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# SAMPLE *2022 COHORT 25* MEDICARE ADVANTAGE ORGANIZATION

## BASELINE REPORT

# Medicare Health Outcomes Survey

Centers for Medicare & Medicaid Services

Health Services Advisory Group

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


**CENTER FOR MEDICARE**

October 2023

Medicare Advantage Organizations,

The Centers for Medicare & Medicaid Services (CMS) is pleased to provide you with your Medicare Advantage Organization's (MAO) baseline results for 2022 Cohort 25 of the Medicare Health Outcomes Survey (HOS). The *2022 Cohort 25 Baseline Report* includes results from the Medicare HOS Version 3.0. CMS encourages MAOs to examine their results for use in quality improvement activities.

The *HOS Baseline Report* is distributed to help MAOs identify opportunities to improve their HOS results. Information on the HOS measures used in the Medicare Star Ratings, as well as additional resources to assist MAOs in their quality improvement efforts, are included in the report. The information indicates where beneficiaries are doing poorly, and identifies subgroups where the MAO performance differs from the national average for a specific measure.

For more program information, contact Health Services Advisory Group (HSAG) through the HOS Information and Technical Support at hos@hsag.com or (888) 880-0077; you may also visit the CMS HOS website at www.cms.gov/Research-Statistics-Data-and-Systems/Research/HOS.

Sincerely,

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

# Medicare Health Outcomes Survey
# Sample MAO Report

The following is a **sample** version of the *Cohort 25 Baseline Report* made available to all Medicare Advantage Organizations (MAOs) participating in the 2022 Cohort 25 Baseline Medicare Health Outcomes Survey.

The figures, tables, and text in this document contain example MAO and state level data; however, all references to the HOS Total reflect **actual** data.

Medicare HOS Information and Technical Support at hos@hsag.com or (888) 880-0077 is available to assist with report questions and interpretation. A full description of the HOS program may be found at www.HOSonline.org.

# Table of Contents

# Executive Summary

This Medicare *Health Outcomes Survey (HOS) Baseline Report* presents aggregate results for Medicare Advantage Organizations (MAOs), as well as specific results for MAO HXXXA based on data from the Medicare HOS 2022 Cohort 25 Baseline Survey. The 2022 Cohort 25 Baseline survey was fielded from July through October of 2022 and included a random sample of 1,005,548 members, consisting of both the aged and disabled, from 620 MAOs. The number of members represents a 10.4% increase from the 910,581 members sampled from 562 MAOs that participated in the HOS 2021 Cohort 24 Baseline Survey.

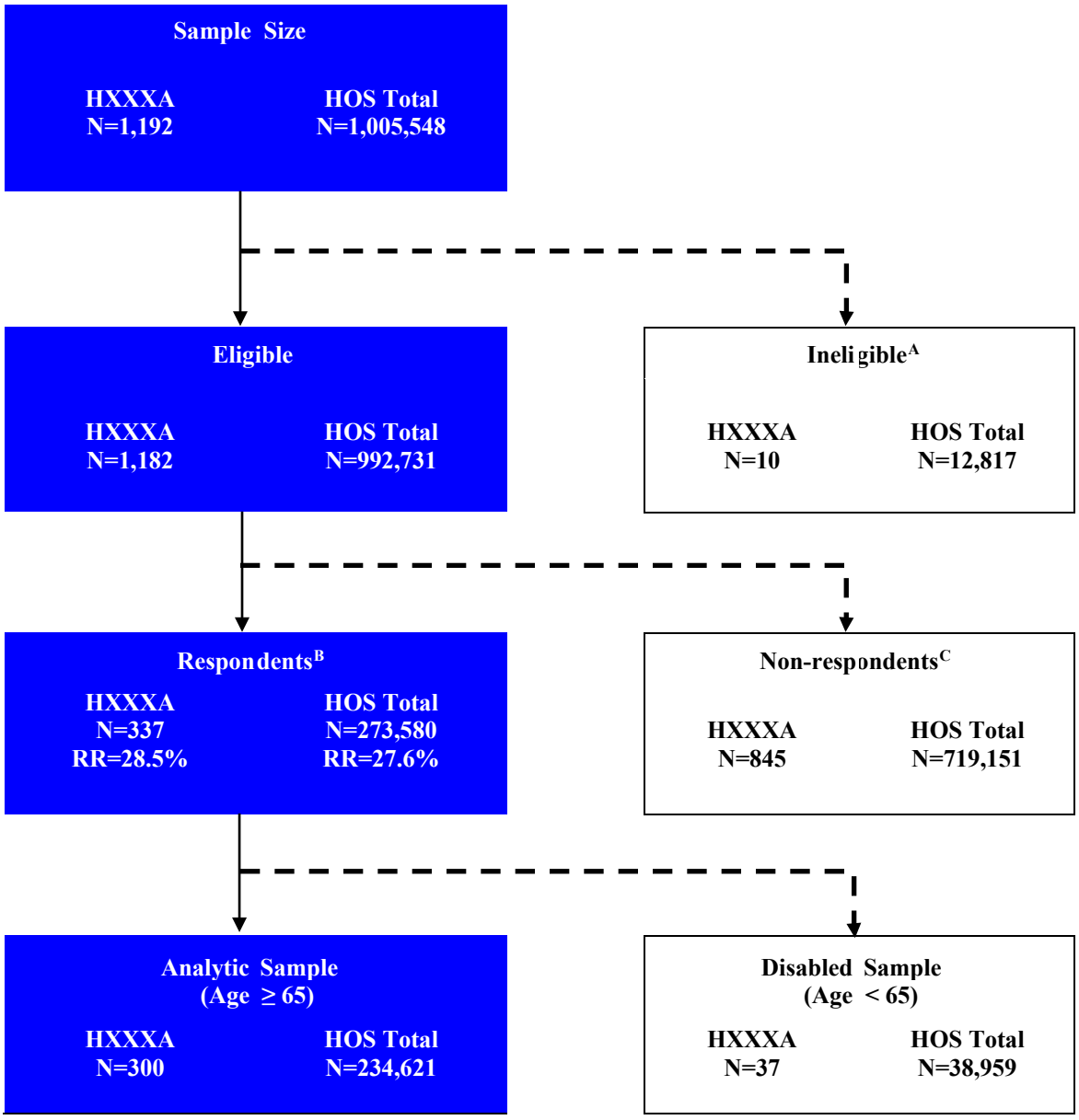
Figure 1 on the following page describes the distribution of the national HOS sample and the response rate for the HOS Total. Of the 1,005,548 members originally sampled, 12,817 were determined to be ineligible during the survey administration. Ineligible individuals met one of the following criteria: deceased, bad address and phone number, bad address and mail-only protocol (*Russian only*), or language barrier. The exclusion of the ineligible individuals from the total sample yields the Cohort 25 Baseline eligible sample of 992,731.

Of the total eligible sample, 273,580 (27.6%) completed the survey. For the purposes of this report, a completed survey is defined as one that could be used to calculate a physical component summary (PCS) score or mental component summary (MCS) score. Of those eligible and completing the survey, 234,621 were seniors (age 65 years or older) who comprised the final 2022 Cohort 25 Baseline analytic sample. Respondents to this baseline cohort will be resurveyed for the Cohort 25 Follow Up Survey in 2024. Results from the combined baseline and follow up surveys will be available in the *2022-2024 Cohort 25 Performance Measurement Report* that is planned for distribution in the Summer of 2025.

The baseline results are intended to help MAOs identify areas for potential improvement and to identify areas where they are doing well. On the following pages of this Executive Summary, the reader will find MAO, state, and national results across key indicators of member health status. For instance, the baseline PCS and MCS scores are provided as well as trend results for the measures over three baseline cohorts. This Executive Summary also provides information about general and comparative health, healthy days, and obesity measures obtained from the survey. More detailed information about the results is found in the Baseline Results section of the report.

For MAOs with a small number of respondents, caution should be exercised when drawing conclusions from the results throughout the *HOS Baseline Report*, as the sample size may be insufficient to allow meaningful interpretation. State and Region level statistics in figures and tables are *not applicable* (NA) for Regional Preferred Provider Organizations (RPPO) and Private Fee-for-Service (PFFS) contracts. For reporting purposes, these types of plans are not included in any specific State or Region results; however, they are included in the HOS Total result.

**Figure 1: 2022 Cohort 25 Baseline Distribution of the Sample and Response Rates for MAO HXXXA and HOS Total**




[A] Ineligible individuals met one of the following criteria: deceased, bad address and phone number, bad address and mail-only protocol (*Russian only*), or language barrier.
[B] Response Rate = [(Respondent Sample/Eligible Sample)] x 100%.
[C] Surveys for which PCS and MCS scores cannot be calculated.

## Summary Score Trends for MAO HXXXA

Physical and Mental Health Scores

The primary physical and mental health status measures for the HOS are the PCS and MCS scores.[D] These baseline scores (when combined with the two-year follow up scores and death status) are important components of the HOS results used for the Medicare Star Ratings for all MAOs.[E] In general, functional health status, as measured by the PCS score, is expected to decline over time in older age groups, while mental health status, as measured by the MCS score, may decline at a slower rate. The baseline PCS and MCS scores are case-mix adjusted to allow for equitable comparisons across all MAOs.[F] For the 2022 HOS national sample, a mean PCS score of 39.4 and a mean MCS score of 52.7 were calculated.

At the national level:

- The mean adjusted PCS score was highest for the 65-69 year age group with a mean PCS of 41.5. As expected, a steady decline with increasing age was pronounced for the physical health measure, with a mean PCS score of 40.4 for the 70-74 year age group, 38.9 for the 75-79 year age group, and 37.2 for the 80-84 year age group. The lowest mean PCS score of 34.9 was for those 85 or older.

- The mean adjusted MCS score was more consistent across age groups, with a mean score of 52.4 for the 65-69 year age group, 52.9 for the 70-74 year age group, and 53.0 for the 75-79 year age group. The mean MCS score for the 80-84 year age group was (53.0) and for those 85 or older was (52.5).

Table 1 presents the mean unadjusted and adjusted PCS and MCS scores for your MAO, your state, and the HOS Total. The results presented in the table are from the Cohort 25 Baseline analytic sample. Additionally, in Appendix 2, Table 33 provides the mean unadjusted and adjusted PCS and MCS scores for each MAO in the state, as well as the state total and HOS Total. For detailed information about the scores, please refer to the Baseline Results section. The baseline information summarized in this table is not suitable for MAO level comparisons and should not be used for public release or marketing purposes.

**Table 1: 2022 Cohort 25 Baseline Mean Unadjusted and Adjusted PCS and MCS Scores for MAO HXXXA, StateXX, and HOS Total[†]**

| | Unadjusted PCS Score (SD) | Adjusted PCS Score (SD) | Unadjusted MCS Score (SD) | Adjusted MCS Score (SD) |
|---|---|---|---|---|
| HXXXA | 39.6 (11.7) | 39.3 ( 6.6) | 52.7 (10.3) | 52.6 ( 5.7) |
| StateXX | 39.3 (12.4) | 39.2 ( 6.1) | 52.7 (10.6) | 52.7 ( 5.4) |
| HOS Total | 39.4 (12.5) | 39.4 ( 6.1) | 52.7 (10.9) | 52.7 ( 5.3) |

[†] See Appendix 2, Table 33 results for each MAO in the state, and Tables 34 and 35 for percentile score distributions.

[D] See Appendix 1 for more information about how PCS and MCS scores are derived from the HOS measure.
[E] For additional information, refer to the HOS and the Star Ratings section of this report.
[F] Case-mix adjustment is a statistical technique that controls for differences in sociodemographic characteristics, chronic medical conditions, and HOS study design variables.

Table 2 shows the trends in mean unadjusted and adjusted PCS and MCS scores for MAO HXXXA over the most recent baseline cohorts, where available. The direction of these trends reflects the overall physical and mental health status of your MAO members over time. While the demographics of your members may change, negative trends indicate poorer health status across those questions comprising the PCS and MCS scores.

**Table 2: Trends in Mean Unadjusted and Adjusted PCS and MCS Scores over Three Baseline Cohorts for MAO HXXXA**

| | Unadjusted PCS Score (SD) | Adjusted PCS Score (SD) | Unadjusted MCS Score (SD) | Adjusted MCS Score (SD) |
|---|---|---|---|---|
| *2022 Cohort 25* | 39.6 (11.7) | 39.3 (6.6) | 52.7 (10.3) | 52.6 (5.7) |
| *2021 Cohort 24* | 39.0 (12.8) | 39.0 (7.2) | 52.6 (11.8) | 52.2 (5.6) |
| *2020 Cohort 23* | 39.9 (12.9) | 40.0 (7.5) | 52.7 (10.9) | 52.7 (5.6) |

NA in a row indicates the MAO did not have results for that cohort.

## Health Status Trends for MAO HXXXA

The *2022 Cohort 25 Baseline Report* includes results for the Medicare population across different indicators of health: general health, comparative physical health, and comparative mental health. The indicator of general self-rated health is used in the calculation of PCS and MCS scores. The comparative health indicators are considered foundational measures of health-related quality of life (HRQOL).

Table 3 describes results for the general and comparative health status of members in your MAO, your state, and the HOS Total. Individuals who indicated that their general health was "Fair" or "Poor," or that their physical or mental health was "Slightly Worse" or "Much Worse" compared to one year ago may assume greater risk for mortality.[1, 2] Thus, self-rated health status questions are sentinel indicators of underlying health problems that require effective identification and treatment.

**Table 3: 2022 Cohort 25 Baseline Self-Rated General and Comparative Health Status for MAO HXXXA, StateXX, and HOS Total**

| | General Health | | Comparative Physical Health | | Comparative Mental Health | |
|---|---|---|---|---|---|---|
| | Excellent to Good* | Fair or Poor | Much Better to About the Same* | Slightly Worse or Much Worse | Much Better to About the Same* | Slightly Worse or Much Worse |
| HXXXA | 69.2% | 30.8% | 75.5% | 24.5% | 86.0% | 14.0% |
| StateXX | 71.5% | 28.5% | 71.8% | 28.2% | 85.5% | 14.5% |
| HOS Total | 72.5% | 27.5% | 71.9% | 28.1% | 85.8% | 14.2% |

* Categories for general health included "Excellent," "Very good," or "Good." Categories for comparative health included "Much better," "Slightly better," or "About the same."

Table 4 shows the results of general and comparative health status for your MAO over the current and previous two baseline cohorts, where available. These trends may change over time based on the composition of your MAO membership. Nevertheless, self-rated health status questions may help your MAO anticipate future health outcomes and health care utilization of your members. Negative trends indicate a decline in perceived health status that may be influenced by current or future disease or injury outcomes.

**Table 4: Trends in Self-Rated General and Comparative Health Status Over Three Baseline Cohorts for MAO HXXXA**

| | General Health | | Comparative Physical Health | | Comparative Mental Health | |
|---|---|---|---|---|---|---|
| | Excellent to Good* | Fair or Poor | Much Better to About the Same* | Slightly Worse or Much Worse | Much Better to About the Same* | Slightly Worse or Much Worse |
| *2022 Cohort 25* | 69.2% | 30.8% | 75.5% | 24.5% | 86.0% | 14.0% |
| *2021 Cohort 24* | 66.4% | 33.6% | 69.1% | 30.9% | 83.3% | 16.7% |
| *2020 Cohort 23* | 75.9% | 24.1% | 74.3% | 25.7% | 84.6% | 15.4% |

* Categories for general health included "Excellent," "Very good," or "Good." Categories for comparative health included "Much better," "Slightly better," or "About the same."
NA in a row indicates that the MAO did not have results for that cohort.

Table 5 illustrates the percentage of members with 14 or more days of poor physical health, poor mental health, and activity limitations in the past 30 days for your MAO, your state, and the HOS Total. In general, 14 or more days of poor health or activity limitations are considered indicative of poor well-being.[3] These HRQOL measures help identify vulnerable sub-populations with the greatest risk for disease or injury.

**Table 5: 2022 Cohort 25 Baseline Healthy Days Measures for MAO HXXXA, StateXX, and HOS Total**

| | 14 or More Days of Poor Physical Health | 14 or More Days of Poor Mental Health | 14 or More Days of Activity Limitations |
|---|---|---|---|
| HXXXA | 21.1% | 14.4% | 16.6% |
| StateXX | 20.9% | 12.0% | 15.6% |
| HOS Total | 21.1% | 12.7% | 15.2% |

Table 6 below describes the Healthy Days results for your MAO over the current and previous two baseline cohorts, where available. Your MAO may consider using these HRQOL indicators as tools to evaluate the distal or environmental factors that influence health (i.e., access to care and social support).[3] The health status of your members may improve as these broader influences on health are incorporated into quality improvement efforts.

**Table 6: Trends in Healthy Days Measures over Three Baseline Cohorts for MAO HXXXA**

| | 14 or More Days of Poor Physical Health | 14 or More Days of Poor Mental Health | 14 or More Days of Activity Limitations |
|---|---|---|---|
| *2022 Cohort 25* | 21.1% | 14.4% | 16.6% |
| *2021 Cohort 24* | 20.4% | 13.1% | 17.4% |
| *2020 Cohort 23* | 19.2% | 11.1% | 15.8% |

NA in a row indicates that the MAO did not have results for that cohort.

Table 7 depicts the distribution of Body Mass Index (BMI)[G] for members in your MAO, your state, and the HOS Total. Healthy People 2030 set a target to reduce the proportion of obesity to 36% in the adult population.[4] Underweight and obesity are threats to the health status of older adults. Underweight in the elderly is usually caused by disease and acts as an effect modifier on the relationship between aging and muscle loss. Rapid unintentional weight loss hastens the muscle loss usually associated with increasing age.[5] On the other hand, obesity increases the risk for chronic diseases such as hypertension and type-2 diabetes. According to an analysis of obesity prevalence in MAOs, individuals who were obese accounted for significantly poorer health outcomes and higher utilization of health care services when compared to individuals who were overweight.[6] Helping your members maintain a healthy weight may increase their quality of life and reduce health care expenditures.

**Table 7: 2022 Cohort 25 Baseline BMI Measures for MAO HXXXA, StateXX, and HOS Total**

| | Underweight (BMI <18.5) | Normal Weight (BMI 18.5 to 24.99) | Overweight (BMI 25 to 29.99) | Obese (BMI ≥30) |
|---|---|---|---|---|
| HXXXA | 2.2% | 27.0% | 35.6% | 35.2% |
| StateXX | 2.2% | 27.2% | 40.0% | 30.5% |
| HOS Total | 2.4% | 29.6% | 35.6% | 32.3% |

Table 8 illustrates the distribution of BMI categories for your MAO over the current and previous two baseline cohorts, where available. As of 2021, obesity rates were still high and variables such as geographic location and socioeconomic status influenced these figures.[7] Although the composition of your MAO beneficiaries may change from year to year, these trend data allow your MAO to monitor the direction of the prevalence of obesity within your membership. Successful efforts to move individuals into the normal weight category may reduce the incidence of negative health outcomes directly linked to either underweight or obesity.

**Table 8: Trends in BMI Measures over Three Baseline Cohorts for MAO HXXXA**

| | Underweight (BMI <18.5) | Normal Weight (BMI 18.5 to 24.99) | Overweight (BMI 25 to 29.99) | Obese (BMI ≥30) |
|---|---|---|---|---|
| *2022 Cohort 25* | 2.2% | 27.0% | 35.6% | 35.2% |
| *2021 Cohort 24* | 1.5% | 35.7% | 36.1% | 26.8% |
| *2020 Cohort 23* | 2.8% | 26.5% | 40.6% | 30.2% |

NA in a row indicates that the MAO did not have results for that cohort.

[G] BMI is calculated as: BMI = [weight in pounds / (height in inches)$^2$] x 703, which uses the member's self-reported height and weight to produce the standard measure of kg/m$^2$ units.

# Reader's Guide

The Reader's Guide is provided to assist MAOs in using their *Medicare HOS Baseline Report* information effectively. This section will guide the reader in identifying key topics, such as the CMS Medicare Star Ratings, and will also answer general questions about the reports and data. For further assistance, please refer to the Technical Assistance information below. Additionally, the HOS Highlights and Resources section of this report contains information about website content, webinars, and other HOS program updates.

## Technical Assistance

Medicare HOS Information and Technical Support at hos@hsag.com or (888) 880-0077 is available to assist 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). A full description of the HOS program is available at www.HOSonline.org.

## How to Use the Information in this Report

This report is designed to assist MAOs in identifying opportunities to reduce health disparities and explore potential programmatic interventions aimed at maintaining or improving the overall health of their Medicare population. Health status indicators are displayed within demographic groups to emphasize where members are doing poorly. This detail is included to help plans identify population subgroups and potential areas for further investigations that can inform health-related interventions for the MAO population.

**What information can I find in this *Baseline Report*?**
A random sample of people with Medicare is drawn from each participating MAO and surveyed every spring (i.e., the HOS questionnaire is administered to a different baseline cohort, or group, each year). The results for key health indicators derived from the HOS are provided in the report. Please refer to the description of each report section below and to the Table of Contents for the specific section pages.

- **HOS Highlights and Resources:** introduces new and updated HOS program information, self-paced training webinars, and website resources for MAOs and other data users.

- **HOS and the Star Ratings:** discusses the HOS measures currently used by CMS for the Medicare Star Ratings. The *Improving or Maintaining Physical Health* and *Improving or Maintaining Mental Health* measures are reported in the *HOS Performance Measurement Report*. The *Improving Bladder Control, Monitoring Physical Activity,* and *Reducing the Risk of Falling* measures, previously reported in the *HOS Baseline Report*, are reported in the *Healthcare Effectiveness Data and Information Set* (*HEDIS®*)[H] *HOS Effectiveness of*

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

*Care Report*. Information about the Medicare Star Ratings is also available in the HOS and the Star Ratings section of this report.

- **2022 Cohort 25 Baseline Results:** provides results for the MAO and national HOS Total analytic samples including a summary of the number of participating members, the response rates, and demographic information. Detailed results are also provided for key health indicators derived from the HOS, such as physical component summary (PCS) and mental component summary (MCS) scores, Physical Functioning Activities of Daily Living (PFADL) scores, General Health and Comparative Health, Depression, Pain, Chronic Medical Conditions, Activities of Daily Living (ADLs), Healthy Days Measures, BMI, and Sleep Measures. In this section, demographic tables compare the MAO to the HOS Total, where estimates highlighted in **red** indicate groups in the MAO that are worse off than the overall HOS sample. Five questions were removed from the HOS in 2022: Arthritis of the Hip or Knee, Arthritis of the Hand or Wrist, Sciatica, Smoking, and Income.

- **Appendix 1:** describes the program, sampling methodology, survey administration, and the HOS 3.0 instrument. Information is included about the questions used in the calculation of PCS and MCS scores, and case-mix adjustment of the scores.

- **Appendix 2:** includes a table that reports PCS and MCS scores for each MAO in the state, the state total, and HOS Total. Two tables provide percentile distributions of PCS and MCS scores for your MAO, the state total, and HOS Total.

- **References:** lists journal articles, technical reports, and website references that are provided throughout the report.

**Where can I find additional HOS Program information, such as sampling methodology, and timelines for the reporting and data distribution?**
An overview of the HOS Program, the sampling schedule, and program timelines are available on the Program page of the HOS website at www.HOSonline.org. A table of MAO report and data distribution is provided on the Data page of the website.

**Are HOS measures part of the CMS Medicare Star Ratings?**
HOS measures are included in the Medicare Star Ratings, which CMS developed to provide consumer information about MAOs and to reward high-performing health plans. CMS displays MAO information in the Medicare Plan Finder (MPF) tool on the www.medicare.gov/plan-compare website and awards quality bonus payments to high-performing health plans. For information about the Star Ratings, refer to the HOS and the Star Ratings section in this report.

**How are the Baseline Reports distributed?**
All reports are distributed electronically to participating MAOs through the CMS Health Plan Management System (HPMS), which requires an HPMS User ID. The *HOS Baseline Reports* are distributed in a ZIP file one year after data collection. Downloads include the PDF report and the summary-level data in a comma separated values (CSV) file that contains contract-level survey responses, demographic data, and calculated scores. Please visit the CMS site for information on how to obtain 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.

**When will MAOs receive member-level data for Cohort 25 Baseline?**
The merged baseline and follow up member-level data will be distributed to the MAOs in 2025, after completion of the 2024 follow up survey and construction of the merged baseline and follow up dataset. Data availability is expected to coincide with the release of the *2022-2024 Cohort 25 Performance Measurement Report* in 2025. MAOs are notified via HPMS about the report and data availability and how to request their merged data from the HOS Technical Support Team.

**Where can I find overall survey results information for earlier HOS cohorts that can be compared to the information in this report?**
The Survey Results section on the HOS website (www.HOSonline.org) provides a table depicting general status information at the national HOS level, including sample sizes, completed surveys, and response rates, for the baseline and follow up cohorts administered and reported to date. Participating MAOs may also access their earlier reports through HPMS.

## Need More Help?

- MAOs are encouraged to direct their questions to the HOS Technical Support Team at HSAG at hos@hsag.com.
- Information about peer-reviewed articles, technical reports, and manuals related to the HOS is available on the Resources page of the HOS website (www.HOSonline.org). Consult the Home page for a listing of new reports and general updates.
- A glossary consisting of definitions relevant to the Medicare HOS may be accessed from the "Glossary" link at the bottom of site webpages.
- Participating MAOs contracted with a CMS approved survey vendor to administer the survey following the HOS protocol that is specified in the NCQA *HEDIS Measurement Year (MY) 2021, Volume 6: Specifications for the Medicare Health Outcomes Survey* manual.[8] The most recent HEDIS Volume 6 manuals are available at no cost from the NCQA Store. Copies of older HEDIS publications may be obtained by calling NCQA Customer Support at (888) 275-7585.

# HOS Highlights and Resources

## Recent HOS Enhancements

### Changes to the *Improving or Maintaining Physical Health* and *Improving or Maintaining Mental Health* Display Measures

CMS finalized the following updates to two measures from the Medicare HOS: the *Improving or Maintaining Physical Health* (PCS) measure and *Improving or Maintaining Mental Health* (MCS) measure for the 2022 measurement year (Federal Register 2021).[9]

- First, CMS changed the case-mix adjustment to improve the case-mix model performance and simplify the implementation and interpretation of case-mix results when particular case-mix variables, such as education level, are missing.
- Second, CMS increased the minimum required denominator from 30 to 100 respondents for each of these measures. The increase to the minimum denominator brings these measures into alignment with the denominator requirements for the HEDIS measures that come from the HOS survey.

Details regarding the case-mix adjustment are presented in the Calculation of Outcomes section in Appendix 1.

Since the case-mix specification change is substantive, as described in Section 422.164(d)(2), the two measures will remain on display for the 2024 and 2025 Star Ratings and will return to the Star Ratings program in 2026.

### Physical Functioning Activities of Daily Living (PFADL) Display Measure

The longitudinal PFADL change score measure is part of the 2024 display measures on both the CMS website and the 2024 Star Ratings Validation Tables in HPMS. CMS may consider the measure for the Star Ratings in the future.

The PFADL is a longitudinal change score measure derived from the HOS. It measures, at the MAO contract level, the change over two years in the physical functioning of members enrolled in MAO contracts and complements the measurement of physical health status. The PFADL change score can be interpreted as approximating the percent of function retained over two years by the average member in an MAO. The PFADL scale combines two VR-12 physical functioning questions (limitations in moderate activities and climbing stairs) with the six ADL questions to create a Likert-type scale. PFADL scale scores are created from responses to the baseline and the two-year follow-up questions. The unadjusted PFADL scale score has been added to the *HOS Baseline Report*. A more detailed methodology used to create the PFADL change score measure is described on the Survey Results page of the HOS website (www.HOSonline.org).

## HOS Resources

### HOS 3.0 Survey Instrument

The 2022 survey administration used the HOS 3.0 that was implemented in 2015. The HOS 3.0 uses the Veterans RAND 12-Item Health Survey (VR-12) as the core physical and mental health outcomes measures, and the three HEDIS® Effectiveness of Care measures are the *Management of Urinary Incontinence in Older Adults, Physical Activity in Older Adults,* and *Fall Risk Management.* The HOS survey instrument can be downloaded from NCQA's website (www.ncqa.org/hedis/measures/hos).

### 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
- Listing of journal articles, bibliographies, and technical reports relating to the HOS
- Links to project partners

### 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 MAO 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 Survey Vendors section under the Program page on the HOS website provides an annual list of CMS approved survey vendors. Survey vendors are required to reapply for approval each year. There were three survey vendors approved to administer the HOS in 2022.

### 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. Examples are questions about where to find the current survey administration documents and HOS questionnaires, how MAOs 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.

### Self-Paced Training Webinars

A series of basic to advanced self-paced training webinars are available on the HOS website. The webinars run 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 or others seeking to obtain an overview of the HOS. In addition, 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 training discusses maximizing the use of the *HOS Baseline Report* to provide information on the health of Medicare Advantage (MA) members and incorporating chronic care improvement programs (CCIPs) in quality improvement activities.

- **Using Your Medicare Health Outcomes Survey (HOS) Data:** An intermediate training session assisting MAOs with using their HOS data to identify priorities and assess the impact of interventions. It also demonstrates the advantages of linking HOS data with your own MAO data.

- **Understanding the Medicare Health Outcomes Survey (HOS) Performance Results Used in the MA Plan Ratings:** An advanced training session describing the methodology used in calculating the Performance Measurement Results. The tutorial discusses the primary health outcomes collected from the survey, the PCS and MCS scores, and how they are used to describe changes in the functional status of MAO members over a two-year period. It also discusses how the HOS results are used in the MA Plan Ratings, also called the Medicare Part C and D Star Ratings.

### 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 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 and the Star Ratings

## Medicare Star Ratings

CMS developed the Medicare Star Ratings to help consumers compare health plans and the care and services they provide based on quality and performance, to make accurate data more transparent and standardized among plans, and to reward top-performing health plans. Consumers can use the Medicare Plan Finder (MPF) tool www.medicare.gov/plan-compare to search for health plans in their geographic area and compare cost estimates and coverage information. CMS rates the relative quality of service and care provided by MAOs based on a five-star rating scale that uses HOS measures combined with other measurement results. Up to 38 unique quality measures were included in the 2023 Medicare Part C and D Star Ratings. These measures include: providing preventive services, managing chronic illness, access to care, HEDIS measures, the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey, and plan responsiveness.

The Medicare Part C Star Ratings include five contract level HOS measures: two measures of functional health and the three HEDIS Effectiveness of Care measures.

Three functional health measures are reported in each MAO's annual *HOS Performance Measurement Report*. Two results are derived from the VR-12 portion of the HOS, which serves as the core source for the PCS and MCS scores. The final measures are based on the case-mix adjusted PCS and MCS change scores between baseline and follow up surveys, as well as death status, in the Performance Measurement Results section. The PFADL measure is derived from two physical functioning and six ADL questions and remains under development.

- *Improving or Maintaining Physical Health* display measure is the "Physical Health Percent Better or Same" result
- *Improving or Maintaining Mental Health* display measure is the "Mental Health Percent Better or Same" result
- *Physical Functioning Activities of Daily Living* display measure is the PFADL result (in development)

Since 2021, the HEDIS Effectiveness of Care measures are reported in each MAO's annual *HEDIS HOS Effectiveness of Care Report*. These measures are calculated from questions about information and care members receive from their healthcare providers, using data for the baseline and follow up cohorts from the same measurement year (i.e., a round of data). Member responses are used to derive the HEDIS measures: Management of Urinary Incontinence in Older Adults, Physical Activity in Older Adults, and Fall Risk Management. CMS uses these measures for the Medicare Star Ratings. Further information is available in the *HEDIS HOS Report*.

- *Improving Bladder Control* measure is the Treatment of Urinary Incontinence rate
- *Monitoring Physical Activity* measure is the Advising Physical Activity rate
- *Reducing the Risk of Falling* measure is the Managing Fall Risk rate

## 2023 and 2024 Medicare Part C Star Ratings

The HOS cohorts related to data collection, report dissemination, and CMS Medicare Part C Star Ratings results are provided in the Medicare HOS Survey Administration Timeline Table below. This information will guide MAOs in understanding the sources of data used for specific Medicare Star Ratings measures.

The 2024 Medicare Part C Star Ratings will be posted in October 2023 and the HOS data sources are highlighted yellow in the table below. The HOS 2020-2022 Cohort 23 Merged Baseline and Follow Up dataset will be used for the three functional health measures, and the combined 2022 Cohort 25 Baseline and 2022 Cohort 23 Follow Up dataset will be used for the three HEDIS Effectiveness of Care measures.

The 2023 Medicare Part C Star Ratings were posted in October 2022 and are highlighted green in the table below. For instance, the 2019-2021 Cohort 22 Merged Baseline and Follow Up dataset was used for the three functional health measures, and the combined 2021 Cohort 24 Baseline and 2021 Cohort 22 Follow Up dataset was used for the three HEDIS Effectiveness of Care measures.

Additional information about the Medicare Star Ratings, can be found on the CMS website at https://go.cms.gov/partcanddstarratings. For any questions related to Medicare Part C and D Star Ratings, you may send an email inquiry directly to PartCandDStarRatings@cms.hhs.gov. Please be sure to include your contract number(s) in the email.

**Medicare HOS Survey Administration and Star Ratings Timeline Table**

| Calendar Year | Baseline Data Collection | Follow Up Data Collection | Baseline Reports | Follow Up Reports | 2-yr PCS/MCS Change for Star Ratings* | HEDIS Measures for Star Ratings** | Star Rating Year |
|---|---|---|---|---|---|---|---|
| 2024 | *Cohort 27* | *Cohort 25* | *Cohort 26* | *Cohort 24* | *2020-2022 Cohort 23* | *2022 Cohort 25 Baseline & 2022 Cohort 23 Follow Up* | 2024 |
| 2023 | *Cohort 26* | *Cohort 24* | *Cohort 25* | *Cohort 23* | *2019-2021 Cohort 22* | *2021 Cohort 24 Baseline & 2021 Cohort 22 Follow Up* | 2023 |
| 2022 | *Cohort 25* | *Cohort 23* | *Cohort 24* | *Cohort 22* | *2018-2020 Cohort 21* | *2020 Cohort 23 Baseline & 2020 Cohort 21 Follow Up* | 2022 |
| 2021 | *Cohort 24* | *Cohort 22* | *Cohort 23* | *Cohort 21* | *2017-2019 Cohort 20* | *2019 Cohort 22 Baseline & 2019 Cohort 20 Follow Up* | 2021 |

* PCS and MCS remain on display for the 2023 and 2024 Star Ratings years.
** The HEDIS Effectiveness of Care Measures collected by the HOS are calculated form the combined round of baseline and follow up data by reporting year: Management of Urinary Incontinence in Older Adults, Physical Activity in Older Adults, and Fall Risk Management.

## MAO Resources for Best Practices and the Star Ratings

A study titled *Analysis of Key Drivers of Improving or Maintaining Medicare Health Outcomes Survey (HOS) Scores* is available on the HOS website at www.HOSonline.org.[10] The study describes how two-year mortality and two-year changes in the VR-12 items are associated with key HOS measures used in the Medicare Star Ratings. The HOS measures relate to maintaining and improving health and are derived from changes in the PCS and MCS scores. The results from this study clarify the properties of several CMS quality measures and identify which items most influence contract-level PCS and MCS scores.

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.[11] This guide is intended to help MAOs develop and apply strategies that address the HOS items used in the CMS Medicare Part C Star Ratings including an overview of the HOS, national performance results on HOS items included in the Medicare Part C Star Ratings, best practices in promoting quality preventive health care for the elderly, and HOS resources available to MAOs. 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 available on the HOS website at www.HOSonline.org.[12] 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. The articles were selected because they describe interventions that could impact functional status outcomes in elderly populations.

All three documents are available on the HOS website at www.HOSonline.org. The study results may be found and downloaded from the Applications section of the Resources page.

# 2022 Cohort 25 Baseline Results

This report presents the Medicare HOS 2022 Cohort 25 Baseline results for MAO HXXXA and the national HOS Total. The aggregate data are provided to facilitate internal quality improvement activities. **Please be advised that the information in this report is not suitable for MAO level comparisons. Therefore, these data should not be used for public release or marketing purposes.**

## Distribution of the Sample and Response Rates

The HOS 2022 Cohort 25 Baseline included a random sample of 1,005,548 members, both the aged and disabled, from 620 MAOs. The number represents a 10.4% increase from the 910,581 people sampled from 562 MAOs in the HOS 2021 Cohort 24 Baseline.

Of the 1,005,548 members originally sampled for the 2022 Cohort 25 Baseline, 12,817 were determined to be ineligible during the survey administration. Ineligible individuals of the sample met one of the following criteria: deceased; bad address and phone number; bad address and mail-only protocol (*Russian only*); or language barrier. Removing the ineligible individuals from the total sample yielded the Cohort 25 Baseline eligible sample of 992,731.

Of the 992,731 members in the eligible sample, 27.6% (273,580) completed the baseline survey. For the purposes of this report, a completed survey was defined as one that could be used to calculate a PCS or MCS score.[I]

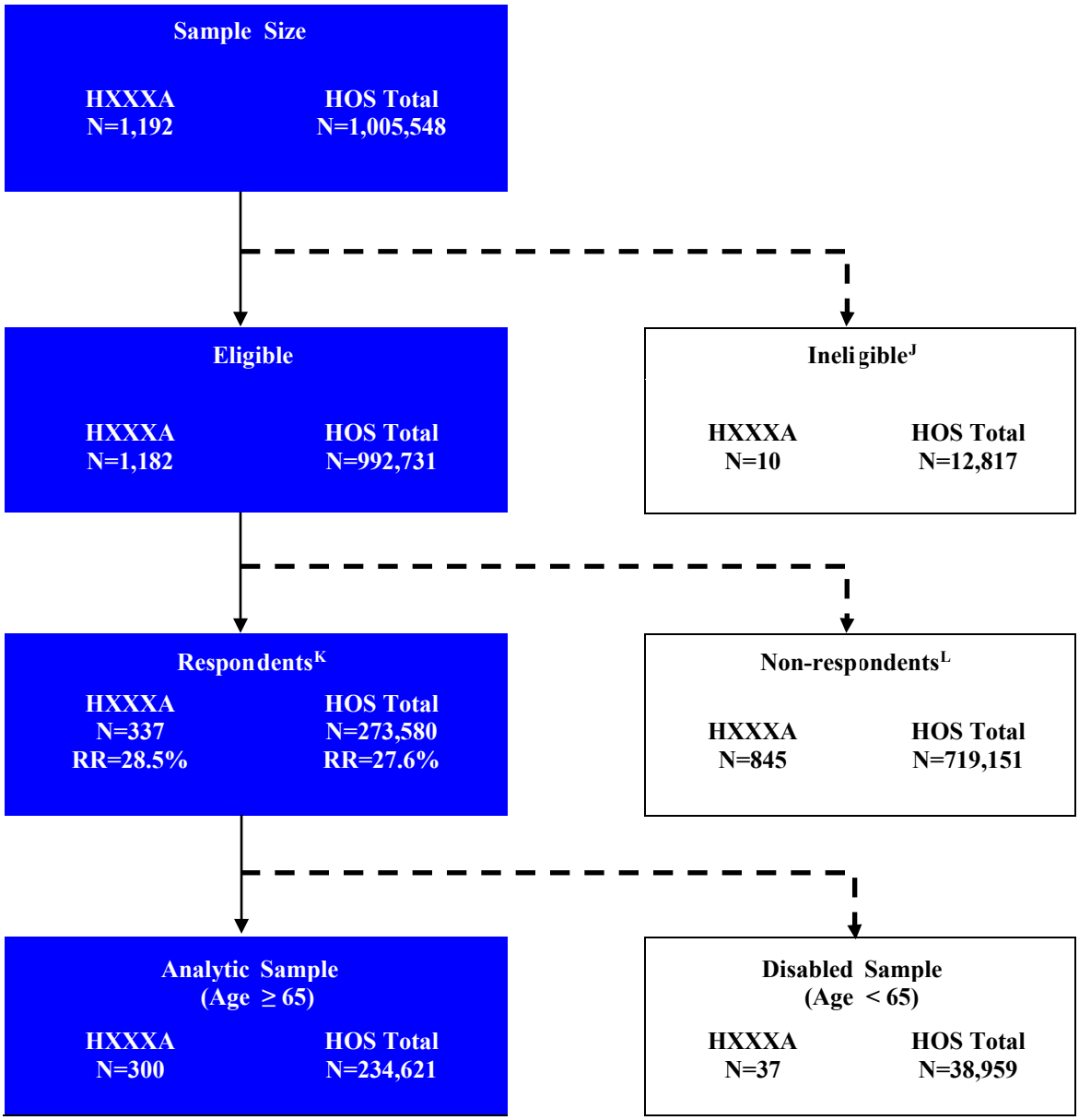
The 992,731 members of the Cohort 25 Baseline eligible sample included 804,441 seniors (age 65 years or older). Of the 804,441 eligible seniors sampled, 234,621 completed the baseline survey. This group of seniors comprised the Cohort 25 Baseline analytic sample. Please refer to Figure 2 on the following page for a graphical depiction of the response rates and distribution of the sample. MAOs 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.

The average number of senior respondents per MAO was 378, with a minimum of 1 and a maximum of 2,122 respondents. The top 25% of MAOs had 422 or more senior respondents, while 25% had 224 or less. Ten percent of the MAOs had 799 or more respondents, and ten percent had 164 or fewer respondents. Based on the analytic criteria, the mean MAO level response rate at baseline for seniors was 28.7%, with a minimum response rate of 5.8% and a maximum of 50.2%. The top 25% of MAOs had a response rate of 32.4% or greater, while 25% had a response rate of 24.2% or less. Ten percent of the MAOs had a response rate of 36.8% or higher and ten percent had a response rate of 20.5% or lower.

[I] The overall response rates in the report are calculated after data processing and score calculation. An initial overall survey completion rate was calculated by NCQA following the data collection and used the criteria of at least 80% completion of survey items and all six ADL questions answered. This initial rate may be reported elsewhere and will differ from the overall response rate in this report.

Figure 2 illustrates the calculation of the response rates, the distribution of the eligible sample, and the process for determining the number of members in the analytic sample for MAO HXXXA and the HOS Total. All analyses in this report use the Cohort 25 Baseline analytic sample of seniors.

**Figure 2: 2022 Cohort 25 Baseline Distribution of the Sample and Response Rates for MAO HXXXA and HOS Total**




[J] Ineligible individuals met one of the following criteria: deceased, bad address and phone number, bad address and mail-only protocol (*Russian only*), or language barrier.
[K] Response Rate = [(Respondent Sample/Eligible Sample)] x 100%.
[L] Surveys for which PCS and MCS scores cannot be calculated.

## Demographics

Table 9 presents demographics for MAO HXXXA and the HOS Total. The mean age for the HOS Total sample was 74.7 years (not shown in the table). HOS demographics in the table are detailed by sub-categories within the age, gender, race, marital status, education, geographic category,[M] and Medicaid status groups. In 2022, annual household income was removed from the HOS 3.0.

**Table 9: 2022 Cohort 25 Baseline Demographics for MAO HXXXA and HOS Total**

| HOS Demographic | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| **Age** | (N=300) | (N=234,621) |
| 65-69 | 89 (29.7%) | 66,877 (28.5%) |
| 70-74 | 84 (28.0%) | 62,693 (26.7%) |
| 75-79 | 70 (23.3%) | 48,599 (20.7%) |
| 80-84 | 33 (11.0%) | 31,143 (13.3%) |
| 85+ | 24 ( 8.0%) | 25,309 (10.8%) |
| **Gender** | (N=300) | (N=234,621) |
| Male | 118 (39.3%) | 98,737 (42.1%) |
| Female | 182 (60.7%) | 135,884 (57.9%) |
| **Race** | (N=300) | (N=234,621) |
| White | 220 (73.3%) | 177,881 (75.8%) |
| Black | 45 (15.0%) | 29,545 (12.6%) |
| Other/Unknown | 35 (11.7%) | 27,195 (11.6%) |
| **Marital Status** | (N=288) | (N=220,475) |
| Married | 131 (45.5%) | 105,272 (47.7%) |
| Widowed | 70 (24.3%) | 51,336 (23.3%) |
| Divorced or Separated | 75 (26.0%) | 47,226 (21.4%) |
| Never Married | 12 ( 4.2%) | 16,641 ( 7.5%) |
| **Education** | (N=286) | (N=219,060) |
| Did Not Graduate HS | 54 (18.9%) | 36,078 (16.5%) |
| High School Graduate | 79 (27.6%) | 66,344 (30.3%) |
| Some College | 79 (27.6%) | 60,206 (27.5%) |
| 4 Year Degree or Beyond | 74 (25.9%) | 56,432 (25.8%) |
| **Geographic Category** | (N=300) | (N=234,621) |
| Metropolitan | 240 (80.0%) | 183,791 (78.3%) |
| Micropolitan | 32 (10.7%) | 30,216 (12.9%) |
| Rural | 28 ( 9.3%) | 20,614 ( 8.8%) |
| **Medicaid Status** | (N=300) | (N=234,621) |
| Medicaid | 101 (33.7%) | 65,864 (28.1%) |
| Non-Medicaid | 199 (66.3%) | 168,757 (71.9%) |

[M] Geographic categories were derived from the MA Health Service Delivery classifications defined at 42 CFR 422.116 (c). The Metropolitan label includes members in "Large Metro" or "Metro" counties and the Rural label includes members in the "Rural" or "Counties with Extreme Access Considerations (CEAC)" counties.

## Physical and Mental Component Summary Scores

*Definition of Measures*

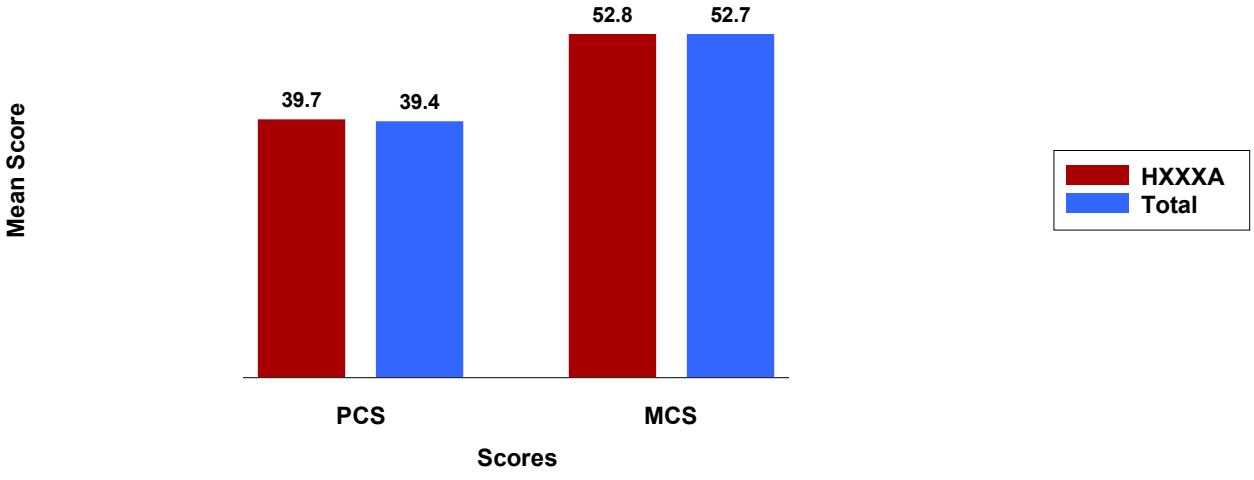
- The HOS health status measures are the PCS score and the MCS score. These scores are calculated from the VR-12 (Questions 1-7 in the HOS 3.0) which asks respondents about their usual activities and how they would rate their health.
- The VR-12 is a barometer of physical and mental health status. Concepts included in the measures are: physical functioning, role limitations due to physical problems (role-physical), bodily pain, general health, vitality, role limitations due to emotional problems (role-emotional), social functioning, and mental health.
- A higher PCS or MCS score reflects better health status. The PCS and MCS scores are case-mix adjusted[N] to allow for equitable comparisons across all MAOs.

*How Is Your MAO Doing?*

Figure 3 depicts the mean adjusted PCS and MCS scores for MAO HXXXA and the HOS Total. For the HOS Total, the mean PCS of 39.4 indicates that the physical health status of seniors is substantially lower, on average, than the mean PCS of 50 (SD=10) for the general U.S. population. The mean MCS of 52.7 indicates that the mental health status of seniors is slightly higher, on average, than the mean MCS of 50 (SD=10) for the general U.S. population.

For additional mean unadjusted and adjusted PCS and MCS scores, refer to the Executive Summary section. **Only adjusted scores are displayed in the tables and graphs in the remainder of the report.**

**Figure 3: 2022 Cohort 25 Baseline Mean Adjusted PCS and MCS Scores for MAO HXXXA and HOS Total**




[N] Case-mix adjustment is a statistical technique that controls for differences in sociodemographic characteristics, chronic medical conditions, and HOS study design variables. For additional information about case-mix adjustment and scoring for the VR-12, please refer to Appendix 1.

## PFADL Scale Score

*Definition of Measure*

- The PFADL scale combines two VR-12 physical functioning (PF) questions (Questions 2a-b about limitations in moderate activities or climbing stairs) with the six ADL questions (Questions 10a-f about difficulty with bathing, dressing, eating, walking, getting in and out of chairs, or using the toilet) to create a Likert-type scale ranging from 0-16.
- To create the PFADL scale score, each PF and ADL item is scored from 0-2 points, where a physical limitation or inability to perform an ADL = 0 points, some limitation or difficulty = 1 point, and no limitation or difficulty = 2 points. The unadjusted PFADL scale score is the sum of the points from the 8 items; the score ranges from 0 to 16, where a higher score is better.

The PFADL scale has been used since the 1998-2000 Cohort 1 Performance Measurement as a covariate in death models to measure baseline functional status for the calculation of the Physical Health results, which combine risk-adjusted two-year mortality rates and changes in the PCS score. Responses from the six ADLs are also used by CMS in the annual frailty assessments for Program of All-Inclusive Care for the Elderly (PACE) organizations.

The PFADL change score is created from the baseline and the two-year follow up scale scores and is posted as a display measure on the 2024 Star Ratings Validation table in HPMS. A detailed methodology used to create the PFADL change score is described on the Survey Results page of the HOS website at www.hosonline.org.

*How Is Your MAO Doing?*

Table 10 depicts the mean PFADL scale score for MAO HXXXA, StateXX, and the HOS Total. PFADL scale scores range from 0 to 16.

**Table 10: 2022 Cohort 25 Baseline Mean PFADL Scale Scores for MAO HXXXA, StateXX, and HOS Total**

| | Mean PFADL Scale Score |
|---|---|
| HXXXA | 13.35 |
| StateXX | 13.25 |
| HOS Total | 13.25 |

Note: If no members reported for these measures, the results are *not applicable* (NA).

Table 11 displays the means and percentile distributions of the PFADL scale score for MAO HXXXA, StateXX, and the HOS Total. At the national level, the mean PFADL scale score is 13.25, with a minimum of 0 and maximum of 16.00. The top 25% of MAOs had scores of 16.00, while 25% had scores of 12.00 or lower. Ten percent of MAOs had scores of 16.00, and 10% had scores of 9.00 or lower.

**Table 11: 2022 Cohort 25 Baseline Distribution of Mean PFADL Scale Scores for MAO HXXXA, StateXX, and HOS Total**

| | Mean | SD | P10 | P25 | Median | P75 | P90 | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| HXXXA | 13.35 | 2.84 | 10.00 | 12.00 | 14.00 | 16.00 | 16.00 | 2.00 | 16.00 |
| StateXX | 13.25 | 2.94 | 9.00 | 12.00 | 14.00 | 16.00 | 16.00 | 0.00 | 16.00 |
| HOS Total | 13.25 | 3.00 | 9.00 | 12.00 | 14.00 | 16.00 | 16.00 | 0.00 | 16.00 |

Note: If no members reported for this measure, the result is *not applicable* (NA). If there was only one MAO in the state, the standard deviation (SD) for the state was *not calculated* (NC).

## General Health and Comparative Health

*Definition of Measures*

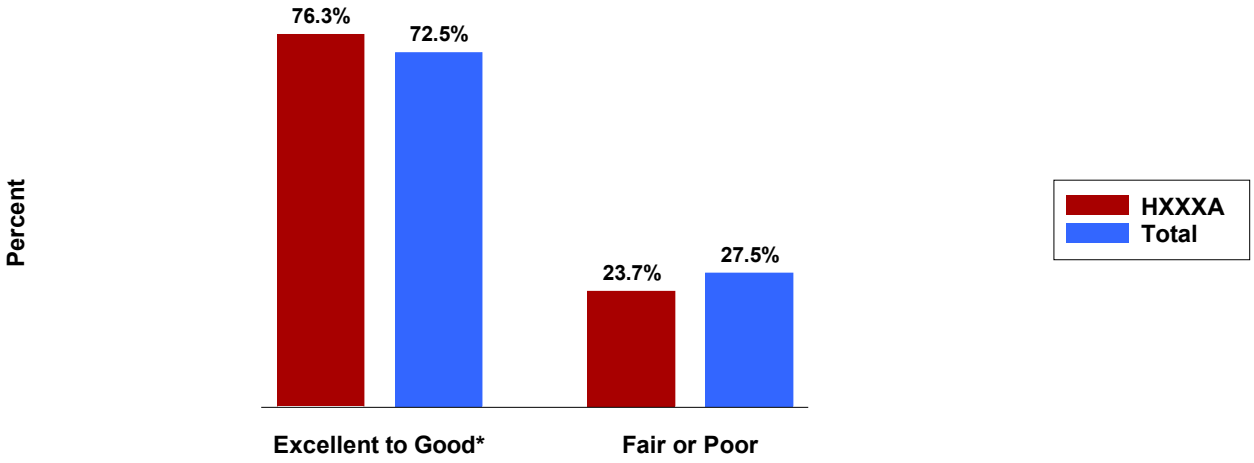
- General health status is a self-reported measure of health perception using ratings of "Excellent," "Very good," "Good," "Fair," or "Poor."[13] This measure is found in Question 1 of the HOS.
- Two measures of physical and mental health compared to one year ago use ratings of "Much better," "Slightly better," "About the same," "Slightly worse," or "Much worse." These measures are found in Questions 8 and 9.

General self-rated health status is a valid and reliable method for assessing health across different populations.[1] 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 mortality.[14, 15]

*How Is Your MAO Doing?*

Figure 4 displays the respondents' self-reported general health status for your MAO and the HOS Total.

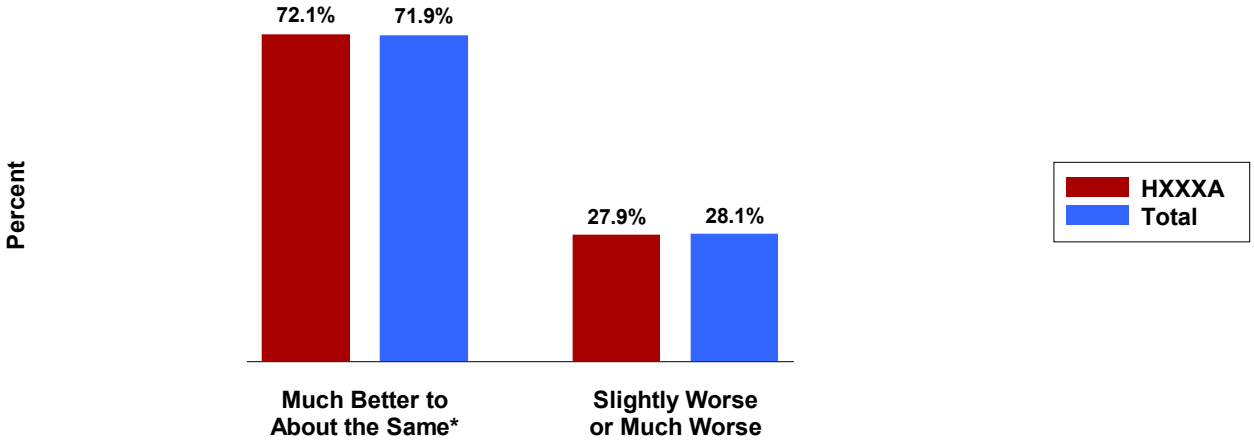
**Figure 4: 2022 Cohort 25 Baseline Self-Rated General Health Status for MAO HXXXA and HOS Total**




* Categories for general health included "Excellent," "Very good," or "Good."

Figure 5 displays the respondents' self-reported physical health status as compared to one year ago for your MAO and the HOS Total.

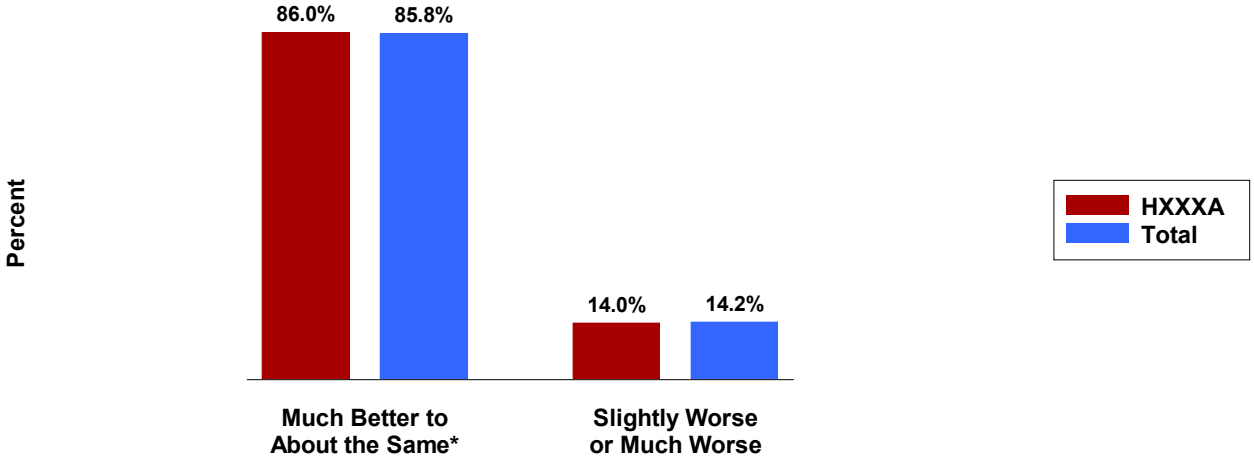
**Figure 5: 2022 Cohort 25 Baseline Self-Rated Physical Health Compared to One Year Ago for MAO HXXXA and HOS Total**




* Categories for comparative health included "Much better," "Slightly better," or "About the same."

Figure 6 displays the respondents' self-reported mental health status as compared to one year ago for your MAO and the HOS Total.

**Figure 6: 2022 Cohort 25 Baseline Self-Rated Mental Health Compared to One Year Ago for MAO HXXXA and HOS Total**




* Categories for comparative health included "Much better," "Slightly better," or "About the same."

Table 12 compares the self-reported general and comparative health status measures by adjusted PCS and MCS scores for MAO HXXXA and the HOS Total.

**Table 12: 2022 Cohort 25 Baseline Mean Adjusted Scores by Self-Rated General and Comparative Health Status for MAO HXXXA and HOS Total**

| Self-Rated Health Status | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| | PCS Mean (SD) | MCS Mean (SD) | PCS Mean (SD) | MCS Mean (SD) |
| **General Health** | | | | |
| Excellent to Good* | 41.2 (5.9) | 54.0 (4.9) | 40.9 (5.5) | 53.9 (4.7) |
| Fair or Poor | 35.1 (6.0) | 49.4 (6.3) | 35.4 (5.9) | 49.8 (5.7) |
| **Comparative Health-Physical** | | | | |
| Much Better to About the Same** | 40.3 (6.1) | 53.7 (4.9) | 40.5 (5.7) | 53.5 (4.9) |
| Slightly Worse or Much Worse | 36.5 (7.1) | 49.5 (6.8) | 36.9 (6.4) | 50.9 (6.0) |
| **Comparative Health-Mental** | | | | |
| Much Better to About the Same** | 39.9 (6.5) | 53.3 (5.3) | 40.0 (5.9) | 53.4 (4.9) |
| Slightly Worse or Much Worse | 36.5 (6.1) | 48.6 (6.3) | 36.3 (6.7) | 49.0 (6.3) |

* Categories for general health included “Excellent,” “Very good,” or “Good.”
** Categories for comparative health included “Much better,” “Slightly better,” or “About the same.”

## Depression

*Definition of Measures*

- The HOS includes two questions (Questions 36a and 36b) that serve as a screening measure for depression.[O] Each question is assigned points depending on the response given, from 0 ("Not at all") to 3 ("Nearly every day"). For this report, a member is considered to have a positive depression screen when he or she scores three points or greater on the combined total points of the two depression questions, when both questions are answered.

Individuals with a positive depression screen may be at risk for depressive disorders. Depression is under-diagnosed in the elderly Medicare population, and is a significant health problem that has been linked to poor health outcomes.[16, 17] Older adults may suffer mental distress associated with limitations in daily activities, physical impairments, grief from loss of loved ones, changes in living situations, or untreated mental illness.[18] Additionally, depression is significantly associated with other psychological dysfunction, as well as the presence of common chronic medical conditions, such as diabetes.[19, 20] As a result, older adults with depression are frequently misdiagnosed or do not receive proper treatment for their depressive symptoms.[21] Depression screening tools have been developed for use in clinical settings to rapidly identify individuals at risk for major depression. Those with positive depression screens should be followed-up by more comprehensive diagnostic evaluations to identify whether or not they have major depression.[22, 23] Evidence-based programs have been developed to improve mental health among older adults. Social supports through local area agencies may also be effective.[18]

*How Is Your MAO Doing?*

Table 13 depicts members with a positive depression screen, and the distribution of responses to the two individual depression questions for MAO HXXXA and the HOS Total.

**Table 13: 2022 Cohort 25 Baseline Frequency of Positive Depression Screen for MAO HXXXA and HOS Total**

| Depression Screening Questions | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| **Little interest or pleasure in doing things in past two weeks** | | |
| Not at all (0 pts) | 192 (66.9%) | 148,705 (67.2%) |
| Several days (1 pt) | 62 (21.6%) | 43,526 (19.7%) |
| More than half the days (2 pts) | 13 ( 4.5%) | 16,067 ( 7.3%) |
| Nearly every day (3 pts) | 20 ( 7.0%) | 12,935 ( 5.8%) |
| **Feeling down, depressed, or hopeless in past two weeks** | | |
| Not at all (0 pts) | 205 (72.2%) | 160,544 (73.3%) |
| Several days (1 pt) | 55 (19.4%) | 40,538 (18.5%) |
| More than half the days (2 pts) | 16 ( 5.6%) | 10,690 ( 4.9%) |
| Nearly every day (3 pts) | 8 ( 2.8%) | 7,155 ( 3.3%) |
| **Positive Depression Screen*** | 34 (12.1%) | 27,700 (12.8%) |

* A positive depression screen is defined as scoring 3 points or greater on the sum total of the two depression questions, when both questions are answered.

[O] Beginning with the 2013 HOS 2.5, two depression screening questions from the Patient Health Questionnaire-2 (PHQ-2) replaced the questions that served as the depression screening measure in previous versions of the HOS. Due to the change in the depression screening methodology, estimates of the proportion with positive depression screens in this report are not comparable to estimates produced using the HOS versions 1.0 or 2.0.

## Pain

*Definition of Measures*

- The HOS includes three questions to measure self-reported pain over the previous seven days. Question 33 asks how much pain interfered with day-to-day activities from 1 ("Not at all") to 5 ("Very much"), and Question 34 asks how often pain kept the member from socializing from 1 ("Never") to 5 ("Always"). Both questions have five possible categorical responses. Question 35 asks the member to rate his/her average pain, with responses ranging from 0 ("No pain") to 10 ("Worst imaginable pain"). In 2021, the response scale for question 35 changed from 1 ("No pain") to 0 ("No pain"). Due to the change, the "No pain" response is not comparable to results from prior years.

Self-reported pain is common among older adults.[24] Pain may be caused by, and contribute to, many health-related quality of life factors,[25, 26] including but not limited to, selected health conditions, sleep, and sociodemographic characteristics, such as those measured in the HOS.

Pain screening is the initial step in establishing an appropriate pain management program for elderly patients. Physical activity and complementary medicine techniques may be helpful alternatives in relieving certain types of pain.[27]

*How Is Your MAO Doing?*

Figure 7 shows the distribution of self-reported pain scores, grouped into categories, for MAO HXXXA and the HOS Total.

**Figure 7: 2022 Cohort 25 Baseline Frequency of Self-Rated Pain Score for MAO HXXXA and HOS Total**

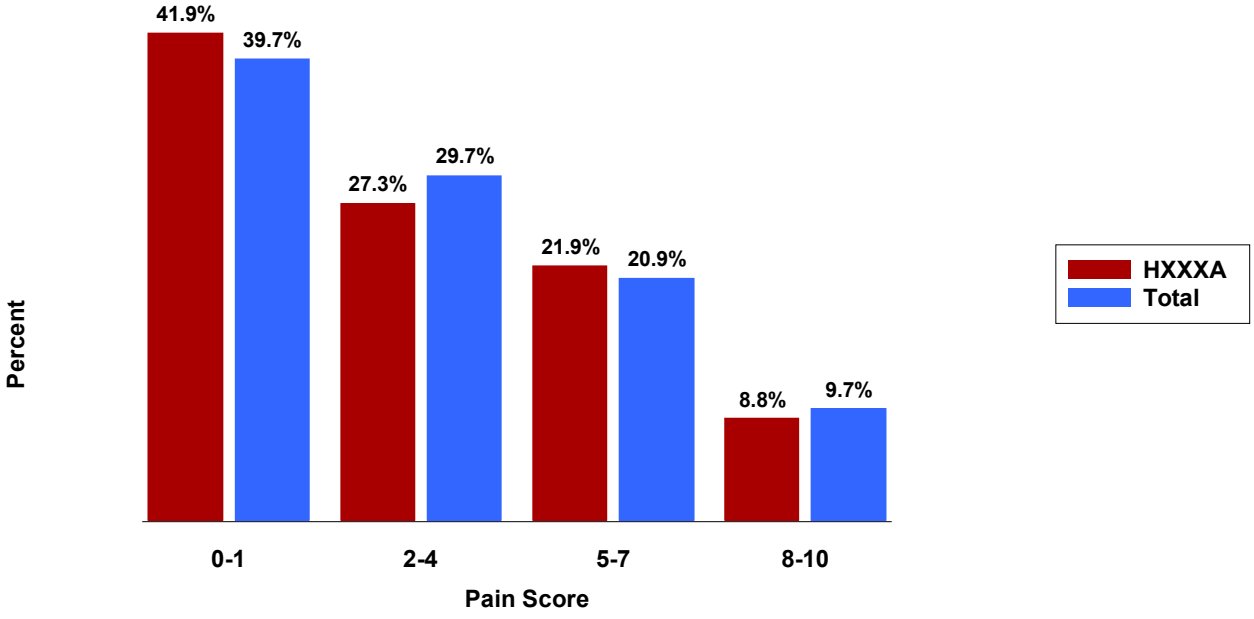


Figure 8 illustrates the relationship between the reported extent that pain interfered with day-to-day activities and mean adjusted PCS score for MAO HXXXA and the HOS Total.

**Figure 8: 2022 Cohort 25 Baseline Mean Adjusted PCS Score by Extent Pain Interfered with Day-to-Day Activities for MAO HXXXA and HOS Total**

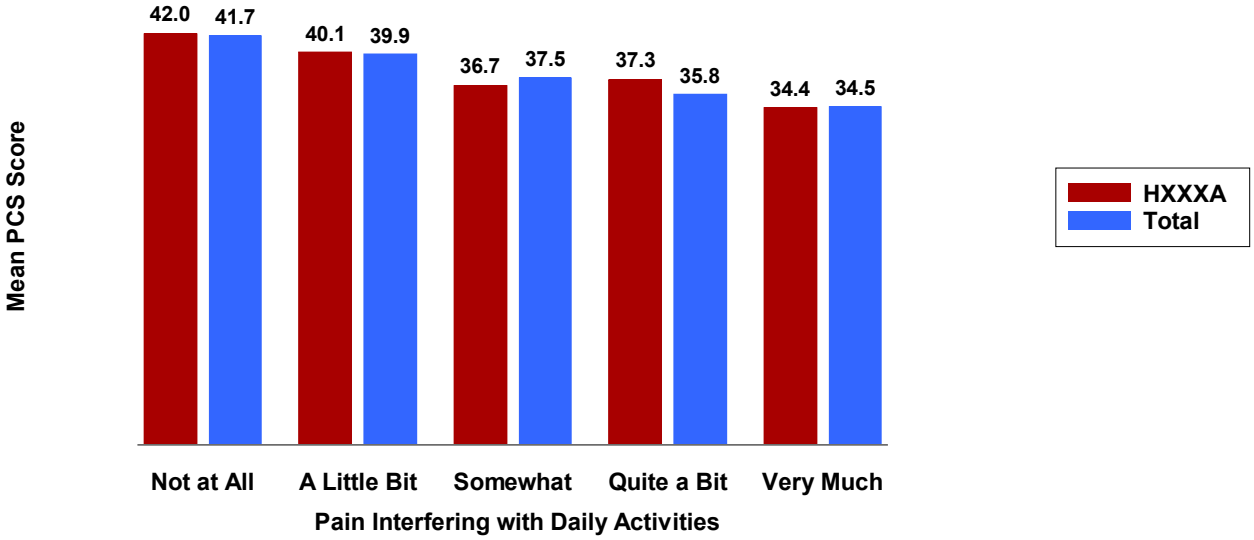
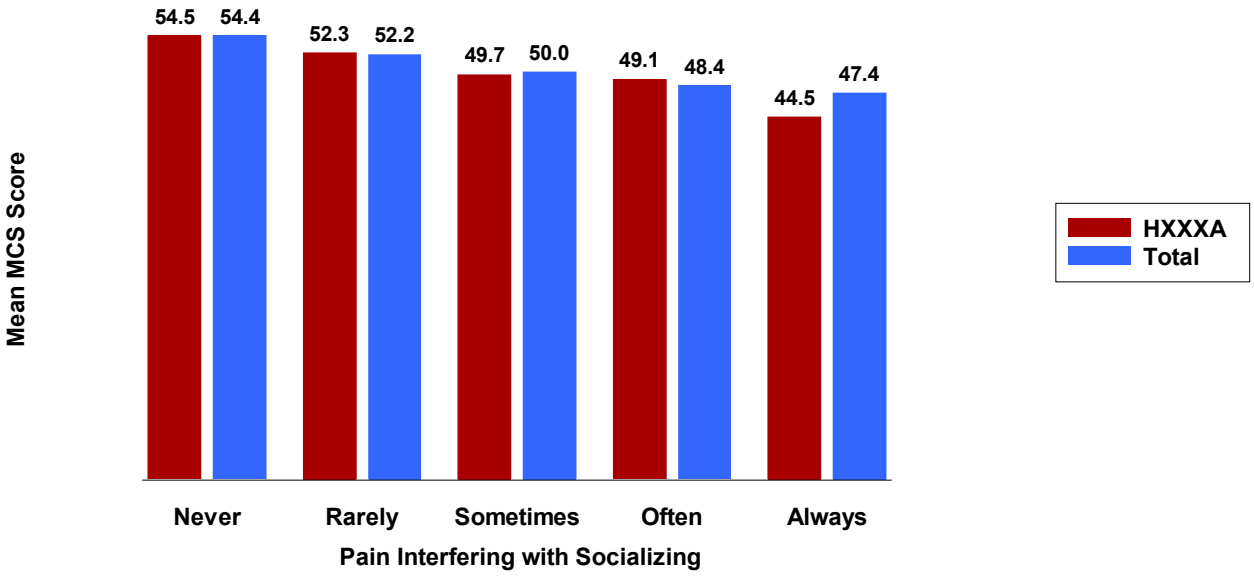



Figure 9 shows the relationship between the reported extent that pain interfered with socialization with others and mean adjusted MCS score for MAO HXXXA and the HOS Total.

**Figure 9: 2022 Cohort 25 Baseline Mean Adjusted MCS Score by Extent Pain Interfered with Socializing with Others for MAO HXXXA and HOS Total**



## Chronic Medical Conditions

*Definition of Measures*

- Chronic medical conditions are multiple measures of the prevalence of chronic disease across the member lifespan. Chronic conditions are those that last a year or more, and require ongoing medical attention and/or limit activities of daily living. Twelve measures are found in Questions 20-31.

For older adults, the presence of chronic medical conditions can reduce the quality of life, accelerate a decline in functioning, and lead to conflicting medical advice when care is not coordinated.[28] The increased cost associated with chronic disease is an important factor driving overall Medicare spending.[29] This cost is further exacerbated by the proportion of multiple chronic conditions in the population, which accounts for over three-fourths of those 65 and over.[30]An important feature of the Medicare HOS is the ability to report and quantify self-reported chronic conditions in the MA population.

*How Is Your MAO Doing?*

Table 14 shows the prevalence of 12 self-reported chronic medical conditions in your MAO and the HOS Total. Depression was added to the list of chronic medical conditions in the 2013 HOS 2.5. Arthritis of the Hip or Knee, Arthritis of the Hand or Wrist, and Sciatica were removed from the list in the 2022 HOS 3.0. The chronic medical conditions are quantified in the HOS when members positively respond to the question, "Has a doctor ever told you that you had (the specified condition)?"

**Table 14: 2022 Cohort 25 Baseline Prevalence of Chronic Medical Conditions for MAO HXXXA and HOS Total**

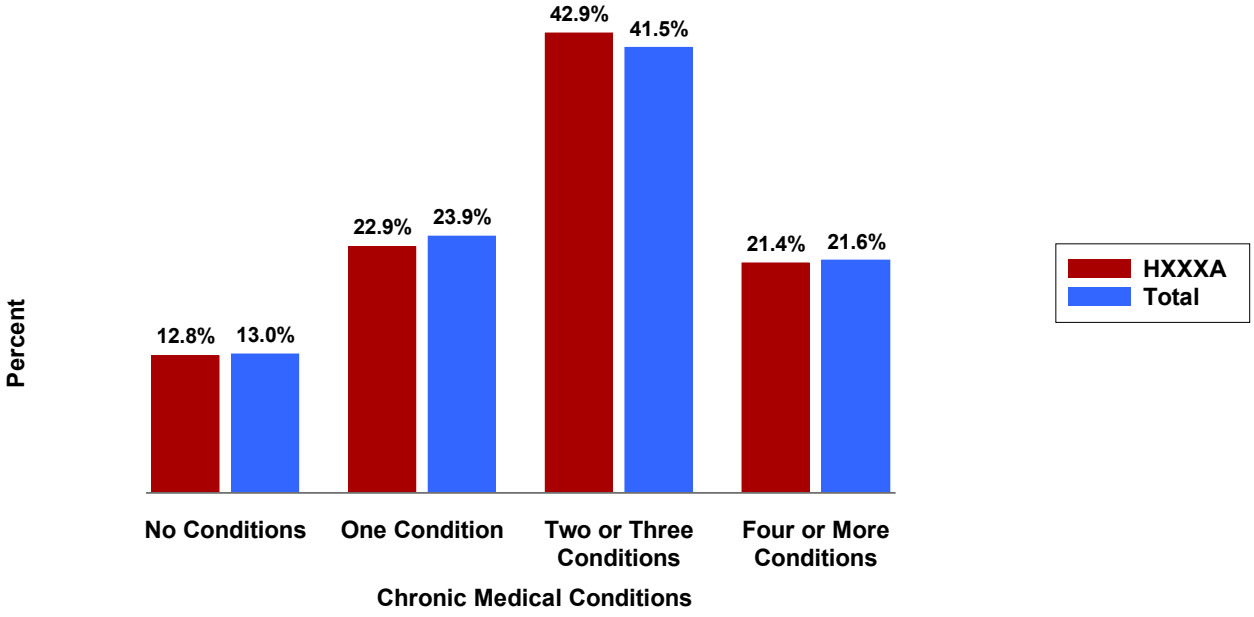
| Medical Condition | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| Hypertension | 183 (64.4%) | 148,634 (66.4%) |
| Diabetes | 89 (31.0%) | 64,110 (28.7%) |
| Other Heart Conditions | 59 (20.5%) | 49,069 (22.1%) |
| Osteoporosis | 57 (20.2%) | 47,378 (21.3%) |
| Depression | 61 (21.3%) | 46,023 (20.7%) |
| Pulmonary Disease | 58 (20.4%) | 42,709 (19.1%) |
| Any Cancer (except skin cancer) | 48 (17.4%) | 33,252 (15.5%) |
| Coronary Artery Disease | 35 (12.3%) | 26,331 (11.9%) |
| Congestive Heart Failure | 27 ( 9.5%) | 19,171 ( 8.6%) |
| Myocardial Infarction | 30 (10.5%) | 17,964 ( 8.1%) |
| Stroke | 21 ( 7.4%) | 17,067 ( 7.7%) |
| Gastrointestinal Disease | 12 ( 4.2%) | 12,024 ( 5.4%) |

A longitudinal study using HOS data concluded that multiple conditions at baseline and the 2-year follow up were associated with worse health in terms of ADLs and HRQOL, and are important outcomes for intervention to improve long-term health.[31]

An earlier study of HOS respondents found that people with multiple chronic conditions and risk for depression had the largest mental health decline over the two-year follow up period. In this study, people with multiple chronic conditions had greater risks for mortality, poor functional status, unnecessary hospitalizations, adverse drug events, duplicative tests, and conflicting medical advice.[32] According to the Centers for Disease Control and Prevention (CDC), around 50% of older adults have at least two chronic medical conditions, which can increase the risk of depression.[21]

Figure 10 illustrates the distribution of members by number of chronic medical conditions, including categories of none, one, two or three, and four or more chronic conditions for MAO HXXXA. Compare the percentage of members in your MAO who have multiple chronic conditions with the HOS Total. People who reported multiple physical health conditions, as well as mental health conditions such as depression and anxiety, also reported significantly more physically unhealthy and activity limitation days.[33]

**Figure 10: 2022 Cohort 25 Baseline Distribution of Chronic Medical Conditions for MAO HXXXA and HOS Total**




Note: Removal of three conditions in 2022 will affect comparability to prior years.

## 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.[34] ADLs include bathing, dressing, eating, getting in or out of chairs, walking, and using the toilet. These measures are found in Question 10. Impairment with ADLs is defined as members who reported either difficulty or inability to perform the specific ADL ("Yes, I have difficulty" or "I am unable to do this activity").
- Instrumental activities of daily living (IADLs) assess independent living skills that are more complex than ADLs.[35, 36] IADLs include preparing meals, managing money, and taking medications. These measures are found in Question 11. For IADLs, impairment is defined as members who reported difficulty performing the specific IADL ("Yes, I have difficulty").

Six ADLs are included in the HOS to examine reported difficulty with the performance of daily tasks. The ability to perform these tasks is predictive of current disease status and mortality risk.[37, 38] Regular assessment of functional status is recommended for improving the effectiveness of care, especially for older adults prior to hospital discharge and those living with dementia.[38]

There are three IADLs in the HOS that examine reported difficulty with the performance of tasks of independence. In comparison to the ADLs, IADLs are considered to recognize earlier changes in functioning, and can be used as an indication of the need for intervention or further medical work-up.[36]

*How Is Your MAO Doing?*

Table 15 highlights the prevalence of impairments in performing ADLs and IADLs for members in MAO HXXXA and the HOS Total.

**Table 15: 2022 Cohort 25 Baseline Prevalence of Impairments in ADLs and IADLs for MAO HXXXA and HOS Total**

| Impairment Type | MAO HXXXA Impairments N (%) | HOS Total Impairments N (%) |
|---|---|---|
| **Activities of Daily Living** | | |
| Walking | 101 (34.9%) | 75,985 (34.1%) |
| Getting in or out of chairs | 64 (22.0%) | 50,177 (22.5%) |
| Bathing | 38 (13.1%) | 33,406 (14.9%) |
| Dressing | 29 (10.0%) | 26,590 (11.9%) |
| Using the Toilet | 16 ( 5.7%) | 19,109 ( 8.6%) |
| Eating | 17 ( 5.9%) | 11,965 ( 5.4%) |
| **Instrumental Activities of Daily Living*** | | |
| Preparing meals | 36 (13.2%) | 24,997 (12.2%) |
| Managing money | 16 ( 5.7%) | 11,645 ( 5.5%) |
| Taking medication as prescribed | 17 ( 6.0%) | 11,182 ( 5.2%) |

* Respondents who indicated "I don't do this activity" to IADL questions were removed from the denominator.

Table 16 presents the mean adjusted PCS scores for MAO HXXXA and the HOS Total by level of impairment across ADLs and IADLs. You may compare members with and without impairments in your MAO to the HOS Total.

**Table 16: 2022 Cohort 25 Baseline Mean Adjusted PCS Score by ADL and IADL Impairment Status for MAO HXXXA and HOS Total**

| | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| Impairment Type | Impairment PCS Mean (SD) | No Impairment PCS Mean (SD) | Impairment PCS Mean (SD) | No Impairment PCS Mean (SD) |
| **Activities of Daily Living** | | | | |
| Walking | 35.9 (6.7) | 41.3 (5.7) | 36.1 (6.2) | 41.2 (5.4) |
| Getting in or out of chairs | 35.3 (6.2) | 40.6 (6.2) | 35.5 (6.3) | 40.6 (5.6) |
| Bathing | 34.4 (6.7) | 40.2 (6.2) | 34.4 (6.4) | 40.4 (5.7) |
| Dressing | 34.6 (6.1) | 39.9 (6.4) | 34.3 (6.6) | 40.2 (5.7) |
| Using the Toilet | 33.1 (7.2) | 39.8 (6.4) | 34.1 (6.7) | 40.0 (5.9) |
| Eating | 32.2 (7.7) | 39.9 (6.2) | 34.0 (6.8) | 39.8 (6.0) |
| **Instrumental Activities of Daily Living*** | | | | |
| Preparing meals | 34.6 (7.1) | 40.4 (6.0) | 35.1 (6.0) | 40.6 (5.6) |
| Managing money | 33.3 (7.9) | 39.9 (6.3) | 35.0 (6.3) | 40.1 (5.8) |
| Taking medication as prescribed | 34.6 (7.6) | 39.7 (6.4) | 33.3 (6.6) | 39.8 (5.8) |

* Respondents who indicated "I don't do this activity" to IADL questions were removed from the denominator.

Table 17 presents the mean adjusted MCS scores for MAO HXXXA and the HOS Total by level of impairment across ADLs and IADLs. You may compare members with and without impairments to the HOS Total.

**Table 17: 2022 Cohort 25 Baseline Mean Adjusted MCS Score by ADL and IADL Impairment Status for MAO HXXXA and HOS Total**

| | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| Impairment Type | Impairment MCS Mean (SD) | No Impairment MCS Mean (SD) | Impairment MCS Mean (SD) | No Impairment MCS Mean (SD) |
| **Activities of Daily Living** | | | | |
| Walking | 49.8 (6.2) | 54.2 (4.7) | 50.6 (5.9) | 53.9 (4.7) |
| Getting in or out of chairs | 49.2 (6.3) | 53.7 (5.1) | 50.1 (6.0) | 53.6 (4.9) |
| Bathing | 48.9 (6.9) | 53.3 (5.3) | 49.1 (6.0) | 53.4 (5.0) |
| Dressing | 48.9 (6.6) | 53.1 (5.4) | 48.8 (6.1) | 53.3 (5.0) |
| Using the Toilet | 46.4 (7.2) | 53.0 (5.4) | 48.7 (6.2) | 53.2 (5.1) |
| Eating | 46.6 (7.4) | 53.1 (5.3) | 48.2 (6.1) | 53.0 (5.2) |
| **Instrumental Activities of Daily Living*** | | | | |
| Preparing meals | 48.3 (6.8) | 53.5 (5.0) | 49.4 (5.9) | 53.5 (4.9) |
| Managing money | 44.9 (6.7) | 53.3 (5.2) | 48.2 (5.9) | 53.3 (5.0) |
| Taking medication as prescribed | 48.1 (7.3) | 53.0 (5.5) | 47.5 (6.0) | 53.1 (5.1) |

* Respondents who indicated "I don't do this activity" to IADL questions were removed from the denominator.

Table 18 shows the survey respondents by the number of ADL impairments including categories of none, one, two, and three or more ADL impairments for members in MAO HXXXA and the HOS Total.

**Table 18: 2022 Cohort 25 Baseline Number of ADL Impairments for MAO HXXXA and HOS Total**

| Number of ADL Impairments | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| None | 179 (61.3%) | 137,831 (61.2%) |
| 1 ADL Impairment | 44 (15.1%) | 32,753 (14.5%) |
| 2 ADL Impairments | 25 ( 8.6%) | 21,849 ( 9.7%) |
| 3 or More ADL Impairments | 44 (15.1%) | 32,906 (14.6%) |

Figure 11 shows the relationship between increasing numbers of ADL impairments and mean adjusted PCS scores for MAO HXXXA and the HOS Total.

**Figure 11: 2022 Cohort 25 Baseline Mean Adjusted PCS Scores by Number of ADL Impairments for MAO HXXXA and HOS Total**

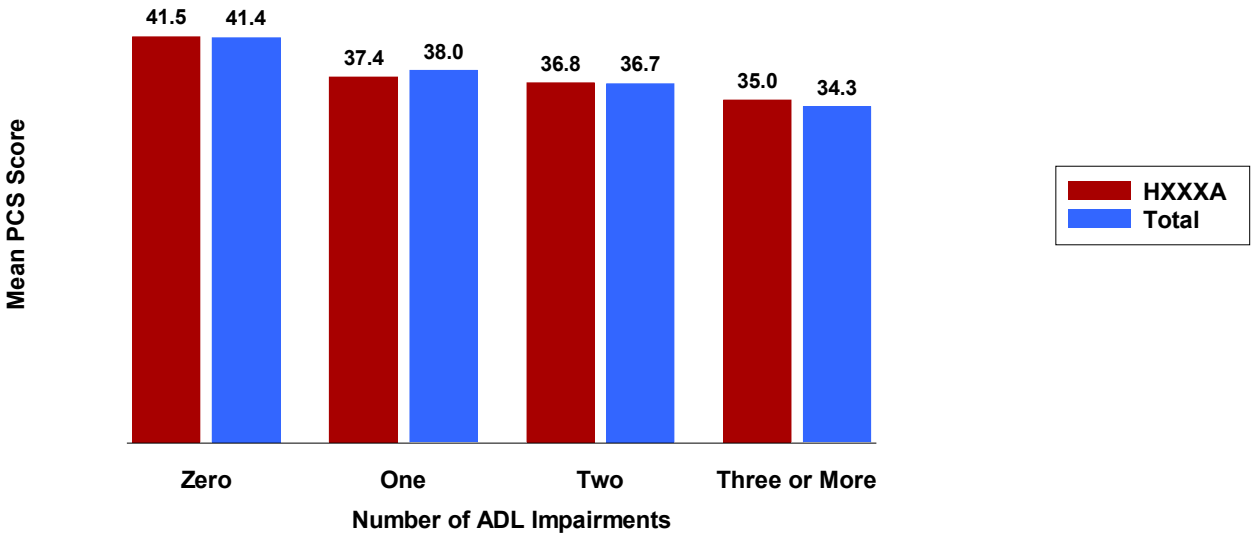
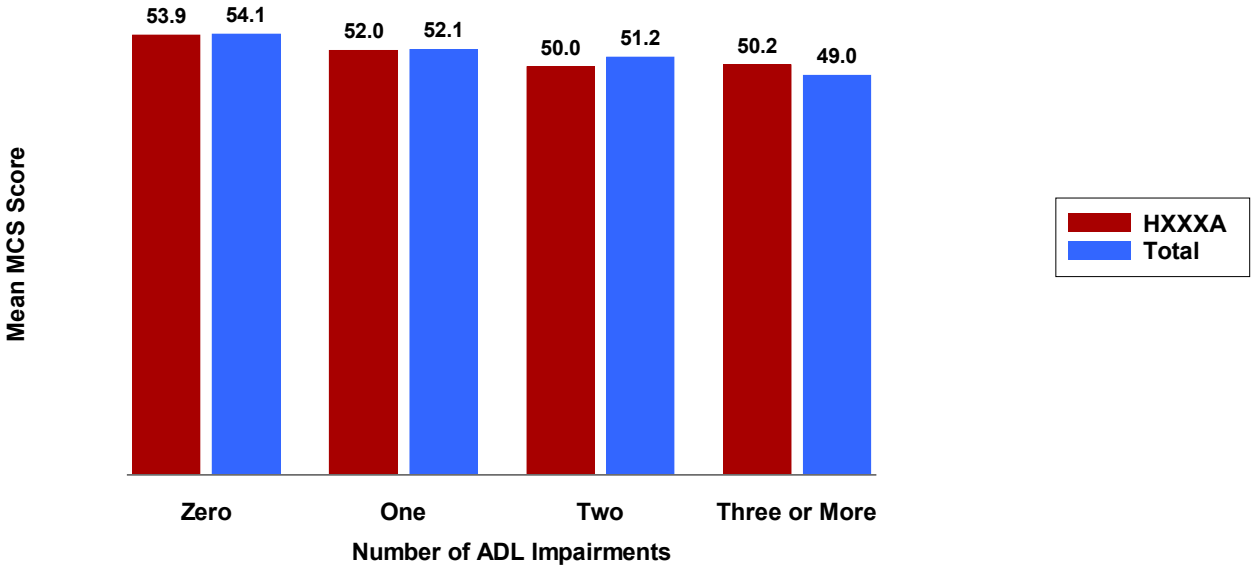


Figure 12 illustrates the relationship between increasing numbers of ADL impairments and mean adjusted MCS scores for MAO HXXXA and the HOS Total.

**Figure 12: 2022 Cohort 25 Baseline Mean Adjusted MCS Scores by Number of ADL Impairments for MAO HXXXA and HOS Total**



## Healthy Days Measures

*Definition of Measures*

- Physically unhealthy days is a self-reported measure of the number of days during the past 30 days when physical health was not good. The measure is found in Question 12.
- Mentally unhealthy days is a self-reported measure of the number of days during the past 30 days when mental health was not good. The measure is found in Question 13.
- Days with activity limitations is a self-reported measure of the number of days during the past 30 days when poor physical or mental health kept the member from usual activities. The measure is found in Question 14.

Healthy Days Measures provide key information on the functional status of vulnerable sub-populations, and are used to assess the HRQOL[39] across the U.S. As sentinel indicators of present and future disease and injury risk, MAOs may use Healthy Days Measures to identify vulnerable sub-populations for effective preventative care and disease management. According to the CDC, "In recent years, several organizations have found these Healthy Days Measures useful at the national, state, and community levels for (1) identifying health disparities, (2) tracking population trends, and (3) building broad coalitions around a measure of population health compatible with the World Health Organization's definition of health."[40] The CDC HRQOL program considers 14 or more unhealthy days in the past 30 days as an indicator of poor well-being.[3]

*How Is Your MAO Doing?*

Table 19 provides the frequency distributions of Healthy Days Measures for your MAO and HOS Total.

**Table 19: 2022 Cohort 25 Baseline Distribution of Healthy Days Measures for MAO HXXXA and HOS Total**

| Healthy Days Measures | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| **Physically Unhealthy Days** | | |
| None | 142 (51.6%) | 114,566 (53.0%) |
| 1-13 | 75 (27.3%) | 55,924 (25.9%) |
| 14-30* | 58 (21.1%) | 45,661 (21.1%) |
| **Mentally Unhealthy Days** | | |
| None | 179 (64.6%) | 140,416 (64.5%) |
| 1-13 | 58 (20.9%) | 49,599 (22.8%) |
| 14-30* | 40 (14.4%) | 27,594 (12.7%) |
| **Days with Activity Limitations** | | |
| None | 182 (65.7%) | 147,434 (67.7%) |
| 1-13 | 49 (17.7%) | 37,165 (17.1%) |
| 14-30* | 46 (16.6%) | 33,093 (15.2%) |

* Fourteen or more unhealthy days in the previous 30 days indicates poor well-being.

Figure 13 depicts the relationship between the reported number of days with activity limitations during the previous 30 days and mean adjusted PCS scores.

**Figure 13: 2022 Cohort 25 Baseline Mean Adjusted PCS Scores by Number of Days with Activity Limitations for MAO HXXXA and HOS Total**

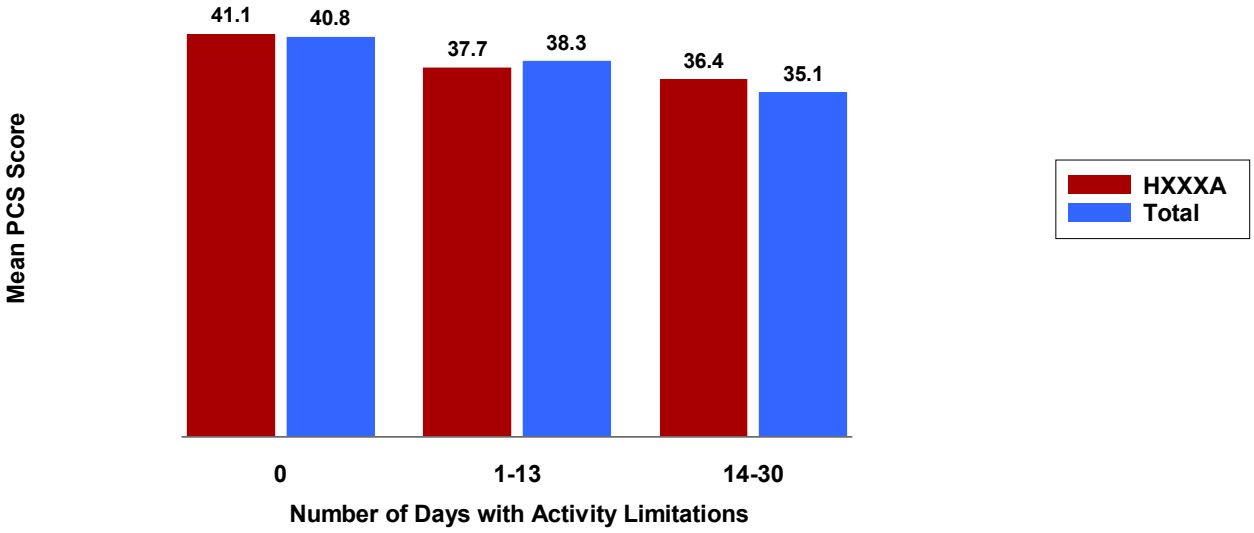
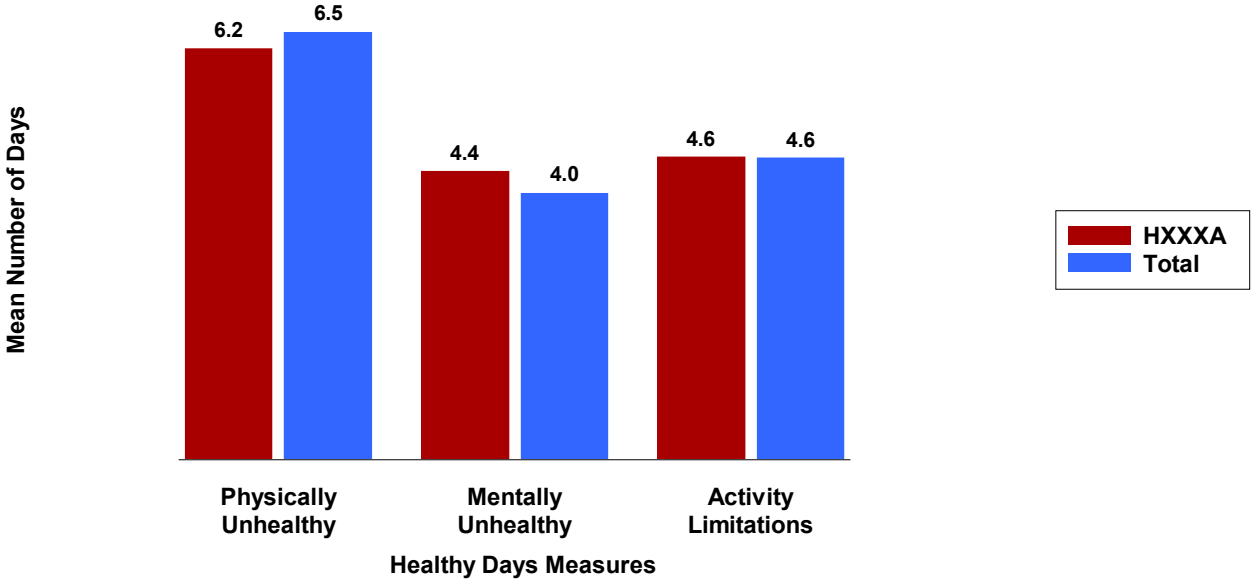



Figure 14 presents the mean numbers of reported physically unhealthy days, mentally unhealthy days, and days with activity limitations during the previous 30 days in MAO HXXXA and the HOS Total.

**Figure 14: 2022 Cohort 25 Baseline Mean Number of Unhealthy Days for the Healthy Days Measures for MAO HXXXA and HOS Total**



## Body Mass Index

*Definition of Measures*

- Self-reported height and weight values are used to calculate BMI,[P] a measure that correlates with the amount of body fat in adult men and women. BMI is derived from Questions 50 and 51.[Q]

A BMI of 30 or higher is considered obese and increases risk for several chronic conditions including: hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, and some cancers.[41] Being overweight (BMI 25-29.9) or obese has been shown to accelerate the aging process.[42] Physical activity, diet, age, gender, ethnicity, and educational status are known to influence the risk for obesity.[43] For instance, females are at higher risk of developing morbid obesity than males. The prevalence of obesity among older adults has risen significantly over the past 30 years.[44] A BMI under 18.5 is considered underweight. Rapid weight loss often indicates an underlying disease and can accelerate the loss of muscle mass, which naturally occurs with the aging process.[5]

A study using the HOS 2006-2008 Cohort 9 Merged Baseline and Follow Up data explored the prevalence of obesity in MA members age 65 years or older.[6] In this study, most of the reported health conditions were significantly more prevalent among obese than normal weight members, in particular, high blood pressure (75.8% of obese vs. 53.9% of normal weight), diabetes (34.8% vs. 12.7%), and arthritis of the hip or knee (55.3% vs. 31.3%). Exceptions were osteoporosis and stroke. Osteoporosis was significantly less prevalent among the obese (16.1% vs. 26.9%). The prevalence of stroke increased only slightly with BMI (7.9% vs 7.3%). The results also indicated that obese individuals had substantially greater limitations with ADLs than people with normal weight.[6]

*How Is Your MAO Doing?*

Table 20 shows the distribution of BMI categories by gender including underweight (BMI less than 18.5), normal or healthy weight (BMI of 18.5-24.99), overweight (BMI of 25-29.99), and obese (BMI of 30 or more) for MAO HXXXA and the HOS Total.

**Table 20: 2022 Cohort 25 Baseline Distribution of BMI Categories by Gender for MAO HXXXA and HOS Total**

| | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| BMI Category | N (%) | N (%) | N (%) | N (%) |
| Underweight (<18.5) | 2 ( 1.9%) | 4 ( 2.5%) | 1,472 ( 1.6%) | 3,607 ( 3.0%) |
| Normal (18.5-24.99) | 29 (27.1%) | 43 (26.9%) | 24,583 (27.4%) | 38,085 (31.3%) |
| Overweight (25-29.99) | 41 (38.3%) | 54 (33.8%) | 37,262 (41.5%) | 38,077 (31.3%) |
| Obese (≥30) | 35 (32.7%) | 59 (36.9%) | 26,363 (29.4%) | 41,942 (34.5%) |

Note: BMI categories were modified beginning with the *2017 Cohort 20 Baseline Report*. Underweight was changed from "<20" to "<18.5" and normal weight was changed from "20 to 24.99" to "18.5 to 24.99."

[P] BMI is calculated as: BMI = [weight in pounds / (height in inches)$^2$] x 703, which uses the member's self-reported height and weight to produce the standard measure of kg/m$^2$ units.
[Q] Beginning in 2012, questions for weight and height changed from categorical responses to open ended responses.

Table 21 presents the mean adjusted PCS and MCS scores by BMI categories for MAO HXXXA and the HOS Total.

**Table 21: 2022 Cohort 25 Baseline Mean Adjusted PCS and MCS Scores by BMI Categories for MAO HXXXA and HOS Total**

| | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| BMI Category | PCS Mean (SD) | MCS Mean (SD) | PCS Mean (SD) | MCS Mean (SD) |
| Underweight (<18.5) | 40.8 (4.0) | 53.3 (5.5) | 38.2 (6.5) | 52.0 (5.5) |
| Normal (18.5-24.99) | 40.4 (6.5) | 53.3 (5.6) | 40.3 (6.3) | 53.3 (5.2) |
| Overweight (25-29.99) | 40.5 (6.3) | 53.3 (5.6) | 40.1 (6.1) | 53.3 (5.3) |
| Obese (≥30) | 37.7 (6.6) | 51.8 (6.0) | 38.5 (6.1) | 52.2 (5.6) |

Table 22 shows the mean number of chronic conditions by BMI categories for MAO HXXXA and the HOS Total. Obesity exacerbates chronic conditions such as diabetes, hyperlipidemia, and hypertension, increasing medical costs and negatively affecting quality of life.[45, 46]

**Table 22: 2022 Cohort 25 Baseline Mean Number of Chronic Conditions by BMI Categories for MAO HXXXA and HOS Total**

| BMI Category | MAO HXXXA Number of Conditions Mean (SD) | HOS Total Number of Conditions Mean (SD) |
|---|---|---|
| Underweight (<18.5) | 1.7 (0.8) | 2.3 (1.8) |
| Normal (18.5-24.99) | 2.0 (1.6) | 2.0 (1.7) |
| Overweight (25-29.99) | 2.1 (1.6) | 2.2 (1.7) |
| Obese (≥30) | 3.0 (2.1) | 2.7 (1.8) |

Note: Removal of three conditions in 2022 will affect comparability to prior years.

## Sleep Measures

*Definition of Measures*

- Sleep duration is a self-reported measure of the average number of hours of actual sleep at night during the past month. The measure is found in Question 48.
- Sleep quality is a self-reported measure that rates the overall sleep quality during the past month. The measure is found in Question 49.

Two sleep questions in the HOS 3.0 were drawn from the Pittsburgh Sleep Quality Index (PSQI). The questions focus on "habitual" (i.e., past month) sleep duration and quality to capture more chronic sleep disturbances. The PSQI has a high test-retest reliability and good validity in patients with insomnia.[47]

Over half of older adults suffer from symptoms of insomnia, a common problem related to aging.[48] Sleep disorders in the elderly can be caused by many factors, including medication, diseases, poor sleeping habits, and age-related changes in circadian sleep/wake regulation. Sleep can be evaluated in different ways and there is substantial evidence linking insufficient sleep duration and poor sleep quality to mental and physical health morbidity and mortality.[49] Conversely, improved sleep may support patient engagement and adherence.[50]

Sleep disorders, including chronic insomnia, obstructive sleep apnea, and restless legs syndrome, are highly prevalent among older adults, often comorbid with other age-related health conditions, and portend poorer treatment and other health outcomes.[51,52] However, sleep disorders remain underdiagnosed in primary care settings for many reasons,[53] and patient surveys show that only a small number of patients discuss sleep problems with their doctors.[54,55] Therefore, it is recommended that providers routinely identify and evaluate sleep symptoms of disordered sleep and offer appropriate management.[56]

*How Is Your MAO Doing?*

Table 23 provides frequency distributions of sleep duration ("Less than 5," "5–6," "7–8," and "9 or more hours") and sleep quality ("Very good," "Fairly good," "Fairly bad," and "Very bad") for MAO HXXXA and the HOS Total.

**Table 23: 2022 Cohort 25 Baseline Distributions of Sleep Duration and Quality for MAO HXXXA and HOS Total**

| Sleep Questions | MAO HXXXA N (%) | HOS Total N (%) |
|---|---|---|
| **Hours of actual sleep** | | |
| Less than 5 hours | 31 (10.8%) | 19,662 ( 8.9%) |
| 5-6 hours | 107 (37.4%) | 86,193 (39.1%) |
| 7-8 hours | 134 (46.9%) | 101,967 (46.3%) |
| 9 or more hours | 14 ( 4.9%) | 12,597 ( 5.7%) |
| **Overall sleep quality** | | |
| Very good | 58 (20.1%) | 48,150 (21.8%) |
| Fairly good | 172 (59.7%) | 133,291 (60.3%) |
| Fairly bad | 49 (17.0%) | 32,680 (14.8%) |
| Very bad | 9 ( 3.1%) | 6,946 ( 3.1%) |

## Health Status by Baseline Demographic Groups for MAO HXXXA

Evidence from several studies suggests the differences in health among Medicare eligible people by age, gender, racial, and socioeconomic groups.[57, 58, 59, 60, 61, 62, 63] The following tables show differences in health status by demographic categories, including potential disparities within your MAO, and comparisons of your MAO with the HOS Total. Groups are defined by the sub-categories for a demographic characteristic (e.g., the 65-69 age group or White race). While annual household income was not available, the geographic category (defined on the Demographics page) was added to the following tables. Estimates for the MAO that are highlighted in red indicate groups worse off than their HOS counterparts.

**Table 24: 2022 Cohort 25 Baseline Mean Adjusted PCS and MCS Scores by Selected Demographic Characteristics for MAO HXXXA and HOS Total**

| | Adjusted PCS | | Adjusted MCS | |
|---|---|---|---|---|
| HOS Demographic | MAO HXXXA Mean (SD)* | HOS Total Mean (SD) | MAO HXXXA Mean (SD)* | HOS Total Mean (SD) |
| **Total** | **39.3 (6.6)** | 39.4 (6.1) | **52.6 (5.7)** | 52.7 (5.3) |
| **Age** | | | | |
| 65-69 | **40.9 (5.9)** | 41.5 (5.8) | **52.1 (5.6)** | 52.4 (5.6) |
| 70-74 | **40.6 (6.3)** | 40.4 (5.7) | **53.4 (5.4)** | 52.9 (5.3) |
| 75-79 | **39.1 (6.0)** | 38.9 (5.7) | **53.2 (5.6)** | 53.0 (5.2) |
| 80-84 | **36.8 (7.2)** | 37.2 (5.6) | **52.9 (5.7)** | 53.0 (5.0) |
| 85+ | **32.7 (5.6)** | 34.9 (5.8) | **49.4 (6.6)** | 52.5 (5.1) |
| **Gender** | | | | |
| Male | **40.6 (6.5)** | 40.3 (6.0) | **53.3 (5.4)** | 53.3 (5.0) |
| Female | **38.5 (6.5)** | 38.7 (6.1) | **52.1 (5.9)** | 52.3 (5.5) |
| **Race** | | | | |
| White | **39.5 (6.5)** | 39.7 (6.1) | **53.2 (5.5)** | 53.3 (5.3) |
| Black | **37.6 (5.8)** | 36.9 (5.4) | **51.0 (5.5)** | 51.1 (4.7) |
| Other/Unknown | **40.1 (7.7)** | 39.7 (6.2) | **51.1 (6.4)** | 50.8 (5.3) |
| **Marital Status** | | | | |
| Married | **41.9 (6.3)** | 41.4 (5.9) | **54.2 (5.4)** | 54.2 (5.0) |
| Widowed | **37.0 (5.4)** | 36.8 (6.1) | **51.9 (5.5)** | 51.9 (5.4) |
| Divorced or Separated | **37.1 (7.1)** | 38.6 (5.9) | **50.9 (6.3)** | 51.5 (5.6) |
| Never Married | **40.5 (3.7)** | 39.3 (5.8) | **52.2 (4.9)** | 51.7 (5.4) |
| **Education** | | | | |
| Did Not Graduate HS | **35.7 (6.6)** | 35.5 (6.0) | **49.1 (6.1)** | 49.7 (5.3) |
| High School Graduate | **38.0 (6.2)** | 38.1 (5.6) | **52.2 (5.9)** | 52.6 (5.2) |
| Some College | **39.8 (5.9)** | 39.9 (5.6) | **53.7 (5.3)** | 53.5 (5.3) |
| 4 Year Degree or Beyond | **43.2 (6.2)** | 43.5 (5.5) | **54.7 (4.9)** | 54.7 (5.0) |
| **Geographic Category** | | | | |
| Metropolitan | **39.5 (6.7)** | 39.5 (6.1) | **52.5 (5.9)** | 52.7 (5.3) |
| Micropolitan | **38.7 (6.5)** | 39.1 (6.2) | **52.3 (5.8)** | 52.7 (5.4) |
| Rural | **38.1 (4.8)** | 38.7 (6.1) | **53.8 (3.3)** | 52.9 (5.3) |
| **Medicaid Status** | | | | |
| Medicaid | **36.4 (6.0)** | 36.6 (5.9) | **49.9 (5.7)** | 50.1 (5.4) |
| Non-Medicaid | **40.8 (6.3)** | 40.5 (5.8) | **54.0 (5.2)** | 53.8 (4.9) |

* Means for demographic groups in the MAO column(s) highlighted in **red** are lower by ten percent or more compared to the corresponding groups in the HOS Total column(s). In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

## Table 25: 2022 Cohort 25 Baseline Distribution of Self-Rated General Health Status, and Physical and Mental Health Status Compared to One Year Ago by Demographic Group for MAO HXXXA and HOS Total

| HOS Demographic | General Health Status Fair or Poor | | Comparative Health-Physical Slightly Worse or Much Worse | | Comparative Health-Mental Slightly Worse or Much Worse | |
|---|---|---|---|---|---|---|
| | MAO HXXXA N (%)* | HOS Total N (%) | MAO HXXXA N (%)* | HOS Total N (%) | MAO HXXXA N (%)* | HOS Total N (%) |
| **Total** | **91 (30.8%)** | 63,208 (27.5%) | **72 (24.5%)** | 62,980 (28.1%) | **41 (14.0%)** | 31,577 (14.2%) |
| **Age** | | | | | | |
| 65-69 | **33 (37.1%)** | 17,512 (26.6%) | **20 (23.3%)** | 15,943 (24.8%) | **16 (18.6%)** | 8,874 (13.9%) |
| 70-74 | **20 (24.1%)** | 15,478 (25.1%) | **17 (20.2%)** | 15,072 (25.0%) | **11 (13.1%)** | 7,956 (13.3%) |
| 75-79 | **15 (22.1%)** | 12,634 (26.5%) | **17 (24.3%)** | 13,152 (28.4%) | **7 (10.1%)** | 6,287 (13.7%) |
| 80-84 | **11 (34.4%)** | 8,897 (29.3%) | **10 (31.3%)** | 9,367 (31.8%) | **3 ( 9.4%)** | 4,221 (14.5%) |
| 85+ | **12 (52.2%)** | 8,687 (35.4%) | **8 (36.4%)** | 9,446 (39.9%) | **4 (18.2%)** | 4,239 (18.2%) |
| **Gender** | | | | | | |
| Male | **33 (28.7%)** | 25,730 (26.5%) | **26 (22.4%)** | 25,898 (27.5%) | **13 (11.2%)** | 12,214 (13.1%) |
| Female | **58 (32.2%)** | 37,478 (28.1%) | **46 (25.8%)** | 37,082 (28.6%) | **28 (15.8%)** | 19,363 (15.1%) |
| **Race** | | | | | | |
| White | **64 (29.6%)** | 43,031 (24.6%) | **54 (25.1%)** | 48,268 (28.4%) | **34 (15.8%)** | 23,545 (14.0%) |
| Black | **17 (38.6%)** | 11,044 (38.2%) | **12 (27.3%)** | 7,315 (26.3%) | **4 ( 9.3%)** | 3,762 (13.8%) |
| Other/Unknown | **10 (28.6%)** | 9,133 (34.2%) | **6 (17.1%)** | 7,397 (28.6%) | **3 ( 8.6%)** | 4,270 (16.6%) |
| **Marital Status** | | | | | | |
| Married | **29 (22.3%)** | 22,255 (21.5%) | **28 (21.5%)** | 26,088 (25.4%) | **14 (10.8%)** | 12,410 (12.2%) |
| Widowed | **23 (33.3%)** | 15,861 (31.6%) | **17 (25.0%)** | 15,804 (31.7%) | **11 (16.2%)** | 7,942 (16.1%) |
| Divorced or Separated | **31 (42.5%)** | 14,933 (32.2%) | **21 (28.8%)** | 14,006 (30.4%) | **13 (18.1%)** | 7,518 (16.5%) |
| Never Married | **5 (41.7%)** | 5,267 (32.2%) | **3 (25.0%)** | 4,299 (26.5%) | **1 ( 8.3%)** | 2,253 (14.0%) |
| **Education** | | | | | | |
| Did Not Graduate HS | **29 (53.7%)** | 16,904 (47.8%) | **15 (28.3%)** | 11,708 (33.4%) | **7 (13.2%)** | 6,391 (18.4%) |
| High School Graduate | **23 (29.5%)** | 19,256 (29.6%) | **20 (25.6%)** | 18,611 (28.8%) | **15 (19.2%)** | 9,289 (14.5%) |
| Some College | **20 (25.6%)** | 13,609 (23.0%) | **17 (21.8%)** | 16,187 (27.6%) | **8 (10.4%)** | 7,937 (13.6%) |
| 4 Year Degree or Beyond | **16 (21.9%)** | 7,844 (14.1%) | **18 (25.0%)** | 13,325 (24.2%) | **10 (13.9%)** | 6,292 (11.5%) |
| **Geographic Category** | | | | | | |
| Metropolitan | **70 (29.7%)** | 48,254 (26.8%) | **53 (22.6%)** | 48,354 (27.6%) | **35 (15.0%)** | 24,656 (14.2%) |
| Micropolitan | **12 (38.7%)** | 8,659 (29.3%) | **10 (31.3%)** | 8,555 (29.6%) | **2 ( 6.3%)** | 4,064 (14.2%) |
| Rural | **9 (32.1%)** | 6,295 (31.1%) | **9 (32.1%)** | 6,071 (30.7%) | **4 (14.3%)** | 2,857 (14.6%) |
| **Medicaid Status** | | | | | | |
| Medicaid | **52 (52.5%)** | 30,018 (46.6%) | **28 (28.6%)** | 22,248 (35.8%) | **20 (20.6%)** | 12,311 (20.0%) |
| Non-Medicaid | **39 (19.9%)** | 33,190 (20.0%) | **44 (22.4%)** | 40,732 (25.2%) | **21 (10.7%)** | 19,266 (12.0%) |

* Percentages for demographic groups in the MAO column(s) highlighted in **red** are greater by ten percentage points or more compared to corresponding groups in the HOS Total column(s). In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

**Table 26: 2022 Cohort 25 Baseline Distribution of Positive Depression Screen by Demographic Group for MAO HXXXA and HOS Total**

| HOS Demographic | MAO HXXXA Positive Screen N (%)* | HOS Total Positive Screen N (%) |
|---|---|---|
| **Total** | **34 (12.1%)** | 27,700 (12.8%) |
| **Age** | | |
| 65-69 | **14 (16.9%)** | 8,413 (13.6%) |
| 70-74 | **5 ( 6.3%)** | 6,814 (11.7%) |
| 75-79 | **7 (10.4%)** | 5,267 (11.7%) |
| 80-84 | **1 ( 3.2%)** | 3,539 (12.4%) |
| 85+ | **7 (31.8%)** | 3,667 (16.2%) |
| **Gender** | | |
| Male | **13 (11.6%)** | 10,658 (11.7%) |
| Female | **21 (12.4%)** | 17,042 (13.6%) |
| **Race** | | |
| White | **24 (11.5%)** | 18,805 (11.3%) |
| Black | **7 (16.7%)** | 4,969 (19.1%) |
| Other/Unknown | **3 ( 9.7%)** | 3,926 (15.8%) |
| **Marital Status** | | |
| Married | **10 ( 7.9%)** | 9,229 ( 9.1%) |
| Widowed | **8 (12.3%)** | 7,436 (15.3%) |
| Divorced or Separated | **14 (19.2%)** | 7,578 (16.8%) |
| Never Married | **1 ( 9.1%)** | 2,446 (15.5%) |
| **Education** | | |
| Did Not Graduate HS | **12 (24.0%)** | 7,915 (23.4%) |
| High School Graduate | **13 (16.7%)** | 8,782 (13.9%) |
| Some College | **5 ( 6.5%)** | 6,163 (10.7%) |
| 4 Year Degree or Beyond | **4 ( 5.7%)** | 3,501 ( 6.5%) |
| **Geographic Category** | | |
| Metropolitan | **26 (11.5%)** | 21,279 (12.5%) |
| Micropolitan | **4 (13.3%)** | 3,777 (13.5%) |
| Rural | **4 (15.4%)** | 2,644 (13.9%) |
| **Medicaid Status** | | |
| Medicaid | **22 (23.9%)** | 13,868 (23.5%) |
| Non-Medicaid | **12 ( 6.3%)** | 13,832 ( 8.8%) |

* Percentages for demographic groups in the MAO column highlighted in **red** are greater by ten percentage points or more compared to the corresponding groups in the HOS Total column. In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

**Table 27: 2022 Cohort 25 Baseline Distribution of Pain Interfering with Daily Activities and Socializing by Demographic Group for MAO HXXXA and HOS Total**

| HOS Demographic | Pain Interfering with Daily Activities Quite a Bit or Very Much | | Pain Limiting Socialization Often or Always | |
|---|---|---|---|---|
| | MAO HXXXA N (%)* | HOS Total N (%) | MAO HXXXA N (%)* | HOS Total N (%) |
| **Total** | **53 (18.4%)** | 37,530 (16.9%) | **26 ( 9.1%)** | 20,945 ( 9.4%) |
| **Age** | | | | |
| 65-69 | **17 (20.7%)** | 11,544 (18.2%) | **8 ( 9.8%)** | 6,719 (10.6%) |
| 70-74 | **13 (16.0%)** | 9,122 (15.3%) | **6 ( 7.5%)** | 5,093 ( 8.5%) |
| 75-79 | **10 (14.7%)** | 7,218 (15.6%) | **5 ( 7.5%)** | 3,904 ( 8.5%) |
| 80-84 | **4 (12.1%)** | 4,964 (16.9%) | **1 ( 3.0%)** | 2,679 ( 9.1%) |
| 85+ | **9 (37.5%)** | 4,682 (19.9%) | **6 (25.0%)** | 2,550 (10.9%) |
| **Gender** | | | | |
| Male | **14 (12.4%)** | 13,458 (14.4%) | **7 ( 6.3%)** | 7,108 ( 7.6%) |
| Female | **39 (22.3%)** | 24,072 (18.7%) | **19 (10.9%)** | 13,837 (10.7%) |
| **Race** | | | | |
| White | **39 (18.3%)** | 26,744 (15.8%) | **19 ( 8.9%)** | 14,304 ( 8.4%) |
| Black | **11 (26.2%)** | 6,346 (23.3%) | **4 ( 9.8%)** | 3,574 (13.1%) |
| Other/Unknown | **3 ( 9.1%)** | 4,440 (17.4%) | **3 ( 9.4%)** | 3,067 (12.0%) |
| **Marital Status** | | | | |
| Married | **17 (13.3%)** | 13,260 (12.9%) | **6 ( 4.7%)** | 6,794 ( 6.6%) |
| Widowed | **17 (24.6%)** | 10,101 (20.2%) | **8 (11.8%)** | 5,728 (11.5%) |
| Divorced or Separated | **17 (23.3%)** | 9,960 (21.6%) | **12 (16.2%)** | 5,907 (12.8%) |
| Never Married | **2 (18.2%)** | 2,880 (17.8%) | **0** | 1,738 (10.7%) |
| **Education** | | | | |
| Did Not Graduate HS | **15 (28.8%)** | 9,551 (27.3%) | **9 (17.3%)** | 5,870 (16.8%) |
| High School Graduate | **13 (16.9%)** | 11,806 (18.2%) | **8 (10.4%)** | 6,351 ( 9.8%) |
| Some College | **16 (20.3%)** | 9,473 (16.1%) | **6 ( 7.7%)** | 5,146 ( 8.7%) |
| 4 Year Degree or Beyond | **8 (11.1%)** | 5,068 ( 9.2%) | **3 ( 4.2%)** | 2,573 ( 4.7%) |
| **Geographic Category** | | | | |
| Metropolitan | **39 (17.0%)** | 28,227 (16.2%) | **19 ( 8.3%)** | 16,138 ( 9.3%) |
| Micropolitan | **7 (22.6%)** | 5,439 (18.9%) | **5 (16.1%)** | 2,878 (10.0%) |
| Rural | **7 (25.9%)** | 3,864 (19.7%) | **2 ( 7.4%)** | 1,929 ( 9.8%) |
| **Medicaid Status** | | | | |
| Medicaid | **29 (31.5%)** | 18,071 (29.6%) | **15 (16.3%)** | 11,376 (18.7%) |
| Non-Medicaid | **24 (12.2%)** | 19,459 (12.1%) | **11 ( 5.7%)** | 9,569 ( 5.9%) |

* Percentages for demographic groups in the MAO column(s) highlighted in **red** are greater by ten percentage points or more compared to the corresponding groups in the HOS Total column(s). In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

## Table 28: 2022 Cohort 25 Baseline Distribution of Members Reporting Multiple Chronic Medical Conditions§ in MAO HXXXA and HOS Total

| HOS Demographic | MAO HXXXA Multiple Conditions§ N (%)* | HOS Total Multiple Conditions§ N (%) |
|---|---|---|
| **Total** | **173 (59.9%)** | 142,283 (63.1%) |
| **Age** | | |
| 65-69 | **48 (58.5%)** | 37,297 (57.9%) |
| 70-74 | **46 (56.1%)** | 37,187 (61.4%) |
| 75-79 | **44 (64.7%)** | 30,793 (65.9%) |
| 80-84 | **18 (54.5%)** | 20,385 (68.4%) |
| 85+ | **17 (70.8%)** | 16,621 (69.4%) |
| **Gender** | | |
| Male | **61 (53.5%)** | 56,812 (60.0%) |
| Female | **112 (64.0%)** | 85,471 (65.4%) |
| **Race** | | |
| White | **132 (61.7%)** | 107,750 (62.8%) |
| Black | **27 (64.3%)** | 18,945 (68.4%) |
| Other/Unknown | **14 (42.4%)** | 15,588 (59.8%) |
| **Marital Status** | | |
| Married | **66 (51.6%)** | 61,074 (58.6%) |
| Widowed | **46 (66.7%)** | 34,861 (68.9%) |
| Divorced or Separated | **51 (68.9%)** | 31,412 (67.3%) |
| Never Married | **7 (63.6%)** | 10,254 (62.3%) |
| **Education** | | |
| Did Not Graduate HS | **31 (59.6%)** | 25,041 (70.3%) |
| High School Graduate | **46 (59.7%)** | 42,689 (65.2%) |
| Some College | **55 (69.6%)** | 37,904 (63.6%) |
| 4 Year Degree or Beyond | **37 (51.4%)** | 31,095 (55.7%) |
| **Geographic Category** | | |
| Metropolitan | **137 (59.6%)** | 110,847 (62.8%) |
| Micropolitan | **20 (62.5%)** | 18,811 (64.6%) |
| Rural | **16 (59.3%)** | 12,625 (63.5%) |
| **Medicaid Status** | | |
| Medicaid | **65 (69.1%)** | 45,231 (72.7%) |
| Non-Medicaid | **108 (55.4%)** | 97,052 (59.5%) |

§ Multiple chronic medical conditions are defined as having two or more conditions.

* Percentages for demographic groups in the MAO column highlighted in **red** are greater by ten percentage points or more compared to the corresponding groups in the HOS Total column. In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

Note: Removal of three conditions in 2022 will affect comparability to prior years.

**Table 29: 2022 Cohort 25 Baseline Distribution of Multiple ADL Impairments§ by Demographic Group for MAO HXXXA and HOS Total**

| HOS Demographic | MAO HXXXA ADL Impairments§ N (%)* | HOS Total ADL Impairments§ N (%) |
|---|---|---|
| **Total** | **69 (23.6%)** | 54,755 (24.3%) |
| **Age** | | |
| 65-69 | **20 (23.3%)** | 12,927 (20.0%) |
| 70-74 | **17 (20.5%)** | 12,079 (20.0%) |
| 75-79 | **11 (15.9%)** | 10,867 (23.3%) |
| 80-84 | **9 (28.1%)** | 8,638 (29.1%) |
| 85+ | **12 (54.5%)** | 10,244 (42.9%) |
| **Gender** | | |
| Male | **19 (16.4%)** | 20,935 (22.1%) |
| Female | **50 (28.4%)** | 33,820 (25.9%) |
| **Race** | | |
| White | **53 (24.8%)** | 39,679 (23.2%) |
| Black | **9 (20.9%)** | 8,550 (30.5%) |
| Other/Unknown | **7 (20.0%)** | 6,526 (24.9%) |
| **Marital Status** | | |
| Married | **22 (16.9%)** | 19,330 (18.7%) |
| Widowed | **22 (32.4%)** | 15,970 (31.7%) |
| Divorced or Separated | **23 (31.5%)** | 12,683 (27.3%) |
| Never Married | **2 (16.7%)** | 4,417 (27.0%) |
| **Education** | | |
| Did Not Graduate HS | **24 (45.3%)** | 12,777 (36.0%) |
| High School Graduate | **16 (20.5%)** | 17,228 (26.5%) |
| Some College | **18 (23.1%)** | 13,426 (22.7%) |
| 4 Year Degree or Beyond | **10 (13.9%)** | 8,529 (15.4%) |
| **Geographic Category** | | |
| Metropolitan | **48 (20.7%)** | 41,832 (23.7%) |
| Micropolitan | **10 (31.3%)** | 7,528 (25.9%) |
| Rural | **11 (39.3%)** | 5,395 (27.2%) |
| **Medicaid Status** | | |
| Medicaid | **34 (35.1%)** | 24,643 (39.2%) |
| Non-Medicaid | **35 (17.9%)** | 30,112 (18.5%) |

§ Multiple ADL impairments are defined as having two or more impairments.

* Percentages for demographic groups in the MAO column highlighted in **red** are greater by ten percentage points or more compared to the corresponding groups in the HOS Total column. In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

**Table 30: 2022 Cohort 25 Baseline Mean Number of Unhealthy Physical, Mental, and Activity Limitation Days by Demographic Group in MAO HXXXA and HOS Total**

| HOS Demographic | MAO HXXXA Number of Unhealthy Days | | | HOS Total Number of Unhealthy Days | | |
|---|---|---|---|---|---|---|
| | Physical Mean (SD)* | Mental Mean (SD)* | Activity Mean (SD)* | Physical Mean (SD) | Mental Mean (SD) | Activity Mean (SD) |
| **Total** | **6.6 (9.9)** | **4.3 (8.0)** | **5.0 (9.0)** | 6.5 (10.0) | 4.0 (7.9) | 4.6 (8.8) |
| **Age** | | | | | | |
| 65-69 | **7.4 (9.8)** | **5.1 (9.2)** | **6.6 (10.4)** | 6.5 (9.9) | 4.5 (8.2) | 4.7 (8.8) |
| 70-74 | **5.8 (9.4)** | **3.7 (7.3)** | **4.2 (8.0)** | 6.0 (9.6) | 3.8 (7.6) | 4.1 (8.3) |
| 75-79 | **6.0 (10.4)** | **2.9 (5.9)** | **3.3 (7.5)** | 6.2 (9.8) | 3.7 (7.5) | 4.3 (8.6) |
| 80-84 | **4.1 (7.9)** | **2.7 (7.4)** | **2.6 (6.3)** | 6.7 (10.2) | 3.7 (7.6) | 4.6 (9.0) |
| 85+ | **11.6 (11.1)** | **9.9 (9.7)** | **10.3 (10.9)** | 8.1 (11.1) | 4.5 (8.5) | 6.0 (10.4) |
| **Gender** | | | | | | |
| Male | **6.5 (9.7)** | **3.3 (7.3)** | **4.7 (9.0)** | 6.1 (9.8) | 3.5 (7.5) | 4.2 (8.6) |
| Female | **6.6 (10.0)** | **4.9 (8.3)** | **5.2 (8.9)** | 6.8 (10.1) | 4.4 (8.1) | 4.8 (9.0) |
| **Race** | | | | | | |
| White | **6.6 (10.0)** | **4.4 (8.1)** | **5.1 (8.9)** | 6.3 (9.9) | 3.9 (7.7) | 4.4 (8.7) |
| Black | **7.4 (9.7)** | **4.1 (7.3)** | **4.8 (8.5)** | 7.5 (10.2) | 4.7 (8.5) | 5.1 (9.2) |
| Other/Unknown | **5.2 (9.7)** | **3.9 (8.0)** | **4.8 (10.1)** | 6.7 (9.9) | 4.5 (8.3) | 5.0 (9.1) |
| **Marital Status** | | | | | | |
| Married | **4.7 (8.6)** | **2.4 (5.7)** | **3.6 (8.1)** | 5.4 (9.3) | 3.1 (6.9) | 3.7 (8.1) |
| Widowed | **7.3 (10.4)** | **5.7 (9.1)** | **5.3 (8.4)** | 7.2 (10.4) | 4.6 (8.3) | 5.2 (9.4) |
| Divorced or Separated | **9.7 (11.2)** | **6.5 (9.7)** | **7.8 (10.7)** | 7.7 (10.5) | 5.2 (8.7) | 5.7 (9.5) |
| Never Married | **6.5 (9.3)** | **4.8 (8.6)** | **2.9 (8.6)** | 7.0 (10.2) | 4.7 (8.5) | 5.1 (9.1) |
| **Education** | | | | | | |
| Did Not Graduate HS | **10.5 (11.5)** | **6.9 (9.9)** | **7.8 (10.4)** | 8.9 (11.0) | 5.9 (9.5) | 6.6 (10.3) |
| High School Graduate | **7.4 (10.2)** | **4.7 (8.1)** | **5.7 (9.7)** | 6.9 (10.2) | 4.3 (8.1) | 4.9 (9.1) |
| Some College | **4.7 (8.2)** | **3.8 (7.8)** | **3.9 (7.7)** | 6.3 (9.8) | 3.8 (7.6) | 4.4 (8.6) |
| 4 Year Degree or Beyond | **5.6 (9.8)** | **2.8 (6.5)** | **3.9 (8.4)** | 4.5 (8.6) | 2.7 (6.3) | 3.1 (7.3) |
| **Geographic Category** | | | | | | |
| Metropolitan | **6.5 (9.8)** | **4.2 (7.9)** | **5.1 (9.1)** | 6.3 (9.9) | 4.0 (7.8) | 4.5 (8.7) |
| Micropolitan | **7.3 (11.1)** | **5.6 (8.9)** | **5.1 (9.4)** | 6.9 (10.2) | 4.2 (8.0) | 4.9 (9.1) |
| Rural | **6.6 (9.6)** | **3.3 (7.3)** | **4.0 (7.4)** | 7.2 (10.4) | 4.2 (8.0) | 5.1 (9.3) |
| **Medicaid Status** | | | | | | |
| Medicaid | **10.2 (11.1)** | **7.9 (10.0)** | **8.1 (10.8)** | 9.8 (11.2) | 6.6 (9.7) | 7.5 (10.6) |
| Non-Medicaid | **4.9 (8.8)** | **2.6 (6.2)** | **3.6 (7.6)** | 5.2 (9.2) | 3.1 (6.9) | 3.5 (7.8) |

* Means for demographic groups in the MAO column(s) highlighted in **red** are greater by ten percent or more compared to the corresponding groups in the HOS Total column(s). In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

**Table 31: 2022 Cohort 25 Baseline Distribution of BMI Categories by Demographic Group for MAO HXXXA and HOS Total**

| HOS Demographic | MAO HXXXA | | HOS Total | |
|---|---|---|---|---|
| | Underweight (<18.5 BMI) N (%)* | Obese (≥30 BMI) N (%)* | Underweight (<18.5 BMI) N (%) | Obese (≥30 BMI) N (%) |
| **Total** | **6 ( 2.2%)** | **94 (35.2%)** | 5,079 ( 2.4%) | 68,305 (32.3%) |
| **Age** | | | | |
| 65-69 | **3 ( 3.6%)** | **38 (45.2%)** | 1,223 ( 2.0%) | 23,158 (38.0%) |
| 70-74 | **0** | **23 (31.5%)** | 1,139 ( 2.0%) | 19,934 (34.9%) |
| 75-79 | **0** | **19 (30.6%)** | 1,031 ( 2.3%) | 13,848 (31.5%) |
| 80-84 | **2 ( 8.0%)** | **7 (28.0%)** | 724 ( 2.6%) | 7,315 (26.5%) |
| 85+ | **1 ( 4.3%)** | **7 (30.4%)** | 962 ( 4.4%) | 4,050 (18.6%) |
| **Gender** | | | | |
| Male | **2 ( 1.9%)** | **35 (32.7%)** | 1,472 ( 1.6%) | 26,363 (29.4%) |
| Female | **4 ( 2.5%)** | **59 (36.9%)** | 3,607 ( 3.0%) | 41,942 (34.5%) |
| **Race** | | | | |
| White | **4 ( 2.0%)** | **72 (36.2%)** | 3,636 ( 2.2%) | 52,272 (32.1%) |
| Black | **2 ( 5.3%)** | **15 (39.5%)** | 633 ( 2.5%) | 10,493 (41.5%) |
| Other/Unknown | **0** | **7 (23.3%)** | 810 ( 3.4%) | 5,540 (23.6%) |
| **Marital Status** | | | | |
| Married | **2 ( 1.7%)** | **38 (32.2%)** | 1,915 ( 1.9%) | 30,336 (30.1%) |
| Widowed | **1 ( 1.5%)** | **20 (30.8%)** | 1,482 ( 3.1%) | 15,564 (32.5%) |
| Divorced or Separated | **1 ( 1.4%)** | **30 (42.9%)** | 1,153 ( 2.6%) | 15,978 (35.6%) |
| Never Married | **1 ( 8.3%)** | **6 (50.0%)** | 449 ( 2.9%) | 5,671 (36.4%) |
| **Education** | | | | |
| Did Not Graduate HS | **0** | **22 (48.9%)** | 954 ( 2.9%) | 11,366 (34.7%) |
| High School Graduate | **2 ( 2.7%)** | **32 (42.7%)** | 1,522 ( 2.4%) | 22,495 (35.8%) |
| Some College | **2 ( 2.7%)** | **25 (33.8%)** | 1,269 ( 2.2%) | 19,740 (34.1%) |
| 4 Year Degree or Beyond | **2 ( 2.8%)** | **14 (19.7%)** | 1,221 ( 2.2%) | 13,579 (24.9%) |
| **Geographic Category** | | | | |
| Metropolitan | **4 ( 1.9%)** | **72 (33.8%)** | 4,052 ( 2.4%) | 51,808 (31.3%) |
| Micropolitan | **1 ( 3.7%)** | **10 (37.0%)** | 630 ( 2.3%) | 9,699 (35.4%) |
| Rural | **1 ( 3.7%)** | **12 (44.4%)** | 397 ( 2.1%) | 6,798 (36.5%) |
| **Medicaid Status** | | | | |
| Medicaid | **3 ( 3.6%)** | **40 (47.6%)** | 1,811 ( 3.2%) | 21,344 (37.9%) |
| Non-Medicaid | **3 ( 1.6%)** | **54 (29.5%)** | 3,268 ( 2.1%) | 46,961 (30.3%) |

* Percentages for demographic groups within the MAO column(s) highlighted in **red** are greater by ten percentage points or more compared to the corresponding groups in the HOS Total column(s). In this report, estimates highlighted in **red** indicate groups worse off than their HOS Total counterparts.

# Appendix 1

## Program Background

This section introduces the Medicare HOS. A complete description of the HOS program, the program timeline, previous survey results, and supporting documents are available on the HOS website at www.HOSonline.org.

CMS is committed to monitoring the quality of care provided by MAOs. The HOS results continue to be an important part of the CMS quality improvement activities, to ensure that medical care paid for under the Medicare program meets professionally recognized standards of health care. Section 722 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) 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 before November 1, 2003. Collected since 1998, the Medicare HOS is the first patient-reported outcomes measure in Medicare managed care, and therefore remains a critical part of assessing MAO quality. In addition, CMS includes the HOS results as one component of their performance assessment program.

The goal of the Medicare HOS program is to gather valid and reliable clinically meaningful data for uses such as: targeting quality improvement activities and resources; monitoring health plan performance; rewarding top-performing health plans; helping people with Medicare make informed health care choices; and advancing the science of functional health outcomes measurement. This *HOS Baseline Report* is part of a larger CMS effort to increase the health care industry's capacity to improve the health status of its Medicare population. The baseline results are intended to help MAOs identify areas for potential improvement. The report contains information on baseline measures of physical and mental health, chronic medical conditions, functional status (e.g., ADLs), clinical measures, and other health status indicators. The *HOS Baseline Report* is made available to all participating MAOs one year after the annual baseline cohort data collection is completed.

## 2022 Medicare Advantage Organization Participation

MAOs with Medicare contracts in effect on or before January 1, 2021, were required to report the Baseline HOS in 2022, provided they have a minimum enrollment of 500 members as of February 2022.

- All MAOs, including all coordinated care plans, local and regional preferred provider organizations (PPO), Private Fee-for-Service (PFFS) contracts, and Medical Savings Account (MSA) contracts
- Section 1876 cost contracts, even if closed for enrollment
- Employer/union only contracts
- Medicare-Medicaid Plans (MMP)

CMS excluded beneficiaries enrolled in Institutional Special Needs Plans (I-SNP) at the plan benefit package (PBP) level from the HOS Baseline Survey. Contracts in effect on or before January 1, 2021, with only one PBP or with multiple PBPs that are all I-SNPs as of February 1, 2022, were exempt from the Baseline reporting requirement. Contracts with a minimum of 500

non-I-SNP members after I-SNP members were excluded were required to administer the Baseline Survey in 2022 to their non-I-SNP members. Contracts with less than 500 non-I-SNP members after I-SNP members were excluded are not required to report HOS Baseline.

MAOs that administered the HOS Baseline Survey in 2020 were required to administer the HOS Follow Up Survey in 2022. In the event of a consolidation, merger, or novation, the surviving contract had to report Follow Up HOS for all members of all contracts involved. All eligible members of these contracts were resurveyed and the results were reported as one under the surviving contract. For a contract conversion, the contract had to report if its new organization type was required to report. Refer to the list of participating MAO contracts available in the Survey Results section on the Survey page of the HOS website (www.HOSonline.org).

All PACE organizations with Medicare contracts in effect on or before January 1, 2021, and with a minimum enrollment of 30 members as of February 1, 2022, were required by CMS to administer the HOS-Modified (HOS-M) in 2022.

MAOs sponsoring Fully Integrated Dual Eligible (FIDE) Special Needs Plans (SNPs) in 2022 could elect to report HOS or HOS-M at the PBP level to determine eligibility for a frailty assessment under the Affordable Care Act. For contracts with more than 500 members, voluntary reporting is in addition to standard HOS requirements for quality reporting at the contract level. The requirements for participating in the HOS or HOS-M for frailty are as follows:

- The PBP that will be the FIDE SNP in 2023 must have existed as of January 1, 2022.
- The PBP did not have to meet FIDE SNP requirements to be surveyed in 2022, but must have been a Dual Eligible SNP.
- The PBP must have at least 50 enrollees and up to 1,200 enrollees were sampled, if available.

## 2022 Methodology and Design

Cohort 25 Baseline Sampling

- MAOs with fewer than 500 members were not required to report HOS.
- For MAOs with 500 to 1,200 members, all eligible members were included in the sample.
- For MAOs with more than 1,200 members, a simple random sample of 1,200 members was selected.
- Members were defined as eligible if they were 18 years or older on the date the sample was drawn. The six months enrollment requirement was waived beginning in 2009, and members with End Stage Renal Disease (ESRD) were no longer excluded from the sampling beginning in 2010. Since 2019, MAOs could also request a survey sample larger than 1,200. Oversampling was expressed as a whole percentage of the standard sample size. Since 2020, I-SNPs have been excluded from the HOS Baseline.

Survey Administration

- MAOs contracted with a CMS approved survey vendor to administer the survey following the protocol specified in the *HEDIS MY 2021, Volume 6: Specifications for the Medicare Health Outcomes Survey* manual. The manual detailed the methods for mail, telephone, and mixed methods of data collection.

- The mail component of the survey used prenotification letters, a standardized questionnaire, survey letters, and reminder/thank you postcards. Sample respondents completed the HOS in English, Spanish, Chinese, or Russian language versions of the mail survey. While no surveys were completed in Russian for Cohort 25 Baseline, the Russian language option became available in 2019.
- Survey vendors attempted telephone follow up in English, Spanish or Chinese (with at least five attempts) 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 Chinese language telephone protocol was added to the HOS in 2020. A standardized version of an Electronic Telephone Interviewing System script was used to collect telephone interview data for the survey.
- Survey vendors performed initial data cleaning and follow up with survey respondents, as necessary.

Data Evaluation and Processing

The entire HOS data file was reviewed using SAS® 9.4 programs to verify the quality of the data submitted by survey vendors. Reliable and valid HOS data are essential for maintaining the integrity of HOS measures used in the Medicare Star Ratings. Data files were reviewed for errors prior to merging the files into a final HOS dataset. Vendor generated errors were identified for correction, while errors attributable to the survey respondent, such as skip pattern errors, were left 'as is' in the final HOS dataset.

- Data consistency checks were performed to identify:
  - Out of range dates and response values
  - Duplicate Beneficiary Link Keys and Medicare Beneficiary Identifier (MBI) numbers
  - Data shifts in value assignment
  - Inconsistencies in data distributions of survey response values among vendors
  - Discrepancies in the percent complete and survey disposition codes
  - Inconsistent assignment of survey variables (such as survey disposition, round number, and survey language)
  - Patterns of missing responses across MAO data
- Text files from vendors were concatenated into the final HOS dataset.
- Additional fields were created and added to the final HOS dataset such as the percent of survey completed, the number of ADL questions answered, indicators for ineligible and completed surveys, and the PCS and MCS Scores.

Medicare HOS 3.0 Instrument

The 2022 survey administration used the HOS 3.0 that was implemented in 2015. The HOS 3.0 evaluates the HRQOL of MA members by measuring their physical and mental health status using the VR-12.[64] Modifications in the HOS 3.0 from the previous version (HOS 2.5) included: changes to questions about leakage of urine, sleep duration and quality, and primary language spoken in the home. In a formatting change, the survey uses a two-column layout for each page. In 2022, the Arthritis of the Hip or Knee, Arthritis of the Hand or Wrist, Sciatica, Smoking, and Income items were removed.

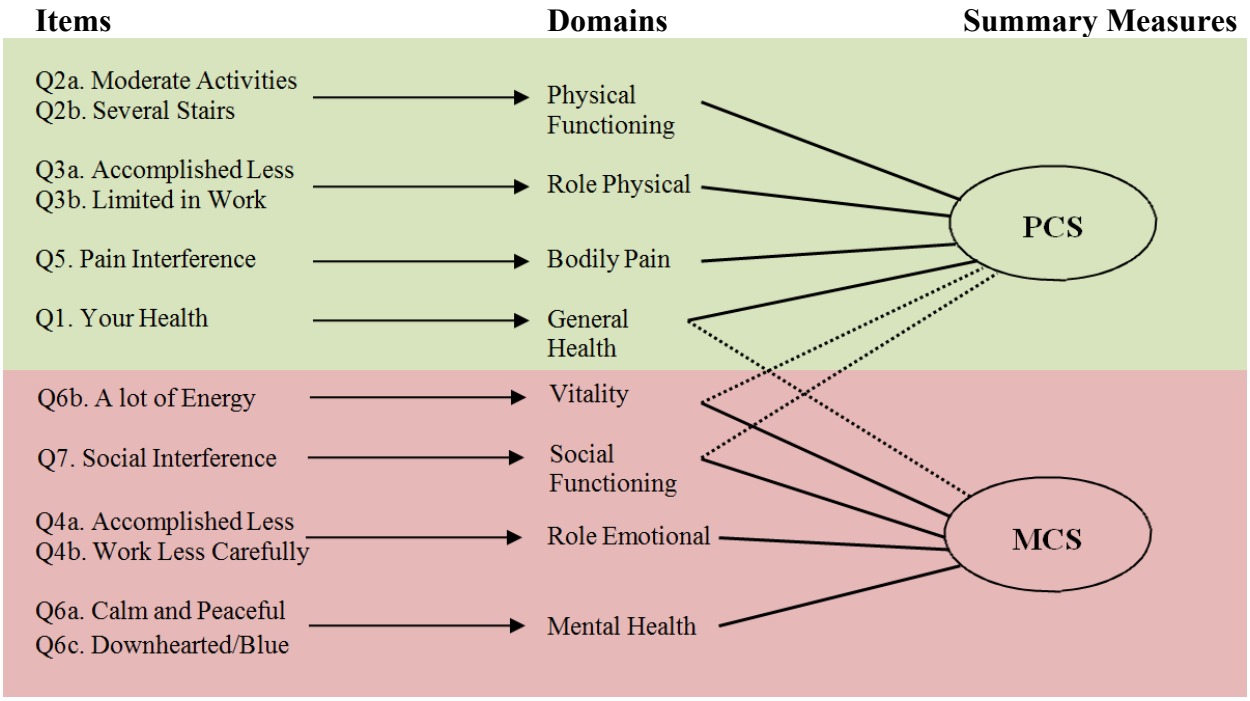
The HOS also contains questions about: sociodemographics, ADLs, IADLs, chronic medical conditions, self-rated health, number of unhealthy days in the past 30 days, depression risk, cognitive functioning, memory, pain, living arrangements, and height and weight used for calculation of BMI. Three HEDIS Effectiveness of Care measures are included to evaluate management of urinary incontinence, physical activity, and fall risk management. Questions regarding race, ethnicity, sex, primary language, and disability status are included to comply with standards established by Section 4302 of the Affordable Care Act. The HOS survey instruments are available on NCQA's website at www.ncqa.org/hedis/measures/hos.

The VR-12 was derived from the Veterans RAND 36-Item Health Survey (VR-36).[65, 66, 67] The VR-12 is a generic, multipurpose health survey, which consists of the 12 most important items from the VR-36 for construction of the physical and mental health summary scores (Questions Q1-Q7) and two items that assess change in physical and emotional health compared to one year ago (Q8 and Q9) that are not used in the calculation of the summary scores. The shorter instrument was adopted to reduce response burden and survey costs, while maintaining comparability of HOS results over time. The body of literature supports the shorter survey as a reliable and valid substitute for the 36-item health survey. In addition, conversion formulas have been developed and validated for comparison of the VR-12 with the earlier 36-item survey that allows reliable comparisons of HOS results.[68]

In comparison with the earlier 36-item survey, two modifications were made in the VR-12 and previously in the VR-36. The first modification was an increase in the number of response choices for the items used for role limitations due to physical problems (Q3a and Q3b) and role limitations due to emotional problems (Q4a and Q4b), from a two-point choice of "Yes" or "No" to a five-point Likert scale ("No, none of the time," "Yes, a little of the time," "Yes, some of the time," "Yes, most of the time," and "Yes, all of the time"). 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 other usual activities. The second modification was that two questions were used to assess health change, one focusing on physical health (Q8) and one on emotional problems (Q9), in contrast to the one general change item in the 36-item survey.[69, 70]

The VR-12 measures the same eight health domains as the 36-item health survey: 1) Physical Functioning, 2) Role-Physical, 3) Role-Emotional, 4) Bodily Pain, 5) Social Functioning, 6) Mental Health, 7) Vitality, and 8) General Health. Each domain aggregates one or two items and all eight domains are used to calculate the two summary measures, as illustrated in the VR-12 mapping model that follows in Figure 15.

**Figure 15: Mapping of HOS 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 imputation of missing data.[64] For those members with complete responses across the VR-12, the following steps[71] were taken 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 weighted 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.[72]
- 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 zero 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. Using 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.[73] 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.[71] For each combination of missing data, the

respondents' 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.[74] 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.

Case-Mix Adjustment for Comparison of MAOs at Baseline

Beneficiaries are not randomly assigned to MAOs. Therefore, unadjusted PCS and MCS scores may be biased by demographic and chronic health characteristics that are disproportionately represented in some MAOs. For this reason, the PCS and MCS scores are case-mix adjusted to allow for equitable comparisons across all MAOs. In the context of the HOS, case-mix refers to those member characteristics measured at baseline (such as age and the presence of chronic conditions) that are outside the control and influence of the MAO, but that may contribute to better or worse physical and/or mental health summary scores.[73] Case-mix adjustment is a statistical technique that uses multiple regression models to control for those differences, thus allowing comparisons in performance and quality across MAOs.

Models used to adjust the summary scores included variables to control for differences in sociodemographic characteristics, chronic medical conditions, and HOS study design variables.

- Sociodemographic characteristics included age, gender, race, education, and marital status.
- Chronic medical conditions were measured from 12 questions about medical conditions.
- HOS study design variables included who completed the survey, CMS region, and the survey vendor.

Two different generalized linear regression models were used to adjust PCS and MCS scores since not all members responded to all survey questions. Only one model, the most comprehensive model possible, was used to calculate an adjusted score for each member.

- Model One: If a respondent had completed data for all the covariates, then the adjusted scores were calculated using Model One, which contains all variables.
- Model Two: If a respondent did not have enough completed data for Model One, then Model Two was used. Age, gender, race, CMS region, and survey vendor were included in Model Two because they were available for all sampled members.
- Adjusted MAO scores can only be calculated with use of the complete HOS dataset.

## Table 32: Covariates Used in the Case Mix Adjustment of PCS and MCS Scores

| | Model One | Model Two |
|---|---|---|
| **Sociodemographic Covariates** | | |
| Age (Integer) | √ | √ |
| Gender (Male or Female) | √ | √ |
| CMS Race (Black, Other Minority) | √ | √ |
| Education | √ | |
| Marital Status | √ | |
| **Chronic Medical Conditions** | | |
| Hypertension or high blood pressure | √ | |
| Angina pectoris or coronary artery disease | √ | |
| Congestive heart failure | √ | |
| Myocardial infarction or heart attack | √ | |
| Other heart conditions, such as problems with heart valves or arrhythmias | √ | |
| Stroke | √ | |
| Emphysema, or asthma, or COPD (Chronic Obstructive Pulmonary Disease) | √ | |
| Crohn's disease, ulcerative colitis, or inflammatory bowel disease | √ | |
| Osteoporosis | √ | |
| Diabetes, high blood sugar, or sugar in the urine | √ | |
| Depression | √ | |
| Any cancer (other than skin cancer) | √ | |
| **HOS Study Design Variables** | | |
| Who Completed Survey (Self or Other) | √ | |
| CMS Region | √ | √ |
| Survey Vendor | √ | √ |

**Note:** Model One included all covariates listed in Table 32 and was used for respondents with completed data for all the covariates. Model Two was limited to age, gender, race, CMS region, and survey vendor, and was used for respondents who did not have enough completed data for Model One.

# Appendix 2

**Table 33: 2022 Cohort 25 Baseline Mean Unadjusted and Adjusted PCS and MCS Scores for All MAOs in StateXX and HOS Total**

| | Unadjusted PCS Score (SD) | Adjusted PCS Score (SD) | Unadjusted MCS Score (SD) | Adjusted MCS Score (SD) |
|---|---|---|---|---|
| HXXXA | 40.0 (12.4) | 39.7 ( 5.6) | 52.3 (11.1) | 52.8 ( 5.3) |
| HXXXB | 38.9 (11.9) | 39.7 ( 5.6) | 53.2 (10.4) | 53.1 ( 4.8) |
| HXXXC | 39.6 (12.4) | 39.5 ( 6.3) | 51.8 (10.7) | 52.3 ( 5.5) |
| HXXXD | 39.1 (12.1) | 38.8 ( 6.1) | 52.4 (11.4) | 52.0 ( 5.2) |
| HXXXE | 38.6 (12.7) | 39.1 ( 6.0) | 52.2 (11.4) | 53.0 ( 5.1) |
| StateXX | 39.2 (12.3) | 39.3 ( 5.9) | 52.4 (11.0) | 52.7 ( 5.2) |
| HOS Total | 39.4 (12.5) | 39.4 ( 6.1) | 52.7 (10.9) | 52.7 ( 5.3) |

**Table 34: 2022 Cohort 25 Baseline Percentile Distribution of Adjusted PCS Scores for MAO HXXXA, StateXX, and HOS Total**

| | Mean | SD | P10 | P25 | Median | P75 | P90 | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| HXXXA | 39.7 | 5.6 | 33.2 | 36.2 | 39.4 | 43.7 | 46.8 | 17.9 | 52.2 |
| StateXX | 39.3 | 5.9 | 32.6 | 36.0 | 39.1 | 43.6 | 46.8 | 9.4 | 52.8 |
| HOS Total | 39.4 | 6.1 | 32.2 | 35.9 | 39.1 | 43.8 | 47.2 | 4.0 | 54.1 |

**Table 35: 2022 Cohort 25 Baseline Percentile Distribution of Adjusted MCS Scores for MAO HXXXA, StateXX, and HOS Total**

| | Mean | SD | P10 | P25 | Median | P75 | P90 | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| HXXXA | 52.8 | 5.3 | 44.4 | 49.7 | 54.6 | 56.8 | 58.1 | 35.3 | 59.2 |
| StateXX | 52.7 | 5.2 | 44.3 | 49.9 | 54.4 | 56.8 | 57.9 | 33.1 | 59.7 |
| HOS Total | 52.7 | 5.3 | 44.0 | 50.1 | 54.7 | 56.9 | 58.0 | 29.8 | 60.0 |

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