

# **Comparison of the Health Status of Medicare Fee-For-Service and Managed Care Enrollees Using the Health Outcomes Survey**

## **Final Report**

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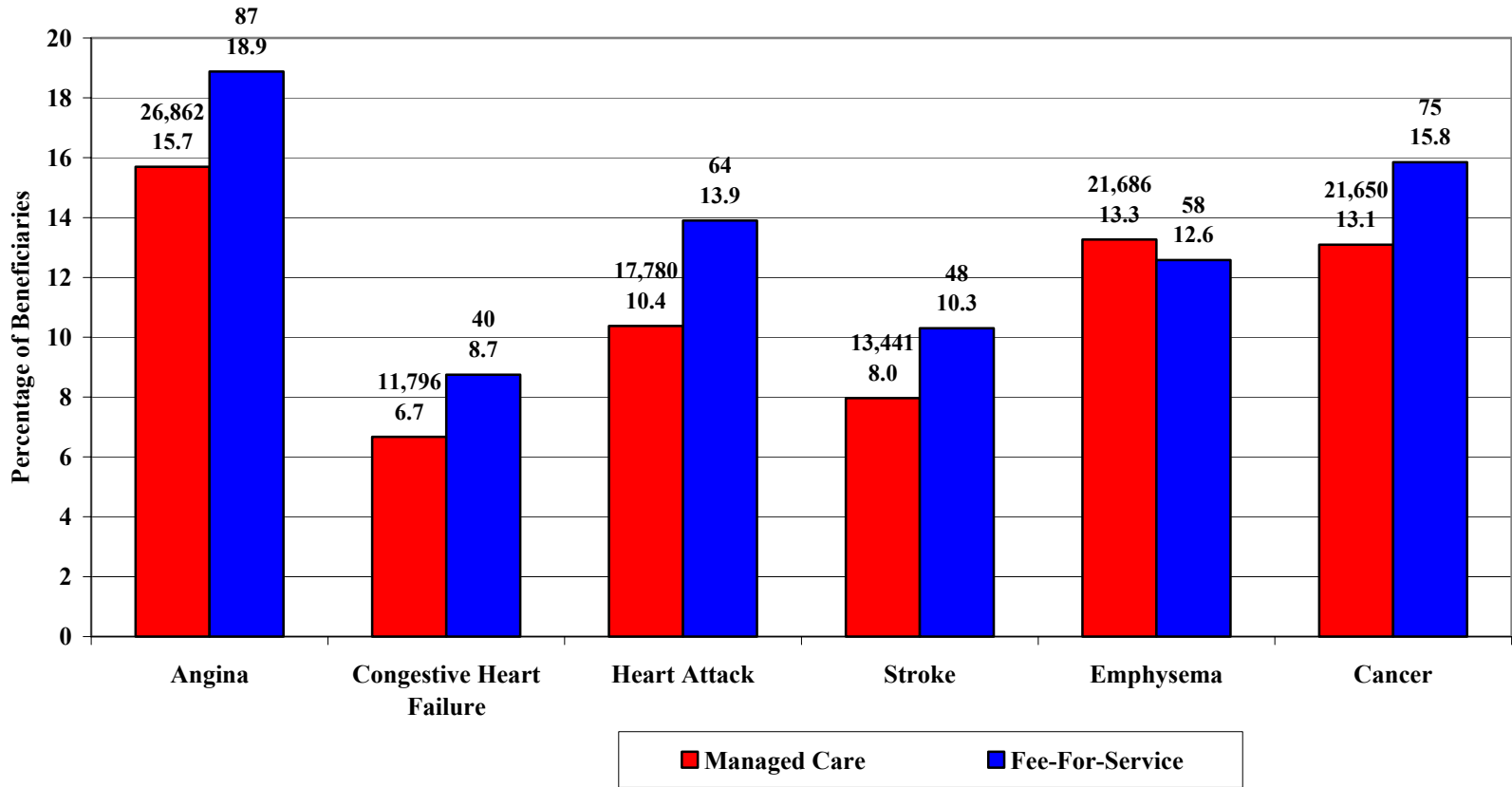
# Executive Summary

In this report, Health Economics Research, Inc. compares the average health status of the Medicare managed care (MCO) and fee-for-service (FFS) populations, using the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database. The report presents a summary analysis of respondents to the baseline HOS for each population, including demographic characteristics, mean physical and mental health scores, distributions of scores, prevalence of chronic conditions, functional status, and self-reported general health status.

All population-based comparisons show that Medicare FFS enrollees are in poorer health status than managed care enrollees, although the magnitude of the difference varies depending on the particular measure. The prevalence of chronic disease is higher in the FFS population (Figure ES-1). In the FFS population, 18.9% report angina versus 15.7% in the managed care population; 8.7% in FFS report congestive heart failure versus 6.7% in managed care; 13.9% report previous heart attack in FFS versus 10.4% in managed care; and 10.3% in FFS report prior stroke versus 8.0% in managed care. The prevalence of some other chronic diseases is more similar among FFS and managed care enrollees, but only one of 13 chronic diseases is (slightly) more prevalent among managed care enrollees, and the one exception (emphysema) may result from random variation arising from small FFS sample sizes.

Figure ES-1

Percentage of Medicare Beneficiaries Reporting Selected Medical Conditions



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

In terms of functional status (Figure ES-2), 59% of managed care enrollees have no limitations in any activities of daily living versus only 50% with no limitations in FFS. Eight percent of FFS enrollees have difficulty with 5 or 6 activities of daily living versus 6% of managed care enrollees with similar functional impairment. A full 41% of FFS enrollees have difficulty walking compared to 32% of managed care enrollees. Also, 41% of FFS enrollees report themselves to be in "poor" or "fair" health versus only 28% of managed care enrollees (Figure ES-3).

Convenient summary measures of physical and mental health were calculated from the SF-36 or SF-12 questions included in the HOS. They summarize 8 health concepts--physical functioning, role limitations due to physical health problems, bodily pain, general health, vitality, mental health, role limitations due to emotional problems, and social functioning. Comparison of the summary SF-36 health scales show that the FFS population is in poorer physical and mental health than the managed care population, but the differences are relatively small (Figure ES-4). The SF-36 physical health summary score, the PCS, is 40.6 points on average for the managed care population versus 38.2 points for the FFS population, for a difference of 2.5 points.<sup>1</sup> This difference is statistically and clinically significant, but relatively small. Similarly, the mental health summary score (MCS) difference between the two populations is 2.9 points, 51.8 for managed care versus 48.9 for FFS. Again, this is a statistically and clinically significant difference, but a relatively small one.

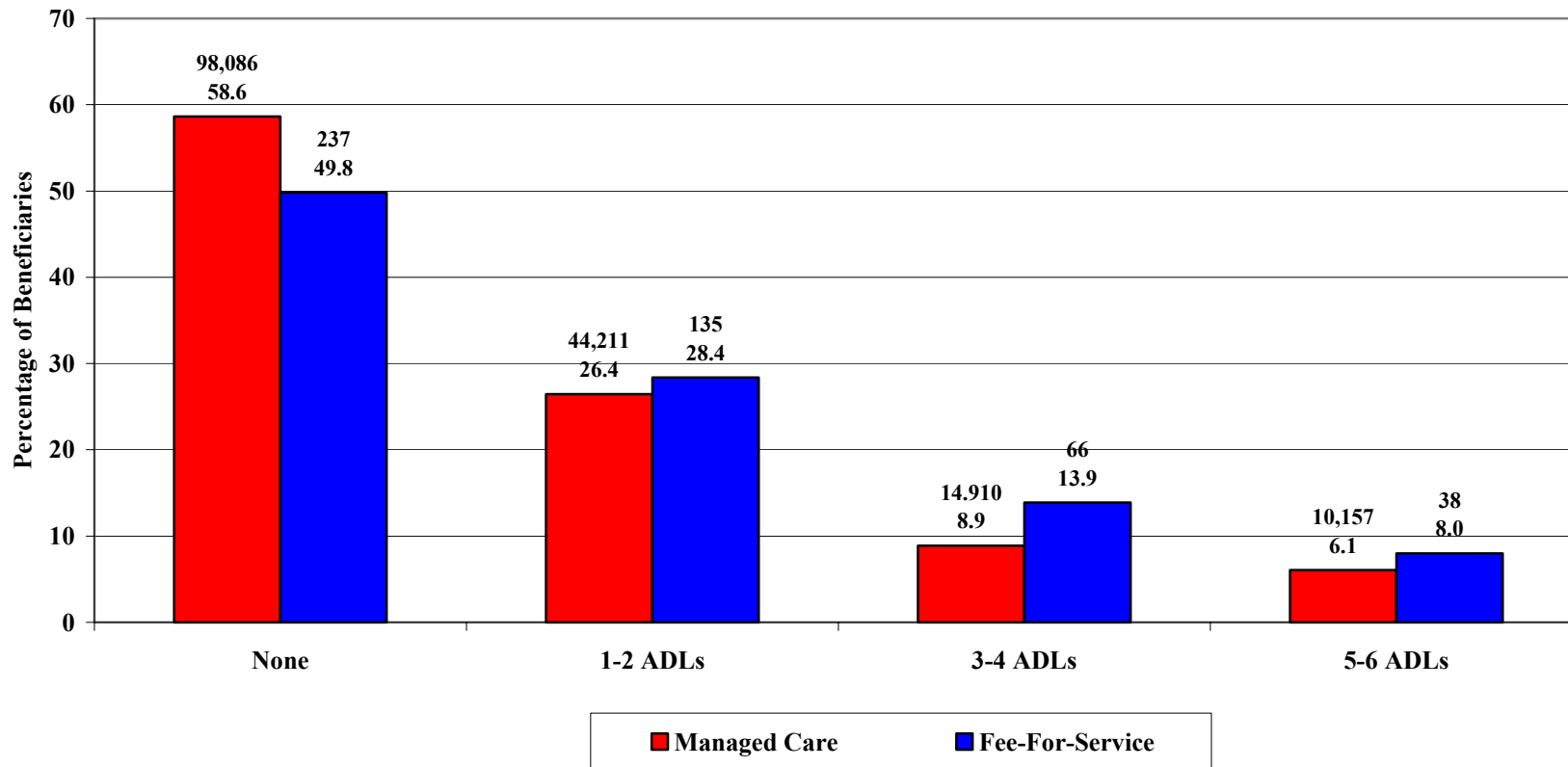
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<sup>1</sup> The difference is 2.5 rather than 2.4 because of rounding the MCO and FFS mean scores to one decimal place.



Figure ES-2

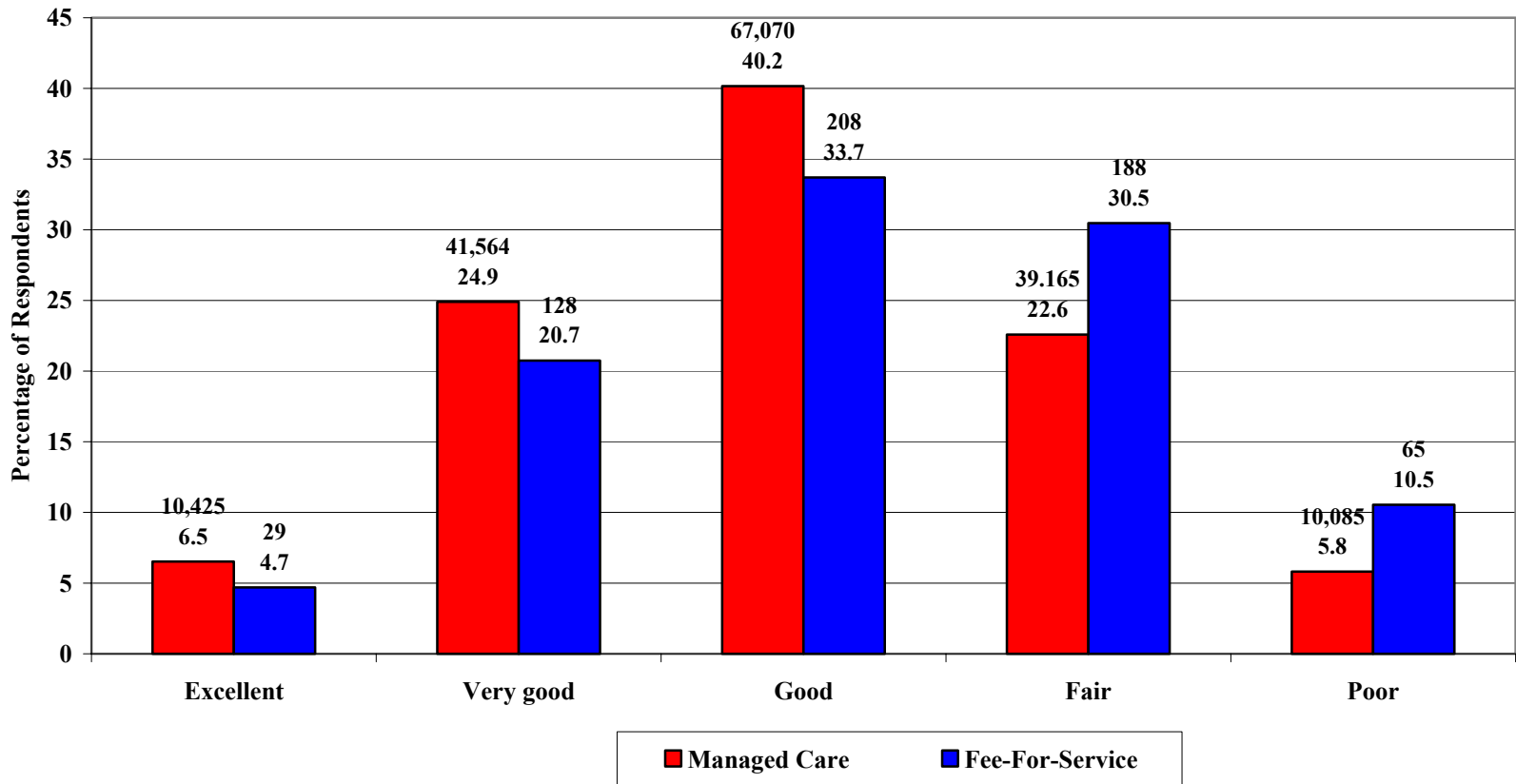
Percentage of Medicare Beneficiaries Who Have Difficulty Performing Activities of Daily Living (ADLs)



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure ES-3

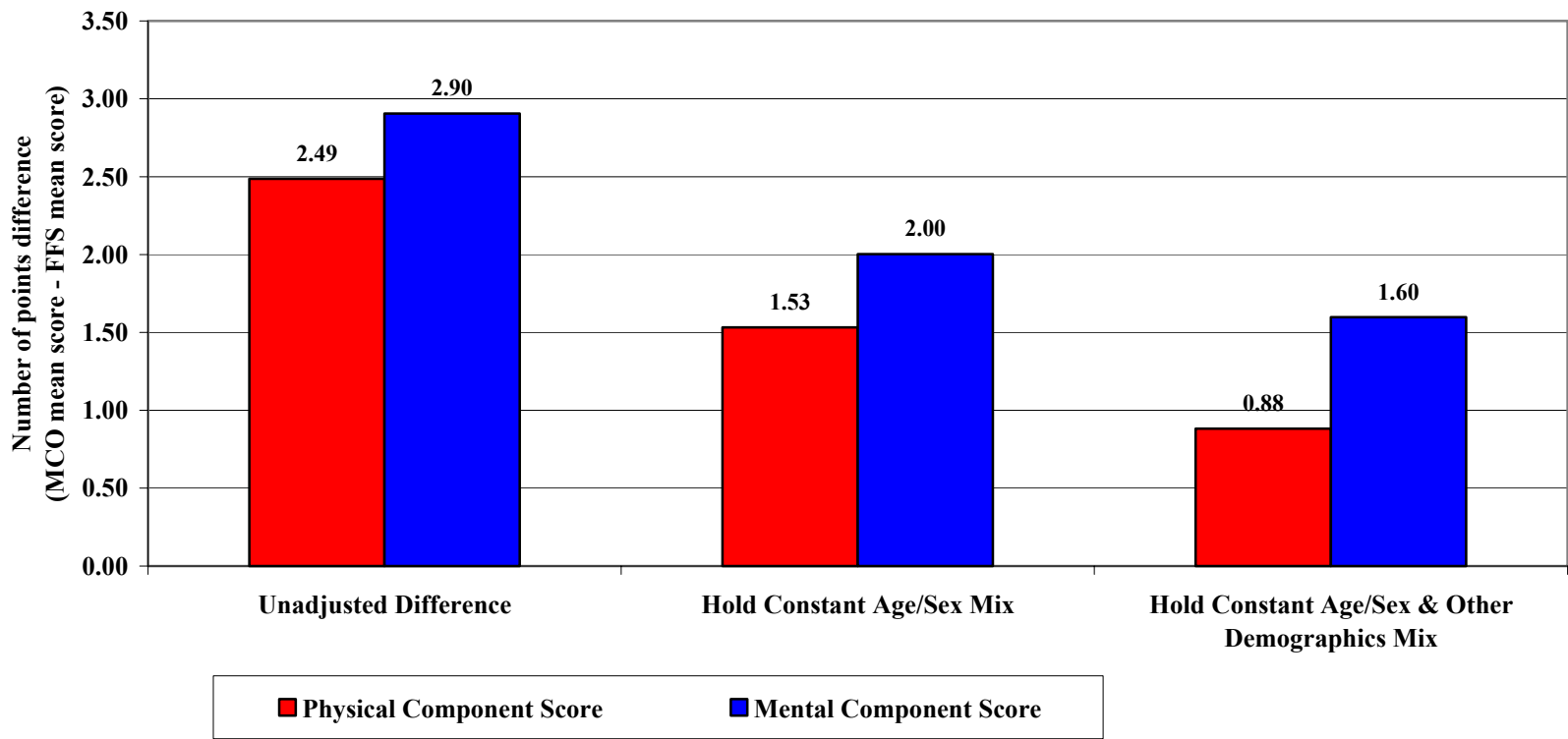
Self-Reported General Health Status of Medicare Beneficiaries



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure ES-4

Difference In Mean SF-36 Health Summary Scores Between Managed Care and Fee-For-Service Medicare Enrollees



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Moreover, much of the FFS/managed care differences in summary physical and mental health scores disappear

Moreover, much of the FFS/managed care differences in summary physical and mental health scores disappear when adjustments are made for the demographic mix of the two populations (Figure ES-4). Holding constant the age, sex, race, poverty status (Medicaid enrollment), and original entitlement by disability mix of the two populations eliminates about two-thirds of the mean FFS/managed care difference in physical health score and half of the mean difference in mental health score. The remaining difference in physical health scores between the two populations is neither statistically nor clinically significant; the remaining difference in mental health score is statistically, but not clinically significant. If we focus on the SF-36 PCS and MCS summary physical and mental health results, the impression that the Medicare FFS population is, on average, in much worse health than the Medicare managed care population is not borne out.

The major limitations of our analysis are survey nonresponse bias, small FFS sample size, and limited analysis of demographic and other factors possibly accounting for FFS/managed care differences. Also, differences in FFS and managed care enrollees' health status are subject to interpretation and different results from alternative measures. There is no absolute consensus on what constitutes a "large" or "small" difference in health status between two populations on a single health status measure. Moreover, health is multi-dimensional and the magnitude of the difference between two populations may appear larger or smaller when comparing different dimensions of health, or when developing alternative summary measures of health with variant weightings of individual dimensions.

# 1

## Introduction

The Health Outcomes Survey (HOS) is a relatively new HEDIS<sup>®</sup> measure. It was developed to allow comparison of changes in self-reported health status over a two-year period for two principal components of health status: physical health and mental health. The HOS HEDIS<sup>®</sup> measure is being calculated for Medicare managed care health plans. Each year a cohort of 1,000 enrollees in each health plan who have been continuously enrolled for at least six months in the plan are surveyed. When each cohort is resurveyed in two years, the mean two-year change in physical and mental health compared to the expected change among health plan enrollees serves as an indicator of the effectiveness of care provided by each health plan. The National Committee for Quality Assurance (1998, 1999) provides more details on the managed care HOS.

The Health Care Financing Administration (HCFA) is also conducting the Health Outcome Survey among Medicare fee-for-service enrollees to investigate analogous measures of effectiveness of care in the fee-for-service (FFS) sector. HCFA contracted with Health Economics Research, Inc. (HER), and its survey subcontractor, New England Research Institutes, Inc. (NERI), to conduct the FFS HOS. HER/NERI conducted the HOS for 10 subsamples of the Medicare fee-for-service population--five small geographic areas, four group practices, and a national random sample. For the FFS population, beneficiaries had to be enrolled in Medicare FFS continuously for at least 12

months preceding the start of the survey period. McCall *et al.* (2000) provide more details on the FFS HOS, including an analysis of baseline results.

The existence of both the managed care and FFS surveys provides a unique opportunity to compare the self-reported health status of Medicare's managed care and FFS enrollees. For this report, HER has compared the responses to the HOS for the managed care (MCO) and fee-for-service (FFS) populations, using the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.<sup>1</sup> The report tables present a summary analysis of respondents to the baseline HOS for each population, including demographic characteristics, mean physical and mental health scores, distributions of scores, prevalence of chronic conditions, functional status, and self-reported general health status. Our analysis identifies the baseline health status distributions from which the two-year change scores will be used to evaluate the effectiveness of MCO and FFS health care.

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<sup>1</sup> HER created this joint FFS/managed care database as the first part of this task order. The specifics of this file were detailed in a March 27<sup>th</sup> memo to HCFA and in the data dictionary which accompanied the database.

# 2

## Methods

### 2.1 Calculation of Physical and Mental Health Summary Scores

The Short Form-36 (SF-36) is the underlying general health status assessment tool of the HOS. Summary scales of physical and mental health, denoted ‘physical component score’ (PCS) and ‘mental component score’ (MCS), are calculated from the SF-36 responses of each beneficiary. In the SF-36, the PCS and the MCS are calculated using eight scales that comprise all 36 questions. The scales are based on various health concepts, and are split into two categories, for physical health and mental health (Ware *et al.*, 1993). The physical health scales are physical functioning, role-physical, bodily pain, and general health. The mental health scales are vitality, social functioning, role-emotional, and mental health. While the eight scales are classified into separate physical and mental health domains, all eight scales are used to calculate both the PCS and the MCS; the four mental health scales are given less weight in the PCS score, and greater weight in the MCS score, and vice-versa.

The PCS and MCS may also be computed from a 12-question subset of the SF-36, the SF-12. The SF-12 survey and scoring method were developed as a shorter version of the SF-36 survey, which would produce comparable health measures (scores), but a higher survey response rate. The SF-12 questions include two questions each from the physical functioning, role-physical, role-emotional, and mental health scales, and one

question each on bodily pain, general health, vitality, and social functioning (Ware *et al.*, 1995). All twelve of these questions must be answered for either the PCS or MCS component scores to be computed; no averages or substitutions may be made. The SF-12 represents the smallest subset of HOS questions that may be used to compute the PCS and MCS scale scores.<sup>1</sup>

The SF-36 was our preferred scoring method and was used whenever possible. The PCS and MCS scores calculated from the SF-36 are more accurate and more sensitive to changes in health status. The SF-12 scores are used in cases where we were unable to calculate an SF-36 score. In calculating response rates, a beneficiary was considered a ‘respondent’ *only* if at least one of these two methods could be used to calculate a mental and physical summary score for the beneficiary.

Table 1 shows managed care and FFS respondents by scoring method. For the managed care HOS, 97% of scores are created using the SF-36 (when both are feasible we used the SF-36). For the FFS survey, on the other hand, only 81% of the scores are from the SF-36, with 19% from the SF-12. The greater proportion of FFS SF-12 scores reflects the use of completion of the SF-12 as the definition of a completed survey for the FFS HOS. In the FFS HOS, special efforts were made to "convert" nonrespondents to the initial SF-36 questionnaire to respondents to the SF-12 questionnaire. The summary PCS and MCS scores from the SF-12 are designed to be comparable to the SF-36 scores. When we analyzed the SF-12 versus SF-36 scores of respondents to the FFS HOS for whom both could be calculated (McCall *et al.*, 2000), we found that the mean SF-12 PCS

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<sup>1</sup> For complete descriptions and scoring guidelines for the SF-36 and the SF-12, refer to Ware *et al.* 1993 and 1995.



**Table 1**  
**HOS Respondents by Scoring Method**

	<b>Number of Respondents</b>	
	<u>Managed Care</u>	<u>Fee-For-Service</u>
SF-36 Score Only <sup>1</sup>	4,326	38
SF-12 Score Only <sup>2</sup>	4,582	1,279
Both SF-36 and SF-12 Scores <sup>3</sup>	160,014	5,317
All Scored Beneficiaries <sup>4</sup>	168,922	6,634
Neither Score <sup>5</sup>	110,213	3,366

<sup>1</sup> The survey could be scored using the SF-36 scoring method, but not the SF-12.

<sup>2</sup> The survey could be scored using the SF-12 scoring method, but not the SF-36.

<sup>3</sup> The survey could be scored using both the SF-36 and the SF-12 scoring methods.

<sup>4</sup> A beneficiary was counted as having a score if the survey could be scored using either one or both of the scoring methods. All beneficiaries in this category were used in the analysis presented in this report.

<sup>5</sup> Either the beneficiary did not return a survey or the survey did not contain enough information to be scored using either scoring method. Incomplete surveys were not used in any section of the analysis contained in this report.

**OUTPUT:** RUN001

**SOURCE:** Health Economics Research, Inc. Analysis of the 1997 Joint Managed Care/Fee-For-Service Health Outcomes Survey (HOS) Database.

was slightly higher (by 0.87 points) than the mean SF-36 PCS, and the mean SF-12 MCS was slightly lower (by 0.69 points) than the mean SF-36 MCS. These differences are small, and could be due in part to random sampling error. The different proportions of SF-36 versus SF-12 scores in the FFS versus managed care HOS should not have any appreciable effect on our comparisons.

The FFS HOS and the managed care HOS used alternative definitions of a completed survey. The definition of a completed survey used by HER/NERI while conducting the FFS HOS was that it must be possible to calculate either an SF-36 or an SF-12 score. In our analyses for this report, we use this FFS HOS definition of a respondent. The FFS HOS definition of response does not require other specific questions or percentages of questions to be answered. The MCO definition requires that a respondent must answer at least 80% of the survey, including questions 1, 2, and 41.

Table 1a displays how the respondent definition affects mean health scores. Although the response rate for the FFS sample is significantly lower when the MCO definition of a completed survey is used,<sup>2</sup> mean PCS and MCS scores are virtually identical under either response rate definition for both FFS and MCO samples. Mean scores for MCO beneficiaries who are respondents under the FFS response definition but who are not respondents under the MCO definition are slightly lower than scores of those who are respondents under the MCO definition (38.6 versus 40.6 for PCS and 49.8 versus 51.9 for MCS). But these beneficiaries comprise only 5,313 of the 168,922 total beneficiaries who are MCO respondents under the FFS response definition and thus have little effect on average scores. The mean PCS for the FFS sample does not differ based on whether or not the survey meets the MCO definition of a completed survey, and the mean MCS is only slightly lower if the observation does not meet the MCO response

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<sup>2</sup> This is primarily because those who completed the SF-12 only are respondents under the FFS response definition, but not under the MCO definition.

Table 1-a

## Response Rates by Definition of Completed Survey

	Number	Response Rate	PCS	MCS	95% Confidence Intervals			
					PCS		MCS	
					Lower	Upper	Lower	Upper
<b>FFS Definition</b>								
MCO Benes	168,922	60.5	40.6	51.8	40.5	40.6	51.8	51.9
FFS Benes	6,634	66.3	38.4	50.9	38.1	38.7	50.6	51.1
<b>MCO Definition</b>								
MCO Benes	163,609	58.6	40.6	51.9	40.5	40.7	51.8	52.0
FFS Benes	5,152	51.5	38.4	51.0	37.7	39.1	50.4	51.6
<b>Scored surveys NOT included in the MCO Definition</b>								
MCO Benes	5,313	1.9	38.6	49.8	38.0	39.3	49.2	50.4
FFS Benes	1,482	14.8	38.4	50.3	37.2	39.6	49.7	50.9

**OUTPUT:** RUN004 and RUN019

**SOURCE:** Health Economics Research, Inc. Analysis of the 1997 Joint Managed Care/Fee-For-Service Health Outcomes Survey (HOS) Database.

definition. In short, our use of the FFS HOS response definition rather than the MCO HOS response definition appears to have no effect on our results.

## 2.2 Fee-for-Service/Managed Care Comparisons

We present two sets of FFS/managed care comparisons in this report:

- a comparison of FFS and managed care respondents to the HOS; and
- a comparison of the national Medicare FFS and managed care populations.

One set of comparisons is of respondents to the FFS HOS and to the managed care HOS. This comparison includes FFS respondents from all 10 FFS HOS subsamples—the national random sample, the five small geographic area samples, and the four physician group practice samples—and all respondents to the Cohort 1 managed care HOS. The purpose of this analysis is simply to compare characteristics of respondents to the FFS HOS to characteristics of respondents to the managed care HOS. These comparisons do not generalize to any larger population beyond HOS respondents. The sample size of FFS observations is maximized in this comparison because all 10 FFS survey subsamples are included in the analysis. In this analysis, observations (respondents) are unweighted.

Another set of comparisons is of the national FFS and managed care populations. Of the 10 FFS survey subsamples, only the single random national sample was designed to be representative of the entire Medicare national FFS population. The other subsamples are drawn from particular geographic areas or group practice beneficiaries, and are not representative of the national Medicare population. To represent the FFS Medicare population, we included only the FFS national sample in the second set of comparisons. The sampling frame for this subsample comprised only 1,000 of the total 10,000 FFS HOS sampling frame. Therefore, the FFS sample sizes for the second set of

comparisons are approximately one-tenth as large as for the comparison of HOS respondents. This limits the statistical power of these comparisons to detect FFS/managed care differences, especially for small subpopulations (e.g., beneficiaries who are highly functionally impaired).

Without adjustments, respondents to the managed care HOS do not represent the national Medicare managed care population. The managed care HOS samples 1,000 beneficiaries from each Medicare managed care plan. Therefore, the same number of beneficiaries are sampled from large and small plans. But beneficiaries in large plans comprise a larger share of the national Medicare managed care population. To account for the different shares of plans in total managed care enrollment, we weight plan respondents by the individual plan's share of total Medicare managed care enrollment.

The weight we employ is:

$$\text{weight for managed care observations in plan } i = [E(i)/E][1/R(i)]\text{NOBS}, \quad (1)$$

where  $E(i)$  is enrollment in plan  $i$ ,  $E$  is total national Medicare managed care enrollment,  $R(i)$  is the number of respondents for plan  $i$ , and NOBS is number of observations (i.e., total number of managed care HOS respondents across all plans). Weighting up to the national average can be thought of as a two-step procedure. First, means for each plan are computed. Second, the plan means are weighted to the national total. The first term,  $E(i)/E$  accounts for each plan's share of total managed care enrollment. The second term,  $1/R(i)$ , accounts for the number of respondents for each plan. Respondents from plans with fewer overall respondents receive a higher weight, because they are more important in determining the plan average. The third term, NOBS, is a normalizing factor so that

the sum of the weights equals the number of Medicare managed care respondents. In the SAS programming language, this ensures that the degrees of freedom used in statistical tests equal the number of managed care observations, which yields the correct test results.

In our analyses, each respondent to the FFS HOS national sample received a weight of one. Since the FFS national sample is a simple random sample of the national FFS population, there was no need to weight FFS observations differentially. In sum, to compare the national Medicare FFS and managed care populations, we used the following procedure:

- limit FFS sample to the single national random sample;
- weight managed care observations by the weight shown in equation (1) above; and
- weight FFS observations by one.

### 2.3 Sampling and Nonresponse Bias

The FFS national sample we analyze may not accurately reflect the universe of Medicare FFS enrollees for one or more of three reasons: sampling bias, nonresponse bias, or random error. We discuss random error (tests of statistical significance) in Section 2.6 below. In this section, we discuss sampling and nonresponse bias. The distribution by demographic characteristic of the sample frame and respondents to the managed care and FFS HOSs are shown in Table 2. In addition, the rightmost column of Table 2 shows the proportions of the universe of FFS enrollees by selected demographic characteristics.

**Table 2**  
**Nationally Representative HOS Sample Distribution by Demographic Characteristics**

	Enrollment-Weighted Managed Care <sup>1</sup>					Fee-for-Service National Sample <sup>2</sup>					
	Sample Frame	Number of Respondents	Percentage Response Rate <sup>3</sup>	Percentage of Survey Frame <sup>4</sup>	Percentage of Respondents <sup>5</sup>	Sample Frame	Number of Respondents	Percentage Response Rate	Percentage of Survey Frame	Percentage of Respondents	Percentage of FFS Universe <sup>6</sup>
<b>Entire Sample</b>	279,135	168,922	56.5	100.0	100.0	1,000	617	61.7	100.0	100.0	100.0
<b>Gender</b>											
Male	120,656	73,015	56.6	43.8	43.9	403	247	61.3	40.3	40.0	42.9
Female	158,479	95,907	56.5	56.2	56.1	597	370	62.0	59.7	60.0	57.1
<b>Race</b>											
White	240,095	148,859	57.8	85.6	87.5	876	545	62.2	87.6	88.3	85.1
Black	24,121	12,283	48.9	7.4	6.4	80	45	56.3	8.0	7.3	9.2
Other	14,919	7,779	49.1	7.0	6.1	44	27	61.4	4.4	4.4	5.2
<b>Original Reason For Entitlement</b>											
Aged without ESRD	259,937	158,377	56.9	93.9	94.4	803	512	63.8	80.3	83.0	--
Aged with ESRD	37	18	55.9	0.0	0.0	0	0	n/a	n/a	n/a	--
Disabled Without ESRD	19,145	10,518	51.2	6.1	5.5	197	105	53.3	19.7	17.0	--
Disabled With ESRD	*	*	*	*	*	*	*	*	*	*	--
ESRD Only	*	*	*	*	*	*	*	*	*	*	--
<b>Medicaid Status</b>											
No Medicaid	266,880	163,229	57.1	95.7	96.6	838	539	64.3	83.8	87.4	--
Medicaid Coverage	12,255	5,693	44.7	4.3	3.4	162	78	48.1	16.2	12.6	--
<b>Age</b>											
Under 65	18,154	9,885	50.6	5.8	5.2	130	65	50.0	13.0	10.5	13.6
65-74	145,244	92,542	59.9	50.5	53.5	426	261	61.3	42.6	42.3	45.7
75-84	90,387	54,088	55.8	34.0	33.6	325	214	65.8	32.5	34.7	29.8
85+	25,350	12,407	45.2	9.6	7.7	119	77	64.7	11.9	12.5	10.8

\* Data suppressed because of fewer than 10 respondents.

<sup>1</sup> Includes all managed care survey recipients, data is weighted by enrollment of managed care plans.

<sup>2</sup> Includes fee-for-service national sample only

<sup>3</sup> Weighted by plan enrollment.

<sup>4</sup> Weighted by plan enrollment.

<sup>5</sup> Weighted by plan enrollment.

<sup>6</sup> 1997 Data for all Medicare FFS enrollees from Table 6, p.94 of HCFA (1999).

OUTPUT: RUN018 and NERI25

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Our FFS national sample was not a random sample of all FFS enrollees. Beneficiaries had to be enrolled in Medicare Part A and B for the continuous 12 month period in 1997 to be eligible for our sample (McCall *et al.*, 1998). Thus, Medicare beneficiaries turning 65 during 1997 were ineligible, resulting in a lower percentage of beneficiaries in the younger elderly age group. This is evident comparing the "percentage of survey frame" to the "percentage of FFS universe" columns in Table 2. The older age of the population, in turn, affects the proportion that are female as male Medicare beneficiaries tend to die off more rapidly than their female counterparts, leaving a more female population with increasing age.

Response rates for blacks, the Medicaid-enrolled, and the under-age-65 disabled were lower in the FFS national sample. This creates further differences between respondents to the FFS national sample, and the universe of FFS enrollees. For example, 13.6 percent of the universe of enrollees are under age 65 versus only 10.5 percent of respondents to the national FFS HOS sample. Overall, respondents to the FFS national sample are more female, more white, and more concentrated among the older elderly than the FFS universe.

We did not make any adjustments for differences between the FFS national sample respondents and the FFS universe in our analyses. If such adjustments had been made, how much difference would they make in our results? As an illustrative example, we compute the effect on the mean SF-36 PCS and MCS of reweighting our data to reflect the age distribution of the FFS universe. Using the mean national sample PCS values by age from Table 4 and the FFS universe proportions from Table 2, the



reweighted mean FFS PCS is  $(31.8)*(0.136) + (41.6)*(0.457) + (37.9)*(0.298) + (32.6)*(0.108) = 38.2$ , which is the same as the unweighted FFS PCS (first row of Table 4). Using the national sample MCS values by age from Table 4 and the FFS universe proportions from Table 2, the reweighted mean FFS MCS is  $(37.5)*(0.136) + (51.4)*(0.457) + (49.8)*(0.298) + (48.0)*(0.108) = 48.6$ . This compares to an unweighted FFS MCS of 48.9 (first row of Table 4). In sum, the reweighted PCS is the same, and the reweighted MCS differs only slightly, from their unadjusted values.<sup>3</sup> Similar calculations for other demographic factors show similar differences, that is, one-half point or smaller, in the mean PCS and MCS. This level of difference is not clinically significant (see Section 2.7 below).

We conclude that our national FFS sample respondents adequately represent the universe of Medicare FFS enrollees, at least insofar as can be determined from demographic characteristics.<sup>4</sup> Moreover, it should be remembered that our main focus is on comparisons of the FFS and managed care populations. The differential nonresponse by demographic characteristic is similar for both FFS and managed care survey eligibles (Table 2). Hence, comparisons between the two sets of respondents or populations should not be biased to a significant degree by nonresponse. We also note that to the extent that nonresponse bias is related to demographic characteristics such as age and

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<sup>3</sup> Our FFS national sample includes too few of both the under-age-65 disabled and the younger elderly age 65-74 relative to the FFS universe. Since the disabled are in poorer average health while the younger elderly are in better average health compared to the entire Medicare universe, these discrepancies tend to offset each other.

<sup>4</sup> We can observe nonresponse only by demographic characteristics, which are available for the sampling frame. It is possible that nonresponse differences might be greater by health status. However, we have no way to observe this or correct for it since health status is not observable for nonrespondents. HER is conducting an additional investigation into this issue through a claims-based analysis of respondents and non-respondents to the FFS HOS.

Medicaid enrollment, our analyses that stratify or control for demographic characteristics (see next section) adjust for the nonresponse bias associated with these characteristics.

## 2.4 Adjustment for Demographic Characteristics

Another issue is adjustment for demographic characteristics in comparing FFS and managed care respondents or populations. Two questions can be asked in making the comparison:

- What is the (unadjusted) difference in health status between the two populations?
- What is the difference in health status holding constant demographic characteristics?

The first question asks about differences between the two populations, not adjusting for any characteristics of the populations. For example, the average health status of the managed care population might be better because the managed care population is younger, on average, than the FFS population. The second question asks whether the two populations differ controlling for certain observable characteristics that may differ between the two populations, for example, age, sex, and race. The second question asks, within demographic category, are managed care enrollees healthier? For example, does managed care enroll healthier 75 to 84 year old white females than FFS? Both of these questions are valid, and of interest.

Most of our analysis is presented unadjusted for demographic characteristics, that is, it answers the first question posed above. But some of our analyses address the second question. Demographic characteristics are held constant for selected statistics in one of

three ways. First, stratification by demographic characteristic is used. The descriptive analysis of 75 to 84 year olds, for example, is limited to this single age strata, and holds age constant in comparing FFS and managed care. Second, the direct method of age standardization is used to adjust the age distribution of the managed care population to the FFS population in Table 3 when SF-36 scale scores are compared. Third, multiple regression analysis is used to examine the impact of simultaneously controlling for multiple demographic factors on the FFS/managed care difference in SF-36 physical and mental component scores. These regressions examine how much of the FFS/managed care difference in scores can be explained by demographic differences between the two populations.

## 2.5 Overview of Effect of Adjustments

Table 3 presents an overview of the effects of various adjustments on comparisons of health status scores between the FFS and managed care organization (MCO) samples. Physical Component Scores (PCS), Mental Component Scores (MCS), and the eight SF-36 subscales are shown. The PCS and MCS are presented with alternative scoring methods (SF-36 only, SF-12 only, and SF-36 if available otherwise SF-12—the latter, which is used in the remainder of the report, has suffix "FIN"). Adjusting for MCO plan size has only a small effect on scores. For example, the PCSFIN rises from 40.55 to 40.64 when MCO observations are weighted for plan size. Adjusting the (unweighted) MCO scores to the age distribution of the national Medicare FFS population has a larger effect. Age adjustment accounts for about half the

Table 3

## FFS and Managed Care Organization (MCO) Health Status Scores, Alternative Adjustments and Samples

	Unadjusted MCO Sample		Adjusted MCO Sample		Entire FFS Sample		National FFS Sample		
	Number of Respondents	Mean Scores	Enrollment-Weighted MCO <sup>1</sup>	Age Adjusted MCO <sup>2</sup>	Number of Respondents	Mean Scores	Number of Respondents	Mean Scores	95% C.I.s <sup>3</sup>
PCS36	164,340	40.57	40.68	39.22	5,355	38.28	451	38.04	1.1
PCS12	164,596	41.32	41.42	40.05	6,596	39.11	610	38.87	0.9
PCSFIN	168,922	40.55	40.64	39.23	6,634	38.40	617	38.16	1.0
MCS36	164,340	51.93	51.95	50.99	5,355	51.01	451	49.14	1.1
MCS12	164,596	51.12	51.12	50.22	6,596	50.35	610	48.56	0.9
MCSFIN	168,922	51.83	51.84	50.90	6,634	50.88	617	48.94	0.9
PFS	168,362	40.25	40.07	38.63	5,548	37.87	479	37.44	1.2
RPS	167,762	42.68	42.67	41.39	6,615	40.46	624	39.86	1.0
BPS	168,922	44.48	44.49	43.43	6,634	43.90	626	43.18	1.0
GHS	166,749	45.20	45.21	43.77	5,462	43.04	468	42.16	1.1
VTS	168,904	47.37	47.34	46.12	5,492	45.53	475	44.76	1.1
SFS	168,922	47.35	47.15	45.82	6,634	45.34	629	43.57	1.1
RES	167,343	47.98	47.90	47.00	6,598	47.15	618	45.58	0.8
MHS	168,855	50.68	50.65	49.61	5,490	49.65	475	48.15	1.0
PCS36	This is the mean Physical Component Score, based on the SF-36 Scoring Method.								
PCS12	This is the mean Physical Component Score, based on the SF-12 Scoring Method.								
PCSFIN	This is the mean score for all respondents who received either an SF-36 and/or and SF-12 Score. PCSFIN is equal to PCS36 if available, otherwise, PCSFIN=PCS12.								
MCS36	This is the mean Mental Component Score, based on the SF-36 Scoring Method.								
MCS12	This is the mean Mental Component Score, based on the SF-12 Scoring Method.								
MCSFIN	This is the mean score for all respondents who received either an SF-36 and/or and SF-12 Score. MCSFIN is equal to MCS36 if available, otherwise, MCSFIN=MCS12.								
PFS	Physical Functioning Scale Score (0-100)								
RPS	Role-Physical Scale Score (0-100)								
BPS	Pain Index Scale Score (0-100)								
GHS	General Health Scale Score (0-100)								
VTS	Vitality Scale Score (0-100)								
SFS	Social Functioning Scale Score (0-100)								
RES	Role-Emotional Scale Score (0-100)								
MHS	Mental Health Scale Score (0-100)								

<sup>1</sup>Weighted by size of plan

<sup>2</sup>Adjusted to reflect age distribution of FFS Medicare Population. Unweighted.

<sup>3</sup>C.I. is confidence intervals. The mean score plus or minus these factors gives the 95% C.I.

**OUTPUT:** RUN002, RUN003, RUN009, RUN013, RUN019

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

MCO/FFS difference in PCS, and about one-third the difference in MCS (comparing to the national FFS sample). Restricting the FFS sample to the single national random sample has a small to moderate effect on health scores (as compared to the entire FFS sample); PCSFIN falls from 38.28 to 38.04 and MCSFIN from 50.88 to 48.94.

## 2.6 Tests of Statistical Significance

HER performed tests of statistical significance of MCO/FFS differences. Formal tests were performed for the comparisons of HOS respondents and of MCO/FFS populations. For all these comparisons, the mean health scores of the MCO and FFS respondents were significantly different at a 95% confidence level, using a two-tailed t-test. Chi-squared tests also indicated that the proportions of respondents in each category differed significantly between the two groups for each of the variables we compared. This is due in part to the large number of respondents included in the managed care survey sample. Because of the very precise estimates of the managed care means and proportions, even small differences from FFS become statistically significant. Statistical significance does not, of course, necessarily imply that MCO/FFS differences are clinically or substantively important.

## 2.7 Clinical Significance of Health Score Differences<sup>5</sup>

The HOS, and therefore our analysis in this report, uses the SF-36 Physical Component Score (PCS) and Mental Component Score (MCS) as basic measures of beneficiary health status. When comparing PCS and MCS among individuals, time periods, or populations (such as the Medicare FFS and MCO populations), what constitutes a clinically significant difference? No universally accepted answer to this question exists. One approach to defining a "minimally clinically important difference" is to apply conventional statistical standards for "effect" sizes. Cohen's (1988) conventions are the most widely known and used. He defines small effects as 0.2 standard deviations, medium effects as 0.5 standard deviations, and large effects as 0.8 standard deviations. Since the MCS and PCS are normalized to have standard deviations of 10 points, these conventions translate into differences of 2, 5, and 8 points on the component scales. The SF-36 developers have themselves endorsed this approach (QualityMetric, Inc., 2000).

Another approach is to relate score differences to external factors that are considered to be important or interpretable. In other contexts, change in component score due to job loss or divorce could provide an interpretable metric. In the analysis of health status, the impact of chronic diseases on health scores provides a natural benchmark. Ware *et al.*, (1995, p. 51) show that the effect of co-morbidities (asthma, COPD, angina, etc.) on the PCS range from 2 to 6 points. Co-morbidities other than clinical depression tend to have much smaller impacts on the MCS (Ware *et al.*, 1995, p. 52). QualityMetric,

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<sup>5</sup> The authors thank Kevin Smith of New England Research Institutes, Inc. for his input to this section.

Inc., (2000) provides additional examples of the clinical correlates of the different effect sizes. For example, an improvement of 2 points on the PCS or MCS has been correlated to pre/post drug treatment for migraine headaches.

Based on these considerations, we consider PCS or MCS differences of 2 points or more between the FFS and managed care Medicare populations to be "minimally clinically important" differences. Differences of less than 2 points are considered to be not very significant clinically.

# 3

## Results

In this section, we present a set of tables comparing FFS and MCO scores for our two sets of comparisons:

1. FFS versus MCO national Medicare populations, and
2. FFS versus MCO HOS respondents.

The tables are based on the analysis of the baseline Medicare FFS HOS in HER's Second Annual Report to HCFA for its project *Research and Analytic Support for Implementing Performance Measurement in Medicare Fee For Service* (McCall et al., 2000).

### 3.1 Comparison of Fee-for-Service and Managed Care Populations

We begin with a comparison of the FFS and MCO populations, because greatest interest attaches to this comparison. As discussed in Section 2.2, the FFS HOS single national FFS random sample is used to represent the national Medicare FFS population. HOS MCO respondents are weighted as discussed in Section 2.2 to represent the national Medicare managed care population. When we use the word "population" in this section, it should be understood as these samples representing their populations, not the true population values, which we cannot observe. We use this term (population) to distinguish our comparison in this section from the comparison of HOS respondents presented in the next section.



Figures 1 and 2 compare Medicare MCO and FFS enrollees' mean summary health scores to noninstitutionalized US population norms<sup>1</sup> by three age categories<sup>2</sup>. Figure 1, which compares physical (PCS) scores, shows that both Medicare samples have markedly worse physical health than the entire US population, as would be expected of an aged and disabled population. Mean Medicare scores for the 65-74 and 75+ age ranges are comparable to the national norms, however, as would be expected since virtually all of the elderly are Medicare eligible.

Medicare MCO enrollees have 2.5 points better physical health than FFS enrollees<sup>3</sup>. Based on the discussion in Section 2.7, we would consider this a small, but clinically important difference.<sup>4</sup> The overall MCO/FFS difference in physical scores is larger than the differences among the two specific age ranges, indicating that some of the better average health of MCO enrollees is due to a younger age mix. Holding age range constant, the MCO/FFS physical health difference is less than what we would consider "minimally clinically significant".

The mean mental component score (MCS) for the Medicare MCO population is higher than the US population norm, but the mean FFS MCS score is lower. Thus,

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<sup>1</sup> Based on the results published by Ware *et al.*

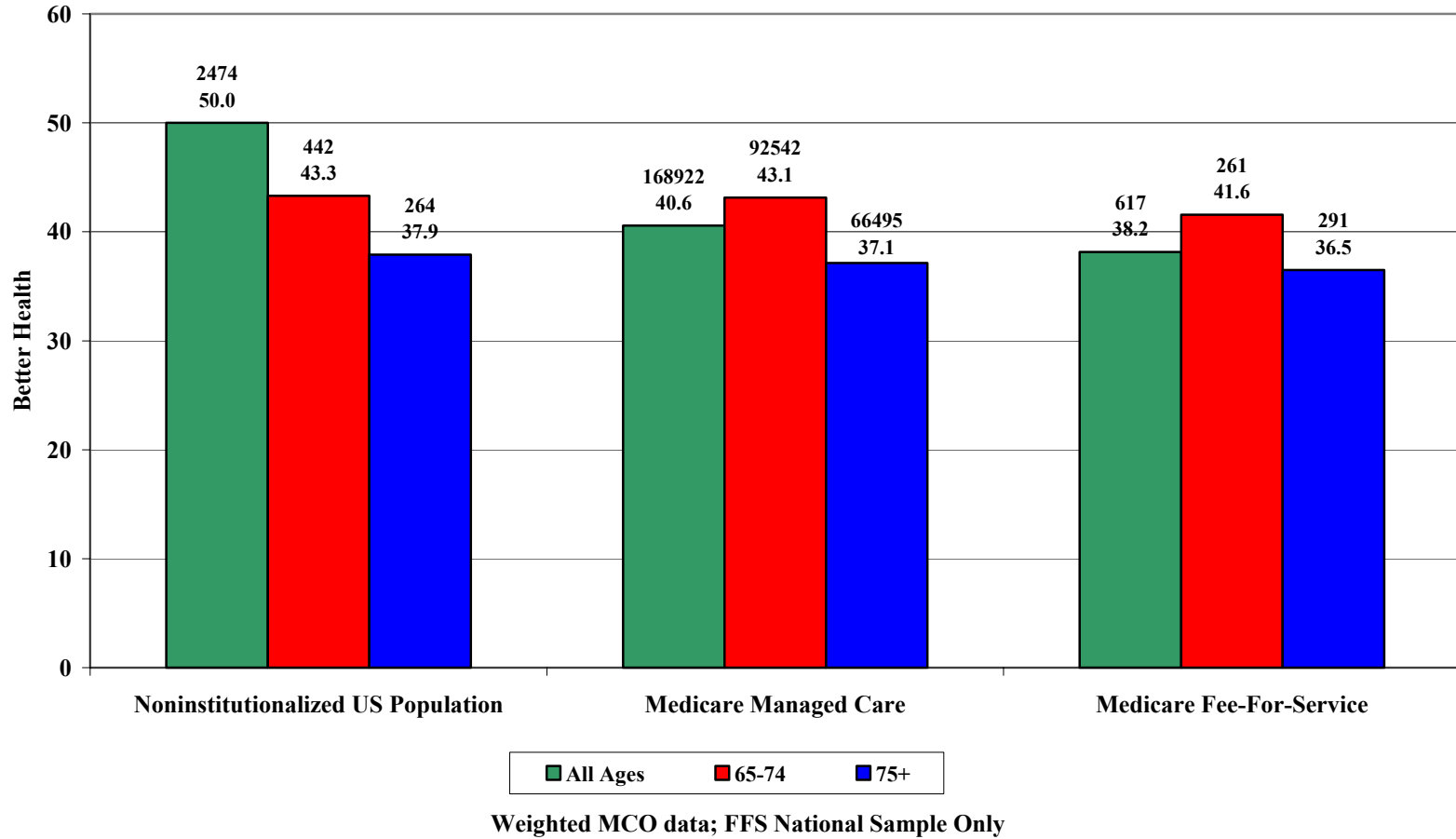
<sup>2</sup> The Medicare totals include the under-age-65 disabled population (not shown separately) in addition to 65-74 and 75+ age ranges.

<sup>3</sup> The difference is 2.5 rather than 2.4 because of rounding in the MCO and FFS mean scores. Referring to the "enrollment-weighted MCO" column versus the "national FFS sample, mean scores" column of Table 3, and the four SF-36 physical health subscales (PFS, RPS, BPS, and GHS), we see that MCO enrollees have better health on each of the four measured dimensions of physical health. The smallest MCO/FFS advantage, 1.31 points, is for the BP, or bodily pain, subscale

<sup>4</sup> As discussed in Section 2.6, the difference is statistically significant.

Figure 1

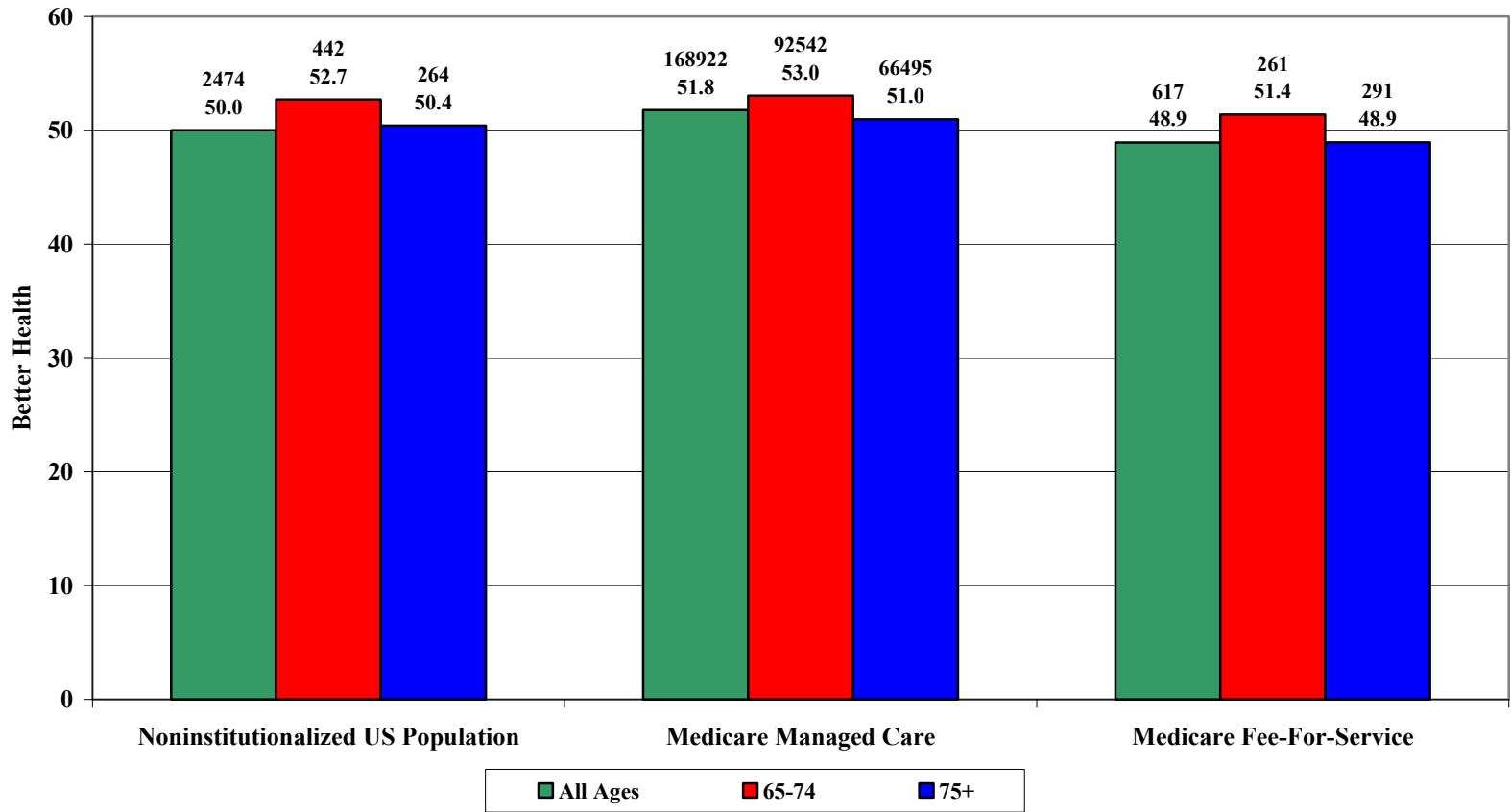
Nationally Representative Comparison of Medicare Beneficiaries' Mean Physical Component Scores to US Norms



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure 2

Nationally Representative Comparison of Medicare Beneficiaries' Mean Mental Component Scores to US Norms



Weighted MCO data; FFS National Sample Only

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Medicare MCO enrollees have better self-reported mental health than the US population as a whole, and than FFS Medicare enrollees. The MCO/FFS difference in mental health is 2.9 points, which is again a small, but clinically significant difference<sup>5</sup>. Controlling for age again lessens the FFS/MCO difference. The difference in mental health status between the Medicare population (considering both MCO and FFS enrollees together) and the entire US population is small, below the threshold for what we would consider clinically significant. It is striking that the mental health of the Medicare population is equivalent to that of entire US population, despite the much worse physical health of the Medicare population.

Figures 3 and 4 show the proportion of the FFS and MCO populations who scored in each ten-point range for the PCS and MCS. These figures show that the FFS population has greater representation in the lower score ranges, indicating poorer health. For example, 8.1% of the FFS population has a very poor physical health score between 11 and 20, while only 5.6% of the MCO population does. The mental health scores show less variation than the physical component scores, with over 40% of each population scoring in the 51-60 point range, slightly above the US population norm.

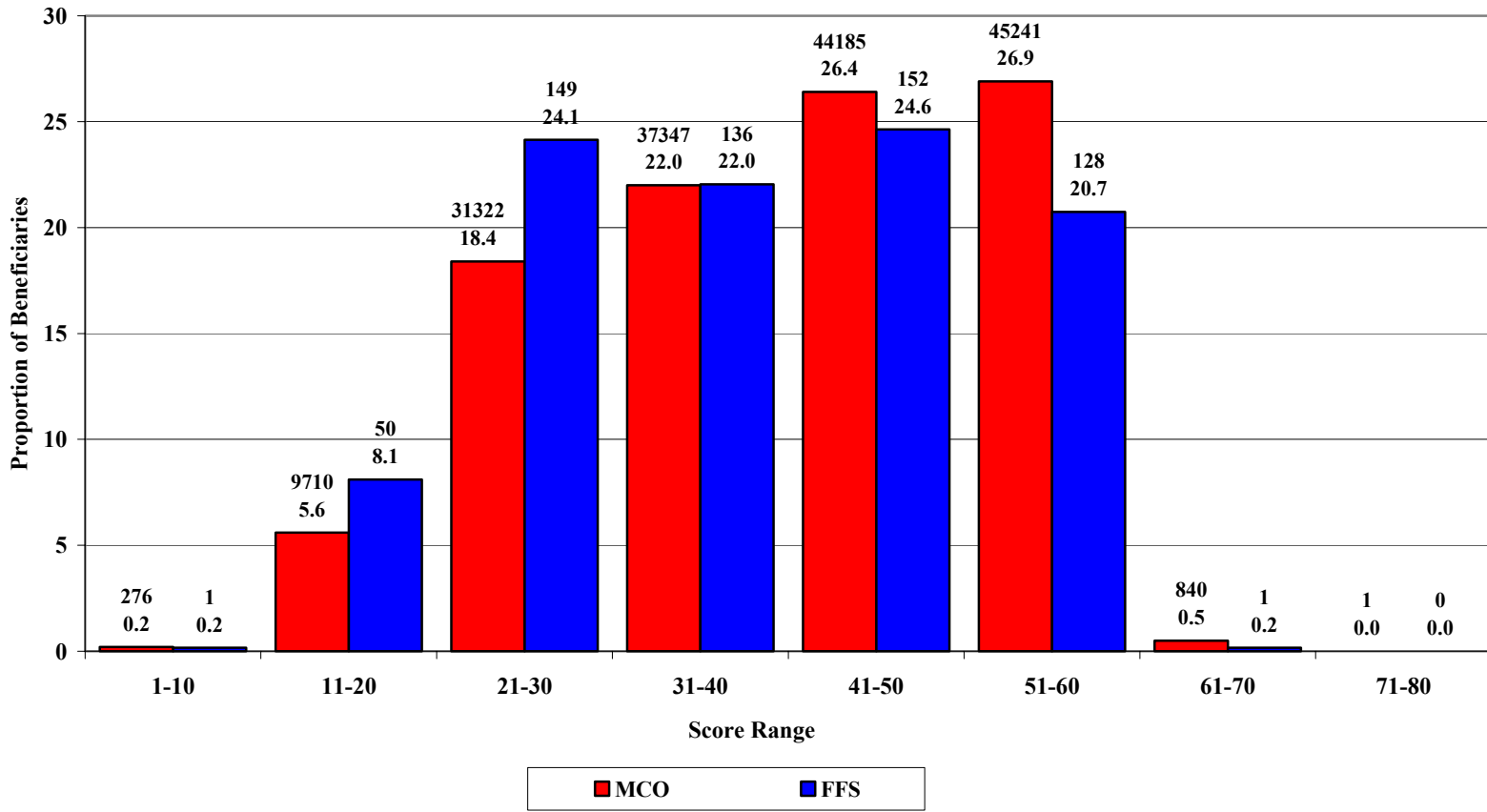
Table 4 presents mean PCS and MCS scores stratified by demographic characteristics, including age, sex, original reason for entitlement, Medicaid enrollment, education, and income. The mean scores for the MCO population are consistently higher than those for the FFS population, indicating better health among managed care enrollees,

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<sup>5</sup> Referring to Table 3, the same columns as in footnote 7, but the four mental health subscales (VTS, SFS, RES, and MHS), we see that MCO enrollees have better health on each of the four measured dimensions of mental health. The smallest MCO advantage, 2.32 points, is for the RES, or role emotional subscale.

Figure 3

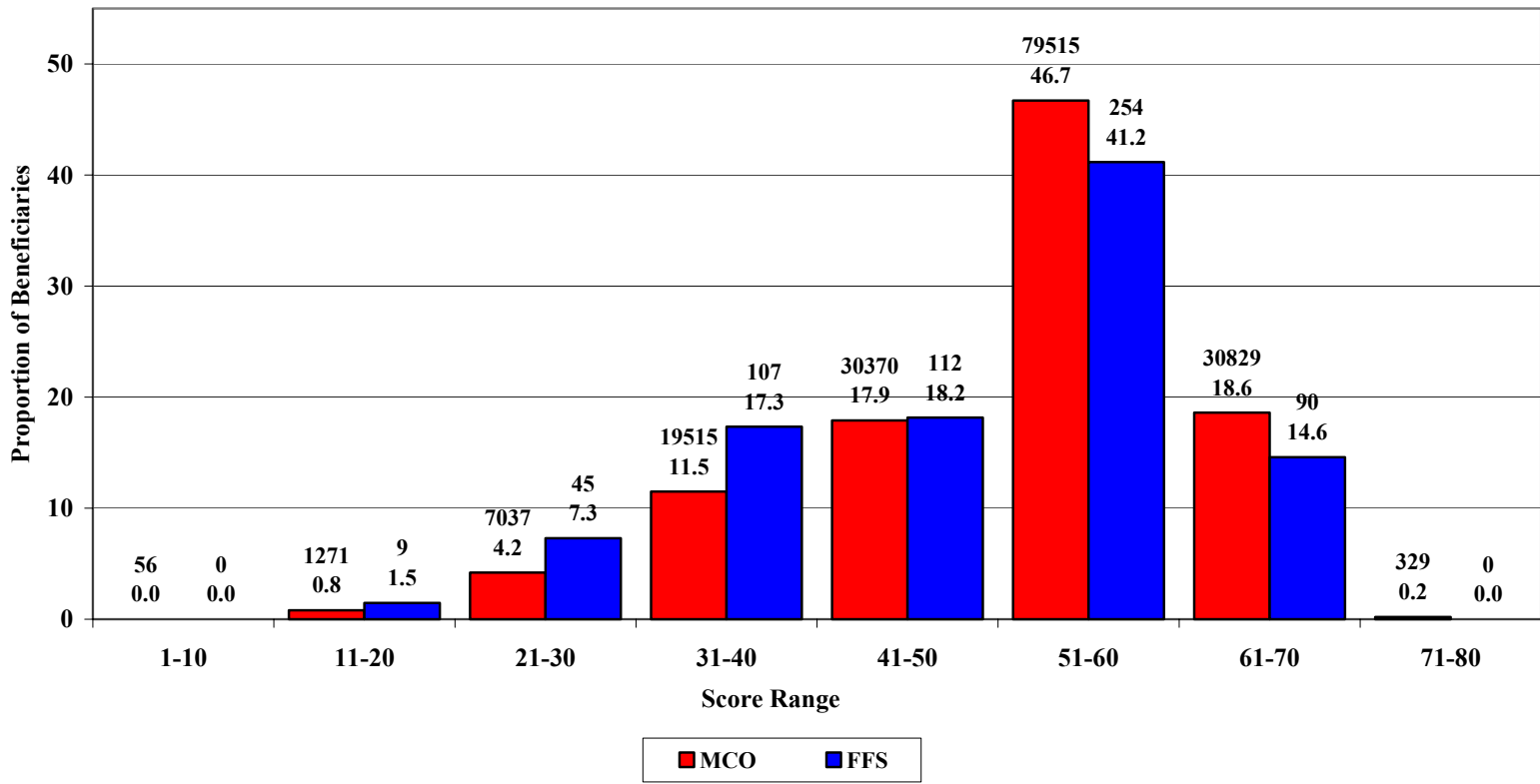
Nationally Representative Distribution of Physical Component Scores Among HOS Respondents



Weighted MCO data; FFS National Sample Only

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

**Figure 4**  
**Nationally Representative Distribution of Mental Component Scores Among HOS Respondents**



Weighted MCO data; FFS National Sample Only

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

**Table 4**  
**Nationally Representative Mean Health Scores of HOS Respondents by Demographic Characteristics**

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<b>Entire Sample</b>	168,922	100.0	40.6	51.8	40.5	40.6	51.7	51.8	617	100.0	38.2	48.9	37.2	39.1	48.0	49.9
<b>Gender</b>																
Male	73,015	43.9	41.6	52.2	41.5	41.7	52.1	52.3	247	40.0	38.8	48.9	37.3	40.3	47.4	50.3
Female	95,907	56.1	39.9	51.5	39.8	40.0	51.5	51.6	370	60.0	37.7	49.0	36.4	39.0	47.8	50.2
<b>Race</b>																
White	148,859	87.5	40.8	52.1	40.5	41.0	52.0	52.1	545	88.3	38.5	49.6	37.5	39.6	48.6	50.5
Black	12,283	6.4	38.6	50.0	38.4	38.8	49.8	50.2	45	7.3	34.6	45.0	31.6	37.5	41.5	48.5
Other/Unknown	7,779	6.1	40.8	50.3	40.8	40.8	50.1	50.6	27	4.4	36.4	42.7	32.1	40.8	38.8	46.6
<b>Original Reason For Entitlement</b>																
Aged without ESRD	158,377	94.4	41.3	52.4	41.2	41.3	52.3	52.4	512	83.0	39.8	50.7	38.8	40.9	49.8	51.6
Aged with ESRD	18	0.0	30.8	46.1	26.7	34.8	42.1	50.1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Disabled Without ESRD	10,518	5.5	30.2	42.5	29.9	30.4	42.2	42.8	105	17.0	29.9	40.2	27.7	32.1	37.7	42.7
Disabled With ESRD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ESRD Only	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<b>Medicaid Status</b>																
No Medicaid	163,229	96.6	40.9	52.1	40.8	40.9	52.0	52.1	539	87.4	39.1	50.0	38.1	40.2	49.0	50.9
Medicaid Coverage	5,693	3.4	34.2	46.0	33.9	34.5	45.7	46.3	78	12.6	31.3	41.7	29.0	33.6	38.9	44.5
<b>Age</b>																
Under 65	9,885	5.2	29.9	42.3	29.7	30.2	42.0	42.5	65	10.5	31.8	37.5	29.0	34.5	34.2	40.8
65-74	92,542	53.5	43.3	53.1	43.2	43.3	53.0	53.2	261	42.3	41.6	51.4	40.1	43.0	50.1	52.6
75-84	54,088	33.6	39.6	51.9	39.5	39.6	51.8	52.0	214	34.7	37.9	49.8	36.3	39.6	48.3	51.3
85+	12,407	7.7	34.8	49.6	34.6	35.0	49.4	49.8	77	12.5	32.6	48.0	30.2	35.0	45.6	50.3
<b>Marital Status</b>																
Married	97,244	58.0	41.5	52.5	41.4	41.5	52.5	52.6	240	52.1	40.0	50.2	38.5	41.6	48.9	51.6
Divorced	15,099	9.3	39.9	50.8	39.7	40.1	50.6	51.0	28	6.1	37.5	41.4	33.8	41.2	36.8	46.1
Separated	1,628	1.0	37.4	47.3	36.8	38.0	46.7	47.9	*	*	*	*	*	*	*	
Widowed	47,235	28.4	39.3	51.2	39.2	39.4	51.1	51.3	152	33.0	35.3	49.9	33.3	37.2	48.1	51.7
Never Married	5,368	3.3	41.4	50.5	41.1	41.7	50.2	50.8	36	7.8	41.9	45.1	38.5	45.3	41.0	49.2

**Table 4 (continued)**  
**Nationally Representative Mean Health Scores of HOS Respondents by Demographic Characteristics**

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
				Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper	
<b>Education</b>																
8th Grade or Less	21,140	12.5	37.4	48.7	37.2	37.5	48.6	48.9	74	16.3	33.8	46.8	31.2	36.4	44.2	49.4
Some high school, but did not graduate	29,696	17.6	38.8	50.3	38.6	38.9	50.1	50.4	72	15.8	35.6	48.7	32.8	38.4	45.8	51.6
High school graduate or GED	57,119	33.6	40.9	52.2	40.8	41.0	52.1	52.3	150	33.0	38.7	47.7	36.8	40.7	45.8	49.6
Some college or 2 year degree	34,324	22.2	41.5	53.0	41.4	41.7	52.9	53.1	87	19.1	40.2	51.6	37.7	42.7	49.4	53.8
4 year college degree	10,991	6.6	43.9	53.9	43.7	44.1	53.7	54.1	34	7.5	43.7	48.6	39.6	47.7	44.6	52.6
More than a 4 year college degree	11,698	7.5	44.2	54.6	44.0	44.4	54.5	54.8	38	8.4	42.8	54.4	39.1	46.5	51.7	57.1
<b>Household Income</b>																
Less than \$5,000	5,525	3.6	36.9	48.2	36.6	37.2	47.8	48.5	24	5.8	32.1	45.0	27.4	36.9	40.2	49.7
\$5,000-\$9,999	18,411	11.4	36.7	48.7	36.5	36.9	48.5	48.9	52	12.5	33.8	46.5	30.6	37.1	43.3	49.8
\$10,000-\$19,999	41,296	27.1	38.9	50.8	38.8	39.0	50.7	50.9	94	22.5	35.8	47.7	33.5	38.1	45.2	50.2
\$20,000-\$29,999	28,820	18.8	41.1	52.6	41.0	41.3	52.5	52.8	82	19.7	38.3	48.9	35.8	40.8	46.6	51.2
\$30,000-\$39,999	17,472	11.9	42.8	53.6	42.6	43.0	53.5	53.8	50	12.0	41.6	49.5	38.4	44.8	45.9	53.0
\$40,000-\$49,999	9,402	6.6	43.5	53.9	43.3	43.7	53.7	54.1	33	7.9	43.1	53.6	38.7	47.6	51.0	56.3
\$50,000-\$79,999	8,988	6.6	44.9	55.1	44.7	45.2	54.9	55.2	30	7.2	45.9	52.1	42.0	49.9	48.4	55.9
\$80,000-\$99,999	1,878	1.3	45.3	54.1	44.8	45.8	53.7	54.5	*	*	*	*	*	*	*	*
\$100,000 or more	2,273	1.5	46.5	54.8	46.1	47.0	54.5	55.2	*	*	*	*	*	*	*	*
Don't Know	18,378	11.1	40.0	50.9	39.8	40.2	50.8	51.1	41	9.8	36.5	47.2	32.7	40.3	43.3	51.1
<b>Residence is:</b>																
Owned or being bought by you	122,175	75.3	41.5	52.5	41.4	41.5	52.5	52.6	325	73.1	39.8	49.8	38.5	41.2	48.6	51.0
Owned or being bought by someone in your family other than you	11,099	6.9	37.7	50.1	37.4	37.9	49.8	50.3	30	6.7	36.2	45.7	31.7	40.7	41.0	50.5
Rented for money	26,390	15.9	38.7	50.0	38.5	38.8	49.9	50.2	76	17.1	33.6	46.5	31.0	36.2	43.7	49.3
Not owned and one in which you live without payment of rent	3,214	1.9	38.6	49.8	38.1	39.0	49.4	50.2	12	2.7	40.0	51.5	33.1	46.9	45.0	58.0
Nursing home (write-in response)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*	*	*	*	*	*	*	*
<b>Retirement Community</b>																
Yes	19,032	13.8	39.6	51.1	39.5	39.8	50.9	51.2	51	11.3	36.5	46.4	33.1	39.9	43.0	49.7
No	144,213	86.2	40.8	52.0	40.7	40.9	52.0	52.1	399	88.7	38.8	49.6	37.6	40.0	48.5	50.7
<b>Medical Services Provided (if in a Retirement Community)</b>																
Yes	3,338	11.4	38.4	49.4	38.0	38.8	49.0	49.7	17	34.0	30.1	44.7	24.8	35.4	37.9	51.5
No	21,478	88.6	39.4	50.5	39.2	39.5	50.4	50.7	33	66.0	39.4	46.9	35.3	43.6	43.1	50.8



Table 4 (continued)

## Nationally Representative Mean Health Scores of HOS Respondents by Demographic Characteristics

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<b>Who Completed the Survey</b>																
Person to whom the survey was addressed	143,970	89.3	41.4	52.6	41.3	41.5	52.6	52.7	451	82.4	40.3	50.1	39.2	41.4	49.1	51.1
Family member or relative	16,108	9.7	34.9	46.5	34.7	35.1	46.3	46.7	82	15.0	30.8	46.1	28.1	33.5	43.3	48.8
Friend	955	0.6	33.9	44.9	33.1	34.6	44.1	45.7	*	*	*	*	*	*	*	*
Professional caregiver	500	0.3	34.9	47.6	34.0	35.9	46.6	48.6	*	*	*	*	*	*	*	*
<b>Enrollment Category<sup>1</sup></b>																
Enrolled less than 6 mos.	26,845	14.3	40.5	51.8	40.4	40.7	51.6	51.9	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Enrolled 6 mos.-1 yr.	24,332	9.5	41.2	51.5	41.0	41.3	51.4	51.7	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Enrolled for over 1 yr.	117,745	76.2	40.6	51.9	40.5	40.7	51.8	52.0	617	100.0	38.2	48.9	37.2	39.1	48.0	49.9

\* Data suppressed because of fewer than 10 respondents.

<sup>1</sup> This is the length of enrollment for the beneficiary in the plan they are enrolled in at the time of the survey. For FFS beneficiaries, it is their continuous period of FFS enrollment.

OUTPUT: RUN018, RUN022, RUN023 and NER125

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

even within demographic categories. For example, the mean PCS for Medicare managed care enrollees dually enrolled in Medicaid is 34.2 compared to a corresponding FFS mean of 31.3 (95% confidence interval 29.0 to 33.6). One exception to the general pattern is that the PCS for MCO enrollees under-age-65 (currently entitled by disability) is lower than among the same age group in the FFS population (MCO PCS of 29.9 versus FFS PCS of 31.8). However, this difference is not statistically significant at the 5% level as indicated by the FFS 95% confidence interval of 29.0 to 34.5. (Note that the under-age-65 FFS mean is based on only 65 respondents.) With the exception of the under-age-65, all other age groups show smaller PCS and MCS differences between managed care and FFS than the overall difference. This indicates that the age distributions of the two populations are explaining some of the overall difference.

HCFA staff asked Health Economics Research, Inc. to compare fee-for-service (FFS)/managed care organization (MCO) health status for "core" Medicare beneficiaries defined as those 75 to 79 years old. Unfortunately, the number of 75 to 79 year old respondents in the FFS national sample is small, only 133. This results in a lack of statistical power to detect FFS/MCO differences among 75 to 79 year olds. But we did compare mean PCS and MCS for this age group. The PCS difference between managed care and FFS is very small, 40.4 for MCO enrollees versus 40.0 for FFS. The FFS 95% confidence interval is 37.9 to 42.0, so the null hypothesis of no FFS/MCO difference cannot be rejected for 75 to 79 year olds. But the small FFS sample size provides little statistical power to detect differences. The MCS difference is 52.2 MCO versus 50.6

FFS (CI=48.8 to 52.4). Again the null hypothesis of no difference cannot be rejected, but there is little statistical power.

Figures 5 and 6 show the mean PCS and MCS scores based on the number of chronic conditions the beneficiary reported. Thirteen chronic conditions were self-reported in the survey; no FFS beneficiary suffered from more than 11 of these conditions simultaneously. The average PCS and MCS scores for the FFS population are again lower than MCO means for almost all numbers of chronic conditions (some FFS means are based on very few respondents and so show substantial random variability).

Table 5 presents prevalence and mean PCS and MCS scores by population for each chronic condition. The self-reported prevalence of all chronic conditions with the exception of emphysema is higher in the FFS population, indicating greater burden of chronic disease among Medicare FFS enrollees<sup>6</sup>. FFS PCS and MCS means by chronic condition are consistently lower than MCO population means, indicating poorer physical and mental health among FFS enrollees, even controlling for the presence of specific chronic conditions. For example, MCO enrollees reporting congestive heart failure (CHF) appear to be in poorer physical and mental health than FFS enrollees reporting CHF. However, many of the differences are not statistically significant because of small sample sizes in our FFS national sample.

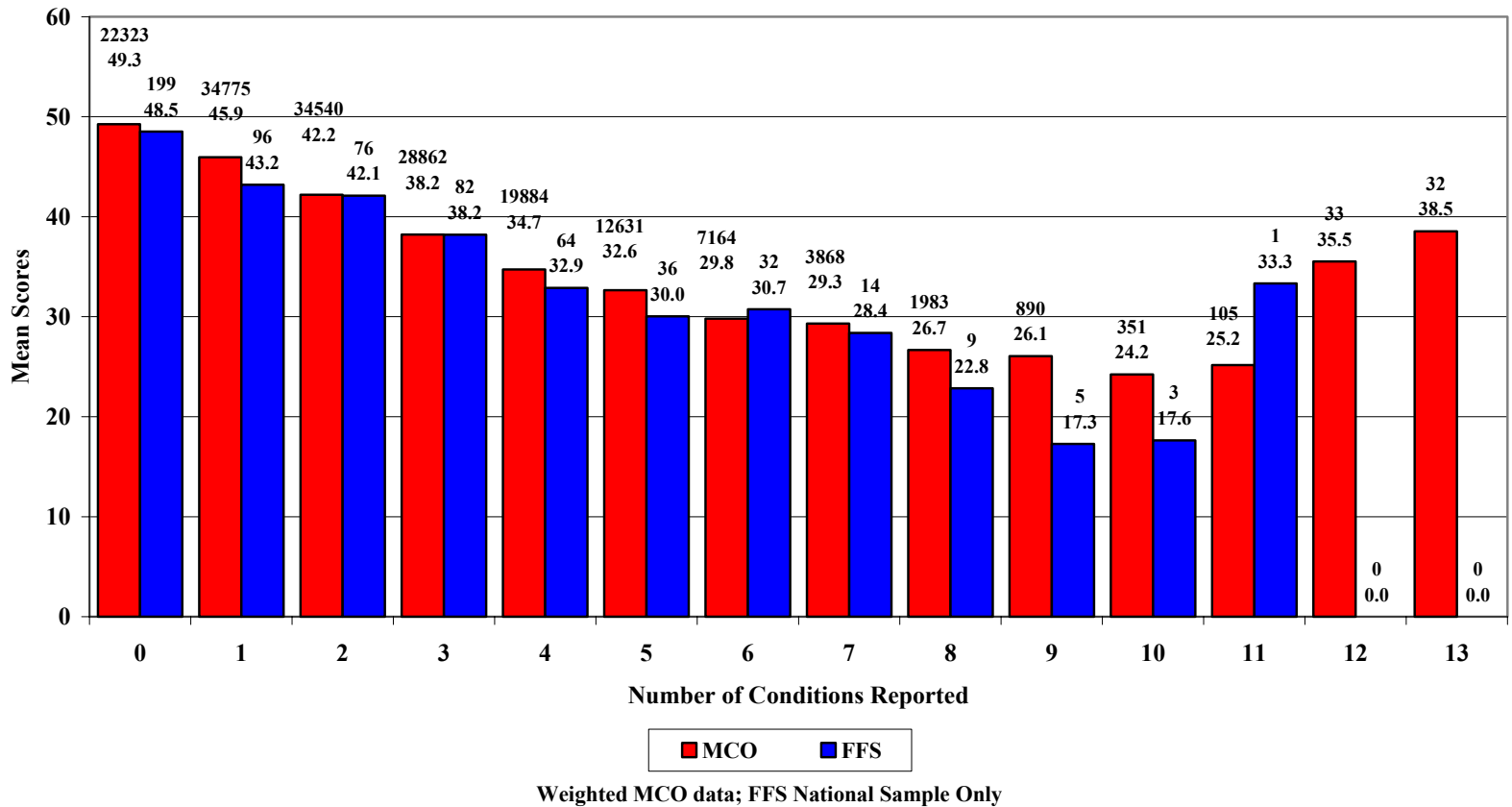
Tables 6 and 7 present the distribution of beneficiaries based on their ability to perform six activities of daily living (ADLs), namely, walking, eating, bathing, dressing

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<sup>6</sup> The lower reported prevalence of emphysema in FFS may be an anomalous statistic resulting from small FFS sample sizes. With the larger sample sizes of the entire FFS sample, emphysema is reported to be more prevalent in FFS. See Section 3.2.

Figure 5

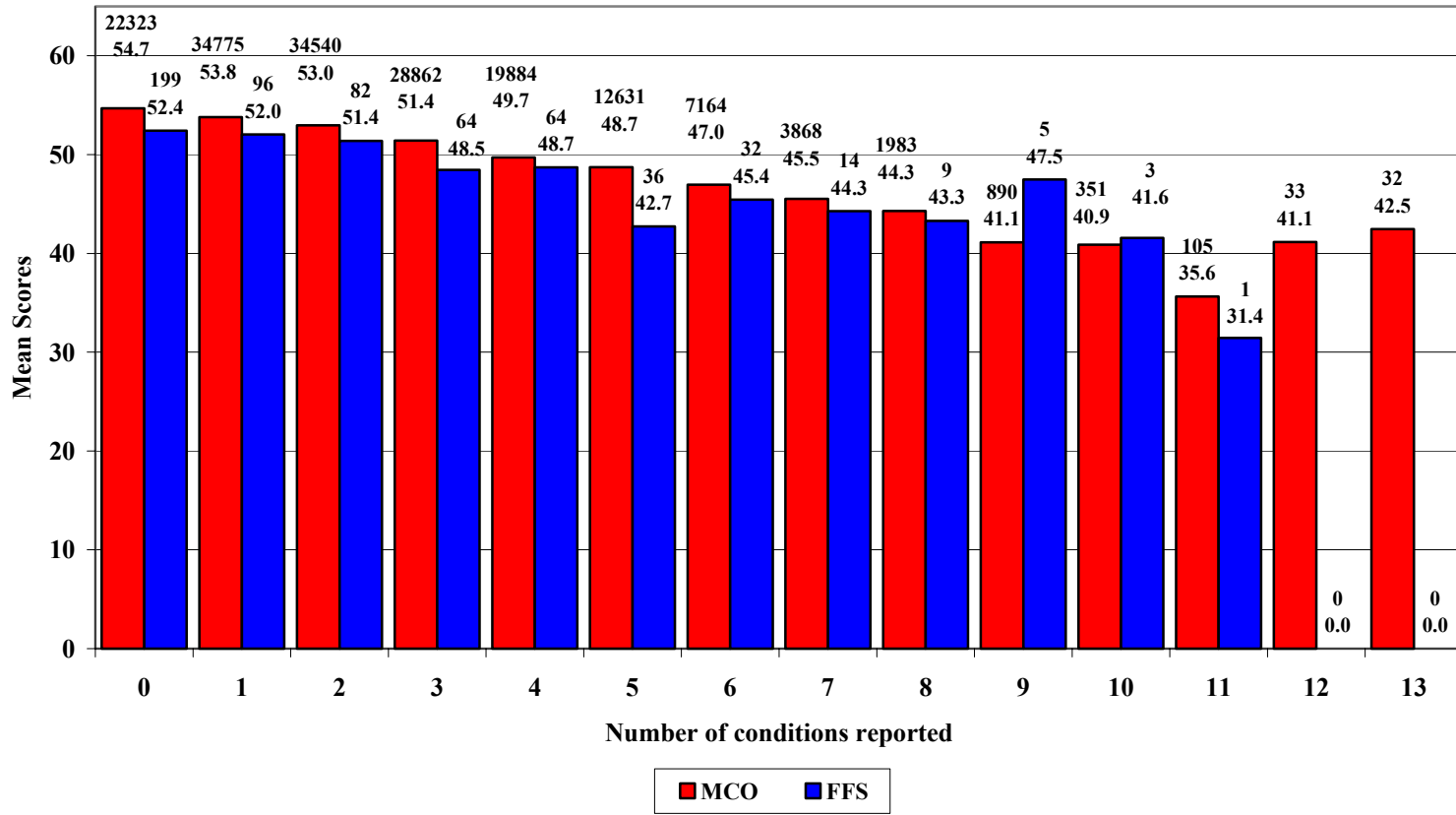
Nationally Representative Average Physical Component Scores  
By Number of Chronic Conditions Reported



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure 6

Nationally Representative Average Mental Component Scores  
by Number of Chronic Conditions Reported



Weighted MCO data; FFS National Sample Only

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 5

## Nationally Representative Frequencies and Mean Health Scores for HOS Respondents with Specified Chronic Conditions

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample								
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals				
					PCS	MCS	Lower	Upper					PCS	MCS	Lower	Upper	
<b>High blood pressure</b>																	
Yes	87,830	52.1	38.7	51.1	38.7	38.8	51.0	51.1	261	55.2	35.3	48.0	33.9	36.7	46.6	49.4	
No	78,433	47.9	42.8	52.8	42.7	42.9	52.7	52.8	212	44.8	42.1	50.7	40.5	43.7	49.2	52.2	
<b>Angina</b>																	
Yes	26,862	15.7	34.8	49.4	34.7	35.0	49.3	49.5	87	18.9	33.6	46.1	31.0	36.1	43.4	48.7	
No	137,674	84.3	41.8	52.4	41.8	41.9	52.3	52.4	374	81.1	39.6	49.9	38.3	40.8	48.8	51.0	
<b>CHF</b>																	
Yes	11,796	6.7	30.9	47.1	30.7	31.1	46.9	47.3	40	8.7	27.1	46.0	23.5	30.7	42.4	49.7	
No	152,727	93.3	41.5	52.3	41.4	41.5	52.2	52.3	417	91.2	39.6	49.6	38.5	40.8	48.5	50.7	
<b>Heart Attack</b>																	
Yes	17,780	10.4	34.8	49.4	34.6	35.0	49.2	49.5	64	13.9	33.5	46.6	30.1	36.8	43.6	49.7	
No	146,266	89.6	41.4	52.2	41.4	41.5	52.2	52.3	396	86.0	39.2	49.6	38.0	40.4	48.5	50.7	
<b>Other Heart Condition</b>																	
Yes	35,361	20.9	36.1	49.7	36.0	36.3	49.6	49.8	113	24.4	34.0	46.8	31.8	36.1	44.5	49.0	
No	129,332	79.1	41.9	52.5	41.9	42.0	52.4	52.5	350	75.6	39.9	50.1	38.6	41.1	48.9	51.3	
<b>Stroke</b>																	
Yes	13,441	8.0	33.5	47.5	33.3	33.7	47.3	47.7	48	10.3	30.9	44.6	27.6	34.1	41.1	48.0	
No	151,636	92.0	41.3	52.3	41.3	41.4	52.2	52.3	418	89.7	39.2	49.7	38.0	40.3	48.6	50.8	
<b>Emphysema</b>																	
Yes	21,686	13.3	34.0	48.7	33.9	34.2	48.6	48.9	58	12.6	29.9	44.1	26.8	33.0	41.2	47.1	
No	143,612	86.7	41.8	52.4	41.7	41.9	52.3	52.5	403	87.4	39.6	50.0	38.4	40.8	48.9	51.1	
<b>Crohn's Disease</b>																	
Yes	9,305	5.4	34.3	46.9	34.0	34.5	46.6	47.1	31	6.8	32.9	44.4	28.7	37.1	40.1	48.6	
No	155,084	94.6	41.1	52.2	41.0	41.1	52.2	52.3	424	93.2	39.0	49.8	37.8	40.2	48.7	50.9	
<b>Arthritis-Hip</b>																	
Yes	63,577	37.4	34.9	50.4	34.8	35.0	50.3	50.5	197	42.0	32.2	47.8	30.7	33.8	46.2	49.4	
No	102,221	62.6	44.1	52.8	44.0	44.2	52.7	52.8	272	58.0	42.9	50.4	41.6	44.2	49.1	51.7	
<b>Arthritis-Hand</b>																	
Yes	57,194	34.4	36.1	50.1	36.0	36.2	50.0	50.2	180	38.4	32.5	46.4	30.9	34.2	44.6	48.1	
No	108,280	65.6	43.1	52.8	43.0	43.1	52.7	52.8	288	61.5	42.1	51.0	40.8	43.4	49.8	52.3	

Table 5 (continued)

## Nationally Representative Frequencies and Mean Health Scores for HOS Respondents with Specified Chronic Conditions

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample								
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals				
					PCS		MCS						PCS		MCS		
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper	
<b>Sciatica</b>																	
Yes	38,193	23.2	34.5	49.1	34.4	34.6	48.9	49.2	140	30.0	33.1	47.1	31.1	35.1	45.1	49.1	
No	126,375	76.8	42.6	52.8	42.5	42.7	52.7	52.8	327	70.0	40.6	50.1	39.4	41.9	48.9	51.3	
<b>Diabetes</b>																	
Yes	27,868	16.4	36.2	49.5	36.1	36.4	49.4	49.6	84	17.8	32.9	47.6	30.6	35.1	44.9	50.2	
No	138,078	83.6	41.5	52.3	41.5	41.6	52.3	52.4	387	82.2	39.7	49.7	38.4	40.9	48.6	50.8	
<b>Any Cancer</b>																	
Yes	21,650	13.1	38.1	50.6	38.0	38.3	50.4	50.7	75	15.8	34.4	44.2	31.7	37.1	41.5	47.0	
No	144,595	86.9	41.0	52.1	41.0	41.1	52.0	52.1	398	84.1	39.1	50.2	37.9	40.3	49.1	51.3	

OUTPUT: RUN029 and NERI25

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 6

## Nationally Representative Functional Status of HOS Respondents

	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample											
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals							
					PCS		MCS						PCS		MCS					
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper				
<u>Difficulty* in:</u>																				
None	98,086	58.6	47.5	54.5	47.4	47.4	54.5	54.5	237	49.8	46.9	54.3	45.9	48.0	53.3	55.3				
1-2 ADLs	44,211	26.4	33.8	50.9	33.7	33.7	50.8	50.8	135	28.4	33.6	46.6	32.1	35.1	44.6	48.7				
3-4 ADLs	14,910	8.9	26.7	45.5	26.5	26.5	45.3	45.3	66	13.9	25.9	44.1	23.9	27.8	41.3	46.8				
5-6 ADLs	10,157	6.1	25.8	40.2	25.6	25.6	40.0	40.0	38	8.0	23.4	35.2	21.1	25.7	32.2	38.3				
*Includes 'unable to perform'																				
<u>Unable to perform:</u>																				
None	160,376	95.8	41.2	52.2	41.1	41.2	52.2	52.3	451	94.8	39.1	49.8	38.0	40.2	48.8	50.8				
1-2 ADLs	4,638	2.8	25.8	42.9	25.5	26.1	42.9	43.3	16	3.4	26.2	41.6	21.9	30.6	35.8	47.4				
3-4 ADLs	902	0.6	26.0	41.6	25.4	26.6	41.6	42.5	*	*	*	*	*	*	*	*				
5-6 ADLs	1,448	0.8	33.5	42.6	32.9	34.1	42.6	43.3	*	*	*	*	*	*	*	*				

\* Data suppressed because of fewer than 10 respondents.

**NOTES:**

ADL is activity of daily living.

PCS is physical component score

MCS is mental component score

**OUTPUT:** RUN018 and NER125

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.



Table 7

## Nationally Representative Distribution of HOS Respondents by Activities of Daily Living

Because of a health or physical problem, do you have any difficulty doing the following activities?	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<u>Bathing</u>																
Unable to do	3,993	2.3	29.0	41.0	28.6	29.3	40.6	41.4	11	2.3	20.7	35.6	16.6	24.9	28.9	42.3
Have difficulty	20,044	11.8	26.4	43.9	26.2	26.5	43.7	44.1	87	18.4	25.3	42.8	23.6	27.0	40.2	45.3
No Difficulty	142,760	85.8	43.0	53.3	42.9	43.0	53.2	53.3	376	79.3	41.9	51.0	40.8	43.0	50.0	52.1
<u>Dressing</u>																
Unable to do	2,821	1.6	30.1	41.8	29.7	30.5	41.3	42.3	11	2.3	23.0	34.9	17.5	28.5	27.8	41.9
Have difficulty	17,149	10.1	26.0	43.1	25.8	26.1	42.9	43.3	70	14.8	25.1	41.3	23.3	27.0	38.5	44.2
No Difficulty	146,784	88.3	42.6	53.1	42.5	42.6	53.0	53.1	393	82.9	41.1	51.0	40.0	42.2	50.0	52.0
<u>Eating</u>																
Unable to do	1,633	1.0	33.7	43.9	33.1	34.3	43.3	44.5	*	*	*	*	*	*	*	*
Have difficulty	8,165	4.9	28.4	40.8	28.2	28.6	40.5	41.1	35	7.4	26.2	33.9	23.3	29.1	30.8	37.0
No Difficulty	156,674	94.1	41.4	52.6	41.4	41.5	52.5	52.6	430	91.3	39.6	50.8	38.4	40.7	49.8	51.8
<u>Getting in or out of chairs</u>																
Unable to do	2,261	1.3	30.3	42.9	29.8	30.8	42.3	43.5	11	2.3	22.5	34.6	16.4	28.6	28.3	40.8
Have difficulty	42,461	25.4	29.5	47.3	29.4	29.5	47.1	47.4	135	28.4	28.2	43.2	26.6	29.7	41.2	45.2
No Difficulty	121,791	73.3	44.8	53.7	44.7	44.9	53.6	53.7	330	69.4	43.0	52.1	41.9	44.2	51.1	53.2
<u>Walking</u>																
Unable to do	4,272	2.6	27.3	43.4	27.0	27.6	43.0	43.8	18	3.8	22.9	36.6	19.6	26.1	31.0	42.2
Have difficulty	53,893	32.1	29.7	48.1	29.7	29.8	48.0	48.2	192	40.6	29.5	45.0	28.2	30.8	43.3	46.7
No Difficulty	108,343	65.2	46.6	54.1	46.6	46.7	54.0	54.1	263	55.6	45.8	53.1	44.7	46.9	52.0	54.2
<u>Using the toilet</u>																
Unable to do	1,985	1.2	31.5	42.8	30.9	32.0	42.2	43.4	*	*	*	*	*	*	*	*
Have difficulty	12,033	7.5	26.9	42.4	26.7	27.0	42.2	42.6	49	10.3	25.8	38.2	23.3	28.2	35.2	41.2
No Difficulty	152,677	91.3	42.0	52.8	41.9	42.0	52.7	52.8	420	88.3	40.1	50.7	39.0	41.2	49.7	51.7

\* Data suppressed because of fewer than 10 respondents.

OUTPUT: RUN018 and NER125

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/  
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

toileting, and transferring in and out of chairs. Table 6 tabulates each population based on the number of activities a beneficiary has difficulty with or is unable to perform, while Table 7 presents frequencies and mean PCS and MCS scores by individual ADL. Fifty nine percent of MCO enrollees have no difficulty performing any of the six ADLs versus 50% of FFS enrollees. Eight percent of FFS enrollees have difficulty performing 5 or 6 ADLs versus 6% of MCO enrollees. A higher proportion of FFS enrollees are unable to perform ADLs, although the proportions of "unable to perform" are small in both populations. The proportion of FFS enrollees "unable to do" or "having difficulty" is equal or greater than the proportion of managed care enrollees for all individual ADLs (Table 7). These statistics consistently indicate higher levels of functional impairment among FFS enrollees.

PCS and MCS are lower among FFS enrollees controlling for functional limitations, although MCO/FFS differences are small and often not statistically significant. Although some MCO/FFS difference remains holding functional status constant, the difference is substantially reduced. For example, among beneficiaries with no difficulty in any ADL, the FFS PCS is 0.8 points lower than managed care (Table 6) versus 2.5 points lower among all beneficiaries (Table 4). Similarly, the FFS MCS is 0.2 points lower than managed care among beneficiaries with no impairments (Table 6), versus 2.9 points among all enrollees (Table 4). The physical functioning subscale is, of course, a component of the SF-36 PCS and MCS summary scales. Hence, it is perhaps not surprising that FFS/MCO PCS and MCS differences are reduced holding constant functional limitations (one expects a positive correlation between the PF score and the

number of ADL limitations). However, physical functioning is just one of eight SF-36 subscales.

Table 8 presents the distribution of FFS and MCO populations on self-rated general health status. Respondents were asked, “In general, would you say your health is: excellent, very good, good, fair, or poor?” A substantially higher proportion of MCO respondents report their health as excellent or very good (31.4% MCO versus 25.4% FFS), and good (40.2% MCO versus 33.7% FFS), whereas a higher proportion of FFS respondents report fair or poor health (41.0% FFS versus 28.4% MCO). MCO/FFS differences in PCS and MCS are attenuated holding constant self-reported general health status.

### **3.2 Comparison of Respondents to the Fee-for-Service and Managed Care Health Outcomes Surveys**

Our second comparison is of respondents to the FFS and managed care Health Outcomes Surveys. As discussed in Section 2.2 above, our comparison of HOS respondents includes all the 10 subsamples of the FFS HOS (one national random sample, five small geographic area samples, and four group practice samples), and all MCO HOS respondents, unweighted by plan size. Thus, the statistics presented disproportionately reflect Medicare FFS enrollees in certain geographic areas<sup>7</sup> and

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<sup>7</sup> The FFS HOS small geographic area samples were drawn from beneficiaries residing in certain counties in the states of Georgia, Pennsylvania, Arizona, Washington state, and Wisconsin. See McCall et al. (2000) for more details.

Table 8

## Nationally Representative Distribution of Self-Rated General Health Status Among HOS Respondents

Self-Rated General Health Status	Enrollment-Weighted Managed Care Respondents								Fee-for-Service National Sample							
	Number	Percent	95% Confidence Intervals						Number	Percent	95% Confidence Intervals					
			PCS		MCS		PCS				MCS					
			Lower	Upper	Lower	Upper	Lower	Upper			Lower	Upper				
Excellent	10,425	6.5	53.5	57.5	53.4	53.7	57.3	57.6	29	4.7	54.7	57.7	53.6	55.8	55.6	59.7
Very good	41,564	24.9	49.2	56.1	49.1	49.3	56.0	56.1	128	20.7	48.7	56.0	47.4	50.1	54.8	57.2
Good	67,070	40.2	41.5	53.1	41.4	41.6	53.0	53.1	208	33.7	41.3	51.8	40.1	42.6	50.5	53.0
Fair	39,165	22.6	30.6	47.1	30.5	30.7	46.9	47.2	188	30.5	30.2	44.2	28.9	31.4	42.6	45.8
Poor	10,085	5.8	24.0	38.3	23.8	24.1	38.0	38.5	65	10.5	23.2	35.9	21.6	24.8	33.0	38.9

**OUTPUT:** RUN018 and NERI25

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

visiting certain group practices<sup>8</sup>, and MCO enrollees in smaller health plans (since enrollees in smaller health plans have a higher probability of being eligible for the MCO HOS).

Nevertheless, the summary comparisons in Section 2.5 indicate that mean MCO health status scores weighted for plan size and mean FFS scores for the random national sample do not differ substantially from mean scores for unweighted MCO enrollees and the entire FFS HOS, respectively. In any case, the comparisons presented in this section are valid as a simple description of differences in FFS and MCO respondents to the HOS. Because results for FFS and MCO respondents (this section) do not differ very much from results for FFS and MCO populations (Section 3.1), we do not present a detailed discussion of results for respondents. Rather, we provide a brief discussion with a focus on instances where the results for respondents differ from the results for populations.

The set of tables and figures we provide for respondents in this section (Tables 9-14 and Figures 7-12) have the same format as the ones we presented for populations in the previous section (Tables 2 and 4-8 and Figures 1-6). Table 9 is a duplicate of Table 2, except based on unweighted managed care respondents and all 10 FFS subsamples. Consistent with the Table 2 results for populations, we see that the under-age-65 disabled, age 85 and over, and the poor (Medicaid enrollees) comprise a smaller share of Medicare MCO HOS respondents than FFS respondents. Comparing Tables 2 and 9, it is clear that FFS respondents from all 10 FFS subsamples (Table 9) have a lower proportion

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<sup>8</sup> The group practices are located in the states of Wisconsin, Arizona, Pennsylvania, and Washington state. Beneficiaries seen by group practice physicians comprised the sampling frames for the group practice samples. See McCall et al. (2000) for more details.

**Table 9**  
**HOS Sample Distribution by Demographic Characteristics**

	Managed Care Respondents <sup>1</sup>					Fee-for-Service Respondents <sup>2</sup>				
	Sample Frame	Number of Respondents	Percentage Response Rate <sup>3</sup>	Percentage of Survey Frame <sup>4</sup>	Percentage of Respondents <sup>5</sup>	Sample Frame	Number of Respondents	Percentage Response Rate	Percentage of Survey Frame	Percentage of Respondents
<b>Entire Sample</b>	279,135	168,922	60.5	100.0	100.0	10,000	6,634	66.3	100.0	100.0
<b>Gender</b>										
Male	120,656	73,015	60.5	43.2	43.2	4,070	2,738	67.3	40.7	41.3
Female	158,479	95,907	60.5	56.8	56.8	5,930	3,896	65.7	59.3	58.7
<b>Race</b>										
Unknown	1,093	538	49.2	0.4	0.3	21	14	66.7	0.2	0.2
White	240,095	148,859	62.0	86.0	88.1	9,264	6,225	67.2	92.6	93.8
Black	24,121	12,283	50.9	8.6	7.3	490	261	53.3	4.9	3.9
Other	4,883	2,500	51.2	1.7	1.5	91	55	60.4	0.9	0.8
Asian	2,779	1,751	63.0	1.0	1.0	56	33	58.9	0.6	0.5
Hispanic	5,960	2,875	48.2	2.1	1.7	62	36	58.1	0.6	0.5
North American Native	204	115	56.4	0.1	0.1	16	10	62.5	0.2	0.2
<b>Original Reason For Entitlement</b>										
Unknown	*	*	*	*	*	*	*	*	*	*
Aged without ESRD	259,937	158,377	60.9	93.1	93.8	8,986	6,048	67.3	89.9	91.2
Aged with ESRD	37	18	48.6	0.0	0.0	0	0	0.0	0.0	0.0
Disabled Without ESRD	19,145	10,518	54.9	6.9	6.2	1,010	583	57.7	10.1	8.8
Disabled With ESRD	*	*	*	*	*	*	*	*	*	*
ESRD Only	*	*	*	*	*	*	*	*	*	*
<b>Medicaid Status</b>										
No Medicaid	266,880	163,229	61.2	95.6	96.6	8,828	5,981	67.8	88.3	90.2
Medicaid Coverage	12,255	5,693	46.5	4.4	3.4	1,172	653	55.7	11.7	9.8
<b>Age</b>										
Under 65	18,154	9,885	54.5	6.5	5.9	965	554	57.4	9.7	8.4
65-74	145,244	92,542	63.7	52.0	54.8	3,935	2,823	71.7	39.4	42.6
75-84	90,387	54,088	59.8	32.4	32.0	3,748	2,529	67.5	37.5	38.1
85+	25,350	12,407	48.9	9.1	7.3	1,352	728	53.8	13.5	11.0

\* Data suppressed because of fewer than 10 respondents.

<sup>1</sup> Includes all managed care survey recipients, and uses unweighted data.

<sup>2</sup> Includes all fee-for-service survey recipients. This sample is not representative of the nation as a whole.

<sup>3</sup> Response rate for that characteristic (e.g. The response rate for males is the total number of men who returned surveys divided by the total number of men who received a survey)

<sup>4</sup> Representativeness of that characteristic in the survey pool (the number of men who were sent surveys divided by the total number of surveys sent out)

<sup>5</sup> Representativeness of that characteristic in the survey sample (the number of men who responded to the survey divided by the total number of survey respondents)

OUTPUT: RUN001

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

of blacks, Medicaid enrollees, under-age-65 disabled, and very old (age 85+) than the single FFS national sample analyzed in the preceding section (Table 2). Hence, we would expect the entire FFS sample analyzed in this section to have better average health status than the FFS national sample. Conversely, the weighted and unweighted Medicare managed care samples (Tables 2 versus 9) show very similar characteristics, and we do not expect much difference in health status characteristics.

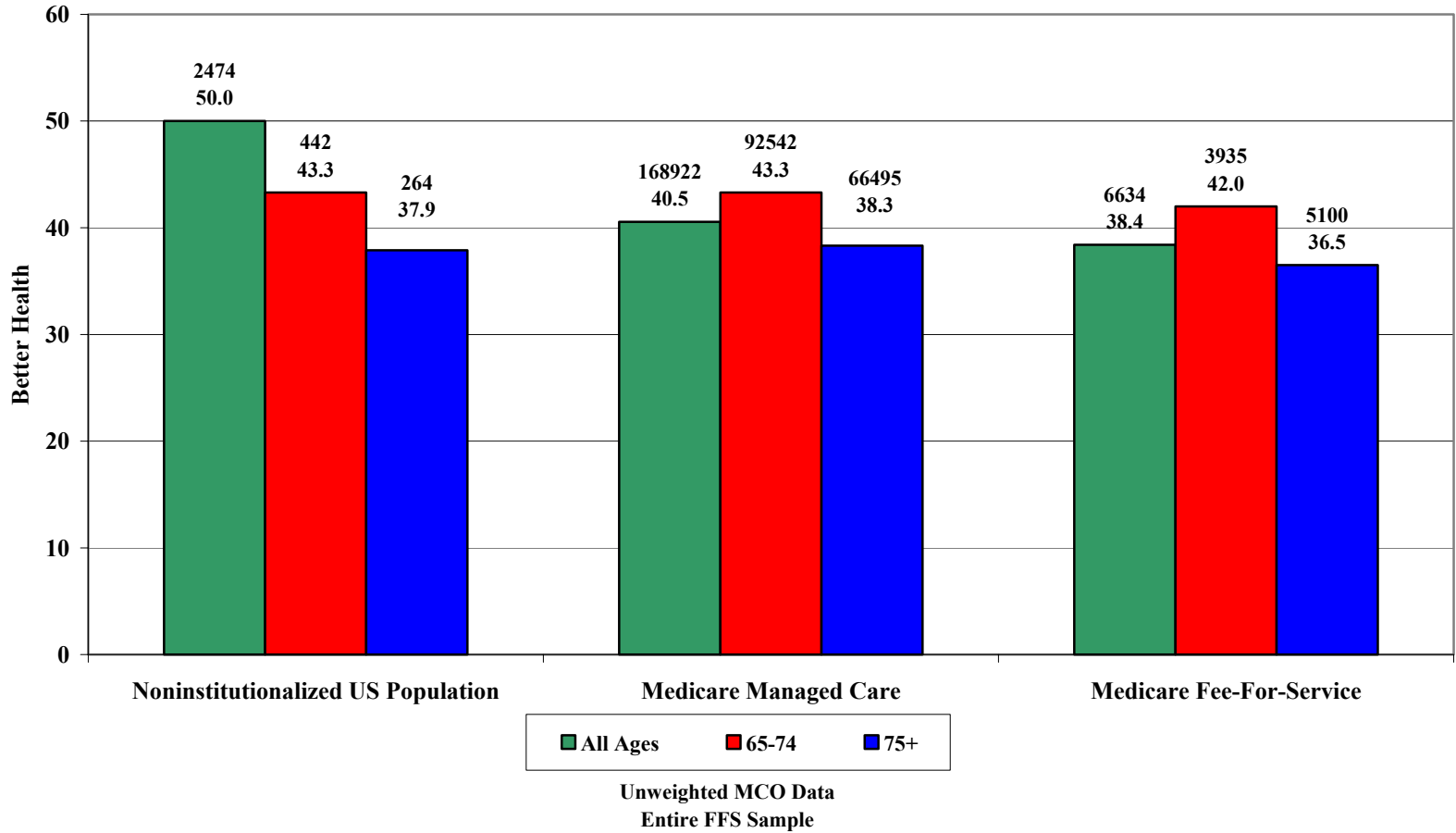
Figures 7 and 8 repeat Figures 1 and 2 using the unweighted MCO data and the entire FFS sample. The results for the PCS scores are similar. But the mean MCS for the entire FFS sample is higher than the national norm in Figure 8 whereas mean MCS for the FFS national sample is lower than the national norm was lower in Figure 2. The better mental health status of the entire FFS sample as compared to the national FFS sample is presumably related to the better socioeconomic status of the entire sample as discussed in the preceding paragraph.

Figures 9 and 10 again show the distribution of the PCS and MCS scores, using the unweighted MCO data and the entire FFS sample. Results are similar to the analogous Figures 3 and 4 for the MCO and FFS populations, except that the better mental health status of FFS respondents as opposed to FFS population is again apparent in Figure 10 versus Figure 4. The average of MCO respondents' mental health is better than the average for FFS respondents, but the MCO advantage is smaller than for the MCO versus FFS populations.

Table 10 presents unweighted data for all HOS respondents, which may be compared to the data that represents populations shown in Table 4. Results again are

Figure 7

A Comparison of HOS Respondents' Mean Physical Component Scores to US Norms

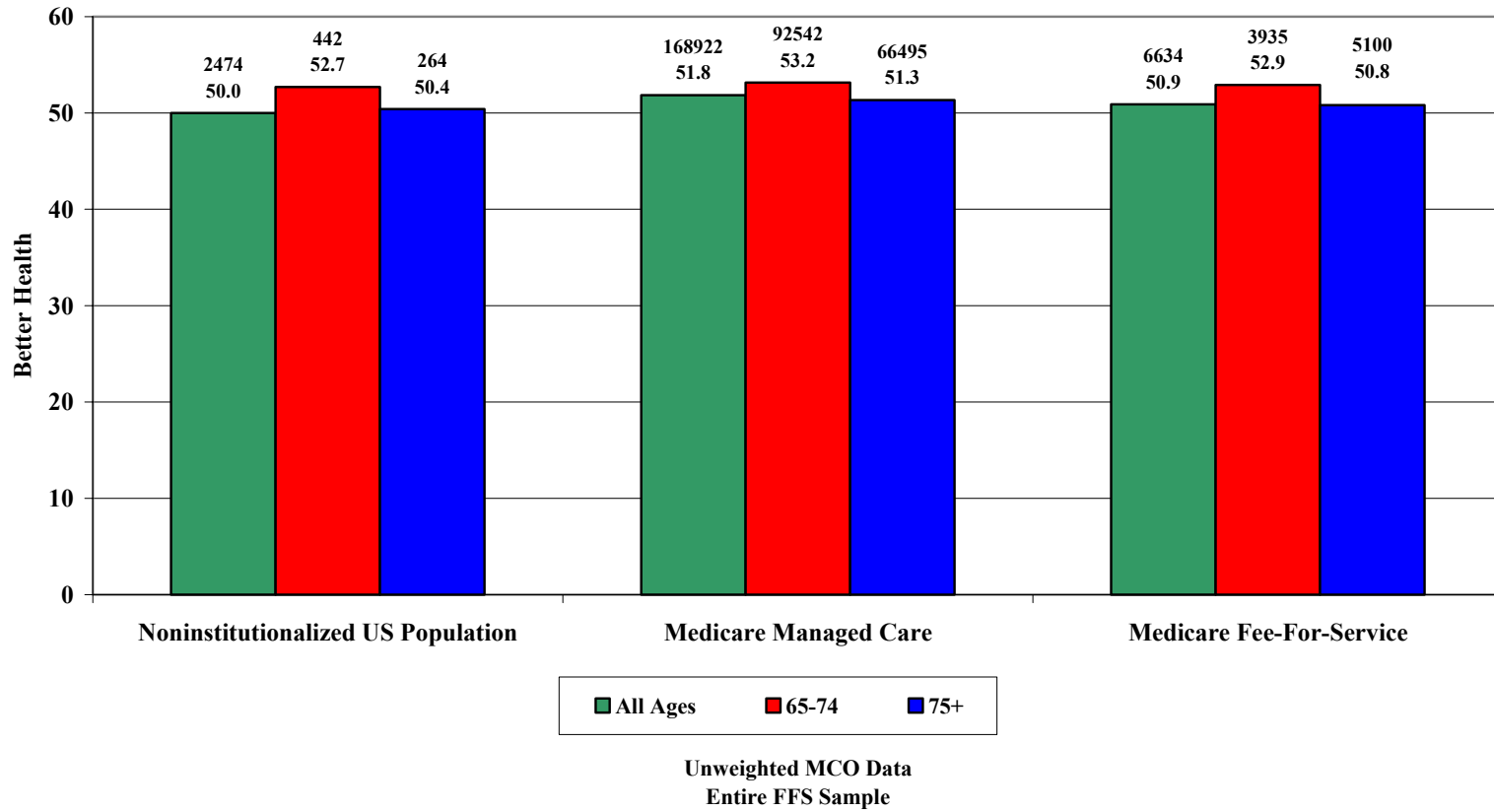


SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.



Figure 8

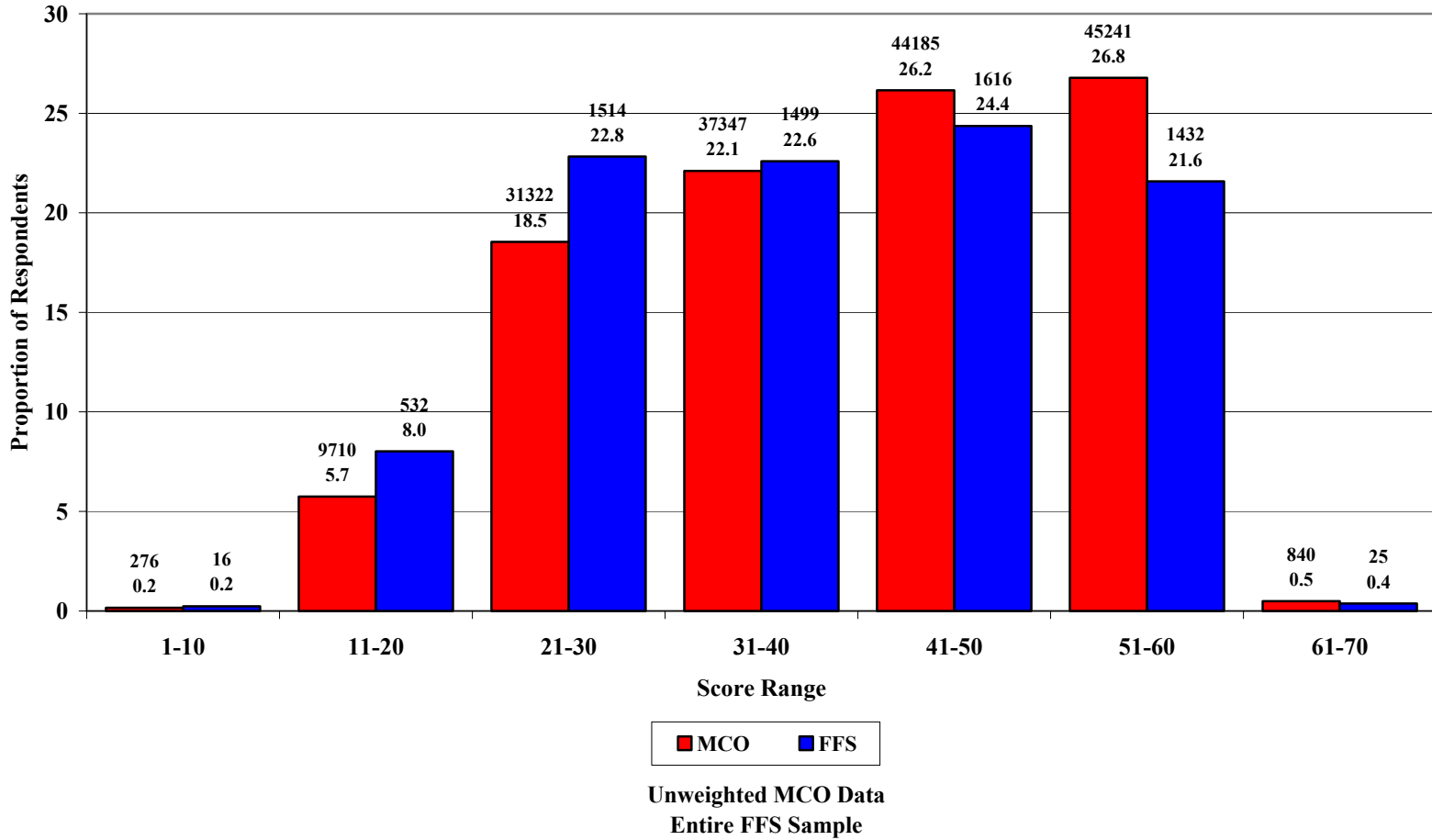
A Comparison of HOS Respondents' Mean Mental Component Score to US Norms



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure 9

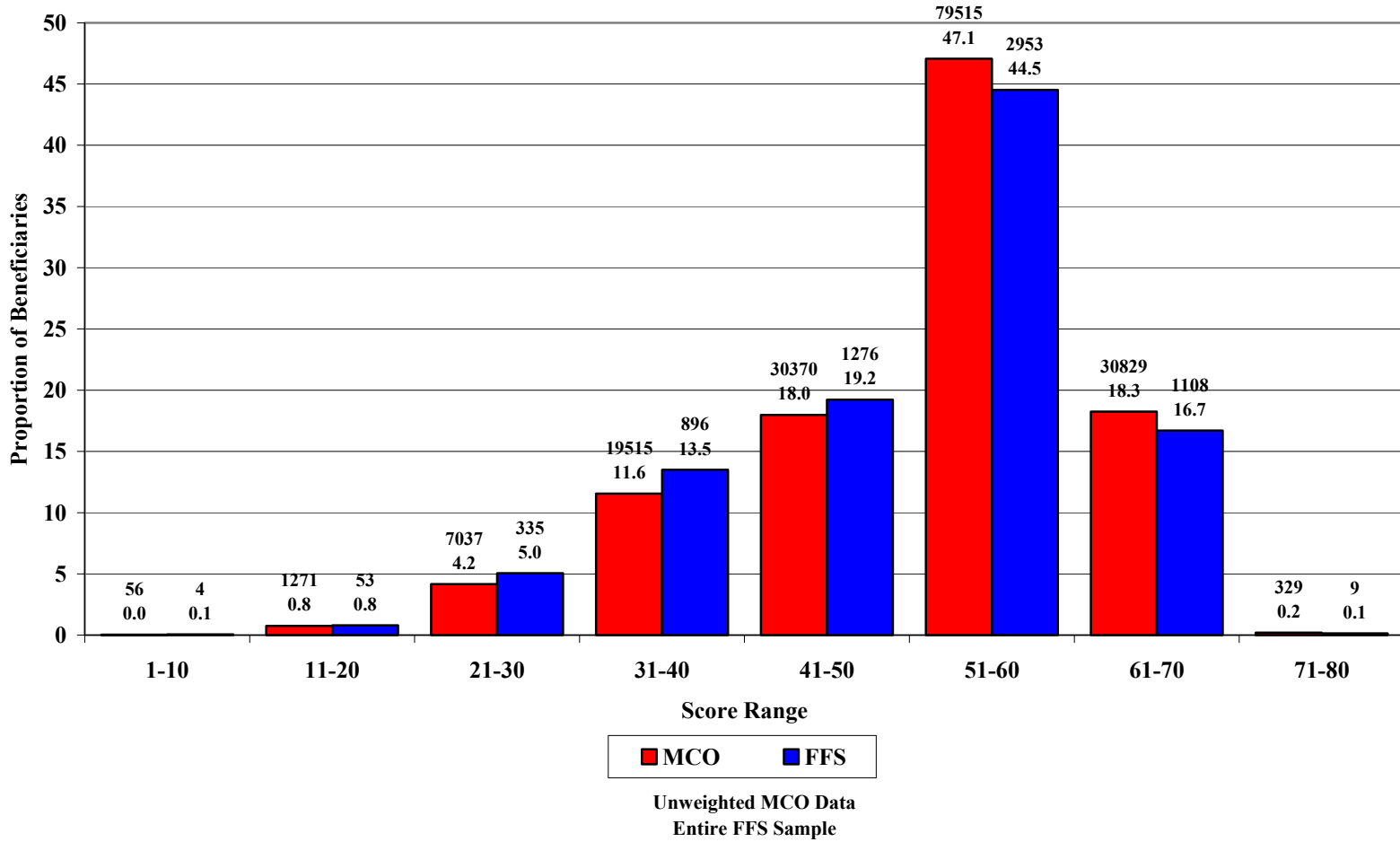
Distribution of Physical Component Scores Among HOS Respondents



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Figure 10

Distribution of Mental Component Scores Among HOS Respondents



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 10

Mean Health Scores of HOS Respondents by Demographic Characteristics

	Managed Care Respondents								Fee-for-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
				Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper	
<b>All Respondents</b>	168,922	100.0	40.5	51.8	40.5	40.6	51.8	51.9	6,634	100.0	38.4	50.9	38.1	38.7	50.6	51.4
<b>Gender</b>																
Male	73,015	43.2	41.4	52.2	41.3	41.5	52.1	52.2	2,738	41.3	39.4	51.0	38.9	39.8	50.6	51.4
Female	95,907	56.8	39.9	51.6	39.8	40.0	51.5	51.6	3,896	58.7	37.7	50.8	37.3	38.1	50.4	51.1
<b>Race</b>																
White	148,859	88.1	40.7	52.1	40.7	40.8	52.0	52.1	6,225	93.8	38.5	51.1	38.2	38.8	50.8	51.4
Black	12,283	7.3	38.0	49.9	37.8	38.3	49.7	50.1	261	3.9	35.7	47.3	34.3	37.0	45.8	48.8
Other	2,500	1.5	41.5	50.9	41.0	42.0	50.5	51.4	55	0.8	37.4	49.7	34.0	40.9	46.4	52.9
Asian	1,751	1.0	43.1	52.5	42.5	43.6	52.1	53.0	33	0.5	40.5	51.0	36.7	44.3	47.3	54.7
Hispanic	2,875	1.7	39.1	48.3	38.7	39.5	47.9	48.8	36	0.5	35.5	40.0	31.7	39.4	36.3	43.8
North American Native	115	0.1	35.1	49.7	32.8	37.5	47.5	52.0	10	0.2	42.6	48.3	35.7	49.6	41.1	55.4
Unknown	538	0.3	40.7	51.6	39.6	41.7	50.7	52.5	14	0.2	32.0	56.1	26.2	37.8	51.7	60.4
<b>Original Reason For Entitlement</b>																
Aged without ESRD	158,377	93.8	41.3	52.4	41.2	41.3	52.4	52.5	6,048	91.2	39.1	51.8	38.7	39.4	51.5	52.0
Aged with ESRD	18	0.0	31.7	46.4	26.2	37.1	41.0	51.7	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a
Disabled Without ESRD	10,518	6.2	29.8	43.0	29.6	30.0	42.7	43.2	583	8.8	31.6	41.7	30.6	32.6	40.6	42.8
Disabled With ESRD	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
ESRD Only	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<b>Medicaid Status</b>																
No Medicaid	163,229	96.6	40.8	52.1	40.7	40.9	52.0	52.1	5,981	90.2	39.1	51.6	38.7	39.4	51.3	51.8
Medicaid Coverage	5,693	3.4	33.2	45.1	32.9	33.5	44.8	45.4	653	9.8	32.4	44.5	31.5	33.3	43.5	45.4
<b>Age</b>																
Under 65	9,885	5.9	29.7	42.7	29.5	30.0	42.4	42.9	965	8.4	31.9	41.6	31.1	32.6	40.7	42.4
65-74	92,542	54.8	43.3	53.2	43.2	43.4	53.1	53.2	3,935	42.6	42.0	52.9	41.6	42.3	52.6	53.2
75-84	54,088	32.0	39.2	51.8	39.1	39.3	51.7	51.8	3,748	38.1	37.5	51.5	37.1	37.9	51.1	51.8
85+	12,407	7.3	34.3	49.5	34.1	34.5	49.3	49.7	1,352	11.0	32.6	48.2	32.0	33.2	47.6	48.8
<b>Marital Status</b>																
Married	97,244	58.4	41.5	52.6	41.4	41.5	52.5	52.6	3,153	57.7	39.6	52.2	39.1	40.0	51.8	52.5
Divorced	15,099	9.1	39.5	50.4	39.3	39.7	50.2	50.5	335	6.1	36.3	46.6	34.9	37.6	45.2	47.9

Table 10 (continued)

Mean Health Scores of HOS Respondents by Demographic Characteristics

	Managed Care Respondents								Fee-for-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
Separated	1,628	1.0	37.6	47.3	37.0	38.2	46.7	47.9	49	0.9	35.3	43.0	31.7	38.8	39.7	46.4
Widowed	47,235	28.4	39.1	51.2	39.0	39.2	51.1	51.3	1,572	28.8	36.3	50.5	35.7	36.9	49.9	51.0
Never Married	5,368	3.2	41.0	50.4	40.6	41.3	50.1	50.7	349	6.4	38.5	47.4	37.3	39.8	46.0	48.8
<b>Education</b>																
8th Grade or Less	21,140	12.8	37.0	48.6	36.8	37.1	48.4	48.8	752	13.9	34.5	48.0	33.6	35.4	47.2	48.9
Some high school, but did not graduate	29,696	18.0	38.6	50.3	38.5	38.7	50.2	50.4	739	13.7	35.3	49.0	34.5	36.2	48.2	49.8
High school graduate or GED	57,119	34.6	40.9	52.2	40.8	41.0	52.1	52.3	1,858	34.3	38.5	50.9	38.0	39.1	50.4	51.4
Some college or 2 year degree	34,324	20.8	41.5	53.1	41.4	41.6	52.9	53.2	1,100	20.3	39.9	52.1	39.2	40.6	51.5	52.7
4 year college degree	10,991	6.7	44.0	54.1	43.8	44.2	53.9	54.3	449	8.3	40.7	53.5	39.6	41.8	52.6	54.4
More than a 4 year college degree	11,698	7.1	44.7	54.6	44.5	44.9	54.4	54.8	516	9.5	42.0	53.7	41.0	43.0	52.9	54.5
<b>Household Income</b>																
Less than \$5,000	5,525	3.6	36.5	47.5	36.2	36.8	47.1	47.8	229	4.7	33.3	45.2	31.8	34.8	43.7	46.8
\$5,000-\$9,999	18,411	12.1	36.4	48.6	36.2	36.6	48.5	48.8	572	11.6	32.8	46.6	31.9	33.7	45.6	47.6
\$10,000-\$19,999	41,296	27.1	38.8	50.8	38.7	38.9	50.7	50.9	1,099	22.4	36.4	49.8	35.7	37.1	49.2	50.5
\$20,000-\$29,999	28,820	18.9	41.3	52.6	41.1	41.4	52.5	52.7	913	18.6	38.4	51.4	37.6	39.2	50.7	52.0
\$30,000-\$39,999	17,472	11.5	42.9	53.7	42.8	43.1	53.5	53.8	583	11.9	40.5	52.8	39.6	41.5	52.0	53.6
\$40,000-\$49,999	9,402	6.2	43.9	54.3	43.7	44.2	54.1	54.5	371	7.5	42.1	54.0	40.9	43.4	53.0	54.9
\$50,000-\$79,999	8,988	5.9	45.3	54.8	45.1	45.5	54.6	55.0	407	8.3	43.1	53.6	42.0	44.3	52.7	54.5
\$80,000-\$99,999	1,878	1.2	45.7	54.8	45.2	46.2	54.5	55.2	75	1.5	46.7	55.3	44.6	48.9	53.7	56.9
\$100,000 or more	2,273	1.5	46.8	55.5	46.4	47.2	55.1	55.8	137	2.8	43.8	54.3	41.8	45.8	52.8	55.8
Don't Know	18,378	12.1	39.7	51.2	39.5	39.9	51.1	51.4	531	10.8	36.8	49.5	35.7	37.8	48.6	50.5
<b>Residence is:</b>																
Owned or being bought by you	122,175	75.0	41.5	52.6	41.5	41.6	52.5	52.6	3,897	73.8	39.8	52.1	39.4	40.2	51.8	52.4
Owned or being bought by someone in your family other than you	11,099	6.8	37.6	50.2	37.3	37.8	50.0	50.4	368	7.0	35.2	48.2	34.0	36.4	47.0	49.3
Rented for money	26,390	16.2	38.0	49.8	37.8	38.1	49.7	50.0	821	15.5	34.6	47.5	33.8	35.4	46.6	48.3
Not owned and one in which you live without payment of rent	3,214	2.0	37.8	50.2	37.4	38.2	49.8	50.6	147	2.8	34.4	50.5	32.5	36.3	48.6	52.5
Nursing home (write-in response)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	48	0.9	27.1	40.2	24.4	29.7	36.7	43.7
<b>Retirement Community</b>																
Yes	19,032	11.7	38.7	50.7	38.5	38.9	50.6	50.9	908	17.2	37.3	50.6	36.5	38.1	49.9	51.4
No	144,213	88.4	40.8	52.0	40.7	40.9	52.0	52.1	4,367	82.8	38.6	51.1	38.2	39.0	50.8	51.5

Table 10 (continued)

## Mean Health Scores of HOS Respondents by Demographic Characteristics

	Managed Care Respondents								Fee-for-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<b>Medical Services Provided (if in a Retirement Community)</b>																
Yes	3,338	13.4	37.7	49.2	37.3	38.2	48.8	49.6	220	24.6	35.4	50.0	33.8	37.1	48.5	51.5
No	21,478	86.5	38.5	50.1	38.4	38.7	49.9	50.2	673	75.4	37.9	50.8	37.0	38.8	50.0	51.6
<b>Who Completed the Survey</b>																
Person to whom the survey was addressed	143,970	89.2	41.4	52.6	41.3	41.4	52.5	52.6	5,136	84.4	39.9	52.2	39.6	40.2	51.9	52.5
Family member or relative	16,108	10.0	34.3	46.8	34.1	34.5	46.7	47.0	804	13.2	30.8	45.4	30.0	31.6	44.5	46.2
Friend	955	0.6	34.7	45.6	33.9	35.4	44.8	46.5	55	0.9	34.8	41.2	31.8	37.7	37.8	44.6
Professional caregiver	500	0.3	34.7	45.2	33.6	35.7	44.1	46.3	85	1.4	34.1	46.1	31.7	36.5	43.4	48.7
Other (write-in response)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*	*	*	*	*	*	*	*
<b>Enrollment Category<sup>1</sup></b>																
Enrolled less than 6 mos.	26,845	15.9	41.3	52.0	41.1	41.4	51.9	52.2	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a
Enrolled 6 mos.-1 yr.	24,332	14.4	40.9	51.7	40.7	41.0	51.6	51.9	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a
Enrolled for over 1 yr.	117,745	69.7	40.3	51.8	40.2	40.4	51.6	52.0	6,634	100.0	38.4	50.9	38.1	38.7	50.6	51.1

\* Data suppressed because of fewer than 10 respondents.

<sup>1</sup> This is the length of enrollment for the beneficiary in the plan they are enrolled in at the time of the survey. For FFS beneficiaries, it is their continuous period of FFS enrollment.

OUTPUT: RUN002 and RUN003

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

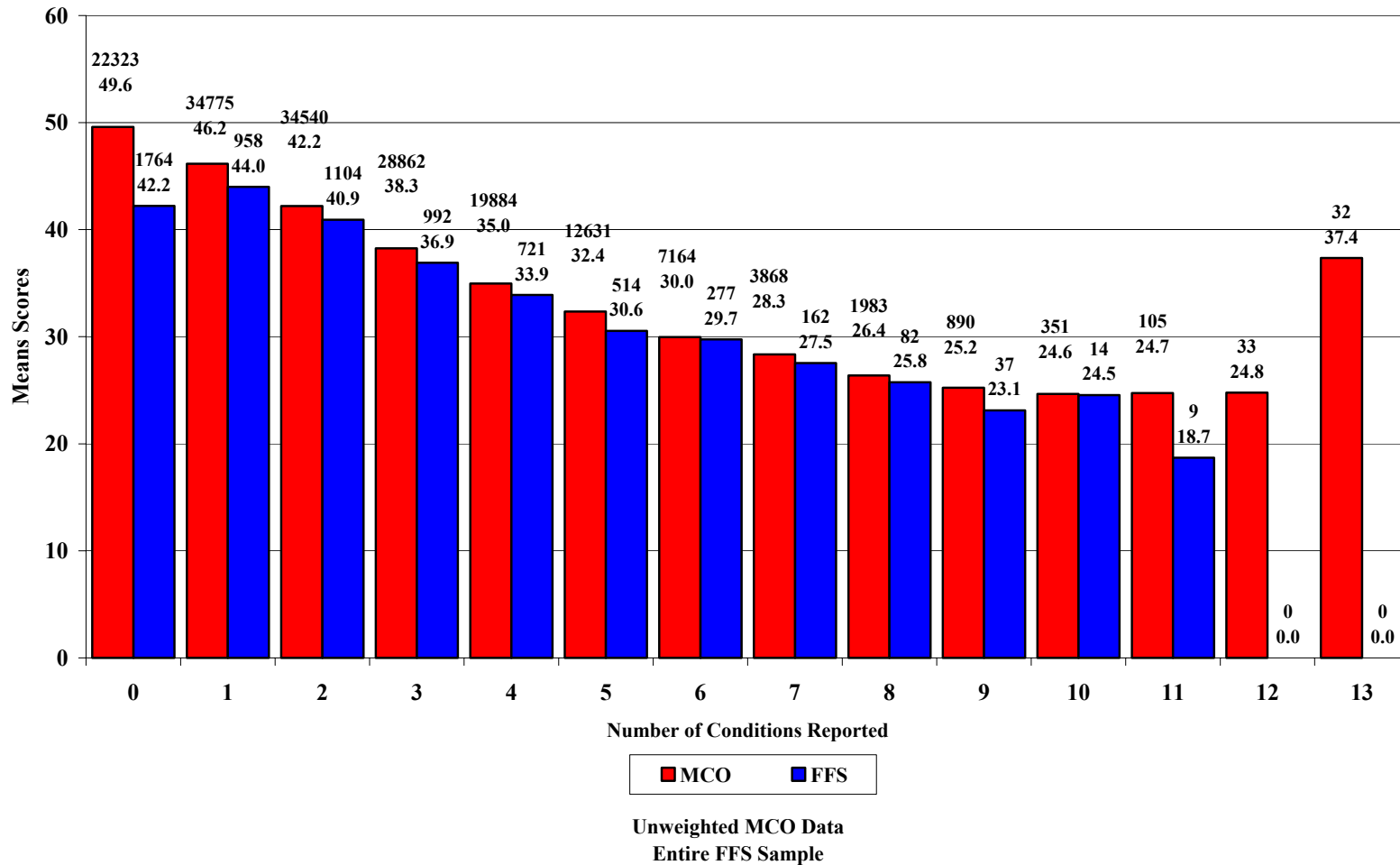
similar with the exception of the somewhat higher mental health status of all FFS respondents (Table 10) versus respondents to the national random sample (Table 4). Table 10 confirms that the entire FFS HOS sample has a higher average educational and income level than the FFS national sample alone.

Figures 11 and 12 duplicate Figures 5 and 6, but using unadjusted data for all HOS respondents. Results for physical health status (Figures 11 and 5) are similar. But the mental health status of all FFS respondents with higher counts of multiple chronic conditions (6 or more) exceeds that of MCO respondents similarly burdened with chronic disease (Figure 12), while this is not consistently true for the MCO/FFS population comparison (Figure 6). FFS sample sizes of beneficiaries with large numbers of chronic conditions are relatively limited, so not too much should be concluded from this result. But it is another manifestation of the better mental health status of all FFS respondents versus the FFS population (single national random sample).

Table 11 compares the unweighted MCO and entire FFS data by chronic condition. Table 5 is the corresponding table for MCO and FFS populations. Chronic disease prevalence is mixed among all FFS respondents (Table 11) compared to the nationally representative FFS sample (Table 5). Interestingly, emphysema is more prevalent among FFS respondents than the FFS population, and more prevalent among FFS respondents than MCO respondents (Table 11). This may indicate that the lower prevalence of emphysema in the FFS national sample than in the weighted MCO sample is a statistical fluke due to small FFS national sample size.

Figure 11

Average Physical Component Scores by Number of Chronic Conditions Reported, HOS Respondents

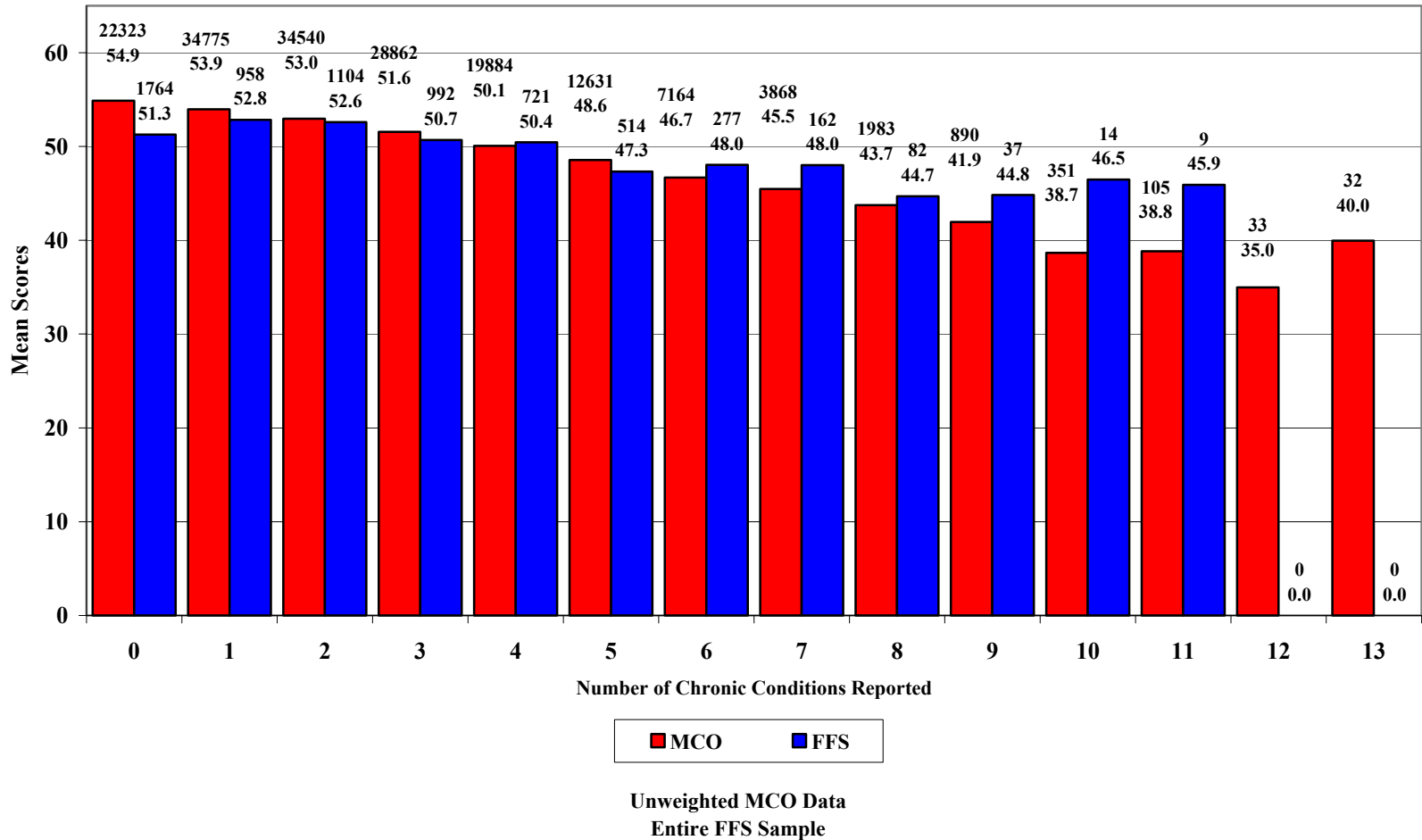


SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.



Figure 12

Average Mental Component Score by Number of Chronic Conditions Reported, HOS Respondents



SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

**Table 11**  
**Frequencies and Mean Health Scores for HOS Respondents with Specified Chronic Conditions**

	Managed Care Respondents								Fee-For-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
				Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper	
<b>High blood pressure</b>																
Yes	87,830	52.8	38.6	51.0	38.6	38.7	51.0	51.1	2,856	52.4	36.7	50.7	36.3	37.2	50.3	51.1
No	78,433	47.2	42.7	52.8	42.6	42.8	52.7	52.9	2,596	47.6	40.1	51.4	39.6	40.6	51.0	51.8
<b>Angina</b>																
Yes	26,862	16.3	34.7	49.3	34.5	34.8	49.1	49.4	992	18.4	33.2	49.3	32.4	33.9	48.6	50.0
No	137,674	83.7	41.8	52.4	41.8	41.9	52.4	52.5	4,389	81.6	39.6	51.4	39.2	40.0	51.1	51.7
<b>CHF</b>																
Yes	11,796	7.2	30.7	47.2	30.5	30.9	47.0	47.4	458	8.5	28.9	47.4	28.0	29.9	46.4	48.5
No	152,727	92.8	41.4	52.3	41.4	41.5	52.2	52.3	4,905	91.5	39.3	51.4	39.0	39.7	51.1	51.7
<b>Heart Attack</b>																
Yes	17,780	10.8	34.6	49.3	34.4	34.8	49.1	49.5	691	12.9	32.9	49.3	32.0	33.8	48.5	50.1
No	146,266	89.2	41.4	52.3	41.3	41.5	52.2	52.3	4,653	87.1	39.3	51.3	38.9	39.6	51.0	51.7
<b>Other Heart Condition</b>																
Yes	35,361	21.5	35.9	49.5	35.7	36.0	49.4	49.6	1,401	25.9	34.1	49.6	33.4	34.7	49.0	50.2
No	129,332	78.5	41.9	52.6	41.9	42.0	52.5	52.6	4,005	74.1	39.9	51.6	39.5	40.3	51.3	51.9
<b>Stroke</b>																
Yes	13,441	8.1	33.0	47.3	32.8	33.2	47.1	47.5	555	10.3	30.6	47.2	29.7	31.5	46.2	48.2
No	151,636	91.9	41.3	52.3	41.2	41.4	52.3	52.4	4,850	89.7	39.3	51.5	38.9	39.6	51.2	51.8
<b>Emphysema</b>																
Yes	21,686	13.1	33.8	48.6	33.6	33.9	48.4	48.7	744	13.8	31.9	48.2	31.1	32.8	47.4	49.1
No	143,612	86.8	41.7	52.4	41.6	41.7	52.4	52.5	4,657	86.2	39.4	51.5	39.1	39.8	51.2	51.9
<b>Crohn's Disease</b>																
Yes	9,305	5.7	34.1	46.4	33.9	34.3	46.2	46.6	386	7.2	32.4	47.2	31.2	33.5	46.0	48.5
No	155,084	94.4	41.0	52.3	41.0	41.1	52.2	52.3	4,979	92.8	38.9	51.4	38.6	39.3	51.1	51.7
<b>Arthritis-Hip</b>																
Yes	63,577	38.3	34.9	50.4	34.8	35.0	50.3	50.5	2,231	41.0	33.0	49.9	32.5	33.5	49.5	50.4
No	102,221	61.6	44.1	52.8	44.1	44.2	52.7	52.9	3,215	59.0	42.0	51.8	41.6	42.5	51.4	52.1
<b>Arthritis-Hand</b>																
Yes	57,194	34.5	35.9	50.0	35.8	36.0	49.9	50.1	1,968	36.2	33.8	49.7	33.3	34.3	49.2	50.2
No	108,280	65.4	43.1	52.9	43.0	43.1	52.8	52.9	3,473	63.8	40.9	51.8	40.5	41.3	51.5	52.2

Table 11 (continued)

## Frequencies and Mean Health Scores for HOS Respondents with Specified Chronic Conditions

		Managed Care Respondents								Fee-For-Service Respondents							
		Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
						PCS		MCS						PCS		MCS	
						Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<b>Sciatica</b>																	
	Yes	38,193	23.2	34.3	48.9	34.2	34.4	48.8	49.0	1,419	26.2	33.2	49.0	32.6	33.8	48.4	49.6
	No	126,375	76.8	42.5	52.8	42.5	42.6	52.7	52.9	3,988	73.8	40.2	51.7	39.9	40.6	51.4	52.1
<b>Diabetes</b>																	
	Yes	27,868	16.8	36.0	49.5	35.9	36.2	49.4	49.7	948	17.4	34.0	49.4	33.2	34.7	48.6	50.1
	No	138,078	83.2	41.5	52.3	41.4	41.6	52.3	52.4	4,502	82.6	39.3	51.4	38.9	39.6	51.1	51.7
<b>Any Cancer</b>																	
	Yes	21,650	13.0	38.0	50.9	37.8	38.1	50.7	51.0	971	17.8	35.8	50.9	35.1	36.6	50.3	51.6
	No	144,595	87.0	41.0	52.0	40.9	41.0	52.0	52.1	4,483	82.2	38.9	51.0	38.5	39.2	50.7	51.4

OUTPUT: RUN002 and RUN003

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Tables 12 and 13 (compare to Tables 6 and 7) present the functional status of FFS and MCO respondents. FFS respondents (Table 12) have considerably better functional status than the FFS population (Table 6). Fifty nine percent of all FFS respondents—the same as the MCO percentage--have no difficulty in any ADLs compared to 50% for the FFS population. But a higher proportion of FFS respondents have difficulty with larger numbers of activities of daily living (3-4 or 5-6 ADLs compared to 1-2 ADLs) as compared to MCO respondents (Table 12). So the overall functional status of FFS respondents is worse than of MCO respondents.

Table 14 presents the distribution of self-rated general health status among all MCO and FFS respondents to the HOS. The FFS distribution is again better among all respondents (Table 14) than among the single national FFS sample (Table 8). In particular, a higher proportion of all FFS respondents (Table 14) rate their health as "good" compared to "fair" or "poor" than in the single national FFS sample (Table 8). But health ratings remain worse among all FFS HOS respondents compared to MCO respondents.

Table 12  
Functional Status of HOS Respondents

	Managed Care Respondents								Fee-for-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
				Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper	
<u>Difficulty* in:</u>																
None	98,086	58.6	47.4	54.5	47.4	47.4	54.5	54.5	3,939	59.4	44.3	53.1	43.9	44.6	52.8	53.4
1-2 ADLs	44,211	26.4	33.6	50.7	33.6	33.6	50.7	50.7	1,547	23.3	33.1	50.5	32.7	33.6	50.0	51.1
3-4 ADLs	14,910	8.9	26.5	45.4	26.5	26.5	45.4	45.4	632	9.5	26.4	45.8	25.8	27.0	44.9	46.7
5-6 ADLs	10,157	6.1	25.4	40.5	25.4	25.4	40.5	40.5	516	7.8	24.1	41.3	23.4	24.8	40.3	42.3
*Includes 'unable to perform'																
<u>Unable to perform:</u>																
None	160,376	95.8	41.1	52.2	41.1	41.1	52.2	52.2	6,276	94.6	39.2	51.3	38.9	39.5	51.1	51.6
1-2 ADLs	4,638	2.8	25.8	43.2	25.8	25.8	43.2	43.2	234	3.5	24.8	44.1	23.7	25.8	42.6	45.7
3-4 ADLs	902	0.5	26.0	40.5	26.0	26.0	40.5	40.5	51	0.8	23.9	39.3	21.7	26.2	35.8	42.7
5-6 ADLs	1,448	0.9	32.8	43.4	32.8	32.8	43.4	43.4	73	1.1	25.4	40.2	23.0	27.7	37.5	42.9

**NOTES:**

ADL is activity of daily living.

PCS is physical component score

MCS is mental component score

**OUTPUT:** RUN002, RUN003, RUN020 and RUN024

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/  
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 13  
Distribution of HOS Respondents by Activities of Daily Living

Because of a health or physical problem, do you have any difficulty doing the following activities?	Managed Care Respondents								Fee-For-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
<b>Bathing</b>																
Unable to do	3,993	2.4	28.4	41.7	28.0	28.7	41.3	42.2	231	4.2	24.6	42.1	23.4	25.8	40.6	43.6
Have difficulty	20,044	12.0	26.3	43.8	26.2	26.4	43.6	44.0	904	16.5	26.0	45.0	25.4	26.5	44.2	45.7
No Difficulty	142,760	85.6	42.9	53.3	42.9	43.0	53.2	53.3	4,340	79.3	41.7	52.7	41.4	42.0	52.4	53.0
<b>Dressing</b>																
Unable to do	2,821	1.7	29.5	41.6	29.1	29.9	41.1	42.1	162	3.0	24.4	41.3	22.9	25.8	39.4	43.2
Have difficulty	17,149	10.3	25.8	43.2	25.7	26.0	43.0	43.4	757	13.8	25.2	44.1	24.6	25.8	43.2	44.9
No Difficulty	146,784	88.0	42.5	53.1	42.5	42.6	53.0	53.1	4,547	83.2	41.1	52.5	40.7	41.4	52.2	52.8
<b>Eating</b>																
Unable to do	1,633	1.0	33.5	44.1	32.9	34.1	43.5	44.8	67	1.2	27.7	40.9	25.0	30.4	38.1	43.6
Have difficulty	8,165	4.9	28.0	40.2	27.8	28.2	40.0	40.5	406	7.4	26.9	40.6	26.0	27.9	39.4	41.7
No Difficulty	156,674	94.2	41.3	52.6	41.3	41.4	52.5	52.6	4,977	91.3	39.5	52.0	39.1	39.8	51.7	52.3
<b>Getting in or out of chairs</b>																
Unable to do	2,261	1.4	30.1	42.8	29.6	30.6	42.3	43.4	119	2.2	24.8	40.4	23.1	26.5	38.2	42.5
Have difficulty	42,461	25.5	29.3	47.2	29.3	29.4	47.1	47.4	1,705	31.2	28.6	47.0	28.2	29.1	46.5	47.6
No Difficulty	121,791	73.1	44.7	53.6	44.6	44.8	53.6	53.7	3,637	66.6	43.4	53.2	43.1	43.8	52.9	53.5
<b>Walking</b>																
Unable to do	4,272	2.6	27.2	43.6	26.9	27.6	43.2	44.0	204	3.7	24.2	41.7	23.0	25.3	39.9	43.4
Have difficulty	53,893	32.4	29.6	48.1	29.5	29.7	48.0	48.2	2,065	37.8	28.8	48.0	28.4	29.2	47.5	48.5
No Difficulty	108,343	65.0	46.5	54.1	46.5	46.6	54.0	54.1	3,195	58.4	45.5	53.5	45.1	45.8	53.2	53.8
<b>Using the toilet</b>																
Unable to do	1,985	1.2	31.4	43.2	30.9	31.9	42.6	43.8	98	1.8	26.1	39.8	24.2	28.1	37.6	42.0
Have difficulty	12,033	7.2	26.6	42.4	26.4	26.7	42.2	42.7	559	10.2	25.9	42.7	25.1	26.6	41.7	43.7
No Difficulty	152,677	91.6	41.8	52.7	41.7	41.9	52.7	52.8	4,807	87.9	40.1	52.2	39.8	40.4	51.9	52.4

OUTPUT: RUN002 and RUN003

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/ Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 14

## Distribution of Self-Rated General Health Status Among HOS Respondents

Self-Rated General Health Status	Managed Care Respondents								Fee-For-Service Respondents							
	Number	Percent	PCS	MCS	95% Confidence Intervals				Number	Percent	PCS	MCS	95% Confidence Intervals			
					PCS		MCS						PCS		MCS	
					Lower	Upper	Lower	Upper					Lower	Upper	Lower	Upper
Excellent	10,425	6.2	53.7	57.6	53.5	53.8	57.5	57.7	312	4.7	54.0	57.1	53.3	54.7	56.3	57.9
Very good	41,564	24.7	49.2	56.1	49.2	49.3	56.0	56.2	1,378	20.8	48.5	56.2	48.1	49.0	55.8	56.6
Good	67,070	39.9	41.5	53.2	41.4	41.6	53.1	53.2	2,556	38.6	40.8	52.9	40.4	41.1	52.5	53.3
Fair	39,165	23.3	30.7	46.9	30.6	30.7	46.8	47.0	1,787	27.0	29.6	46.9	29.2	30.0	46.4	47.4
Poor	10,085	6.0	23.6	38.7	23.4	23.7	38.4	38.9	590	8.9	22.8	38.6	22.3	23.4	37.7	39.6

OUTPUT: RUN002 and RUN003

SOURCE: Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/  
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

# 4

## Fee-for-Service/Managed Care Differences in Health Scores Adjusting for Demographic Mix

In this section, we return to comparison of the entire Medicare FFS and MCO populations, as in Section 3.1. But we use multiple regression analysis to simultaneously control for multiple demographic characteristics when comparing FFS and MCO enrollees' health status. This differs from the descriptive analyses in Section 3.1 when at most a single demographic characteristic (e.g., age) was held constant for a comparison. We limit our comparison in this section to FFS/MCO differences in the summary SF-36 physical and mental health scores, PCS and MCS, respectively.

### 4.1 Methods

Tables 15 and 16 present the multiple regression results. The PCS is the dependent variable in Table 15; in Table 16, the MCS is the dependent variable. The sample is the union of the FFS national sample and the entire MCO sample, weighted to reflect plan enrollment. Thus, the results should be representative of the national Medicare FFS and MCO enrollee populations as of 1997.

Each analysis begins with an unadjusted difference of FFS from managed care (Model 1 of Tables 15 and 16). The difference is captured by the coefficient of a binary variable that takes the value '1' when an observation (beneficiary) is from the FFS national sample. The intercept coefficient in Model 1 reflects the mean MCO PCS or MCS score. The FFS mean score is given by the sum of the coefficients of the intercept and the FFS binary variable.



Table 15

Nationally Representative Fee -for-Service/Managed Care Difference in Physical  
Component Score Controlling for Demographic Factors

	1	2	3			
	<u>Unadjusted Difference</u>	<u>Control for Age/Sex</u>	<u>Control for Age/ Sex &amp; Other Demographics</u>			
Number of Observations:	169,539	169,539	169,539			
R-Square	0.0001	0.0995	0.1500			
Adjusted R-Square	0.0001	0.0995	0.1499			
Dependent Variable Mean:	38.16	38.16	38.16			
Root Mean Square Error:	0.7448	0.7069	0.6868			
Model Parameters	2	11	15			
Computer Output:	RUN040.LST	RUN040.LST	RUN040.LST			
	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>	<u>Parameter Estimate</u>	<u>t-ratio</u>
Intercept	40.64	54.57	42.27	59.68	43.06	62.55
FFS Difference from Managed Care	-2.49	-3.34	-1.53	-2.17	-0.88	-1.28
<u>Age/Sex</u>						
Male, 0-54	--	--	-7.33	-44.64	-5.37	-33.09
Male, 55-64	--	--	-6.72	-37.26	-7.44	-42.34
Male, 65-74	--	--	2.12	23.68	1.64	18.78
Male, 75-84	--	--	-3.26	-33.73	-4.31	-45.69
Male, 85+	--	--	-6.29	-41.39	-7.10	-47.98
Female, 0-54	--	--	-8.56	-48.70	-5.92	-34.01
Female, 55-64	--	--	-17.80	-73.53	-18.55	-78.79
Female, 75-84	--	--	-2.58	-31.03	-3.14	-38.79
Female, 85+	--	--	-9.00	-79.68	-9.05	-82.16
<u>Other Demographics</u>						
Medicaid	--	--	--	--	-7.13	-77.76
Originally Disabled	--	--	--	--	-16.08	-51.41
Black	--	--	--	--	-2.55	-23.16
Other Race	--	--	--	--	1.04	7.23

**NOTE:**

Female, 65-74 is the omitted age/sex category in Models 2 and 3, which is captured in the intercept.  
FFS national sample, weighted MCO data.

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/  
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

Table 16

Nationally Representative Fee -for-Service/Managed Care Difference in Mental  
Component Score Controlling for Demographic Factors

	1		2		3	
	<b>Unadjusted Difference</b>		<b>Control for Age/Sex</b>		<b>Control for Age/ Sex &amp; Other Demographics</b>	
Number of Observations:	169,539		169,539		169,539	
R-Square	0.0001		0.1295		0.1701	
Adjusted R-Square	0.0001		0.1294		0.1700	
Dependent Variable Mean:	48.94		48.94		48.94	
Root Mean Square Error:	0.7015		0.6546		0.6391	
Model Parameters	2		11		15	
Computer Output:	RUN040.LST		RUN040.LST		RUN040.LST	
	<b>Parameter Estimate</b>	<b>t-ratio</b>	<b>Parameter Estimate</b>	<b>t-ratio</b>	<b>Parameter Estimate</b>	<b>t-ratio</b>
<b>Label</b>						
Intercept	51.84	73.90	52.80	80.49	53.75	83.9
FFS Difference from Managed Care	-2.90	-4.14	-2.00	-3.06	-1.60	-2.50
<b><u>Age/Sex</u></b>						
Male, 0-54	--	--	-11.53	-75.85	-9.83	-65.08
Male, 55-64	--	--	-12.66	-75.79	-12.95	-79.20
Male, 65-74	--	--	1.44	17.42	0.93	11.43
Male, 75-84	--	--	-1.55	-17.40	-2.44	-27.78
Male, 85+	--	--	-1.77	-12.54	-2.43	-17.64
Female, 0-54	--	--	-14.02	-86.13	-11.77	-72.62
Female, 55-64	--	--	-17.46	-77.90	-17.81	-81.27
Female, 75-84	--	--	-0.66	-8.55	-1.16	-15.36
Female, 85+	--	--	-3.36	-32.16	-3.58	-34.92
<b><u>Other Demographics</u></b>						
Medicaid	--	--	--	--	-5.71	-66.97
Originally Disabled	--	--	--	--	-7.13	24.50
Black	--	--	--	--	-2.53	24.70
Other Race	--	--	--	--	-3.29	24.60

**NOTE:** Female, 65-74 is the omitted age/sex category in Models 2 and 3, which is captured in the intercept.

**SOURCE:** Health Economics Research, Inc. analysis of the Round One Joint Managed Care (May-September 1998 data)/  
Fee-For-Service (June 1998-January 1999 data) Health Outcomes Survey (HOS) Database.

In the second model in Tables 15 and 16, a vector of age/sex cells is added to the regression explanatory variables to control for age/sex mix differences between the FFS and MCO populations. The category "female, 65-74" is omitted to avoid perfect collinearity in the regression. The intercept coefficient now measures the mean PCS or MCS of females, age 65-74 who are enrolled in managed care. All the other age/sex coefficients measure PCS or MCS relative to the intercept term. For example, the coefficient for "male, 0-54" must be added to the intercept coefficient to obtain the mean PCS or MCS for males age 0-54 enrolled in managed care. The coefficient of the FFS binary variable reflects the average FFS difference from managed care, holding constant age/sex mix.

Model 3 in Tables 15 and 16 adds three demographic factors to the explanatory variables: poverty status (Medicaid enrollment), aged originally entitled by disability, and race (divided into white, black, and other race). The omitted categories reflected in the coefficient of the intercept are: not enrolled in Medicaid, not originally disabled, white race, and female, age 65-74. The coefficient of the FFS binary variable now reflects the average FFS difference from managed care holding constant age, sex, and the additional three demographic factors<sup>1</sup>.

Other factors could be held constant when comparing FFS to managed care. We limited ourselves to holding constant the demographic variables shown in Tables 15 and

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<sup>1</sup> Most of the beneficiaries on which the age/sex and other demographic effects are estimated are enrolled in managed care because the sample size of the MCO HOS is much larger than the sample size of the FFS HOS. Therefore, the demographic effects primarily reflect relationships in the MCO population. We estimated the Model 3 regressions in Tables 15 and 16 separately on FFS and MCO samples and found that the relationship of the demographic variables to the PCS and MCS was similar in the two populations.

16 for a few reasons. First, our comparisons are intended as an initial exploratory analysis, not an exhaustive analysis of all possible comparisons that could be analyzed in future work. Second, all the demographic factors analyzed in this section are available for all Medicare enrollees (FFS or managed care) from HCFA administrative files. Other factors, such as education and income, are available only from surveys such as the HOS for a small subset of Medicare beneficiaries, which may limit their general usefulness in making comparisons and adjustments. Third, survey-derived variables such as education and income suffer from substantial item nonresponse. This missing data would reduce our sample sizes and might limit the validity of our regression estimates. Fourth, all the variables that we utilize, with the exception of race, are currently used to adjust HCFA Medicare capitation payments for Medicare + Choice organizations. Controlling for these variables may provide some evidence about health status selection bias between managed care and FFS holding constant payment adjusters.

## **4.2 Results**

Model 1 of Table 15 shows that the unadjusted FFS/MCO difference in PCS is negative 2.49 points, that is, the average PCS among FFS enrollees is 2.5 points lower than among MCO enrollees. This is the same finding as in Table 4 (the 2.4 instead of 2.5 difference in Table 4 in FFS versus MCO PCS is due to rounding). This difference, while small, is both statistically and clinically significant.

When age/sex mix is held constant in Model 2, the FFS difference from managed care falls (in absolute value) to negative 1.53 points. While still statistically significant, this difference falls below our threshold of 2 points and is no longer considered clinically significant. To repeat, we do not find a clinically significant difference in physical health as measured by the PCS between Medicare FFS and managed care enrollees when we hold constant their age/sex mix. Controlling for age/sex mix "explains" (accounts for) 39% of the unadjusted FFS/MCO difference ( $1 - (1.53/2.49) = 0.39$ ).

In Model 3, in addition to age and sex, we control for Medicaid enrollment (poverty status), originally disabled, and race. With these three variables entered, the FFS difference from managed care is reduced to negative 0.88 points. This difference is neither statistically nor clinically significant. The three additional demographic factors explain an additional 26% of the original FFS difference from managed care. Altogether, the demographic factors in Model 3 account for 65%, or about two-thirds, of the FFS/MCO difference in PCS ( $1 - (0.88/2.49) = 0.65$ ).

The pattern is much the same for the MCS, as shown in Table 16. The unadjusted difference is 2.90 points, with FFS enrollees having lower mental health status. This difference is statistically and clinically significant, although relatively small. When age/sex mix is held constant (Model 2), the difference falls to 2.00 points, and remains statistically significant. When the additional demographic factors are added, the difference falls to 1.60 points and remains statistically significant, although it is no longer clinically important. Age/sex alone explains 31% ( $1 - 2/2.9 = 0.31$ ) of FFS/MCO MCS

differences, and all demographic factors simultaneously explain 45% ( $1-1.6/2.9=0.45$ ) of the difference. Hence, a somewhat smaller percentage of mental health than physical health differences are explained by demographic factors.

The pattern of demographic coefficients in Tables 15 and 16 is plausible. As shown in Model 3 of Table 15, the under-age-65 disabled have poorer physical health status than the younger elderly. Disabled females aged 55 to 64 report particularly poor physical health status. As expected, the older elderly also report poorer physical health status than the younger elderly. Men seem to report slightly better physical health than women in most age ranges, but differences by sex are not pronounced. Blacks and Medicaid enrollees have poorer health status than whites and non-dual eligibles, respectively. The originally disabled report particularly poor physical health status, holding other factors constant.

Model 3 of Table 16 shows that the under-age-65 disabled report considerably poorer mental health than the younger elderly. This is not surprising since many of the disabled have mental disabilities, and all are not able to work. Reported mental health is only slightly worse among the older elderly than the younger elderly. Perceptions of well being seem to decline more slowly with age than physical health. Women report slightly worse mental health than men at most age ranges, but the differences by sex are again small. Medicaid enrollees, the originally disabled, and nonwhites all report poorer mental health.

# 5

## Conclusion

This report has compared the average health status of Medicare FFS and managed care enrollees. All population-based comparisons show that Medicare FFS enrollees are in poorer health status than managed care enrollees, although the magnitude of the difference varies depending on the particular measure. The prevalence of chronic disease is higher in the FFS population. In the FFS population, 18.9% report angina versus 15.7% in the managed care population; 8.7% in FFS report congestive heart failure versus 6.7% in managed care; 13.9% report previous heart attack in FFS versus 10.4% in managed care; 10.3% report prior stroke versus 8.0% in managed care. The prevalence of some other chronic diseases is more similar among FFS and managed care enrollees, but only one of 13 chronic diseases (emphysema) is (slightly) more prevalent among managed care enrollees, and this may be accounted for by random small sample variation in the FFS sample.

In terms of functional status, 59% of managed care enrollees have no limitations in any activities of daily living versus only 50% with no limitations in FFS. And 8% of FFS enrollees have difficulty with 5 or 6 activities of daily living versus 6% of managed care enrollees with similar functional impairment. A full 41% of FFS enrollees have difficulty walking compared to 32% of managed care enrollees. Also, 41% of FFS enrollees report themselves to be in "poor" or "fair" health versus only 28% of managed care enrollees.

Convenient summary measures of physical and mental health can be calculated from the SF-36 or SF-12 questions included on the HOS. They summarize 8 health concepts--physical functioning, role physical, bodily pain, general health, vitality, mental health, role emotional, and social functioning. Comparison of the summary SF-36 health scales show that the FFS population is in poorer physical and mental health than the managed care population, but the differences are relatively small. The SF-36 physical health summary score, the PCS, is 40.6 points on average for the managed care population versus 38.2 points for the FFS population, for a difference of 2.4 points. This difference is statistically and clinically significant, but relatively small. Similarly, the mental health summary score (MCS) difference between the two populations is only 2.9 points, 51.8 for managed care versus 48.9 for FFS. Again, this is a statistically and clinically significant difference, but a relatively small one.

Moreover, much of the FFS/MCO differences in summary physical and mental health scores disappear when adjustments are made for the demographic mix of the two populations. Holding constant age, sex, race, poverty status (Medicaid enrollment), and original entitlement by disability eliminates about two-thirds of the mean FFS/MCO difference in physical health score and half of the mean difference in mental health score. The remaining difference in physical health score between the two populations is neither statistically nor clinically significant; the remaining difference in mental health score is statistically, but not clinically significant. For those who responded (see following paragraph), if we focus on the SF-36 PCS and MCS summary physical and mental health



results, the impression that the Medicare FFS population is, on average, in much worse health than the Medicare MCO population is not borne out.

The major limitations of our analysis are survey nonresponse bias, small FFS sample size, and limited analysis of demographic and other factors possibly accounting for FFS/managed care differences. The response rates to the FFS and MCO are 60% to 70%, which means that 30% to 40% of eligible respondents did not respond. Beneficiaries expected to be in poorer health status, such as the under-age-65 disabled, very old, poor (Medicaid enrolled), and minorities are less likely to respond. Depending on the relative proportions of sick and healthy beneficiaries in the FFS and managed care populations and their relative survey response rates, HOS respondents could misrepresent the true health status differences among FFS and managed care enrollees. Also, we had a relatively limited FFS national sample of 617 respondents. Especially in analysis of rare events (e.g., low prevalence chronic diseases or highly functionally impaired beneficiaries) small sample sizes create random error that can bias statistical comparisons.

We conducted limited analysis of factors explaining FFS/MCO differences. Many more analyses of this type could be done in future work, such as controlling for demographic factors when comparing functional status or self-reported general health among FFS and MCO populations. Also, in further work, perhaps the geographic distribution of the populations could be adjusted for. The MCO population, in particular, is highly concentrated in a few states and market areas, which could affect its average health status scores.

Interpretation of differences in FFS and managed care health status is challenging. Differences are subject to alternative interpretations and conflicting results from alternative measures. There is no absolute consensus on what constitutes a "large" or "small" difference in health status between two populations on a single health status measure, such as the SF-36 summary health scores. Moreover, health is multi-dimensional and the magnitude of the difference between two populations may appear larger or smaller when comparing different dimensions of health, or when developing alternative summary measures of health with variant weightings of individual dimensions.

In this study, we did not examine the relationship of self-reported health status to medical expenditures. Moreover, none of the measures or scales of health that we employed, including the SF-36 summary scales of health, are calibrated in terms of their relationship to dollars of medical expenditures. For these reasons, and possible bias from nonresponse (see earlier discussion), the results of this study should not be used to infer differences, or lack of differences, in the costliness of medical care required by the Medicare fee-for-service and managed care populations.

A simplified, hypothetical numerical example demonstrates why the results of this study cannot be used to infer differences in medical costliness, or appropriate payment level differences, among Medicare fee-for-service and managed care populations. The hypothetical example is shown in Table 17. For simplicity, we assume that there are only

Table 17

**Hypothetical Simulation of Mean Health Score vs. Medical Expenditure  
Differences Among Fee for Service and Managed Care Populations**

	<u>Fee for Service</u>		<u>Managed Care</u>	
	<u>Healthy</u>	<u>Sick</u>	<u>Healthy</u>	<u>Sick</u>
% of population	85	15	90	10
Health score	45	25	45	25
Medical expenditures	\$2,500	\$20,000	\$2,500	\$20,000
Average health score		42.0		43.0
Average medical expenditures		\$5,125		\$4,250

SOURCE: Health Economics Research, Inc.

two types of Medicare beneficiaries, "healthy" and "sick". Healthy beneficiaries have a health score of 45, where a higher score indicates better health, and incur medical expenditures of \$2,500. Sick beneficiaries have a lower health score of 25 and incur higher medical expenditures of \$20,000.

Although these assumptions are hypothetical, they are not arbitrary. The assumptions about the health scores of the "healthy" and "sick" are not implausible given the actual distribution of SF-36 physical component scores shown in Figure 3 of this report. A physical component score of 25 is two standard deviations below a score of 45, indicating substantially worse health<sup>1</sup>. Moreover, Table 2-2 of Pope *et al.* (1999) shows that the 90<sup>th</sup> percentile annualized expenditure for Medicare beneficiaries in 1996 was

<sup>1</sup> The SF-36 scores are scaled to have a US population mean of 50 and a standard deviation of 10.

\$16,761 and the 95<sup>th</sup> percentile expenditure was \$30,798. That is, 10% of Medicare beneficiaries had 1996 expenditures greater than \$16,761 and 5% had expenditures greater than \$30,798. So a mean expenditure of \$20,000 for the "sick" is not implausible.

Returning to the example in Table 17, we further hypothesize that the Medicare fee for service population is composed of 85% healthy beneficiaries and 15% sick beneficiaries, while the Medicare managed care population is composed of 90% healthy beneficiaries and 10% sick beneficiaries. That is, we assume that there is some "adverse selection" against the Medicare fee for service population, that it contains a higher proportion of sick beneficiaries. With these assumptions, we then calculate the hypothetical mean health scores and expenditures of the Medicare fee for service and managed care populations. The means are the health scores or expenditures of the "healthy" and "sick" weighted by their proportions in the two populations. For example, the mean health score of the fee for service population is  $0.85*45 + 0.15*25 = 42$ .

The results (shown in Table 17) are that the mean health scores of the two populations differ by only 1 point (42 fee for service versus 43 managed care), or 2%, whereas mean expenditures differ by \$875, or 21% (\$5,125 fee for service versus \$4,250 managed care). The costliness of the fee for service population relative to managed care is much greater than might be (incorrectly) inferred from its only slightly lower average health score. Hypothetically, the \$875 lower average cost per enrollee in managed care could sum to nearly \$5 billion total lower costs if cumulated across 5.7 million Medicare managed care enrollees.

Of course, this example is only hypothetical. We have not investigated in this study the relative costliness of the Medicare fee for service and managed care populations. But the example shows that it is possible to use plausible assumptions to generate results similar to those that we have found for certain indices of health—a small fee for service/managed care difference in average health scores—that is consistent with a much greater average medical costliness of fee for service enrollees relative to managed care enrollees. These seemingly paradoxical results arise from the well-known extremely skewed distribution of medical expenditures, and the fact that the health scores analyzed in this report are not calibrated in terms of dollars of medical expenditures. Our conclusion is that it is unwarranted to use the results of our study to make any inferences concerning the relative expected medical costliness of Medicare fee for service enrollees versus managed care enrollees.

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