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2019 Cohort 22
Medicare Advantage Organization
Baseline Report

Medicare Health

Outcomes Survey

Centers for Medicare & Medicaid Services
Health Services Advisory Group
March 2020

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 2019 Cohort 22 of the Medicare Health Outcomes Survey (HOS). The 2019 Cohort 22 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. Resources to assist MAOs in their quality improvement efforts are included in the report. The information indicates where beneficiaries are doing poorly.

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

Sincerely,

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

Executive Summary .............................................................................................................. 1
   Profile of MAO H2926 ...................................................................................................... 1
Reader’s Guide .................................................................................................................... 5
   Technical Assistance ....................................................................................................... 5
HOS Highlights .................................................................................................................. 7
   Implementation of HOS 3.0 .............................................................................................. 7
   HOS Website .................................................................................................................. 7
   Semiannual HOS Newsletters ......................................................................................... 7
   CMS Approved Survey Vendors ..................................................................................... 7
   Frequently Asked Questions (FAQs) ................................................................................ 7
   Self-Paced Training Webinars ......................................................................................... 8
   Veterans RAND 12-Item Health Survey (VR-12) Website ............................................... 8
2019 Cohort 22 Baseline Results ....................................................................................... 9
   Distribution of the Sample and Response Rate .............................................................. 9
   Demographics ................................................................................................................ 10
   Physical and Mental Component Summary Scores ....................................................... 11
   General Health and Comparative Health ..................................................................... 12
   Depression ..................................................................................................................... 14
   Pain .................................................................................................................................. 16
   Chronic Medical Conditions .......................................................................................... 18
   Activities of Daily Living ............................................................................................... 19
   Healthy Days Measures ................................................................................................ 23
   Body Mass Index ........................................................................................................... 25
   Sleep Measures ............................................................................................................. 27
Appendix 1 ......................................................................................................................... 28
   Program Background ..................................................................................................... 28
   2019 Medicare Advantage Organization Participation .................................................. 28
   2019 Methodology and Design ...................................................................................... 29
Appendix 2 ......................................................................................................................... 33
   2019 Cohort 22 Baseline Frequencies of Survey Fields for MAO H2926 ....................... 33
References ......................................................................................................................... 45
**Executive Summary**

This Medicare Health Outcomes Survey (HOS) Baseline Report presents aggregate results for MAO H2926 based on data from the Medicare HOS 2019 Cohort 22 Baseline Survey. A profile of the Cohort 22 Baseline sample is provided below for your Medicare Advantage Organization (MAO). In addition, the results for the physical component summary (PCS) and mental component summary (MCS) scores and other health status measures are described in this section. More detailed information about the results is provided in the Baseline Results section of the report.

Please note that the results in this report include all respondents (seniors and non-seniors). However, the three Healthcare Effectiveness Data and Information Set (HEDIS®) Effectiveness of Care measures and the two functional health measures derived from the HOS in the Medicare Part C Star Ratings are based only on seniors. These HEDIS measures were not calculated since your MAO did not have a sufficient number of seniors (N ≥ 100) or was not required to report HOS HEDIS measures.

**Profile of MAO H2926**

**Sample**

In 2019, the HOS Cohort 22 Baseline sample for your MAO included a random sample of 177 beneficiaries, including both the disabled (age 18-64) and seniors (age 65 or older). Of the eligible sample of 177 beneficiaries, 35.0% (62) completed the survey and comprised your 2019 Cohort 22 Baseline respondent sample. In the respondent sample, 96.8% were 18-64 years of age, 41.9% were male, and 98.4% were White. In addition, 51.6% of the respondents had never married, and 100.0% were Medicaid recipients. Further, 13.3% did not graduate high school and 42.6% had an annual household income of less than $10,000.

**General and Comparative Health**

The 2019 Cohort 22 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), and are tracked by the Federal Government as part of the national Healthy People Health-Related Quality of Life 2020 Goals. Please note that the goals of Healthy People 2030 are currently under development.

Table 1 describes results for the general and comparative health status of beneficiaries in your MAO respondent sample. Beneficiaries 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. Thus, general self-rated health status questions are sentinel indicators of underlying health problems that require effective identification and treatment.
### Table 1: 2019 Cohort 22 Baseline Self-Rated General and Comparative Health Status for MAO H2926

<table>
<thead>
<tr>
<th>Self-Rated Health Status</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent to Good*</td>
<td>34</td>
<td></td>
<td>55.7%</td>
</tr>
<tr>
<td>Fair or Poor</td>
<td>27</td>
<td></td>
<td>44.3%</td>
</tr>
<tr>
<td><strong>Physical Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much Better to About the Same**</td>
<td>38</td>
<td></td>
<td>62.3%</td>
</tr>
<tr>
<td>Slightly Worse or Much Worse</td>
<td>23</td>
<td></td>
<td>37.7%</td>
</tr>
<tr>
<td><strong>Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much Better to About the Same**</td>
<td>43</td>
<td></td>
<td>71.7%</td>
</tr>
<tr>
<td>Slightly Worse or Much Worse</td>
<td>17</td>
<td></td>
<td>28.3%</td>
</tr>
</tbody>
</table>

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

### Physical and Mental Health

The primary physical and mental health status measures for the HOS are the PCS and MCS scores.\(^A\) 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.\(^B\) 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. A higher PCS or MCS score reflects better health status. The PCS and MCS scores in this report were not case-mix adjusted.

Table 2 presents the mean unadjusted PCS and MCS scores for your MAO. The results presented in the table are from the Cohort 22 Baseline respondent sample. For detailed information about the scores, please refer to the Baseline Results section. Note that 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 2: 2019 Cohort 22 Baseline Mean Unadjusted Scores by Self-Rated General and Comparative Health Status for MAO H2926

<table>
<thead>
<tr>
<th>Self-Rated Health Status</th>
<th>MAO H2926</th>
<th>PCS Mean (SD)</th>
<th>MCS Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent to Good*</td>
<td>39.1 (11.0)</td>
<td>51.2 (12.9)</td>
<td></td>
</tr>
<tr>
<td>Fair or Poor</td>
<td>25.5 (10.4)</td>
<td>42.4 (15.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much Better to About the Same**</td>
<td>36.9 (11.8)</td>
<td>52.6 (10.8)</td>
<td></td>
</tr>
<tr>
<td>Slightly Worse or Much Worse</td>
<td>27.0 (11.7)</td>
<td>38.1 (15.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much Better to About the Same**</td>
<td>34.1 (13.2)</td>
<td>53.5 (10.0)</td>
<td></td>
</tr>
<tr>
<td>Slightly Worse or Much Worse</td>
<td>31.6 (11.2)</td>
<td>29.9 (9.4)</td>
<td></td>
</tr>
</tbody>
</table>

† If no beneficiaries reported for a category, the result is not applicable (NA). If only one member reported in a category, the standard deviation (SD) was not calculated (NC).
* Categories for general health included “Excellent,” “Very good,” or “Good.”
** Categories for comparative health included “Much better,” “Slightly better,” or “About the same.”

\(^A\) See Appendix 1 for more information about how PCS and MCS scores are derived from the HOS measure.
\(^B\) For additional information, refer to the HOS and the Medicare Star Ratings section on www.HOSonline.org.
Chronic Medical Conditions

An important feature of the Medicare HOS is the ability to describe and quantify several common chronic medical conditions in the Medicare Advantage (MA) population. Table 3 shows the prevalence of 15 chronic medical conditions in your MAO.

Table 3: 2019 Cohort 22 Baseline Prevalence of Chronic Medical Conditions for MAO H2926

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>29</td>
<td>29</td>
<td>48.3%</td>
</tr>
<tr>
<td>Arthritis - Hip or Knee</td>
<td>27</td>
<td>27</td>
<td>44.3%</td>
</tr>
<tr>
<td>Arthritis - Hand or Wrist</td>
<td>19</td>
<td>19</td>
<td>30.6%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>28</td>
<td>28</td>
<td>46.7%</td>
</tr>
<tr>
<td>Sciatica</td>
<td>16</td>
<td>16</td>
<td>26.7%</td>
</tr>
<tr>
<td>Other Heart Conditions</td>
<td>9</td>
<td>9</td>
<td>15.3%</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>13</td>
<td>13</td>
<td>21.3%</td>
</tr>
<tr>
<td>Depression</td>
<td>38</td>
<td>38</td>
<td>61.3%</td>
</tr>
<tr>
<td>Pulmonary Disease</td>
<td>22</td>
<td>22</td>
<td>36.1%</td>
</tr>
<tr>
<td>Any Cancer (except skin cancer)</td>
<td>7</td>
<td>7</td>
<td>11.5%</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>1</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>6</td>
<td>6</td>
<td>10.2%</td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td>1</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Stroke</td>
<td>3</td>
<td>3</td>
<td>4.9%</td>
</tr>
<tr>
<td>Gastrointestinal Disease</td>
<td>3</td>
<td>3</td>
<td>5.1%</td>
</tr>
</tbody>
</table>

Activities of Daily Living

Six Activities of Daily Living (ADLs) are included in the HOS to examine reported difficulty with the performance of daily tasks. ADLs include bathing, dressing, eating, getting in or out of chairs, walking, and using the toilet. For ADLs, impairment is defined as beneficiaries reporting either difficulty or inability to perform an ADL.

Instrumental activities of daily living (IADLs) in the HOS assess independent living skills that are more complex than ADLs. IADLs include preparing meals, managing money, and taking medications. For IADLs, impairment is defined as beneficiaries who reported difficulty performing the specific IADL.

Table 4 on the following page highlights the prevalence of impairments in performing ADLs and IADLs for beneficiaries in MAO H2926.
Table 4: 2019 Cohort 22 Baseline Prevalence of Impairments in ADLs and IADLs for MAO H2926

<table>
<thead>
<tr>
<th>Impairment Type</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities of Daily Living</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td></td>
<td>36</td>
<td>59.0%</td>
</tr>
<tr>
<td>Getting in or out of chairs</td>
<td></td>
<td>23</td>
<td>37.7%</td>
</tr>
<tr>
<td>Bathing</td>
<td></td>
<td>19</td>
<td>31.1%</td>
</tr>
<tr>
<td>Dressing</td>
<td></td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>Using the toilet</td>
<td></td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>Eating</td>
<td></td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td>Instrumental Activities of Daily Living*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing meals</td>
<td></td>
<td>9</td>
<td>20.5%</td>
</tr>
<tr>
<td>Managing money</td>
<td></td>
<td>10</td>
<td>18.9%</td>
</tr>
<tr>
<td>Taking medication as prescribed</td>
<td></td>
<td>9</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

* Respondents that indicated “I don’t do this activity” to IADL questions were removed from the denominator.

Healthy Days Measures

Table 5 provides the percentage of beneficiaries with 14 or more days of poor physical health, poor mental health, and activity limitations in the past 30 days for your MAO. In general, 14 or more days of poor health or activity limitations are considered indicative of poor well-being. These HRQOL measures are useful in identifying vulnerable sub-populations with the greatest risk for disease or injury.

Table 5: 2019 Cohort 22 Baseline Healthy Days Measures for MAO H2926

<table>
<thead>
<tr>
<th>Healthy Days Measures</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically Unhealthy Days</td>
<td></td>
<td>29</td>
<td>48.3%</td>
</tr>
<tr>
<td>14-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentally Unhealthy Days</td>
<td></td>
<td>18</td>
<td>30.0%</td>
</tr>
<tr>
<td>14-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days with Activity Limitations</td>
<td></td>
<td>23</td>
<td>37.7%</td>
</tr>
<tr>
<td>14-30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Body Mass Index

Self-reported height and weight values are used to calculate Body Mass Index (BMI), a measure that correlates with the amount of body fat in adult men and women. Table 6 depicts the distribution of BMI for beneficiaries in your MAO.

Table 6: 2019 Cohort 22 Baseline BMI Measures for MAO H2926

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt;18.5)</td>
<td></td>
<td>4</td>
<td>6.8%</td>
</tr>
<tr>
<td>Normal (18.5-24.99)</td>
<td></td>
<td>13</td>
<td>22.0%</td>
</tr>
<tr>
<td>Overweight (25-29.99)</td>
<td></td>
<td>14</td>
<td>23.7%</td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td></td>
<td>28</td>
<td>47.5%</td>
</tr>
</tbody>
</table>

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.”
Reader’s Guide

The Reader’s Guide is provided to assist Medicare Advantage Organizations (MAOs) use their Medicare Health Outcomes Survey (HOS) Baseline Report information effectively. This section will guide the reader to identify key topics, such as the CMS Medicare Star Ratings, and answer general questions about the reports and data. For further assistance, please refer to the Technical Assistance information below. Additionally, the What’s New section in this report has information about new website content, webinars, and HOS program updates.

Technical Assistance

The Medicare HOS Information and Technical Support Telephone Line (1-888-880-0077) and Email Address (hos@hsag.com) are available to provide assistance with report questions and interpretation. Additionally, the CMS HOS website provides general information on the 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 can I use the information contained in this report?
The baseline report is designed to assist MAOs in identifying the overall health of their Medicare population and explore potential programmatic interventions aimed at maintaining or improving the overall health of their Medicare population. The Medicare HOS website includes a Trainings section under the Resources page to assist MAOs in their quality improvement activities. Please refer to the What’s New section in this report for updates about the HOS.

What if I encounter a term I do not understand?
A glossary consisting of definitions relevant to the Medicare HOS may be accessed from the “Glossary” link at the bottom of site webpages.

Where can I find my MAO level results and how they were generated?
The 2019 Cohort 22 Baseline results for the physical and mental health summary scores and other health status measures are presented in the Executive Summary and Baseline Results sections in this report. A summary of the data collection and analysis may be found in Appendix 1. In addition, response frequencies for the majority of the survey questions may be found in Appendix 2. Please note that the percentages in the tables and graphs may not add to 100% due to rounding.

Where can I find the number and a description of the beneficiaries that participated in determining my MAO level results?
The Baseline Results section provides a summary of the number of participating beneficiaries, the response rates, and demographic information.

Where can I find the 2019 NCQA HEDIS® Measure results derived from the HOS?
The 2019 National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS®)1 Measure results were not calculated since your MAO did not have a sufficient number of seniors (N ≥ 100) or was not required to report HOS HEDIS measures.
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 (www.medicare.gov/plan-compare) and awards quality bonus payments to high-performing health plans. For information about the Star Ratings, refer to the Star Ratings page on the HOS website.

Where can I find HOS Program information, such as sampling methodology and timelines for the reporting and data distribution?
A summary of the HOS sampling methodology and survey administration may be found in Appendix 1 of this report. 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.

What survey questions were used in the HOS?
The 2019 Medicare HOS 3.0 questionnaire and previous HOS instruments may be downloaded from the Survey page on the HOS website. In addition, the HOS questionnaire may also be found in the NCQA HEDIS 2019, Volume 6: Specifications for the Medicare Health Outcomes Survey Manual on the HOS website.9

Where can I obtain a copy of the HEDIS 2019 Volume 6 Manual?
The manual is available online for download from the Survey Administration section under the Program page on the HOS website. Copies of other HEDIS Volume 6 publications may be obtained by calling the NCQA Customer Support Telephone Line at 1-888-275-7585 or via NCQA’s Publications Center (https://store.ncqa.org/).

When will MAOs receive beneficiary level data for Cohort 22 Baseline?
The merged baseline and follow up beneficiary level data will be distributed to the MAOs in the Fall of 2022, after completion of the 2021 follow up survey and the release of the 2019-2021 Cohort 22 Performance Measurement Report in 2022. MAOs are notified via the CMS Health Plan Management System (HPMS) of the availability of their merged data and how to request it.

How can I obtain additional copies of this report?
All report distribution occurs electronically to participating MAOs through HPMS, which requires an HPMS User ID. Downloads include the PDF report and the summary-level data in a CSV file, which contains contract-level survey responses and demographic data. Please visit the following CMS site for information on how to establish access to HPMS: www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/HPMS/Overview. If you require assistance regarding HPMS access, please contact CMS at hpms_access@cms.hhs.gov.

Where can I find information about research and reports related to the HOS?
Information about peer-reviewed articles, technical reports, and manuals related to the HOS may be found on the Resources page on the HOS website (www.HOSonline.org). Consult the Home page for a listing of new reports and general updates.
HOS Highlights

Implementation of HOS 3.0

The 2019 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 four HEDIS Effectiveness of Care measures are the Management of Urinary Incontinence in Older Adults, Physical Activity in Older Adults, Fall Risk Management, and Osteoporosis Testing in Older Women. The 2019 HOS 3.0 is available on the Survey page of the HOS website (www.HOSonline.org).

HOS Website

The HOS website is a resource that provides:
- Historical overview of the project
- Updates on project activities
- Reports of ongoing research efforts
- Access to public use files and supporting documentation
- Clearinghouse of electronic information about journal articles, bibliographies, and technical reports relating to the HOS
- Links to project partners

Semiannual HOS Newsletters

The HOS Newsletters contain information about HOS products, services, and timelines; program updates; self-paced training programs; and other relevant topics, such as sharing of best practices. HOS Newsletters are circulated semiannually via email, in winter and summer, to MAO contacts and users of the HOS technical support, and are 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 a list of CMS approved survey vendors. There were five survey vendors approved to administer the HOS in 2019.

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.

- **Introduction to the Medicare Health Outcomes Survey (HOS):** a basic training session appropriate for MAOs that are new to the HOS or those wanting 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 beneficiaries 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 beneficiaries over a two-year period. It also discusses how the HOS results are used in the Medicare Advantage (MA) Plan Ratings, also called the Medicare 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/](http://www.bu.edu/sph/about/departments/health-law-policy-and-management/research/vr-36-vr-12-and-vr-6d/).
2019 Cohort 22 Baseline Results

This report presents the HOS 2019 Cohort 22 Baseline results for MAO H2926. Please note that the results in this report include all respondents (seniors and non-seniors). However, the three HEDIS Effectiveness of Care measures and the two functional health measures in the Medicare Part C Star Ratings derived from the HOS are based only on seniors. The HEDIS measures were not calculated since your MAO did not have a sufficient number of seniors (N ≥ 100) or was not required to report HOS HEDIS measures. 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 Rate

Please refer to Figure 1 for a graphical depiction of the distribution of the sample and response rate for MAO H2926. 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 Cohort 22 Baseline respondent sample is used for all analyses in this report.

Figure 1: 2019 Cohort 22 Baseline Distribution of the Sample and Response Rate for MAO H2926

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Less</th>
<th>Ineligible&lt;sup&gt;C&lt;/sup&gt;</th>
<th>MAO H2926=0</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAO H2926=177</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Eligible Sample</th>
<th>Less</th>
<th>Non-respondents</th>
<th>MAO H2926=115</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAO H2926=177</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respondents&lt;sup&gt;D&lt;/sup&gt;</th>
<th>=</th>
<th>Response Rate&lt;sup&gt;E&lt;/sup&gt;</th>
<th>MAO H2926=35.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAO H2926=62</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>C</sup> Deceased, not enrolled in MAO, bad address and phone, bad address and mail-only protocol (Chinese and Russian only), language barrier, or removed from sample due to age less than 18 years.

<sup>D</sup> Respondents include completed surveys for which PCS or MCS scores can be calculated

<sup>E</sup> Response Rate = [(Respondents/Eligible Sample) x 100%]
Demographics

Table 7 presents demographics for MAO H2926. HOS demographics in the table are detailed by sub-categories within the age, gender, race, marital status, education, annual household income, and Medicaid status groups.

**Table 7: 2019 Cohort 22 Baseline Demographics for MAO H2926**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>MAO H2926</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>(N=62)</td>
<td></td>
</tr>
<tr>
<td>18-64</td>
<td>60</td>
<td>96.8%</td>
</tr>
<tr>
<td>65+</td>
<td>2</td>
<td>3.2%</td>
</tr>
<tr>
<td>Gender</td>
<td>(N=62)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>41.9%</td>
</tr>
<tr>
<td>Female</td>
<td>36</td>
<td>58.1%</td>
</tr>
<tr>
<td>Race</td>
<td>(N=62)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>61</td>
<td>98.4%</td>
</tr>
<tr>
<td>Black</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>1</td>
<td>1.6%</td>
</tr>
<tr>
<td>Marital Status</td>
<td>(N=62)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>6</td>
<td>9.7%</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>4.8%</td>
</tr>
<tr>
<td>Divorced or Separated</td>
<td>21</td>
<td>33.9%</td>
</tr>
<tr>
<td>Never Married</td>
<td>32</td>
<td>51.6%</td>
</tr>
<tr>
<td>Education</td>
<td>(N=60)</td>
<td></td>
</tr>
<tr>
<td>Did Not Graduate HS</td>
<td>8</td>
<td>13.3%</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>27</td>
<td>45.0%</td>
</tr>
<tr>
<td>Some College</td>
<td>18</td>
<td>30.0%</td>
</tr>
<tr>
<td>4 Year Degree or Beyond</td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td>Annual Household Income</td>
<td>(N=61)</td>
<td></td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>26</td>
<td>42.6%</td>
</tr>
<tr>
<td>$10,000 - $19,999</td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>$20,000 - $29,999</td>
<td>5</td>
<td>8.2%</td>
</tr>
<tr>
<td>$30,000 - $49,999</td>
<td>5</td>
<td>8.2%</td>
</tr>
<tr>
<td>$50,000 or More</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td>Don't Know</td>
<td>8</td>
<td>13.1%</td>
</tr>
<tr>
<td>Medicaid Status</td>
<td>(N=62)</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>62</td>
<td>100.0%</td>
</tr>
<tr>
<td>Non-Medicaid</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
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 2019 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 measure 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 in this report were not case-mix adjusted.²

How Is Your MAO Doing?

Figure 2 depicts the mean unadjusted PCS and MCS scores for MAO H2926.

Figure 2: 2019 Cohort 22 Baseline Mean Unadjusted PCS and MCS Scores for MAO H2926

<table>
<thead>
<tr>
<th>Scores</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCS</td>
<td>33.1</td>
</tr>
<tr>
<td>MCS</td>
<td>47.0</td>
</tr>
</tbody>
</table>

² Case-mix adjustment is a statistical technique that controls for differences in demographics, socioeconomic characteristics, chronic medical conditions, and HOS study design variables. For additional information about scoring for the VR-12, please refer to Appendix 1.
Evidence from various studies suggests the presence of variations in health among Medicare eligible beneficiaries by age, racial, and socioeconomic groups.\textsuperscript{10,11,12,13,14,15} Table 8 presents the mean unadjusted PCS and MCS scores by categories of age, race, and annual household income for MAO H2926, and illustrates some of these differences.

Table 8: 2019 Cohort 22 Baseline Mean Unadjusted Scores by Selected Demographics for MAO H2926

<table>
<thead>
<tr>
<th>Demographic</th>
<th>MAO H2926</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCS Mean (SD)</td>
<td>MCS Mean (SD)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-64</td>
<td>33.2 (12.6)</td>
<td>47.0 (14.7)</td>
</tr>
<tr>
<td>65+</td>
<td>29.1 (12.3)</td>
<td>45.9 (12.7)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>33.1 (12.7)</td>
<td>47.3 (14.4)</td>
</tr>
<tr>
<td>Black</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>32.7 (NC)</td>
<td>26.6 (NC)</td>
</tr>
<tr>
<td>Annual Household Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>37.9 (11.9)</td>
<td>47.3 (15.3)</td>
</tr>
<tr>
<td>$10,000 - $19,999</td>
<td>25.7 (12.5)</td>
<td>46.6 (14.5)</td>
</tr>
<tr>
<td>$20,000 - $29,999</td>
<td>30.5 (4.8)</td>
<td>42.9 (15.9)</td>
</tr>
<tr>
<td>$30,000 - $49,999</td>
<td>36.9 (16.5)</td>
<td>51.5 (14.0)</td>
</tr>
<tr>
<td>$50,000 or More</td>
<td>23.0 (9.6)</td>
<td>57.5 (3.0)</td>
</tr>
<tr>
<td>Don't know</td>
<td>32.5 (11.1)</td>
<td>45.0 (16.0)</td>
</tr>
</tbody>
</table>

* If no beneficiaries reported for a category, the result is not applicable (NA). If only one member reported in a category, the standard deviation (SD) was not calculated (NC).

General Health and Comparative Health

Definition of Measures

- General self-rated health status is a measure of a person’s perception of their health using ratings of “Excellent,” “Very good,” “Good,” “Fair,” or “Poor.”\textsuperscript{16} 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.\textsuperscript{2} 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.\textsuperscript{17,18}
How Is Your MAO Doing?

Figure 3 displays the respondents’ self-reported general health status for your MAO.

**Figure 3: 2019 Cohort 22 Baseline Self-Rated General Health Status for MAO H2926**

![Bar chart]

<table>
<thead>
<tr>
<th>Status</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent to Good*</td>
<td>55.7%</td>
</tr>
<tr>
<td>Fair or Poor</td>
<td>44.3%</td>
</tr>
</tbody>
</table>

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

Figure 4 displays the respondents’ self-reported physical health status as compared to one year ago for your MAO.

**Figure 4: 2019 Cohort 22 Baseline Self-Rated Physical Health Compared to One Year Ago for MAO H2926**

![Bar chart]

<table>
<thead>
<tr>
<th>Status</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much Better to About the Same*</td>
<td>62.3%</td>
</tr>
<tr>
<td>Slightly Worse or Much Worse</td>
<td>37.7%</td>
</tr>
</tbody>
</table>

* Categories for comparative health included “Much better,” “Slightly better,” or “About the same.”
Figure 5 displays the respondents’ self-reported mental health status as compared to one year ago for your MAO.

**Figure 5: 2019 Cohort 22 Baseline Self-Rated Mental Health Compared to One Year Ago for MAO H2926**

![Bar chart showing self-rated mental health status with 71.7% Much Better to About the Same and 28.3% Slightly Worse or Much Worse.]

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

**Depression**

**Definition of Measures**

- The HOS includes two questions (Questions 39a and 39b) that serve as a screening measure for depression. Each question is assigned points depending on the response given, from 0 (“Not at all”) to 3 (“Nearly every day”). For this report, a Medicare beneficiary 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, and 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. Additionally, depression is significantly associated with other psychological dysfunction, as well as the presence of common chronic medical conditions, such as diabetes. As a result, older adults with depression are frequently misdiagnosed or do not receive proper treatment for their depressive symptoms. Depression screening tools have been developed for use in clinical settings to rapidly identify individuals at risk for major depression. Those with positive depression

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*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 a positive depression screen in this report are not comparable to estimates produced using the HOS versions 1.0 or 2.0.*
screens should be followed-up by more comprehensive diagnostic evaluations to identify whether or not they have major depression.\textsuperscript{24,25}

How Is Your MAO Doing?

Table 9 depicts beneficiaries with a positive depression screen, and the distribution of responses to the two individual depression questions for MAO H2926.

Table 9: 2019 Cohort 22 Baseline Frequency of Positive Depression Screen for MAO H2926

<table>
<thead>
<tr>
<th>Depression Screening Questions</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little interest or pleasure in doing things in past two weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all (0 pts)</td>
<td>28</td>
<td></td>
<td>45.9%</td>
</tr>
<tr>
<td>Several days (1 pt)</td>
<td>22</td>
<td></td>
<td>36.1%</td>
</tr>
<tr>
<td>More than half the days (2 pts)</td>
<td>2</td>
<td></td>
<td>3.3%</td>
</tr>
<tr>
<td>Nearly every day (3 pts)</td>
<td>9</td>
<td></td>
<td>14.8%</td>
</tr>
<tr>
<td>Feeling down, depressed, or hopeless in past two weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all (0 pts)</td>
<td>36</td>
<td></td>
<td>61.0%</td>
</tr>
<tr>
<td>Several days (1 pt)</td>
<td>14</td>
<td></td>
<td>23.7%</td>
</tr>
<tr>
<td>More than half the days (2 pts)</td>
<td>1</td>
<td></td>
<td>1.7%</td>
</tr>
<tr>
<td>Nearly every day (3 pts)</td>
<td>8</td>
<td></td>
<td>13.6%</td>
</tr>
<tr>
<td>Positive Depression Screen*</td>
<td>11</td>
<td></td>
<td>18.6%</td>
</tr>
</tbody>
</table>

* 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.
Pain

Definition of Measures

- The HOS includes three questions to measure self-reported pain over the previous seven days. Question 36 asks how much pain interfered with day-to-day activities from 1 (“Not at all”) to 5 (“Very much”), and Question 37 asks how often pain kept the beneficiary from socializing from 1 (“Never”) to 5 (“Always”). Both Questions 36 and 37 have five possible categorical responses. Question 38 asks the beneficiary to rate his/her average pain, ranging from 1 (“No pain”) to 10 (“Worst imaginable pain”).

Self-reported pain is common among seniors. Without proper pain management, opioid abuse, and alcohol abuse are increasing among seniors as they attempt to control their pain. Several organizations have published recommendations on what should be done to improve the safety of opioid prescribing, including decreasing risk of addiction and abuse.

Pain screening is the initial step in establishing an appropriate pain management program for elderly beneficiaries. In fact, The Joint Commission requires assessment and management of pain when clinically indicated for patients in accredited hospitals, clinics, and long term care facilities, while minimizing the risks associated with treatment. Physical activity and complementary medicine techniques may be helpful alternatives in relieving certain types of pain.

How Is Your MAO Doing?

Figure 6 shows the distribution of self-reported pain scores, grouped into categories, for MAO H2926.

Figure 6: 2019 Cohort 22 Baseline Frequency of Self-Rated Pain Score for MAO H2926
Figure 7 illustrates the relationship between the reported extent that pain interfered with day-to-day activities and mean unadjusted PCS score for MAO H2926.

**Figure 7: 2019 Cohort 22 Baseline Mean Unadjusted PCS Score by Extent Pain Interfered with Day-to-Day Activities for MAO H2926**

![Graph showing the relationship between pain interfering with day-to-day activities and mean unadjusted PCS score for MAO H2926.]

Figure 8 shows the relationship between the reported extent that pain interfered with socialization with others and mean unadjusted MCS score for MAO H2926.

**Figure 8: 2019 Cohort 22 Baseline Mean Unadjusted MCS Score by Extent Pain Interfered with Socializing with Others for MAO H2926**

![Graph showing the relationship between pain interfering with socializing and mean unadjusted MCS score for MAO H2926.]

Chronic Medical Conditions

Definition of Measures

- Chronic medical conditions are multiple measures of the prevalence of chronic disease across the beneficiary lifespan. Chronic conditions are those that last a year or more, and require ongoing medical attention and/or limit activities of daily living. Fifteen measures are found in Questions 20-34.

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. The increased cost associated with chronic disease is an important factor driving overall Medicare spending. According to the U.S. Department of Health and Human Services, two of three adults over the age of 65 have two or more chronic conditions and the need for coordinated care. 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.

How Is Your MAO Doing?

Table 10 shows the prevalence of 15 chronic medical conditions in your MAO. Depression was added to the list of chronic medical conditions in the 2013 HOS 2.5. The chronic medical conditions are quantified in the HOS when beneficiaries positively respond to the question, “Has a doctor ever told you that you had (the specified condition)?”

Table 10: 2019 Cohort 22 Baseline Prevalence of Chronic Medical Conditions for MAO H2926

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>MAO</th>
<th>H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>29</td>
<td></td>
<td>48.3%</td>
<td></td>
</tr>
<tr>
<td>Arthritis - Hip or Knee</td>
<td>27</td>
<td></td>
<td>44.3%</td>
<td></td>
</tr>
<tr>
<td>Arthritis - Hand or Wrist</td>
<td>19</td>
<td></td>
<td>30.6%</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>28</td>
<td></td>
<td>46.7%</td>
<td></td>
</tr>
<tr>
<td>Sciatica</td>
<td>16</td>
<td></td>
<td>26.7%</td>
<td></td>
</tr>
<tr>
<td>Other Heart Conditions</td>
<td>9</td>
<td>1</td>
<td>15.3%</td>
<td></td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>13</td>
<td></td>
<td>21.3%</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>38</td>
<td></td>
<td>61.3%</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Disease</td>
<td>22</td>
<td></td>
<td>36.1%</td>
<td></td>
</tr>
<tr>
<td>Any Cancer (except skin cancer)</td>
<td>7</td>
<td>1</td>
<td>11.5%</td>
<td></td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>1</td>
<td>1</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>6</td>
<td>1</td>
<td>10.2%</td>
<td></td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td>1</td>
<td>1</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>3</td>
<td>1</td>
<td>4.9%</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal Disease</td>
<td>3</td>
<td>1</td>
<td>5.1%</td>
<td></td>
</tr>
</tbody>
</table>
Table 11 illustrates the distribution of beneficiaries by number of chronic medical conditions including categories of none, one, two, three, and four or more conditions for MAO H2926.

Table 11: 2019 Cohort 22 Baseline Distribution of Chronic Medical Conditions for MAO H2926

<table>
<thead>
<tr>
<th>Number of Chronic Medical Conditions</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td>5</td>
<td>8.1%</td>
</tr>
<tr>
<td>1 Condition</td>
<td></td>
<td>10</td>
<td>16.1%</td>
</tr>
<tr>
<td>2 Conditions</td>
<td></td>
<td>7</td>
<td>11.3%</td>
</tr>
<tr>
<td>3 Conditions</td>
<td></td>
<td>12</td>
<td>19.4%</td>
</tr>
<tr>
<td>4 or More Conditions</td>
<td></td>
<td>28</td>
<td>45.2%</td>
</tr>
</tbody>
</table>

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. 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 beneficiaries 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. IADLs include preparing meals, managing money, and taking medications. These measures are found in Question 11. For IADLs, impairment is defined as beneficiaries 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. 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. Like the Healthy Days Measures, ADLs are considered foundational health indicators and, therefore, are tracked by the federal Healthy People 2020 program.

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.
How Is Your MAO Doing?

Table 12 below highlights the prevalence of impairments in performing ADLs and IADLs for beneficiaries in MAO H2926.

**Table 12: 2019 Cohort 22 Baseline Prevalence of Impairments in ADLs and IADLs for MAO H2926**

<table>
<thead>
<tr>
<th>Impairment Type</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities of Daily Living</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td></td>
<td>36</td>
<td>59.0%</td>
</tr>
<tr>
<td>Getting in or out of chairs</td>
<td></td>
<td>23</td>
<td>37.7%</td>
</tr>
<tr>
<td>Bathing</td>
<td></td>
<td>19</td>
<td>31.1%</td>
</tr>
<tr>
<td>Dressing</td>
<td></td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>Using the toilet</td>
<td></td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>Eating</td>
<td></td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td><strong>Instrumental Activities of Daily Living</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparing meals</td>
<td></td>
<td>9</td>
<td>20.5%</td>
</tr>
<tr>
<td>Managing money</td>
<td></td>
<td>10</td>
<td>18.9%</td>
</tr>
<tr>
<td>Taking medication as prescribed</td>
<td></td>
<td>9</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

* Respondents who indicated “I don’t do this activity” to IADL questions were removed from the denominator.

Figure 9 presents the mean unadjusted PCS scores for MAO H2926 by level of impairment in walking ability.

**Figure 9: 2019 Cohort 22 Baseline Mean Unadjusted PCS Scores by Level of Impairment in Walking Ability for MAO H2926**

![Figure 9: 2019 Cohort 22 Baseline Mean Unadjusted PCS Scores by Level of Impairment in Walking Ability for MAO H2926](image)
Figure 10 presents the mean unadjusted MCS scores for MAO H2926 by level of impairment in walking ability.

**Figure 10: 2019 Cohort 22 Baseline Mean Unadjusted MCS Scores by Level of Impairment in Walking Ability for MAO H2926**

Table 13 shows the survey respondents by the number of ADL impairments including categories of none, one, two, and three or more ADL impairments for MAO H2926.

**Table 13: 2019 Cohort 22 Baseline Number of ADL Impairments for MAO H2926**

<table>
<thead>
<tr>
<th>Number of Impaired ADLs</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>20</td>
<td>32.8%</td>
</tr>
<tr>
<td>1 ADL Impairment</td>
<td>15</td>
<td>24.6%</td>
</tr>
<tr>
<td>2 ADL Impairments</td>
<td>9</td>
<td>14.8%</td>
</tr>
<tr>
<td>3 or More ADL Impairments</td>
<td>17</td>
<td>27.9%</td>
</tr>
</tbody>
</table>
Figure 11 shows the relationship between increasing numbers of ADL impairments and mean unadjusted PCS scores for MAO H2926.

**Figure 11: 2019 Cohort 22 Baseline Mean Unadjusted PCS Scores by Number of ADL Impairments for MAO H2926**

<table>
<thead>
<tr>
<th>Number of ADL Impairments</th>
<th>Mean PCS Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>43.8</td>
</tr>
<tr>
<td>One</td>
<td>33.2</td>
</tr>
<tr>
<td>Two</td>
<td>27.5</td>
</tr>
<tr>
<td>Three or More</td>
<td>23.8</td>
</tr>
</tbody>
</table>

Figure 12 presents the relationship between increasing numbers of ADL impairments and mean unadjusted MCS scores for MAO H2926.

**Figure 12: 2019 Cohort 22 Baseline Mean Unadjusted MCS Scores by Number of ADL Impairments for MAO H2926**

<table>
<thead>
<tr>
<th>Number of ADL Impairments</th>
<th>Mean MCS Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>50.6</td>
</tr>
<tr>
<td>One</td>
<td>45.9</td>
</tr>
<tr>
<td>Two</td>
<td>46.5</td>
</tr>
<tr>
<td>Three or More</td>
<td>44.5</td>
</tr>
</tbody>
</table>
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 beneficiary 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 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.”

The CDC HRQOL program considers 14 or more unhealthy days in the past 30 days as an indicator of poor well-being. Table 14 provides the frequency distributions of the Healthy Days Measures for your MAO.

How Is Your MAO Doing?

Table 14: 2019 Cohort 22 Baseline Distribution of Healthy Days Measures for MAO H2926

<table>
<thead>
<tr>
<th>Healthy Days Measures</th>
<th>MAO H2926</th>
<th></th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically Unhealthy Days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>15</td>
<td></td>
<td>25.0%</td>
</tr>
<tr>
<td>1-13</td>
<td>16</td>
<td></td>
<td>26.7%</td>
</tr>
<tr>
<td>14-30</td>
<td>29</td>
<td></td>
<td>48.3%</td>
</tr>
<tr>
<td>Mentally Unhealthy Days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>20</td>
<td></td>
<td>33.3%</td>
</tr>
<tr>
<td>1-13</td>
<td>22</td>
<td></td>
<td>36.7%</td>
</tr>
<tr>
<td>14-30</td>
<td>18</td>
<td></td>
<td>30.0%</td>
</tr>
<tr>
<td>Days with Activity Limitations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>24</td>
<td></td>
<td>39.3%</td>
</tr>
<tr>
<td>1-13</td>
<td>14</td>
<td></td>
<td>23.0%</td>
</tr>
<tr>
<td>14-30</td>
<td>23</td>
<td></td>
<td>37.7%</td>
</tr>
</tbody>
</table>

* 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 unadjusted PCS scores for MAO H2926.

**Figure 13: 2019 Cohort 22 Baseline Mean Unadjusted PCS Scores by Number of Days with Activity Limitations for MAO H2926**

![Bar chart showing mean PCS scores for different number of activity limitation days.](chart)

Figure 14 presents the mean numbers of reported physically unhealthy days, mentally unhealthy days, and days with activity limitations during the previous 30 days for the respondent sample in MAO H2926.

**Figure 14: 2019 Cohort 22 Baseline Mean Number of Unhealthy Days for the Healthy Days Measures for MAO H2926**

![Bar chart showing mean number of unhealthy days.](chart)
Body Mass Index

Definition of Measures

- Self-reported height and weight values are used to calculate BMI\(^1\), a measure that correlates with the amount of body fat in adult men and women. BMI is derived from Questions 55 and 56.\(^1\)

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.\(^40\) Being overweight (BMI 25-29.9) or obese has been shown to accelerate the aging process.\(^41\) Physical activity, diet, age, gender, ethnicity, and educational status are known to influence the risk for obesity.\(^42\) For instance, females are at higher risk of developing morbid obesity than males. The prevalence of obesity among adults has risen significantly over the past 30 years.\(^43,44\) 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.\(^45\)

A study using the HOS 2006-2008 Cohort 9 Merged Baseline and Follow Up data explored the prevalence of obesity in MA beneficiaries age 65 or older.\(^46\) In this study, most of the reported health conditions were significantly more prevalent among obese than normal weight beneficiaries, 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 beneficiaries had substantially greater limitations with ADLs than normal weight beneficiaries.\(^46\)

How Is Your MAO Doing?

Table 15 shows the distribution of BMI categories including underweight (BMI less than 18.5), normal weight (BMI of 18.5-24.99), overweight (BMI of 25-29.99), and obese (BMI of 30 or more) for MAO H2926.

Table 15: 2019 Cohort 22 Baseline Distribution of BMI Categories for MAO H2926

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>MAO H2926</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>4</td>
</tr>
<tr>
<td>Normal (18.5-24.99)</td>
<td>13</td>
</tr>
<tr>
<td>Overweight (25-29.99)</td>
<td>14</td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td>28</td>
</tr>
</tbody>
</table>

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.”

\(^1\) BMI is calculated as: BMI = [weight in pounds / (height in inches)\(^2\)] x 703, which uses the height and weight to produce the standard measure of kg/m\(^2\) units.

\(^1\) Beginning in 2012, questions for weight and height changed from requesting categorical responses to open ended responses.
Table 16 shows the distribution of BMI categories by gender for your MAO.

**Table 16: 2019 Cohort 22 Baseline Distribution of BMI Categories by Gender for MAO H2926**

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>MAO H2926</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>2</td>
<td>8.3%</td>
<td>2</td>
<td>5.7%</td>
<td></td>
</tr>
<tr>
<td>Normal (18.5-24.99)</td>
<td>4</td>
<td>16.7%</td>
<td>9</td>
<td>25.7%</td>
<td></td>
</tr>
<tr>
<td>Overweight (25-29.99)</td>
<td>10</td>
<td>41.7%</td>
<td>4</td>
<td>11.4%</td>
<td></td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td>8</td>
<td>33.3%</td>
<td>20</td>
<td>57.1%</td>
<td></td>
</tr>
</tbody>
</table>

Table 17 presents the mean unadjusted PCS and MCS scores by BMI categories for your MAO.

**Table 17: 2019 Cohort 22 Baseline Mean Unadjusted PCS and MCS Scores by BMI Categories for MAO H2926**

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>PCS Mean (SD)</th>
<th>MAO H2926</th>
<th>MCS Mean (SD)</th>
<th>MAO H2926</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>37.1 (16.4)</td>
<td>41.3 (24.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (18.5-24.99)</td>
<td>28.7 (12.2)</td>
<td>49.2 (13.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight (25-29.99)</td>
<td>35.6 (13.2)</td>
<td>49.4 (16.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td>34.2 (12.1)</td>
<td>45.7 (13.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* If no beneficiaries reported for a category, the result is *not applicable* (NA). If only one member reported in a category, the standard deviation (SD) was *not calculated* (NC).

Table 18 shows the mean number of chronic conditions by BMI categories for your MAO. Obesity exacerbates chronic conditions such as diabetes, hyperlipidemia, and hypertension, increasing medical costs and negatively affecting quality of life.47,48

**Table 18: 2019 Cohort 22 Baseline Mean Number of Chronic Medical Conditions by BMI Categories for MAO H2926**

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>MAO H2926</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>1.3 (1.3)</td>
</tr>
<tr>
<td>Normal (18.5-24.99)</td>
<td>3.4 (2.6)</td>
</tr>
<tr>
<td>Overweight (25-29.99)</td>
<td>3.2 (2.3)</td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td>4.1 (2.1)</td>
</tr>
</tbody>
</table>

* If no beneficiaries reported for a category, the result is *not applicable* (NA). If only one member reported in a category, the standard deviation (SD) was *not calculated* (NC).
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 53.
- Sleep quality is a self-reported measure that rates the overall sleep quality during the past month. The measure is found in Question 54.

Two sleep questions that were new in the 2015 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, rather than past week measures, in order to capture more chronic sleep disturbances. The PSQI has a high test-retest reliability and good validity in patients with insomnia.49

Over half of older adults suffer from symptoms of insomnia, a common problem related to aging.50 Sleep disorders in the elderly can be caused by a number of factors, including medication, diseases, poor sleeping habits, and age-related changes in circadian sleep/wake regulation. There is substantial evidence linking insufficient sleep duration and poor sleep quality to mental and physical health morbidity and mortality.51 Various epidemiologic findings associate sleep duration with obesity, diabetes, impaired glucose tolerance, hypertension, and mortality. People who report fair or poor health are less likely to overestimate sleep hours and report shorter sleep hours on average than those with better self-rated health.52 These observations provide a basis for future studies on weight control interventions and maintenance of daily routines in sleep habits to increase the quantity and quality of sleep.

How Is Your MAO Doing?

Table 19 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 your MAO.

Table 19: 2019 Cohort 22 Baseline Distributions of Sleep Duration and Quality for MAO H2926

<table>
<thead>
<tr>
<th>Sleep Questions</th>
<th>MAO H2926</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hours of actual sleep</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 hours</td>
<td>7</td>
<td></td>
<td>11.3%</td>
</tr>
<tr>
<td>5-6 hours</td>
<td>27</td>
<td></td>
<td>43.5%</td>
</tr>
<tr>
<td>7-8 hours</td>
<td>22</td>
<td></td>
<td>35.5%</td>
</tr>
<tr>
<td>9 or more hours</td>
<td>6</td>
<td></td>
<td>9.7%</td>
</tr>
<tr>
<td><strong>Overall sleep quality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td>11</td>
<td></td>
<td>17.7%</td>
</tr>
<tr>
<td>Fairly good</td>
<td>30</td>
<td></td>
<td>48.4%</td>
</tr>
<tr>
<td>Fairly bad</td>
<td>17</td>
<td></td>
<td>27.4%</td>
</tr>
<tr>
<td>Very bad</td>
<td>4</td>
<td></td>
<td>6.5%</td>
</tr>
</tbody>
</table>
Appendix 1

Program Background

This section provides a brief introduction to the Medicare HOS. A complete description of the HOS program, the program timeline, the HOS 3.0 instrument, 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 beneficiary satisfaction to facilitate consumer choice and program administration must use the same types of data that were collected prior to November 1, 2003. Collected since 1998, the 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 beneficiaries 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, clinical measures, NCQA HEDIS 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.

2019 Medicare Advantage Organization Participation

MAOs with Medicare contracts in effect on or before January 1, 2018, and a minimum enrollment of 500 members were required to report the Baseline HOS in 2019. Note that Baseline HOS was optional for Institutional Special Needs Plans (I-SNP):

- 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)

MAOs that administered the HOS Baseline Survey in 2017 were required to administer the HOS Follow Up Survey in 2019. 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.

All Program of All-Inclusive Care for the Elderly (PACE) organizations with Medicare contracts in effect on or before January 1, 2018, and with a minimum enrollment of 30 beneficiaries as of October 1, 2018, were required by CMS to administer the HOS-Modified (HOS-M) in 2019.

MAOs sponsoring Fully Integrated Dual Eligible (FIDE) Special Needs Plans (SNPs) within Medicare contracts in effect on or before January 1, 2018, and with a minimum enrollment of 50 beneficiaries could request a frailty assessment. The assessment determined eligibility for a frailty adjustment payment, similar to the payments provided to PACE programs, for FIDE SNPs with similar average level of frailty to PACE. In 2019, plans were also permitted to choose whether their assessments would be calculated based on ADLs reported in the HOS or on a separate sample of beneficiaries who completed the HOS-M. Voluntary reporting for frailty assessment at the FIDE SNP level is in addition to standard HOS requirements for quality reporting at the contract level.

2019 Methodology and Design

Cohort 22 Baseline Sampling

- MAOs with fewer than 500 beneficiaries were not required to report HOS.
- For MAOs with 500 to 1,200 beneficiaries, all eligible beneficiaries were included in the sample.
- For MAOs with more than 1,200 beneficiaries and less than 3,000 beneficiaries, a simple random sample of 1,200 beneficiaries was selected for the baseline survey.
- For MAOs with 3,000 or more beneficiaries, beneficiaries who responded to the previous year’s baseline survey were excluded from the random sample of 1,200 for the current year.
- Beneficiaries 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 beneficiaries with End Stage Renal Disease (ESRD) are no longer excluded from the sampling beginning in 2010.

Survey Administration

- MAOs contracted with a CMS approved survey vendor to administer the survey following the protocol specified in the HEDIS 2019, 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.
- Survey vendors attempted telephone follow up in English or Spanish (with at least six attempts) in those instances when beneficiaries failed to respond after the second mail survey or returned an incomplete mail survey in order to obtain responses for missing items. 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 Cleaning
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, Medicare Beneficiary Identifier Numbers (MBIDNUMs), and Health Insurance Claim (HIC) 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)

- 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 2019 survey administration used the HOS 3.0 that was implemented in 2015. The HOS 3.0 evaluates HRQOL of Medicare Advantage beneficiaries by measuring their physical and mental health status using the VR-12. Modifications in the HOS 3.0 from the previous version (HOS 2.5) included: changes to questions about leakage of urine, osteoporosis testing in older women, 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.

The HOS also contains questions about: socio-demographics, 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. Four HEDIS® Effectiveness of Care measures are included to evaluate management of urinary incontinence, physical activity, osteoporosis testing, 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 2019 HOS 3.0 and previous versions of HOS instruments are available on the Survey page of the HOS website (www.HOSonline.org).

The VR-12 was derived from the Veterans RAND 36-Item Health Survey (VR-36). 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
The 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 allow reliable comparisons of HOS results.\textsuperscript{57}

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.\textsuperscript{58,59}

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.

\textbf{Figure 15: Mapping of HOS VR-12 to 8 Health Domains and 2 Summary Measures}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{mapping_HOS_VR12.png}
\caption{Mapping of HOS VR-12 to 8 Health Domains and 2 Summary Measures}
\end{figure}

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. For those beneficiaries with complete responses across the VR-12, the following steps 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.
  - Step Three: A constant was added to each of the estimates obtained from Step Two. The scores were then standardized using normative values from a 1990 U.S. general population. Therefore, a mean score of 50 represents the national average, a 10-point difference above and below the mean score is one standard deviation, and, with few exceptions, the scores have a range of 0 through 100 (higher being better).

- When a beneficiary 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. Depending on the pattern of missing item responses for a beneficiary, a different set of regression weights was required to compute that individual’s PCS and/or MCS Scores. For each combination of missing data, the beneficiaries’ 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.

- Beneficiary 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. 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.
Appendix 2

2019 Cohort 22 Baseline Frequencies of Survey Fields for MAO H2926

Q1. In general, would you say your health is:

(N=61)

- Excellent: 3.3%
- Very Good: 18.0%
- Good: 34.4%
- Fair: 34.4%
- Poor: 9.8%

Q2a. Does your health now limit you in moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?

(N=61)

- Yes, limited a lot: 45.9%
- Yes, limited a little: 32.8%
- No, not limited at all: 21.3%

Q2b. Does your health now limit you in climbing several flights of stairs?

(N=58)

- Yes, limited a lot: 53.4%
- Yes, limited a little: 31.0%
- No, not limited at all: 15.5%

Q3a. During the past 4 weeks, have you accomplished less than you would like with your work or other regular daily activities as a result of your physical health?

(N=62)

- Yes, all of the time: 17.7%
- Yes, most of the time: 21.0%
- Yes, some of the time: 29.0%
- Yes, a little of the time: 9.7%
- No, none of the time: 22.6%

Q3b. During the past 4 weeks, were you limited in the kind of work or other activities as a result of your physical health?

(N=62)

- Yes, all of the time: 24.2%
- Yes, most of the time: 21.0%
- Yes, some of the time: 21.0%
- Yes, a little of the time: 11.3%
- No, none of the time: 22.6%

Q4a. During the past 4 weeks, have you accomplished less than you would like with your work or other regular daily activities as a result of any emotional problems?

(N=62)

- Yes, all of the time: 3.2%
- Yes, most of the time: 17.7%
- Yes, some of the time: 19.4%
- Yes, a little of the time: 19.4%
- No, none of the time: 40.3%
Q4b. During the past 4 weeks, did you not do work or other activities as carefully as usual as a result of any emotional problems?

- Yes, all of the time: 4.8%
- Yes, most of the time: 11.3%
- Yes, some of the time: 16.1%
- Yes, a little of the time: 17.7%
- No, none of the time: 50.0%

Q5. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

(N=62)

- Extremely: 12.9%
- Quite a bit: 17.7%
- Moderately: 19.4%
- A little bit: 22.6%
- Not at all: 27.4%

Q6a. How much of the time during the past 4 weeks:
Have you felt calm and peaceful?

(N=61)

- All of the time: 14.8%
- Most of the time: 31.1%
- A good bit of the time: 11.5%
- Some of the time: 18.0%
- A little of the time: 19.7%
- None of the time: 4.9%

Q6b. How much of the time during the past 4 weeks:
Did you have a lot of energy?

(N=62)

- All of the time: 9.7%
- Most of the time: 19.4%
- A good bit of the time: 9.7%
- Some of the time: 27.4%
- A little of the time: 16.1%
- None of the time: 17.7%

Q6c. How much of the time during the past 4 weeks:
Have you felt downhearted and blue?

(N=61)

- All of the time: 1.6%
- Most of the time: 16.4%
- A good bit of the time: 8.2%
- Some of the time: 18.0%
- A little of the time: 29.5%
- None of the time: 26.2%

Q7. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(N=61)

- All of the time: 11.5%
- Most of the time: 16.4%
- Some of the time: 24.6%
- A little of the time: 13.1%
- None of the time: 34.4%
Q8. Compared to one year ago, how would you rate your physical health in general now?

(N=61)

- Much better: 6.6%
- Slightly better: 9.8%
- About the same: 45.9%
- Slightly worse: 23.0%
- Much worse: 14.8%

Q9. Compared to one year ago, how would you rate your emotional problems (such as feeling anxious, depressed or irritable) in general now?

(N=60)

- Much better: 15.0%
- Slightly better: 8.3%
- About the same: 48.3%
- Slightly worse: 20.0%
- Much worse: 8.3%

Q10a. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Bathing?

(N=61)

- I am unable to do this activity: 18.0%
- Yes, I have difficulty: 13.1%
- No, I do not have difficulty: 68.9%

Q10b. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Dressing?

(N=61)

- I am unable to do this activity: 8.2%
- Yes, I have difficulty: 16.4%
- No, I do not have difficulty: 75.4%

Q10c. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Eating?

(N=60)

- I am unable to do this activity: 3.3%
- Yes, I have difficulty: 8.3%
- No, I do not have difficulty: 88.3%

Q10d. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Getting in or out of chairs?

(N=61)

- I am unable to do this activity: 8.2%
- Yes, I have difficulty: 29.5%
- No, I do not have difficulty: 62.3%
Q10e. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Walking?

(N=61)

- I am unable to do this activity: 24.6%
- Yes, I have difficulty: 34.4%
- No, I do not have difficulty: 41.0%

Q10f. Because of a health or physical problem, do you have any difficulty doing the following activities without special equipment or help from another person: Using the toilet?

(N=61)

- I am unable to do this activity: 8.2%
- Yes, I have difficulty: 16.4%
- No, I do not have difficulty: 75.4%

Q11a. Because of a health or physical problem, do you have any difficulty preparing meals?

(N=60)

- I do not do this activity: 26.7%
- Yes, I have difficulty: 15.0%
- No, I do not have difficulty: 58.3%

Q11b. Because of a health or physical problem, do you have any difficulty managing money?

(N=61)

- I do not do this activity: 13.1%
- Yes, I have difficulty: 16.4%
- No, I do not have difficulty: 70.5%

Q11c. Because of a health or physical problem, do you have any difficulty taking medication as prescribed?

(N=61)

- I do not do this activity: 1.6%
- Yes, I have difficulty: 14.8%
- No, I do not have difficulty: 83.6%

Q12. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

(N=60)

- 0 days: 25.0%
- 1-13 days: 26.7%
- 14-30 days: 48.3%
Q13. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

(N=60)

- 0 days: 33.3%
- 1-13 days: 36.7%
- 14-30 days: 30.0%

Q14. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

(N=61)

- 0 days: 39.3%
- 1-13 days: 23.0%
- 14-30 days: 37.7%

Q15. Are you blind or do you have serious difficulty seeing, even when wearing glasses?

(N=61)

- Yes: 6.6%
- No: 93.4%

Q16. Are you deaf or do you have serious difficulty hearing, even with a hearing aid?

(N=62)

- Yes: 4.8%
- No: 95.2%

Q17. Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering or making decisions?

(N=60)

- Yes: 38.3%
- No: 61.7%

Q18. Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?

(N=60)

- Yes: 50.0%
- No: 50.0%
Q19. In the past month, how often did memory problems interfere with your daily activities?

(N=62)

- Every day: 8.1%
- Most days: 6.5%
- Some days: 14.5%
- Rarely: 27.4%
- Never: 43.5%

Q20. Has a doctor ever told you that you had: Hypertension or high blood pressure?

(N=60)

- Yes: 48.3%
- No: 51.7%

Q21. Has a doctor ever told you that you had: Angina pectoris or coronary artery disease?

(N=59)

- Yes: 1.7%
- No: 98.3%

Q22. Has a doctor ever told you that you had: Congestive heart failure?

(N=59)

- Yes: 10.2%
- No: 89.8%

Q23. Has a doctor ever told you that you had: A myocardial infarction or heart attack?

(N=60)

- Yes: 1.7%
- No: 98.3%

Q24. Has a doctor ever told you that you had: Other heart conditions, such as problems with heart valves or the rhythm of your heartbeat?

(N=59)

- Yes: 15.3%
- No: 84.7%
Q25. Has a doctor ever told you that you had: A stroke?  
(N=61)  
Yes 4.9%  
No 95.1%

Q26. Has a doctor ever told you that you had: Emphysema, or asthma, or COPD (chronic obstructive pulmonary disease)?  
(N=61)  
Yes 36.1%  
No 63.9%

Q27. Has a doctor ever told you that you had: Crohn's disease, ulcerative colitis, or inflammatory bowel disease?  
(N=59)  
Yes 5.1%  
No 94.9%

Q28. Has a doctor ever told you that you had: Arthritis of the hip or knee?  
(N=61)  
Yes 44.3%  
No 55.7%

Q29. Has a doctor ever told you that you had: Arthritis of the hand or wrist?  
(N=62)  
Yes 30.6%  
No 69.4%

Q30. Has a doctor ever told you that you had: Osteoporosis, sometimes called thin or brittle bones?  
(N=61)  
Yes 21.3%  
No 78.7%
Q31. Has a doctor ever told you that you had: Sciatica (pain or numbness that travels down your leg to below your knee)?

(N=60)

- Yes: 26.7%
- No: 73.3%

Q32. Has a doctor ever told you that you had: Diabetes, high blood sugar, or sugar in the urine?

(N=60)

- Yes: 46.7%
- No: 53.3%

Q33. Has a doctor ever told you that you had: Depression?

(N=62)

- Yes: 61.3%
- No: 38.7%

Q34. Has a doctor ever told you that you had: Any cancer (other than skin cancer)?

(N=61)

- Yes: 11.5%
- No: 88.5%

Q35a. Are you currently under treatment for: Colon or rectal cancer?

(N=18)

- Yes: 0.0%
- No: 100.0%

Q35b. Are you currently under treatment for: Lung cancer?

(N=18)

- Yes: 0.0%
- No: 100.0%
Q35c. Are you currently under treatment for: Breast cancer?

(N=18)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6%</td>
<td>94.4%</td>
</tr>
</tbody>
</table>

Q35d. Are you currently under treatment for: Prostate cancer?

(N=17)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.9%</td>
<td>94.1%</td>
</tr>
</tbody>
</table>

Q35e. Are you currently under treatment for: Other cancer (other than skin cancer)?

(N=17)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.6%</td>
<td>82.4%</td>
</tr>
</tbody>
</table>

Q36. In the past 7 days, how much did pain interfere with your day to day activities?

(N=61)

<table>
<thead>
<tr>
<th>Not at all</th>
<th>A little bit</th>
<th>Somewhat</th>
<th>Quite a bit</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.8%</td>
<td>23.0%</td>
<td>13.1%</td>
<td>16.4%</td>
<td>14.8%</td>
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</table>

Q37. In the past 7 days, how often did pain keep you from socializing with others?

(N=62)

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.5%</td>
<td>24.2%</td>
<td>21.0%</td>
<td>14.5%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

Q38. In the past 7 days, how would you rate your pain on average?

(N=61)

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<thead>
<tr>
<th>1</th>
<th>2-4</th>
<th>5-7</th>
<th>8-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.6%</td>
<td>26.2%</td>
<td>34.4%</td>
<td>14.8%</td>
</tr>
</tbody>
</table>
Q39a. Over the past 2 weeks, how often have you had little interest or pleasure in doing things?

(N=61)

- Not at all: 45.9%
- Several days: 36.1%
- More than half the days: 3.3%
- Nearly every day: 14.8%

Q39b. Over the past 2 weeks, how often have you felt down, depressed or hopeless?

(N=59)

- Not at all: 61.0%
- Several days: 23.7%
- More than half the days: 1.7%
- Nearly every day: 13.6%

Q40. In general, compared to other people your age, would you say that your health is:

(N=61)

- Excellent: 4.9%
- Very Good: 14.8%
- Good: 24.6%
- Fair: 29.5%
- Poor: 26.2%

Q41. Do you now smoke every day, some days, or not at all?

(N=62)

- Every day: 11.3%
- Some days: 1.6%
- Not at all: 87.1%
- Don't Know: 0.0%

Q42. Many people experience leakage of urine, also called urinary incontinence. In the past six months, have you experienced leaking of urine?

(N=61)

- Yes: 31.1%
- No: 68.9%

Q43. During the past six months, how much did leaking of urine make you change your daily activities or interfere with your sleep?

(N=19)

- A lot: 31.6%
- Somewhat: 42.1%
- Not at all: 26.3%
Q44. Have you ever talked with a doctor, nurse or other health care provider about leaking of urine?

(N=19)

Yes: 94.7%
No: 5.3%

Q45. There are many ways to control or manage the leaking of urine, including bladder training, exercises, medication and surgery. Have you ever talked with a doctor, nurse, or other health care provider about any of these approaches?

(N=19)

Yes: 52.6%
No: 47.4%

Q46. In the past 12 months, did you talk with a doctor or other health provider about your level of exercise or physical activity?

(N=62)

Yes: 51.6%
No: 45.2%
No visits: 3.2%

Q47. In the past 12 months, did a doctor or other health provider advise you to start, increase or maintain your level of exercise or physical activity?

(N=60)

Yes: 48.3%
No: 51.7%

Q48. A fall is when your body goes to the ground without being pushed. In the past 12 months, did you talk with your doctor or other health provider about falling or problems with balance or walking?

(N=61)

Yes: 29.5%
No: 67.2%
No visits: 3.3%

Q49. Did you fall in the past 12 months?

(N=62)

Yes: 32.3%
No: 67.7%
Q50. In the past 12 months, have you had a problem with balance or walking?

(N=61)

Yes: 52.5%
No: 47.5%

Q51. Has your doctor or other health provider done anything to help prevent falls or treat problems with balance or walking?

(N=60)

Yes: 45.0%
No: 50.0%
No visits: 5.0%

Q52. Have you ever had a bone density test to check for osteoporosis, sometimes thought of as 'brittle bones'?

(N=62)

Yes: 41.9%
No: 58.1%

Q53. During the past month, on average, how many hours of actual sleep did you get at night?

(N=62)

Less than 5 hours: 11.3%
5-6 hours: 43.5%
7-8 hours: 35.5%
9 or more hours: 9.7%

Q54. During the past month, how would you rate your overall sleep quality?

(N=62)

Very Good: 17.7%
Fairly Good: 48.4%
Fairly Bad: 27.4%
Very Bad: 6.5%
References

1 HEDIS® is a registered trademark of the National Committee for Quality Assurance.


