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SAMPLE

2021 MEDICARE

HEALTH OUTCOMES

SURVEY-MODIFIED

REPORT

MEDICARE HEALTH OUTCOMES SURVEY

CENTERS
FOR MEDICARE
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HEALTH
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ADVISORY
GROUP

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, Maryland 21244-1850

CENTER FOR MEDICARE

October 2022

PACE organizations,

The Centers for Medicare & Medicaid Services (CMS) is pleased to provide you with your organization's results from the 2021 Medicare Health Outcomes Survey-Modified (HOS-M). The HOS-M, which is an abbreviated version of the Medicare Health Outcomes Survey (HOS), assesses the physical and mental health functioning of enrollees in Program of All-Inclusive Care for the Elderly (PACE) organizations to generate information for payment adjustment.

The HOS-M Report focuses on specialized plans serving frail and elderly beneficiaries, and summarizes demographic information, physical and mental health status, and selected health status measures. Additionally, in each respective plan report, the health status indicators of the plan's enrollees are compared to the combined Medicare HOS-M sample averages (HOS-M Total).

CMS encourages participating PACE organizations to examine their results for use in quality improvement activities. You may submit inquiries to hos@hsag.com, or contact Health Services Advisory Group through the HOS Information and Technical Support telephone line at (888) 880-0077, and you may visit the CMS HOS website at www.cms.gov/Research-Statistics-Data-and-Systems/Research/HOS/index.html for more program information.

Sincerely,

Elizabeth Goldstein, PhD
Director
Division of Consumer Assessment & Plan Performance

Medicare Health Outcomes Survey-Modified Sample Plan Report

The following is a **sample** version of the 2021 Health Outcomes Survey-Modified (HOS-M) Report made available to all PACE Organizations participating in the 2021 Medicare HOS-M Survey.

The figures, tables, and text in this document contain example plan-level data; however, all references to the *HOS-M Total* reflect **actual** summary data for all organizations.

The Medicare HOS Information and Technical Support Telephone Line (1-888-880-0077), and HOS email address (*hos@hsag.com*), are available to provide assistance with report questions and interpretation. A full description of the HOS program may be found at *www.HOSonline.org*.

Table of Contents

Executive Summary

Originally entitled the Program of All Inclusive Care for the Elderly (PACE) Health Survey, the Medicare Health Outcomes Survey-Modified (HOS-M) is administered to frail and elderly people with Medicare who are at greatest risk for poor health outcomes[1] and are enrolled in PACE organizations.[2,3]

A study comparing enrollees in the PACE program and Special Needs Plans (SNPs) with enrollees in other Medicare Advantage (MA) health plans found significant differences in health status.[4] The study used the Medicare HOS *2010 Cohort 13 Baseline* data on SNPs and other traditional MA plans, and the 2010 HOS-M data on PACE. This report indicated that specialized PACE and SNP plans report lower levels of physical and mental health outcomes than other MA plans, and the findings were consistent with those from previous years.[5] Mean physical and mental health scores for specified, at-risk members reporting urinary incontinence, depressed mood, obesity, and proxy response were lowest for PACE organizations, followed by SNPs, and were highest for other MA plans.

The main goal of the HOS-M is to assess the frailty of this population so that the Centers for Medicare & Medicaid Services (CMS) can appropriately adjust Medicare payments to the PACE organizations.

2021 HOS-M Sample

For the 2021 HOS-M, all eligible members in PACE organizations with fewer than 1,200 enrollees were surveyed. For larger plans having 1,200 or more enrollees, a random sample of 1,200 eligible members was selected. The combined total sample for the 2021 HOS-M included 37,792 members from 131 PACE organizations. This marked a decrease from the 38,624 members included in the 2020 HOS-M. Initial sample eligibility is based on community-residing members who do not have end-stage renal disease (ESRD) and are age 55 or older. After excluding an additional 3,322 ineligible members, the *2021 HOS-M eligible sample* was 34,470. For details on sampling eligibility, see Appendix 1. Of the 34,470 members in the eligible sample, 18,171 completed the survey, which is a response rate of 52.7%. These 18,171 members comprise the *2021 HOS-M analytic sample.* The mean age of the respondents in the analytic sample was 77.0 years; 68.5% were female; 64.9% were White; and proxy respondents filled out 46.5% of the surveys.

Trends in Health Status Measures for PACE HXXXA

The primary health status measures for the HOS-M are the physical component summary (PCS) and mental component summary (MCS) scores. Algorithms based on norms established in 1990 are used to score PCS and MCS. These algorithms yield favorably scored (i.e., higher is better) measures with a mean of 50 and a standard deviation of 10 in the general U.S. population. In general, functional health status as measured by the PCS score, is expected to decline in older age groups, while mental health status, as measured by the MCS score, declines at a slower rate.[6]

Table 1 shows the trends in mean unadjusted PCS and MCS scores and the corresponding standard deviations (SD) over the current and previous two years, where available for your PACE organization. The direction of these trends reflects the overall physical and mental health status of your plan's respondents across time. Though the demographics of your members may change over time, negative trends are associated with poorer health status as indicated by responses across those questions comprising the PCS and MCS scores. Additional information about the summary scores is available in the 2021 HOS-M Results section and Appendix 1.

Table 1: Trends in Mean Unadjusted PCS and MCS Scores over Three Years for PACE HXXXA

Years	Unadjusted PCS Score Mean (SD)	Unadjusted MCS Score Mean (SD)
2021 HOS-M	29.5 (10.6)	44.1 (13.0)
2020 HOS-M	28.5 (10.7)	43.5 (12.7)
2019 HOS-M	28.4 (10.6)	43.6 (13.4)

NA in a row indicates that the plan did not have results for the HOS-M year.

Trends in Activity of Daily Living (ADL) Results for PACE HXXXA

The table below shows the distribution of members with ADL impairments over the current and previous two years, where available for your PACE organization. The direction of these trends reflects the overall physical functioning of your plan's respondents across time. Additional information about the ADL results is available in the 2021 HOS-M Results section.

Table 2: Trends in ADL Impairments* Over Three Years for PACE HXXXA

Years	Bathing N (%)	Dressing N (%)	Eating N (%)	Chair Transfer N (%)	Walking N (%)	Toilet Use N (%)
2021 HOS-M	162 (56.3%)	123 (42.7%)	50 (17.4%)	166 (57.6%)	222 (77.6%)	86 (30.3%)
2020 HOS-M	458 (60.5%)	333 (43.8%)	138 (18.1%)	419 (55.3%)	597 (78.4%)	287 (37.8%)
2019 HOS-M	543 (67.6%)	400 (50.2%)	144 (18.1%)	480 (60.4%)	624 (77.7%)	358 (44.9%)

* Members responding "*Yes, I have difficulty*" or "*I am unable to do this activity*" are considered to have ADL Impairment.
NA in a row indicates that the plan did not have results for the HOS-M year.

Program Highlights

The Program Highlights section summarizes the Medicare HOS-M program and provides resources to help PACE organizations use their HOS-M reports and data. The section provides information about website content, webinars, and program updates. For further assistance, please refer to the Technical Assistance information below.

Technical Assistance

The Medicare HOS Information and Technical Support Telephone Line (1-888-880-0077) and Email Address (hos@hsag.com) are available to provide assistance with report questions and interpretation. The CMS HOS website provides general information about the HOS program (www.cms.gov/Research-Statistics-Data-and-Systems/Research/HOS/index.html). A full description of the HOS-M is available at www.HOSonline.org.

HOS Website

The HOS website is a resource that provides:

- Historical overview of the project
- Updates on project activities
- Reports of ongoing research efforts
- Access to public use files and supporting documentation
- Clearinghouse of electronic information about journal articles, bibliographies, and technical reports relating to the HOS and HOS-M
- Links to project partners

About the Medicare HOS-M

The Medicare HOS-M was fielded for the first time in 2002 as the PACE Health Survey, and was renamed in 2005 as the HOS-M. It is a modified version of the Medicare HOS. The HOS-M is administered annually by CMS to frail elderly and predominantly dually-eligible members (i.e., recipients of both Medicare and Medicaid) in PACE organizations to adjust plan payments based on the frailty of their members. Together, the HOS and the HOS-M are the first patient-reported outcomes measures in Medicare managed care, and therefore are a critical part of assessing health plan quality.

Similar to the HOS, the HOS-M design uses a sample of health plan members from each participating PACE organization. Unlike the HOS, the HOS-M is a cross-sectional survey that measures the physical and mental health functioning of the sample at a single point in time without a follow-up.

The HOS-M instrument contains ADL items as the core items used to calculate the frailty adjustment factor.[7] The HOS-M instrument also contains the Veterans RAND 12-Item Health Survey (VR-12)[A] to further assess the physical and mental health functioning of the health plan members in PACE organizations.[8,9] The HOS and HOS-M survey instruments can be downloaded from NCQA's website (www.ncqa.org/hedis/measures/hos). The sample report may be downloaded from the HOS-Modified page as well as the Sample Reports page of the Resources section on the HOS website (www.HOSonline.org). Additional information about the HOS program, sampling methodology, and HOS-M instrument is available in Appendix 1.

Semiannual HOS Newsletters

The HOS Newsletters include information about HOS products, services, and timelines; program updates; self-paced training programs; and other relevant topics, such as sharing of best practices, and highlights of recent research. HOS Newsletters are circulated semiannually via email, in spring and fall, to Medicare Advantage Organization (MAO) and PACE contacts and users of HOS technical support. HOS Newsletters are also posted on the HOS website. If you would like to receive the HOS Newsletters, contact the HOS Information and Technical Support team at hos@hsag.com.

CMS Approved Survey Vendors

The HOS-M Survey Vendors section on the Program page of the HOS website provides an annual list of CMS approved survey vendors. Survey vendors are required to reapply for approval each year. A single survey vendor administers the HOS-M, while several survey vendors administer the HOS.

Frequently Asked Questions (FAQs)

The "FAQs" link at the bottom of site webpages (www.HOSonline.org) provides answers to frequently asked questions about the Medicare HOS and HOS-M. Examples are questions about where to find the current survey administration documents and HOS questionnaires, how MAOs and PACE organizations may obtain their reports and data, and where to find quality improvement ideas. Information is also provided about the types of files available for researchers and how to obtain the files.

[A] The VR-12 questions are also included in the HOS and are used to calculate measures applied in the CMS Medicare Star Ratings. HOS-M survey results are not used to calculate Medicare Star Ratings.

Self-Paced Training Webinars

A series of self-paced training webinars are available on the HOS website. The webinars are approximately 30 minutes in length and may be accessed at any time at the convenience of the user. To access the webinars, go to the Trainings section under the Resources page on the HOS website (www.HOSonline.org).

- **Introduction to the Medicare Health Outcomes Survey (HOS):** a basic training session appropriate for MAOs that are new to the HOS and HOS-M or those wanting to obtain an overview of the HOS. Additionally, the introductory training program provides some practical guidance about how to obtain HOS reports and data.
- **Getting the Most from Your Medicare Health Outcomes Survey (HOS) Baseline Report:** an intermediate training session that builds on the information from the basic tutorial described above. The session discusses maximizing use of the HOS report to provide information on the health of members and incorporating chronic care improvement programs (CCIPs). Many concepts covered are applicable to HOS-M reports as well.

Resources for Best Practices

A resource guide titled "Opportunities for Improving Medicare HOS Results through Practices in Quality Preventive Health Care for the Elderly" is available on the HOS website at www.HOSonline.org.[10] This guide helps MAOs and PACE organizations develop and apply strategies that address items in the HOS and HOS-M questionnaires. Section 1 discusses the prevalence of conditions measured by the HOS items and summarizes national HOS results to highlight opportunities for improvement and intervention strategies. Section 2 provides examples of interventions that some MAOs have used to promote patient/physician communication, screening services, or maintenance of functional status among their members.

A companion literature review titled "Functional Status in Older Adults: Intervention Strategies for Impacting Patient Outcomes" is also available on the HOS website at www.HOSonline.org.[11] This literature review synthesizes selected articles about functional status outcomes in older adults and supplements the resource guide. The articles include outcomes that target assessments of health from well-established questionnaires spanning the physical to psychological. In addition, outcome measures include ADLs that capture functional limitations in MA members. The articles were selected because they describe interventions that could impact functional status outcomes in elderly populations.

Veterans RAND 12-Item Health Survey (VR-12) Website

Information about the VR-36, VR-12, and VR-6D instruments is available on the Boston University School of Public Health website. The website offers details on the development, applications, and references for the VR-12, which is the core health outcomes measure in the Medicare HOS and HOS-M. For information about the instruments and to request permission to use the documentation and scoring algorithms, go to: www.bu.edu/sph/about/departments/health-law-policy-and-management/research/vr-36-vr-12-and-vr-6d.

HOS-M Reports and Data Distribution

The Medicare HOS-M reports provide analysis of the aggregate data gathered from PACE organization members and present results and overall findings for the PACE organization sample. The member-level data file provides the sample and survey data that were compiled for each individual member surveyed in the PACE organization. Distribution of HOS-M reports occurs electronically to participating PACE organizations through the CMS Health Plan Management System (HPMS). After the HPMS memo is posted in the Fall to announce availability of HOS-M reports and data, it is important for PACE organizations to obtain their reports through HPMS and to request their member-level data through the HOS Technical Support Email at hos@hsag.com.

Please visit the following CMS site for information on how to establish access to HPMS: www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/HPMS/UserIDProcess.html. If assistance is required regarding HPMS access, contact CMS at hpms_access@cms.hhs.gov. The HOS-Modified page on the HOS website has program timelines and other useful information about report and data distribution.

2021 HOS-M Results

This report presents the 2021 Medicare HOS-M results for PACE HXXXA and the HOS-M Total, which represents the aggregated results for all participating PACE organizations. Percentages in tables and graphs may not add to 100% due to rounding. *Please be advised that the information in this report is not suitable for contract level comparisons. Therefore, these data should not be used for public release or marketing purposes.*

Response Rates and Distribution of the Sample

The 2021 HOS-M included a sample of 37,792 members, including both aged and disabled members, from 131 specialized PACE organizations. Of the 37,792 sampled, 3,322 were determined to be ineligible during the survey administration. Ineligible members met one of the following criteria: deceased; not enrolled in the health plan; bad address and phone number; language barrier; bad address and mail-only protocol (*Russian only*); or removed from the sample due to death, institutionalization, or disenrollment after the sample was drawn. Removing the ineligible members from the total sample yielded the *2021 HOS-M eligible sample* of 34,470.

Of the 34,470 members in the eligible sample, 18,171 completed the survey, which is a response rate of 52.7%. These 18,171 members comprise the *2021 HOS-M analytic sample.* For the purposes of this report, a completed survey was defined as one that could be used to calculate a PCS or MCS score.

The definition of a completed survey, and hence the response rates, are calculated differently for frailty adjusted payments. For frailty adjustment purposes, a survey is defined as complete if all six ADL items are answered. Response rates and ADL distributions considered for payment purposes are reported separately in the CMS HPMS.

For the analytic sample in 131 PACE organizations, the average number of respondents per organization was 139, with a minimum of 14 and a maximum of 740 respondents. The middle fifty percent of the organizations had between 51 and 178 respondents. Ten percent of the organizations had 317 or more respondents and ten percent had 35 or fewer respondents. Organizations with a small number of respondents should exercise **caution** when drawing conclusions from the results as the sample size may be insufficient to allow meaningful interpretation.

Table 3 on the following page illustrates the distribution of the sample and the response rates for the HOS-M Total and your PACE organization. All analyses in this report use the HOS-M Total analytic sample. The denominator for percentages reported in the tables and figures is the number of non-missing responses for each measure. Due to missing data for the measured item (or question), a denominator may be less than the 18,171 respondents in the analytic sample. For more information on the HOS-M sampling, refer to Appendix 1.

Table 3: 2021 HOS-M Response Rates for PACE HXXXA and HOS-M Total

Sample	Sample Size[a] N	Ineligible[b] N	Eligible Sample N	Non-respondents N	Analytic Sample[c] N	Response Rate[d] %
HOS-M Total	37,792	3,322	34,470	16,299	18,171	52.7%
HXXXA	737	94	643	351	292	45.4%

[a] Members are sampled for the HOS-M if they are enrolled in participating PACE organizations, reside in the community, do not have End Stage Renal Disease (ESRD), and are age 55 or older.
[b] Ineligible includes deceased, not enrolled in health plan, bad address and phone number, language barrier, bad address and mail-only protocol (*Russian only*), or removed from sample due to death, institutionalization, or disenrollment after the sample is drawn.
[c] Analytic sample includes respondents for whom PCS or MCS scores can be calculated. This definition is different from that used in frailty adjustment calculations in which a survey is defined as complete if all six ADL items are answered.
[d] Response Rate = [(Analytic Sample/Eligible Sample) x 100%].

Demographic Characteristics of the Sample

Table 4 presents the distribution of survey respondents by demographic characteristics for your PACE organization and the Medicare HOS-M Total. The largest percentages of the HOS-M Total respondents within each demographic category were: age 85 or older; female; and White.

Table 4: 2021 HOS-M Demographics for PACE HXXXA and HOS-M Total

Demographic	Plan HXXXA N (%)	HOS-M Total N (%)
Age	(N=292)	(N=18,171)
55-64	22 (7.5%)	1,677 (9.2%)
65-69	40 (13.7%)	2,735 (15.1%)
70-74	66 (22.6%)	3,386 (18.6%)
75-79	64 (21.9%)	3,071 (16.9%)
80-84	50 (17.1%)	2,940 (16.2%)
85+	50 (17.1%)	4,362 (24.0%)
Gender	(N=292)	(N=18,171)
Male	92 (31.5%)	5,731 (31.5%)
Female	200 (68.5%)	12,440 (68.5%)
Race	(N=292)	(N=18,171)
White	109 (37.3%)	11,793 (64.9%)
Black	168 (57.5%)	2,988 (16.4%)
Asian	1 (0.3%)	1,105 (6.1%)
Hispanic	12 (4.1%)	1,467 (8.1%)
Other/Unknown	2 (0.7%)	818 (4.5%)

Physical (PCS) and Mental (MCS) Component Summary Scores

Definition of Measures

- The core outcomes measures for the HOS-M are the PCS and MCS scores. These scores are calculated from the VR-12 (Questions 1 and 6-11 of the 2021 HOS-M), which asks respondents about their usual activities and how they would rate their health. PCS and MCS scores are scaled from 0 to 100, and higher scores reflect better health status.

The PCS score is a reliable and valid measure of physical health. For the PCS, very high scores indicate no physical limitations, disabilities, or decline in well-being; a high energy level; and a rating of health as "excellent."

The MCS score is a reliable and valid measure of mental health. For the MCS, very high scores indicate frequent positive affect, absence of psychological distress, and no limitations in usual social and role activities due to emotional problems. The MCS may also be used as a screening tool for depression risk. Previous research suggested that individuals from a sample of the 1998 U.S. general population who had an MCS score of 42 or below were at increased risk for depression.[6] However, more recent results suggest an MCS score of 48 or below is a reasonably predictive cut-off for depression risk in the elderly Medicare population.[12]

Figure 1 below presents the mean PCS and MCS scores for your PACE organization and the HOS-M Total.

Figure 1: 2021 HOS-M Mean PCS and MCS Scores for PACE HXXXA and HOS-M Total

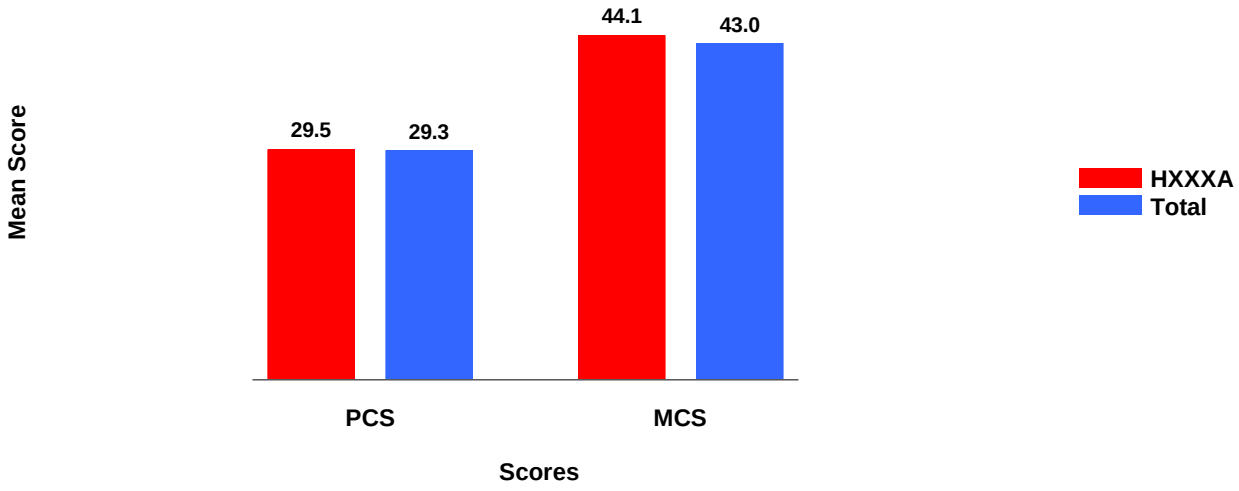


Table 5 on the following page depicts the mean PCS and MCS scores by demographic characteristics. NA in the table indicates there is no information in the category and NC indicates that an SD could not be calculated.

Table 5: 2021 HOS-M Mean PCS and MCS Scores by Demographic Characteristics for PACE HXXXA and HOS-M Total

Demographic	Plan HXXXA		HOS-M Total	
	PCS Mean (SD)	MCS Mean (SD)	PCS Mean (SD)	MCS Mean (SD)
Age				
55-64	31.4 (11.5)	38.8 (11.7)	29.5 (10.9)	41.5 (13.6)
65-69	32.7 (13.1)	43.5 (14.0)	30.1 (11.0)	42.5 (13.1)
70-74	29.8 (9.5)	42.6 (12.9)	30.0 (10.8)	43.2 (13.1)
75-79	27.8 (10.4)	45.1 (12.7)	29.7 (10.6)	43.6 (13.1)
80-84	28.4 (10.0)	45.8 (13.7)	29.1 (10.8)	43.7 (13.3)
85+	28.9 (9.8)	46.0 (12.1)	27.9 (10.3)	43.0 (13.7)
Gender				
Male	32.1 (11.6)	44.0 (11.5)	31.2 (11.4)	43.7 (13.2)
Female	28.3 (9.9)	44.2 (13.7)	28.4 (10.3)	42.7 (13.4)
Race				
White	28.7 (11.0)	42.6 (13.9)	29.0 (10.7)	42.9 (13.4)
Black	30.0 (10.4)	45.6 (12.1)	29.4 (10.7)	44.4 (13.2)
Asian	44.2 (NC)	56.8 (NC)	30.8 (11.4)	42.7 (13.4)
Hispanic	29.1 (9.8)	37.0 (13.7)	29.5 (10.6)	41.2 (13.0)
Other/Unknown	24.5 (8.8)	35.7 (13.2)	29.8 (10.6)	44.0 (12.4)

General Health and Comparative Health

Definition of Measures

- General self-rated health status is a measure of people's perception of their health using ratings of "Excellent," "Very good," "Good," "Fair," or "Poor."[13] This measure is found in Question 1 of the HOS-M.
- Two measures of physical and mental health compared to one year ago use ratings of "Much better," "Slightly better," "About the same," "Slightly worse," or "Much worse." These measures are found in Questions 12 and 13.

Figures 2, 3, and 4 depict the distribution of responses with respect to three self-reported health items: the respondents' general health status; physical health compared to one year ago; and mental health compared to one year ago. Individuals who indicate that their general health was "Fair" or "Poor," or that their physical or mental health compared to one year ago was "Slightly worse" or "Much worse" are known to be at increased risk for near future hospitalization, use of mental health services, and/or mortality.[14,15]

Figure 2 on the next page displays the respondents' self-reported general health status for your PACE organization and the HOS-M Total. A majority of the HOS-M Total respondents reported their general health was "Fair" or "Poor." This result reflects similar findings in a research study that compared health status and quality of care received by people with Medicare enrolled in specialized managed care plans, including PACE organizations, to MA members enrolled in traditional models of care.[5] The 2008 and 2009 HOS-M, and the HOS *2008 Cohort 11 Baseline* and *2009 Cohort 12 Baseline* data were used for the analyses.

Nearly two-thirds of HOS-M respondents in PACE organizations reported self-rated general health of “Fair” or “Poor” when compared to less than one-third of MA members in traditional models of care that reported in these categories. The study also highlights other areas where PACE respondents did more poorly compared to the other MA members, such as having lower PCS and MCS scores, and having greater difficulty performing all ADLs.[5]

Figure 2: 2021 HOS-M General Health Status for PACE HXXXA and HOS-M Total

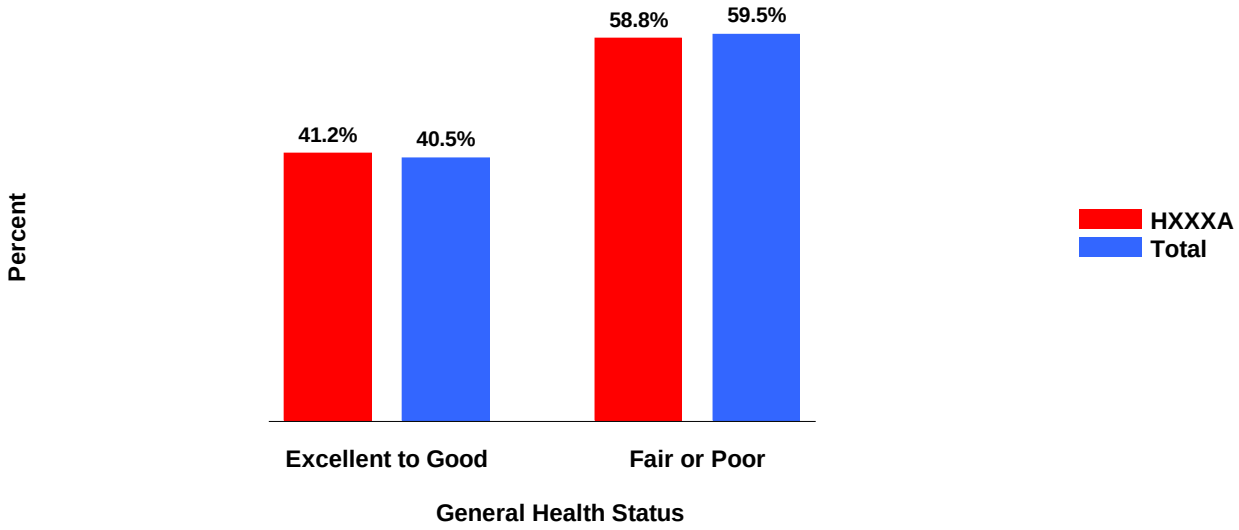


Figure 3 displays the respondents’ self-reported physical health status as compared to one year ago for your PACE organization and the HOS-M Total.

Figure 3: 2021 HOS-M Physical Health Compared to One Year Ago for PACE HXXXA and HOS-M Total

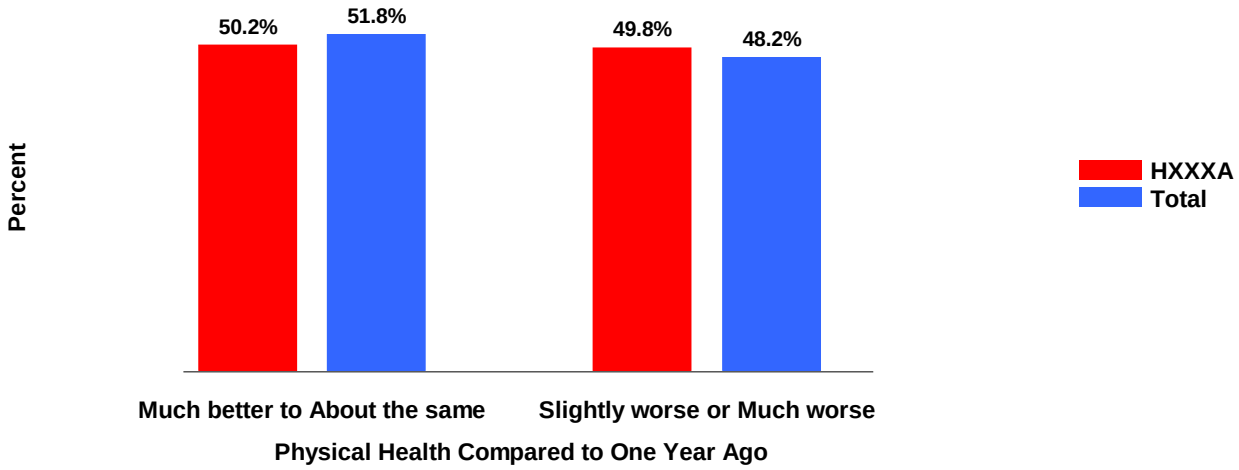


Figure 4 displays the respondents' self-reported mental health status as compared to one year ago for your PACE organization and the HOS-M Total. The results in Figure 3 and Figure 4 indicate that physical health deteriorates much faster than mental health for PACE members.

Figure 4: 2021 HOS-M Mental Health Compared to One Year Ago for PACE HXXXA and HOS-M Total

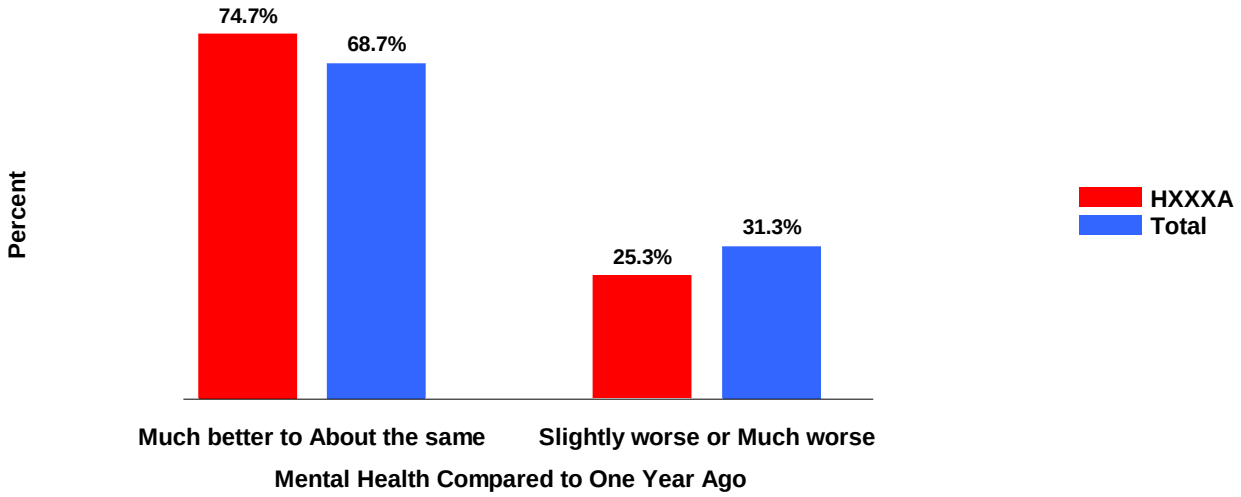


Figure 5 provides the mean PCS scores for your PACE organization and the HOS-M Total by respondents' self-reported general health status.

Figure 5: 2021 HOS-M Mean PCS Scores by General Health Status for PACE HXXXA and HOS-M Total

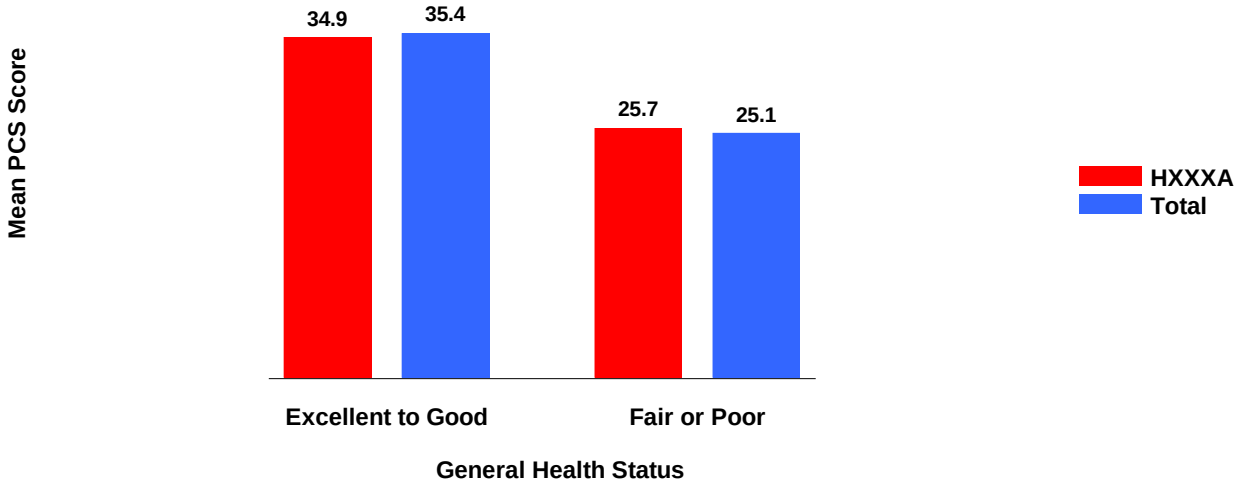
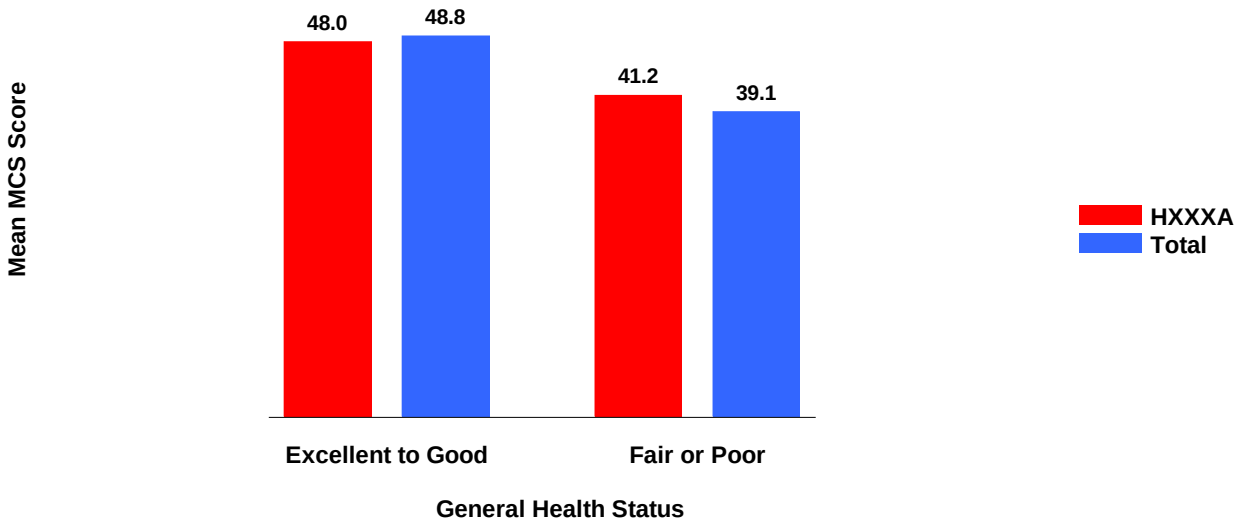


Figure 6 shows the mean MCS scores for your PACE organization and the HOS-M Total by respondents' general health status.

Figure 6: 2021 HOS-M Mean MCS Scores by General Health Status for PACE HXXXA and HOS-M Total



Activities of Daily Living

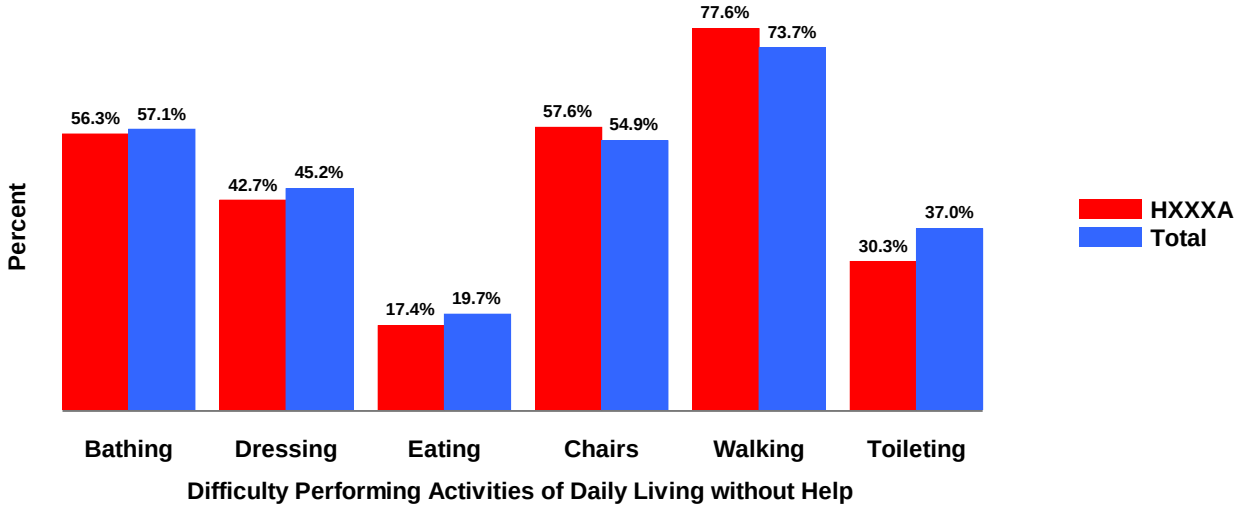
Definition of Measures

- ADLs refer to a set of common daily tasks that are necessary for personal self-care and independent living.[16] ADLs include bathing, dressing, eating, getting in or out of chairs, walking, and using the toilet. These measures are found in Question 4 in the HOS-M. Impairment with ADLs is defined as individuals who reported either difficulty or inability to perform the specific ADL ("Yes, I have difficulty" or "I am unable to do this activity").

The ability to perform these tasks is predictive of current disease status and mortality risk.[17,18] Therefore, regular assessment of functional status is recommended when measuring the effectiveness of care for older adults, and those living with dementia.[16]

Figure 7 on the following page shows the percentages of respondents who reported difficulty performing each of the ADLs without special equipment or help from another person. As previously described, these results include respondents for whom PCS or MCS scores could be calculated. The results in Figure 7 may differ from the frailty adjustment results reported on HPMS because of differences in the selection criteria for each analytic sample. The frailty results reported on HPMS include only respondents for whom all six ADL questions were answered.

Figure 7: 2021 HOS-M Difficulty Performing Activities of Daily Living without Help for PACE HXXXA and HOS-M Total



The HOS-M also asked whether respondents received help from another person in performing any of the six ADLs. Figure 8 shows the percentages of respondents who reported receiving help with each of the ADLs.

Figure 8: 2021 HOS-M Receiving Help from another Person to Perform Activities of Daily Living for PACE HXXXA and HOS-M Total

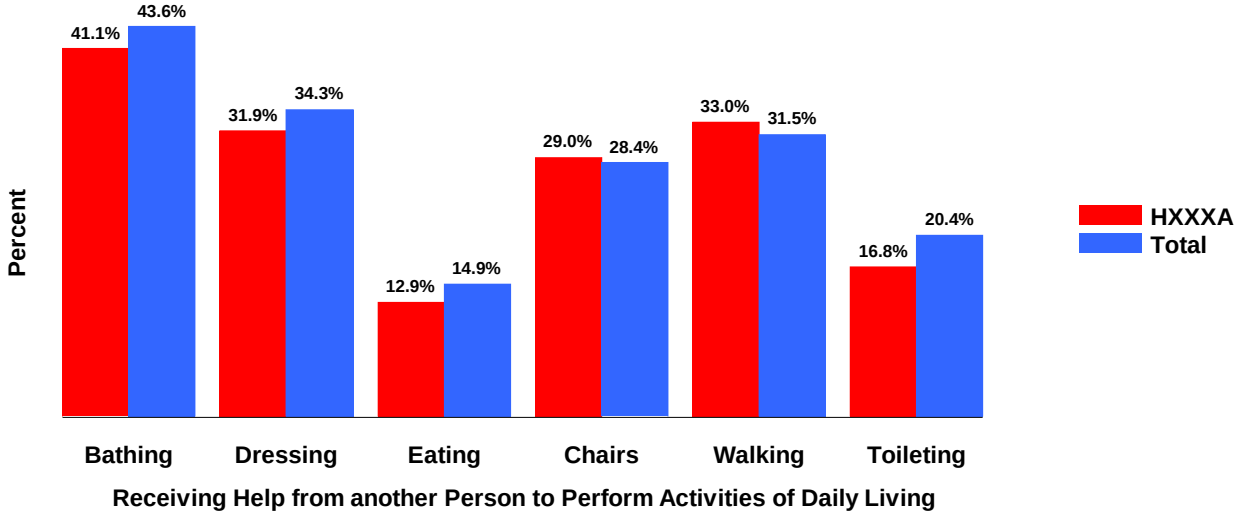


Figure 9 below shows the distribution of respondents with respect to the number of ADL impairments reported. For the HOS-M Total, the vast majority of members reported impairment with one or more of their daily activities.

Figure 9: 2021 HOS-M Number of ADL Impairments for PACE HXXXA and HOS-M Total

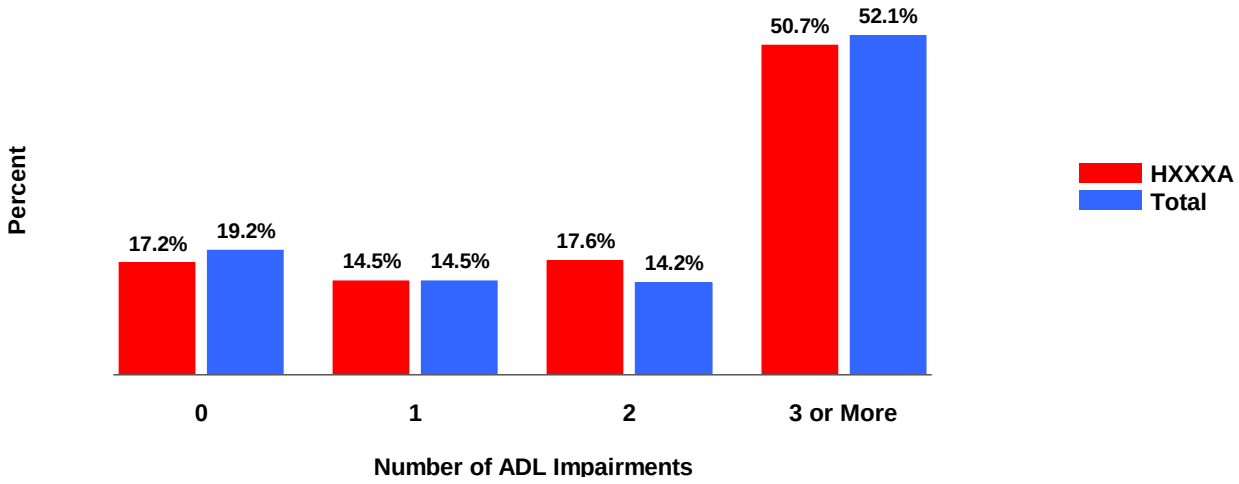


Figure 10 indicates that members who have a greater number of ADL impairments tend to have lower PCS scores. There is an inverse linear relationship indicating that mean PCS decreases with increasing numbers of ADL limitations.

Figure 10: 2021 HOS-M Mean PCS Scores by Number of ADL Impairments for PACE HXXXA and HOS-M Total

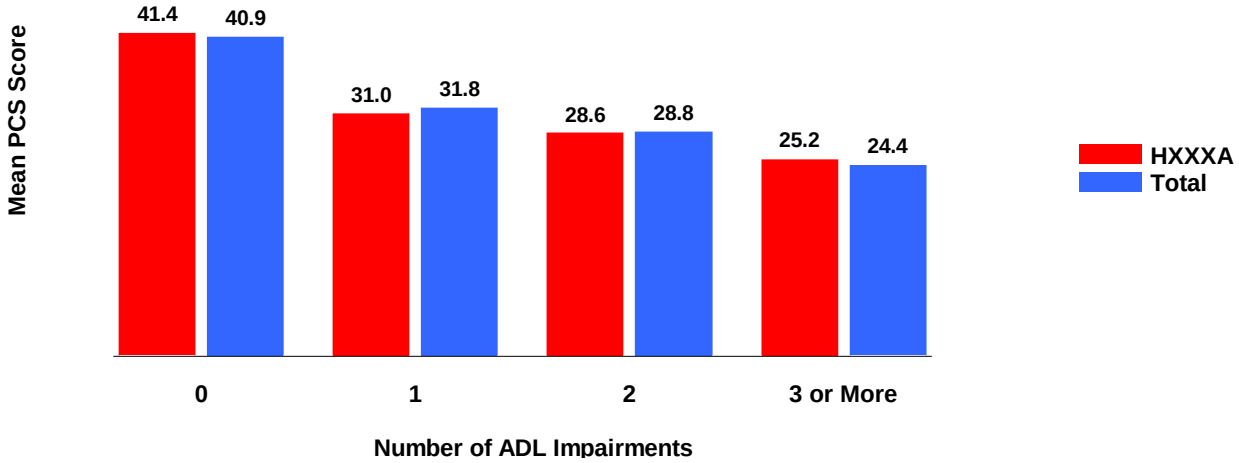
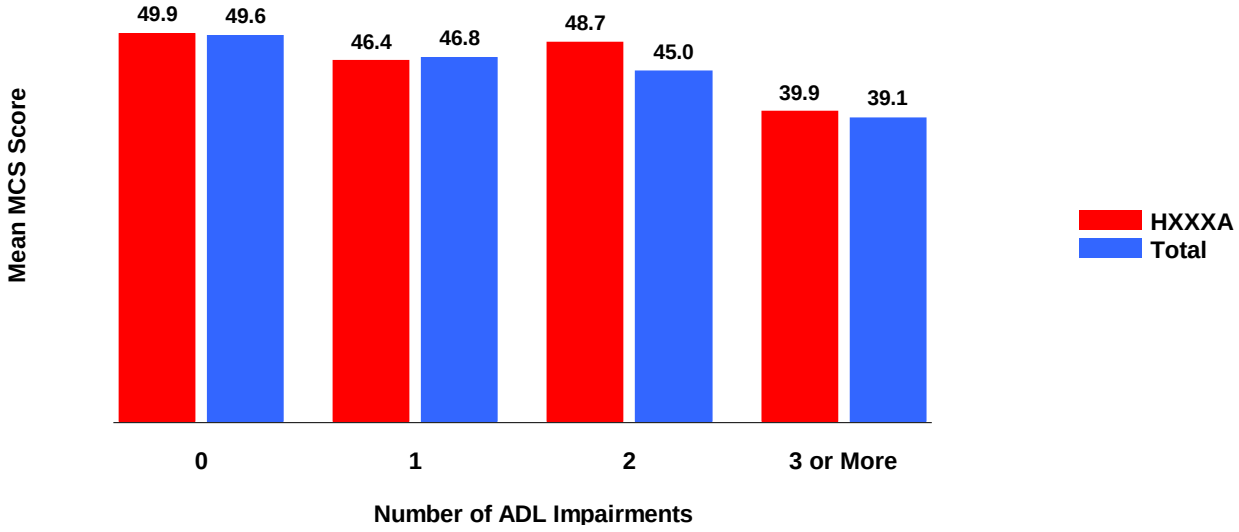


Figure 11 below indicates that MCS scores are also lower for those with a greater number of ADL impairments. The relationship is somewhat similar to that for PCS in that mean MCS generally decreases with increasing numbers of ADL limitations.

Figure 11: 2021 HOS-M Mean MCS Scores by Number of ADL Impairments for PACE HXXXA and HOS-M Total



Other Clinical Measures

Definition of Measures

- Pain that interferes with normal work over the past four weeks is measured with five categories of "Not at all" to "Extremely." The measure is from Question 9 of the HOS-M.
- Memory loss that interferes with daily activities is measured with a "Yes"/"No" response. The measure is from Question 14.
- Difficulty controlling urination (bladder accidents) is measured with five categories from "Never" to "Catheter." The measure is from Question 15.
- Responses to the question "Who completed this survey form?" include "Medicare participant," "Family member, relative, or friend of Medicare participant," and "Nurse or other health professional." The measure is from Question 16.
- Reasons why a proxy filled out the survey for the member include the following responses: "Physical problems," "Memory loss or mental problems," "Unable to speak or read English," "Person not available," and "Other." The measure is from Question 17.

Pain is one of the most common chronic medical conditions among older adults and can negatively impact both physical and mental health by contributing to depression, anxiety, social isolation, cognitive impairment, disability, and premature death.[19] Figure 12 on the following page shows the relationship between mean PCS scores and categories of pain responses for your PACE organization and the HOS-M Total. Members who responded "Quite a bit" or "Extremely" had the lowest PCS scores.

Figure 12: 2021 HOS-M Mean PCS Scores by the Extent Pain Interfered with Normal Work during the Past Four Weeks for PACE HXXXA and HOS-M Total

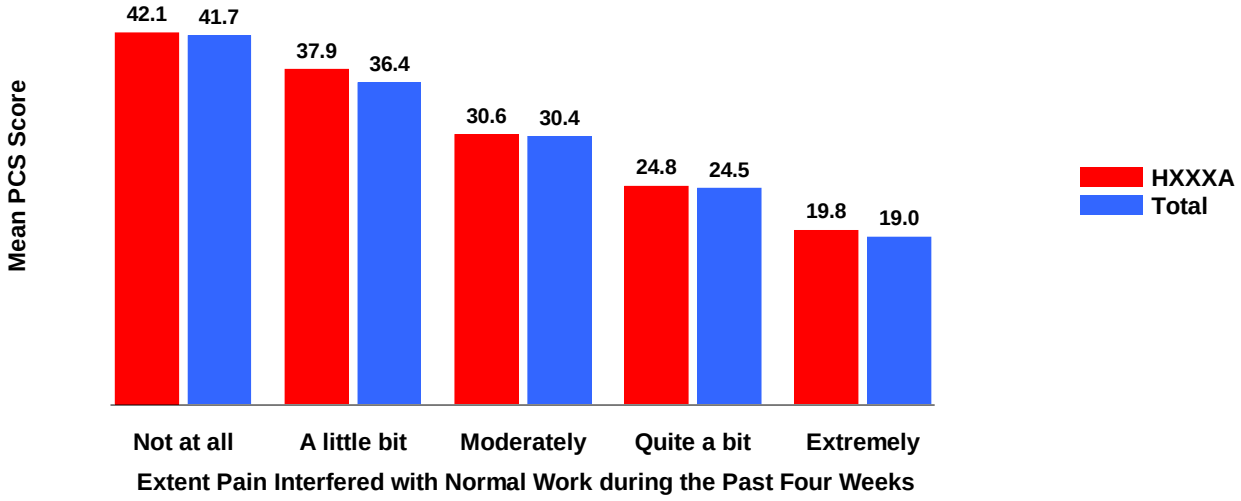


Table 6 provides the number and percentage of respondents who experienced pain in the past four weeks, memory loss, or difficulty controlling urination, and includes the proxy status of the respondents.

Table 6: 2021 HOS-M Health Limitations for PACE HXXXA and HOS-M Total

HOS-M Item	Plan HXXXA N (%)	HOS-M Total N (%)
Pain During the Past 4 Weeks	(N=281)	(N=17,424)
Not at all	39 (13.9%)	2,548 (14.6%)
A little bit	50 (17.8%)	3,009 (17.3%)
Moderately	40 (14.2%)	3,742 (21.5%)
Quite a bit	107 (38.1%)	4,902 (28.1%)
Extremely	45 (16.0%)	3,223 (18.5%)
Memory Loss	(N=278)	(N=17,514)
Yes	124 (44.6%)	8,348 (47.7%)
No	154 (55.4%)	9,166 (52.3%)
Difficulty Controlling Urination	(N=280)	(N=17,647)
Never	84 (30.0%)	5,090 (28.8%)
Less than once a week	52 (18.6%)	2,992 (17.0%)
Once a week or more often	37 (13.2%)	3,054 (17.3%)
Daily	104 (37.1%)	6,202 (35.1%)
Catheter	3 (1.1%)	309 (1.8%)
Proxy Status	(N=234)	(N=15,475)
Medicare participant	137 (58.5%)	8,280 (53.5%)
Family member or friend	88 (37.6%)	5,484 (35.4%)
Health professional	9 (3.8%)	1,711 (11.1%)

If a member had assistance in filling out the survey, the proxy respondent was asked to provide the reasons for the assistance. Table 7 provides the results of the reasons why a proxy filled out the survey for members in your PACE organization and the HOS-M Total.

Table 7: 2021 HOS-M Reasons for a Proxy* for PACE HXXXA and HOS-M Total

HOS-M Item	Plan HXXXA N (%)	HOS-M Total N (%)
Reasons for Proxy	(N=111)	(N=7,834)
Physical problems	50 (45.0%)	2,947 (37.6%)
Memory loss or mental problems	42 (37.8%)	3,595 (45.9%)
Unable to speak or read English	8 (7.2%)	1,325 (16.9%)
Person not available	20 (18.0%)	902 (11.5%)
Other	38 (34.2%)	2,592 (33.1%)

* Percentages may sum to more than 100% since respondents could provide more than one reason.

Appendix 1

Introduction to HOS-M

CMS is committed to monitoring the quality of health care provided by its programs. The focus of the Medicare HOS is to gather valid and reliable health status data that assesses an MAO's ability to maintain or improve the physical and mental health of its Medicare members over time. Baseline data are collected from a new cohort annually. Section 722 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 mandates collecting, analyzing, and reporting health outcomes information. This legislation also specifies that data collected on quality, outcomes, and member satisfaction to facilitate consumer choice and program administration must use the same types of data that were collected prior to November 1, 2003. Collected since 1998, the HOS remains an important component of the CMS performance assessment system for the MA program.

The HOS-M, a variation of the HOS, is specifically designed to collect functional status information from PACE enrollees. CMS uses the data collected to adjust the Medicare capitation rates paid to these plans.[7] PACE organizations are capitated plans authorized by the Balanced Budget Act of 1997. The PACE program is modeled on the On Lok Senior Health Services in San Francisco.[20] The program delivers all needed medical and supportive services to provide the entire continuum of care and services to seniors with chronic care needs, while maintaining their independence in their homes for as long as possible.

An interdisciplinary team of medical and other staff delivers coordinated services through adult day health centers, in home, and inpatient facilities, such as nursing home and hospice, as well as provides referrals for other needed services.[21] Comprehensive care includes medical services; nursing; physical, occupational and recreational therapies; meals; nutritional counseling; social work; personal care and transportation. To receive PACE services, individuals must be 55 years of age or older, live in the PACE service area, be certified to receive nursing home care, and be able to live safely in the community with help from PACE.

2021 Plan Participation

All PACE organizations with Medicare contracts in effect on or before January 1, 2020, and with a minimum of 30 enrollees as of October 31, 2020, were required by CMS to administer the HOS-M in 2021. The HOS-M was administered with the support of the following organizations:

- The National Committee for Quality Assurance (NCQA) assisted CMS with quality oversight for the survey administration and data collection of the HOS-M.
- RTI International (RTI) generated the samples for each PACE organization, provided additional survey support in the administration of the HOS-M, calculated ADL distributions for payment adjustments, and developed frailty reports that are posted on the HPMS Risk Adjustment module under the Survey Results for Frailty Adjustment.
- DataStat, Inc. is the survey vendor that fielded the HOS-M.

- Health Services Advisory Group (HSAG) provided data cleaning, data analysis, data distribution, and prepared the 2021 HOS-M Reports that are posted on the HPMS Quality and Performance/HOS module under the HOS-M Feedback Reports.

2021 Methodology and Design

HOS-M Sampling

Members were defined as eligible for the HOS-M if they were enrolled in a participating PACE organization, resided in the community, did not have ESRD, and were age 55 or older.

- For eligible plans with Medicare populations of 1,200 or more enrollees, a simple random cross-sectional sample of 1,200 eligible members was selected for the survey (i.e., the survey is not a cohort study).
- For eligible plans with populations of less than 1,200 enrollees, all eligible members were included in the HOS-M sample.
- Members with ineligible surveys met one of the following criteria: deceased; not enrolled in the health plan; bad address and phone number; language barrier; bad address and mail-only protocol (*Russian only*); or removed from the sample by RTI due to death, institutionalization, or disenrollment after the sample was drawn.

Survey Administration

The HOS-M protocol differs from the HOS in several ways. The HOS-M survey instrument is shorter (19 questions for HOS-M vs. more than 60 for the HOS), and the PACE organizations provide detailed contact information of their enrollees and family members or caregivers in case a proxy is needed for survey completion. In addition, twice as many telephone attempts (12 for HOS-M vs. 6 for HOS) are conducted for non-respondents to the mail component of survey administration. These differences are designed to achieve a higher response rate for the HOS-M despite the frailty of the target population.[7]

Participating PACE organizations contracted with the survey vendor to administer the survey follow the HOS-M protocol that is specified in the Healthcare Effectiveness Data and Information Set (HEDIS®)[B] Measurement Year (MY) 2020, Volume 6: Specifications for the Medicare Health Outcomes Survey Manual.[22] The most recent HEDIS Volume 6 manuals are available at no cost from the NCQA Store (https://store.ncqa.org/hedis-quality-measurement/hedis-specifications-for-the-medicare-health-outcomes-survey.html). Copies of older HEDIS publications may be obtained by calling NCQA Customer Support at 1-888-275-7585. The manual provides details for the mail and telephone follow up methods of data collection.

- The mail component of the survey used a prenotification letter, survey letter, standardized questionnaire, and reminder/thank you postcards. Respondents completed the survey in English, Spanish, Chinese, or Russian language versions.

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

- The survey vendor attempted telephone follow-up, in those instances when members failed to respond after the second mail survey or returned an incomplete mail survey, to obtain responses for missing items. The telephone phase consisted of 12 telephone attempts; the first six attempts are made to members and up to six telephone attempts may be made to proxies. A standardized version of an Electronic Telephone Interviewing System script was used to collect telephone interview data in English, Spanish, or Chinese.
- To ensure a high response rate to support accurate frailty adjustments for payment, the protocol encouraged a family member, close friend, or caregiver to serve as a proxy respondent when needed. A staff member of a PACE organization may serve as a proxy only at the request of the member, a family member, or other caregiver.

RTI provided survey support by working with smaller plans to develop a detailed contact information file with the name and other contact information for up to two potential proxies, where available.

Data Cleaning

Data consistency checks were performed to validate integrity of the data and to identify the following:

- Out of range dates and response values
- Duplicate Beneficiary Link Keys (BLKEYs) and Medicare Beneficiary Identifier (MBI) Numbers
- Data shifts in value assignment
- Discrepancies in the percent complete and survey disposition codes
- Inconsistent assignment of survey variables (such as survey disposition, round number, and survey language)
- Response consistency checks between related items
- Patterns of missing responses across PACE data

2021 Survey Instrument and Summary Scores

Survey Instrument

The HOS-M survey instrument can be downloaded from NCQA's website (www.ncqa.org/hedis/measures/hos). The core component of the HOS-M is the VR-12 health survey. The VR-12 was developed from the Veterans RAND 36-Item Health Survey (VR-36).[8, 23] The VR-12 is a generic, multipurpose health survey, which consists of selected items from the eight domains of health in the earlier 36-item survey. These domains include: 1) physical functioning; 2) role-physical; 3) bodily pain; 4) general health; 5) vitality; 6) social functioning; 7) role-emotional; and 8) mental health. The role-physical questions assess whether respondents' physical health limits them in the kind of work or other usual activities they perform, while the role-emotional questions assess whether emotional problems have caused respondents to accomplish less in their work or usual activities.

The 14 items of the VR-12 have been tested extensively and shown to be reliable and valid in ambulatory care patient populations.[9] Twelve of the 14 items (Questions 1 and 6-11 of the HOS-M) are used to construct the eight domains that aggregate one or two items each and all eight domains are used to calculate the PCS and MCS scores, as illustrated in the VR-12 mapping model in Figure 13. Two additional items (Questions 12 and 13) are used to assess change in health status, one focusing on physical health and one on emotional problems (not shown in the model).

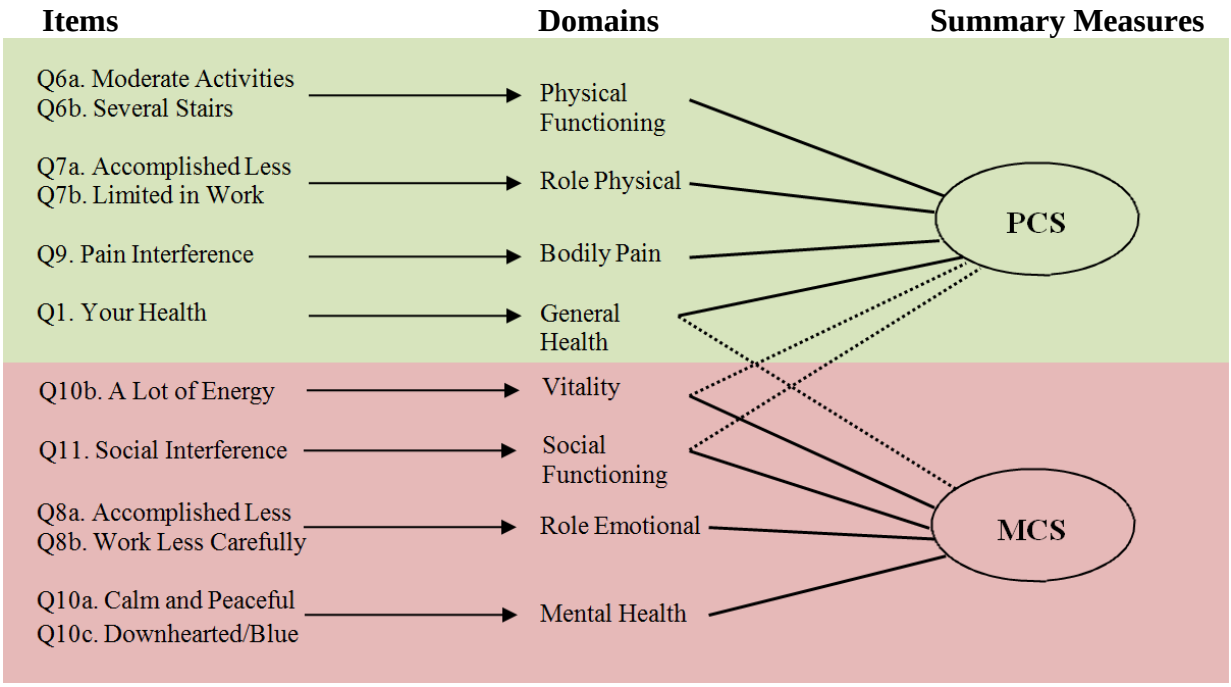
In addition, the HOS-M includes questions about having difficulty with the following:

- Lifting or carrying objects as heavy as 10 pounds (Question 2)
- Walking a quarter-mile (Question 3)
- Performing ADLs and receiving help with ADLs (Questions 4 and 5)
- Experiencing memory loss and urinary incontinence (Questions 14 and 15)

Finally, the HOS-M includes questions that ask:

- Whether the survey is self-completed or completed by a proxy (Question 16)
- The reason for a proxy and how the proxy helped (Questions 17 and 18)
- Professional caregivers to describe their position (Question 19)

Figure 13: Mapping of HOS-M VR-12 to 8 Health Domains and 2 Summary Measures



Note: Domains contributing the most to each summary measure are indicated by a solid line. Domains contributing to a lesser degree are indicated by a broken line. However, all domains contribute to some extent to the scoring of both summary measures (PCS and MCS).

Physical and Mental Component Summary Scores

- The PCS and MCS scores were calculated from the VR-12 using the Modified Regression Estimate (MRE) for scoring and for imputation of missing data.[8] For those members with complete responses across the VR-12, the following steps were taken[24] to calculate PCS and MCS:
  - Step One: New variables were created for each response level choice with one level omitted. Using the 59 total response categories across the VR-12 questions, 47 indicator variables were created.
  - Step Two: Aggregate PCS and MCS scores were created separately from a regression equation that weights each of the 47 indicator variables. The weights were derived from the Veterans SF-36 PCS and MCS Scales using the 1999 Large Health Survey of Veteran Enrollees.[25]
  - Step Three: A constant was added to each of the estimates obtained from Step Two. The scores were then standardized using normative values from a 1990 U.S. general population. Therefore, a mean score of 50 represents the national average, a 10-point difference above and below the mean score is one standard deviation, and, with few exceptions, the scores have a range of 0 through 100 (higher being better).
- When a member had missing data across the VR-12 items, PCS and MCS scores were imputed using the MRE. With the use of the MRE algorithm, PCS and MCS scores can be calculated in as many as 90% of the cases in which one or more VR-12 responses are missing.[26] Depending on the pattern of missing item responses for a member, a different set of regression weights was required to compute that individual's PCS and/or MCS scores.[24] For each combination of missing data, the members' data were merged with the stored regression weights and the PCS or MCS scores were computed and then standardized using the normative values from Step Three.
- Member PCS and MCS results were mode adjusted for the impact of telephone administration compared to the reference mode of mail administration. Comparisons across the VR-12 of matched HOS and Veterans Administration surveys for the same respondents showed that PCS and MCS scores were, on average, 1.9 and 4.5 points greater respectively for telephone compared to mail administered surveys.[27] Therefore, for telephone surveys, 1.9 points were subtracted from the PCS score and 4.5 points were subtracted from the MCS score.
- For the physical health summary measure, very high scores indicate no physical limitations, disabilities, or decline in well-being; high energy level; and a rating of health as "excellent."
- For the mental health summary measure, very high scores indicate frequent positive affect, absence of psychological distress, and no limitations in usual social and role activities due to emotional problems.

For the HOS-M Report, the PCS and MCS scores were *not* adjusted for case mix variables, i.e., demographic characteristics.

Appendix 2

2021 HOS-M Frequencies of Selected Survey Fields for PACE HXXXA

Table A1: 2021 HOS-M Selected Health Status Measures for PACE HXXXA and HOS-M Total

Health Item	Plan HXXXA N (%)	HOS-M Total N (%)
Difficulty Lifting or Carrying 10 Pounds	(N=283)	(N=17,834)
No difficulty	28 (9.9%)	1,766 (9.9%)
A little difficulty	41 (14.5%)	2,133 (12.0%)
Some difficulty	70 (24.7%)	4,108 (23.0%)
A lot of difficulty	71 (25.1%)	4,444 (24.9%)
Not able to do it	73 (25.8%)	5,383 (30.2%)
Difficulty Walking a Quarter-Mile	(N=283)	(N=17,862)
No difficulty	24 (8.5%)	1,552 (8.7%)
A little difficulty	26 (9.2%)	1,823 (10.2%)
Some difficulty	46 (16.3%)	3,108 (17.4%)
A lot of difficulty	80 (28.3%)	4,111 (23.0%)
Not able to do it	107 (37.8%)	7,268 (40.7%)
Health Limits Moderate Activities	(N=283)	(N=17,637)
Yes, limited a lot	154 (54.4%)	10,721 (60.8%)
Yes, limited a little	97 (34.3%)	4,653 (26.4%)
No, not limited at all	32 (11.3%)	2,263 (12.8%)
Health Limits Climbing Several Flights of Stairs	(N=282)	(N=17,517)
Yes, limited a lot	184 (65.2%)	12,047 (68.8%)
Yes, limited a little	63 (22.3%)	3,654 (20.9%)
No, not limited at all	35 (12.4%)	1,816 (10.4%)

2021 HOS-M Frequencies of Selected Survey Fields (continued)

Table A1 (Cont.): 2021 HOS-M Selected Health Status Measures for PACE HXXXA and HOS-M Total

Health Item	Plan HXXXA N (%)	HOS-M Total N (%)
Physical Health in the Past 4 Weeks: Accomplished Less	(N=285)	(N=17,494)
No, none of the time	44 (15.4%)	2,406 (13.8%)
Yes, a little of the time	37 (13.0%)	2,075 (11.9%)
Yes, some of the time	66 (23.2%)	3,700 (21.2%)
Yes, most of the time	55 (19.3%)	3,478 (19.9%)
Yes, all of the time	83 (29.1%)	5,835 (33.4%)
Physical Health in the Past 4 Weeks: Limited in Kind of Work or Activities	(N=280)	(N=17,399)
No, none of the time	43 (15.4%)	2,418 (13.9%)
Yes, a little of the time	33 (11.8%)	1,860 (10.7%)
Yes, some of the time	60 (21.4%)	3,330 (19.1%)
Yes, most of the time	66 (23.6%)	3,521 (20.2%)
Yes, all of the time	78 (27.9%)	6,270 (36.0%)
Mental Health in the Past 4 Weeks: Accomplished Less	(N=284)	(N=17,489)
No, none of the time	89 (31.3%)	4,621 (26.4%)
Yes, a little of the time	39 (13.7%)	2,634 (15.1%)
Yes, some of the time	64 (22.5%)	3,626 (20.7%)
Yes, most of the time	30 (10.6%)	2,474 (14.1%)
Yes, all of the time	62 (21.8%)	4,134 (23.6%)
Mental Health in the Past 4 Weeks: Didn't Do Work or Activities As Usual	(N=280)	(N=17,207)
No, none of the time	102 (36.4%)	5,262 (30.6%)
Yes, a little of the time	40 (14.3%)	2,506 (14.6%)
Yes, some of the time	56 (20.0%)	3,257 (18.9%)
Yes, most of the time	23 (8.2%)	2,122 (12.3%)
Yes, all of the time	59 (21.1%)	4,060 (23.6%)

2021 HOS-M Frequencies of Selected Survey Fields (continued)

Table A1 (Cont.): 2021 HOS-M Selected Health Status Measures for PACE HXXXA and HOS-M Total

Health Item	Plan HXXXA N (%)	HOS-M Total N (%)
Felt Calm and Peaceful During the Past 4 Weeks	(N=288)	(N=17,531)
All of the time	41 (14.2%)	2,128 (12.1%)
Most of the time	74 (25.7%)	4,666 (26.6%)
A good bit of the time	53 (18.4%)	2,729 (15.6%)
Some of the time	76 (26.4%)	4,831 (27.6%)
A little of the time	31 (10.8%)	2,304 (13.1%)
None of the time	13 (4.5%)	873 (5.0%)
Had a Lot of Energy During the Past 4 Weeks	(N=288)	(N=17,575)
All of the time	12 (4.2%)	780 (4.4%)
Most of the time	40 (13.9%)	1,898 (10.8%)
A good bit of the time	35 (12.2%)	1,713 (9.7%)
Some of the time	87 (30.2%)	4,770 (27.1%)
A little of the time	65 (22.6%)	4,782 (27.2%)
None of the time	49 (17.0%)	3,632 (20.7%)
Felt Downhearted and Blue During the Past 4 Weeks	(N=287)	(N=17,556)
All of the time	19 (6.6%)	857 (4.9%)
Most of the time	19 (6.6%)	1,429 (8.1%)
A good bit of the time	26 (9.1%)	1,679 (9.6%)
Some of the time	90 (31.4%)	5,080 (28.9%)
A little of the time	68 (23.7%)	4,329 (24.7%)
None of the time	65 (22.6%)	4,182 (23.8%)
Physical or Emotional Health Interfered With Social Activities During the Past 4 Weeks	(N=287)	(N=17,630)
All of the time	42 (14.6%)	2,765 (15.7%)
Most of the time	57 (19.9%)	3,296 (18.7%)
Some of the time	74 (25.8%)	4,808 (27.3%)
A little of the time	44 (15.3%)	2,741 (15.5%)
None of the time	70 (24.4%)	4,020 (22.8%)

2021 HOS-M Frequencies of Selected Survey Fields (continued)

Table A2: 2021 HOS-M Difficulty with Activities of Daily Living for PACE HXXXA and HOS-M Total

Health Item	Plan HXXXA N (%)	HOS-M Total N (%)
Difficulty Bathing	(N=288)	(N=17,822)
No difficulty	126 (43.8%)	7,642 (42.9%)
Have difficulty/unable to do	162 (56.3%)	10,180 (57.1%)
Difficulty Dressing	(N=288)	(N=17,777)
No difficulty	165 (57.3%)	9,744 (54.8%)
Have difficulty/unable to do	123 (42.7%)	8,033 (45.2%)
Difficulty Eating	(N=287)	(N=17,755)
No difficulty	237 (82.6%)	14,261 (80.3%)
Have difficulty/unable to do	50 (17.4%)	3,494 (19.7%)
Difficulty Getting In/Out of Chairs	(N=288)	(N=17,784)
No difficulty	122 (42.4%)	8,018 (45.1%)
Have difficulty/unable to do	166 (57.6%)	9,766 (54.9%)
Difficulty Walking	(N=286)	(N=17,835)
No difficulty	64 (22.4%)	4,699 (26.3%)
Have difficulty/unable to do	222 (77.6%)	13,136 (73.7%)
Difficulty Using the Toilet	(N=284)	(N=17,810)
No difficulty	198 (69.7%)	11,226 (63.0%)
Have difficulty/unable to do	86 (30.3%)	6,584 (37.0%)

2021 HOS-M Frequencies of Selected Survey Fields (continued)

Table A3: 2021 HOS-M Receiving Help with Activities of Daily Living for PACE HXXXA and HOS-M Total

Health Item	Plan HXXXA N (%)	HOS-M Total N (%)
Receive Help Bathing	(N=287)	(N=17,726)
No help	165 (57.5%)	9,650 (54.4%)
Receive help	118 (41.1%)	7,728 (43.6%)
Do not do this activity	4 (1.4%)	348 (2.0%)
Receive Help Dressing	(N=288)	(N=17,655)
No help	193 (67.0%)	11,324 (64.1%)
Receive help	92 (31.9%)	6,064 (34.3%)
Do not do this activity	3 (1.0%)	267 (1.5%)
Receive Help Eating	(N=287)	(N=17,579)
No help	246 (85.7%)	14,667 (83.4%)
Receive help	37 (12.9%)	2,621 (14.9%)
Do not do this activity	4 (1.4%)	291 (1.7%)
Receive Help Getting In/Out of Chairs	(N=286)	(N=17,607)
No help	200 (69.9%)	12,154 (69.0%)
Receive help	83 (29.0%)	4,999 (28.4%)
Do not do this activity	3 (1.0%)	454 (2.6%)
Receive Help Walking	(N=288)	(N=17,604)
No help	168 (58.3%)	10,356 (58.8%)
Receive help	95 (33.0%)	5,554 (31.5%)
Do not do this activity	25 (8.7%)	1,694 (9.6%)
Receive Help Using the Toilet	(N=286)	(N=17,609)
No help	234 (81.8%)	13,481 (76.6%)
Receive help	48 (16.8%)	3,585 (20.4%)
Do not do this activity	4 (1.4%)	543 (3.1%)

References

[1] Centers for Medicare & Medicaid Services. Medicare HOS-Modified Overview. Available at: https://hosonline.org/en/hos-modified-overview. Accessed on: June 28, 2022.

[2] Eng C, Pedulla J, Elazer GP, et al. Program of All-inclusive Care for the Elderly (PACE): An innovative model of integrated geriatric care and financing. *Journal of the American Geriatrics Society*. Feb 1997; 45(2): 223-232.

[3] Centers for Medicare & Medicaid Services. Program of All Inclusive Care for the Elderly (PACE). Available at: https://www.medicare.gov/your-medicare-costs/get-help-paying-costs/pace. Accessed on: June 28, 2022.

[4] National Committee for Quality Assurance. *Medicare Health Outcomes Survey: Differentiating Health Status Within and Across Different Medicare Programs.* Final Report, 2012. Available at: https://www.hosonline.org/globalassets/hos-online/publications/differentiating_health_status_within_and_across_different_medicare_programs_2012.pdf. Accessed on: June 28, 2022.

[5] Health Services Advisory Group. *Health-Related Quality of Life and Quality of Care in Specialized Medicare Managed Care Plans.* Final Report, 2010. Available at: https://www.hosonline.org/globalassets/hos-online/publications/specialized_managed_care_plans_final_technical_report_2010.pdf. Accessed on: June 28, 2022.

[6] Ware JE, Kosinski M. *SF-36 Physical and Mental Health Summary Scales: A Manual for Users of Version 1*, Second Edition. Lincoln, RI: QualityMetric, Incorporated, 2001.

[7] Walsh EG, Khatustsky G, Johnson L. Functional impairment levels in PACE enrollees. *Health Care Financing Review*. Summer 2008. Volume 29(4): 81-88. Available at: https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/downloads/2008Summerpg81.pdf. Accessed on: June 28, 2022.

[8] Iqbal SU, Rogers W, Selim A, et al. *The Veterans RAND 12 Item Health Survey (VR-12): What it is and How it is used*. 2007. Available at: https://www.hosonline.org/globalassets/hos-online/publications/veterans_rand_12_item_health_survey_vr-12_2007.pdf. Accessed on: June 28, 2022.

[9] Jones D, Kazis LE, Lee A, et al. Health status assessments using the Veterans SF-36 and SF-12. Methods for evaluating outcomes in the Veterans Health Administration. *Journal of Ambulatory Care Management*. 2001; 24(3):1-19.

[10] National Committee for Quality Assurance. *Opportunities for Improving Medicare HOS Results Through Practices in Quality Preventive Health Care for the Elderly: A Guide for Medicare Advantage Organizations*. 2012. Available at: https://www.hosonline.org/globalassets/hos-online/faqs/opportunities_for_improving_medicare_hos_results_2012.pdf. Accessed on: June 28, 2022.

[11] Center for the Assessment of Pharmaceutical Practices (CAPP), Department of Health Policy and Management, Boston University School of Public Health. *Functional Status in Older Adults: Intervention Strategies for Impacting Patient Outcomes.* 2011. Available at: https://www.hosonline.org/globalassets/hos-online/publications/functional_status_in_older_adults_2011.pdf. Accessed on: June 28, 2022.

[12] Health Services Advisory Group. *The Evaluation of a Mental Component Summary Score Threshold for Depression Risk in the Medicare Population*. Final Report, 2006. Available at: https://www.hosonline.org/globalassets/hos-online/publications/hos_evaluation_mcs_depress.pdf. Accessed on: June 28, 2022.

[13] U.S. Department of Health and Human Services. *Healthy People 2020*. Available at: https://www.healthypeople.gov/2020/about/foundation-health-measures/General-Health-Status. Accessed on: June 28, 2022.

[14] Ware JE, Kosinski M, Keller SD. *SF-36 Physical and Mental Health Summary Scales: A User's Manual*. Boston, MA: The Health Institute; 1994.

[15] Wuorela M, Lavonius S, Salminen M, et al. Self-rated health and objective health status as predictors of all-cause mortality among older people: a prospective study with a 5-, 10-, and 27-year follow-up. *BMC Geriatrics* 20**,** 120 (2020). Available at: https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-020-01516-9. Accessed on: June 30, 2022.

[16] Wiener JM, Hanely RJ, Clark R. *Measuring the Activities of Daily Living: Comparisons Across National Surveys.*1990. Available at: https://aspe.hhs.gov/basic-report/measuring-activities-daily-living-comparisons-across-national-surveys. Accessed on: June 28, 2022.

[17] Walter LC, Brand RJ, Counsell SR, et al. Development and validation of a prognostic index for 1-year mortality in older adults after hospitalization. *JAMA*. 2001; 285(23):2987-2994.

[18] Shi SM, McCarthy EP, Mitchell SL, Kim DH. Predicting Mortality and Adverse Outcomes: Comparing the Frailty Index to General Prognostic Indices. J Gen Intern Med. 2020 May;35(5):1516-1522. Available at: https://link.springer.com/article/10.1007/. Accessed on: June 30, 2022.

[19] Domenichiello AF, Ramsden CE. The silent epidemic of chronic pain in older adults. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2019; *93*, 284-290.

[20] On Lok. *About On Lok.* Available at: https://www.onlok.org/about/. Accessed on: June 28, 2022.

[21] Centers for Medicare & Medicaid Services. Program of All-Inclusive Care for the Elderly (PACE) Manual. Available at: https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Internet-Only-Manuals-IOMs-Items/CMS019036. Accessed on: June 28, 2022.

[22] National Committee for Quality Assurance. *HEDIS® Measurement Year (MY) 2020, Volume 6: Specifications for the Medicare Health Outcomes Survey.* Washington DC: NCQA Publication, 2021.

[23] Boston University School of Public Health. VR-36, VR-12 and VR-6D Overview. Available at: https://www.bu.edu/sph/about/departments/health-law-policy-and-management/research/vr-36-vr-12-and-vr-6d/. Accessed on: June 28, 2022.

[24] Spiro A, Rogers WH, Qian S, et al. *Imputing physical and mental summary scores (PCS and MCS) for the Veterans SF-12 Health Survey in the context of missing data*. Technical Report prepared by: The Health Outcomes Technologies Program, Health Services Department, Boston University School of Public Health, Boston, MA and The Institute for Health Outcomes and Policy, Center for Health Quality, Outcomes and Economic Research, Veterans Affairs Medical Center, Bedford, MA. 2004. Available at: https://www.hosonline.org/globalassets/hos-online/publications/hos_veterans_12_imputation.pdf. Accessed on: June 28, 2022.

[25] Perlin J, Kazis LE, Skinner K, et al. *Health status and outcomes of veterans: physical and mental component summary scores, Veterans SF-36, 1999 Large Health Survey of Veteran Enrollees*. Executive Report. Department of Veterans Affairs, Veterans Health Administration, Office of Quality and Performance. Washington, DC. 2000.

[26] Selim A, Iqbal SU, Rogers W, et al. *Medicare Health Outcomes Survey: An Alternative Case-Mix Methodology*. Technical Report prepared by: Center for Health Quality, Outcomes, and Economic Research, VA Medical Center, Bedford, MA. 2007. Available at: https://www.hosonline.org/globalassets/hos-online/publications/hos_case_mix_final_technical_report.pdf. Accessed on: June 28, 2022.

[27] Rogers WH, Gandek B, Sinclair SJ. *Calculating Medicare Health Outcomes Survey Performance Measurement Results*. Technical Report prepared by: Health Assessment Lab, Waltham, MA, The Health Institute, Department of Clinical Care Research, New England Medical Center, Boston , MA. 2004. Available at: https://www.hosonline.org/globalassets/hos-online/publications/hos_calculating_pm_results.pdf. Accessed on: June 28, 2022.