PCS AND MCS SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	72
TABLE 8	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND THE RATING OF HEALTH CARE FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	74
FIGURES 56-62	RATING OF HEALTH CARE AND PCS AND MCS SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	77
TABLE 9	ESTIMATES OF THE RELATIONSHIP BETWEEN PCS AND MCS SCORES AND RATING OF HEALTH PLAN FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES .....	79
FIGURES 63-69	RATING OF HEALTH PLAN AND PCS AND MCS SCORES FOR MEDICARE FFS AND MANAGED CARE BENEFICIARIES.....	84
TABLE 10	COMPARISON OF DEMOGRAPHIC CHARACTERISTICS BETWEEN MEDICARE MANAGED CARE CAHPS TOTAL SURVEY SAMPLE AND THE MANAGED CARE ANALYTIC SAMPLE .....	86
TABLE 11	COMPARISON OF SELF-REPORTED UTILIZATION AND EXPERIENCE WITH CARE RATINGS BETWEEN MEDICARE MANAGED CARE CAHPS TOTAL SURVEY SAMPLE AND THE MANAGED CARE ANALYTIC SAMPLE .....	87

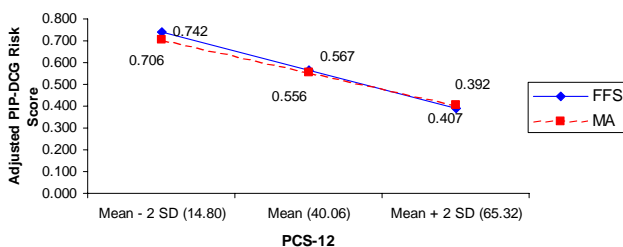
## EXECUTIVE SUMMARY

As the primary payor for beneficiary health services in the United States, it is important to the Centers for Medicare & Medicaid Services (CMS) that managed care and Fee-For-Service (FFS) beneficiaries have the “...best possible health outcomes and quality of life” (Straube, 2006). To help support this mission, the current report examines possible differences in the relationship between health status, health expenditures, utilization of services, and experiences with care between Medicare FFS and managed care (Medicare Advantage [MA]) beneficiaries.

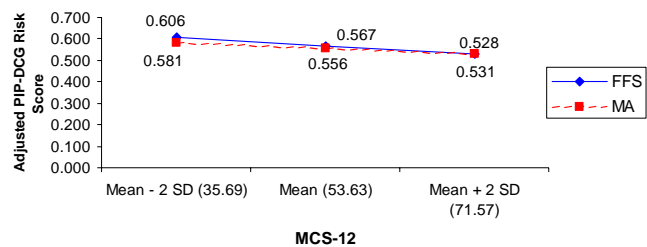
Using CMS data for FFS and managed care beneficiaries, we examined health status as it relates to expenditures, health service usage, and experiences with care using a sample of 82,224 FFS beneficiaries and a sample of 17,901 managed care beneficiaries. Health expenditures are defined as the Principal Inpatient Diagnostic Cost Group Model for Medicare Risk Adjustment (PIP-DCG) score. Hospitalizations and visits to a doctor’s or specialist’s office are assessed using data from the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey. We also examined beneficiaries’ experiences with their doctor or nurse, specialist, health care, and health plan using the CAHPS survey.

The analytic strategies for comparing beneficiaries in managed care and FFS included ordinary least squares regression, logistic regression, and multinomial or polytymous logistic regression. The overall physical component summary (PCS) mean score across the study sample is 40.1 and the mental component summary (MCS) mean score is 53.6. As expected, higher expenditures (as measured by the PIP-DCG risk score) are associated with lower PCS and MCS scores, with small but statistically significant differences between managed care and FFS. FFS beneficiaries have slightly higher PIP-DCG risk scores at lower levels of physical and mental health than managed care beneficiaries. The 3.6 percent and 2.5 percent differences in PIP-DCG risk scores translated into \$205 and \$142 lower expenditures per person per year in 2000 dollars in managed care beneficiaries relative to FFS beneficiaries at low levels of PCS and MCS scores, respectively. The graphs below summarize these relationships for PCS and MCS scores and adjusted PIP-DCG scores.

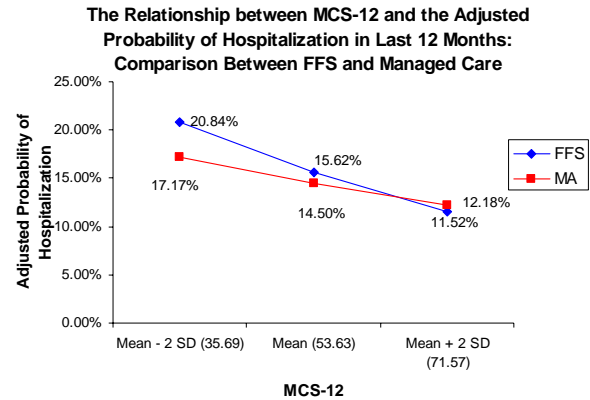
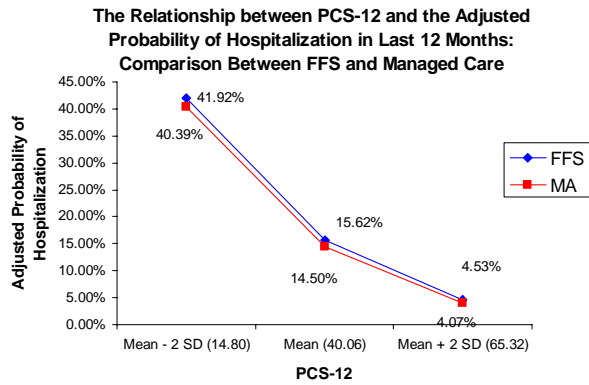
The Relationship between PCS-12 and Adjusted PIP-DCG Risk Scores: Comparison Between FFS and Managed Care



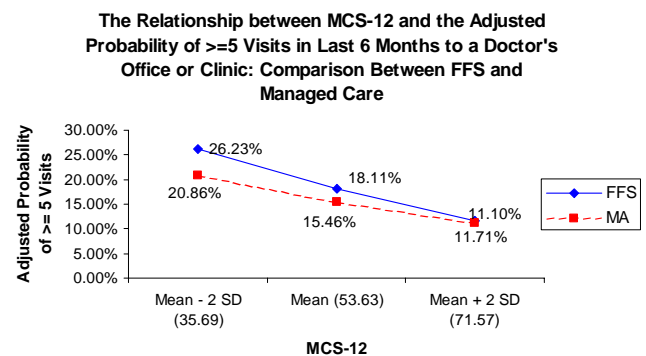
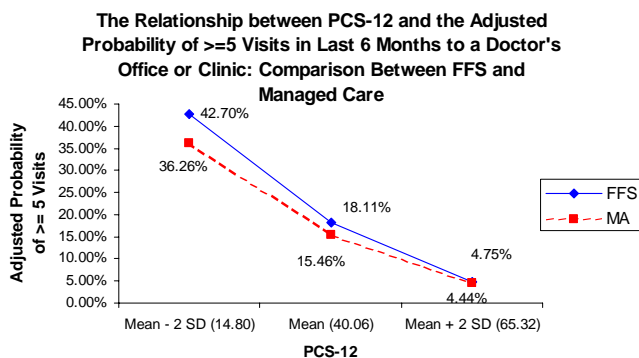
The Relationship between MCS-12 and Adjusted PIP-DCG Risk Scores: Comparison Between FFS and Managed Care



The likelihood of having any hospitalizations does not differ between FFS and managed care beneficiaries for physical health status. However, for mental health status there is a statistically and substantively significant difference between FFS and managed care beneficiaries. At low levels of mental health, the adjusted probability of hospitalizations for FFS beneficiaries is 20.84 percent, and for managed care beneficiaries, the adjusted probability is 17.17 percent. The relationship between PCS and MCS scores and the adjusted probability of hospitalizations in the last twelve months is summarized below.

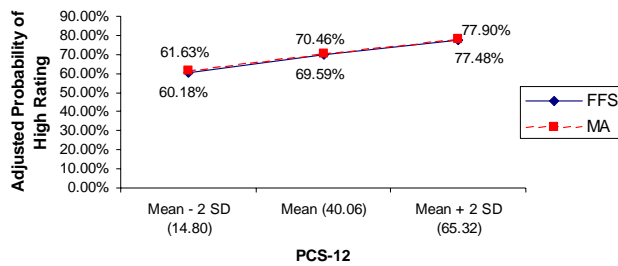


Significant differences were found between the frequency of FFS and managed care beneficiaries' visits to doctors' offices or clinics at lower levels of physical and mental health. The adjusted probability of five or more doctor office visits at low levels of physical health for FFS beneficiaries is 42.70 percent and for managed care beneficiaries, the adjusted probability is 36.26 percent. The adjusted probability of five or more visits to a doctor's office or clinic for FFS beneficiaries is 26.23 percent and for managed care the adjusted probability is 20.86 percent at low levels of mental health (see graphs below).

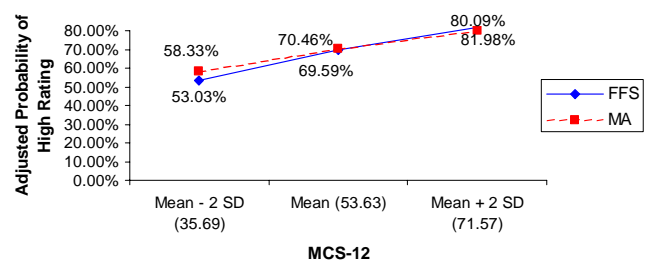


The results of the four global ratings of experiences with care (doctor/nurse, specialist, health care, and health plan) on a 0-10 scale by Medicare beneficiaries consistently indicate that lower levels of physical and mental health are associated with the likelihood of low (0-5) ratings, and that managed care beneficiaries have a significantly higher probability of providing low ratings when compared to FFS beneficiaries. Generally, PCS and MCS scores influence ratings of doctor/nurse, specialist, and health plan similarly across FFS and managed care beneficiaries. However, MCS scores affect ratings of health care differently in FFS than in managed care, especially at lower levels of MCS scores. Moreover, the differences between FFS and managed care beneficiaries vary between high, moderate, and low ratings. At low levels of MCS scores, the managed care beneficiaries have a higher probability of providing both high and low ratings of health care but have a lower probability of providing moderate ratings of health care than the FFS beneficiaries. The graphs below illustrate the relationship between physical and mental health, and the adjusted probability of high (9-10), moderate (6-8), and low (0-5) ratings of health care for FFS and managed care enrollees.

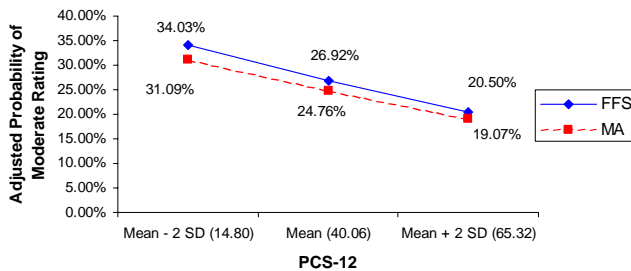
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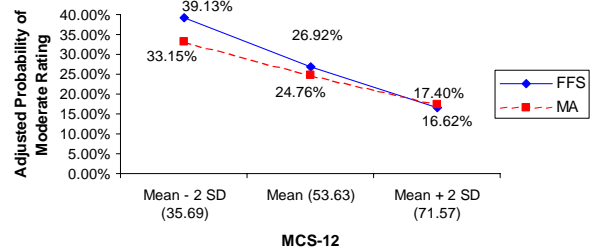
**Relationship between MCS-12 and Adjusted Probability of High Rating of Health Care (9-10): Comparison Between FFS and Managed Care**



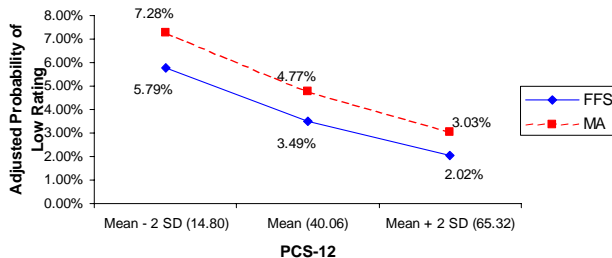
**Relationship between PCS-12 and Adjusted Probability of Moderate Rating of Health Care (6-8): Comparison Between FFS and Managed Care**



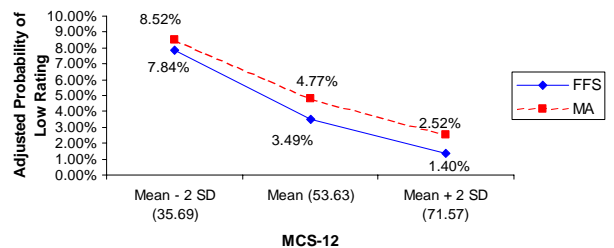
**Relationship between MCS-12 and Adjusted Probability of Moderate Rating of Health Care (6-8): Comparison Between FFS and Managed Care**



**The Relationship between PCS-12 and the Adjusted Probability of Low Rating of Health Care (0-5): Comparison Between FFS and Managed Care**



**The Relationship between MCS-12 and the Adjusted Probability of Low Rating of Health Care (0-5): Comparison Between FFS and Managed Care**



# 1

## INTRODUCTION

In this report, Health Services Advisory Group (HSAG) examines possible differences in the relationship between physical and mental health status, health expenditures, utilization of health services, and experiences with care between beneficiaries in the Medicare managed care (Medicare Advantage [MA]) and Fee-For-Service (FFS) populations. Under the direction of the Centers for Medicare & Medicaid Services (CMS), data were used from the Medicare Health Outcomes Survey (HOS), the Medicare Consumer Assessment of Healthcare Providers and Systems (CAHPS<sup>®1</sup>) Managed Care Enrollee and Disenrollee Surveys, and the CAHPS FFS Survey. The following sections briefly review literature on health status, expenditures, utilization, and experiences with care.

### HEALTH STATUS, EXPENDITURES, AND UTILIZATION

Though there is extensive literature regarding health status, health care expenditures, and utilization for Medicare beneficiaries, this literature tends to focus on specific clinical conditions and targeted outcomes such as hospital length of stay, physician visits, hospital admission, and use of expensive resources (Miller & Luft, 2002). For example, falls (Rizzo et al., 1998) and depression (Burns et al., 2001) have been related to increased utilization and costs. Pneumonia, influenza (Hebert et al., 2005), and renal failure (Fischer et al., 2005) have been related to hospital resource utilization. Chronic conditions were the focus of a Veterans Administration (VA) study of elderly veterans and found to be strongly related to cost, more so than age (Yu et al., 2004).

Fewer studies have examined differences in self-reported health status, expenditures, and utilization between managed care and FFS beneficiaries. Indeed, researchers have recently demonstrated that self-reported health status may be more important than medical record or claims data in predicting medical expenditures (Fleishman et al., 2006; Pacala et al., 2003). For example, in research on health and health care spending among the elderly, results indicate that non-institutionalized elderly persons who had better health (self-reported health was assessed as impaired functional abilities and a single general health question) had similar cumulative health care expenditures compared to those in poorer health (Lubitz et al., 2003). Using the first year of available inpatient encounter data in the Medicare+Choice program, Greenwald et al. (2000) examined difference between FFS and managed care beneficiaries by county, and found only four counties in which the managed care population had higher risk factors than the FFS population. The authors conclude that there is favorable selection in managed care toward enrollees who are predicted to be less costly.

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<sup>1</sup> CAHPS<sup>®</sup> is a registered trademark of the Agency for Healthcare Research and Quality.



Several studies of veterans have examined self-reported health status and health care utilization. A single-item health question and the Medical Outcomes Study (MOS) SF-36 were used to predict mortality and health care utilization with a sample of veterans. The authors found that a single-item health question was comparable to longer health measurements, such as the SF-36 (DeSalvo et al., 2005). Another Veterans Administration (VA) study examined health status and health service usage for 7,702 veterans from seven VA medical centers, and found a strong association for physical and mental component summary (PCS/MCS) scores and the number of hospitalizations and mortality. For each five-point decrease in baseline PCS scores, the odds ratio (OR) for death increased by 1.27, and for hospitalizations the OR increased by 1.19. For MCS scores and a five-point decrease, the OR was 1.08 and 1.07, respectively (Fan et al., 2004). A recent VA study assessed mortality, hospitalization, and outpatient utilization for patients with chronic obstructive pulmonary disease and asthma. Using PCS quartiles, the odd ratios (ORs) for death, hospitalizations, high primary care visits, and high specialty medicine visits were significant. The MCS score was predictive of death, but not related to hospitalizations or high outpatient utilization (Sprenkle, 2004). Additionally, a recent study used the SF-12<sup>®</sup> (Ware et al., 1998) to predict medical expenditures. Using data from the Medical Expenditure Panel Study and data from provider records, the authors found that adding the SF-12 to regression models improved the prediction of subsequent expenditures (Fleishman et al., 2006). Using the Medicare Current Beneficiary Survey (MCBS), Bierman et al (1999) found the responses to a single question about general health status significantly predicts subsequent health care utilization among noninstitutionalized Medicare beneficiaries aged 65 or older.

This brief literature review indicates that researchers are investigating self-reported health status measures as they relate to utilization and expenditures. However, typically this research has not focused on differences between managed care and FFS beneficiaries. For example, research has examined MA market share and FFS expenditures (Keating et al., 2006). Additionally, HMO plan performance has been compared to non-HMO performance (Miller & Luft, 2002) with findings that indicate HMOs use fewer and less expensive resources than FFS. Other research has focused on specific clinical conditions and utilization. For example, Medicare HMO penetration was significantly associated with ischemic stroke death that occurred in nursing homes and residences, instead of hospitals (Bian et al., 2006). However, little research has been conducted on differences between FFS and managed care, which has included overall self-reported health status as it relates to utilization and expenditures.

## **HEALTH STATUS AND BENEFICIARY EXPERIENCES WITH CARE**

The final focus of the current research involves beneficiaries' evaluations of their health care. Though literature exists on beneficiaries' health status and experiences with care, various health status measures are used, which make comparisons across studies difficult. A recent study of Medicare managed care beneficiaries examined the impact of chronic conditions and experiences with care. Using satisfaction with care and health status (two or more impaired activities of daily living [ADLs] and a single health question), from the MCBS, FFS and managed care beneficiaries were compared. FFS enrollees were more satisfied with their care for most chronic conditions compared to managed care enrollees (Pourat et al., 2006). The general health question

from the CAHPS survey was used to analyze the quality of health plan care for sick and healthy MA beneficiaries (Zaslavsky & Cleary, 2002). In this study, enrollee health differentiated several dimensions of health plan performance related to direct medical care. Elliott et al. (2005) conducted a national analysis of 610,231 MA and 220,584 FFS beneficiaries in counties where both MA and FFS systems were available during the years 2000-2003 and found that beneficiary ratings and reports were higher for beneficiaries with better self-reported health in both MA and FFS. Among beneficiaries in “fair” or “poor” self-rated health, FFS beneficiaries had more favorable ratings and reports than MA beneficiaries. In another study using structural equation modeling, a causal relationship between better health and greater satisfaction with care was suggested for HMO frail elderly beneficiaries (Hall et al., 1993); health status was measured using four of the 12 scales from the Sickness Impact Profile (Bergner et al., 1981). A study that used the Community Tracking Survey to examine how managed care patient protection laws relate to health services utilization and patient experiences with health care found that overall, higher levels of physical and mental health as measured by the SF-12<sup>®</sup> (Ware et al., 1998) are related to positive experiences with doctors, and that older persons tend to be more satisfied with their care compared to the non-elderly (Sloan et al., 2005). This age effect has also been found in CAHPS research (Elliott et al., 2001; Landon et al., 2001; Zaslavsky et al., 2001; Zaslavsky et al., 2000).

Little research has been conducted to specifically examine differences in PCS and MCS scores relative to experiences with care between managed care and FFS beneficiaries. Task 5.30a provides the opportunity to explore how differences in health status impact experiences with care, as well as utilization and expenditures. The following section of this report details the methodology used to answer these questions and examines differences for managed care and FFS beneficiaries.

## 2

## METHODOLOGY

### DATA SOURCES

The data utilized in the study were obtained from CMS. The data consisted of self-reported health status measures, claims-based risk scores, self-reported health care utilization, and ratings of care, which were derived from five national surveys of Medicare beneficiaries. These surveys were conducted in 2000, and the claims and encounter data were collected from the period of July 1, 1998, to June 30, 1999. The five national surveys are:

- 2000 Cohort 1 Follow Up Medicare HOS
- 2000 Cohort 3 Baseline Medicare HOS
- 2000 MA CAHPS Enrollee Survey
- 2000 MA CAHPS Disenrollee Assessment Survey
- 2000 FFS CAHPS Survey

The following section describes the data sources in more detail.

### MEDICARE HEALTH OUTCOMES SURVEY

Beginning in 1998 and continuing annually, an HOS baseline cohort is created from a random sample of 1,000 members per plan from MA plans in the United States. In plans with fewer than 1,000 Medicare members, the sample consists of the entire enrolled Medicare population that meets the inclusion criteria. The HOS has a longitudinal design, and each cohort has a two-year follow-up remeasurement. Medicare beneficiaries who are continuously enrolled in a given health plan for at least six months are eligible for sampling. Also, beneficiaries who are institutionalized, nursing home residents, or disabled under age 65 are eligible for inclusion, but those with end stage renal disease are excluded. Beneficiaries are excluded from follow up two years later if they disenrolled from their plan (voluntarily disenrolled), if their plan no longer has a contract in place at the time of follow up (involuntarily disenrolled), or for reason of death. The data collection protocol includes a combination of multiple mailings and telephone follow up for non-respondents over a period of approximately four months. CMS contracts with the National Committee for Quality Assurance (NCQA) for the administration of the HOS. NCQA oversees the data collection activities for the Health Plan Employer Data and Information Set (HEDIS®).<sup>2</sup>

The 2000 HOS instrument consists of a 36-item health survey, as well as additional demographic and health-related questions. Physical and mental functioning and well-being are measured with the PCS and MCS scores. These scores are calculated using the following scales: general health,

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<sup>2</sup> HEDIS® is a registered trademark of the National Committee for Quality Assurance.

mental health, physical functioning, role-emotional, social functioning, role-physical, bodily pain, and vitality. A higher PCS or MCS score reflects better health status. For this study, the 12-item health survey was extracted from the 36-item health survey from which PCS and MCS scores were calculated. Demographic and other background information in the HOS includes gender, age, race, marital status, education, annual household income, homeowner status, Medicaid enrollment, smoking status, the presence or absence of selected chronic conditions, and other negative health symptoms. The complete data collection protocol can be found in the *HEDIS® Volume 6: Specifications for the Medicare Health Outcomes Survey* (NCQA, 2000).

The *2000 Cohort 1 Follow Up* survey included 89,332 beneficiaries who had completed the *Cohort 1 Baseline* survey, were still alive, and enrolled in their original managed care plan. Of these 89,322 beneficiaries, 65,333 (73.14 percent) returned the survey with sufficient information to calculate PCS-12 and MCS-12 scores. Of the 65,333 enrollees, 61,720 were seniors age 65 or older.

The *2000 Cohort 3 Baseline* survey included a random sample of 298,883 beneficiaries from 275 managed care organizations, including both the aged and disabled. Of the 298,883 beneficiaries, 180,373 (60.35 percent) individuals completed the survey with sufficient information to calculate PCS-12 and MCS-12 scores. Of the 180,373 enrollees, 169,275 were seniors age 65 or older.

## **CAHPS MEDICARE SURVEYS FOR MANAGED CARE AND FEE-FOR-SERVICE**

The purpose of the CAHPS surveys is to provide a standardized system for the measurement and reporting of health plan enrollees' experiences with the care they receive. In 1995, the Agency for Healthcare Research and Quality (AHRQ) funded the development of the original CAHPS survey by a consortium of researchers at Harvard Medical School, RTI, RAND, and Westat. In 1997, CMS began collecting CAHPS survey data from managed care enrollees, and in 2000 data collection was initiated for FFS beneficiaries. CAHPS sampling units were designed to allow comparisons between Medicare managed care plans as well as between managed care and traditional FFS Medicare.

The Medicare CAHPS survey instrument produces scores for four global ratings (health plan, physician or nurse, specialist, and overall care received) and five composite measures. The composite measures are sets of questions ("report" items) grouped together to address a single aspect of care (e.g., getting needed care or getting care quickly). Additionally, the survey asks beneficiaries to indicate how often they visited a doctor's office or clinic, specialist, or emergency room in the past six months and whether they have had any hospitalizations in the last 12 months.

The CAHPS FFS survey also contains questions that measure beneficiaries' health status with PCS and MCS scores based on the SF-12<sup>®</sup> health survey (Ware et al., 1995). In contrast, the CAHPS survey for managed care enrollees does not contain the SF-12<sup>®</sup>. For these beneficiaries, the PCS and MCS scores are obtained using the Medicare HOS. The CAHPS surveys are cross-

sectional and are administered by mail, followed by telephone interviews of beneficiaries who do not respond to the mail questionnaires.

For CAHPS managed care, the reporting unit is comprised of the managed care contract. Within a given reporting unit, a simple random sample of 600 enrollees who had continuous coverage for at least six months and who were not institutionalized at the time of the data collection were selected to participate in the survey. The 2000 sample frame included 216,919 Medicare beneficiaries who were eligible to participate in the survey. Of these 216,919 enrollees, 180,043 (83 percent) completed the survey. For CAHPS FFS beneficiaries, the nation is divided into 280 geographic areas referred to as “geounits.” The geounits are groups of contiguous counties within states (1 to 17 in each state). Within each geounit, a simple random sample of FFS beneficiaries is drawn with the goal of achieving a minimum of 300 completed surveys from beneficiaries in each sampling unit.<sup>3</sup> Beneficiaries were eligible to be included in the survey if they were enrolled in Medicare FFS for at least six months prior to the survey, and resided in the U.S. or Puerto Rico. The 2000 sample frame included 162,130 Medicare beneficiaries. Of these 162,130 individuals, 91,854 (56.7 percent) enrollees had PCS and MCS scores. Of these 91,854 beneficiaries, 82,224 were seniors age 65 or older without end stage renal disease (ESRD).

## **MEDICARE CAHPS MANAGED CARE DISENROLLMENT ASSESSMENT SURVEY**

The Medicare CAHPS Disenrollment Assessment survey was first implemented nationally in 2000 to address the biases that may occur from surveying only current health plan enrollees. The survey contains two components. One component obtains data on beneficiaries’ assessment of their health care experiences when disenrolling from the managed care plan (the Assessment Survey) and the other component examines the beneficiaries’ reasons for disenrolling from the managed care plan (the Reasons Survey). The Medicare CAHPS Disenrollment Assessment Survey component is designed to be combined with the Medicare CAHPS Managed Care Enrollee Survey to produce combined survey estimates of beneficiaries’ experiences. Therefore, the Assessment Survey component was identical in content to the CAHPS Managed Care Enrollee Survey. Both surveys were conducted at about the same time period and required that the beneficiaries have at least six months of continuous coverage to be eligible for the survey.

The 2000 Disenrollment Assessment survey consisted of 22,272 beneficiaries. Beneficiaries who disenrolled because they moved out of the plan service area or whose health plan no longer operated in the service area were considered involuntary disenrollees and were not eligible for the sample. Of the eligible 22,272, 12,208 (54.8 percent) individuals completed a questionnaire.

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<sup>3</sup> An exception is a few geounits that are stratified by county to better match managed care.

## CLAIMS AND ENCOUNTER DATA

The Balanced Budget Act of 1997 mandated Medicare to implement risk-adjusted payment for managed care plans in 2000. As a result, CMS collected inpatient claims and encounter data from managed care plans for use in the calculation of the Principal Inpatient Diagnostic Cost Group (PIP-DCG) risk adjustment score. The PIP-DCG risk score is used as a measure of predicted future Medicare expenditures (Pope et al., 2000). The PIP-DCG model utilized both the principal diagnosis code present on inpatient claims and demographic information in developing an index of predicted future medical expenditures. Beneficiaries without any hospital admissions in the prior year received a PIP-DCG risk score that was calculated based only on demographic data. A PIP-DCG risk factor of 1.00 equaled the national average for predicted Medicare expenditures; a risk factor greater than 1.00 exceeded the predicted average cost (Pope et al., 2000). Recently, however, the hierarchical condition categories (HCC) model was implemented for risk adjustment payments to managed care plans (Pope et al., 2004). The HCC model improved upon the PIP-DCG score, which included only inpatient data.

For this study, the data received from CMS contained 2000 PIP-DCG risk scores for all beneficiaries included in the five national surveys. The PIP-DCG risk scores were calculated based on inpatient claims and encounter data from July 1, 1998, through June 30, 1999, to predict 2000 medical expenditures. The PIP-DCG risk scores served as a proxy for health care expenditures examined in the current study.

## ANALYTIC STRATEGY

The current study was conducted to examine the relationship between health status as measured by PCS and MCS scores, health care expenditures as measured by PIP-DCG risk scores, utilization of health care services as measured by self-reported frequency of visits to doctors offices or specialists in the last six months, and the self-reported presence of any hospitalizations in the last 12 months. Beneficiaries' experiences with care are measured by four global ratings of personal doctors or nurses, specialists, overall care received, and health plan. Self-reported utilization of emergency room visits is not examined in the current study because 74.9 percent and 87.5 percent of FFS and managed care samples, respectively, did not provide a response to this question. Additionally, this study assesses (1) whether health care expenditures, health care utilization, and beneficiary experiences with care differ between FFS and Medicare managed care beneficiaries after controlling for self-reported physical and mental health status and (2) whether the relationship of self-reported physical and mental health status with health care expenditures, health care utilization, and beneficiary experiences with care differs between Medicare FFS and managed care beneficiaries.

To obtain measures of health status, self-reported utilization of health care, and experiences with care for the same Medicare managed care enrollee, the combined *HOS 2000 Cohort 1 Follow Up* and *2000 Cohort 3 Baseline* (237,172 records) were merged with the managed care Enrollee and Disenrollee Assessment Surveys (238,417 records) by health information number. As a result, 19,155 Medicare managed care beneficiaries were matched between CAHPS and HOS surveys.

Of these 19,155 enrollees, 17,920 were seniors age 65 or older. Nineteen individuals were further excluded because the members had ESRD resulting in 17,091 managed care enrollees. The survey data for the 17,901 Medicare managed care beneficiaries were combined with FFS CAHPS Survey data (82,224 beneficiaries) to form an analytic file with 100,125 records.

Descriptive statistics, including frequency distributions of demographic and other background information, were calculated for FFS and managed care samples. Demographic and background characteristics included age group (65-69, 70-74, 75-79, 80-84, 85-89, or 90+), gender, race/ethnicity (non-Hispanic White, non-Hispanic African American, Hispanic, other, unknown), education (8th grade or less, some high school, high school graduate, some college, college graduate, more than a 4 year college degree, unknown), eligibility for Medicaid, proxy respondent status (self-respondent, proxy, unknown), smoking status (a smoker who smoked every day or some days, non-smoker, unknown). Bivariate tests examined differences between the managed care and FFS samples with respect to these characteristics.

Multivariate analysis and models were used to examine the relationship between physical and mental health status and outcome measures, after accounting for individual differences in age, gender, race, education, dual eligibility, proxy status, and smoking status. The differences in the relationship between health status and outcome measures between FFS and managed care were examined by incorporating the dummy indicator variable for system of care (0 = managed care, 1 = FFS) and interaction variables between system of care dummy indicator variable and health status (PCS and MCS). PCS and MCS scores were centered at their means prior to being incorporated into the model to aid in the interpretation of model parameters. The mean PCS and MCS scores across the study sample were 40.1 and 53.6, respectively. It should be noted that the PCS and MCS scores reflect norm-based standardized scores with a mean of 50 and a standard deviation of 10 in the 1990 U.S. general population.

A multiple regression model was used to examine the relationship between PCS, MCS, PIP-DCG risk scores, system of care indicator, demographic characteristics, and other background variables. Logistic regression was used to model the probability of having any hospitalizations (binary outcome) in the last 12 months as a function of PCS, MCS, system of care, demographic characteristics, and other background variables. Multinomial or polytymous logistic regression models were used to model the probability of having a high frequency of office visits or specialist visits (greater than or equal to 5 visits), a moderate frequency of office visits or specialist visits (2-4 visits), and a low frequency of office visits or specialist visits (0-1 visit), as a function of PCS, MCS, system of care, demographic, and other background covariates. The low frequency of visits served as the reference category. Additionally, multinomial or polytymous logistic regression models were used to model the probability of having high ratings of care (9-10), moderate ratings of care (6-8), and low ratings of care (0-5), as a function of PCS, MCS, system of care, demographic, and other background characteristics. The low rating of care served as the reference category. A model was fitted separately for each of the four global ratings.

For each outcome, a series of nested models were fitted to the data. A more complex model included all main effects and all possible two-way interaction effects between explanatory

variables in the model. The likelihood ratio test was used to determine whether dropping two-way interaction effects from a more complex model significantly affected the log likelihood ratio and whether each of the predictor variables was statistically significant. The reduced model and the associated model parameters that best fit the data were used to determine the relationship between health status and the outcome measures, and to determine whether the relationship between health status and the outcome measures differed between FFS and managed care.



# 3

## RESULTS

### DESCRIPTIVE ANALYSES

Table 1 presents the distribution of FFS and managed care samples by mean PCS and MCS scores and by distribution of demographic characteristics, other background characteristics, and study outcomes. Demographic, other background characteristics, and study outcomes included age group, gender, race, education, Medicaid dual eligibility, proxy status, smoking status, PIP-DCG risk score deciles, presence of hospitalizations, frequency of doctor office visits, specialist visits, and four global ratings of doctor or nurse, specialist, health care, and health plan (Figures 1-30). The distribution of demographic and background characteristics differed between the managed care and FFS samples. Medicare managed care sample members are younger, more likely to be African American or Hispanic, more likely to have more than an 8th grade education, more likely to have self-responded, and less likely to be Medicaid eligible than the FFS Medicare sample. There was also more missing information on education level, proxy status, and smoking status among the managed care respondents than among FFS respondents.

Managed care members are also different from FFS in the distribution of the study outcomes. After observations with missing data on the outcomes were excluded from the analysis (14 percent of managed care and 1 percent of FFS for hospitalizations; 12 percent of managed care and 4 percent of FFS for office visits), managed care members are more likely to be in the lower PIP-DCG risk groups, less likely to report having any hospitalizations in the last 12 months, less likely to report having more than five visits to doctor's office or clinic or specialists in the last six months, more likely to have high ratings (9-10 response categories) of doctor or nurse, specialists, and health care overall than beneficiaries in the FFS sample. By contrast, FFS beneficiaries are more likely to have a high rating (9-10 response categories) of their health "plan" than the managed care sample.

When mean PCS and MCS scores are examined by category of demographic characteristics, other background variables, and study outcomes, the pattern of the results is similar between FFS and managed care samples (Figures 1-30). As age increases, mean PCS and MCS scores decrease. Females have lower mean PCS and MCS scores than do males. Whites have higher mean PCS and MCS scores than do African Americans or Hispanics. A higher education level is associated with higher mean PCS and MCS scores. Dually eligible beneficiaries have lower mean PCS and MCS scores than do beneficiaries who are not eligible for Medicaid. Proxy respondents have lower mean PCS and MCS scores than do self-respondents, and interestingly, mean PCS scores are similar between smokers and non-smokers. However, smokers have lower mean MCS scores than do non-smokers. Higher PIP-DCG risk scores are associated with lower levels of mean PCS and MCS scores. Beneficiaries who report having any hospitalizations in the last 12 months have lower mean PCS and MCS scores than do beneficiaries who report not having any hospitalizations. Higher frequencies of doctor visits or specialist visits are associated with lower levels of mean PCS and MCS scores. Higher ratings of doctor or nurse, specialist, and overall health care received are associated with higher levels of mean PCS and MCS scores.

Higher ratings of health plans are also associated with higher mean MCS scores. However, the pattern is less clear between ratings of health plan and mean PCS scores. The mean PCS scores appear to be similar across different levels of health plan ratings.

## MULTIVARIATE ANALYSES

### THE RELATIONSHIP BETWEEN HEALTH STATUS AND PIP-DCG RISK SCORES

In the analysis, a PIP-DCG risk score is used as a proxy of future Medicare expenditures. The PIP-DCG risk score was calculated based on the beneficiaries' prior year hospitalization and demographic information (Pope et al., 2000). Beneficiaries without any hospital admissions in the prior year or new beneficiaries received a PIP-DCG risk score that was calculated based only on demographic data. A PIP-DCG risk score of 1.00 indicates a national average level of predicted health care expenditure; a risk score greater than 1.00 indicates a higher than average expected expenditure; a risk score lower than 1.00 indicates a lower than average predicted expenditure. Since the PIP-DCG risk score was calculated to reflect the percentage of national average expenditures, the differences in the PIP-DCG risk scores between managed care and FFS beneficiaries also reflect differences in the predicted expenditures (Greenwald et al. 2000).

Table 2 presents results of the multiple regression model for the relationship between PIP-DCG risk scores, PCS, MCS, systems of care (FFS versus managed care), demographic characteristics, and other background variables. PCS and MCS scores were centered at their respective means prior to being incorporated into the model. A series of nested models were fitted to the data using a generalized linear model based on a normal distribution. The likelihood ratio test between a more complex model and a reduced model was used to determine whether adding or dropping selected two-way interactions between explanatory variables contributed significantly to the fit of the model. The reduced model that best fit the data and associated model parameters are shown in Table 2. The model that included all observations was found to explain 29 percent of the variation in PIP-DCG risk scores ( $n = 100,125$ ;  $R^2 = 0.29$ ).

The model residuals were examined to assess the goodness-of-fit of the model. The link test was performed to test the model specification (UCLA, 2006). The test fits the dependent variable on the predicted value and the square of the predicted value. A significant coefficient for the predicted value and a non-significant coefficient for the squared term are consistent with the model being properly parameterized. For this model, the coefficient for the predicted term was highly significant ( $p < 0.0001$ ) whereas, the coefficient for the square term was not statistically significant ( $p = 0.457$ ), strongly suggesting that the model is correctly parameterized.<sup>4</sup> A check for multicollinearity was conducted by examining the value of the variance inflation factor (VIF). A VIF greater than 10 indicates possible issues with multicollinearity (UCLA, 2006). The explanatory variables were found to have relatively small VIFs, with none having a VIF greater than 10.

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<sup>4</sup> It should be noted that this result does not rule out the possibility of omitting important covariates.

Cooks' D statistic was examined to check for influential observations. Cook's D statistics greater than  $4/n$  may indicate influential observations. For this model, the 99th percentile of Cook's D statistic was  $26/n$ , which is not unusual in cost data and typically have a skewed distribution.<sup>5</sup> Therefore, the 1 percent of observations with the largest values of Cook's D value were excluded and the model was refitted. After the influential observations were excluded, the coefficients for the main effect of PCS, MCS, system of care indicator, and the interaction between PCS and MCS were similar with the same sign and significance as in the full model. However, the coefficients for the interaction between the PCS score and system of care and the MCS score and system of care became statistically significant after influential observations were excluded from the model. The model excluding influential observations was found to explain approximately 33 percent of the variation in the PIP-DCG risk scores ( $n = 99,124$ ;  $R^2 = 0.327$ ).

Based on the model that excluded the influential observations (Table 2), PIP-DCG risk scores are significantly associated with PCS, MCS, systems of care, age, gender, race, education, Medicaid dual eligibility, proxy status, smoking status; interactions between PCS and system of care, MCS and system of care, PCS and MCS, PCS and age, PCS and gender, PCS and Medicaid dual eligibility, PCS and proxy status, PCS and smoking status, age and gender, age and race, age and education, age and Medicaid dual eligibility, gender and Medicaid dual eligibility, and Medicaid and system of care. The results indicate that the association between PCS and PIP-DCG risk scores differ by level of MCS score, system of care, age, gender, Medicaid dual eligibility, proxy status, and smoking status. Additionally, the association between MCS and PIP-DCG risk scores differ by level of PCS and system of care.

To explore the interaction effects associated with PCS and MCS scores, the model parameters are used to calculate the predicted risk scores and plot a series of graphs for: (1) beneficiaries with low, mean, and high PCS scores by FFS and managed care systems, holding demographic and background variables constant at the reference level and the MCS score constant at mean level (Figure 31); (2) beneficiaries with low MCS, mean MCS, and high MCS by FFS and managed care systems, holding demographic and background variables constant at the reference level and PCS constant at mean level (Figure 32); and (3) beneficiaries with different levels of PCS scores (low, mean, and high) by beneficiaries with different levels of MCS scores (low, mean, and high), holding demographic and background categorical variables constant at the reference level (Figure 33). "Low" PCS or MCS scores are defined as two standard deviations below the mean, whereas "high" PCS or MCS scores are defined as two standard deviations above the mean. The reference group includes sample beneficiaries between 65-69 years of age, females, Whites, high school graduates, not eligible for Medicaid, self-respondents, and non-smokers. It should be noted that the PCS and MCS scores reflect norm-based standardized scores with a mean of 50 and a standard deviation of 10, relative to the 1998 U.S. general population. A one-point difference in the PCS or MCS scores reflect a difference of one-tenth of a standard deviation in the 1990 U.S. general population.

The significant interaction term between PCS and system of care on PIP-DCG risk scores ( $\beta = 0.001$ ,  $p < 0.001$ ) indicates that the magnitude of change in PIP-DCG risk scores associated with

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<sup>5</sup> The very large sample sizes here make regression insensitive to the assumption of normally distributed residuals.

1 point change in PCS scores is significantly greater for FFS beneficiaries ( $\beta = -0.007$ ) than for the managed care beneficiaries ( $\beta = -0.007 + 0.001 = -0.006$ ). A one-point increase in PCS scores from the mean is associated with 0.007, and 0.006 decrease in PIP-DCG risk scores for FFS and managed care, respectively, after holding other explanatory variables constant. Additionally, the interaction term indicates that the difference in PIP-DCG risk scores is more pronounced at lower levels of PCS scores, after holding other explanatory variables in the model constant. The differences in PIP-DCG risk scores between FFS and managed care is 0.036 at “low” levels of PCS (-2SD) and 0.011 at the mean level of PCS (Figure 31). The same interpretation holds for MCS. The interaction term between MCS and system of care on PIP-DCG risk scores is statistically significant ( $\beta = 0.001, p < 0.001$ ). The slope is steeper for FFS than for managed care. A one-point increase in MCS scores from the mean score is associated with a decrease of 0.002 point in PIP-DCG risk scores for FFS and 0.001 point for managed care, respectively, after holding other explanatory variables constant (Figure 32, Table 2).

The significant positive interaction term between PCS and MCS indicates that the association of PCS and PIP-DCG risk scores differ by level of MCS scores and vice versa, after holding other explanatory variables in the model constant at the reference level. At a given level of MCS score, the PIP-DCG risk score is negatively associated with PCS scores. The higher the PCS score, the lower the PIP-DCG risk scores. However, the differences in PIP-DCG risk scores between beneficiaries with different levels of physical functioning are larger and more pronounced when beneficiaries have lower levels of mental health. The slope depicting the rate of change in PIP-DCG risk scores associated with a one-point change in MCS scores from the mean is steeper among beneficiaries with lower PCS scores (Figure 33).

### **THE RELATIONSHIP BETWEEN HEALTH STATUS AND HOSPITALIZATIONS**

A logistic regression model with binary data was used to model the log odds of having at least one hospitalization in the past 12 months as a function of PCS and MCS scores, the system of care, age, gender, race, education, dual eligibility status, proxy status, and smoking status. A series of nested models were fitted to the data using a generalized linear model based on a binary (binomial) outcome distribution. The likelihood ratio test between a more complex model and a reduced model was used to determine whether adding or dropping selected two-way interactions between explanatory variables significantly affected the fit of the model. The reduced model that best fit the data and associated model parameters were used to examine the relationship between health status and probability of hospitalization, after controlling for demographic and other background characteristics.

Table 3 presents the model parameters and odds ratios associated with the logistic regression model. The model was found to have good discriminatory power ( $n = 96,822, c\text{-statistic} = 0.708$ ). Moreover, Pearson and deviance goodness-of-fit statistics are close to 1.00 indicating the model fit the data well (Pearson chi-square = 0.9955, deviance = 0.9325). Based on the model and the likelihood ratio test, the log odds of having any hospitalizations in the last 12 months is significantly related to PCS and MCS scores, the system of care, age, gender, race, education, dual eligibility, proxy status, smoking status; interactions between MCS scores and systems of

care, PCS and MCS scores, PCS scores and age, PCS scores and dual eligibility, race and smoking status, and education and system of care.

The interaction term between PCS scores and the system of care is not statistically significant, indicating that the association between PCS and the odds of hospitalizations is similar between FFS and managed care ( $\beta = -0.001$ ,  $p > 0.05$ ). A one-point increase in the PCS score from the mean is associated with a 5.2 percent decrease in the odds of hospitalization ( $\beta = -0.054$ ,  $p < 0.001$ ) for FFS and managed care systems, after holding demographic and other background variables constant at the reference level and MCS scores constant at the mean level. By contrast, the interaction term between MCS scores and the system of care is statistically significant ( $\beta = 0.008$ ,  $p < 0.001$ ). The slope is steeper for FFS than managed care. A one-point increase in MCS scores from the mean is associated with a 1.9 percent and 1.1 percent decrease in the odds of hospitalization for FFS and managed care, respectively, after holding demographic and other background variables constant at the reference level and PCS scores constant at the mean level.

Figures 34 and 35 show the predicted probability of hospitalizations by low, mean, and high levels of PCS and MCS scores for FFS and managed care, holding other variables constant at the reference level. The PCS slopes are similar and the lines are parallel for FFS and managed care. The predicted probability of having any hospitalizations is higher for FFS than managed care. By contrast, the MCS slope is steeper for FFS than the managed care. The differences in the predicted probability of hospitalizations between FFS and managed care are greater and more pronounced at low levels of MCS scores.

The pattern of the interaction between PCS and MCS on the predicted probability of having hospitalizations is similar to those observed for the PIP-DCG risk score model (Figure 36). The slope is steeper for the reference group with low PCS scores, compared to those with mean or high PCS scores. At a given MCS score, the predicted probability of having any hospitalizations is higher among those with lower PCS scores, when other variables are held constant. However, the differences in the predicted probability of having hospitalizations between beneficiaries with different levels of PCS scores are larger and more pronounced at lower levels of mental health functioning.

### **THE RELATIONSHIP BETWEEN HEALTH STATUS AND THE UTILIZATION OF DOCTOR/CLINIC AND SPECIALIST OFFICE VISITS**

In the CAHPS survey, beneficiaries are asked to indicate how many times they went to a doctor's office or clinic or a specialist to get care for themselves in the last six months. The response categories are 0, 1, 2, 3, 4, 5 to 9, and 10 or more, and constitute an ordinal response scale. Initially, a standard (cumulative) ordinal logistic regression model was fitted to the data. However, the results of the model fit indicated that the proportional odds assumption underlying the cumulative logistic regression model was violated. Therefore, a generalized logistic regression model with polytomous (unordered) data, similar to a multinomial logistic regression, was used to examine the relationship between health status and self-reported utilization of doctor and specialist office visits. The response categories were combined into low, moderate, and high

frequency categories. The low category represents none or one visit, the moderate category represents two to four visits, and the high category represents five or more visits in the last six months.

Multinomial or polytymous logistic regression models were used to predict the probability of having high (5 or more visits, 16.5 percent and 12.3 percent of usable respondents for office and specialist visits, respectively), moderate (2-4 visits, 43.4 percent and 44.5 percent of usable respondents for office and specialist visits, respectively), and low (0-1 visit, 40.1 percent and 43.3 percent of usable respondents for office and specialist visits, respectively) frequency of office or specialist visits, as a function of PCS and MCS scores, the system of care, age, gender, race, education, dual eligibility status, proxy status, and smoking status. The low frequency of visits served as the reference category, and a series of nested models were fitted to the data. The likelihood ratio test between a more complex model and a reduced model was used to determine whether adding or dropping selected two-way interactions between explanatory variables significantly affected the fit of the model. The reduced model that best fit the data and associated model parameters was used to examine the relationship between health status and self-reported utilization of doctor and specialist office visits, after controlling for demographic and other background characteristics.

Table 4 presents the model parameters and odds ratios associated with the multinomial or polytymous logistic regression model for office visits ( $n = 94,483$ , Generalized  $R^2 = 0.116$ ). Based on the model and the overall or pooled test of the effects, the log odds of having a moderate frequency or high frequency of office visits relative to having a low frequency of visit are significantly related to:

- PCS and MCS scores
- The system of care
- Age, gender, race, education, dual eligibility
- Proxy status
- Smoking status
- Interactions between PCS scores and the system of care
- Interactions between MCS scores and the system of care
- PCS and MCS scores
- PCS scores and age
- PCS scores and education
- PCS scores and dual eligibility
- PCS scores and proxy status
- MCS scores and proxy status
- Age and gender
- Gender and education
- Gender and proxy status
- Race and dual eligibility
- Education and dual eligibility
- Education and proxy status

- Dual eligibility and the system of care
- Dual eligibility and smoking status
- Proxy status and smoking status

The interaction terms between PCS and system of care ( $\beta_{\text{moderate}} = 0.004, p < 0.05; \beta_{\text{high}} = 0.008, p < 0.01$ ) and between MCS scores and the system of care ( $\beta_{\text{moderate}} = 0.008, p < 0.001; \beta_{\text{high}} = 0.012, p < 0.001$ ) are statistically significant, indicating that physical and mental health status relate to self-reported frequency of doctor visits differently between FFS and managed care especially at low levels of PCS or MCS scores. The slopes are steeper for FFS than managed care. A one-point increase in PCS scores from the mean is associated with a 4.3 percent and 3.9 percent decrease in the odds of having a moderate frequency of office visits relative to a low frequency for FFS and managed care, respectively. A one-point increase in PCS scores from the mean is associated with a 7.7 percent and 6.9 percent decrease in the odds of having a high frequency of visits relative to a low frequency for FFS, and managed care, respectively, after holding covariates constant at the reference level and the MCS score constant at the mean level. Additionally, a one-point increase in MCS scores from the mean is associated with a 2.2 percent and 1.4 percent decrease in the odds of having a moderate frequency of visits relative to a low frequency for FFS and managed care, and a 4.0 percent and 2.8 percent decrease in the odds of having a high frequency of doctor visits relative to a low frequency for FFS, and managed care, respectively, after holding covariates constant at the reference level and the PCS score constant at the mean level.

Figures 37 and 38 show the predicted probability of having a high frequency of doctor visits by low, mean, and high levels of PCS and MCS scores for FFS and managed care sample beneficiaries, holding other variables constant. Both of the PCS and MCS slopes were steeper for FFS than managed care. The predicted probability of having a high frequency of doctor visits is higher in FFS than managed care. However, the differences in the predicted probability of having a high frequency of doctor visits between FFS and managed care are greater and more pronounced at low levels of PCS or MCS scores, after holding other variables constant at the reference level and MCS or PCS scores constant at their means, respectively.

The pattern of the interaction between PCS and MCS scores on the predicted probability of having a high frequency of doctor visits is similar to those observed for the PIP-DCG risk score and hospitalization models (Figure 39). The slope is steeper for beneficiaries with low PCS scores relative to those with mean or high PCS scores, after holding other variables constant. The differences in the predicted probability of having a high frequency of office visits between beneficiaries with different levels of PCS scores are larger and more pronounced when beneficiaries have lower levels of mental health functioning.

Table 5 presents the model parameters and odds ratios associated with the multinomial or polytymous logistic regression model for specialist visits. Based on the model and the overall or pooled test of the effects, the log odds of having a moderate frequency or a high frequency of specialist visits relative to having a low frequency of specialist visits are significantly related to PCS and MCS scores, the system of care, age, gender, education, dual eligibility, proxy status, smoking status; interactions between PCS scores and the system of care, PCS scores and age,



PCS scores and education, PCS scores and proxy status, age and gender, age and education, education and proxy status, age and the system of care, gender and the system of care, race and the system of care, and education and the system of care (n = 53,221, Generalized  $R^2 = 0.130$ ).

The interaction term between PCS scores and the system of care is statistically significant, indicating that physical health status affects the self-reported frequency of specialist visits differently between FFS and managed care ( $\beta_{\text{moderate}} = -0.014, p < 0.001$ ;  $\beta_{\text{high}} = -0.011, p < 0.01$ ). In contrast to the pattern observed with self-reported frequency of office visits, the slope is steeper for managed care than for FFS for self-reported specialist visits. A one-point increase in PCS scores from the mean is associated with a 2.3 percent and a 3.7 percent decrease in the odds of having a moderate frequency of visits relative to a low frequency for FFS and managed care, and a 5.2 percent and a 6.3 percent decrease in the odds of having a high frequency of specialist visits relative to a low frequency for FFS, and managed care, respectively, after holding covariates constant at the reference level and the MCS score constant at the mean level.

The interaction term between MCS scores and the system of care is not statistically significant indicating that MCS scores affect the self-reported frequency of specialist visits similarly between FFS and managed care ( $\beta_{\text{moderate}} = -0.004, p > 0.05$ ;  $\beta_{\text{high}} = -0.005, p > 0.05$ ;  $p$  for pooled effect  $>0.05$ ). A one-point increase in MCS scores from the mean is associated with a 0.8 percent and 1.8 percent decrease in the odds of having a moderate or high frequency of specialist visits relative to a low frequency for FFS and managed care systems, respectively, after holding covariates constant.

Figures 40 and 41 show the predicted probability of having a high frequency of specialist visits by low, mean, and high level of PCS and MCS scores for FFS and managed care beneficiaries, holding other variables constant at the reference level. The predicted probability of having a high frequency of specialist visits is higher in FFS than in managed care. However, the difference in the predicted probability of having a high frequency of specialist visits between FFS and managed care is smaller at higher levels of PCS scores, after holding other variables constant at the reference level and the MCS score constant at the mean level. The interaction between MCS scores and the system of care is not statistically significant, and the slope for MCS scores is parallel between FFS and managed care. Moreover, there are no significant interaction effects between PCS and MCS scores for self-reported frequency of specialist visits.

### [THE RELATIONSHIP BETWEEN HEALTH STATUS AND THE GLOBAL RATINGS OF CARE EXPERIENCES](#)

In the CAHPS survey, beneficiaries are asked to rate their personal doctor or nurse, their specialist, their overall health care, and their health plan using a scale from 0 to 10, which reflects an ordinal response category. Similar to the approach used earlier, a cumulative ordinal logistic regression model was initially fitted to the data. However, the results of the model fit indicated that the proportional odds assumption underlying the cumulative logistic regression model was violated. Therefore, a multinomial or polytomous logistic regression model was used to examine the relationship between health status and the four global ratings of care. The



responses were combined into low, moderate, and high rating categories. The low category represents ratings from 0 through 5, the moderate category represents ratings from 6 through 8, and the high rating category represents ratings of 9 and 10.

Multinomial or polytymous logistic regression models were used to predict the probability of having high (9-10, 66.8 percent, 71.0 percent, 69.8 percent, and 66.2 percent of usable respondents for ratings of doctor/nurse, specialists, health care and health plan), moderate (6-8, 27.7 percent, 23.3 percent, 25.9 percent, and 26.1 percent of usable respondents for ratings of doctor/nurse, specialists, health care, and health plan), and low ratings (0-5, 5.5 percent, 5.7 percent, 4.3 percent, and 7.7 percent of usable respondents for ratings of doctor/nurse, specialists, health care, and health plan), as a function of PCS and MCS scores, the system of care, age, gender, race, education, dual eligibility status, proxy status, and smoking status. The low ratings served as the reference category. A series of nested models were fitted to the data, and the likelihood ratio test between a more complex model and a reduced model was used to determine whether adding or dropping selected two-way interactions between explanatory variables significantly affected the fit of the model. The reduced model that best fit the data and associated model parameters were used to examine the relationship between health status and rating of care experiences, after controlling for demographic and other background characteristics. A separate model was fitted for each of the four global ratings.

Figures 42-47, 49-54, 56-61, and 63-68 present the predicted probability of high, moderate, and low ratings of the four experiences with care measures for doctor/nurse, specialist, health care, and health plan by “low”, “mean”, and “high” levels of PCS and MCS scores for FFS and managed care, respectively, holding other variables constant at the reference level. With the exception of rating of health care and MCS score, the slopes depicting the relationships between PCS scores and the four global ratings and between MCS scores and the other three global ratings measures are not significantly different between FFS and managed care. The slopes depicting the relationship between MCS and ratings of health care are steeper for FFS than managed care. The results suggest that physical health status affects the four global ratings of experience with care similarly among FFS and managed care beneficiaries. However, mental health status affects ratings of overall health care differently between FFS and managed care beneficiaries. Generally, as PCS or MCS scores increase, the probability of high ratings increase and the probability of moderate or low ratings decrease. Managed care beneficiaries have a higher probability of providing low ratings of doctor/nurse, specialists, and health plan than the FFS beneficiaries. For rating of health care, managed care beneficiaries provided a higher probability of both high and low ratings, but a lower probability of moderate ratings than did the FFS beneficiaries at the ‘low’ level of MCS scores.

The pattern of the interaction between PCS and MCS scores on the predicted probability of low ratings of the four measures is similar to those observed for other outcome measures (Figures 48, 55, 62, and 69). The slope is steeper for low PCS scores relative to mean or high PCS scores, after holding other variables constant. At a given level of MCS scores, the probability of low ratings increases as PCS scores decrease. However, the difference in the predicted probability of low ratings of the four measures between beneficiaries with different levels of PCS scores are larger and more pronounced when beneficiaries have lower levels of mental health.

## Experiences with Doctor/Nurse

Table 6 presents the model parameters and odds ratios associated with the multinomial or polytymous logistic regression model for ratings of personal doctor or nurse (n = 85,649; Generalized  $R^2 = 0.033$ ). Based on the model and the overall or pooled test of the effects, the log odds of moderate or high ratings relative to low ratings are significantly related to:

- PCS and MCS scores
- The system of care
- Age, gender, race, education, dual eligibility
- Proxy status
- Smoking status
- Interactions between PCS and MCS scores
- PCS scores and age
- PCS scores and proxy status
- MCS scores and education
- MCS scores and smoking status
- Age and proxy status
- Gender and race
- Gender and education
- Gender and proxy status
- Gender and smoking status
- Race and proxy status
- Dual eligibility and proxy status
- Proxy status and smoking status
- Race and the system of care

The interaction terms between PCS scores and the system of care are not statistically significant, indicating that the association between PCS scores and ratings of doctor or nurse are similar between FFS and managed care sample enrollees ( $\beta_{\text{moderate}} = 0.000, p > 0.05$ ;  $\beta_{\text{high}} = 0.002, p > 0.05$ ;  $p$  for pooled effect  $>0.05$ ). The odds of moderate or high ratings relative to low ratings increases as PCS scores increase ( $\beta_{\text{moderate}} = 0.007, p < 0.01$ ;  $\beta_{\text{high}} = 0.009, p < 0.01$ ). A one-point increase in PCS scores from the mean is associated with a 0.74 percent increase in the odds of having moderate ratings relative to low ratings and a 0.88 percent increase in the odds of having high ratings relative to low ratings of doctor/nurse across FFS and managed care systems, respectively, after holding covariates constant at the reference level and the MCS score constant at the mean level.

The interaction terms between MCS scores and the system of care are not statistically significant ( $p$  for pooled effect  $>0.05$ ) indicating that the association between MCS scores and ratings of doctor or nurse are similar between FFS and managed care sample enrollees. Similar to PCS scores, the odds of moderate or high ratings relative to low ratings increase as MCS scores increase. A one-point increase in MCS scores from the mean is associated with a 0.89 percent

and a 0.35 percent increase in the odds of having moderate or high ratings relative to low ratings of doctor/nurse across FFS and managed care systems, respectively, after holding covariates constant at the reference level and PCS score constant at the mean level.

### Experiences with Specialists

Table 7 presents the model parameters and odds ratios associated with the multinomial or polytymous logistic regression model for ratings of specialists (n = 43,803, Generalized  $R^2 = 0.030$ ). Based on the model and the overall or pooled test of the effects, the log odds of moderate ratings relative to low ratings or the log odds of high ratings relative to low ratings of specialists are significantly related to:

- PCS and MCS scores
- The system of care
- Age, gender, race, education, dual eligibility
- Proxy status
- Smoking status
- Interactions between PCS and MCS scores
- MCS scores and gender
- Age and proxy status
- Gender and proxy status
- Dual eligibility and proxy status
- Gender and the system of care
- Race and the system of care
- Education and the system of care

The interaction terms between PCS scores and the system of care ( $\beta_{\text{moderate}} = -0.002, p > 0.05$ ;  $\beta_{\text{high}} = -0.003, p > 0.05$ ;  $p$  for pooled effect  $> 0.05$ ) and between MCS scores and the system of care ( $\beta_{\text{moderate}} = -0.004, p > 0.05$ ;  $\beta_{\text{high}} = -0.009, p > 0.05$ ;  $p$  for pooled effect  $> 0.05$ ) are not statistically significant, indicating that the association between PCS or MCS scores and ratings of specialists are similar across FFS and managed care. A one-point increase in PCS scores from the mean is associated with a 0.90 percent and a 1.12 percent increase in the odds of moderate or high ratings relative to low ratings of specialists for FFS and managed care systems, after holding covariates constant at the reference level and the MCS score constant at the mean level. A one-point increase in MCS scores from the mean is associated with a 1.61 percent increase and a 3.40 percent increase in the odds of having moderate or high ratings relative to low ratings of specialists across FFS and managed care systems, respectively, after holding covariates constant at the reference level and the PCS score constant at the mean level. Additionally, the odds of high ratings relative to low ratings are not significantly different between FFS and managed care ( $\beta_{\text{high}} = -0.138, \text{odds ratio} = 0.871, p > 0.05$ ). However, the odds of moderate ratings relative to low ratings are significantly lower (26.2 percent lower) in managed care than in FFS ( $\beta_{\text{moderate}} = -0.304, \text{odds ratio} = 0.738, p < 0.01$ ), after accounting for other variables in the model.

## Experiences with Health Care

Table 8 presents the model parameters associated with the multinomial or polytymous logistic regression model for ratings of health care ( $n = 75,054$ ; Generalized  $R^2 = 0.052$ ). Based on the model and the overall or pooled test of the effects, the log odds of moderate ratings relative to low ratings, or the log odds of high ratings relative to low ratings of health care are significantly related to:

- PCS and MCS scores
- The system of care
- Age, gender, race, education, dual eligibility
- Proxy status
- Smoking status
- Interactions between MCS scores and the system of care
- Interactions between PCS and MCS scores
- PCS scores and proxy status
- MCS scores and race
- MCS scores and dual eligibility
- MCS scores and proxy status
- Age and proxy status
- Gender and proxy status
- Gender and smoking status
- Race and dual eligibility
- Race and proxy status
- Education and proxy status
- Dual eligibility and proxy status
- Gender and the system of care
- Race and the system of care

The interaction terms between PCS scores and the system of care are not statistically significant, indicating that the association between PCS scores and the log odds of moderate ratings relative to low ratings, or the log odds of high ratings relative to low ratings of health care are similar across FFS and managed care sample enrollees ( $\beta_{\text{moderate}} = -0.003$ ,  $p > 0.05$ ;  $\beta_{\text{high}} = -0.004$ ,  $p > 0.05$ ). A one-point increase in PCS scores from the mean is associated with a 1.08 percent increase in the odds of moderate ratings relative to low ratings, and a 2.62 percent increase in the odds of high ratings relative to low ratings of health care for FFS and managed care systems, after holding covariates constant at the reference level and the MCS score constant at the mean level.

The interaction terms between MCS scores and the system of care are statistically significant, indicating that the relationship between MCS scores and ratings of overall health care differs between FFS and managed care ( $\beta_{\text{moderate}} = -0.008$ ,  $p > 0.05$ ;  $\beta_{\text{high}} = -0.017$ ;  $p$  for pooled effect  $< 0.001$ ). The slope is steeper for FFS than the managed care beneficiaries. A one-point increase in MCS scores from the mean is associated with a 2.5 percent and a 1.6 percent increase in the

odds of having moderate ratings relative to low ratings for FFS and managed care, and a 6.2 percent and a 4.4 percent increase in the odds of having high ratings relative to low ratings of health care for FFS, and managed care, respectively, after holding demographic and other background variables constant at the reference level and the PCS score constant at the mean level.

## Experiences with Health Plan

Table 9 presents the model parameters and odds ratios associated with the multinomial or polytomous logistic regression model for ratings of health plans (n = 94,514; Generalized  $R^2 = 0.059$ ). Based on the model and the overall or pooled test of the effects, the log odds of moderate ratings relative to low ratings, or the log odds of high ratings relative to low ratings of health plans are significantly related to:

- PCS and MCS scores
- The system of care
- Age, gender, race, education, dual eligibility
- Proxy status
- Smoking status
- Interactions between PCS and MCS scores
- PCS scores and smoking status
- MCS scores and age
- MCS scores and race
- MCS scores and education
- MCS scores and proxy status
- Age and education
- Age and dual eligibility
- Age and proxy status
- Age and smoking status
- Gender and education
- Gender and proxy status
- Race and education
- Race and dual eligibility
- Race and proxy status
- Education and proxy status
- Age and the system of care
- Race and the system of care
- Dual eligibility and the system of care
- Proxy status and system of care
- Smoking status and the system of care

The interaction terms between PCS scores and the system of care ( $\beta_{\text{moderate}} = -0.001, p > 0.05$ ;  $\beta_{\text{high}} = -0.002, p > 0.05$ ;  $p$  for pooled effect  $>0.05$ ) and between MCS scores and the system of

care ( $\beta_{\text{moderate}} = 0.000$ ,  $p > 0.05$ ;  $\beta_{\text{high}} = -0.003$ ,  $p > 0.05$ ;  $p$  for pooled effect  $>0.05$ ) are not statistically significant, indicating that the association between PCS or MCS scores and ratings of health plan are similar across FFS and managed care sample enrollees. A one-point increase in PCS scores from the mean is associated with a 0.32 percent increase in the odds of moderate ratings relative to low ratings, and a 0.87 percent increase in the odds of high ratings relative to low ratings of health plans across FFS and managed care systems, after holding covariates constant at the reference level and the MCS score constant at the mean level. A one-point increase in MCS scores from the mean is associated with a 1.30 percent increase in the odds of having moderate ratings relative to low ratings, and a 3.09 percent increase in the odds of having high ratings relative to low ratings of health care across FFS and managed care systems, respectively, after holding covariates constant at the reference level and the PCS score constant at the mean level. The odds of moderate ratings relative to low ratings are significantly lower (20.7 percent lower) for managed care than FFS ( $\beta_{\text{moderate}} = -0.232$ , odds ratio = 0.793,  $p < 0.01$ ). Additionally, the odds of high ratings relative to low ratings are significantly lower (32.2 percent lower) for managed care than FFS ( $\beta_{\text{high}} = -0.391$ , odds ratio = 0.677,  $p < 0.001$ ), after accounting for other variables in the model.

## ANALYSIS OF REPRESENTATIVENESS OF MANAGED CARE SAMPLE

As indicated earlier, to obtain measures of health status, self-reported utilization of health care, and experiences with care for the same Medicare managed care enrollee, the 2000 CAHPS national surveys representing managed care enrollees as well as disenrollees were merged with the combined HOS 2000 Cohort 1 Follow Up and 2000 Cohort 3 Baseline by health information number. The managed care analytic file contains 17,091 managed care enrollees aged 65 and older who did not have ESRD at the time of the survey. The survey data for the 17,901 Medicare managed care beneficiaries were combined with FFS CAHPS Survey data (82,224 beneficiaries) to form an analytic file for the study with 100,125 records.

A sample of 17,091 managed care sample beneficiaries represents a relatively small proportion (7.7 percent) of the 220,732 Medicare sample beneficiaries aged 65 or older without ESRD who were included as part of the 2000 CAHPS managed care national surveys. This analysis determines whether the managed care analytic sample of 17,091 beneficiaries utilized in this study differed systematically from the 2000 total CAHPS national managed care sample of 220,732 beneficiaries aged 65 and older without ESRD.

Due to the large sample size involved, effect size was used to determine whether the two samples differed systematically on demographic characteristics, self-reported presence or absence of hospitalizations, self-reported frequency of visits to doctor or clinics, self-reported frequency visits to specialists, four global experiences with care ratings (doctor/nurse, specialist, health care, and health plan), responses on a general health question, and responses on a transitional health question (Tables 10-11). Effect size is “A measure of the magnitude of a relationship, either in the units of the original measure...or in standardized units” (Cohen et al., 2003, p. 673). A small effect size is 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 (Cohen, 1988).

The differences between the two samples that meet the criterion for a small effect size were found for percentage of the samples with unknown educational level, unknown proxy responses, and self-respondents. The managed care analytic sample has lower percentage of respondents with unknown educational level or unknown proxy responses, and higher percentage of self-respondents when compared to the total CAHPS sample. However, the two samples were found to be comparable in age group, gender, race, educational attainment, Medicaid dual eligibility, smoking status, self-reported presence or absence of hospitalizations, self-reported frequency of visits to doctor or clinic, self-reported frequency of specialist visits, four global ratings of experiences with care, and health status. None of the differences between the two samples on these variables approached the small effect size criterion. The results indicated that the managed care analytic sample did not differ systematically from the total CAHPS national survey sample on the majority of the studied variables and is representative of the managed care beneficiaries aged 65 and older without ESRD.

# 4

## DISCUSSION

### EXPENDITURES

The data provided by CMS presented a unique opportunity to analyze differences between managed care and FFS beneficiaries in the relationship between health status, expenditures, utilization, and experiences with care. In the study, the PIP-DCG risk score was used as a proxy for future health expenditures. The PIP-DCG risk-adjustment model was developed as a prospective model to predict future health expenditures based on prior year hospitalizations and demographic information (Pope et al., 2000). The model was estimated based on 5 percent sample of Medicare FFS beneficiaries in 1995 and 1996. Health expenditures included in the model were: hospital inpatient, hospital outpatient, professional, home health, and durable medical equipment. Hospice expenditures, other third-party payments, prescription medications, and beneficiaries' out-of-pocket expenses were excluded from health expenditures. When the model was developed, the average per capita Medicare payment in 1996 was \$5,186. If 1996 Medicare payment per capita were projected to 2000-year expenditures using a consumer price index for all items, the average per capita Medicare payment would be \$5,692 in 2000 dollars.

According to the results presented here, the differences in expenditures (as measured by the PIP-DCG risk scores) between FFS and MA are significant, but small; and are more pronounced at lower levels of mental and physical health, with higher PIP-DCG scores for FFS beneficiaries. At low levels of physical health, the FFS reference beneficiaries were predicted to incur 74.2 percent of national average expenditures (PIP-DCG risk score = 0.742) whereas the managed care reference beneficiaries were predicted to incur 70.6 percent of national average expenditures (PIP-DCG risk score = 0.706, Figure 31). The 3.6 percent difference in the PIP-DCG risk score translated into a lower expenditure of \$205 per beneficiary per year in 2000 dollars in the managed care relative to the FFS delivery system. At low levels of mental health, the predicted health expenditures were 60.6 percent and 58.1 percent of national average per capita Medicare payments for FFS and managed care reference beneficiaries, respectively. The 2.5 percent difference in the PIP-DCG risk score between the two groups represents a difference of \$142 per beneficiary per year in 2000 dollars in the managed care relative to FFS delivery system. These results should be interpreted cautiously, however, because as Kan points out, a FFS-based PIP-DCG model only produces consistent estimates for a random FFS sample, but not for an HMO sample (2002). The lower expenditures for managed care beneficiaries in comparison to FFS beneficiaries with similar low levels of physical or mental health may reflect managed care efficiency in coordinating care, barriers in access to care for beneficiaries with poorer health status, or may be due to other unobserved differences between FFS and managed care beneficiaries.

Additionally, the interaction effect between PCS and MCS scores in predicting health expenditures has not been commonly explored in previous research. Fleishman et al (2006) evaluated the contribution of PCS-12 and MCS-12 scores to the prediction of medical expenditures in the general population using the 2000-2001 Medical Expenditure Panel Survey



(MEPS). The authors reported that adding PCS and MCS scores to the regression model improved the ability of the model to predict future expenditures. The PCS score was more strongly related to medical expenditures than the MCS score. However, the authors did not include the interaction effect between PCS and MCS scores in the regression models. Our results were consistent with Fleishman et al's with regard to the strength of PCS scores relative to MCS scores in predicting health expenditures. The regression coefficient associated with the PCS score was three times greater than the regression coefficient associated with the MCS score, after all other covariates were included in the model. Furthermore, we found a significant synergistic effect between PCS and MCS scores in influencing the PIP-DCG risk scores or predicted health expenditures. The effect of having low physical functioning in combination with low mental health functioning is greater than would be observed by having low functioning on either one of the components alone. A reference beneficiary who had low physical functioning but had an average mental functioning was predicted to have 17.5 percent or \$996 higher expenditures per year in 2000 dollars than a similar reference person with average physical functioning and average mental health functioning. In contrast, a reference person with both low physical and low mental health functioning was predicted to have 22.5 percent or \$1,281 higher expenditures per year in 2000 dollars than a similar reference person with an average physical functioning and mental health functioning.

## UTILIZATION

A key strength of the health care utilization analyses in the current report is the comparison of PCS and MCS scores at levels of varying health care usage. One consistent finding in these results is the greater likelihood for FFS beneficiaries to utilize health services at lower levels of mental and physical health. Managed care beneficiaries with poor mental health are not as likely to be hospitalized as FFS beneficiaries. At low levels of physical *and* mental health, FFS beneficiaries are more likely to have a high frequency of doctor visits, compared to managed care beneficiaries. The reasons behind these differences are not clear. Future research should focus on understanding the causes behind these differences and their relationship to quality of care. In the FFS system, increased visits for beneficiaries in poorer health may be a result of fragmentation or duplication of care or having better access to the health care system. In the managed care system, lower visits for beneficiaries in poorer health may be a result of having an effective chronic disease management program that reduces overall utilization or a result of poor access or barriers to care. Another possible explanation for this discrepancy may be due to costs that less healthy managed care beneficiaries incur. To understand this possibility more fully, post hoc we examined the MA 2001 CAHPS Disenrollee Reasons data; specifically, we considered the most important reasons that beneficiaries disenrolled from their health plan (this variable in the data file is "plan most important reasons group" or "mirgroup"). The highest percentage of beneficiaries indicated that their premiums or co-payments were too high (31.4 percent, or 6,679 out of 21,296).

There is wide variation in MA plan benefits (Biles et al., 2006). For example, some MA plans have a \$200 to \$300 co-payment per hospital day. Other plans charge \$25 per physician visit, amounting to \$600 for 24 visits. Total annual out-of-pocket 2005 spending for MA enrollees in poor health was \$4,844, compared to \$1,557 for beneficiaries in good health (Biles et al., 2006).

Additionally, out-of-pocket expenses for MA enrollees in poor health are greater than FFS beneficiaries who also have a Medigap Plan (Biles et al., 2006). Clearly, for beneficiaries who are in poor health, managed care can be very expensive, thus limiting the number of doctor and specialist visits, as well as hospitalizations. Biles et al. (2006) note that “The most fundamental factor underlying the pattern of out-of-pocket costs by Medicare Advantage enrollees is the great variation in the use of health care services, and the annual cost of services, by individual Medicare beneficiaries.”

To address variation in costs for beneficiaries who are ill, Biles et al. (2006) suggest the following changes to current Medicare policy:

- Suspend the annual MA plan lock-in for beneficiaries
- Increase standardization of MA benefit packages
- Improve payment accuracy
- Limit the vulnerability of MA plan enrollees to excessive out-of-pocket costs

### **EXPERIENCES WITH CARE**

The current study used four global ratings from the CAHPS survey to evaluate beneficiaries’ experiences with care. These are ratings of doctor/nurse, ratings of specialist, ratings of health care, and ratings of health plan. For the rating of health plan measure, the wording of the questionnaire in the FFS survey is different from the managed care survey. The FFS beneficiaries were asked to rate “Medicare” instead of the health plan. The survey item may not be comparable between FFS and managed care beneficiaries. However, the results of the study based on ratings of health plan measure were consistent with those found based on ratings of doctor/nurse and ratings of specialist. Generally, as PCS or MCS scores increase, the probability of high ratings increase and the probability of moderate or low ratings decrease. Managed care beneficiaries had a higher probability of providing low ratings of doctor/nurse, specialists, and health plan than the FFS beneficiaries across different levels of physical and mental health status.

In contrast, the results were somewhat different for the rating of overall health care measure. Beneficiaries’ physical health status affects ratings of health care similarly between FFS and managed care beneficiaries. These are consistent with those found for the other three global rating measures. However, the mental health status as reflected by the MCS scores affects rating of overall health care differently in FFS than in managed care beneficiaries. At low levels of MCS scores, managed care beneficiaries had a higher probability of providing both high and low ratings of health care and a lower probability of providing moderate ratings than did the FFS beneficiaries. Overall, the results indicated a less favorable rating of health care among managed care beneficiaries compared to the FFS beneficiaries especially at a lower level of mental health.

The results of this study are conflicting somewhat with those reported by Elliot et al. (2005). Using responses from a single self-reported health status item and a 0-10 rating of health care from the CAHPS surveys, the authors found FFS beneficiaries reported a more favorable rating than the managed care beneficiaries and the differences in ratings were found to be greater

among those with “fair” or “poor” health. The magnitude of the differences was relatively small with a median difference of 0.07 standard deviations for rating of care. In this study, we did not find the magnitude of the differences between FFS and managed care beneficiaries in their ratings of doctor/nurse, specialist, health care or health plan to vary by beneficiaries’ physical health status. However, we found the magnitude of the differences between FFS and managed care beneficiaries in the rating of health care to vary by mental health status. The results may indicate that the interaction effect between health status and system of care differ depending upon (1) whether physical or mental health status is involved, or (2) which measure of experiences with care rating is employed in the study. A single health status item employed by the authors captures perceived overall health and does not distinguish between physical and mental health status. It is also possible that the results of the study differ depending upon whether a single health item or a composite summary measure is used. Alternatively, the results of this study may reflect patterns that are unique to the matched data between HOS and CAHPS surveys. The extent of the overlap between HOS and CAHPS data may vary by type and size of managed care plans or by geographic regions. Furthermore, this study did not limit the respondents to counties where both MA and FFS systems were available. Therefore, the results may be confounded by geographical differences in the relationship between health status, system of care, and experiences with care.

Possibilities for why managed care enrollees’ ratings would be lower than FFS enrollees may be due to costs and hence, ability to access necessary mental health care. Indeed, research has found that beneficiaries who disenroll from managed care typically do so in order to obtain needed health services (Morgan et al., 1997). It is important to note that in a recent study, patients’ global ratings of their health care are not related to the technical quality of their care. Using a sample of older managed care patients, a set of quality indicators used to measure care for 22 clinical conditions was not associated with global patient ratings of care (Chang et al., 2006).

In sum, the most disconcerting findings from the current study are the significant differences in health care utilization (hospitalizations and frequency of visits to doctor/specialist offices) found between FFS and managed care beneficiaries.

## **POLICY IMPLICATIONS**

CMS may want to consider a special study that examines possible explanations for why managed care beneficiaries who have lower levels of physical and mental health also have lower health care utilization and PIP-DCG scores, compared to FFS beneficiaries. Previous research has found favorable selection in managed care; younger and healthier beneficiaries tend to select managed care health plans, and be expected to have lower health expenditures and utilization. However, in the current study, when health status and other covariates were controlled for, managed care beneficiaries still had lower health care utilization and lower PIP-DCG risk scores compared to FFS beneficiaries. Possible reasons for the difference may be due to higher out-of-pocket costs for managed care beneficiaries, managed care health plans that operate more efficiently, or effective disease management programs, or a combination of these reasons, or due to unobserved differences between managed care and FFS beneficiaries. Understanding which of

these reasons best explains the discrepancies between managed care and FFS beneficiaries may assist CMS to provide the most effective care to all Medicare beneficiaries at the lowest cost possible. Furthermore, the study indicates that beneficiaries with combined lower physical and mental health status fared much worse than beneficiaries with lower physical or mental health status alone. This subgroup of beneficiaries may merit special attention for inclusion in the care management program to ensure appropriate coordination of care.

## 5

### LIMITATIONS

As Fleishman et al. (2006) note, there are many expenditures that are unpredictable in medical care. One limitation of the conclusions in this report is the reliance on a proxy for medical expenditures. While the PIP-DCG score was created originally to predict costs for Medicare FFS beneficiaries, the lack of true costs for beneficiaries in the sample is a limitation. The interpretation of the results should be noted with this limitation. Furthermore, PIP-DCG risk scores were calculated from inpatient admission data and may be impacted by the completeness of inpatient encounter data submitted to CMS by managed care organizations. Under-submission of inpatient encounter data will result in lower PIP-DCG risk scores for managed care beneficiaries than FFS beneficiaries. Moreover, PIP-DCG risk scores may be lower among the managed care beneficiaries if the managed care organizations shifted care from an inpatient to an ambulatory care setting to reduce hospitalization rates. The reliance solely on inpatient admission was a limitation for the PIP-DCG risk model. As a result, the hierarchical condition categories (HCC) model was implemented for risk adjustment payments to managed care plans. The HCC's model incorporates data across ambulatory and inpatient settings in the calculation of the risk scores. Future research could examine the association between HCC's risk scores, health status, and systems of care.

A second limitation of the analyses presented here involves the time of the year for survey data collection. The HOS data are collected in the spring/summer and the CAHPS data are collected in the fall for managed care enrollees. The time ordering of health status, as measured by the PCS and MCS (HOS) and collected in the spring/summer precedes the utilization data, which is derived from the CAHPS surveys in the fall. However, for FFS beneficiaries, the health status measure and the utilization measures are captured in the same survey. Additionally, the CAHPS ratings of care and utilization are based on a six-month recall period; however, health status is based on a four-week recall period. It is therefore not possible to infer a directional sequence, or causation between health status and utilization. The difference in timing of data collection may also bias the comparison between FFS and managed care systems. Additionally, the measurement of health status was subsequent to the measurement of inpatient data used to calculate the PIP-DCG risk scores. The PCS and MCS scores observed in the study may be influenced by both illness and quality of care received in the year following the measurement of PIP-DCG. It is important to examine how baseline PCS and MCS scores predict subsequent cost and utilization and the extent to which this relationship differs between FFS and managed care.

A third limitation concerns a greater amount of missing data observed among managed care respondents than among FFS respondents. If members with high utilization were more likely to have missing data than members with low utilization, then the findings may be biased. Furthermore, in the current analyses, we did not restrict analyses to counties and/or states in which beneficiaries have a choice between managed care and traditional Medicare. The complexities and resources involved in modeling experiences with care, utilization, and expenditures by county or state made this type of comparison difficult within the analytical time

frame. Thus some observed differences between managed care and FFS beneficiaries may reflect geographic differences in areas where managed care penetration is high. Additionally, managed care plans vary in their performance, costs, and utilizations at the regional and provider level. The results may not be generalizable to specific managed care plans. Finally, no survey weights were used; consequently, results are limited to the study population and may not be generalizable to the overall Medicare population.

## 6

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# APPENDIX

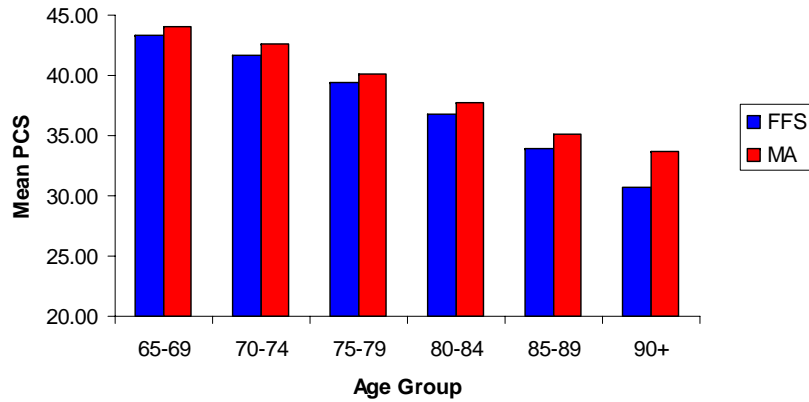
MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 1 Mean PCS and MCS Scores by Demographic, Self-Reported Utilization, and Ratings of Care Among FFS and Managed Care Medicare Sample Beneficiaries												
	FFS Medicare Sample (n=82,224)						Managed Care Medicare Sample (n=17,901)					
	Number of Enrollees	Percent of Sample	Mean PCS	SD	Mean MCS	SD	Number of Enrollees	Percent of Sample	Mean PCS	SD	Mean MCS	SD
<b>Age Group</b>												
65-69	18,309	22.27%	43.31	12.37	54.42	8.39	4,683	26.16%	44.04	10.93	53.05	8.60
70-74	23,202	28.22%	41.71	12.48	54.53	8.37	5,374	30.02%	42.66	11.06	52.72	8.69
75-79	19,287	23.46%	39.40	12.64	53.94	8.94	4,041	22.57%	40.14	11.21	51.79	9.39
80-84	12,505	15.21%	36.76	12.57	53.40	9.44	2,331	13.02%	37.76	10.96	50.61	9.70
85-89	6,132	7.46%	33.95	12.20	52.73	9.88	1,077	6.02%	35.09	10.84	49.87	10.18
90+	2,789	3.39%	30.76	11.54	52.00	10.36	395	2.21%	33.66	10.46	48.31	10.26
<b>Gender</b>												
Male	35,505	43.18%	40.94	12.60	54.53	8.54	7,876	44.00%	42.19	11.20	52.48	8.89
Female	46,719	56.82%	38.97	13.01	53.56	9.13	10,025	56.00%	40.35	11.45	51.71	9.36
<b>Race</b>												
White	74,670	90.81%	39.93	12.91	54.16	8.77	15,745	87.96%	41.30	11.42	52.24	9.08
Black	4,273	5.20%	37.79	12.55	51.81	10.04	1,100	6.14%	39.05	10.93	50.48	9.71
Hispanic	1,002	1.22%	37.00	11.93	50.40	10.61	683	3.82%	41.01	10.96	50.58	9.88
Other	1,936	2.35%	41.44	12.14	53.41	8.94	370	2.07%	41.86	11.03	51.52	9.16
Unknown	343	0.42%	41.01	12.60	53.50	9.17	3	0.02%	39.78	16.28	46.56	9.78
<b>Education</b>												
8th grade or less	11,036	13.42%	35.30	12.58	50.98	10.54	1,820	10.17%	37.87	11.14	49.49	9.92
Some high school	11,830	14.39%	37.67	12.82	52.81	9.55	2,603	14.54%	39.58	11.18	50.80	9.59
High School Graduate	27,754	33.75%	40.25	12.72	54.26	8.60	5,893	32.92%	41.46	11.27	52.45	8.91
Some College	15,310	18.62%	40.98	12.72	55.13	8.01	3,172	17.72%	42.34	11.27	53.37	8.40
College Graduate	6,491	7.89%	42.93	12.45	55.46	7.59	1,040	5.81%	44.83	10.52	53.72	8.23
More than 4-yr College	7,590	9.23%	43.58	12.12	55.61	7.44	1,055	5.89%	45.01	10.63	54.80	7.33
Unknown	2,213	2.69%	38.47	12.78	53.65	9.45	2,318	12.95%	39.75	11.69	50.65	9.93
<b>Medicaid Dual Eligible</b>												
No	75,780	92.16%	40.45	12.77	54.35	8.59	17,060	95.30%	41.50	11.29	52.30	9.00
Yes	6,444	7.84%	32.42	11.77	49.60	10.97	841	4.70%	34.22	10.94	47.02	10.81
<b>Proxy</b>												
No	58,474	71.12%	41.52	12.49	55.12	7.97	13,839	77.31%	42.13	11.10	52.72	8.74
Yes	14,806	18.01%	32.28	11.95	49.89	10.79	1,877	10.49%	36.02	11.37	49.07	10.32
Unknown	8,944	10.88%	41.20	12.33	53.27	9.09	2,185	12.21%	39.44	11.77	50.40	9.97
<b>Smoking Status</b>												
No	33,359	40.57%	39.49	12.90	54.27	8.72	6,455	36.06%	41.03	11.32	52.52	8.88
Yes	7,259	8.83%	39.79	12.82	52.74	9.70	1,601	8.94%	40.73	11.48	51.15	9.47
Unknown	41,606	50.60%	40.09	12.85	53.95	8.87	9,845	55.00%	41.31	11.40	51.89	9.28
<b>PIP-DCG Risk Score Decile</b>												
0.446-0.484	7,964	9.69%	44.68	11.67	54.69	7.86	1,992	11.13%	44.66	10.49	53.04	8.47
0.487-0.553	8,040	9.78%	45.54	11.25	55.55	7.38	1,967	10.99%	45.91	10.05	53.97	7.93
0.554-0.588	10,779	13.11%	42.94	12.15	54.98	7.89	2,654	14.83%	43.56	10.67	53.03	8.49
0.589-0.703	2,995	3.64%	43.47	11.88	55.01	7.98	715	3.99%	44.75	10.56	53.44	8.20
0.705-0.745	7,723	9.39%	43.74	11.63	55.45	7.53	1,778	9.93%	44.09	10.30	53.45	8.31
0.747-0.904	9,946	12.10%	39.74	12.43	54.13	8.72	2,218	12.39%	39.94	11.12	52.12	9.11
0.907-0.918	9,596	11.67%	39.34	12.53	54.56	8.51	2,078	11.61%	40.00	11.10	51.71	9.28
0.921-1.095	7,075	8.60%	36.52	12.44	52.97	9.84	1,423	7.95%	37.87	10.96	50.63	9.82
1.096-1.375	9,386	11.42%	33.50	12.11	52.11	10.12	1,683	9.40%	34.89	10.62	49.43	10.26
1.376-6.536	8,720	10.61%	31.64	11.73	50.97	10.70	1,393	7.78%	33.89	11.04	48.59	10.38
<b>Hospitalized in Last 12 Month</b>												
No	64,145	78.01%	41.71	12.48	54.61	8.36	12,538	70.04%	42.68	10.90	52.72	8.71
Yes	17,332	21.08%	32.98	11.92	51.68	10.29	2,807	15.68%	35.56	11.28	50.30	10.07
Unknown	747	0.91%	36.69	12.72	52.45	9.59	2,556	14.28%	39.86	11.69	50.72	9.87
<b>Number of Doctor's Office Visits</b>												
0	15,291	18.60%	44.98	11.96	54.98	8.23	3,595	20.08%	44.61	10.50	53.25	8.49
1	15,561	18.93%	43.16	12.10	55.27	7.80	3,424	19.13%	43.68	10.75	53.21	8.41
2	16,493	20.06%	40.13	12.54	54.33	8.50	3,310	18.49%	41.08	11.10	52.40	8.88
3	10,755	13.08%	37.97	12.45	53.29	9.35	2,047	11.44%	39.61	11.19	51.38	9.37
4	7,189	8.74%	36.48	12.47	53.30	9.27	1,245	6.95%	38.23	11.07	51.23	9.66
5-9	10,441	12.70%	33.98	12.13	52.38	9.81	1,723	9.63%	36.75	11.33	50.56	9.79
10 or more	2,983	3.63%	31.40	11.59	50.81	10.64	426	2.38%	33.95	11.27	49.58	10.24
Unknown	3,511	4.27%	38.18	12.78	53.15	9.53	2,131	11.90%	39.60	11.75	50.45	9.98

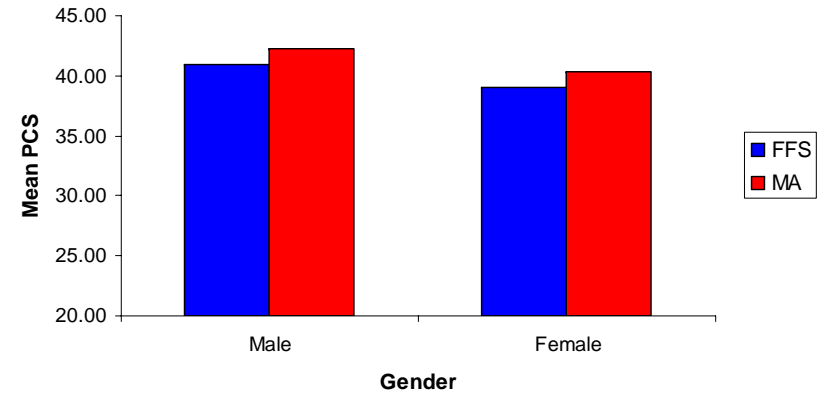
MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 1, continued														
Mean PCS and MCS Scores by Demographic, Self-Reported Utilization, and Ratings of Care Among FFS and Managed Care Medicare Sample Beneficiaries														
	FFS Medicare Sample (n=82,224)						Managed Care Medicare Sample (n=17,901)							
	Number of Enrollees	Percent of Sample	Mean PCS	SD	Mean MCS	SD	Number of Enrollees	Percent of Sample	Mean PCS	SD	Mean MCS	SD		
<b>Number of Specialist Visits</b>			FFS			FFS			MA			MA		
0	2,165	2.63%	37.85	12.84	52.26	9.80	7,249	40.49%	43.38	10.89	52.86	8.58		
1	10,560	12.84%	40.05	12.68	54.41	8.68	3,062	17.11%	41.76	11.08	52.74	8.72		
2	9,854	11.98%	38.09	12.75	53.79	8.98	2,345	13.10%	39.76	11.26	51.59	9.41		
3	6,072	7.38%	36.07	12.49	53.18	9.46	1,339	7.48%	38.63	11.48	51.49	9.48		
4	3,312	4.03%	34.66	12.33	52.70	9.52	746	4.17%	37.70	11.04	51.64	9.64		
5-9	4,105	4.99%	33.33	11.95	52.25	9.95	842	4.70%	36.48	11.24	50.30	10.02		
10 or more	1,322	1.61%	31.53	11.75	50.79	10.73	248	1.39%	34.62	11.56	48.91	10.54		
Unknown	44,834	54.53%	41.97	12.56	54.45	8.51	2,070	11.56%	39.63	11.76	50.34	10.05		
<b>Rating of Doctor or Nurse</b>														
0	62	0.08%	35.08	13.11	49.04	13.03	38	0.21%	35.34	12.57	45.53	9.85		
1	110	0.13%	38.24	12.64	51.82	9.57	24	0.13%	40.22	11.35	48.48	7.84		
2	151	0.18%	35.10	13.25	51.11	9.83	38	0.21%	38.46	12.48	50.63	11.37		
3	271	0.33%	36.39	13.02	49.44	11.31	62	0.35%	38.31	12.53	50.30	10.37		
4	383	0.47%	35.97	12.53	50.43	10.19	93	0.52%	37.59	11.30	48.66	10.66		
5	2,852	3.47%	37.53	12.88	51.50	10.00	585	3.27%	39.56	11.39	50.04	9.55		
6	2,141	2.60%	37.93	12.81	52.12	9.49	388	2.17%	41.04	11.20	51.28	9.34		
7	4,785	5.82%	39.12	12.73	52.85	9.00	837	4.68%	40.79	10.96	51.12	9.39		
8	13,356	16.24%	39.55	12.62	53.67	8.69	2,254	12.59%	40.91	11.26	52.15	8.68		
9	11,896	14.47%	40.18	12.66	54.44	8.32	2,066	11.54%	41.78	11.33	53.03	8.46		
10	36,539	44.44%	39.77	12.99	54.54	8.80	6,718	37.53%	41.20	11.46	52.59	9.07		
Unknown	9,678	11.77%	41.77	12.82	53.76	9.14	4,798	26.80%	41.39	11.35	51.47	9.51		
<b>Rating of Specialist</b>														
0	99	0.12%	31.73	12.21	50.43	11.08	26	0.15%	35.53	12.79	46.55	9.30		
1	88	0.11%	34.51	13.28	51.92	9.24	44	0.25%	35.16	10.74	48.78	11.68		
2	153	0.19%	33.90	12.64	49.85	10.67	60	0.34%	36.08	10.44	48.66	10.17		
3	194	0.24%	35.01	11.95	49.86	11.14	62	0.35%	37.07	11.31	49.88	9.49		
4	237	0.29%	34.52	11.95	50.93	10.11	73	0.41%	37.88	10.91	49.50	9.80		
5	1,155	1.40%	34.49	12.44	50.09	10.44	313	1.75%	38.32	10.88	49.51	9.91		
6	912	1.11%	35.11	12.13	50.77	10.14	195	1.09%	38.56	11.38	49.00	9.85		
7	1,918	2.33%	36.81	12.49	52.23	9.14	424	2.37%	39.22	11.03	51.04	9.47		
8	5,550	6.75%	36.94	12.62	52.90	9.18	1,193	6.66%	39.67	11.45	51.49	9.05		
9	7,074	8.60%	37.93	12.76	53.88	8.68	1,571	8.78%	40.11	11.44	52.19	9.16		
10	18,029	21.93%	37.41	12.87	54.09	9.24	4,433	24.76%	39.87	11.45	52.32	9.24		
Unknown	46,815	56.94%	41.82	12.59	54.36	8.58	9,507	53.11%	42.48	11.19	52.25	9.02		
<b>Rating of Health Care</b>														
0	64	0.08%	33.12	12.85	43.86	13.95	31	0.17%	35.89	11.92	44.86	11.70		
1	57	0.07%	35.03	12.04	49.93	12.52	11	0.06%	34.70	11.16	47.59	13.50		
2	118	0.14%	32.17	11.55	47.68	12.88	34	0.19%	39.17	10.96	48.36	9.95		
3	222	0.27%	34.06	12.12	48.01	10.17	59	0.33%	37.13	11.90	48.63	10.91		
4	345	0.42%	34.40	12.54	48.47	11.18	77	0.43%	35.91	10.79	49.07	9.83		
5	1,762	2.14%	34.89	12.31	49.58	10.61	408	2.28%	37.87	11.13	48.83	9.91		
6	1,580	1.92%	35.27	12.24	50.04	9.98	280	1.56%	38.50	11.44	49.84	9.34		
7	3,933	4.78%	36.71	12.39	51.41	9.61	627	3.50%	39.90	11.07	50.44	9.48		
8	11,055	13.44%	37.61	12.47	52.83	9.03	1,974	11.03%	39.23	11.24	50.90	9.28		
9	13,172	16.02%	39.22	12.64	54.32	8.33	2,465	13.77%	40.59	11.32	52.64	8.45		
10	30,539	37.14%	39.56	12.93	54.83	8.65	6,241	34.86%	41.05	11.39	52.62	9.11		
Unknown	19,377	23.57%	43.61	12.43	54.55	8.56	5,694	31.81%	42.86	11.22	52.23	9.18		
<b>Rating of Health Plan</b>														
0	371	0.45%	38.08	13.46	49.98	13.05	144	0.80%	40.35	11.64	49.99	10.50		
1	185	0.22%	38.63	13.26	52.01	10.94	78	0.44%	42.03	11.94	48.16	10.86		
2	232	0.28%	38.33	13.47	50.64	11.07	108	0.60%	40.69	11.87	50.74	9.47		
3	421	0.51%	37.78	12.98	50.74	10.51	152	0.85%	39.74	11.69	49.76	9.99		
4	613	0.75%	37.15	12.87	51.21	10.09	208	1.16%	39.77	11.35	50.58	9.06		
5	3,718	4.52%	39.15	12.88	52.46	9.67	1,036	5.79%	40.69	11.31	50.74	9.62		
6	2,534	3.08%	38.47	12.81	52.61	9.25	570	3.18%	40.34	11.29	50.98	9.11		
7	5,340	6.49%	38.76	12.76	52.97	9.10	1,199	6.70%	41.10	11.24	51.58	9.08		
8	12,301	14.96%	39.51	12.70	53.50	8.71	2,713	15.16%	41.12	11.43	52.10	8.95		
9	15,321	18.63%	39.75	12.72	54.34	8.39	2,892	16.16%	41.67	11.14	52.77	8.57		
10	37,986	46.20%	39.91	12.95	54.45	8.88	6,392	35.71%	41.58	11.30	52.80	9.01		
Unknown	3,202	3.89%	45.02	12.16	54.78	8.16	2,409	13.46%	40.15	11.77	50.77	9.81		

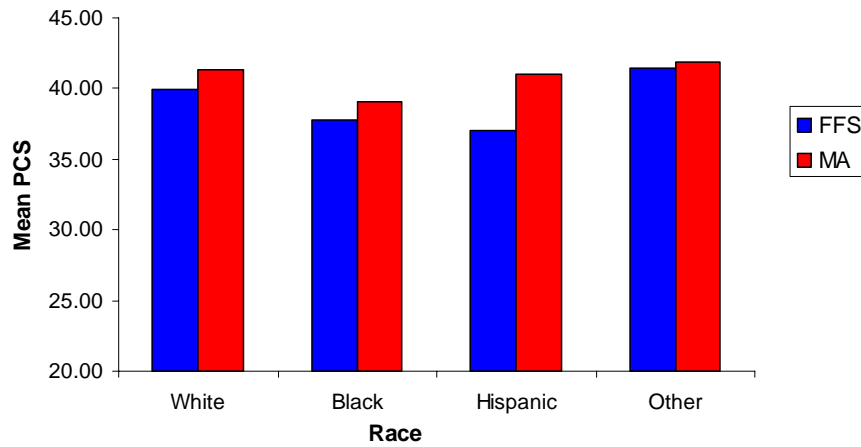
**Figure 1: Mean PCS by Age Group: FFS vs MA**



**Figure 2: Mean PCS by Gender: FFS vs MA**



**Figure 3: Mean PCS by Race: FFS vs MA**



**Figure 4: Mean PCS by Education: FFS vs MA**

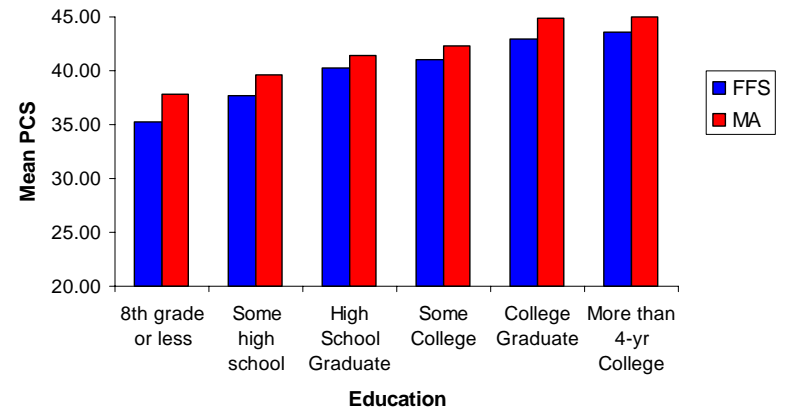


Figure 5: Mean PCS by Dual Eligibility: FFS vs MA

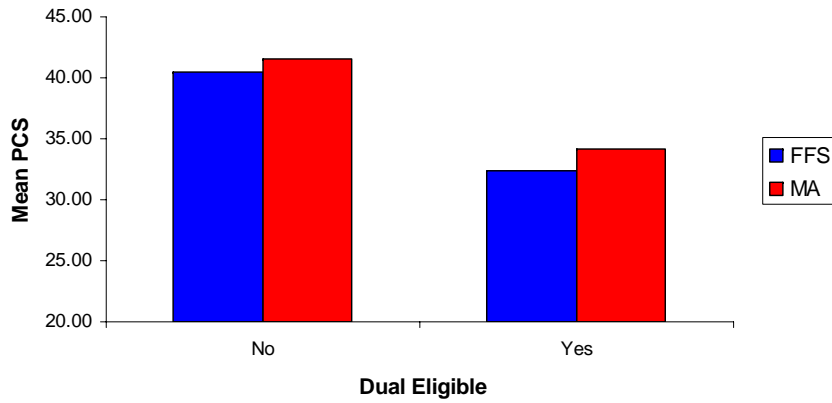


Figure 6: Mean PCS by Proxy: FFS vs MA

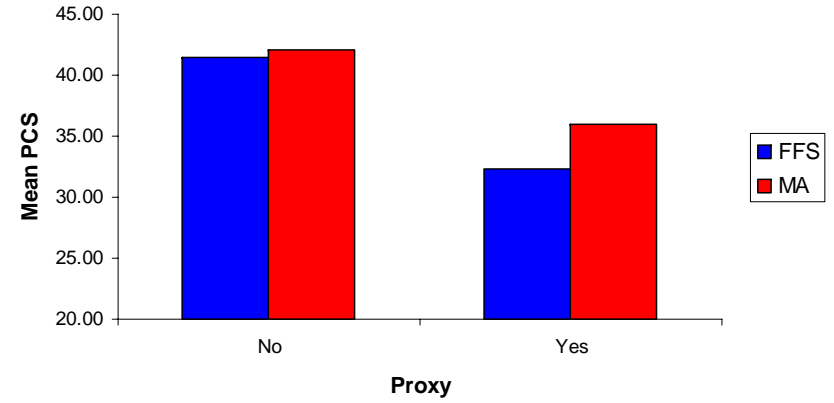


Figure 7: Mean PCS by Smoking Status: FFS vs MA

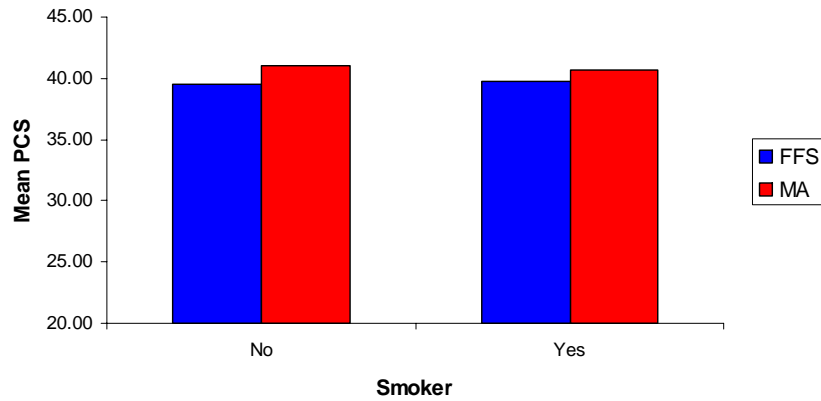
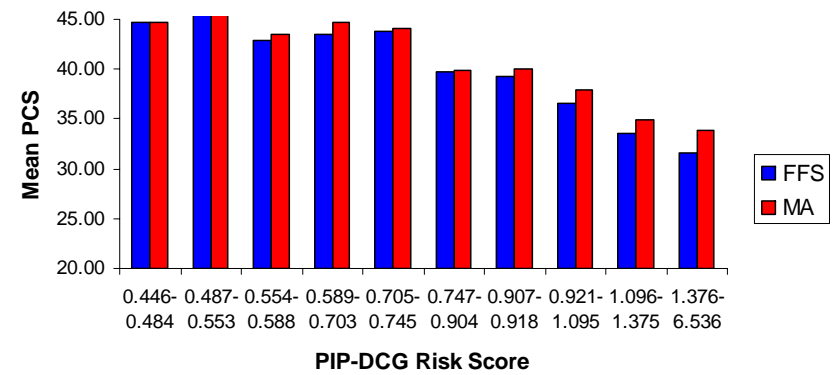
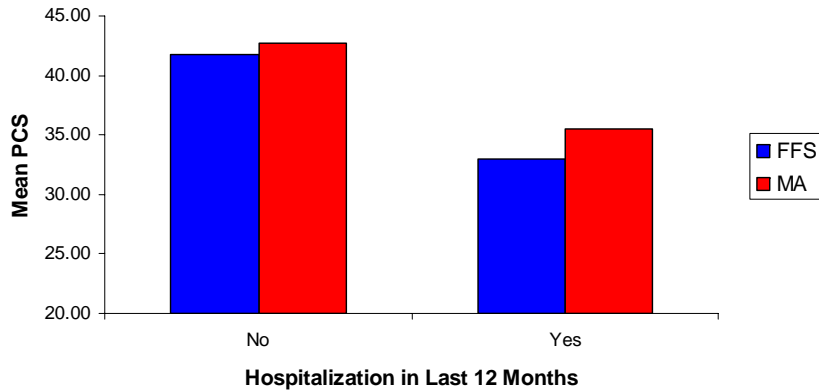


Figure 8: Mean PCS by PIP-DCG Risk Decile: FFS vs MA

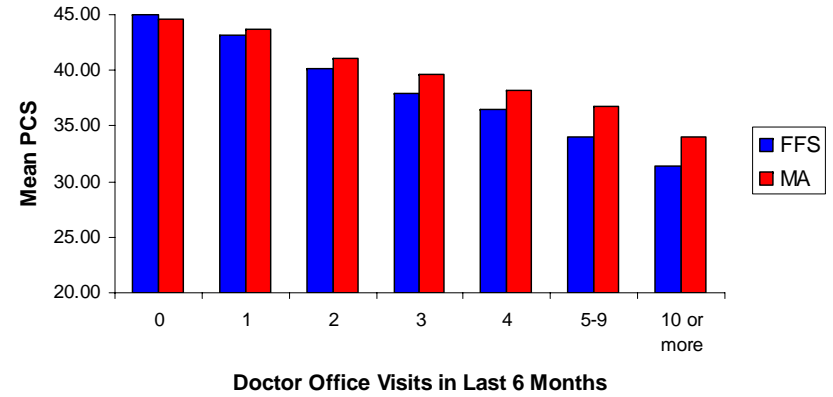




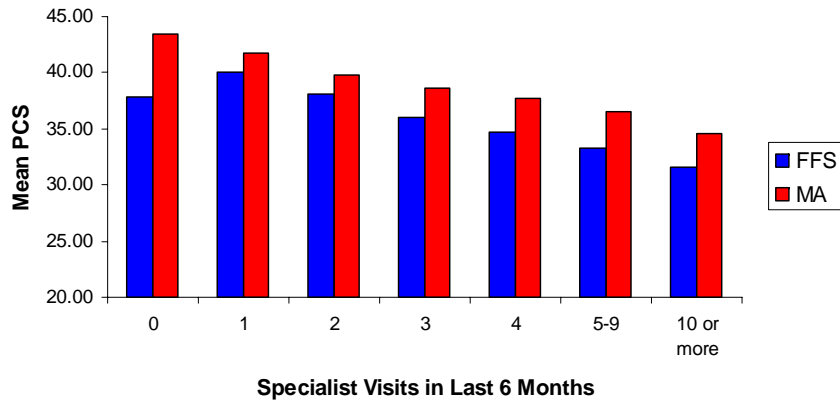
**Figure 9: Mean PCS by Hospitalization: FFS vs MA**



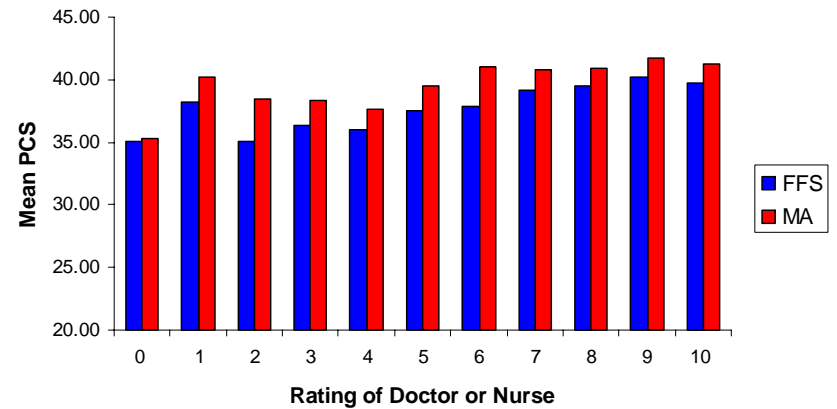
**Figure 10: Mean PCS by Doctor Office Visits: FFS vs MA**



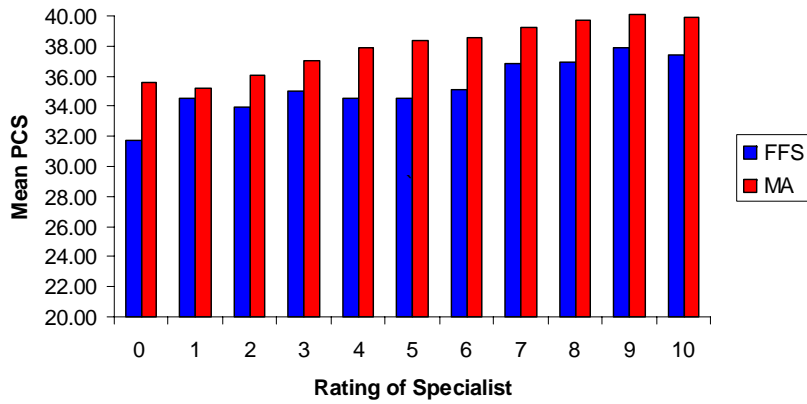
**Figure 11: Mean PCS by Specialist Visits: FFS vs MA**



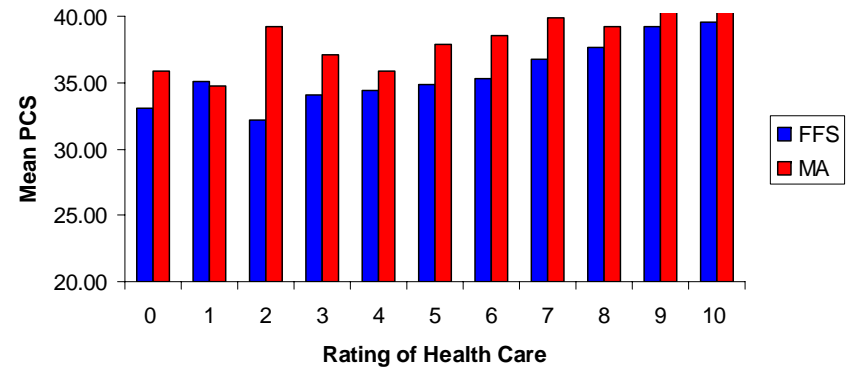
**Figure 12: Mean PCS by Rating of Doctor: FFS vs MA**



**Figure 13: Mean PCS by Rating of Specialist: FFS vs MA**



**Figure 14: Mean PCS by Rating of Health Care: FFS vs MA**



**Figure 15: Mean PCS by Rating of Health Plan: FFS vs MA**

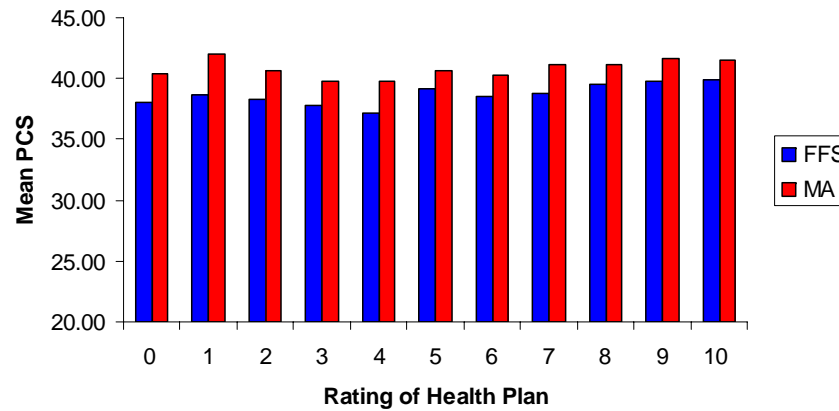


Figure 16: Mean MCS by Age Group: FFS vs MA

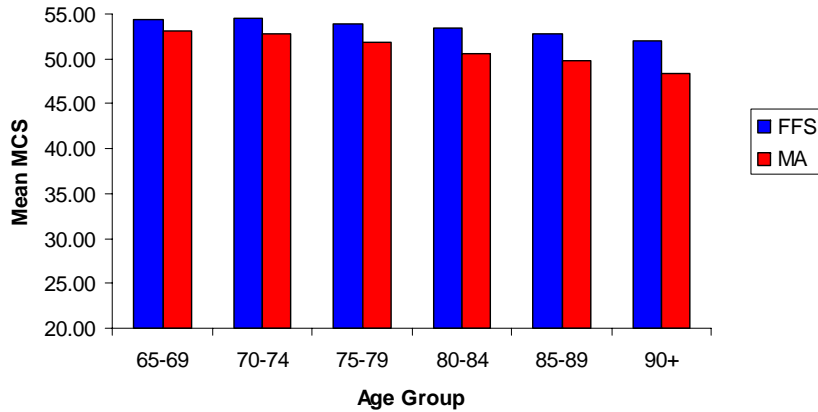


Figure 17: Mean MCS by Gender: FFS vs MA

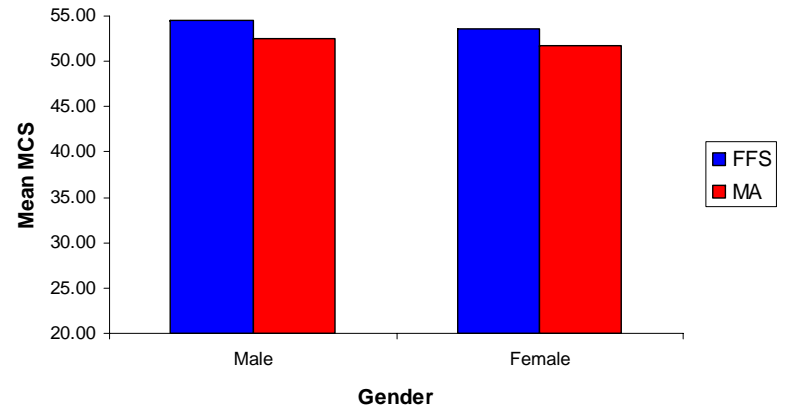


Figure 18: Mean MCS by Race: FFS vs MA

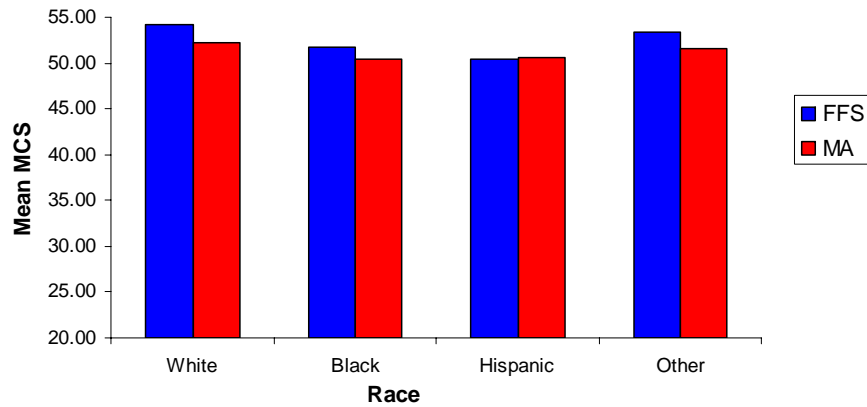
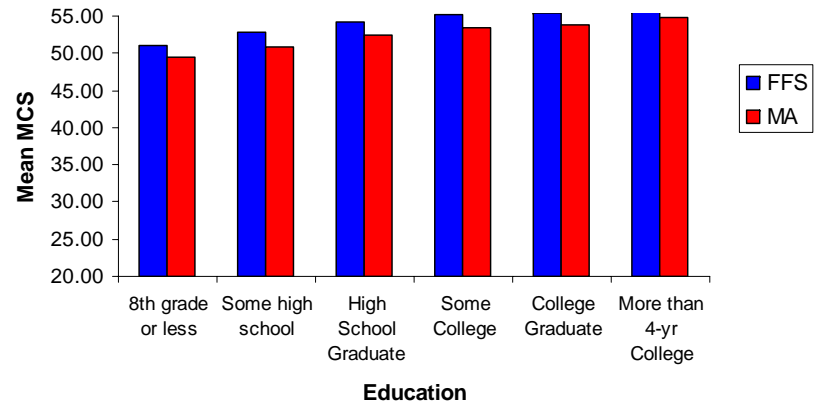
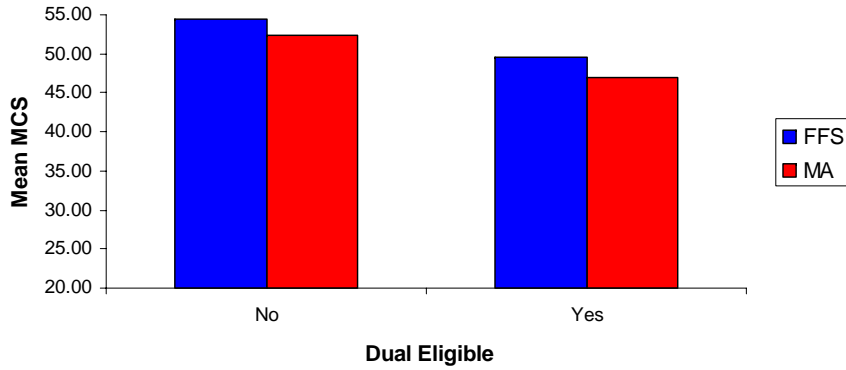


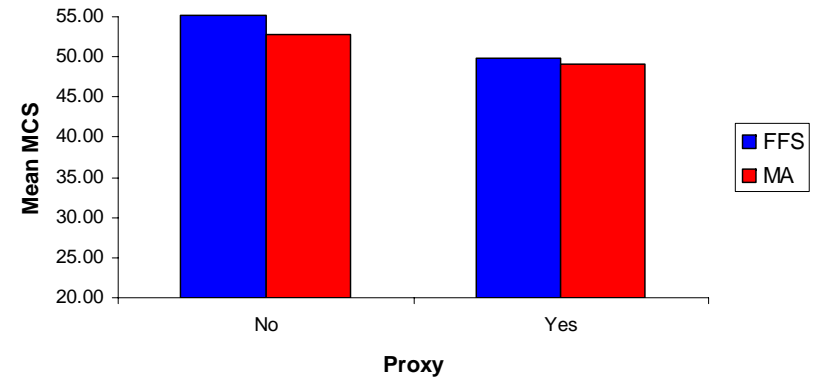
Figure 19: Mean MCS by Education: FFS vs MA



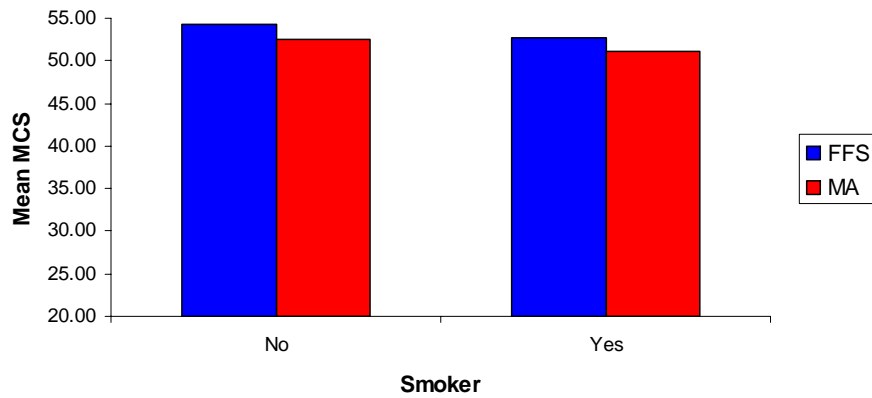
**Figure 20: Mean MCS by Dual Eligibility:  
 FFS vs MA**



**Figure 21: Mean MCS by Proxy: FFS vs MA**



**Figure 22: Mean MCS by Smoking Status: FFS vs MA**



**Figure 23: Mean MCS by PIP-DCG Risk Decile:  
 FFS vs MA**

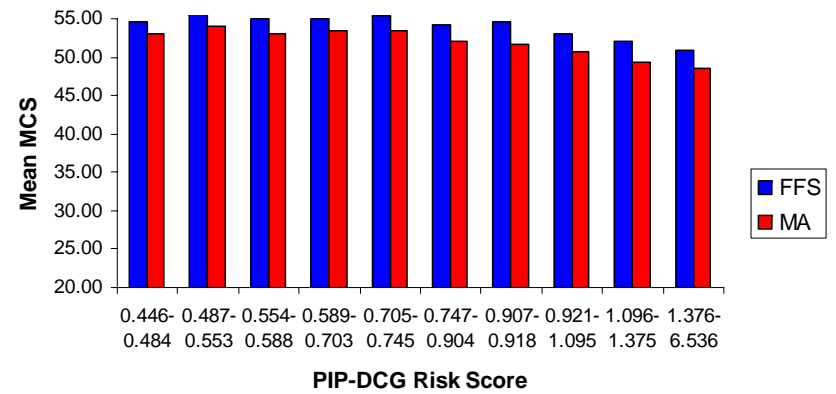


Figure 24: Mean MCS by Hospitalization: FFS vs MA

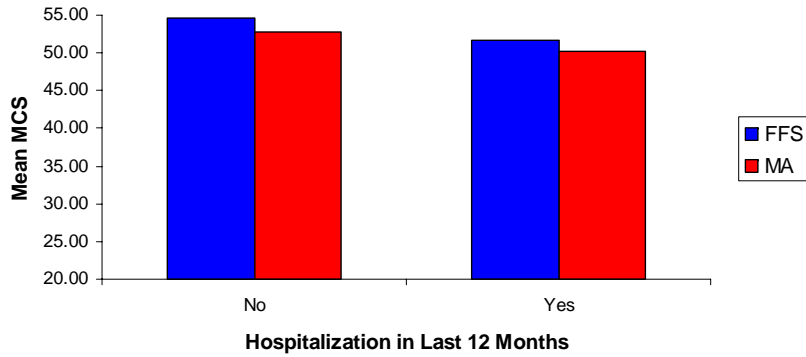


Figure 25: Mean MCS by Office Visits: FFS vs MA

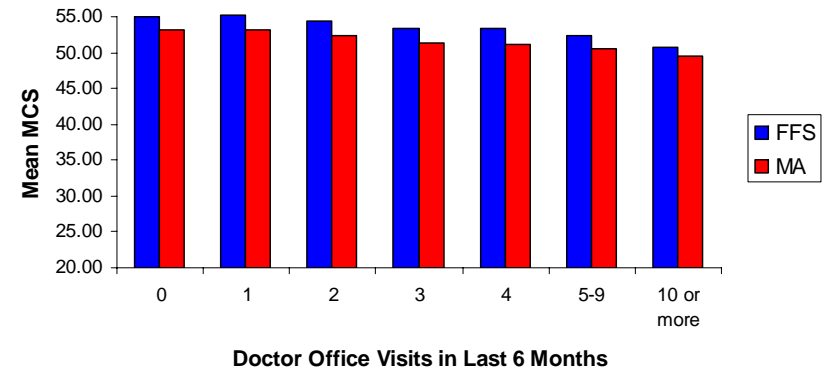


Figure 26: Mean MCS by Specialist Visits: FFS vs MA

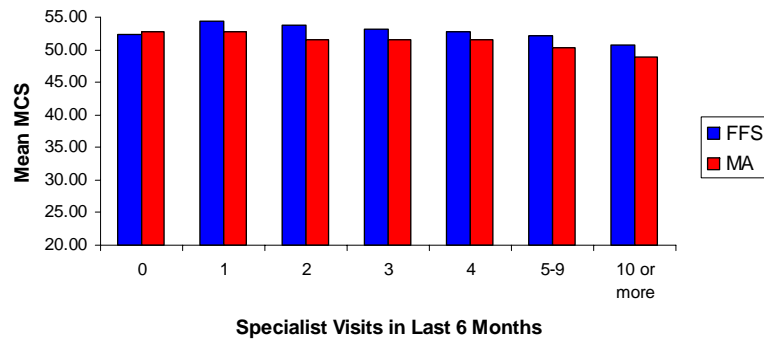
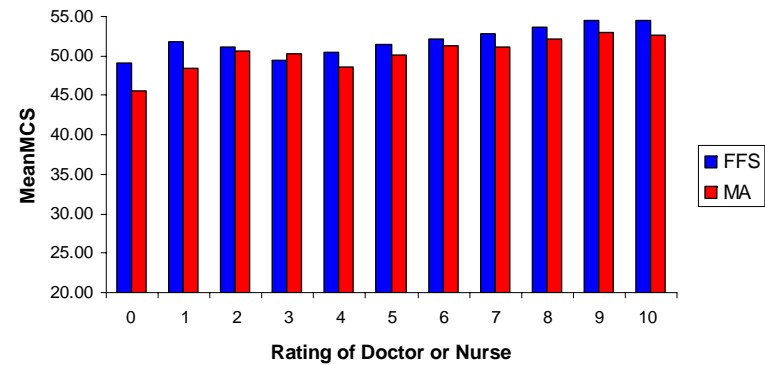
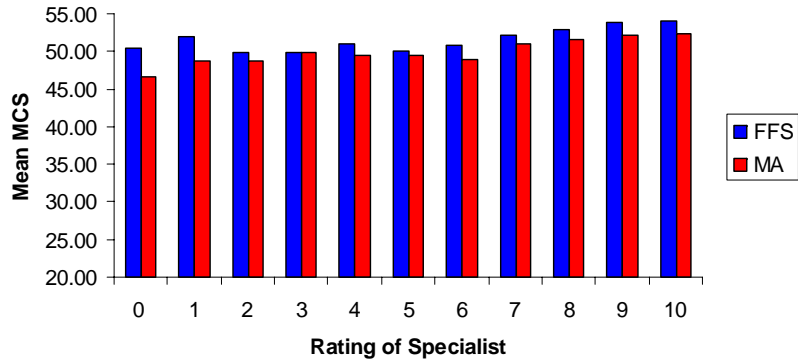


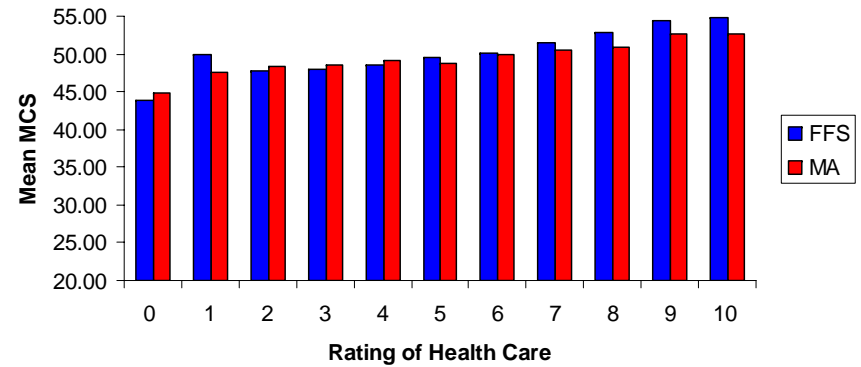
Figure 27: Mean MCS by Rating of Doctor: FFS vs MA



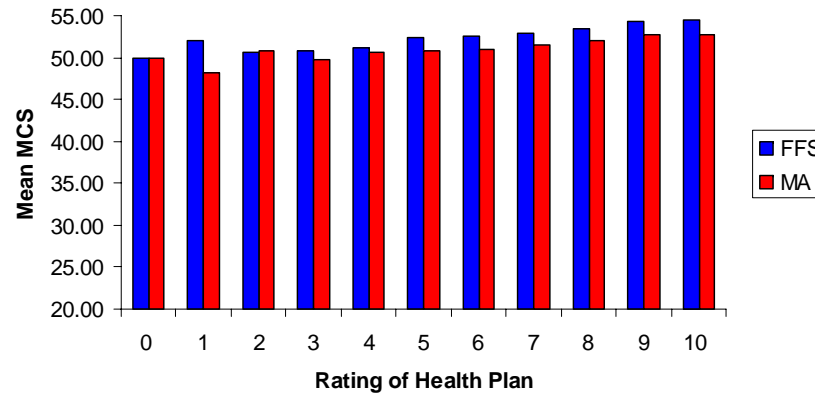
**Figure 28: Mean MCS by Rating of Specialist:  
 FFS vs MA**



**Figure 29: Mean MCS by Rating of Health Care:  
 FFS vs MA**



**Figure 30: Mean MCS by Rating of Health Plan:  
 FFS vs MA**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 2**  
**Estimates of the Relationship between PCS and MCS Scores and PIP-DCG Risk Scores**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Including Influential Observations				Excluding Influential Observations			
	Coefficient	Standard Error	t Value	p Value <sup>c</sup>	Coefficient	Standard Error	t Value	p Value <sup>c</sup>
PCS-12 <sup>b</sup>	-0.0078	0.0004	-22.04	***	-0.0069	0.0003	-23.54	***
MCS-12 <sup>b</sup>	-0.0021	0.0003	-7.36	***	-0.0022	0.0002	-9.27	***
Managed Care (MCO)	-0.0100	0.0043	-2.35	*	-0.0105	0.0035	-3.00	**
MCO * PCS-12	0.0006	0.0004	1.61	NS	0.0010	0.0003	3.39	***
MCO * MCS-12	0.0006	0.0005	1.24	NS	0.0008	0.0004	2.08	*
PCS_12 * MCS_12	0.0001	0.0000	8.96	***	0.0001	0.0000	8.68	***
Aged 70-74	0.1246	0.0082	15.26	***	0.1269	0.0067	18.89	***
Aged 75-79	0.2833	0.0085	33.17	***	0.2863	0.0070	40.72	***
Aged 80-84	0.4456	0.0098	45.54	***	0.4518	0.0081	56.09	***
Aged 85-89	0.6326	0.0134	47.04	***	0.6253	0.0111	56.25	***
Aged 90+	0.7307	0.0211	34.68	***	0.6628	0.0177	37.47	***
Male	0.1180	0.0066	17.80	***	0.1127	0.0055	20.63	***
Race - Black	0.0272	0.0135	2.02	*	0.0019	0.0112	0.17	NS
Race - Hispanic	0.0695	0.0292	2.38	*	0.0300	0.0243	1.23	NS
Race - Other	-0.0279	0.0181	-1.54	NS	-0.0235	0.0149	-1.58	NS
Race - Unknown	-0.0395	0.0369	-1.07	NS	-0.0746	0.0307	-2.43	*
8th grade or less	0.0051	0.0127	0.40	NS	-0.0043	0.0105	-0.41	NS
Some High School	0.0131	0.0104	1.25	NS	0.0219	0.0086	2.56	*
Some College	0.0071	0.0088	0.80	NS	0.0067	0.0072	0.92	NS
College	-0.0211	0.0124	-1.71	NS	-0.0246	0.0102	-2.42	*
More than 4 year College	-0.0095	0.0115	-0.83	NS	-0.0116	0.0094	-1.23	NS
Education - Unknown	0.0000	0.0172	0.00	NS	-0.0161	0.0142	-1.13	NS
Medicaid Eligible	0.5839	0.0155	37.60	***	0.5491	0.0129	42.54	***
Proxy - Yes	0.0470	0.0052	8.99	***	0.0382	0.0043	8.85	***
Proxy -Unknown	0.0458	0.0052	8.76	***	0.0280	0.0043	6.48	***
Smoker - Yes	-0.0166	0.0057	-2.90	**	-0.0171	0.0047	-3.63	***
Smoker - Unknown	-0.0301	0.0034	-8.83	***	-0.0234	0.0028	-8.32	***
Aged 70-74 * PCS_12	-0.0004	0.0004	-1.16	NS	-0.0004	0.0003	-1.20	NS
Aged 75-79 * PCS_12	0.0005	0.0004	1.27	NS	0.0004	0.0003	1.43	NS
Aged 80-84 * PCS_12	0.0012	0.0004	2.91	**	0.0014	0.0004	3.96	***
Aged 85-89 * PCS_12	0.0026	0.0006	4.58	***	0.0028	0.0005	6.00	***
Aged 90+ * PCS_12	0.0029	0.0008	3.54	***	0.0042	0.0007	6.07	***
Male * PCS_12	-0.0007	0.0003	-2.62	**	-0.0005	0.0002	-2.25	*
Medicaid Eligible * PCS_12	-0.0011	0.0005	-2.19	*	0.0011	0.0004	2.42	*
Proxy Response * PCS_12	-0.0037	0.0004	-9.92	***	-0.0022	0.0003	-7.18	***
Proxy Unknown * PCS_12	-0.0016	0.0004	-3.91	***	-0.0003	0.0003	-0.79	NS
Smoker * PCS_12	0.0016	0.0005	3.50	***	0.0013	0.0004	3.52	***
Smoking Unknown * PCS_12	0.0025	0.0003	9.48	***	0.0018	0.0002	8.32	***
Male * MCS_12	-0.0011	0.0004	-3.14	**	-0.0004	0.0003	-1.46	NS



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 2, continued**  
**Estimates of the Relationship between PCS and MCS Scores and PIP-DCG Risk Scores**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Including Influential Observations				Excluding Influential Observations			
	Coefficient	Standard Error	t Value	p Value <sup>c</sup>	Coefficient	Standard Error	t Value	p Value <sup>c</sup>
Proxy Response * MCS_12	0.0000	0.0004	0.08	NS	0.0002	0.0004	0.65	NS
Proxy Unknown * MCS_12	-0.0011	0.0005	-2.08	*	0.0000	0.0005	-0.01	NS
Aged 70-74 * Male	0.0424	0.0087	4.87	***	0.0423	0.0072	5.91	***
Aged 75-79 * Male	0.0674	0.0092	7.31	***	0.0712	0.0076	9.37	***
Aged 80-84 * Male	0.0505	0.0106	4.78	***	0.0586	0.0087	6.73	***
Aged 85-89 * Male	0.0896	0.0138	6.50	***	0.0712	0.0115	6.21	***
Aged 90+ * Male	0.1167	0.0208	5.61	***	0.0682	0.0176	3.87	***
Aged 70-74 * Black	-0.0235	0.0187	-1.26	NS	-0.0209	0.0155	-1.35	NS
Aged 75-79 * Black	-0.0303	0.0200	-1.51	NS	-0.0536	0.0167	-3.22	**
Aged 80-84 * Black	-0.0364	0.0237	-1.54	NS	-0.0467	0.0198	-2.36	*
Aged 85-89 * Black	-0.0454	0.0292	-1.55	NS	-0.0865	0.0246	-3.52	***
Aged 90+ * Black	-0.0656	0.0403	-1.63	NS	-0.0360	0.0342	-1.05	NS
Aged 70-74 * Hispanic	-0.0917	0.0356	-2.58	**	-0.0743	0.0297	-2.50	*
Aged 75-79 * Hispanic	-0.1245	0.0375	-3.32	***	-0.1231	0.0313	-3.93	***
Aged 80-84 * Hispanic	-0.0851	0.0430	-1.98	*	-0.0901	0.0359	-2.51	*
Aged 85-89 * Hispanic	-0.0099	0.0561	-0.18	NS	-0.0971	0.0482	-2.02	*
Aged 90+ * Hispanic	0.0948	0.0901	1.05	NS	0.0379	0.0925	0.41	NS
Aged 70-74 * Other Race	-0.0146	0.0261	-0.56	NS	-0.0286	0.0215	-1.33	NS
Aged 75-79 * Other Race	0.0414	0.0298	1.39	NS	-0.0295	0.0248	-1.19	NS
Aged 80-84 * Other Race	0.0565	0.0348	1.62	NS	-0.0035	0.0290	-0.12	NS
Aged 85-89 * Other Race	-0.0249	0.0490	-0.51	NS	-0.0459	0.0412	-1.11	NS
Aged 90+ * Other Race	0.1053	0.0734	1.43	NS	-0.0082	0.0650	-0.13	NS
Aged 70-74 * Unknown Race	-0.0019	0.0661	-0.03	NS	-0.0139	0.0555	-0.25	NS
Aged 75-79 * Unknown Race	0.0480	0.1113	0.43	NS	-0.0017	0.0957	-0.02	NS
Aged 80-84 * Unknown Race	-0.0578	0.1259	-0.46	NS	0.0102	0.1181	0.09	NS
Aged 85-89 * Unknown Race	0.0360	0.0917	0.39	NS	-0.0140	0.0775	-0.18	NS
Aged 90+ * Unknown Race	0.1154	0.0986	1.17	NS	-0.0331	0.0986	-0.34	NS
Aged 70-74 * <=8th Grade	0.0141	0.0164	0.86	NS	0.0059	0.0135	0.44	NS
Aged 75-79 * <=8th Grade	0.0000	0.0167	0.00	NS	0.0087	0.0138	0.63	NS
Aged 80-84 * <=8th Grade	0.0584	0.0177	3.31	***	0.0411	0.0146	2.82	**
Aged 85-89 * <=8th Grade	-0.0144	0.0209	-0.69	NS	-0.0075	0.0174	-0.43	NS
Aged 90+ * <=8th Grade	-0.0081	0.0279	-0.29	NS	0.0229	0.0236	0.97	NS

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 2, continued**  
**Estimates of the Relationship between PCS and MCS Scores and PIP-DCG Risk Scores**  
**for Medicare FFS and Managed Care Beneficiaries**

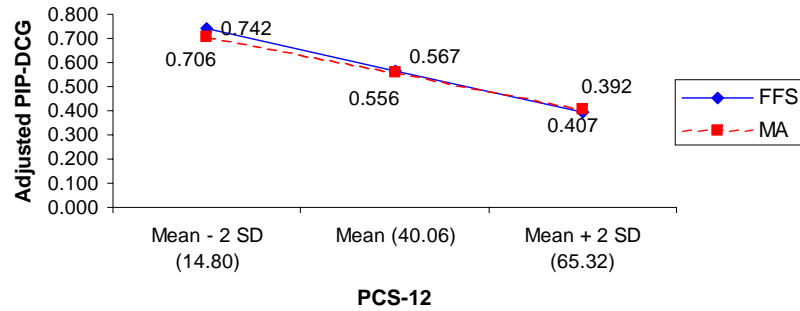
Explanatory Variables <sup>a</sup>	Including Influential Observations				Excluding Influential Observations			
	Coefficient	Standard Error	t Value	p Value <sup>c</sup>	Coefficient	Standard Error	t Value	p Value <sup>c</sup>
Aged 70-74 * someHS	0.0000	0.0138	0.00	NS	-0.0089	0.0114	-0.78	NS
Aged 75-79 * someHS	-0.0146	0.0143	-1.02	NS	-0.0283	0.0118	-2.40	*
Aged 80-84 * someHS	-0.0044	0.0162	-0.27	NS	-0.0212	0.0133	-1.59	NS
Aged 85-89 * someHS	-0.0376	0.0205	-1.83	NS	-0.0584	0.0170	-3.44	***
Aged 90+ * someHS	-0.0239	0.0295	-0.81	NS	-0.0195	0.0249	-0.78	NS
Aged 70-74 * SomeCollege	-0.0158	0.0120	-1.32	NS	-0.0178	0.0098	-1.81	NS
Aged 75-79 * SomeCollege	-0.0077	0.0127	-0.60	NS	-0.0127	0.0104	-1.22	NS
Aged 80-84 * SomeCollege	-0.0015	0.0148	-0.10	NS	-0.0098	0.0122	-0.81	NS
Aged 85-89 * SomeCollege	-0.0079	0.0202	-0.39	NS	-0.0235	0.0167	-1.40	NS
Aged 90+ * SomeCollege	0.0249	0.0305	0.82	NS	0.0290	0.0257	1.13	NS
Aged 70-74 * College	0.0186	0.0167	1.11	NS	0.0140	0.0137	1.02	NS
Aged 75-79 * College	0.0080	0.0179	0.44	NS	-0.0054	0.0148	-0.37	NS
Aged 80-84 * College	0.0558	0.0208	2.69	**	0.0150	0.0171	0.88	NS
Aged 85-89 * College	-0.0205	0.0282	-0.73	NS	-0.0300	0.0234	-1.29	NS
Aged 90+ * College	0.0234	0.0382	0.61	NS	0.0336	0.0320	1.05	NS
Aged 70-74 * >College	-0.0136	0.0156	-0.87	NS	-0.0184	0.0128	-1.43	NS
Aged 75-79 * >College	-0.0152	0.0169	-0.90	NS	-0.0220	0.0139	-1.58	NS
Aged 80-84 * >College	0.0057	0.0198	0.29	NS	-0.0215	0.0163	-1.32	NS
Aged 85-89 * >College	0.0461	0.0270	1.71	NS	-0.0078	0.0225	-0.35	NS
Aged 90+ * >College	0.0708	0.0461	1.53	NS	0.0187	0.0396	0.47	NS
Aged 70-74 * Unknown Education	-0.0035	0.0226	-0.15	NS	-0.0187	0.0187	-1.00	NS
Aged 75-79 * Unknown Education	0.0306	0.0229	1.34	NS	0.0020	0.0190	0.11	NS
Aged 80-84 * Unknown Education	-0.0034	0.0257	-0.13	NS	-0.0116	0.0213	-0.54	NS
Aged 85-89 * Unknown Education	-0.0103	0.0306	-0.34	NS	-0.0057	0.0254	-0.22	NS
Aged 90+ * Unknown Education	-0.0279	0.0434	-0.64	NS	-0.0213	0.0370	-0.58	NS
Aged 70-74 * Medicaid	-0.0458	0.0190	-2.41	*	-0.0647	0.0159	-4.08	***
Aged 75-79 * Medicaid	-0.0864	0.0194	-4.44	***	-0.0852	0.0162	-5.26	***
Aged 80-84 * Medicaid	-0.1261	0.0215	-5.86	***	-0.1589	0.0180	-8.82	***
Aged 85-89 * Medicaid	-0.2156	0.0248	-8.69	***	-0.2107	0.0209	-10.10	***
Aged 90+ * Medicaid	-0.3647	0.0287	-12.69	***	-0.3542	0.0245	-14.44	***
Medicaid * Male	-0.0497	0.0137	-3.62	***	-0.0506	0.0115	-4.39	***
Medicaid * MCO	-0.1084	0.0185	-5.87	***	-0.1175	0.0155	-7.56	***
Intercept or Constant	0.5748	0.0066	87.47	***	0.5670	0.0054	104.73	***
Observations	100,125				99,124			
R-Square	0.2903				0.3266			

<sup>a</sup> Reference groups are FFS, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

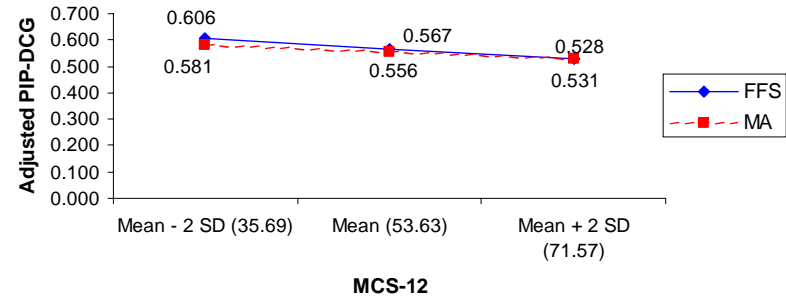
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

<sup>c</sup> \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , NS=Not Significant at  $p < 0.05$  level

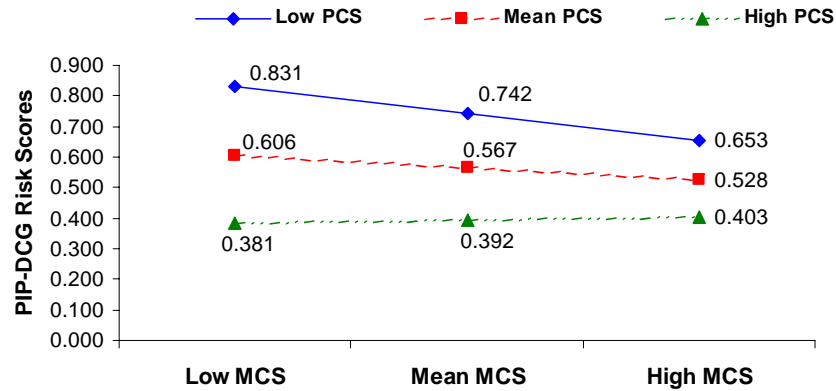
**Figure 31: Relationship between PCS-12 and Adjusted PIP-DCG Risk Scores: Comparison Between FFS and Managed Care**



**Figure 32: Relationship between MCS-12 and Adjusted PIP-DCG Risk Scores: Comparison Between FFS and Managed Care**



**Figure 33: Interaction Effect between PCS-12 and MCS-12 on Adjusted PIP-DCG Risk Scores**



**Table 3**  
**Estimates of the Relationship between PCS and MCS Scores and Likelihood of any Hospitalizations**  
**in the Last 12 Months for Medicare FFS and Managed Care Beneficiaries**

<b>Explanatory Variables<sup>a</sup></b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>Wald Chi-Square</b>	<b>Odds Ratio</b>	<b>p Value<sup>c</sup></b>
PCS-12 <sup>b</sup>	-0.0539	0.0016	1197.45	0.95	***
MCS-12 <sup>b</sup>	-0.0196	0.0011	292.45	0.98	***
Managed Care (MCO)	-0.0874	0.0409	4.58	0.92	*
MCO * PCS-12	-0.0010	0.0022	0.20	1.00	NS
MCO * MCS-12	0.0084	0.0025	11.31	1.01	***
PCS_12 * MCS_12	0.0004	0.0001	18.34	1.00	***
Aged 70-74	0.1174	0.0254	21.31	1.12	***
Aged 75-79	0.1606	0.0266	36.37	1.17	***
Aged 80-84	0.1804	0.0310	33.78	1.20	***
Aged 85-89	0.2866	0.0411	48.64	1.33	***
Aged 90+	0.2501	0.0655	14.60	1.28	***
Male	0.2286	0.0180	161.75	1.26	***
Race - Black	-0.0760	0.0625	1.48	0.93	NS
Race - Hispanic	-0.1838	0.1164	2.49	0.83	NS
Race - Other	-0.4000	0.1074	13.88	0.67	***
Race - Unknown	-0.1593	0.2464	0.42	0.85	NS
8th grade or less	-0.1112	0.0300	13.73	0.89	***
Some High School	-0.0352	0.0282	1.56	0.97	NS
Some College	0.0310	0.0266	1.36	1.03	NS
College	0.0254	0.0373	0.46	1.03	NS
More than 4 year College	0.0806	0.0352	5.26	1.08	*
Education - Unknown	0.0500	0.0556	0.81	1.05	NS
Medicaid Eligible	0.1816	0.0412	19.42	1.20	***
Proxy - Yes	0.2885	0.0234	151.50	1.33	***
Proxy -Unknown	0.3320	0.0284	136.16	1.39	***
Smoker - Yes	-0.2413	0.0333	52.62	0.79	***
Smoker - Unknown	-0.1333	0.0193	47.87	0.88	***

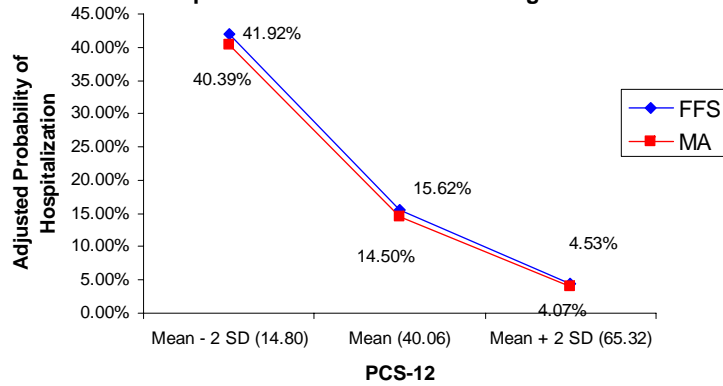
<b>Table 3, continued</b>					
<b>Estimates of the Relationship between PCS and MCS Scores and Likelihood of any Hospitalizations in the Last 12 Months for Medicare FFS and Managed Care Beneficiaries</b>					
<b>Explanatory Variables<sup>a</sup></b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>Wald Chi-Square</b>	<b>Odds Ratio</b>	<b>p Value<sup>c</sup></b>
Aged 70-74 * PCS_12	0.0003	0.0020	0.02	1.00	NS
Aged 75-79 * PCS_12	0.0047	0.0021	5.31	1.00	*
Aged 80-84 * PCS_12	0.0028	0.0023	1.41	1.00	NS
Aged 85-89 * PCS_12	0.0093	0.0029	10.04	1.01	**
Aged 90+ * PCS_12	0.0074	0.0043	2.96	1.01	NS
Medicaid Eligible * PCS_12	0.0108	0.0027	16.08	1.01	***
Black * Smoker-Yes	-0.0057	0.1306	0.00	0.99	NS
Hispanic * Smoker-Yes	-0.3776	0.2833	1.78	0.69	NS
Other Race * Smoker-Yes	0.3574	0.2311	2.39	1.43	NS
Unknown Race * Smoker-Yes	0.8322	0.4387	3.60	2.30	NS
Black * Smoking Unknown	-0.0449	0.0792	0.32	0.96	NS
Hispanic * Smoking Unknown	0.0700	0.1422	0.24	1.07	NS
Other Race * Smoking Unknown	0.0259	0.1339	0.04	1.03	NS
Unknown Race * Smoking Unknown	-0.5648	0.3454	2.67	0.57	NS
8th grade or less * MCO	-0.1306	0.0798	2.67	0.88	NS
Some High School * MCO	0.1814	0.0689	6.93	1.20	**
Some College * MCO	0.0824	0.0668	1.52	1.09	NS
College * MCO	0.2031	0.1007	4.07	1.23	*
More than 4 year College * MCO	-0.1227	0.1065	1.33	0.88	NS
Education - Unknown * MCO	-0.0928	0.1262	0.54	0.91	NS
Intercept or Constant	-1.6869	0.0281	3599.42		
Observations	96,822				
R-Square	0.0866				
C-Statistic	0.7080				

<sup>a</sup> Reference levels are FFS, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

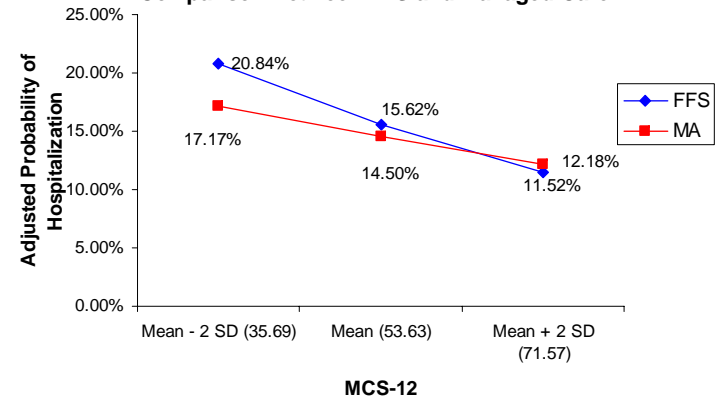
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

<sup>c</sup> \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , NS=Not Significant at  $p < 0.05$  level

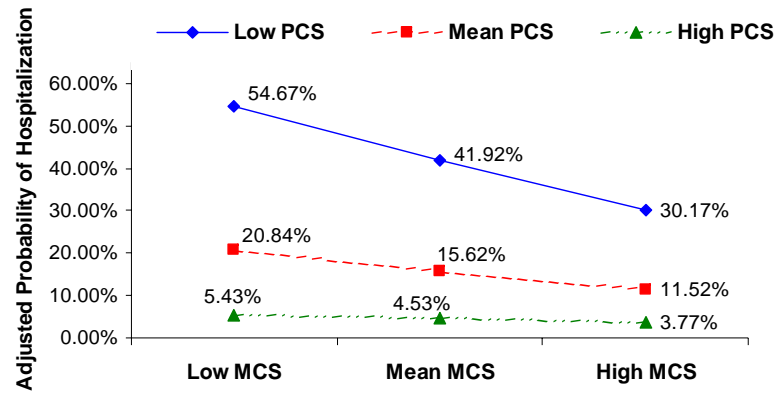
**Figure 34: Relationship between PCS-12 and Adjusted Probability of Hospitalization in Last 12 Months: Comparison Between FFS and Managed Care**



**Figure 35: Relationship between MCS-12 and Adjusted Probability of Hospitalization in Last 12 Months: Comparison Between FFS and Managed Care**



**Figure 36: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of Hospitalizations in Last 12 Months**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 4**  
**Estimates of the Relationship between PCS and MCS Scores and the Frequency of Visits to Doctor's Office or Clinic for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)					Probability of High Use (>=5) / Probability of Low Use (0-1)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	-0.0435	0.0017	654.78	0.96	***	-0.0799	0.0023	1212.68	0.92	***	***
MCS-12 <sup>b</sup>	-0.0219	0.0021	108.51	0.98	***	-0.0409	0.0027	237.68	0.96	***	***
Managed Care (MCO)	-0.2091	0.0232	81.49	0.81	***	-0.3132	0.0339	85.23	0.73	***	***
MCO * PCS-12	0.0040	0.0018	4.75	1.00	*	0.0082	0.0026	9.85	1.01	**	**
MCO * MCS-12	0.0079	0.0023	11.45	1.01	***	0.0122	0.0031	15.72	1.01	***	***
PCS_12 * MCS_12	-0.0005	0.0001	46.18	1.00	***	-0.0005	0.0001	21.31	1.00	***	***
<u>Age Group</u>											
Aged 70-74	-0.0111	0.0305	0.13	0.99	NS	-0.0429	0.0409	1.10	0.96	NS	
Aged 75-79	-0.0812	0.0314	6.67	0.92	**	-0.1584	0.0426	13.84	0.85	***	
Aged 80-84	-0.1979	0.0354	31.29	0.82	***	-0.3207	0.0488	43.20	0.73	***	
Aged 85-89	-0.3630	0.0460	62.36	0.70	***	-0.7271	0.0690	110.99	0.48	***	
Aged 90+	-0.5537	0.0671	68.16	0.57	***	-0.9879	0.1054	87.86	0.37	***	
Male	-0.2638	0.0374	49.73	0.77	***	-0.5617	0.0549	104.67	0.57	***	***
<u>Race</u>											
Race - Black	-0.0368	0.0425	0.75	0.96	NS	-0.3180	0.0612	27.01	0.73	***	
Race - Hispanic	0.0447	0.0929	0.23	1.05	NS	0.2416	0.1143	4.47	1.27	*	
Race - Other	-0.1625	0.0619	6.89	0.85	**	-0.2601	0.0914	8.10	0.77	**	
Race - Unknown	0.0899	0.1276	0.50	1.09	NS	-0.3426	0.2081	2.71	0.71	NS	
<u>Education</u>											
8th grade or less	-0.3561	0.0453	61.82	0.70	***	-0.5175	0.0674	58.93	0.60	***	
Some High School	-0.1668	0.0345	23.41	0.85	***	-0.3183	0.0513	38.53	0.73	***	
Some College	0.0777	0.0303	6.60	1.08	*	0.2418	0.0415	33.96	1.27	***	
College	0.1816	0.0474	14.69	1.20	***	0.5143	0.0612	70.55	1.67	***	
More than 4 year College	0.3621	0.0481	56.70	1.44	***	0.6972	0.0615	128.32	2.01	***	
Education - Unknown	-0.0932	0.0713	1.71	0.91	NS	0.1450	0.0965	2.26	1.16	NS	
Medicaid Eligible	-0.2581	0.1069	5.83	0.77	*	-0.2174	0.1345	2.61	0.80	NS	*
<u>Proxy Status</u>											
Proxy - Yes	0.0459	0.0589	0.61	1.05	NS	0.2178	0.0744	8.58	1.24	**	
Proxy - Unknown	-0.3294	0.0646	26.03	0.72	***	-0.0829	0.0862	0.93	0.92	NS	
<u>Smoking Status</u>											
Smoker - Yes	-0.4127	0.0318	168.88	0.66	***	-0.5886	0.0474	154.36	0.56	***	
Smoker - Unknown	-0.1405	0.0189	55.10	0.87	***	-0.2034	0.0269	57.31	0.82	***	
<u>Age and PCS Interaction</u>											
Aged 70-74 * PCS_12	0.0001	0.0019	0.00	1.00	NS	0.0016	0.0025	0.41	1.00	NS	
Aged 75-79 * PCS_12	0.0045	0.0019	5.47	1.00	*	0.0120	0.0025	22.03	1.01	***	
Aged 80-84 * PCS_12	0.0077	0.0022	12.68	1.01	***	0.0177	0.0029	36.79	1.02	***	
Aged 85-89 * PCS_12	0.0044	0.0028	2.49	1.00	NS	0.0126	0.0041	9.67	1.01	**	
Aged 90+ * PCS_12	0.0189	0.0040	22.27	1.02	***	0.0346	0.0060	32.92	1.04	***	
<u>Education and PCS Interaction</u>											
8th grade or less * PCS_12	-0.0010	0.0022	0.19	1.00	NS	-0.0007	0.0031	0.05	1.00	NS	
Some High School * PCS_12	-0.0012	0.0020	0.37	1.00	NS	-0.0054	0.0028	3.67	0.99	NS	
Some College * PCS_12	-0.0020	0.0019	1.16	1.00	NS	-0.0074	0.0025	8.68	0.99	**	
College * PCS_12	0.0035	0.0027	1.75	1.00	NS	0.0043	0.0034	1.59	1.00	NS	
> 4 year College * PCS_12	0.0016	0.0026	0.38	1.00	NS	-0.0052	0.0033	2.41	0.99	NS	
Education - Unknown * PCS_12	-0.0011	0.0039	0.08	1.00	NS	0.0087	0.0053	2.70	1.01	NS	
Medicaid * PCS_12	0.0035	0.0027	1.64	1.00	NS	0.0120	0.0036	10.96	1.01	***	**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 4 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Frequency of Visits to Doctor's Office or Clinic for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)					Probability of High Use (>=5) / Probability of Low Use (0-1)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
<u>Proxy Status and PCS Interaction</u>											
Proxy - Yes * PCS_12	0.0093	0.0019	22.74	1.01	***	0.0077	0.0026	8.89	1.01	**	***
Proxy -Unknown * PCS_12	0.0012	0.0023	0.30	1.00	NS	0.0025	0.0030	0.70	1.00	NS	NS
<u>Age and MCS Interaction</u>											
Aged 70-74 * MCS_12	-0.0010	0.0026	0.16	1.00	NS	0.0038	0.0032	1.41	1.00	NS	NS
Aged 75-79 * MCS_12	0.0006	0.0027	0.05	1.00	NS	0.0059	0.0033	3.26	1.01	NS	NS
Aged 80-84 * MCS_12	0.0014	0.0029	0.23	1.00	NS	0.0092	0.0036	6.43	1.01	*	NS
Aged 85-89 * MCS_12	0.0037	0.0036	1.05	1.00	NS	0.0100	0.0045	4.95	1.01	*	NS
Aged 90+ * MCS_12	-0.0031	0.0046	0.44	1.00	NS	0.0121	0.0061	3.89	1.01	*	NS
<u>Proxy Status and MCS Interaction</u>											
Proxy - Yes * MCS_12	0.0119	0.0023	26.87	1.01	***	0.0128	0.0027	22.19	1.01	***	***
Proxy -Unknown * MCS_12	0.0062	0.0030	4.21	1.01	*	0.0068	0.0038	3.32	1.01	NS	NS
<u>Age and Gender Interaction</u>											
Aged 70-74 * Male	0.1251	0.0410	9.31	1.13	**	0.2422	0.0585	17.12	1.27	***	***
Aged 75-79 * Male	0.1718	0.0435	15.57	1.19	***	0.3817	0.0609	39.33	1.46	***	***
Aged 80-84 * Male	0.2333	0.0504	21.48	1.26	***	0.4458	0.0690	41.77	1.56	***	***
Aged 85-89 * Male	0.2395	0.0666	12.94	1.27	***	0.4528	0.0920	24.20	1.57	***	***
Aged 90+ * Male	0.4996	0.0994	25.25	1.65	***	0.7090	0.1390	26.03	2.03	***	***
<u>Age and Medicaid Interaction</u>											
Aged 70-74 * Medicaid	-0.1384	0.0932	2.21	0.87	NS	-0.1140	0.1132	1.01	0.89	NS	NS
Aged 75-79 * Medicaid	-0.1098	0.0946	1.35	0.90	NS	-0.1562	0.1160	1.81	0.86	NS	NS
Aged 80-84 * Medicaid	-0.1776	0.1060	2.81	0.84	NS	-0.0776	0.1284	0.37	0.93	NS	NS
Aged 85-89 * Medicaid	-0.4127	0.1225	11.35	0.66	***	-0.0648	0.1478	0.19	0.94	NS	NS
Aged 90+ * Medicaid	-0.2091	0.1384	2.28	0.81	NS	-0.1542	0.1841	0.70	0.86	NS	NS
<u>Gender and Education Interaction</u>											
Male * 8th grade or less	-0.0949	0.0525	3.27	0.91	NS	-0.0767	0.0711	1.17	0.93	NS	NS
Male * Some High School	-0.0234	0.0476	0.24	0.98	NS	0.0660	0.0671	0.97	1.07	NS	NS
Male * Some College	0.1232	0.0429	8.25	1.13	**	0.0851	0.0602	2.00	1.09	NS	NS
Male * College	0.1590	0.0596	7.12	1.17	**	0.0675	0.0809	0.69	1.07	NS	NS
Male * > 4 year College	0.1202	0.0583	4.25	1.13	*	0.1379	0.0782	3.11	1.15	NS	NS
Male * Education - Unknown	0.0166	0.0928	0.03	1.02	NS	-0.0302	0.1271	0.06	0.97	NS	NS
<u>Gender and Proxy Interaction</u>											
Male * Proxy - Yes	0.0634	0.0485	1.70	1.07	NS	0.2812	0.0608	21.40	1.32	***	***
Male * Proxy -Unknown	0.0538	0.0558	0.93	1.06	NS	0.1372	0.0756	3.30	1.15	NS	NS
<u>Race and MCO Interaction</u>											
Race - Black * MCO	-0.0045	0.0877	0.00	1.00	NS	0.2400	0.1241	3.74	1.27	NS	NS
Race - Hispanic * MCO	-0.2560	0.1254	4.17	0.77	*	-0.2483	0.1635	2.31	0.78	NS	NS
Race - Other * MCO	-0.1253	0.1389	0.81	0.88	NS	-0.1494	0.2107	0.50	0.86	NS	NS
<u>Race and Medicaid Interaction</u>											
Race - Black * Medicaid	0.1235	0.0854	2.09	1.13	NS	0.3056	0.1092	7.83	1.36	**	**
Race - Hispanic * Medicaid	0.1547	0.1438	1.16	1.17	NS	0.0296	0.1747	0.03	1.03	NS	NS
Race - Other * Medicaid	0.2442	0.1193	4.19	1.28	*	0.4259	0.1534	7.71	1.53	**	**
Race - Unknown * Medicaid	-0.3186	0.4590	0.48	0.73	NS	0.6932	0.5152	1.81	2.00	NS	NS

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 4 - Continued**  
Estimates of the Relationship between PCS and MCS Scores and the Frequency of Visits to Doctor's Office or Clinic for Medicare FFS and Managed Care Beneficiaries

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)				Probability of High Use (≥5) / Probability of Low Use (0-1)				p-value for overall effect <sup>c</sup>	
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square		Odds Ratio
<u>Education and Medicaid Interaction</u>										
8th grade or less * Medicaid	0.3757	0.0871	18.60	1.46	***	0.5259	0.1088	23.38	1.69	***
Some High School * Medicaid	0.1417	0.0936	2.29	1.15	NS	0.2453	0.1173	4.38	1.28	*
Some College * Medicaid	-0.0175	0.1252	0.02	0.98	NS	-0.0973	0.1550	0.39	0.91	NS
College * Medicaid	0.0204	0.2188	0.01	1.02	NS	-0.4401	0.2947	2.23	0.64	NS
> 4 year College * Medicaid	-0.3258	0.2242	2.11	0.72	NS	-0.4143	0.2756	2.26	0.66	NS
Education - Unknown * Medicaid	-0.1700	0.1721	0.98	0.84	NS	-0.0380	0.2127	0.03	0.96	NS
<u>Education and Proxy Interaction</u>										
≤8thGr * Proxy - Yes	0.3049	0.0620	24.16	1.36	***	0.3834	0.0816	22.09	1.47	***
≤8thGr * Proxy-Unknown	0.2448	0.0842	8.46	1.28	**	0.4373	0.1141	14.70	1.55	***
SomeHS * Proxy-Yes	0.1507	0.0648	5.40	1.16	*	0.2342	0.0813	8.29	1.26	**
SomeHS * Proxy-Unknown	0.1912	0.0785	5.94	1.21	*	0.3176	0.1062	8.94	1.37	**
SomeCollege * Proxy-Yes	-0.2030	0.0787	6.65	0.82	**	-0.2163	0.0938	5.32	0.81	*
SomeCollege * Proxy-Unknown	0.0922	0.0764	1.46	1.10	NS	0.0290	0.1021	0.08	1.03	NS
College * Proxy-Yes	-0.1862	0.1142	2.66	0.83	NS	-0.1323	0.1331	0.99	0.88	NS
College * Proxy-Unknown	-0.0344	0.1114	0.10	0.97	NS	-0.2746	0.1525	3.24	0.76	NS
> 4 year College * Proxy-Yes	-0.3519	0.1249	7.93	0.70	**	-0.5254	0.1465	12.86	0.59	***
> 4 year College * Proxy-Unknown	0.0882	0.1134	0.61	1.09	NS	-0.0782	0.1492	0.27	0.92	NS
Education Unknown * Proxy-Yes	0.0042	0.1479	0.00	1.00	NS	-0.1172	0.1817	0.42	0.89	NS
Education Unknown * Proxy-Unknown	0.2592	0.1202	4.65	1.30	*	-0.2989	0.1693	3.12	0.74	NS
<u>Medicaid and Proxy Interaction</u>										
Medicaid * Proxy-Yes	-0.0922	0.0765	1.45	0.91	NS	-0.2122	0.0947	5.02	0.81	*
Medicaid * Proxy-Unknown	0.2169	0.1026	4.47	1.24	*	0.1432	0.1276	1.26	1.15	NS
Medicaid * MCO	0.2538	0.1030	6.07	1.29	*	0.3448	0.1299	7.04	1.41	**
<u>Medicaid and Smoking Interaction</u>										
Medicaid * Smoker-Yes	0.2967	0.1030	8.29	1.35	**	0.3984	0.1288	9.57	1.49	**
Medicaid * Smoker - Unknown	0.0945	0.0697	1.84	1.10	NS	0.0797	0.0848	0.88	1.08	NS
<u>Proxy and MCO Interaction</u>										
Proxy-Yes * MCO	0.1390	0.0630	4.86	1.15	*	0.1804	0.0811	4.95	1.20	*
Proxy-Unknown * MCO	0.0776	0.1179	0.43	1.08	NS	0.2456	0.1583	2.41	1.28	NS
<u>Proxy and Smoking Interaction</u>										
Proxy-Yes * Smoker-Yes	-0.0158	0.0774	0.04	0.98	NS	-0.2414	0.1030	5.49	0.79	*
Proxy-Yes * Smoker-Unknown	0.0560	0.0475	1.39	1.06	NS	0.1458	0.0582	6.28	1.16	*
Proxy-Unknown * Smoker-Yes	-0.0109	0.0914	0.01	0.99	NS	0.1075	0.1237	0.76	1.11	NS
Proxy-Unknown * Smoker-Unknown	0.1397	0.0588	5.63	1.15	*	0.1215	0.0780	2.43	1.13	NS
Intercept	0.4686	0.0301	241.74			-0.5545	0.0412	180.97		
Observations	94,483									
R-Square	0.1164									

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

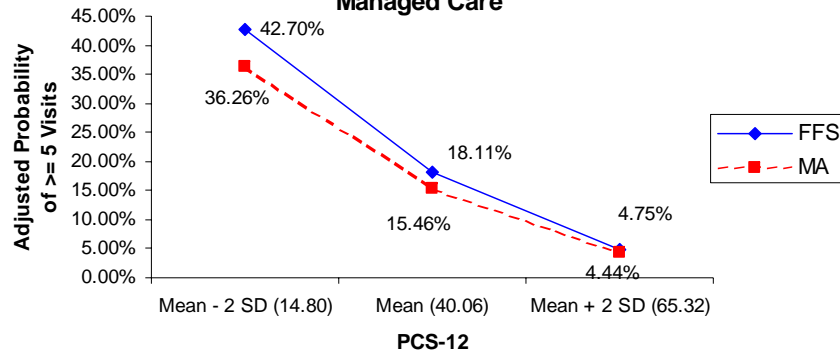
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

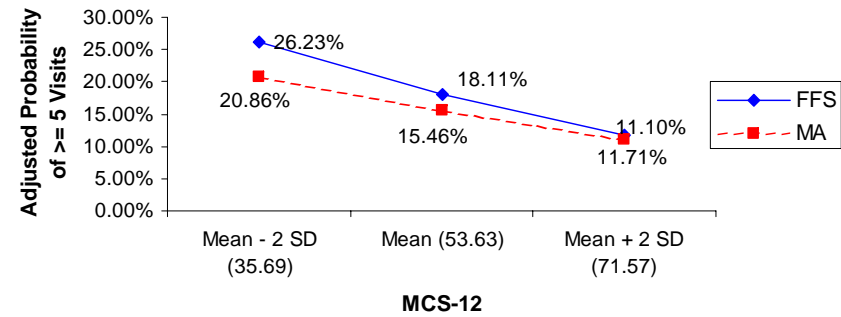
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

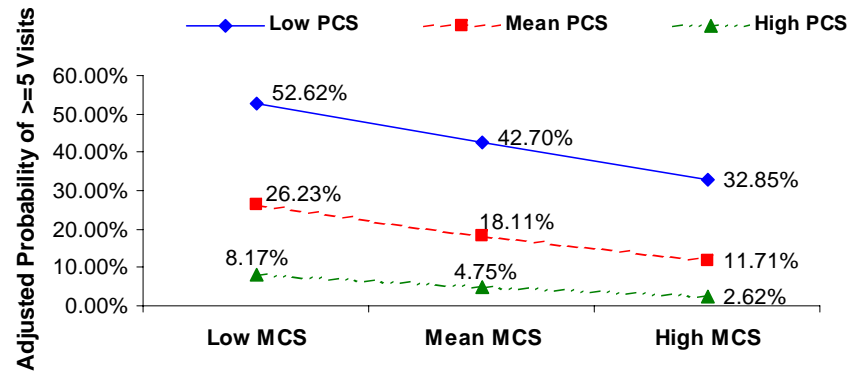
**Figure 37: Relationship between PCS-12 and the Adjusted Probability of  $\geq 5$  Visits in Last 6 Months to a Doctor's Office or Clinic: Comparison Between FFS and Managed Care**



**Figure 38: Relationship between MCS-12 and the Adjusted Probability of  $\geq 5$  Visits in Last 6 Months to a Doctor's Office or Clinic: Comparison Between FFS and Managed Care**



**Figure 39: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of  $\geq 5$  Visits in Last 6 Months to Doctor's or Clinic**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 5**  
**Estimates of the Relationship between PCS and MCS Scores and the Frequency of Specialist Visits**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)					Probability of High Use (>=5) / Probability of Low Use (0-1)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	-0.0228	0.0022	105.57	0.98	***	-0.0538	0.0034	254.82	0.95	***	***
MCS-12 <sup>b</sup>	-0.0078	0.0013	34.08	0.99	***	-0.0184	0.0018	107.03	0.98	***	***
Managed Care (MCO)	-1.3778	0.0575	574.80	0.25	***	-1.1822	0.0956	152.76	0.31	***	***
MCO * PCS-12	-0.0145	0.0020	51.31	0.99	***	-0.0111	0.0034	10.59	0.99	**	***
MCO * MCS-12	-0.0039	0.0025	2.52	1.00	NS	-0.0054	0.0038	1.96	0.99	NS	NS
<u>Age Group</u>											
Aged 70-74	0.0382	0.0554	0.47	1.04	NS	0.0222	0.0849	0.07	1.02	NS	***
Aged 75-79	-0.0605	0.0581	1.08	0.94	NS	-0.1450	0.0890	2.66	0.87	NS	***
Aged 80-84	-0.0170	0.0682	0.06	0.98	NS	-0.2495	0.1049	5.65	0.78	*	***
Aged 85-89	-0.2907	0.0947	9.43	0.75	**	-0.7360	0.1544	22.72	0.48	***	***
Aged 90+	-0.2396	0.1550	2.39	0.79	NS	-0.5945	0.2447	5.90	0.55	*	***
Male	-0.0811	0.0441	3.38	0.92	NS	-0.1878	0.0678	7.67	0.83	**	NS
<u>Race</u>											
Race - Black	-0.0017	0.0592	0.00	1.00	NS	-0.2129	0.0873	5.94	0.81	*	NS
Race - Hispanic	0.1027	0.1067	0.93	1.11	NS	0.0628	0.1459	0.19	1.06	NS	NS
Race - Other	-0.1382	0.0815	2.87	0.87	NS	-0.0249	0.1156	0.05	0.98	NS	NS
Race - Unknown	0.1140	0.1928	0.35	1.12	NS	0.2375	0.2707	0.77	1.27	NS	NS
<u>Education</u>											
8th grade or less	-0.3207	0.0972	10.88	0.73	***	-0.3227	0.1505	4.60	0.72	*	***
Some High School	-0.1831	0.0765	5.72	0.83	*	-0.2884	0.1213	5.65	0.75	*	***
Some College	0.0156	0.0602	0.07	1.02	NS	0.0069	0.0940	0.01	1.01	NS	NS
College	0.2542	0.0824	9.52	1.29	**	0.1865	0.1309	2.03	1.21	NS	NS
More than 4 year College	0.2531	0.0766	10.91	1.29	***	0.5316	0.1130	22.12	1.70	***	***
Education - Unknown	-0.2567	0.1466	3.07	0.77	NS	-0.0322	0.2170	0.02	0.97	NS	NS
Medicaid Eligible	-0.1652	0.0449	13.55	0.85	***	-0.2339	0.0634	13.60	0.79	***	***
<u>Proxy Status</u>											
Proxy - Yes	0.1632	0.0554	8.67	1.18	**	0.5139	0.0789	42.45	1.67	***	***
Proxy - Unknown	-0.0900	0.0707	1.62	0.91	NS	0.4111	0.0971	17.91	1.51	***	***
<u>Smoking Status</u>											
Smoker - Yes	-0.2236	0.0368	37.00	0.80	***	-0.3608	0.0570	40.09	0.70	***	***
Smoker - Unknown	-0.0562	0.0215	6.81	0.95	**	-0.1288	0.0322	16.01	0.88	***	***
<u>Age and PCS Interaction</u>											
Aged 70-74 * PCS_12	0.0044	0.0023	3.59	1.00	NS	0.0097	0.0035	7.61	1.01	**	***
Aged 75-79 * PCS_12	0.0015	0.0025	0.37	1.00	NS	0.0073	0.0037	3.84	1.01	*	***
Aged 80-84 * PCS_12	0.0069	0.0029	5.80	1.01	*	0.0179	0.0043	17.33	1.02	***	***
Aged 85-89 * PCS_12	0.0095	0.0039	6.03	1.01	*	0.0094	0.0064	2.17	1.01	NS	NS
Aged 90+ * PCS_12	0.0194	0.0063	9.52	1.02	**	0.0318	0.0102	9.82	1.03	**	NS
<u>Education and PCS Interaction</u>											
8th grade or less * PCS_12	0.0034	0.0032	1.14	1.00	NS	0.0070	0.0049	2.07	1.01	NS	NS
Some High School * PCS_12	-0.0021	0.0027	0.58	1.00	NS	0.0020	0.0043	0.22	1.00	NS	NS
Some College * PCS_12	-0.0040	0.0024	2.81	1.00	NS	-0.0048	0.0036	1.75	1.00	NS	NS
College * PCS_12	-0.0023	0.0033	0.49	1.00	NS	-0.0033	0.0048	0.47	1.00	NS	NS
> 4 year College * PCS_12	-0.0099	0.0032	9.73	0.99	**	-0.0156	0.0045	12.18	0.98	***	NS
Education - Unknown * PCS_12	0.0015	0.0052	0.08	1.00	NS	0.0189	0.0080	5.59	1.02	*	NS
<u>Proxy and PCS Interaction</u>											
Proxy - Yes * PCS_12	0.0063	0.0026	6.04	1.01	*	0.0093	0.0037	6.32	1.01	*	NS
Proxy - Unknown * PCS_12	0.0016	0.0032	0.25	1.00	NS	0.0058	0.0045	1.65	1.01	NS	NS

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 5 - Continued  
Estimates of the Relationship between PCS and MCS Scores and the Frequency of Specialist Visits  
for Medicare FFS and Managed Care Beneficiaries

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)					Probability of High Use (>=5) / Probability of Low Use (0-1)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
<b>Age and Gender Interaction</b>											
Aged 70-74 * Male	-0.0453	0.0551	0.68	0.96	NS	-0.0663	0.0850	0.61	0.94	NS	***
Aged 75-79 * Male	0.0925	0.0582	2.52	1.10	NS	0.2231	0.0885	6.36	1.25	*	
Aged 80-84 * Male	0.2000	0.0672	8.85	1.22	**	0.2491	0.0994	6.28	1.28	*	
Aged 85-89 * Male	0.3207	0.0885	13.12	1.38	***	0.3252	0.1352	5.79	1.38	*	
Aged 90+ * Male	-0.0796	0.1417	0.32	0.92	NS	0.3414	0.2112	2.61	1.41	NS	
<b>Age and Education Interaction</b>											
Aged 70-74 * 8th grade or less	-0.0339	0.1073	0.10	0.97	NS	0.1359	0.1609	0.71	1.15	NS	**
Aged 70-74 * Some High School	0.1042	0.0909	1.31	1.11	NS	0.1086	0.1414	0.59	1.11	NS	
Aged 70-74 * Some College	0.0689	0.0745	0.86	1.07	NS	0.1688	0.1151	2.15	1.18	NS	
Aged 70-74 * College	-0.0517	0.1008	0.26	0.95	NS	0.0680	0.1613	0.18	1.07	NS	
Aged 70-74 * > 4 year College	0.0708	0.0941	0.57	1.07	NS	0.1513	0.1403	1.16	1.16	NS	
Aged 70-74 * Education - Unknown	0.4676	0.1783	6.88	1.60	**	0.3272	0.2625	1.55	1.39	NS	
Aged 75-79 * 8th grade or less	-0.0437	0.1099	0.16	0.96	NS	0.0508	0.1645	0.10	1.05	NS	
Aged 75-79 * Some High School	-0.0221	0.0949	0.05	0.98	NS	0.2427	0.1424	2.90	1.27	NS	
Aged 75-79 * Some College	0.1478	0.0792	3.48	1.16	NS	0.1657	0.1210	1.87	1.18	NS	
Aged 75-79 * College	0.0887	0.1098	0.65	1.09	NS	0.2736	0.1689	2.63	1.31	NS	
Aged 75-79 * > 4 year College	0.1596	0.1026	2.42	1.17	NS	-0.0869	0.1536	0.32	0.92	NS	
Aged 75-79 * Education - Unknown	0.3486	0.1769	3.88	1.42	*	0.0437	0.2648	0.03	1.04	NS	
Aged 80-84 * 8th grade or less	-0.1014	0.1182	0.74	0.90	NS	0.3071	0.1738	3.12	1.36	NS	
Aged 80-84 * Some High School	-0.0219	0.1079	0.04	0.98	NS	0.2347	0.1625	2.09	1.26	NS	
Aged 80-84 * Some College	0.0149	0.0953	0.02	1.02	NS	0.4230	0.1399	9.15	1.53	**	
Aged 80-84 * College	-0.0442	0.1296	0.12	0.96	NS	0.3868	0.1901	4.14	1.47	*	
Aged 80-84 * > 4 year College	-0.0193	0.1238	0.02	0.98	NS	0.1322	0.1758	0.57	1.14	NS	
Aged 80-84 * Education - Unknown	0.3714	0.2023	3.37	1.45	NS	0.4066	0.2951	1.90	1.50	NS	
Aged 85-89 * 8th grade or less	0.1889	0.1415	1.78	1.21	NS	0.5703	0.2108	7.32	1.77	**	
Aged 85-89 * Some High School	0.0587	0.1406	0.17	1.06	NS	0.2632	0.2171	1.47	1.30	NS	
Aged 85-89 * Some College	0.2682	0.1310	4.19	1.31	*	0.2981	0.2040	2.14	1.35	NS	
Aged 85-89 * College	0.0465	0.1803	0.07	1.05	NS	0.2318	0.2777	0.70	1.26	NS	
Aged 85-89 * > 4 year College	-0.0977	0.1690	0.33	0.91	NS	0.0859	0.2399	0.13	1.09	NS	
Aged 85-89 * Education - Unknown	0.7579	0.2429	9.74	2.13	**	0.2067	0.4107	0.25	1.23	NS	
Aged 90+ * 8th grade or less	0.2837	0.1962	2.09	1.33	NS	0.1767	0.3055	0.33	1.19	NS	
Aged 90+ * Some High School	0.1378	0.2105	0.43	1.15	NS	0.3333	0.3133	1.13	1.40	NS	
Aged 90+ * Some College	0.2500	0.2146	1.36	1.28	NS	0.6750	0.2995	5.08	1.96	*	
Aged 90+ * College	0.6840	0.2796	5.99	1.98	*	0.5600	0.4055	1.91	1.75	NS	
Aged 90+ * > 4 year College	0.3927	0.3126	1.58	1.48	NS	-1.2837	0.6646	3.73	0.28	NS	
Aged 90+ * Education - Unknown	0.2271	0.3917	0.34	1.25	NS	-0.0037	0.6219	0.00	1.00	NS	
<b>Education and Proxy Interaction</b>											
<=8thGr * Proxy - Yes	0.1560	0.0851	3.36	1.17	NS	-0.0616	0.1234	0.25	0.94	NS	**
<=8thGr * Proxy-Unknown	0.2519	0.1315	3.67	1.29	NS	0.1080	0.1807	0.36	1.11	NS	
SomeHS * Proxy-Yes	0.1000	0.0870	1.32	1.11	NS	0.1309	0.1190	1.21	1.14	NS	
SomeHS * Proxy-Unknown	-0.0342	0.1242	0.08	0.97	NS	-0.1393	0.1720	0.66	0.87	NS	
SomeCollege * Proxy-Yes	-0.0945	0.0994	0.90	0.91	NS	-0.1532	0.1302	1.39	0.86	NS	
SomeCollege * Proxy-Unknown	0.0813	0.1162	0.49	1.08	NS	-0.0981	0.1567	0.39	0.91	NS	
College * Proxy-Yes	-0.2730	0.1424	3.68	0.76	NS	-0.0717	0.1790	0.16	0.93	NS	
College * Proxy-Unknown	-0.0669	0.1638	0.17	0.94	NS	-0.5040	0.2396	4.43	0.60	*	
> 4 year College * Proxy-Yes	-0.0767	0.1530	0.25	0.93	NS	0.0133	0.1865	0.01	1.01	NS	
> 4 year College * Proxy-Unknown	-0.0883	0.1537	0.33	0.92	NS	-0.1348	0.1991	0.46	0.87	NS	

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 5 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Frequency of Specialist Visits**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Use (2-4) / Probability of Low Use (0-1)					Probability of High Use (>=5) / Probability of Low Use (0-1)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Education Unknown * Proxy-Yes	-0.6063	0.1941	9.76	0.55	**	-0.0899	0.2513	0.13	0.91	NS	
Education Unknown * Proxy-Unknown	-0.1439	0.1496	0.92	0.87	NS	-0.5334	0.2346	5.17	0.59	*	
<u>Age and MCO Interaction</u>											
Aged 70-74 * MCO	0.0281	0.0595	0.22	1.03	NS	-0.1788	0.1005	3.16	0.84	NS	
Aged 75-79 * MCO	0.0420	0.0637	0.44	1.04	NS	-0.1746	0.1061	2.71	0.84	NS	
Aged 80-84 * MCO	-0.1146	0.0757	2.29	0.89	NS	-0.2210	0.1228	3.24	0.80	NS	
Aged 85-89 * MCO	-0.1471	0.1025	2.06	0.86	NS	-0.2234	0.1761	1.61	0.80	NS	
Aged 90+ * MCO	-0.4266	0.1683	6.43	0.65	*	-0.6907	0.3025	5.21	0.50	*	
Male * MCO	0.2613	0.0444	34.64	1.30	***	0.1369	0.0749	3.34	1.15	NS	***
<u>Race and MCO Interaction</u>											
Race - Black * MCO	-0.2242	0.1035	4.69	0.80	*	0.1309	0.1656	0.62	1.14	NS	
Race - Hispanic * MCO	-0.1674	0.1437	1.36	0.85	NS	-0.4536	0.2467	3.38	0.64	NS	
Race - Other * MCO	-0.3417	0.1660	4.24	0.71	*	-0.4223	0.2832	2.22	0.66	NS	
<u>Education and MCO Interaction</u>											
8th grade or less * MCO	0.0427	0.0821	0.27	1.04	NS	-0.2624	0.1428	3.38	0.77	NS	
Some High School * MCO	0.0710	0.0704	1.02	1.07	NS	0.0276	0.1176	0.06	1.03	NS	
Some College * MCO	0.2105	0.0616	11.66	1.23	***	0.2183	0.1027	4.52	1.24	*	
College * MCO	0.2577	0.0888	8.41	1.29	**	0.3330	0.1486	5.02	1.40	*	
> 4 year College * MCO	0.3825	0.0867	19.48	1.47	***	0.2220	0.1461	2.31	1.25	NS	
Education - Unknown * MCO	0.1508	0.1271	1.41	1.16	NS	0.1539	0.2062	0.56	1.17	NS	
Intercept	0.4503	0.0462	94.94			-0.9437	0.0708	177.49			
Observations	53,221										
R-Square	0.1301										

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

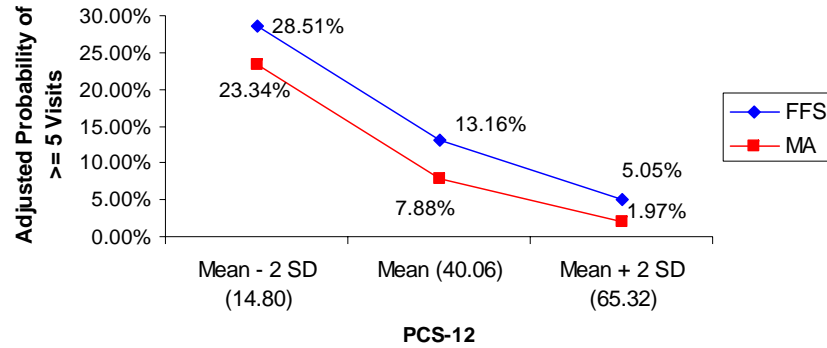
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

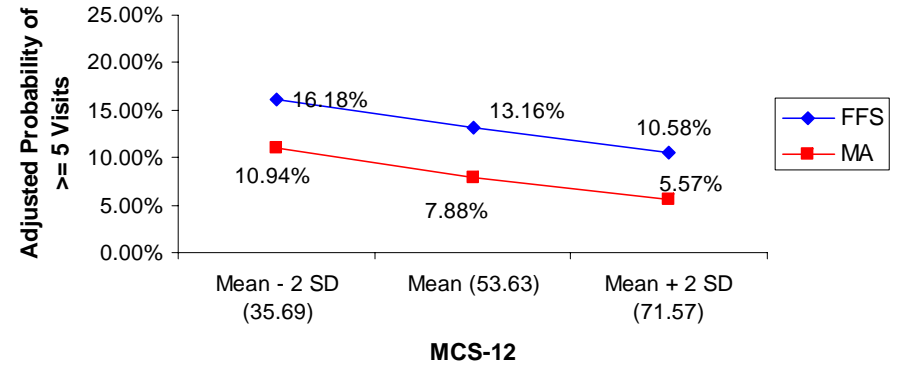
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

**Figure 40: Relationship between PCS-12 and Adjusted Probability of  $\geq 5$  Visits in Last 6 Months to a Specialist: Comparison Between FFS and Managed Care**



**Figure 41: Relationship between MCS-12 and Adjusted Probability of  $\geq 5$  Visits in Last 6 Months to a Specialist: Comparison Between FFS and Managed Care**





MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 6 Estimates of the Relationship between PCS and MCS Scores and the Rating of Doctor or Nurse for Medicare FFS and Managed Care Beneficiaries											
Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	0.0074	0.0028	6.77	1.01	**	0.0088	0.0027	10.34	1.01	**	**
MCS-12 <sup>b</sup>	0.0088	0.0037	5.84	1.01	*	0.0314	0.0035	80.11	1.03	***	***
Managed Care (MCO)	-0.1401	0.0859	2.66	0.87	NS	-0.0140	0.0816	0.03	0.99	NS	*
MCO * PCS-12	0.0003	0.0039	0.01	1.00	NS	0.0022	0.0037	0.37	1.00	NS	NS
MCO * MCS-12	-0.0003	0.0044	0.01	1.00	NS	-0.0057	0.0042	1.84	0.99	NS	NS
PCS_12 * MCS_12	0.0000	0.0001	0.02	1.00	NS	0.0005	0.0001	16.79	1.00	***	***
<u>Age Group</u>											
Aged 70-74	0.1091	0.0573	3.62	1.12	NS	0.2348	0.0550	18.20	1.26	***	***
Aged 75-79	0.0058	0.0612	0.01	1.01	NS	0.2829	0.0585	23.36	1.33	***	***
Aged 80-84	0.0240	0.0751	0.10	1.02	NS	0.3860	0.0717	29.01	1.47	***	***
Aged 85-89	-0.2109	0.1077	3.84	0.81	.05	0.3569	0.1012	12.44	1.43	***	***
Aged 90+	-0.2670	0.1878	2.02	0.77	NS	0.3570	0.1752	4.15	1.43	*	*
Male	0.1771	0.0717	6.10	1.19	*	-0.0398	0.0685	0.34	0.96	NS	***
<u>Race</u>											
Race - Black	-0.2309	0.1341	2.97	0.79	NS	0.2086	0.1232	2.87	1.23	NS	***
Race - Hispanic	-0.6464	0.2836	5.20	0.52	*	0.2620	0.2513	1.09	1.30	NS	***
Race - Other	0.1406	0.1982	0.50	1.15	NS	0.2325	0.1885	1.52	1.26	NS	***
Race - Unknown	-0.0050	0.3584	0.00	1.00	NS	-0.3532	0.3453	1.05	0.70	NS	***
<u>Education</u>											
8th grade or less	-0.2505	0.0828	9.14	0.78	**	0.0544	0.0773	0.49	1.06	NS	***
Some High School	-0.1628	0.0704	5.35	0.85	*	0.0866	0.0659	1.73	1.09	NS	***
Some College	0.0368	0.0613	0.36	1.04	NS	-0.0553	0.0584	0.90	0.95	NS	***
College	0.3143	0.0988	10.11	1.37	**	0.0303	0.0956	0.28	1.05	NS	***
More than 4 year College	0.2342	0.0985	5.66	1.26	*	-0.0640	0.0951	0.45	0.94	NS	***
Education - Unknown	-0.2254	0.1363	2.74	0.80	NS	-0.0810	0.1269	0.41	0.92	NS	***
Medicaid Eligible	-0.4703	0.1490	9.97	0.62	**	0.0145	0.1357	0.01	1.01	NS	***
<u>Proxy Status</u>											
Proxy - Yes	-0.2313	0.1312	3.11	0.79	NS	-0.2164	0.1241	3.04	0.81	NS	***
Proxy - Unknown	0.0749	0.1674	0.20	1.08	NS	0.3176	0.1593	3.98	1.37	*	***
<u>Smoking Status</u>											
Smoker - Yes	-0.4074	0.0875	21.69	0.67	***	-0.1526	0.0811	3.54	0.86	NS	***
Smoker - Unknown	0.0513	0.0532	0.93	1.05	NS	0.1062	0.0505	4.42	1.11	*	***
<u>Age and PCS Interaction</u>											
Aged 70-74 * PCS_12	-0.0035	0.0037	0.92	1.00	NS	0.0026	0.0035	0.57	1.00	NS	***
Aged 75-79 * PCS_12	0.0019	0.0039	0.23	1.00	NS	0.0050	0.0037	1.86	1.01	NS	***
Aged 80-84 * PCS_12	0.0017	0.0046	0.14	1.00	NS	0.0079	0.0043	3.33	1.01	NS	***
Aged 85-89 * PCS_12	0.0000	0.0061	0.00	1.00	NS	0.0125	0.0057	4.75	1.01	*	***
Aged 90+ * PCS_12	0.0026	0.0090	0.09	1.00	NS	0.0232	0.0085	7.43	1.02	**	***
<u>Proxy and PCS Interaction</u>											
Proxy-Yes * PCS_12	-0.0020	0.0036	0.31	1.00	NS	-0.0067	0.0034	3.84	0.99	*	***
Proxy-Unknown * PCS_12	-0.0087	0.0050	3.11	0.99	NS	-0.0068	0.0047	2.08	0.99	NS	***
<u>Education and MCS Interaction</u>											
8th grade or less * MCS_12	-0.0018	0.0049	0.14	1.00	NS	-0.0100	0.0046	4.84	0.99	*	***
Some High School * MCS_12	0.0002	0.0048	0.00	1.00	NS	-0.0015	0.0045	0.10	1.00	NS	***
Some College * MCS_12	0.0011	0.0048	0.06	1.00	NS	0.0054	0.0046	1.33	1.01	NS	***
College * MCS_12	-0.0021	0.0075	0.08	1.00	NS	0.0015	0.0074	0.04	1.00	NS	***
> 4 year College * MCS_12	0.0139	0.0070	3.99	1.01	*	0.0149	0.0068	4.79	1.02	*	***

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 6 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Doctor or Nurse**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Education - Unknown * MCS_12	0.0056	0.0088	0.40	1.01	NS	0.0072	0.0082	0.77	1.01	NS	NS
Medicaid * MCS_12	-0.0079	0.0055	2.06	0.99	NS	-0.0111	0.0051	4.86	0.99	*	
<u>Smoking and MCS Interaction</u>											
Smoker-Yes * MCS_12	0.0146	0.0054	7.19	1.01	**	0.0085	0.0051	2.78	1.01	NS	NS
Smoker-Unknown * MCS_12	0.0113	0.0035	10.46	1.01	**	0.0105	0.0033	9.80	1.01	**	
<u>Age and Proxy Interaction</u>											
Aged 70-74 * Proxy - Yes	0.1142	0.1339	0.73	1.12	NS	-0.0003	0.1265	0.00	1.00	NS	***
Aged 70-74 * Proxy-Unknown	0.1959	0.1713	1.31	1.22	NS	0.1994	0.1635	1.49	1.22	NS	
Aged 75-79 * Proxy-Yes	0.1436	0.1342	1.14	1.15	NS	-0.1148	0.1266	0.82	0.89	NS	NS
Aged 75-79 * Proxy-Unknown	0.1082	0.1733	0.39	1.11	NS	0.0750	0.1644	0.21	1.08	NS	
Aged 80-84 * Proxy-Yes	0.2512	0.1426	3.10	1.29	NS	-0.1383	0.1349	1.05	0.87	NS	NS
Aged 80-84 * Proxy-Unknown	0.0039	0.1920	0.00	1.00	NS	-0.0720	0.1813	0.16	0.93	NS	
Aged 85-89 * Proxy-Yes	0.4145	0.1641	6.38	1.51	*	-0.2020	0.1547	1.70	0.82	NS	NS
Aged 85-89 * Proxy-Unknown	0.3181	0.2486	1.64	1.37	NS	-0.1392	0.2354	0.35	0.87	NS	
Aged 90+ * Proxy-Yes	0.4654	0.2233	4.34	1.59	*	-0.1169	0.2095	0.31	0.89	NS	NS
Aged 90+ * Proxy-Unknown	0.2073	0.3746	0.31	1.23	NS	-0.1723	0.3511	0.24	0.84	NS	
<u>Gender and Race Interaction</u>											
Male * Race - Black	0.2638	0.1617	2.66	1.30	NS	0.3030	0.1506	4.05	1.35	*	NS
Male * Race - Hispanic	0.0934	0.2488	0.14	1.10	NS	-0.1383	0.2235	0.38	0.87	NS	
Male * Race - Other	-0.3661	0.2227	2.70	0.69	NS	-0.1769	0.2115	0.70	0.84	NS	NS
Male * Race-Unknown	-0.7603	0.4992	2.32	0.47	NS	0.0666	0.4709	0.02	1.07	NS	
<u>Gender and Education Interaction</u>											
Male * 8th grade or less	-0.0745	0.1122	0.44	0.93	NS	-0.1709	0.1053	2.64	0.84	NS	NS
Male * Some High School	-0.0091	0.1040	0.01	0.99	NS	-0.0927	0.0982	0.89	0.91	NS	
Male * Some College	0.0811	0.0956	0.72	1.08	NS	0.1001	0.0919	1.19	1.11	NS	NS
Male * College	0.1418	0.1393	1.04	1.15	NS	0.1014	0.1354	0.56	1.11	NS	
Male * > 4 year College	0.1701	0.1329	1.64	1.19	NS	0.2445	0.1289	3.60	1.28	NS	NS
Male * Education - Unknown	-0.2741	0.1908	2.06	0.76	NS	-0.0790	0.1770	0.20	0.92	NS	
Male * Medicaid	0.0680	0.1433	0.23	1.07	NS	-0.0676	0.1331	0.26	0.93	NS	NS
<u>Gender and Proxy Interaction</u>											
Male * Proxy - Yes	-0.0560	0.0921	0.37	0.95	NS	0.1889	0.0876	4.65	1.21	*	***
Male * Proxy - Unknown	-0.0872	0.1267	0.47	0.92	NS	-0.3233	0.1207	7.17	0.72	**	
<u>Gender and Smoking Interaction</u>											
Male * Smoker - Yes	0.2875	0.1160	6.14	1.33	*	0.2017	0.1092	3.41	1.22	NS	NS
Male * Smoker - Unknown	-0.0919	0.0728	1.59	0.91	NS	-0.0738	0.0696	1.12	0.93	NS	
<u>Race and Proxy Interaction</u>											
Race - Black * Proxy-Yes	-0.0825	0.1689	0.24	0.92	NS	-0.3310	0.1561	4.49	0.72	*	NS
Race - Black * Proxy-Unknown	-0.1070	0.2299	0.22	0.90	NS	-0.1443	0.2115	0.47	0.87	NS	
Race - Hispanic * Proxy-Yes	0.1327	0.2783	0.23	1.14	NS	-0.0827	0.2489	0.11	0.92	NS	NS
Race - Hispanic * Proxy-Unknown	0.5171	0.5116	1.02	1.68	NS	-0.4366	0.4775	0.84	0.65	NS	
Race - Other * Proxy-Yes	-0.0950	0.2296	0.17	0.91	NS	-0.4383	0.2182	4.03	0.65	*	NS
Race - Other * Proxy-Unknown	0.6978	0.6316	1.22	2.01	NS	0.9166	0.6082	2.27	2.50	NS	
Race - Unknown * Proxy-Yes	0.3996	0.5849	0.47	1.49	NS	0.1025	0.5635	0.03	1.11	NS	NS
Race - Unknown * Proxy-Unknown	0.5593	0.8213	0.46	1.75	NS	0.2531	0.7943	0.10	1.29	NS	
<u>Education and Medicaid Interaction</u>											
8th grade or less * Medicaid	0.2372	0.1739	1.86	1.27	NS	0.1411	0.1605	0.77	1.15	NS	NS
Some High School * Medicaid	0.0701	0.1870	0.14	1.07	NS	-0.0215	0.1713	0.02	0.98	NS	
Some College * Medicaid	-0.1127	0.2377	0.22	0.89	NS	-0.2165	0.2191	0.98	0.81	NS	

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 6 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Doctor or Nurse**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
College * Medicaid	-1.1067	0.3854	8.25	0.33	**	-0.6480	0.3350	3.74	0.52	NS	
> 4 year College * Medicaid	-0.2932	0.4137	0.50	0.75	NS	-0.3505	0.3872	0.82	0.70	NS	
Education - Unknown * Medicaid	-0.0415	0.3050	0.02	0.96	NS	-0.3343	0.2778	1.45	0.72	NS	
<u>Medicaid and Proxy Interaction</u>											
Medicaid * Proxy-Yes	0.3138	0.1430	4.82	1.37	*	-0.0380	0.1313	0.08	0.96	NS	***
Medicaid * Proxy-Unknown	-0.0080	0.2378	0.00	0.99	NS	0.1983	0.2149	0.85	1.22	NS	
<u>Proxy and Smoking Interaction</u>											
Proxy-Yes * Smoker-Yes	0.2142	0.1484	2.08	1.24	NS	-0.0601	0.1394	0.19	0.94	NS	**
Proxy-Yes * Smoker-Unknown	0.0680	0.0903	0.57	1.07	NS	-0.0856	0.0858	1.00	0.92	NS	
Proxy-Unknown * Smoker-Yes	0.3124	0.2190	2.03	1.37	NS	0.1662	0.2085	0.64	1.18	NS	
Proxy-Unknown * Smoker-Unknown	-0.1269	0.1353	0.88	0.88	NS	-0.1535	0.1289	1.42	0.86	NS	
<u>Age and MCO Interaction</u>											
Aged 70-74 * MCO	-0.1872	0.1134	2.72	0.83	NS	-0.2636	0.1074	6.02	0.77	*	NS
Aged 75-79 * MCO	0.1052	0.1265	0.69	1.11	NS	-0.0021	0.1198	0.00	1.00	NS	
Aged 80-84 * MCO	-0.1922	0.1472	1.70	0.83	NS	-0.1475	0.1375	1.15	0.86	NS	
Aged 85-89 * MCO	0.0991	0.1977	0.25	1.10	NS	0.0188	0.1851	0.01	1.02	NS	
Aged 90+ * MCO	0.2172	0.3037	0.51	1.24	NS	0.1058	0.2864	0.14	1.11	NS	
<u>Race and MCO Interaction</u>											
Race - Black * MCO	-0.1714	0.1931	0.79	0.84	NS	-0.2655	0.1751	2.30	0.77	NS	**
Race - Hispanic * MCO	0.0819	0.2692	0.09	1.09	NS	-0.4746	0.2420	3.85	0.62	*	
Race - Other * MCO	-0.1117	0.2955	0.14	0.89	NS	-0.2678	0.2781	0.93	0.77	NS	
Intercept	1.6346	0.0635	663.64			2.3375	0.0605	1492.62			
Observations	85,649										
R-Square	0.0325										

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

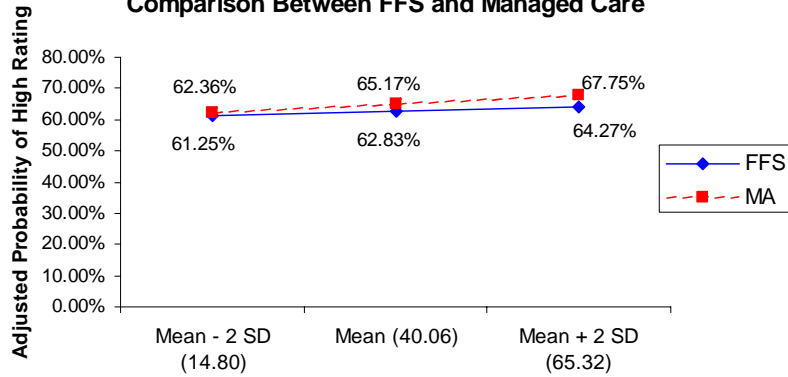
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

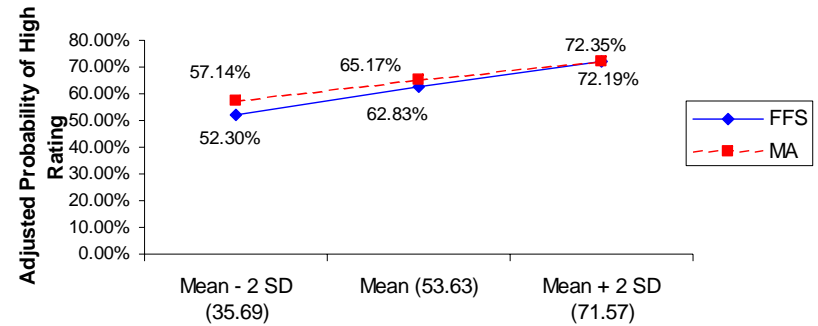
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

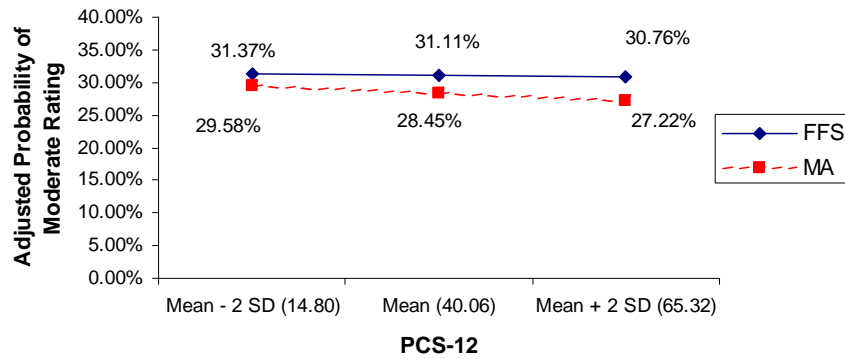
**Figure 42: Relationship between PCS-12 and Adjusted Probability of High Rating of Doctor or Nurse (9-10): Comparison Between FFS and Managed Care**



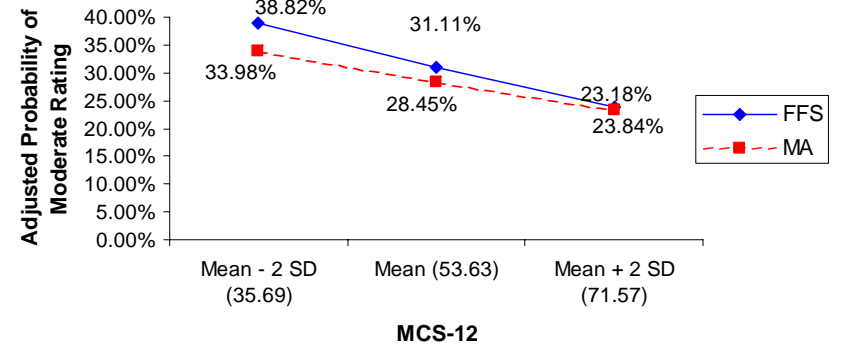
**Figure 43: Relationship between MCS-12 and Adjusted Probability of High Rating of Doctor or Nurse (9-10): Comparison Between FFS and Managed Care**



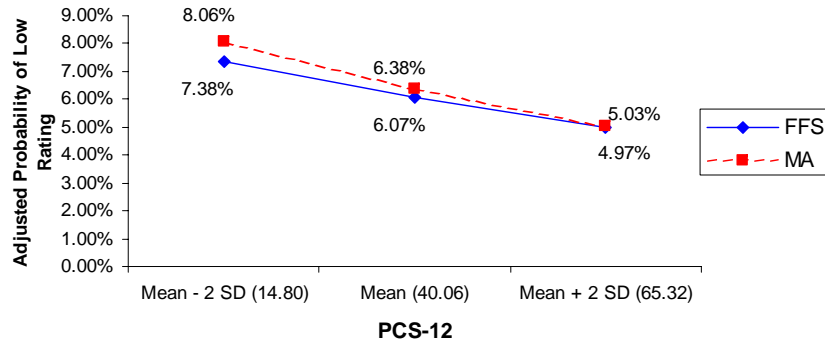
**Figure 44: Relationship between PCS-12 and Adjusted Probability of Moderate Rating of Doctor or Nurse (6-8): Comparison Between FFS and Managed Care**



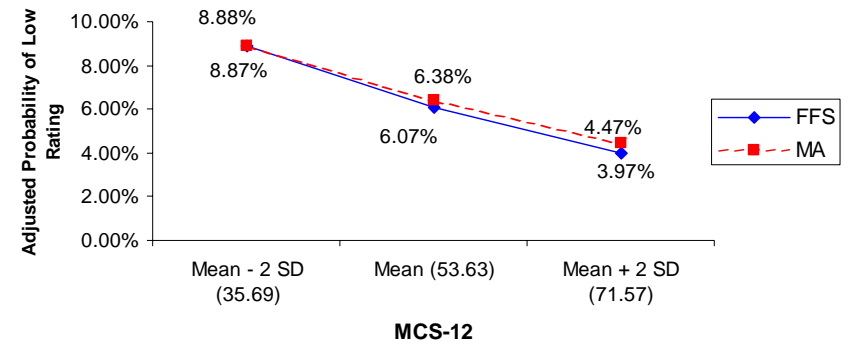
**Figure 45: Relationship between MCS-12 and Adjusted Probability of Moderate Rating of Doctor or Nurse (6-8): Comparison Between FFS and Managed Care**



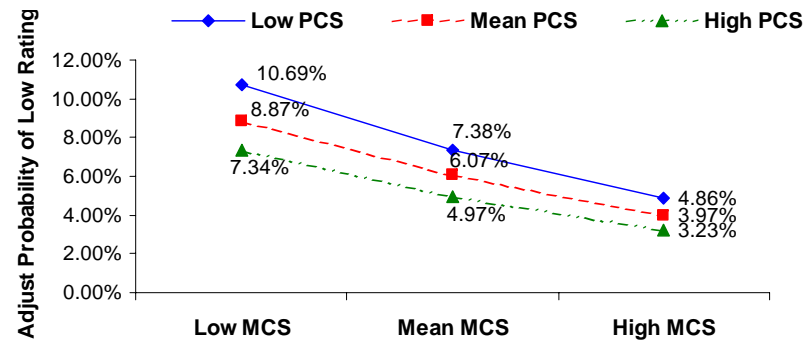
**Figure 46: Relationship between PCS-12 and Adjusted Probability of Low Rating of Doctor or Nurse (0-5): Comparison Between FFS and Managed Care**



**Figure 47: Relationship between MCS-12 and Adjusted Probability of Low Rating of Doctor or Nurse (0-5): Comparison Between FFS and Managed Care**



**Figure 48: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of Low Rating of Doctor or Nurse**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 7 Estimates of the Relationship between PCS and MCS Scores and the Rating of Specialist for Medicare FFS and Managed Care Beneficiaries											
Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	0.0090	0.0022	16.79	1.01	***	0.0151	0.0021	53.48	1.02	***	***
MCS-12 <sup>b</sup>	0.0159	0.0035	20.85	1.02	***	0.0335	0.0032	106.13	1.03	***	***
Managed Care (MCO)	-0.3039	0.1116	7.41	0.74	**	-0.1378	0.1019	1.83	0.87	NS	**
MCO * PCS-12	-0.0025	0.0049	0.26	1.00	NS	-0.0029	0.0045	0.40	1.00	NS	NS
MCO * MCS-12	-0.0044	0.0056	0.62	1.00	NS	-0.0087	0.0051	2.91	0.99	NS	NS
PCS_12 * MCS_12	-0.0001	0.0002	0.55	1.00	NS	0.0004	0.0002	5.31	1.00	*	***
<u>Age Group</u>											
Aged 70-74	-0.1165	0.0944	1.53	0.89	NS	0.0686	0.0875	0.61	1.07	NS	***
Aged 75-79	-0.0944	0.1010	0.87	0.91	NS	0.1670	0.0937	3.18	1.18	NS	***
Aged 80-84	-0.2364	0.1161	4.15	0.79	*	0.1084	0.1067	1.03	1.11	NS	***
Aged 85-89	-0.3865	0.1619	5.70	0.68	*	0.0390	0.1475	0.07	1.04	NS	***
Aged 90+	-0.6265	0.2777	5.09	0.53	*	-0.0634	0.2481	0.07	0.94	NS	***
Male	0.2357	0.1055	4.99	1.27	*	0.0077	0.0995	0.01	1.01	NS	***
<u>Race</u>											
Race - Black	-0.3183	0.1510	4.45	0.73	*	-0.0158	0.1353	0.01	0.98	NS	*
Race - Hispanic	-0.0579	0.2749	0.04	0.94	NS	0.3051	0.2497	1.49	1.36	NS	*
Race - Other	-0.2521	0.2170	1.35	0.78	NS	-0.2261	0.2003	1.27	0.80	NS	*
Race - Unknown	0.0024	0.5075	0.00	1.00	NS	-0.2228	0.4754	0.22	0.80	NS	*
<u>Education</u>											
8th grade or less	-0.1285	0.0916	1.97	0.88	NS	0.1026	0.0847	1.47	1.11	NS	***
Some High School	-0.0567	0.0858	0.44	0.94	NS	0.1108	0.0796	1.94	1.12	NS	***
Some College	-0.0217	0.0717	0.09	0.98	NS	-0.1232	0.0671	3.37	0.88	NS	***
College	0.4289	0.1033	17.24	1.54	***	0.1269	0.0991	1.64	1.14	NS	***
More than 4 year College	0.2074	0.0904	5.27	1.23	*	-0.0504	0.0860	0.34	0.95	NS	***
Education - Unknown	-0.3114	0.1561	3.98	0.73	*	-0.1857	0.1424	1.70	0.83	NS	***
Medicaid Eligible	-0.4902	0.1457	11.32	0.61	***	-0.0648	0.1252	0.27	0.94	NS	***
<u>Proxy Status</u>											
Proxy - Yes	0.0351	0.1598	0.05	1.04	NS	-0.2832	0.1493	3.60	0.75	NS	**
Proxy -Unknown	-0.3360	0.1875	3.21	0.71	NS	-0.2556	0.1729	2.18	0.77	NS	**
<u>Smoking Status</u>											
Smoker - Yes	-0.2590	0.0828	9.79	0.77	**	-0.1163	0.0759	2.35	0.89	NS	**
Smoker - Unknown	0.0212	0.0497	0.18	1.02	NS	0.0264	0.0465	0.32	1.03	NS	**
Male * MCS_12	-0.0006	0.0044	0.02	1.00	NS	0.0080	0.0041	3.71	1.01	NS	**
<u>Age and Gender Interaction</u>											
Aged 70-74 * Male	0.0126	0.1275	0.01	1.01	NS	-0.0221	0.1196	0.03	0.98	NS	NS
Aged 75-79 * Male	-0.0341	0.1355	0.06	0.97	NS	-0.0797	0.1271	0.39	0.92	NS	NS
Aged 80-84 * Male	-0.1226	0.1500	0.67	0.88	NS	-0.2006	0.1397	2.06	0.82	NS	NS
Aged 85-89 * Male	0.4117	0.2017	4.17	1.51	*	0.2174	0.1891	1.32	1.24	NS	NS
Aged 90+ * Male	0.7395	0.3078	5.77	2.09	*	0.3108	0.2900	1.15	1.36	NS	NS
<u>Age and Proxy Interaction</u>											
Aged 70-74 * Proxy - Yes	0.0676	0.1809	0.14	1.07	NS	-0.0639	0.1684	0.14	0.94	NS	**
Aged 70-74 * Proxy-Unknown	0.1908	0.2287	0.70	1.21	NS	0.1572	0.2121	0.55	1.17	NS	**
Aged 75-79 * Proxy-Yes	0.2325	0.1844	1.59	1.26	NS	-0.0107	0.1723	0.00	0.99	NS	**
Aged 75-79 * Proxy-Unknown	0.5779	0.2516	5.28	1.78	*	0.4656	0.2356	3.90	1.59	*	**
Aged 80-84 * Proxy-Yes	0.4063	0.1918	4.49	1.50	*	0.0953	0.1789	0.28	1.10	NS	**
Aged 80-84 * Proxy-Unknown	0.2827	0.2572	1.21	1.33	NS	0.1500	0.2371	0.40	1.16	NS	**
Aged 85-89 * Proxy-Yes	0.3589	0.2246	2.55	1.43	NS	-0.2107	0.2096	1.01	0.81	NS	**

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 7 - Continued  
Estimates of the Relationship between PCS and MCS Scores and the Rating of Specialist  
for Medicare FFS and Managed Care Beneficiaries

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Aged 85-89 * Proxy-Unknown	0.1585	0.3416	0.22	1.17	NS	0.0314	0.3115	0.01	1.03	NS	NS
Aged 90+ * Proxy-Yes	0.3291	0.3243	1.03	1.39	NS	-0.2135	0.2966	0.52	0.81	NS	
Aged 90+ * Proxy-Unknown	0.0089	0.5216	0.00	1.01	NS	-0.5878	0.4761	1.52	0.56	NS	
<u>Gender and Race Interaction</u>											
Male * Race - Black	-0.1522	0.2154	0.50	0.86	NS	-0.3369	0.1951	2.98	0.71	NS	NS
Male * Race - Hispanic	-0.4622	0.3199	2.09	0.63	NS	-0.3624	0.2839	1.63	0.70	NS	
Male * Race - Other	-0.0610	0.2882	0.04	0.94	NS	-0.3646	0.2694	1.83	0.69	NS	
Male * Race-Unknown	-1.1431	0.7281	2.46	0.32	NS	-0.6816	0.6552	1.08	0.51	NS	
<u>Gender and Proxy Interaction</u>											
Male * Proxy - Yes	-0.3142	0.1202	6.84	0.73	**	0.2108	0.1123	3.53	1.23	NS	***
Male * Proxy - Unknown	0.1547	0.1686	0.84	1.17	NS	-0.0774	0.1572	0.24	0.93	NS	***
<u>Medicaid and Proxy Interaction</u>											
Medicaid * Proxy-Yes	0.5499	0.1898	8.40	1.73	**	0.0267	0.1691	0.03	1.03	NS	***
Medicaid * Proxy-Unknown	0.6025	0.3362	3.21	1.83	NS	0.3954	0.3000	1.74	1.49	NS	
Male * MCO	-0.0169	0.1128	0.02	0.98	NS	0.1269	0.1038	1.49	1.14	NS	*
<u>Race and MCO Interaction</u>											
Race - Black * MCO	0.2852	0.2505	1.30	1.33	NS	0.0167	0.2258	0.01	1.02	NS	*
Race - Hispanic * MCO	-0.2601	0.3240	0.64	0.77	NS	-0.6397	0.2882	4.93	0.53	*	
Race - Other * MCO	0.1046	0.3572	0.09	1.11	NS	-0.2782	0.3360	0.69	0.76	NS	
<u>Education and MCO Interaction</u>											
8th grade or less * MCO	0.1289	0.1953	0.44	1.14	NS	-0.2914	0.1787	2.66	0.75	NS	***
Some High School * MCO	-0.2230	0.1751	1.62	0.80	NS	-0.2394	0.1570	2.32	0.79	NS	
Some College * MCO	-0.0582	0.1517	0.15	0.94	NS	-0.1707	0.1389	1.51	0.84	NS	
College * MCO	-0.0894	0.2251	0.16	0.91	NS	-0.3761	0.2134	3.11	0.69	NS	
> 4 year College * MCO	0.4823	0.2290	4.44	1.62	*	0.0075	0.2192	0.00	1.01	NS	
Education - Unknown * MCO	-0.3720	0.2672	1.94	0.69	NS	-0.5588	0.2355	5.63	0.57	*	
Intercept	1.5595	0.0882	312.92			2.6829	0.0824	1060.57			
Observations	43,803										
R-Square	0.0300										

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

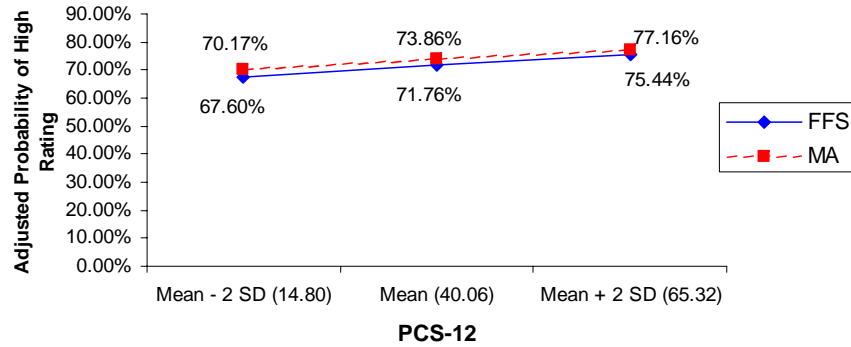
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

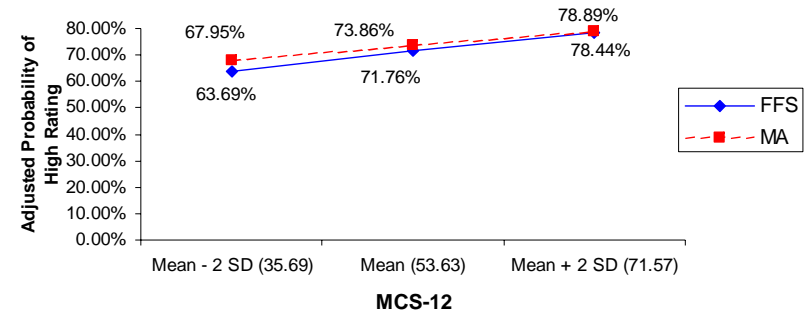
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

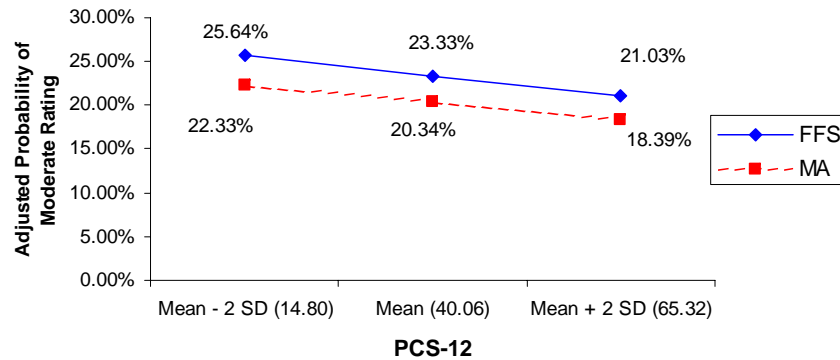
**Figure 49: Relationship between PCS-12 and Adjusted Probability of High Rating of Specialist (9-10): Comparison Between FFS and Managed Care**



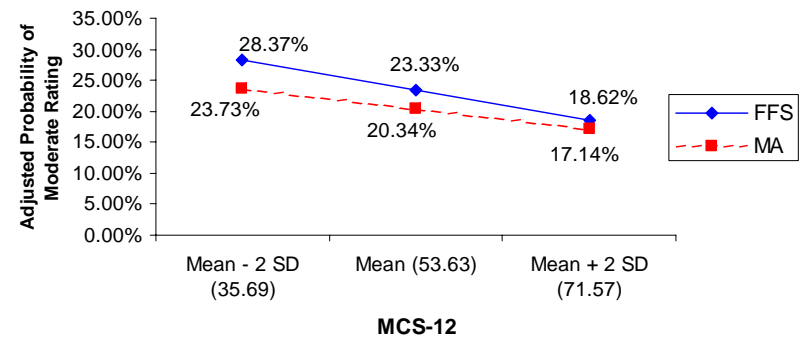
**Figure 50: Relationship between MCS-12 and Adjusted Probability of High Rating of Specialist (9-10): Comparison Between FFS and Managed Care**



**Figure 51: Relationship between PCS-12 and Adjusted Probability of Moderate Rating of Specialist (6-8): Comparison Between FFS and Managed Care**

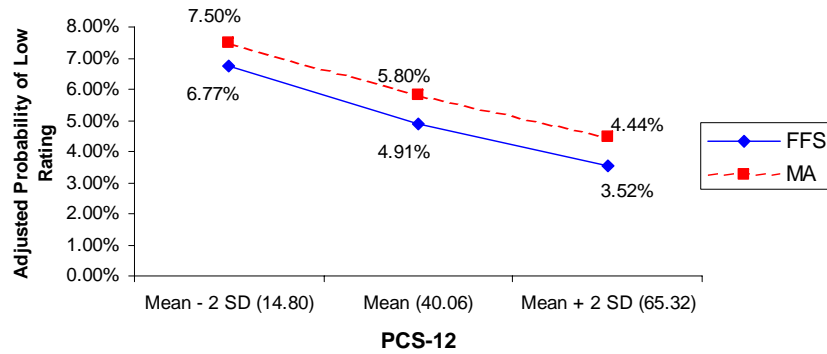


**Figure 52: Relationship between MCS-12 and Adjusted Probability of Moderate Rating of Specialist (6-8): Comparison Between FFS and Managed Care**

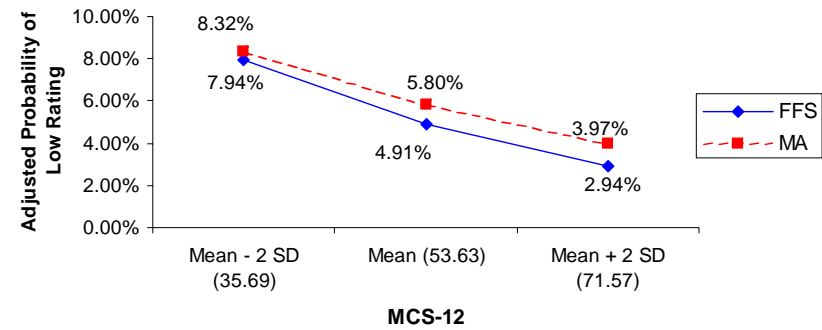




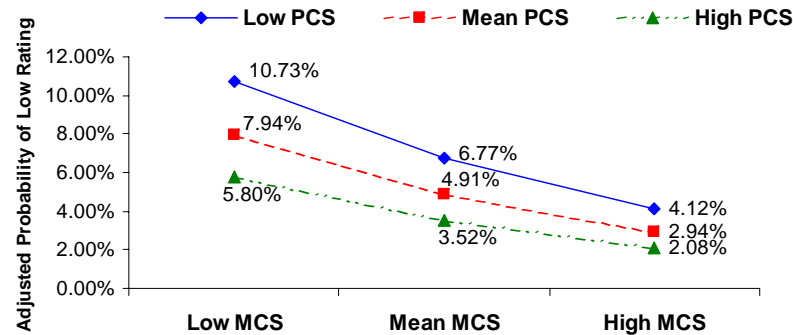
**Figure 53: Relationship between PCS-12 and Adjusted Probability of Low Rating of Specialist (0-5): Comparison Between FFS and Managed Care**



**Figure 54: Relationship between MCS-12 and Adjusted Probability of Low Rating of Specialist (0-5): Comparison Between FFS and Managed Care**



**Figure 55: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of Low Rating of Specialist**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 8**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Care**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	0.0108	0.0032	11.48	1.01	***	0.0258	0.0031	71.44	1.03	***	***
MCS-12 <sup>b</sup>	0.0242	0.0040	35.82	1.02	***	0.0602	0.0039	237.42	1.06	***	***
Managed Care (MCO)	-0.3965	0.0739	28.79	0.67	***	-0.3005	0.0697	18.61	0.74	***	***
MCO * PCS-12	-0.0031	0.0044	0.49	1.00	NS	-0.0038	0.0042	0.83	1.00	NS	NS
MCO * MCS-12	-0.0082	0.0050	2.67	0.99	NS	-0.0174	0.0048	13.33	0.98	***	***
PCS_12 * MCS_12	-0.0001	0.0002	0.10	1.00	NS	0.0006	0.0002	12.38	1.00	***	***
<u>Age Group</u>											
Aged 70-74	0.0233	0.0623	0.14	1.02	NS	0.1912	0.0600	10.16	1.21	**	
Aged 75-79	0.0581	0.0682	0.73	1.06	NS	0.3275	0.0656	24.93	1.39	***	
Aged 80-84	0.0318	0.0825	0.15	1.03	NS	0.3850	0.0791	23.67	1.47	***	
Aged 85-89	-0.0070	0.1206	0.00	0.99	NS	0.4370	0.1151	14.42	1.55	***	
Aged 90+	-0.1014	0.2097	0.23	0.90	NS	0.3842	0.1984	3.75	1.47	NS	
Male	0.0621	0.0910	0.47	1.06	NS	-0.1907	0.0877	4.73	0.83	*	***
<u>Race</u>											
Race - Black	-0.1300	0.1527	0.72	0.88	NS	0.1501	0.1446	1.08	1.16	NS	
Race - Hispanic	-0.4290	0.2921	2.16	0.65	NS	0.0836	0.2717	0.09	1.09	NS	
Race - Other	-0.1252	0.1994	0.39	0.88	NS	-0.1693	0.1920	0.78	0.84	NS	
Race - Unknown	-0.5506	0.3930	1.96	0.58	NS	-0.2234	0.3653	0.37	0.80	NS	
<u>Education</u>											
8th grade or less	-0.3767	0.1274	8.75	0.69	**	0.0015	0.1187	0.00	1.00	NS	
Some High School	-0.1515	0.1004	2.28	0.86	NS	0.1132	0.0948	1.42	1.12	NS	
Some College	-0.0775	0.0811	0.91	0.93	NS	-0.2698	0.0776	12.08	0.76	***	
College	0.2981	0.1332	5.00	1.35	*	-0.0535	0.1295	0.17	0.95	NS	
More than 4 year College	0.1229	0.1237	0.99	1.13	NS	-0.2697	0.1198	5.07	0.76	*	
Education - Unknown	-0.4140	0.1775	5.44	0.66	*	-0.4091	0.1663	6.06	0.66	*	
Medicaid Eligible	-0.8770	0.1235	50.40	0.42	***	-0.3696	0.1107	11.14	0.69	***	***
<u>Proxy Status</u>											
Proxy - Yes	-0.0081	0.1512	0.00	0.99	NS	-0.3266	0.1454	5.05	0.72	*	
Proxy -Unknown	0.0925	0.1967	0.22	1.10	NS	0.1687	0.1892	0.80	1.18	NS	
<u>Smoking Status</u>											
Smoker - Yes	-0.3535	0.0975	13.14	0.70	***	-0.0618	0.0912	0.46	0.94	NS	
Smoker - Unknown	-0.0238	0.0573	0.17	0.98	NS	0.0391	0.0548	0.51	1.04	NS	
<u>Education and PCS Interaction</u>											
8th grade or less * PCS_12	0.0017	0.0056	0.09	1.00	NS	0.0040	0.0053	0.56	1.00	NS	
Some High School * PCS_12	0.0005	0.0052	0.01	1.00	NS	0.0015	0.0050	0.09	1.00	NS	
Some College * PCS_12	-0.0046	0.0047	0.98	1.00	NS	-0.0051	0.0045	1.26	0.99	NS	
College * PCS_12	0.0131	0.0067	3.78	1.01	NS	0.0180	0.0066	7.45	1.02	**	
> 4 year College * PCS_12	-0.0010	0.0064	0.02	1.00	NS	0.0046	0.0063	0.53	1.00	NS	
Education - Unknown * PCS_12	-0.0082	0.0091	0.82	0.99	NS	-0.0051	0.0086	0.35	0.99	NS	
<u>Proxy and PCS Interaction</u>											
Proxy-Yes * PCS_12	0.0015	0.0046	0.11	1.00	NS	-0.0076	0.0044	2.92	0.99	NS	
Proxy-Unknown * PCS_12	-0.0116	0.0059	3.90	0.99	*	-0.0105	0.0057	3.47	0.99	NS	
Male * MCS_12	0.0049	0.0037	1.70	1.00	NS	0.0067	0.0036	3.41	1.01	NS	NS
<u>Race and MCS Interaction</u>											
Race - Black * MCS_12	0.0014	0.0076	0.03	1.00	NS	-0.0151	0.0071	4.59	0.98	*	
Race - Hispanic * MCS_12	-0.0117	0.0123	0.90	0.99	NS	-0.0182	0.0114	2.57	0.98	NS	
Race - Other * MCS_12	-0.0121	0.0117	1.06	0.99	NS	-0.0231	0.0113	4.17	0.98	*	
Race - Unknown * MCS_12	-0.0165	0.0316	0.27	0.98	NS	-0.0330	0.0299	1.21	0.97	NS	**

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

Table 8 - Continued Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Care for Medicare FFS and Managed Care Beneficiaries											
Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
<u>Education and MCS Interaction</u>											
8th grade or less * MCS_12	0.0004	0.0057	0.01	1.00	NS	-0.0055	0.0054	1.02	0.99	NS	NS
Some High School * MCS_12	-0.0018	0.0056	0.10	1.00	NS	-0.0061	0.0054	1.29	0.99	NS	
Some College * MCS_12	-0.0019	0.0056	0.11	1.00	NS	0.0027	0.0054	0.24	1.00	NS	
College * MCS_12	-0.0008	0.0083	0.01	1.00	NS	0.0038	0.0083	0.21	1.00	NS	
> 4 year College * MCS_12	-0.0052	0.0082	0.40	0.99	NS	0.0017	0.0081	0.05	1.00	NS	
Education - Unknown * MCS_12	-0.0063	0.0099	0.41	0.99	NS	0.0039	0.0095	0.17	1.00	NS	
Medicaid * MCS_12	-0.0109	0.0060	3.32	0.99	NS	-0.0143	0.0056	6.66	0.99	**	*
<u>Proxy and MCS Interaction</u>											
Proxy-Yes * MCS_12	-0.0018	0.0046	0.15	1.00	NS	-0.0079	0.0044	3.17	0.99	NS	*
Proxy-Unknown * MCS_12	0.0000	0.0066	0.00	1.00	NS	0.0023	0.0064	0.13	1.00	NS	
<u>Age and Proxy Interaction</u>											
Aged 70-74 * Proxy - Yes	0.1077	0.1435	0.56	1.11	NS	-0.0632	0.1372	0.21	0.94	NS	***
Aged 70-74 * Proxy-Unknown	0.1415	0.2119	0.45	1.15	NS	0.0543	0.2048	0.07	1.06	NS	
Aged 75-79 * Proxy-Yes	0.1835	0.1464	1.57	1.20	NS	-0.0996	0.1402	0.51	0.91	NS	
Aged 75-79 * Proxy-Unknown	-0.2288	0.2065	1.23	0.80	NS	-0.2995	0.1985	2.28	0.74	NS	
Aged 80-84 * Proxy-Yes	0.2776	0.1560	3.17	1.32	NS	-0.1734	0.1497	1.34	0.84	NS	
Aged 80-84 * Proxy-Unknown	-0.3964	0.2203	3.24	0.67	NS	-0.6344	0.2112	9.03	0.53	**	
Aged 85-89 * Proxy-Yes	0.3813	0.1868	4.17	1.46	*	-0.2469	0.1792	1.90	0.78	NS	
Aged 85-89 * Proxy-Unknown	-0.6309	0.2751	5.26	0.53	*	-0.8410	0.2604	10.43	0.43	**	
Aged 90+ * Proxy-Yes	0.3717	0.2654	1.96	1.45	NS	-0.0994	0.2525	0.16	0.91	NS	
Aged 90+ * Proxy-Unknown	-0.8558	0.3859	4.92	0.42	*	-1.2191	0.3601	11.46	0.30	***	
<u>Gender and Education Interaction</u>											
Male * 8th grade or less	0.1843	0.1300	2.01	1.20	NS	0.0728	0.1235	0.35	1.08	NS	NS
Male * Some High School	0.0086	0.1235	0.00	1.01	NS	-0.1077	0.1178	0.84	0.90	NS	
Male * Some College	0.1851	0.1156	2.57	1.20	NS	0.1890	0.1116	2.87	1.21	NS	
Male * College	0.1211	0.1684	0.52	1.13	NS	0.0366	0.1645	0.05	1.04	NS	
Male * > 4 year College	0.3079	0.1607	3.67	1.36	NS	0.3320	0.1565	4.50	1.39	*	
Male * Education - Unknown	0.1861	0.2209	0.71	1.20	NS	0.2806	0.2087	1.81	1.32	NS	
Male * Medicaid	0.1573	0.1484	1.12	1.17	NS	-0.0277	0.1394	0.04	0.97	NS	NS
<u>Gender and Proxy Interaction</u>											
Male * Proxy - Yes	-0.0372	0.1053	0.12	0.96	NS	0.3890	0.1012	14.77	1.48	***	***
Male * Proxy - Unknown	-0.0060	0.1444	0.00	0.99	NS	-0.0831	0.1390	0.36	0.92	NS	
<u>Gender and Smoking Interaction</u>											
Male * Smoker - Yes	-0.1020	0.1337	0.58	0.90	NS	-0.2636	0.1263	4.36	0.77	*	*
Male * Smoker - Unknown	-0.1591	0.0869	3.35	0.85	NS	-0.1800	0.0838	4.62	0.84	*	
<u>Race and Medicaid Interaction</u>											
Race - Black * Medicaid	0.4834	0.1912	6.40	1.62	*	0.2930	0.1770	2.74	1.34	NS	**
Race - Hispanic * Medicaid	1.2751	0.3410	13.98	3.58	***	0.9756	0.3177	9.43	2.65	**	
Race - Other * Medicaid	0.2346	0.2739	0.73	1.26	NS	0.2712	0.2608	1.08	1.31	NS	
Race - Unknown * Medicaid	-1.3310	0.9490	1.97	0.26	NS	-1.5063	0.8607	3.06	0.22	NS	
<u>Race and Proxy Interaction</u>											
Race - Black * Proxy-Yes	-0.5215	0.1879	7.70	0.59	**	-0.8160	0.1758	21.55	0.44	***	***
Race - Black * Proxy-Unknown	-0.0660	0.2515	0.07	0.94	NS	-0.2965	0.2371	1.56	0.74	NS	
Race - Hispanic * Proxy-Yes	-0.5568	0.3091	3.24	0.57	NS	-0.5740	0.2847	4.07	0.56	*	
Race - Hispanic * Proxy-Unknown	-0.4374	0.5886	0.55	0.65	NS	-0.5355	0.5346	1.00	0.59	NS	
Race - Other * Proxy-Yes	-0.3040	0.2704	1.26	0.74	NS	-0.6806	0.2592	6.89	0.51	**	
Race - Other * Proxy-Unknown	0.5524	0.5647	0.96	1.74	NS	0.1688	0.5504	0.09	1.18	NS	

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 8 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Care**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Race - Unknown * Proxy-Yes	1.9173	1.0232	3.51	6.80	NS	1.2753	0.9933	1.65	3.58	NS	**
Race - Unknown * Proxy-Unknown	0.2824	0.8953	0.10	1.33	NS	0.0352	0.8405	0.00	1.04	NS	
<u>Education and Proxy Interaction</u>											
<=8thGr * Proxy - Yes	0.1065	0.1470	0.52	1.11	NS	-0.0537	0.1393	0.15	0.95	NS	***
<=8thGr * Proxy-Unknown	0.1095	0.2210	0.25	1.12	NS	-0.0255	0.2082	0.02	0.97	NS	
SomeHS * Proxy-Yes	-0.1176	0.1427	0.68	0.89	NS	-0.2586	0.1368	3.57	0.77	NS	
SomeHS * Proxy-Unknown	0.2711	0.2176	1.55	1.31	NS	0.0932	0.2083	0.20	1.10	NS	
SomeCollege * Proxy-Yes	0.0005	0.1744	0.00	1.00	NS	0.1702	0.1697	1.01	1.19	NS	
SomeCollege * Proxy-Unknown	0.4773	0.2231	4.58	1.61	*	0.4260	0.2166	3.87	1.53	*	
College * Proxy-Yes	-0.2414	0.2472	0.95	0.79	NS	0.0279	0.2425	0.01	1.03	NS	
College * Proxy-Unknown	-0.1047	0.3085	0.12	0.90	NS	-0.0247	0.3003	0.01	0.98	NS	
> 4 year College * Proxy-Yes	0.0030	0.2902	0.00	1.00	NS	0.2313	0.2859	0.65	1.26	NS	
> 4 year College * Proxy-Unknown	-0.0854	0.3054	0.08	0.92	NS	-0.0006	0.2968	0.00	1.00	NS	
Education Unknown * Proxy-Yes	-0.1748	0.2947	0.35	0.84	NS	-0.0170	0.2804	0.00	0.98	NS	
Education Unknown * Proxy-Unknown	-0.1827	0.2662	0.47	0.83	NS	-0.0778	0.2492	0.10	0.93	NS	
<u>Medicaid and Proxy Interaction</u>											
Medicaid * Proxy-Yes	0.4423	0.1484	8.88	1.56	**	0.0801	0.1371	0.34	1.08	NS	
Medicaid * Proxy-Unknown	0.2060	0.2489	0.69	1.23	NS	0.3415	0.2279	2.25	1.41	NS	
Male * MCO	0.1245	0.1020	1.49	1.13	NS	0.2243	0.0968	5.37	1.25	*	
<u>Race and MCO Interaction</u>											
Race - Black * MCO	0.0475	0.2108	0.05	1.05	NS	-0.1093	0.1957	0.31	0.90	NS	
Race - Hispanic * MCO	0.0444	0.2913	0.02	1.05	NS	-0.5299	0.2695	3.87	0.59	*	
Race - Other * MCO	0.2255	0.3654	0.38	1.25	NS	0.1841	0.3496	0.28	1.20	NS	
Intercept	2.0427	0.0771	702.38			2.9926	0.0740	1635.68			
Observations	75,054										
R-Square	0.0523										

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

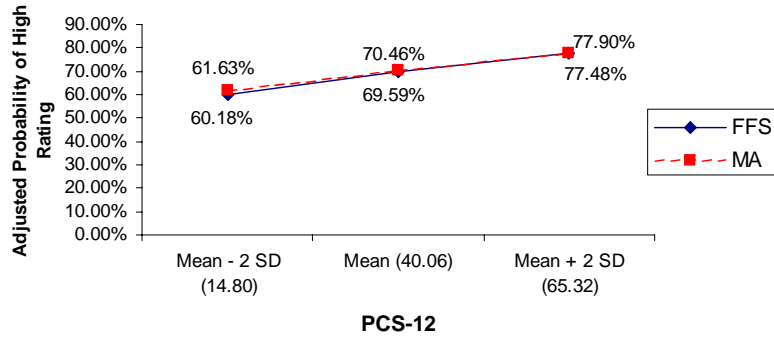
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

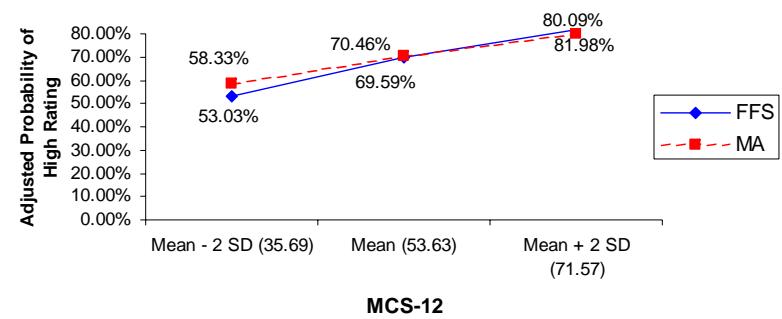
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

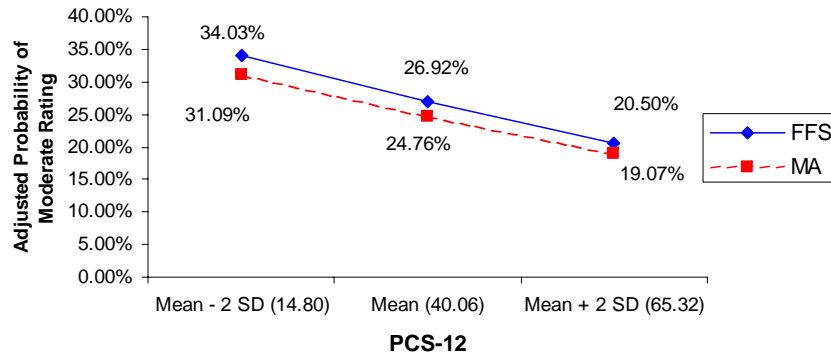
**Figure 56: Relationship between PCS-12 and Adjusted Probability of High Rating of Health Care (9-10): Comparison Between FFS and Managed Care**



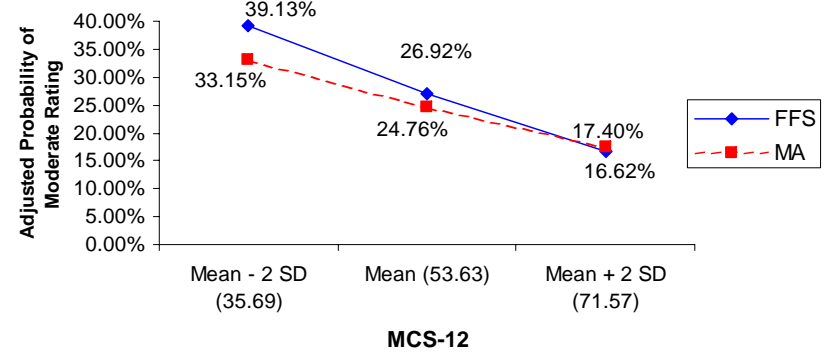
**Figure 57: Relationship between MCS-12 and Adjusted Probability of High Rating of Health Care (9-10): Comparison Between FFS and Managed Care**



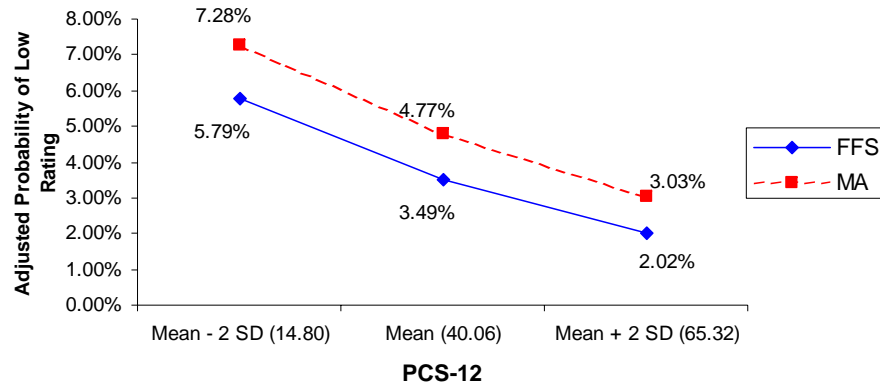
**Figure 58: Relationship between PCS-12 and Adjusted Probability of Moderate Rating of Health Care (6-8): Comparison Between FFS and Managed Care**



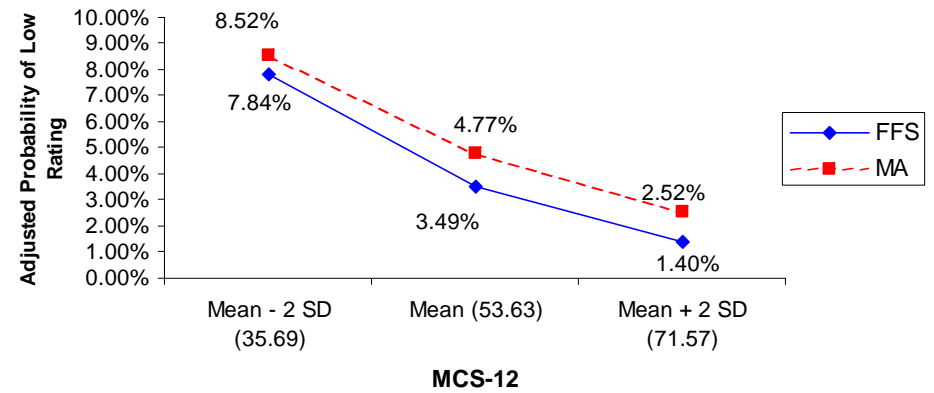
**Figure 59: Relationship between MCS-12 and Adjusted Probability of Moderate Rating of Health Care (6-8): Comparison Between FFS and Managed Care**



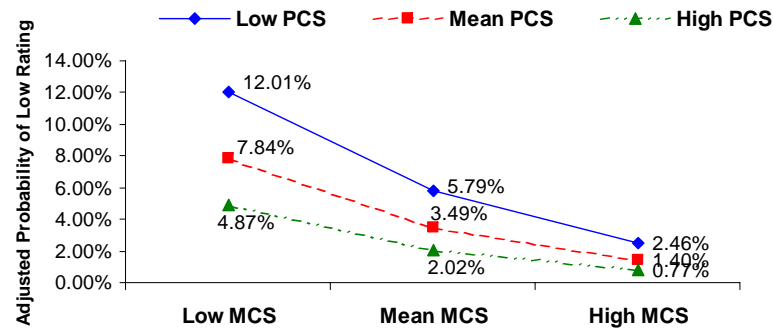
**Figure 60: Relationship between PCS-12 and Adjusted Probability of Low Rating of Health Care (0-5): Comparison Between FFS and Managed Care**



**Figure 61: Relationship between MCS-12 and Adjusted Probability of Low Rating of Health Care (0-5): Comparison Between FFS and Managed Care**



**Figure 62: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of Low Rating of Health Care**



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 9**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Plan**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
PCS-12 <sup>b</sup>	0.0031	0.0026	1.47	1.00	NS	0.0087	0.0024	12.68	1.01	***	***
MCS-12 <sup>b</sup>	0.0129	0.0037	12.37	1.01	***	0.0304	0.0034	78.10	1.03	***	***
Managed Care (MCO)	-0.2321	0.0852	7.42	0.79	**	-0.3906	0.0799	23.88	0.68	***	***
MCO * PCS-12	-0.0012	0.0030	0.17	1.00	NS	-0.0016	0.0028	0.34	1.00	NS	NS
MCO * MCS-12	0.0005	0.0036	0.02	1.00	NS	-0.0033	0.0034	0.99	1.00	NS	NS
PCS_12 * MCS_12	-0.0001	0.0001	1.40	1.00	NS	0.0003	0.0001	8.04	1.00	**	***
<u>Age Group</u>											
Aged 70-74	0.3168	0.0796	15.82	1.37	***	0.5816	0.0746	60.85	1.79	***	***
Aged 75-79	0.4181	0.0899	21.61	1.52	***	0.8650	0.0843	105.34	2.38	***	***
Aged 80-84	0.5391	0.1127	22.86	1.71	***	1.0874	0.1060	105.31	2.97	***	***
Aged 85-89	0.2379	0.1656	2.06	1.27	NS	1.2705	0.1535	68.51	3.56	***	***
Aged 90+	0.2975	0.2787	1.14	1.35	NS	0.9610	0.2618	13.48	2.61	***	***
Male	-0.1537	0.0553	7.72	0.86	**	-0.3718	0.0517	51.81	0.69	***	***
<u>Race</u>											
Race - Black	-0.7237	0.1447	25.01	0.48	***	-0.1171	0.1260	0.86	0.89	NS	***
Race - Hispanic	-0.1235	0.3145	0.15	0.88	NS	0.6254	0.2835	4.87	1.87	*	***
Race - Other	-0.5171	0.1908	7.35	0.60	**	-0.2185	0.1730	1.60	0.80	NS	***
Race - Unknown	-0.4680	0.4114	1.29	0.63	NS	0.0344	0.3639	0.01	1.04	NS	***
<u>Education</u>											
8th grade or less	-0.3982	0.1279	9.70	0.67	**	0.0913	0.1142	0.64	1.10	NS	***
Some High School	-0.0637	0.1032	0.38	0.94	NS	0.3400	0.0943	13.01	1.40	***	***
Some College	0.0374	0.0791	0.22	1.04	NS	-0.3120	0.0747	17.45	0.73	***	***
College	0.2110	0.1151	3.36	1.23	NS	-0.3989	0.1113	12.84	0.67	***	***
More than 4 year College	0.0454	0.1065	0.18	1.05	NS	-0.5365	0.1026	27.33	0.58	***	***
Education - Unknown	-0.5800	0.1876	9.56	0.56	**	-0.4788	0.1670	8.21	0.62	**	***
Medicaid Eligible	-0.0795	0.1492	0.28	0.92	NS	0.5326	0.1335	15.92	1.70	***	***
<u>Proxy Status</u>											
Proxy - Yes	-0.0998	0.1154	0.75	0.91	NS	-0.4342	0.1078	16.21	0.65	***	***
Proxy - Unknown	0.1021	0.1403	0.53	1.11	NS	0.4317	0.1287	11.26	1.54	***	***
<u>Smoking Status</u>											
Smoker - Yes	-0.4367	0.0793	30.34	0.65	***	-0.2787	0.0724	14.82	0.76	***	***
Smoker - Unknown	0.0034	0.0573	0.00	1.00	NS	-0.0498	0.0541	0.85	0.95	NS	NS
<u>Age and PCS Interaction</u>											
Aged 70-74 * PCS_12	-0.0020	0.0030	0.47	1.00	NS	-0.0034	0.0028	1.45	1.00	NS	NS
Aged 75-79 * PCS_12	-0.0026	0.0033	0.60	1.00	NS	-0.0009	0.0031	0.09	1.00	NS	NS
Aged 80-84 * PCS_12	-0.0006	0.0041	0.02	1.00	NS	0.0009	0.0038	0.05	1.00	NS	NS
Aged 85-89 * PCS_12	-0.0101	0.0057	3.13	0.99	NS	-0.0041	0.0053	0.60	1.00	NS	NS
Aged 90+ * PCS_12	0.0150	0.0092	2.66	1.02	NS	0.0212	0.0087	5.91	1.02	*	NS
<u>Proxy and PCS Interaction</u>											
Proxy-Yes * PCS_12	0.0023	0.0031	0.55	1.00	NS	-0.0010	0.0029	0.11	1.00	NS	NS
Proxy-Unknown * PCS_12	-0.0058	0.0043	1.87	0.99	NS	-0.0015	0.0039	0.15	1.00	NS	NS
<u>Smoking and PCS Interaction</u>											
Smoker-Yes * PCS_12	-0.0042	0.0038	1.24	1.00	NS	0.0045	0.0034	1.68	1.00	NS	**
Smoker-Unknown * PCS_12	0.0017	0.0024	0.53	1.00	NS	0.0043	0.0022	3.63	1.00	NS	*
<u>Age and MCS Interaction</u>											
Aged 70-74 * MCS_12	0.0022	0.0039	0.33	1.00	NS	0.0033	0.0036	0.84	1.00	NS	NS
Aged 75-79 * MCS_12	-0.0039	0.0042	0.88	1.00	NS	0.0014	0.0039	0.13	1.00	NS	NS

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 9 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Plan**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Aged 80-84 * MCS_12	-0.0020	0.0049	0.16	1.00	NS	0.0034	0.0046	0.56	1.00	NS	
Aged 85-89 * MCS_12	0.0101	0.0060	2.80	1.01	NS	0.0195	0.0057	11.83	1.02	***	
Aged 90+ * MCS_12	0.0017	0.0081	0.04	1.00	NS	0.0109	0.0077	2.01	1.01	NS	
<u>Race and MCS Interaction</u>											
Race - Black * MCS_12	-0.0039	0.0059	0.43	1.00	NS	-0.0123	0.0053	5.44	0.99	*	
Race - Hispanic * MCS_12	-0.0004	0.0098	0.00	1.00	NS	0.0055	0.0088	0.39	1.01	NS	
Race - Other * MCS_12	0.0047	0.0086	0.30	1.00	NS	0.0125	0.0081	2.35	1.01	NS	
Race - Unknown * MCS_12	-0.0364	0.0264	1.90	0.96	NS	-0.0367	0.0251	2.13	0.96	NS	
<u>Education and MCS Interaction</u>											
8th grade or less * MCS_12	0.0076	0.0044	2.96	1.01	NS	-0.0001	0.0041	0.00	1.00	NS	
Some High School * MCS_12	0.0034	0.0044	0.58	1.00	NS	0.0028	0.0041	0.47	1.00	NS	
Some College * MCS_12	-0.0003	0.0042	0.01	1.00	NS	0.0036	0.0040	0.83	1.00	NS	
College * MCS_12	0.0012	0.0060	0.04	1.00	NS	0.0062	0.0059	1.13	1.01	NS	
> 4 year College * MCS_12	-0.0138	0.0058	5.57	0.99	*	-0.0100	0.0057	3.04	0.99	NS	
Education - Unknown * MCS_12	0.0065	0.0080	0.65	1.01	NS	0.0038	0.0073	0.27	1.00	NS	
<u>Proxy and MCS Interaction</u>											
Proxy - Yes * MCS_12	-0.0071	0.0037	3.65	0.99	NS	-0.0121	0.0035	12.00	0.99	***	**
Proxy -Unknown * MCS_12	-0.0047	0.0054	0.76	1.00	NS	-0.0017	0.0050	0.11	1.00	NS	**
<u>Age and Education Interaction</u>											
Aged 70-74 * 8th grade or less	0.0145	0.1390	0.01	1.01	NS	0.0539	0.1247	0.19	1.06	NS	
Aged 70-74 * Some High School	-0.1618	0.1204	1.80	0.85	NS	-0.2093	0.1101	3.61	0.81	NS	
Aged 70-74 * Some College	-0.1578	0.0966	2.67	0.85	NS	-0.1482	0.0910	2.65	0.86	NS	
Aged 70-74 * College	-0.3144	0.1322	5.65	0.73	*	-0.1934	0.1273	2.31	0.82	NS	
Aged 70-74 * > 4 year College	-0.1492	0.1189	1.57	0.86	NS	-0.0723	0.1146	0.40	0.93	NS	
Aged 70-74 * Education - Unknown	0.3365	0.2277	2.19	1.40	NS	0.1215	0.2057	0.35	1.13	NS	
Aged 75-79 * 8th grade or less	-0.1220	0.1457	0.70	0.89	NS	-0.1691	0.1314	1.66	0.84	NS	
Aged 75-79 * Some High School	-0.2432	0.1322	3.39	0.78	NS	-0.2061	0.1211	2.90	0.81	NS	
Aged 75-79 * Some College	-0.0302	0.1117	0.07	0.97	NS	0.0283	0.1053	0.07	1.03	NS	
Aged 75-79 * College	-0.1718	0.1515	1.29	0.84	NS	-0.1593	0.1460	1.19	0.85	NS	
Aged 75-79 * > 4 year College	-0.0461	0.1379	0.11	0.95	NS	-0.0595	0.1329	0.20	0.94	NS	
Aged 75-79 * Education - Unknown	-0.1135	0.2296	0.24	0.89	NS	-0.0810	0.2037	0.16	0.92	NS	
Aged 80-84 * 8th grade or less	0.0476	0.1582	0.09	1.05	NS	-0.0024	0.1443	0.00	1.00	NS	
Aged 80-84 * Some High School	0.0134	0.1586	0.01	1.01	NS	-0.0506	0.1474	0.12	0.95	NS	
Aged 80-84 * Some College	-0.1356	0.1387	0.96	0.87	NS	0.0751	0.1301	0.33	1.08	NS	
Aged 80-84 * College	-0.0413	0.1951	0.04	0.96	NS	0.1894	0.1873	1.02	1.21	NS	
Aged 80-84 * > 4 year College	-0.0595	0.1774	0.11	0.94	NS	0.1298	0.1697	0.59	1.14	NS	
Aged 80-84 * Education - Unknown	0.4200	0.3008	1.95	1.52	NS	0.6123	0.2724	5.05	1.84	*	
Aged 85-89 * 8th grade or less	0.2643	0.1911	1.91	1.30	NS	0.0450	0.1758	0.07	1.05	NS	
Aged 85-89 * Some High School	-0.2149	0.1953	1.21	0.81	NS	-0.2699	0.1790	2.27	0.76	NS	
Aged 85-89 * Some College	0.2882	0.2020	2.03	1.33	NS	0.2835	0.1902	2.22	1.33	NS	
Aged 85-89 * College	0.7118	0.3228	4.86	2.04	*	0.7043	0.3131	5.06	2.02	*	
Aged 85-89 * > 4 year College	-0.2183	0.2379	0.84	0.80	NS	-0.1316	0.2228	0.35	0.88	NS	
Aged 85-89 * Education - Unknown	0.5114	0.3692	1.92	1.67	NS	0.7287	0.3320	4.82	2.07	*	
Aged 90+ * 8th grade or less	0.2861	0.2457	1.36	1.33	NS	0.3764	0.2291	2.70	1.46	NS	
Aged 90+ * Some High School	0.3287	0.2890	1.29	1.39	NS	0.2830	0.2738	1.07	1.33	NS	
Aged 90+ * Some College	0.2483	0.2893	0.74	1.28	NS	0.3818	0.2750	1.93	1.46	NS	
Aged 90+ * College	-0.0841	0.3519	0.06	0.92	NS	0.3256	0.3339	0.95	1.38	NS	



MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 9 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Plan**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Aged 90+ * > 4 year College	0.0700	0.4262	0.03	1.07	NS	0.2838	0.4065	0.49	1.33	NS	
Aged 90+ * Education - Unknown	1.7303	0.6681	6.71	5.64	**	1.6992	0.6436	6.97	5.47	**	*
<u>Age and Medicaid Interaction</u>											
Aged 70-74 * Medicaid	-0.2080	0.1629	1.63	0.81	NS	-0.2667	0.1455	3.36	0.77	NS	
Aged 75-79 * Medicaid	0.1347	0.1774	0.58	1.14	NS	0.0075	0.1610	0.00	1.01	NS	
Aged 80-84 * Medicaid	-0.1155	0.1972	0.34	0.89	NS	-0.1832	0.1795	1.04	0.83	NS	
Aged 85-89 * Medicaid	-0.2560	0.2125	1.45	0.77	NS	-0.5768	0.1953	8.73	0.56	**	
Aged 90+ * Medicaid	-0.0393	0.2562	0.02	0.96	NS	-0.3517	0.2387	2.17	0.70	NS	***
<u>Age and Proxy Interaction</u>											
Aged 70-74 * Proxy - Yes	-0.0092	0.1173	0.01	0.99	NS	-0.2012	0.1087	3.42	0.82	NS	
Aged 70-74 * Proxy-Unknown	-0.0024	0.1393	0.00	1.00	NS	-0.1623	0.1267	1.64	0.85	NS	
Aged 75-79 * Proxy-Yes	-0.0110	0.1219	0.01	0.99	NS	-0.2944	0.1132	6.76	0.74	**	
Aged 75-79 * Proxy-Unknown	0.0883	0.1506	0.34	1.09	NS	-0.1864	0.1379	1.83	0.83	NS	
Aged 80-84 * Proxy-Yes	-0.0935	0.1319	0.50	0.91	NS	-0.6221	0.1231	25.52	0.54	***	
Aged 80-84 * Proxy-Unknown	-0.1389	0.1731	0.64	0.87	NS	-0.5412	0.1587	11.63	0.58	***	
Aged 85-89 * Proxy-Yes	0.1850	0.1602	1.33	1.20	NS	-0.5939	0.1488	15.93	0.55	***	
Aged 85-89 * Proxy-Unknown	-0.0146	0.2302	0.00	0.99	NS	-0.6546	0.2102	9.70	0.52	**	
Aged 90+ * Proxy-Yes	-0.0023	0.2381	0.00	1.00	NS	-0.7798	0.2225	12.28	0.46	***	
Aged 90+ * Proxy-Unknown	-0.2453	0.3741	0.43	0.78	NS	-1.1529	0.3491	10.91	0.32	***	
<u>Age and Smoking Interaction</u>											
Aged 70-74 * Smoker - Yes	0.0458	0.1113	0.17	1.05	NS	0.0067	0.1019	0.00	1.01	NS	
Aged 70-74 * Smoker-Unknown	-0.0740	0.0756	0.96	0.93	NS	-0.0352	0.0711	0.25	0.97	NS	
Aged 75-79 * Smoker-Yes	-0.0325	0.1370	0.06	0.97	NS	0.0049	0.1251	0.00	1.00	NS	
Aged 75-79 * Smoker-Unknown	-0.0881	0.0840	1.10	0.92	NS	-0.0397	0.0790	0.25	0.96	NS	
Aged 80-84 * Smoker-Yes	0.0480	0.1944	0.06	1.05	NS	0.1017	0.1790	0.32	1.11	NS	
Aged 80-84 * Smoker-Unknown	-0.1310	0.1009	1.68	0.88	NS	-0.0238	0.0951	0.06	0.98	NS	
Aged 85-89 * Smoker-Yes	-0.0674	0.3134	0.05	0.93	NS	-0.2569	0.2886	0.79	0.77	NS	
Aged 85-89 * Smoker-Unknown	-0.1395	0.1339	1.08	0.87	NS	-0.0951	0.1257	0.57	0.91	NS	
Aged 90+ * Smoker-Yes	-0.1589	0.5688	0.08	0.85	NS	0.5768	0.5066	1.30	1.78	NS	
Aged 90+ * Smoker-Unknown	0.2022	0.1881	1.16	1.22	NS	0.6213	0.1787	12.08	1.86	***	***
<u>Gender and Education Interaction</u>											
Male * 8th grade or less	-0.0154	0.0970	0.03	0.98	NS	-0.1678	0.0885	3.60	0.85	NS	
Male * Some High School	0.0288	0.0912	0.10	1.03	NS	-0.1331	0.0840	2.51	0.88	NS	
Male * Some College	0.0112	0.0778	0.02	1.01	NS	0.0458	0.0732	0.39	1.05	NS	
Male * College	0.1627	0.1075	2.29	1.18	NS	0.1456	0.1030	2.00	1.16	NS	
Male * > 4 year College	0.1282	0.1002	1.64	1.14	NS	-0.0071	0.0958	0.01	0.99	NS	
Male * Education - Unknown	0.3243	0.1660	3.82	1.38	.05	0.2814	0.1507	3.49	1.33	NS	
Male * Medicaid	-0.1441	0.1224	1.39	0.87	NS	-0.2315	0.1108	4.36	0.79	*	NS
<u>Gender and Proxy Interaction</u>											
Male * Proxy - Yes	0.0261	0.0775	0.11	1.03	NS	0.5083	0.0725	49.22	1.66	***	***
Male * Proxy - Unknown	-0.1346	0.1054	1.63	0.87	NS	-0.1214	0.0965	1.58	0.89	NS	
<u>Race and Education Interaction</u>											
Race-Black * 8th grade or less	0.2986	0.1828	2.67	1.35	NS	0.1044	0.1609	0.42	1.11	NS	
Race-Black * Some High School	0.3433	0.1815	3.58	1.41	NS	-0.0318	0.1609	0.04	0.97	NS	
Race-Black * Some College	0.4988	0.2103	5.62	1.65	*	0.1467	0.1917	0.59	1.16	NS	
Race-Black * College	0.1646	0.3336	0.24	1.18	NS	0.3740	0.2989	1.57	1.45	NS	

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 9 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Plan**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>c</sup>	
Race-Black * > 4 year College	0.6044	0.2786	4.71	1.83	*	0.5956	0.2570	5.37	1.81	*	
Race-Black * Education - Unknown	0.0548	0.3217	0.03	1.06	NS	0.1304	0.2692	0.23	1.14	NS	
Race-Hispanic * 8th grade or less	0.3142	0.3142	1.00	1.37	NS	0.2285	0.2805	0.66	1.26	NS	
Race-Hispanic * Some High School	0.0789	0.3779	0.04	1.08	NS	0.1263	0.3365	0.14	1.13	NS	
Race-Hispanic * Some College	-0.7025	0.4273	2.70	0.50	NS	0.0280	0.3548	0.01	1.03	NS	
Race-Hispanic * College	0.5455	0.6045	0.81	1.73	NS	0.1770	0.5824	0.09	1.19	NS	
Race-Hispanic * > 4 year College	0.0075	0.5118	0.00	1.01	NS	-0.0853	0.4769	0.03	0.92	NS	
Race-Hispanic * Education - Unknown	-0.0677	0.5629	0.01	0.93	NS	0.0965	0.4790	0.04	1.10	NS	
Race-Other * 8th grade or less	-0.0688	0.2687	0.07	0.93	NS	-0.1279	0.2466	0.27	0.88	NS	
Race-Other * Some High School	-0.0626	0.3121	0.04	0.94	NS	-0.1206	0.2841	0.18	0.89	NS	
Race-Other * Some College	-0.0131	0.2656	0.00	0.99	NS	-0.0504	0.2440	0.04	0.95	NS	
Race-Other * College	0.5570	0.3779	2.17	1.75	NS	0.4619	0.3631	1.62	1.59	NS	
Race-Other * > 4 year College	-0.1093	0.2693	0.16	0.90	NS	-0.4245	0.2560	2.75	0.65	NS	
Race-Other * Education - Unknown	0.9418	0.5950	2.51	2.56	NS	0.8556	0.5650	2.29	2.35	NS	
Race-Unknown * 8th grade or less	-0.8145	0.8414	0.94	0.44	NS	-1.0398	0.7607	1.87	0.35	NS	
Race-Unknown * Some High School	-0.2069	0.7364	0.08	0.81	NS	-0.5402	0.6536	0.68	0.58	NS	
Race-Unknown * Some College	0.5404	0.5662	0.91	1.72	NS	-0.6398	0.5390	1.41	0.53	NS	
Race-Unknown * College	9.3023	85.7485	0.01	10963.05	NS	9.0314	85.7478	0.01	8361.27	NS	
Race-Unknown * > 4 year College	10.7394	119.6558	0.01	46137.60	NS	9.0765	119.6562	0.01	8747.33	NS	
Race-Unknown * Education - Unknown	9.9118	111.3755	0.01	20166.91	NS	7.9005	111.3757	0.01	2698.64	NS	
<u>Race and Medicaid Interaction</u>											
Race - Black * Medicaid	0.2726	0.1625	2.81	1.31	NS	0.1814	0.1457	1.55	1.20	NS	
Race - Hispanic * Medicaid	0.5582	0.2661	4.40	1.75	*	0.2109	0.2411	0.77	1.23	NS	
Race - Other * Medicaid	0.7725	0.2318	11.11	2.17	***	0.6343	0.2165	8.58	1.89	**	
Race - Unknown * Medicaid	-0.1719	0.7450	0.05	0.84	NS	-0.5292	0.6839	0.60	0.59	NS	
<u>Education and Proxy Interaction</u>											
<=8thGr * Proxy - Yes	0.3140	0.1119	7.87	1.37	**	0.0209	0.1023	0.04	1.02	NS	
<=8thGr * Proxy-Unknown	-0.0261	0.1787	0.02	0.97	NS	0.0792	0.1596	0.25	1.08	NS	
SomeHS * Proxy-Yes	0.2869	0.1152	6.21	1.33	*	0.0825	0.1076	0.59	1.09	NS	
SomeHS * Proxy-Unknown	-0.1349	0.1677	0.65	0.87	NS	-0.0551	0.1521	0.13	0.95	NS	
SomeCollege * Proxy-Yes	-0.0450	0.1290	0.12	0.96	NS	0.2244	0.1220	3.38	1.25	NS	
SomeCollege * Proxy-Unknown	-0.2411	0.1528	2.49	0.79	NS	-0.0967	0.1416	0.47	0.91	NS	
College * Proxy-Yes	-0.3126	0.1810	2.98	0.73	NS	-0.0378	0.1739	0.05	0.96	NS	
College * Proxy-Unknown	-0.4341	0.2055	4.46	0.65	*	-0.3836	0.1925	3.97	0.68	*	
> 4 year College * Proxy-Yes	-0.1485	0.1816	0.67	0.86	NS	0.0976	0.1749	0.31	1.10	NS	
> 4 year College * Proxy-Unknown	-0.0428	0.2087	0.04	0.96	NS	-0.0299	0.1976	0.02	0.97	NS	
Education Unknown * Proxy-Yes	-0.2076	0.2429	0.73	0.81	NS	-0.1675	0.2209	0.57	0.85	NS	
Education Unknown * Proxy-Unknown	-0.3389	0.2246	2.28	0.71	NS	-0.1105	0.2011	0.30	0.90	NS	
<u>Medicaid and Proxy Interaction</u>											
Medicaid * Proxy-Yes	0.0980	0.1355	0.52	1.10	NS	-0.1132	0.1228	0.85	0.89	NS	
Medicaid * Proxy-Unknown	0.1282	0.2202	0.34	1.14	NS	0.0937	0.1957	0.23	1.10	NS	
<u>Race and Proxy Interaction</u>											
Race - Black * Proxy-Yes	0.0371	0.1570	0.06	1.04	NS	-0.3417	0.1407	5.90	0.71	*	
Race - Black * Proxy-Unknown	0.0299	0.1850	0.03	1.03	NS	-0.2692	0.1622	2.75	0.76	NS	
Race - Hispanic * Proxy-Yes	-0.4460	0.2788	2.56	0.64	NS	-0.6074	0.2484	5.98	0.54	*	
Race - Hispanic * Proxy-Unknown	-0.7285	0.4836	2.27	0.48	NS	-0.7758	0.4000	3.76	0.46	NS	
Race - Other * Proxy-Yes	0.0544	0.2208	0.06	1.06	NS	-0.2718	0.2045	1.77	0.76	NS	
Race - Other * Proxy-Unknown	0.6051	0.3853	2.47	1.83	NS	0.1892	0.3597	0.28	1.21	NS	

MEDICARE HEALTH OUTCOMES SURVEY  
FINAL REPORT, TASK 5.30A

**Table 9 - Continued**  
**Estimates of the Relationship between PCS and MCS Scores and the Rating of Health Plan**  
**for Medicare FFS and Managed Care Beneficiaries**

Explanatory Variables <sup>a</sup>	Probability of Moderate Rating (6-8) / Probability of Low Rating (0-5)					Probability of High Rating (9-10) / Probability of Low Rating (0-5)					p-value for overall effect <sup>c</sup>
	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>b</sup>	Coefficient	Standard Error	Wald Chi-Square	Odds Ratio	p Value <sup>b</sup>	
Race - Unknown * Proxy-Yes	0.6791	0.7293	0.87	1.97	NS	0.4887	0.6798	0.52	1.63	NS	
Race - Unknown * Proxy-Unknown	9.0188	49.0614	0.03	8256.66	NS	9.3140	49.0602	0.04	11092.58	NS	
<u>Age and MCO Interaction</u>											
Aged 70-74 * MCO	-0.0365	0.0840	0.19	0.96	NS	-0.1739	0.0784	4.92	0.84	*	***
Aged 75-79 * MCO	0.0737	0.0964	0.58	1.08	NS	-0.1244	0.0900	1.91	0.88	NS	
Aged 80-84 * MCO	-0.0035	0.1206	0.00	1.00	NS	-0.2454	0.1128	4.74	0.78	*	
Aged 85-89 * MCO	-0.0054	0.1579	0.00	0.99	NS	-0.5151	0.1474	12.20	0.60	***	
Aged 90+ * MCO	-0.1509	0.2428	0.39	0.86	NS	-0.5253	0.2300	5.22	0.59	*	
Male * MCO	0.0183	0.0687	0.07	1.02	NS	0.1086	0.0642	2.86	1.11	NS	NS
<u>Race and MCO Interaction</u>											
Race - Black * MCO	0.2699	0.1483	3.31	1.31	NS	0.0168	0.1337	0.02	1.02	NS	***
Race - Hispanic * MCO	-0.1858	0.2323	0.64	0.83	NS	-0.7003	0.2092	11.20	0.50	***	
Race - Other * MCO	0.3491	0.2152	2.63	1.42	NS	0.1154	0.2031	0.32	1.12	NS	
Medicaid * MCO	-0.2867	0.1574	3.32	0.75	NS	-0.5096	0.1426	12.77	0.60	***	***
<u>Proxy and MCO Interaction</u>											
Proxy-Yes * MCO	0.0186	0.0996	0.03	1.02	NS	0.0172	0.0938	0.03	1.02	NS	**
Proxy-Unknown * MCO	-0.2332	0.1851	1.59	0.79	NS	-0.5442	0.1653	10.84	0.58	***	***
<u>Smoking and MCO Interaction</u>											
Smoker-Yes * MCO	0.2720	0.1160	5.50	1.31	*	0.3069	0.1068	8.25	1.36	**	
Smoker-Unknown * MCO	-0.1826	0.0726	6.33	0.83	*	-0.0794	0.0681	1.36	0.92	NS	
Intercept	1.2666	0.0641	390.93			2.0799	0.0600	1202.67			
Observations	94,514										
R-Square	0.0594										

<sup>a</sup> Reference levels are fee-for-service, aged 65-69, female, white, high school graduate, not eligible for Medicaid, self-respondent, and non-smoker

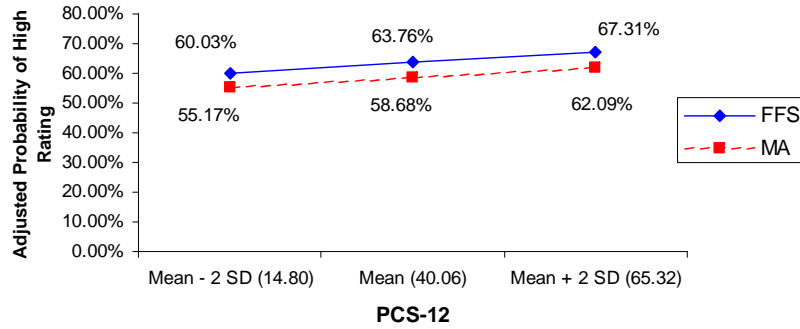
<sup>b</sup> PCS and MCS were centered at sample means of 40.06 and 53.63, respectively

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001, NS=Not statistically significant at 0.05 level

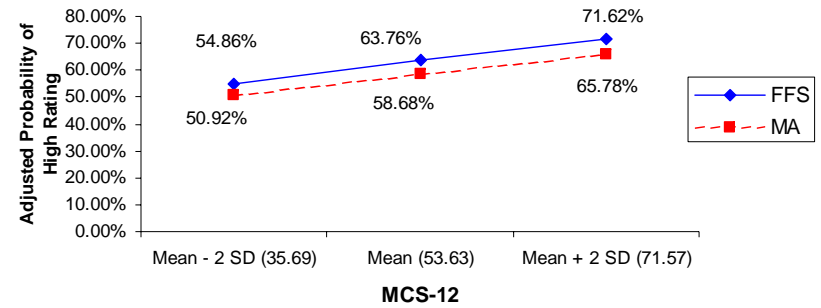
<sup>c</sup> p-value for the overall testing of the statistical significance of the effect of the explanatory variable on the study outcome across the two models.

The results pertain to the explanatory variable as a whole regardless of the number of levels

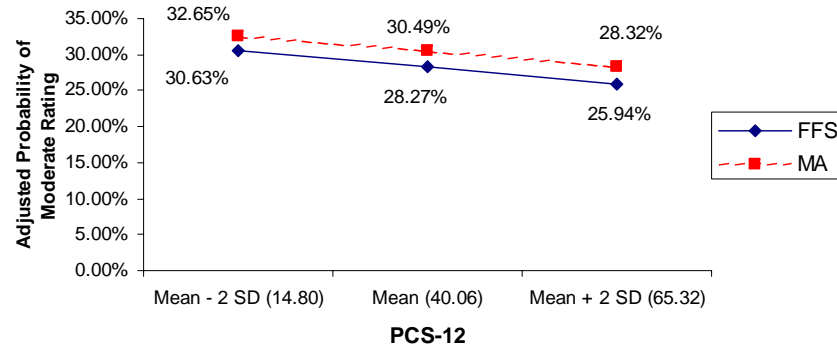
**Figure 63: Relationship between PCS-12 and Adjusted Probability of High Rating of Health Plan (9-10): Comparison Between FFS and Managed Care**



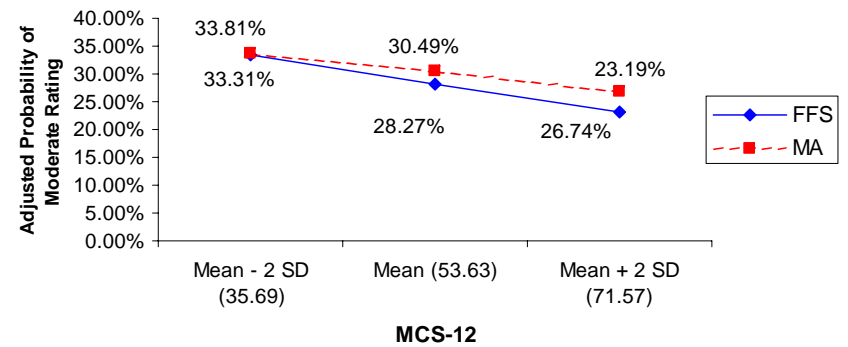
**Figure 64: Relationship between MCS-12 and Adjusted Probability of High Rating of Health Plan (9-10): Comparison Between FFS and Managed Care**



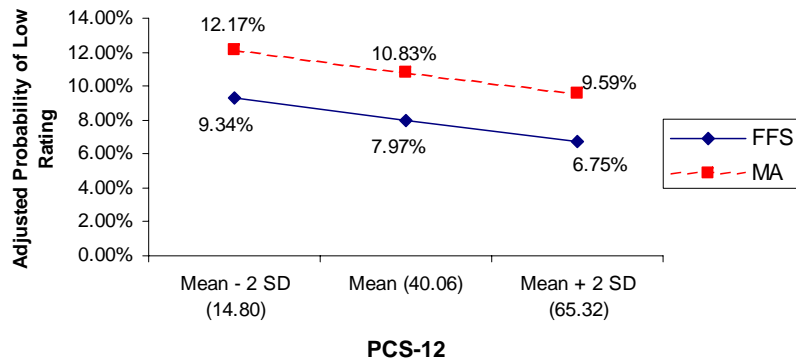
**Figure 65: Relationship between PCS-12 and Adjusted Probability of Moderate Rating of Health Plan (6-8): Comparison Between FFS and Managed Care**



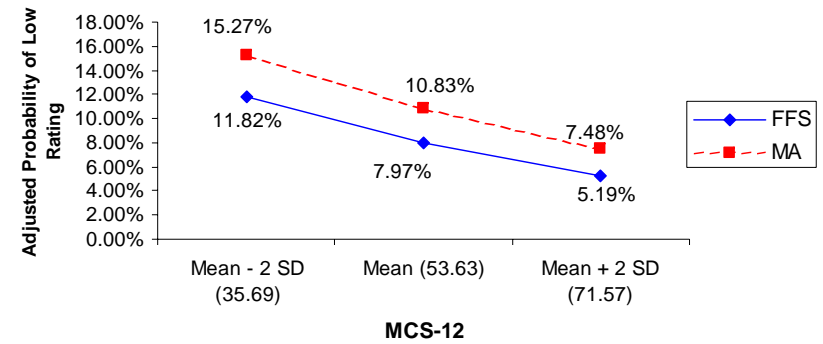
**Figure 66: Relationship between MCS-12 and Adjusted Probability of Moderate Rating of Health Plan (6-8): Comparison Between FFS and Managed Care**



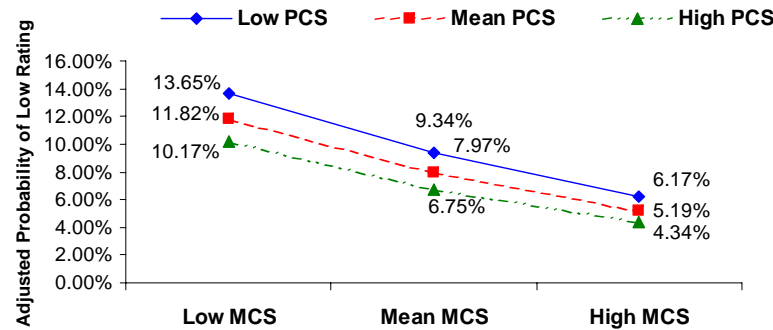
**Figure 67: Relationship between PCS-12 and Adjusted Probability of Low Rating of Health Plan (0-5): Comparison Between FFS and Managed Care**



**Figure 68: Relationship between MCS-12 and Adjusted Probability of Low Rating of Health Plan (0-5): Comparison Between FFS and Managed Care**



**Figure 69: Interaction Effect of PCS-12 and MCS-12 on Adjusted Probability of Low Rating of Health Care**



**Table 10**  
**Comparison of Demographic Characteristics Between Medicare Managed Care CAHPS**  
**Total Survey Sample and the Managed Care Analytic Sample**

	CAHPS Managed Care Total Sample (n=220,732)		CAHPS + HOS Managed Care Analytic Sample (n=17,901)		Effect Size
	Number of Enrollees	Percent of Samples	Number of Enrollees	Percent of Samples	
<u>Age Group</u>					
65-69	55,622	25.20%	4,683	26.16%	0.022
70-74	62,037	28.11%	5,374	30.02%	0.042
75-79	49,252	22.31%	4,041	22.57%	0.006
80-84	31,149	14.11%	2,331	13.02%	0.032
85-89	15,861	7.19%	1,077	6.02%	0.047
90+	6,811	3.09%	395	2.21%	0.055
<u>Gender</u>					
Male	92,539	41.92%	7,876	44.00%	0.042
Female	128,193	58.08%	10,025	56.00%	0.042
<u>Race</u>					
White	183,290	83.04%	15,745	87.96%	0.140
Black	19,368	8.77%	1,100	6.14%	0.100
Hispanic	11,201	5.07%	683	3.82%	0.061
Other	6,738	3.05%	370	2.07%	0.063
Unknown	135	0.06%	3	0.02%	0.024
<u>Education</u>					
8th grade or less	22,312	10.11%	1,820	10.17%	0.002
Some high school	30,599	13.86%	2,603	14.54%	0.019
High School Graduate	60,610	27.46%	5,893	32.92%	0.119
Some College	32,948	14.93%	3,172	17.72%	0.076
College Graduate	11,014	4.99%	1,040	5.81%	0.036
More than 4-yr College	11,138	5.05%	1,055	5.89%	0.037
Unknown	52,111	23.61%	2,318	12.95%	0.279 *
<u>Medicaid Dual Eligible</u>					
No	209,104	94.73%	17,060	95.30%	0.026
Yes	11,628	5.27%	841	4.70%	0.026
<u>Proxy</u>					
No	146,439	66.34%	13,839	77.31%	0.245 *
Yes	22,496	10.19%	1,877	10.49%	0.010
Unknown	51,797	23.47%	2,185	12.21%	0.298 *
<u>Smoking Status</u>					
No	66,572	30.16%	6,455	36.06%	0.125
Yes	16,601	7.52%	1,601	8.94%	0.052
Unknown	137,559	62.32%	9,845	55.00%	0.149

\* denotes small effect size (0.20 - 0.49) for differences between total CAHPS sample and analytic sample

\*\* Medium effect size (0.50 - 0.80) for differences between total CAHPS sample and analytic sample

\*\*\* Large effect size (>0.80) for differences between total CAHPS sample and analytic sample

**Table 11**  
**Comparison of Self-Reported Utilization and Experience with Care Ratings Between Medicare Managed Care**  
**CAHPS Total Survey Sample and the Managed Care Analytic Sample**

	CAHPS Managed Care Total Sample (n=220,732)		CAHPS + HOS Managed Care Analytic Sample (n=17,901)		Effect Size
	Number of Enrollees	Percent of Samples	Number of Enrollees	Percent of Samples	
<u>Hospitalized in Last 12 Month</u>					
No	132,980	81.29%	12,538	81.71%	0.011
Yes	30,615	18.71%	2,807	18.29%	0.011
Total Excluding Missing	163,595		15,345		
<u>Number of Doctor's Office Visits</u>					
Low (0-1)	75,725	44.35%	7,019	44.51%	0.003
Moderate (2-4)	71,297	41.76%	6,602	41.86%	0.002
High (>=5)	23,712	13.89%	2,149	13.63%	0.008
Total Excluding Missing	170,734		15,770		
<u>Number of Specialist Visits</u>					
Low (0-1)	109,348	63.68%	10,311	65.13%	0.030
Moderate (2-4)	49,548	28.86%	4,430	27.98%	0.019
High (>=5)	12,816	7.46%	1,090	6.89%	0.022
Total Excluding Missing	171,712		15,831		
<u>Rating of Doctor or Nurse</u>					
Low (0-5)	9,810	6.94%	840	6.41%	0.021
Moderate (6-8)	36,825	26.04%	3,479	26.55%	0.012
High (9-10)	94,803	67.03%	8,784	67.04%	0.000
Total Excluding Missing	141,438		13,103		
<u>Rating of Specialist</u>					
Low (0-5)	6,993	7.59%	578	6.89%	0.027
Moderate (6-8)	20,794	22.56%	1,812	21.59%	0.024
High (9-10)	64,376	69.85%	6,004	71.53%	0.037
Total Excluding Missing	92,163		8,394		
<u>Rating of Health Care</u>					
Low (0-5)	7,848	6.00%	620	5.08%	0.040
Moderate (6-8)	32,123	24.54%	2,881	23.60%	0.022
High (9-10)	90,932	69.47%	8,706	71.32%	0.041
Total Excluding Missing	130,903		12,207		
<u>Rating of Health Plan</u>					
Low (0-5)	19,530	11.66%	1,726	11.14%	0.016
Moderate (6-8)	48,329	28.86%	4,482	28.93%	0.001
High (9-10)	99,578	59.47%	9,284	59.93%	0.009
Total Excluding Missing	167,437		15,492		
<u>General Health</u>					
Excellent/Very Good	55,530	32.01%	5,068	31.71%	0.006
Good	67,584	38.96%	6,297	39.40%	0.009
Fair/Poor	50,344	29.02%	4,616	28.88%	0.003
Total Excluding Missing	173,458		15,981		
<u>Health Compared to One year Ago</u>					
Much Better/Better	33,487	19.34%	2,808	17.58%	0.045
Same	110,069	63.56%	10,377	64.98%	0.030
Much Worse/Worse	29,613	17.10%	2,784	17.43%	0.009
Total Excluding Missing	173,169		15,969		

\* denotes small effect size (0.20 - 0.49) for differences between total CAHPS sample and analytic sample

\*\* Medium effect size (0.50 - 0.80) for differences between total CAHPS sample and analytic sample

\*\*\* Large effect size (>0.80) for differences between total CAHPS sample and analytic sample