2021 National Impact Assessment of the Centers for Medicare & Medicaid Services Quality Measures Report Appendices

Prepared for the Centers for Medicare & Medicaid Services (CMS) by Health Services Advisory Group, Inc. (HSAG)

Suggested citation: Centers for Medicare & Medicaid Services. *2021 National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Report Appendices.* Baltimore, MD: US Department of Health and Human Services; 2021. Available at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityMeasures/National-Impact-Assessment-of-the-Centers-for-Medicare-and-Medicaid-Services-CMS-Quality-Measures-Reports

Table of Contents

Appendix A – Acknowledgments

The 2021 Impact Assessment Report is the product of collaboration by agencies of the U.S. Department of Health and Human Services (HHS), the Centers for Medicare & Medicaid Services (CMS), and the private sector. Specifically, we thank:

Health Services Advisory Group, Inc.: Kyle Campbell, PharmD; Melissa Castora-Binkley, PhD, MA, PMP; Ann Clancy, MBA, RN; Eric Clark, MBA-HSM, BSN; Eric Gilbertson, BBA; Susan Jentz, MS; Robert Ziemba, PhD; Karen Davison, MA, RN, MSPH; Nancy Gordon, BS; Melissa Hakim, MA; Kendra Hanley, MS; Megan Keenan, MPH; Julia Mackeprang, MPH, PMP; Allison Peel, DC, MHA, MPH, PMP; Haritha Polisetti, MPharm; Shannon Runge, PhD, MA; Karan Talreja, MPH, BDS; David Wong, MPH; Jenna Zubia, CC

RAND Corporation: Kanaka Shetty, MD, MS; Cheryl Damberg, PhD; Deborah Kim, MPH; Michael Robbins, PhD; Beth Dana, MS; Julie Lai, MPH; Alice Kim, MPH; Megan Beckett, PhD

Qualitative Health Research Consultants LLC (QHRC): Cameron Macdonald, PhD**;** Diana Gutierrez-Meza, MPH; Ali Konkel, MSW; Sofia Jonas, BA

2021 Impact Assessment Technical Expert Panel (TEP):

John Adams, PhD, Principal Senior Statistician, Kaiser Permanente Center for Effectiveness and Safety Research, and Professor of Health Systems Science, Bernard J. Tyson School of Medicine, Pasadena, CA

Ronald Adler, MD, FAAFP, Associate Professor, Family Medicine and Community Health, University of Massachusetts Medical School, Worcester, MA

Dale Bratzler, DO, MPH, Enterprise Chief Quality Officer; Professor, Colleges of Medicine and Public Health, University of Oklahoma, Oklahoma City, OK

Mary Carr, RN, MPH, Vice President for Regulatory Affairs, National Association for Home Care & Hospice, Washington, DC

Sandra Finestone, PsyD, LMFT, Patient/Caregiver Representative, Irvine, CA

Derek Forfang, Patient Representative, National Forum of ESRD Networks, San Pablo, CA

Andrea Gelzer, MD (*TEP Co-Chair*), Senior Vice President, Medical Affairs; Corporate Chief Medical Officer, AmeriHealth Caritas, Philadelphia, PA

Karen Johnson, PhD, formerly Senior Director, National Quality Forum (NQF), Washington, DC

Wenora Johnson, BSBM, U.S. Navy Veteran, Patient/Caregiver Representative, Joliet, IL

Joseph Kunisch, PhD, RN, System Director of Clinical Quality Informatics, Memorial Hermann Health System, Houston, TX

Jack Needleman, PhD, Professor and Chair, Department of Health and Policy Management, Fielding School of Public Health, University of California Los Angeles, Los Angeles, CA

David Nerenz, PhD (*TEP Co-Chair*), Director Emeritus, Center for Health Policy and Health Services Research, Henry Ford Health System, Detroit, MI

K. Rao Poduri, MD, FAAPMR, Professor of Physical Medicine and Rehabilitation and Neurology; Chair Emeritus, Department of Physical Medicine and Rehabilitation, University of Rochester School of Medicine and Dentistry, Rochester, NY

Philip Posner, PhD, Patient/Caregiver Representative, Gainesville, FL

Christopher Queram, MA, President/CEO, Wisconsin Collaborative for Healthcare Quality, Inc., Madison, WI

Edmondo Robinson, MD, MBA, FACP, Senior Vice President and Chief Digital Innovation Officer, Moffitt Cancer Center, Tampa, FL

Patrick Romano, MD, MPH, Professor of Medicine and Pediatrics, Center for Healthcare Policy & Research, University of California Davis, Sacramento, CA

Brock Slabach, MPH, FACHE, Senior Vice President, National Rural Health Association, Leawood, KS

Federal Assessment Steering Committee (FASC):

Girma Alemu, MD, MPH, Public Health Analyst, Health Resources and Services Administration

Sophia Autrey, MPH, Deputy Director, Division of Community and Population Health, iQuality Improvement and Innovation Center, Center for Clinical Standards and Quality, CMS

Peter Briss, MD, MPH, Director of the Office of Medicine and Science, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

CDR Karen Ho Chaves, MHS, U.S. Public Health Service Commissioned Corps; Director, Division of Quality Measurement and Improvement, Center for Quality Improvement and Patient Safety, Agency for Healthcare Research and Quality

Joseph Francis, MD, MPH (*FASC Co-Chair*), Chief Improvement and Analytics Officer, Veterans Health Administration

Elizabeth Goldstein, PhD, Director, Division of Consumer Assessment and Plan Performance, Medicare Drug Benefit and C and D Data Group, Center for Medicare, CMS

David Hunt, MD, FACS, Medical Director of Patient Safety, Office of Policy, HHS Office of the National Coordinator for Health Information Technology

Meagan Khau, MHA, Director, Data and Policy Analytics Group, CMS Office of Minority Health

Karen LLanos, MBA, Director, Medicaid Innovation Accelerator Program, Center for Medicaid and CHIP Services, CMS

Karla Loper, MSN, RN, CPHQ, LSSBB, Acting Chief of Clinical Measurement, Clinical Support Division, Defense Health Agency, Department of Defense

Stacey Lytle, MPH, Technical Director for the Models, Demonstrations, and Analysis Group, CMS Medicare-Medicaid Coordination Office

Barry Marx, MD, FAAP (*FASC Co-Chair*), Director, Office of Clinician Engagement, and a Medical Officer, CMS Center for Clinical Standards and Quality

Cindy Massuda, JD, Hospice Quality Reporting Program Coordinator and Senior Technical Advisor, Division of Chronic and Post Acute Care, Quality Measurement and Value-Based Incentives Group, Center for Clinical Standards and Quality, CMS

Susy Postal, DNP, RN-BC, Chief Health Informatics Officer, Indian Health Service

James Poyer, MS, MBA, Senior Technical Advisor, Division of Quality Measurement, Quality Measurement and Value-Based Incentives Group, Center for Clinical Standards and Quality, CMS

Mark Reardon, MD, MBA, CMS Fellow, CMS Center for Medicare & Medicaid Innovation

Lok Wong Samson, PhD, MHS, Health Policy Analyst, Office of Health Policy, Office of the Assistant Secretary for Planning and Evaluation, HHS

TEP/FASC Workgroups:

Patient Safety

FASC members: M. Reardon, J. Francis, D. Hunt, K. Loper
TEP members: D. Bratzler, D. Forfang, J. Kunisch, D. Nerenz, P. Romano

Person and Family Engagement/Working With Communities

FASC members: G. Alemu, E. Goldstein, M. Khau, S. Lytle, B. Marx, C. Massuda
TEP members: M. Carr, S. Finestone, D. Forfang, K. Johnson, W. Johnson, K.R. Poduri, P. Posner

Communication and Care Coordination

FASC members: K. Chaves, J. Francis, E. Goldstein, S. Lytle, S. Postal
TEP members: D. Forfang, K.R. Poduri, E. Robinson

Effective Prevention and Treatment

FASC members: G. Alemu, S. Autrey, P. Briss, K. Loper, C. Massuda, L. Samson
TEP members: R. Adler, D. Bratzler, S. Finestone, A. Gelzer, W. Johnson, J. Kunisch, D. Nerenz, C. Queram

Affordable Care

FASC members: P. Briss, J. Poyer, M. Reardon
TEP members: J. Adams, A. Gelzer, J. Needleman, C. Queram

Methods and Disparities

FASC members: S. Autrey, K. Chaves, D. Hunt, M. Khau, S. Postal, J. Poyer, L. Samson
TEP members: J. Adams, K. Johnson, J. Needleman, P. Romano, B. Slabach

Appendix B – CMS Measures Included in the Portfolio Analysis and Key Indicators

Please refer to the Excel file by the same name.

Appendix C – Impact Assessment Methods

Section 1890A(a)(6) of the Social Security Act (the Act) requires that the Secretary shall, not later than March 1, 2012, and at least once every three years thereafter, assess the quality and efficiency impact of the use of endorsed measures[i] described in section 1890(b)(7)(B) of the Act and make such assessment available to the public. Under contract with CMS, HSAG has developed the 2021 Impact Assessment Report and three previous triennial reports, published by CMS in 2012, 2015, and 2018. This appendix describes the approach to data analyses for the current report.

Data for this Impact Assessment were reported before the global spread of coronavirus disease; thus, the findings represent an assessment of health care structure, process, and outcome measures pre-pandemic.

To support the development of the 2021 Impact Assessment Report, a Technical Expert Panel (TEP) and Federal Assessment Steering Committee (FASC) were assembled to provide expert input on various aspects of the report. Meeting jointly in Baltimore, Maryland, on May 8–9, 2019, the TEP and FASC gave methodological guidance and input on prioritizing measures. Subsequently, TEP and FASC workgroups met via webinars throughout 2019 and 2020. The Methods Workgroup contributed expertise in health economics, quality measurement, health care policy, and statistics. Refer to Appendix A for a list of TEP and FASC members.

Scope of the Assessment

The 2021 Impact Assessment Report presents an overarching view of CMS quality and efficiency measures by describing characteristics of the CMS measure portfolio and evaluating the national impact of all measures for which data were available. This perspective distinguishes the assessment from evaluations of individual measures and programs that facilitate comparisons of providers and facilities.

Included Programs and Measures

Inclusion criteria used to meet the statutory requirements[ii] were:

(1) the endorsed measure is used pursuant to a program described in section 1890(b)(7)(B)(i)(I) of the Act;
(2) the endorsed measure is used to report performance information to the public; and
(3) the endorsed measure is used in a health care program other than a Medicare program.

Data sets used in classification systems to establish payment rates were excluded. Measures implemented prior to transition from the Physician Quality Reporting System (PQRS), Value-Based Payment Modifier/Value Modifier (VM), and Quality and Resource Use Reports (QRURs) are included as historical context for the quality and cost measures adopted by rule for the Merit-based Incentive Payment System (MIPS). This information was identified in final rules published in the *Federal Register*, CMS news releases, and the CMS.gov website.[1-17]

[i] This report assesses the quality and efficiency impact of endorsed measures and also includes a limited number of non-endorsed measures.
[ii] Section 1890A(a)(6) of the Social Security Act (the Act).

Data Acquisition and Validation

Data for all measures were requested from CMS components and associated contractors. A data validation checklist applying industry best practices for data integrity guided the review of datasets and documentation received from data owners, focusing on completeness and correctness. Data received at the beneficiary or provider level were aggregated to calculate national and subpopulation scores. Then, national-level scores produced from the data were compared with scores publicly reported by CMS to verify the results. Unexplained differences were referred to the data owners for consultation. See the *Trends* section on pages 9–14 of this Appendix C for further detail regarding measure score calculations.

In conjunction with 2016–2018 CMS Denominator Files, which contain beneficiary-level demographic information, these supplemental data sources were used to create a geographic data set aggregated at the state or ZIP code level to support the disparities analyses:

- U.S. Bureau of the Census
  - 2017 Census Bureau Region and Division Codes and State FIPS [Federal Information Processing Standards] Codes[18]
  - 2010 ZCTA [ZIP Code Tabulation Area] to County Relationship Files[19]
  - American Community Survey (ACS) 2013–2017 5-year Summary File with ZCTA-level geography and fields "Median household income in the past 12 months (in 2017 inflation-adjusted dollars) by age of householder"[20]
  - 2010 FIPS Codes for Counties and County Equivalent Entities[21]
- U.S. Department of Housing and Urban Development (HUD)
  - HUD-USPS ZIP Crosswalk Files: County-ZIP crosswalk for 4th quarter 2018[22]
- U.S. Health Resources & Services Administration (HRSA)
  - ZIP Code to ZCTA Crosswalk for the 2017 Uniform Data System report data[23]
- National Center for Health Statistics (NCHS)
  - 2013 NCHS Urban-Rural Classification Scheme for Counties[24]

Meaningful to Patients

Interviews of Medicare beneficiaries and caregivers of beneficiaries were conducted in 2018 to ensure that the report provides context of their relevant health care experiences, quality concerns, and priorities. These interviews aimed to address the research question: *How do patients, families, and caregivers perceive quality in health care, specifically relative to topics identified in the CMS Meaningful Measures framework?*

Medicare beneficiaries, including those dually eligible for Medicare and Medicaid, were selected by a market research firm using purposive sampling, a nonstatistical sampling technique designed to include representation from participants who fit certain criteria. For this sample, the criteria included beneficiaries with relevant health care experiences or their family members from all U.S. Census regions, all socioeconomic and educational levels, and Hispanic and non-Hispanic ethnic groups. The market research panel consisted of more than 10 million volunteers, of which over 5,000 individuals expressed interest in participating in the study.

Through multiple eligibility screenings, 31 individuals consented to participate and were each scheduled for a one-hour telephone interview conducted by a qualitative research firm. The sample consisted of 15 respondents aged 65–74 years (48%), 12 aged 75–84 (39%), and four

aged 85 years and older (13%). Participants reported postgraduate work (29%), a college degree (39%), or some college (13%) as their highest level of education, whereas 16% completed high school and 3% were less educated. Annual household incomes ranged from less than $12,000 (6.5%) to more than $70,000 (22.6%); approximately 48% of the sample reported annual household incomes between $12,000 and $48,000. Participants included family caregivers (32%), nonwhites (22.6%), and rural beneficiaries (19%). Select quotations in each of the sections corresponding to the six CMS health care quality priorities highlight these patients' and caregivers' individual perspectives.

Measure Portfolio

Standardized classification rules were applied to assign each measure to one of six CMS health care quality priorities. Those designations for purposes of the 2021 Impact Assessment Report may vary from previous or future classifications. The report summarizes overall results of the Impact Assessment and also dedicates one section to each quality priority. Measures applicable to a priority are counted[iii] by type (structural, process, outcome, or cost based on the Donabedian method).[25,26] Key analytic findings for those measures, which collectively make up a portfolio, are presented graphically—by quality priority and overall—to illustrate:

- Progress toward outcome measurement.
- Overall results of measure trends.
- Metrics quantifying reduction in burden.
- Proportion of measures with all-payer reach (i.e., not limited to traditional Medicare beneficiaries).

For all portfolio analyses except measure trends, measures were included if implemented in a program for the 2020 performance period. For programs based on a fiscal year (FY), measures were included if implemented in a program using FY 2020 performance data.

Focus on Outcomes

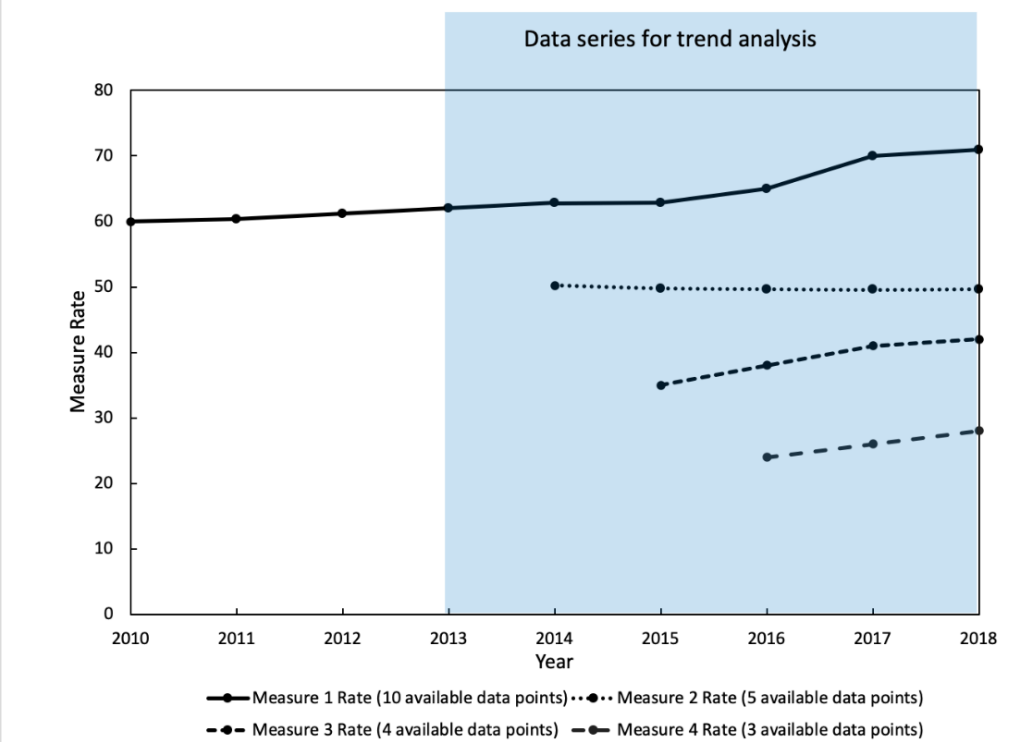
To illustrate progress toward outcome-based measurement, the report compares percentages of outcome measures for performance years 2015 and 2020.

Trends

The trends section describes whether scores aggregated for all measures in the portfolio were improving, declining, or stable. Trends were interpreted from an analysis of national annual measure scores using the most recent three to six consecutive data points, ending with 2018 as the most recent performance period for which most measures had reported data, as depicted in Figure 1. A performance period typically spans 12 months but can vary depending on the measure and the program.

[iii] Portfolio analyses count measures for each CMS program based on published rules or program documentation; duplicate counts result when measures are used in multiple programs. Refer to Appendix B for a full list of measures.

Figure C-1. Illustration of the data used to calculate trends in measure performance. At most six of the most recent data points for each measure were used.



This approach has been updated from previous reports, which used all available data from as many as 13 data points (2006–2018), to establish a more standardized time window for observing trends and accentuate recent measure performance. The statistical approach to calculating trends is described under the section *Measure Performance*.

Aligning with the national effort to reduce health care costs, this report characterizes performance on cost measures as improving when costs decline and declining when costs increase. When feasible, a cost measure is presented with a clinical quality measure to provide context to understand quality in relation to cost (e.g., Affordable Care cost and quality measures related to total hip/knee arthroplasty are presented together).

Reducing Burden

As part of the Patients Over Paperwork initiative, CMS is adopting policies across programs that balance the meaningfulness of quality measurement data with efforts to limit provider burden and improve the doctor-patient relationship.[27] Digital data submission methods and fewer measures are associated with less reporting burden. Measures for the 2020 performance period were defined as digital if the data collection or submission method used the following sources: electronic health records; health information exchanges; clinical registries; case management systems; electronic administrative claims systems; electronically submitted assessments, or wearable devices.[28(p. 84849)] For measures that allow more than one data collection or submission method, the measure was counted as digital if at least one reporting option was digital. The percentage of measures with digital options for submitting data was calculated for each measure portfolio. To address the reduction in provider burden associated with the volume of quality measures, the report compares the number of measures used in CMS quality programs in 2015 and 2020 performance years.

All-Payer Reach

Measures specified to use data from all eligible patients, regardless of their payer, are considered to have all-payer reach, unlike Medicare claims-based measures, which are restricted to Medicare beneficiaries. The percentage of measures with capability for all-payer reach was calculated for the 2020 performance year to indicate a baseline for transition toward population-based payment.

Addressing Performance Measurement Gaps

Measures characterized as *emerging* are those finalized through rulemaking for implementation in a CMS program for performance year 2019 or later.

Measures in development are those listed as such on the CMS Measures Management System web page as of June 3, 2020,[29] or in the *2020 MDP Annual Report,*[30] as well as those funded through Medicare Access and Children's Health Insurance Program (CHIP) Reauthorization Act of 2015 (MACRA) Cooperative Agreements.[31]

Emerging measures and measures in development were categorized by CMS health care quality priority and selectively summarized for the report; Appendix F contains a complete list of the measures.

Measurement gaps corresponding to CMS quality priorities were identified by reviewing key sources published from January 1, 2018, to March 31, 2020, including rules recorded in the *Federal Register*[32]; *2020 Measures under Consideration List Program-Specific Measure Needs and Priorities*[33]; reports from the Measure Applications Partnership[34]; the *2019 MDP Annual Report*[35]; and recommendations of the Impact Assessment Technical Expert Panel (TEP) and Federal Assessment Steering Committee (FASC) convened jointly by HSAG. Other performance measurement gaps or measures in development could exist but were not identified using the sources documented for this report. Gaps identified from key sources are omitted from the gap tables when they could be addressed by emerging measures or measures in development.

Measure Performance

In addition to characterizing measure portfolios, the report highlights analytical findings of the impact of CMS quality measures, represented by:

- **Trends:** Improvement or decline in measure performance over time.
- **Disparities:** Differences in outcomes or care for certain populations or subgroups, as indicated by measure performance scores.
- **Patient impact:** Numbers of patients affected by changes in measure performance over time.
- **Costs avoided:** Estimates of financial impact associated with improvements in measure performance.

Trends

The objective of the trend analysis was to identify whether measure scores improved, declined, or were stable. Trends were calculated from an analysis of national annual measure scores using the most recent three to six consecutive data points, ending with 2018 as the most recent performance period for which most measures had reported data. Beneficiary-level rather than provider-level aggregation was used whenever possible to align with analyses in the report that focus on patient-level impacts. That is, the national rate is the sum of national numerator cases

divided by the sum of national denominator cases even if a quality program reports national aggregate scores as the mean of provider scores. In addition to the aggregated summary statistics and selected highlights in the report text, *Analytic Results for All Measures* (Appendix E) contains detailed results for each measure analyzed.

Trends in performance were measured on a *relative* scale using the average annual percentage change (AAPC) statistic, calculated using regression. This approach, also used for the 2018 Impact Assessment Report, also aligns with that of the AHRQ *National Healthcare Quality and Disparities Reports* (NHQDR).[36]

Log-linear regression was used to estimate the annual change in the logarithm of the measure score. The AAPC was then determined by exponentiating the slope, subtracting 1, and multiplying by 100. The annual change on the logarithmic scale is the slope of the model

$$\log(Y_t) = \beta_0 + \beta_1 Year_t + \epsilon_t\,, \qquad (1)$$

Where $\log(Y_t)$ is the logarithm of the measure score; β_0 is the intercept; β_1 is the slope; and ϵ_t is a normally distributed error term. Since the analysis was limited to the last six years of data, the number of annual data points, indexed by *t*, ranged from three to a maximum of six.

Given the estimate of β_1, the AAPC was given by:

$$AAPC = 100 * [exp(\beta_1) - 1], \qquad (2)$$

where *exp(x)* represents the exponential function.

Calculating confidence intervals for AAPC involved two steps:

1. Calculating the standard error for each annual measure score based on the beneficiary-level sample size
2. Calculating the standard error and confidence interval for each AAPC, using a parametric bootstrap procedure[37]

Calculation of the standard error varied depending on whether the measure score was a proportion, mean, or median.

- For measure scores expressed as proportions, the standard error was given by

$$se_t = \sqrt{\frac{y_t(1-y_t)}{n}}, \qquad (3)$$

  where y_t is the national annual measure score expressed as a proportion and *n* is the denominator.

- **For measure scores expressed as means,** the annual standard errors were obtained from the data owner or calculated from the beneficiary-level data, using

$$se_t = \sqrt{\frac{S_t^2}{n}}, \qquad (4)$$

  where s_t^2 is the variance of the measure scores given by

$$s_t^2 = \sum_i^n \frac{(y_i-\bar{y})^2}{n-1} \qquad (5)$$

  and *n* is the sample size.

- **For measure scores expressed as medians** (e.g., a time-based measure, such as the interval from emergency department arrival to departure)**,** the standard error was estimated with a non-parametric bootstrap technique,[37] in which a sample of *n* beneficiary-level measure results is sampled with replacement from the population of all beneficiary results. This produced what is known as a bootstrap sample; 2,000 such samples were produced, and the median was computed for each. The standard deviation of the resulting bootstrap distribution of medians was used as an estimate of the standard error for an annual measure score.
- **For measure scores expressed as rate ratios,** where the person-time or device-time values in the numerator and denominator rates were equal, the standard error was estimated on the logarithmic scale using:

$$se_t(\log(RR)) = \sqrt{\frac{1}{n}} \quad (6)$$

  where *n* is the event count for the numerator rate.

  This calculation assumes that the denominator rate, the expected rate in standardized rate ratios, is measured without error. When only annual scores at the provider level were available, each annual data point was calculated as the average of provider scores, and the standard errors of the annual scores were based on the standard deviation between provider scores and the number of providers. Uses of this alternative calculation method are clearly noted in the results.

Once the standard error associated with each annual data point was calculated by one of the methods described above, the standard error of the AAPC (SE_{AAPC}) was estimated using a parametric bootstrap technique.[37]

First, a set of 2,000 replicate data series was generated by drawing random values from the distribution of measure scores defined by the observed annual measure scores and standard errors previously calculated. The AAPC was calculated using each replicate time series, as previously described. The set of AAPC estimates for all replicates was used to construct a bootstrap distribution. The standard deviation of this distribution was the estimate of the standard error of the AAPC.

Based on the standard error for the AAPC, 90% confidence intervals (CIs)—chosen to align with significance thresholds used in the AHRQ NHQDR[36]—were constructed around the AAPC.

$$AAPC\ (90\%\ CI) = AAPC\ \pm 1.65(SE_{AAPC}) \quad (7)$$

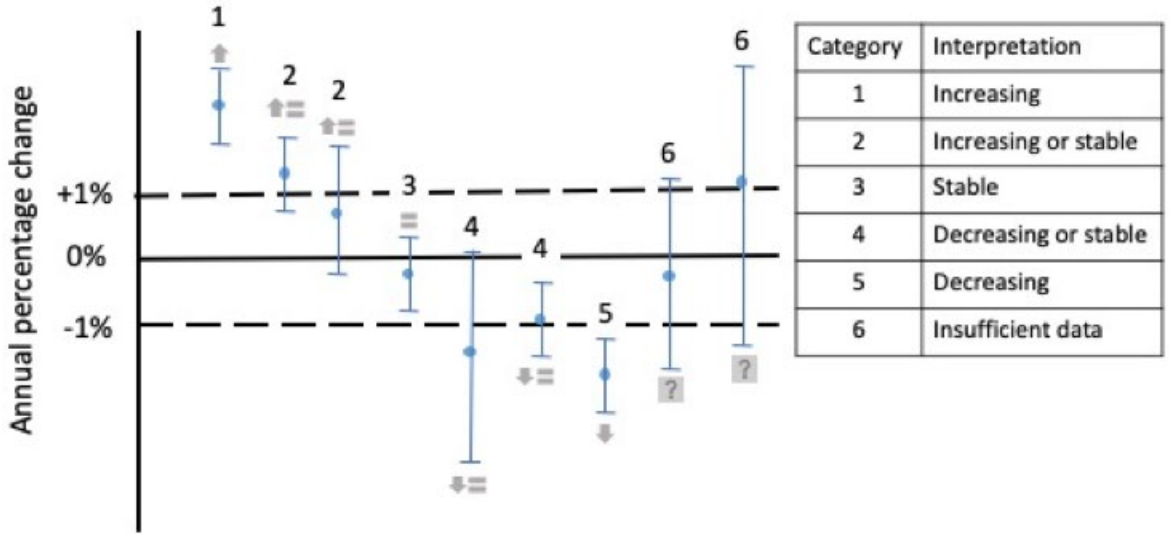
Following the methodology from the 2018 Impact Assessment Report and the AHRQ NHQDR, an AAPC estimate is considered clinically significant if its absolute value is greater than 1%. Decisions concerning clinical significance were based on all values contained in the CI rather than only the point estimate.

The following trend interpretations were based on the lower and upper limits of the 90% CI (see Figure C-2):

1. Increasing – Lower limit of the 90% CI > 1%
2. Increasing or stable – Lower limit of the 90% CI ≥ –1% and upper limit of the 90% CI > 1%

3. Stable – Lower limit of the 90% CI ≥ –1% and upper limit of the 90% CI ≤ 1%
4. Stable or decreasing – Lower limit of the 90% CI < –1% and upper limit of the 90% CI ≤ 1%
5. Decreasing – Upper limit of the 90% CI < –1%
6. Insufficient data – Lower limit of the 90% CI < –1% and upper limit of the 90% CI > 1%

Figure C-2: Interpretations of confidence intervals relative to values of AAPC representing clinically meaningful magnitudes



Category	Interpretation
1	Increasing
2	Increasing or stable
3	Stable
4	Decreasing or stable
5	Decreasing
6	Insufficient data

Four measure trend categories were created by condensing interpretation categories. When higher measure scores reflect better quality, an *increasing* measure score over time represents improvement, and the categories are defined as follows:

- Improving – Data consistent with change in a favorable direction (interpretation 1 or 2)
- Stable – Data consistent with neither improvement nor decline (interpretation 3)
- Declining – Data consistent with change in an unfavorable direction (interpretation 4 or 5)
- Insufficient data (interpretation 6)

When lower measure scores reflect better quality, a *decreasing* measure score over time represents improvement, and the categories are defined in a similar manner but with interpretations 1 and 2 exchanged with interpretations 4 and 5.

Age and Sex Adjustment

Outcome measures used in CMS programs that compare performance between providers are usually adjusted for numerous (often 30 to 50) clinical and demographic factors as needed to make fair comparisons. Controlling for patients' clinical conditions and demographic traits aids in distinguishing between providers on the basis of outcomes that result from variation in the quality of care rather than the baseline risk of the population. These risk-adjustment models are specific to the targeted population for each measure and performance period.

The analytic focus for the 2021 Impact Assessment Report was to assess the impact of measures at the national level rather than to compare providers' performance. However, variables that strongly influence health outcomes and may be expected to change over time, such as distributions of age and sex, could confound the interpretation of measure performance.

Therefore, when beneficiary-level data or stratified measure outcome scores were available, the approach for the trend analyses was to adjust outcome measures by a direct standardization technique[38] such that each annual data point represented the performance expected if the distribution of age and sex were constant over the data series used in the trend analysis.

Measure scores calculated for each age-sex stratum in each year were multiplied by the proportions of the denominator population in each age-sex stratum in the first year of data used for trending. The results are referred to as age-sex adjusted scores. No other adjustments were made for most measures except when measure scores had been adjusted by the data owner and were not available in raw form. In such cases, details of the adjustment are noted in the results.

Provider Variation

The aim of reducing variation in measure performance between providers is to encourage low performers to improve while ensuring that patients receive the same high-quality care regardless of where they are treated. To represent the impact of CMS measures at the provider level, the interquartile range (IQR) was calculated as the absolute difference between the 25th and 75th quartiles of the distribution of provider-level measure scores for the first and last years of the data series used for trending. A large IQR represents high variation in provider performance, indicative of a measure that has room for improvement. Conversely, a small IQR represents low variation, indicating potentially less room for improvement at the provider level. Comparing IQRs from the first and last performance periods shows whether variation in provider measure scores has decreased or increased. Ideally, variation would decrease as performance improves for each measure.

The provider variation analysis was not conducted when provider-level data were not available or when providers were too few to produce informative results (e.g., Prospective Payment System–exempt cancer hospitals).

National Achievable Rate

A national achievable rate represents a measurable goal for performance based on the Achievable Benchmarks of Care (ABC)® approach[39]: the weighted mean score among the highest-ranking providers that cumulatively account for at least 10% of the total patient population. This calculation provides context for interpreting measure data.

The distribution of provider measure scores at the first available data point was used to rank providers. An adjustment to the scores of all providers prevented small providers from being included by chance in the top tier: The adjusted performance fraction (APF) added a constant α to the numerator and a constant $\alpha + \beta$ to the denominator, which moved scores toward $\alpha/(\alpha + \beta)$ by an amount inversely proportional to the sample size for each provider.

To further improve the handling of scores from small providers, information available in the observed distribution of provider scores was used to estimate the parameters, α and β, via maximum likelihood, assuming a beta-binomial distribution. This varies from the published ABC® method (which sets both α and β equal to 1, assuming there is no prior information about the distribution of provider scores) but is consistent with the intent of the published method.

When provider-level denominator data were not available, achievable scores were based on the distribution of provider scores from the first available annual measure score. The achievable score was set at the 10th percentile when lower measure scores indicated better quality and the

90th percentile when higher measure scores indicated better quality. Achievable scores were not calculated if only national-level rates were provided; if significant changes to the measure interrupted a trend; or if providers were too few to produce informative results (e.g., Prospective Payment System-exempt cancer hospitals). Note that CMS may establish benchmarks that differ from the results in the Impact Assessment Report to assist with provider comparisons and performance goals specific to a quality program. The definition for national achievable rate used in this report was chosen to apply consistent methodology across measures and set a benchmark for national performance.

Disparities

Disparities analyses, conducted for all measures for which beneficiary-level or stratified data were acquired, compared national measure scores for identified population subgroups. The analyses estimated disparities for several characteristics separately: sex, age, race, ethnicity, region, urban/rural location, income, and dual-eligibility (Medicare and Medicaid) status. Disparities were examined to determine their magnitude and whether they were narrowing or widening. The main report focuses on a subset of these characteristics: race/ethnicity, urban/rural, income, dual eligibility. Measure-level results of disparities analyses are in Appendix E.

Definitions of Subgroups

For each disparity variable, a reference category was defined, and all other categories were compared with the reference category to determine whether performance gaps existed across subgroups. Table C-1 lists the variables used in disparity analyses with their data sources, category definitions, and reference groups. The definitions were adjusted as necessary to match measure specifications. For example, a measure may exclude the 18–64 age group.

Table C-1: Variables for Disparity Analyses

Variable	Source	Category*	Reference Group
Sex	Varies, depending on measure	Male, Female	Male
Age	Varies, depending on measure	18–64, 65–74, 75–84, 85+	65–74
Race/Ethnicity	Varies, depending on measure	Varied by source – 1997 OMB definitions preferred. Unknown and Other categories excluded	For race: Whites For ethnicity: non-Hispanics
Census Division	U.S. Census Bureau based on the state and ZIP code of the beneficiary at the time of measurement	New England, Middle Atlantic, Southern Atlantic, East North Central, East South Central, West North Central, West South Central, Mountain, Pacific	South Atlantic
Urban/Rural	National Center for Health Statistics urban-rural scheme (2014)[40] based on the state and ZIP code of the beneficiary, which varies depending on the source of the beneficiary's location used for the measure	Large Central Metro: Counties in a metropolitan statistical area (MSA) of 1 million population that contain the largest principal city in the MSA, are completely contained within the largest principal city, or contain at least 250,000 residents of any principal city in the MSA Large Fringe Metro: Counties in an MSA of 1 million population that do not qualify as Large Central Medium Metro: Counties in MSAs of 250,000 to 999,9999 population	Large Central Metro

Variable	Source	Category*	Reference Group
		Small Metro: Counties in MSAs of less than 250,000 population Micropolitan: Counties in micropolitan statistical areas (MISA), urban clusters of 10,000 to 49,999 population Non-Core: Non-metropolitan counties that are not in an MISA	
Income	U.S. Census Bureau 2010 estimates of median household income for beneficiaries aged 65 years or older in the ZIP Code Tabulation Area (ZCTA) linked to the ZIP code of the beneficiary; for measures that are not restricted to Medicare populations, the overall median income in the ZCTA, not limited to older beneficiaries, was used.	Categories of household income based on the 2018 federal poverty limit (FPL) for 2-person family definitions: - Low income: < 199% of FPL - Middle income: 200%–399% of FPL - High income ≥ 400% of FPL	High income (400% of FPL and above)
Dual eligibility	Medicare denominator file	Dual-eligible for Medicare and Medicaid, not dual-eligible	Not dual-eligible

*Categories may differ from those defined in the measure specifications collected by the data owners. Methodology was adjusted as needed to assess the appropriate stratifications for each variable in the disparity analysis. For example, the measure *Breast Cancer Screening* (NQF #2372) in the Medicare Part C Star Ratings Program is specified for female beneficiaries aged 50 and older. As the 18–64 age group was not represented, the analysis compared the 50–64 group with the reference group, 65–74.

Adjustment for Differences in Population Subgroups

Because age and sex are confounding factors associated with health outcomes, scores were age- and sex-standardized to control for differences between subgroups, except when a disparity analysis was intended to compare outcomes by age groups or sex. Adjustment was done using the direct standardization technique previously described in the section *Sex and Age Adjustment*.

Disparity Magnitude

Disparities were identified using the same methodology used for the AHRQ NHQDR.[36] When comparing the most recent annual measure scores for the reference and comparison groups, two criteria were used to determine whether the observed differences in quality measure scores were sufficient to define as a disparity. First, using a two-tailed test, the difference between measure scores for the two groups must be statistically significant with $p < 0.05$. Second, the relative difference between the comparison group and the reference group must have an absolute value of at least 0.1 (10%), where p_1 is the comparison group score and p_2 is the reference group score:

$$\left|\frac{(p1-p2)}{p2}\right| \geq 0.1 \text{ where } p1 < 0.5, \text{ or } \left|\frac{((1-p1)-(1-p2))}{(1-p2)}\right| \geq 0.1 \quad \text{where } p1 \geq 0.5 \qquad (8)$$

For a given absolute difference between proportions, the relative difference is largest when the proportions are close to 0.0 and smallest when the proportions approach 1.0. The second part of Equation 8 addresses this by treating the difference between 95% and 96% as it would treat a difference between 5% and 4%, yielding a relative difference of 25% in both instances rather than 1% in the former and 25% in the latter.

Where the measure result was something other than a proportion (e.g., a median), the computation of the relative difference between results r_1 and r_2 was virtually identical to the above method, and the difference also must have an absolute value of at least 10%:

$$\left|\frac{(r1-r2)}{r2}\right| \geq 0.1 \quad (9)$$

The statistical difference between measure scores was examined using a *z*-test for proportions if the underlying measure was based on a proportion, or a *t*-test if the underlying measure was based on an average, median, or other non–proportion-based measure score.
The formula for a *z*-test for the difference between proportions is:

$$z = \frac{p_1 - p_2}{\sqrt{\frac{p(1-p)}{n_1} + \frac{p(1-p)}{n_2}}}, \quad (10)$$

where

$$p = \frac{(p_1 * n_1) + (p_2 * n_2)}{n_1 + n_2}. \quad (11)$$

In Equations 10 and 11, the proportion for the measure score is p_1 for the reference group and p_2 for the comparison group; n_1 and n_2 are the sample sizes for the reference and comparison groups, respectively.

For measures represented as means or ratios, standard errors for the *t*-test were calculated using the same methods described in the section *Trend Estimation*, except that these calculations were conducted for each stratum separately.

Trends in Disparities

The purpose of the trends in disparities analysis was to determine whether disparities between subgroups were narrowing or widening over time. The analysis was based on comparison of trend estimates calculated separately for each subgroup, e.g.,

$$ln(y_{it}) = \beta_{i0} + \beta_{i1}(Time_t) + \varepsilon_{it}, \quad (12)$$

where subscript $i = 1$ for the comparison group and 2 for the reference group.
A two-sample *z*-test was performed on the slopes, β_{i1}, to determine whether measure score trends differed between reference and comparison groups:

$$z = \frac{(\beta_{11} - \beta_{21})}{\sqrt{[se^2(\beta_{11}) + se^2(\beta_{21})]}}, \quad (13)$$

where the standard errors for the slopes are calculated with the same parametric bootstrap method described in the section *Trend Estimation.*

The difference in slopes is considered statistically significant if the *p*-value corresponding to the *z* statistic computed in Equation 13 is less than the alpha level of 0.10.

To determine the practical significance of the difference in slopes, the difference in strata-specific AAPCs was assessed. The AAPC for each subgroup was calculated as:

$$\text{AAPC}_i = [exp(\beta_{i1}) - 1] * 100, \quad (14)$$

where $i = 1$ for the comparison group and 2 for the reference group. The AAPC in the difference between the two subgroup trends is $\text{AAPC}_1 - \text{AAPC}_2$. An absolute difference > 1% is considered clinically significant.

To interpret the difference in slopes, it was necessary to calculate the predicted results for the most recent year, k, for the comparison and reference groups based on the subgroup-specific regressions. The predicted result for the comparison group is:

$$\hat{y}_{1k} = y_{\theta} \times e^{\beta_{10}+\beta_{11}(k)} \quad (15)$$

If the difference in slopes is not significant ($p < 0.10$) or if $|AAPC_1 - AAPC_2| \leq 1\%$, then no convergence or divergence in the trends is occurring. Otherwise, the interpretation is as shown in Table C-2.

Table C-2. Interpretation of Disparity Change Analysis (Absolute) Results

Predicted Current Scores	Annual Change	Interpretation
$\hat{y}_{1k} > \hat{y}_{2k}$	$AAPC_1 - AAPC_2 < -1\%$	Converging (narrowing)
$\hat{y}_{1k} > \hat{y}_{2k}$	$AAPC_1 - AAPC_2 > 1\%$	Diverging (widening)
$\hat{y}_{1k} \leq \hat{y}_{2k}$	$AAPC_1 - AAPC_2 < -1\%$	Diverging (widening)
$\hat{y}_{1k} \leq \hat{y}_{2k}$	$AAPC_1 - AAPC_2 > 1\%$	Converging (narrowing)

The report describes changes in disparities between comparison and reference groups in Key Indicator measure scores as *improving*, *improving and no longer evident*, and *worsening*. These categories were based on combinations of definitions described above.

- A significant disparity detected in the first year of the data series used for trending was categorized as *improving* if the disparity change analysis indicated either a converging disparity or a diverging disparity in which the comparison group surpassed the reference group.
- If a disparity improved and was not detected in the last year of the data series used for trending, the result was further categorized as *no longer evident*.
- A disparity was categorized as *worsening* if the disparities change analysis indicated a diverging disparity and the measure score for the comparison group was significantly worse than that of the reference group in the last year of data used for trending.

Key Indicators

The report highlights findings for a subset of measures designated as Key Indicators—measures or groups of measures used to gauge performance in areas aligned with CMS health care quality priorities. Fifty-nine Key Indicators track progress critical to providing high-quality care and improving individual outcomes.

An environmental scan identified a broad scope of measures for the 2021 Impact Assessment Report, from which measures designated for accountability purposes, such as public reporting or value-based purchasing, were evaluated by selection criteria for Key Indicators. Measures must have had three or more annual data reporting periods as of December 31, 2018, and no known data issues during the study period. If submitted to the National Quality Forum (NQF) for review, they must have attained endorsement. Measures topped out, duplicative of other measures, or only voluntarily reported were excluded.

Fifty-eight of 62 Key Indicator measures from the 2018 Impact Assessment Report (94%) were retained; four were excluded for failing to meet the inclusion criteria (see Appendix B). Additional Key Indicators for 2021 include those from new CMS programs and others for which the required three annual reporting periods of data have been recently acquired. Measures that met the inclusion criteria were conceptually grouped into Key Indicators and mapped to the six health care quality priorities. A panel of technical experts, clinicians, patients, and caregivers considered whether candidate measures:

- Have a meaningful conceptual basis for representing achievement of a specific goal, strategic result, or objective identified in the CMS Meaningful Measures Initiative.
- Are meaningful to policymakers, providers, patients, and caregivers.
- Are important for promoting better outcomes for patients.

The final list of Key Indicators and included measures is in Appendix B. Refer to *Analytic Results for All Measures* (Appendix E) to find detailed results for each measure analyzed.

The report displays summary trend results for Key Indicators by setting with icons representing measure performance as improved ( ), declined ( ), stable ( ), or mixed ( ), i.e., results differ for a measure across settings or for multiple measures making up a Key Indicator. Table C-3 identifies programs associated with the settings represented in the Key Indicator tables and which programs use measures designated as Key Indicators. *Key Indicator Results* (Appendix D) supplements the aggregated summary statistics and selected highlights in the report text.

Table C-3. CMS Measurement Program Settings

Acute Care
Ambulatory Surgical Center Quality Reporting
Hospital-Acquired Conditions Reduction Program
Hospital Inpatient Quality Reporting
Hospital Outpatient Quality Reporting
Hospital Readmissions Reduction Program
Hospital Value-Based Purchasing
Inpatient Psychiatric Facility Quality Reporting
Medicare and Medicaid Promoting Interoperability Program
Prospective Payment System–Exempt Cancer Hospital Quality Reporting Program
Post-Acute and Long-Term Care
Dialysis Facility Compare
End-Stage Renal Disease Quality Incentive Program
Home Health Quality Reporting Program
Hospice Quality Reporting Program
Inpatient Rehabilitation Facility Quality Reporting Program
Long-Term Care Hospital Quality Reporting Program
Skilled Nursing Facility Quality Reporting Program
Skilled Nursing Facility Value-Based Purchasing Program
Nursing Home Quality Initiative /Nursing Home Compare
Clinician and Accountable Care Organization (ACO)
Medicare Shared Savings Program
Merit-Based Incentive Payment System
Managed Care, Private Market, and Medicaid*
Medicare Part C & D Display Measures
Medicare Part C & D Star Ratings
Medicaid Adult Core Set
Medicaid Child Core Set
Quality Rating System for Qualified Health Plans
Fee-for-Service CAHPS**

*Medicaid Core Set measures include both fee-for-service (FFS) and managed care beneficiaries.
**FFS CAHPS fulfills a statutory requirement to facilitate comparisons of Medicare managed care with care in FFS Medicare; therefore, the survey is included under Managed Care.
Notes:
Eleven facilities in the nation are designated Prospective Payment System (PPS)-Exempt Cancer Hospitals.
"Nursing home" refers to both Medicare-certified skilled nursing facilities and Medicaid-certified nursing facilities.

Patients Impacted

Trends in measure scores were used to estimate patient impact associated with changes in measure scores, calculated only for Key Indicator measures with applicable data. Patient impact is described in terms of patient-level events, such as achieving a positive outcome or avoiding an adverse event. Improving measure scores represent a cumulative positive patient impact. Estimates of patient impact were based on the data series used for trending.

The analysis began with calculating the expected number of numerator events for each year after the first year (baseline) in the data series, time *t*, under the assumption that the baseline measure score was constant over time.

$$Expected\ Numerator\ Events_t = Score_{baseline} * Eligible\ Denominator\ Cases_t \quad (16)$$

The number of observed numerator events in each year was calculated from the observed score:

$$Observed\ Numerator\ Events_t = Score_t * Eligible\ Denominator\ Cases_t \quad (17)$$

The number of eligible denominator cases was often the same as the total denominator size—for example, when a measure included an entire population of patients. However, for sampled measures, this number refers to the number of eligible denominator cases in the sampling frame rather than the sample size. In this way, the methods here estimate impacts on all measured patients rather than only the patients included in samples.

The difference between the observed and expected number of numerator events was the estimate of annual impact for the measure. When a higher score indicates better quality, an observed number greater than the expected number represents a positive impact.

$$Annual\ impact_t = Observed\ numerator\ events_t - Expected\ numerator\ events_t \quad (18)$$

Finally, a cumulative measure of impact was estimated as the sum of the annual impact across all years included in the data series used for trending:

$$Total\ Impact = \sum_{t=2}^{t} Annual\ impact_t \quad (19)$$

Measures with rolling multi-year denominators (e.g., 30-day mortality measures) and chronic condition measures (e.g., control measures related to diabetes or hypertension) required an exception to the use of Equation 19: Total impact was calculated using only the first and last years of the data series. This exception reduced the effect of double-counting numerator cases across years.

Costs Avoided

Costs avoided, rounded to the nearest $100,000, were estimated when national measure scores improved over the data series used for trending, based on a plausible connection between CMS measurement activity and improvements in measured performance. This analysis of Key Indicator measures associates improved performance with costs avoided from the payer perspective (rather than that of the health care provider, the patient, or society) without considering the cost of implementing the measure or associated interventions. Results of a patient impact calculation were multiplied by an estimated health care cost related to the harm or disease condition being measured to estimate costs avoided. This approach, which aligns with

how the National Institutes of Health defines avoided costs, is based on established methods employed by other studies that aim to understand the impact of a change in health outcomes and costs.[41-45] Given the generally large sample sizes associated with the annual measure scores, error estimates for patient impact were not used in the calculation of costs avoided. These errors, if included in the cost calculations, would be very small relative to the uncertainty association with the cost estimates derived from the literature.

To identify Key Indicators and component measures appropriate and feasible for the cost-avoided analyses, the following exclusion criteria were applied:

- Mortality outcome
- Measure expressed as a payment or cost
- Process measure
- Complex measure for which it is not feasible to determine individual outcomes
- Functional outcome measure
- Patient experience measure
- Patient-level or event-level data not available to either estimate patient impact or apply cost estimates to the specific measure or outcome represented
- Declining or stable performance trend

Cost estimates were identified through a targeted scan of economic research studies and grey literature published since January 1, 2009, that report costs of a health problem or illness avoided by a health care intervention corresponding to the Key Indicators. The research strategy involved specified search parameters and defined filters; identification of terminology reflective of the central concepts corresponding to the Key Indicators; selection of appropriate Medical Subject Headings (MeSH); review of grey literature; application of a snowball approach to further identify relevant studies; and re-examination of the sources used in the 2018 Impact Assessment Report.[46]

Information regarding methodology, characteristics of the sample or population, geographic region represented, health conditions, data sources for costs, and other cost details was extracted from the studies. To select which identified cost estimate to use, each relevant study was rated on alignment with the specifications for the Key Indicator—namely, payer perspective, denominator population, denominator health event or illness, and numerator.

The analytic steps to generate cost-avoided estimates began with converting selected cost estimates into 2018 dollars, using the Medical Care Services (MCS) Index report produced by the U.S. Bureau of Labor Statistics.[47] Next, per-event cost estimates were multiplied by the number of additional favorable events or avoided adverse events estimated in the patient impact analysis. When multiple per-event cost estimates were gleaned from the literature review, estimates of total costs avoided were expressed as a range of plausible values. Table C-4 details the cost estimates derived from the targeted literature review and converted to 2018 dollars.

Table C-4. Health Care Cost Estimates Derived From Literature Review

Key Indicator	Cost Estimate per Event (2018 Dollars)
Chronic Condition – Poor Hemoglobin A1c Control	$10,510–$17,910[48]
Hospitalizations – All-Cause Readmissions*	$15,053–$16,146
Infection – Catheter-Associated Urinary Tract Infection	$523–$7,482[42,52-55]
Infection – Central Line-Associated Bloodstream Infection	$4,460–$26,760[42,52-56]
Infection – *Clostridioides difficile* Infection	$2,002–$19,305[52-55,57-60]
Medication Management – Medication Adherence (Statins)	$1,357–$3,455[41,61,62]
Medication Management – Medication Adherence (Diabetes Medications)	$3,785–$8,073[61,62]
Medication Management – Medication Adherence (RAS Antagonists)	$6,139–$8,687[61,62]

* Applicable to the *Plan All-Cause Readmission* measure in Medicare Part C

Summary of Significant Changes Between 2018 and 2021 Impact Assessment Report Methodologies

CMS strives to enhance analytic methods to provide greater value to internal and external stakeholders with each successive Impact Assessment Report. Several methodological changes were adopted for the 2021 report. Table C-5 summarizes the major changes between the last report and this one, most of which were recommended by the TEP and FASC.

Table C-5. Methodological Changes in Impact Assessment Report – 2021 Versus 2018

Analysis Item	2018	2021	Rationale
Most recent year of data included in analyses	2015	2018	2018 is the most recent year of data availability.
Trending time frame	All years the measure was in use (minimum of 3 years, maximum of 12 years)	Minimum of 3 years (2013–2015), maximum of 6 years (2013–2018)	Describes current performance and standardizes time window to compare measure trends
Trending precision	None	90% confidence intervals based on patient-level sample size	Characterizes the precision in measure trend estimates using all available information
Trending categories	Declining, stable, improving, insufficient data, based on the AAPC estimate	Declining, stable, improving, insufficient data, based on the lower and upper limits of the 90% confidence interval for the AAPC estimate	Incorporates information on clinical significance and uncertainty in trending estimates in the interpretation of trends
Achievable results	ABC method	ABC using modified method of provider-level score adjustments	Capitalizes on available data in the observed distribution of provider scores to estimate achievable scores

Analysis Item	2018	2021	Rationale
New disparities variable	Disparities analyses included age, sex, race/ethnicity, income, urban/rural, and Census Division.	All variables from 2018 plus dual eligibility	Adds detail to the range of possible disparities in measure scores
Definition of income categories used in disparities analysis	Quintiles of the U.S. Census Bureau 2010 estimates of median household income in the ZIP Code Tabulation Area (ZCTA) linked to the ZIP code of the beneficiary	U.S. Census Bureau 2010 estimates of median household income for beneficiaries aged ≥ 65 years in the ZIP Code Tabulation Area (ZCTA) linked to the ZIP code of the beneficiary; for measures that are not restricted to Medicare populations, the overall median income in the ZCTA, not limited to older beneficiaries, is used. Categories of household income defined by percentage of the 2018 federal poverty limit (FPL) for 2-person family: - Poor/low income: < 199% of FPL - Middle income: 200%–399% of FPL - High income: ≥ 400% of FPL	Improved match of income to primary measure population and improved alignment with other CMS and HHS income definitions
Patient impact time frame	All years the measure was in use	Aligned with trending time frame, i.e., minimum of 3 years (2013–2015), maximum of 6 years (2013–2018)	Describes impact related to current performance and standardizes time window to compare impact between measures
Cost avoided	Outcome measures and select process measures	Outcome measures only	Increases precision of estimates by identifying costs of an event rather than a process
Provider performance variation	None	Interquartile range in first and last year of trending time series	Provides context for the impact of performance at the provider level

Limitations

The limitations of the Impact Assessment are acknowledged and addressed as follows:

- **Data:** Data required to perform trend analyses and disparities analyses and to adjust outcomes over time may be incomplete because of varying data collection requirements across programs (e.g., collection of race/ethnicity as a single variable versus separate race and ethnicity variables) or limited capability of CMS data owners to provide patient-level data. As a result, summary statistics such as the percentage of measures with significant disparities may differ from the actual percentage of measures because such a statistic does not account for missing data. To mitigate this issue, the report will clearly indicate the total number of measures analyzed for each analysis.
- **Attribution:** This assessment acknowledges the influence of factors other than CMS performance measures, including both federal and private-sector quality initiatives, on achievement of goals for improving the quality of health care and patient outcomes. The analysis does not attempt to establish causal relationships or attribution to specific CMS measures or performance programs, which is more appropriate for analyses of individual measures or quality programs. However, quality measurement is a key component of most quality improvement efforts, and it is plausible that measurement contributed to at least some of the observed improvements characterized in this report.
- **Costs avoided:** Studies that include estimates of health care costs relevant to the measures included in this report are limited. Valid published literature was not available to quantify health care costs for all of the Key Indicators identified as potentially appropriate for cost-avoided analysis. To mitigate this limitation, measures were excluded from the cost-avoided analysis when credible cost estimates were not available.
- **Income:** This report defines income by the U.S. Census Bureau 2010 estimates of median household income for beneficiaries aged 65 years or older in the ZIP Code Tabulation Area (ZCTA) linked to the five-digit ZIP code of the beneficiary. Because of diverse populations within ZIP codes, use of median household income can under- or overestimate various levels of FPL. Though this effect could obscure small disparities, the primary aim of the disparities analyses for this report was to detect larger disparities that are both statistically and clinically significant.
- **Dual eligibility:** The population of beneficiaries who are dual eligible for Medicare and Medicaid varies by state, in part because of state-specific Medicaid eligibility rules. Variation between states does not strongly affect the report analyses, which are primarily at the national level.
- **Comparing results:** The results of previous Impact Assessment Reports[63] are not directly comparable with the results presented here because of methodological differences. Newer data and enhanced analyses make each successive report a better and more informative indicator of the current landscape of the impact of quality performance measures.

Appendix C References

1. Centers for Medicare & Medicaid Services. *Medicare 2020 Part C & D Star Ratings Technical Notes.* Baltimore, MD: US Department of Health and Human Services; 2019. https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/Downloads/Star-Ratings-Technical-Notes-Oct-10-2019.pdf. Accessed April 28, 2021.
2. Centers for Medicare & Medicaid Services. 2020 Core Set of Children's Health Care Quality Measures for Medicaid and CHIP (Child Core Set). Baltimore, MD: US Department of Health and Human Services; 2020. https://www.medicaid.gov/medicaid/quality-of-care/downloads/performance-measurement/2020-child-core-set.pdf. Accessed April 28, 2021.
3. Centers for Medicare & Medicaid Services. 2020 Core Set of Adult Health Care Quality Measures for Medicaid (Adult Core Set). Baltimore, MD: US Department of Health and Human Services; 2020. https://www.medicaid.gov/medicaid/quality-of-care/downloads/performance-measurement/2020-adult-core-set.pdf. Accessed April 28, 2021.
4. Medicare Program: Changes to Hospital Outpatient Prospective Payment and Ambulatory Surgical Center Payment Systems and Quality Reporting Programs; Revisions of Organ Procurement Organizations Conditions of Coverage; Prior Authorization Process and Requirements for Certain Covered Outpatient Department Services; Potential Changes to the Laboratory Date of Service Policy; Changes to Grandfathered Children's Hospitals- Within-Hospitals; Notice of Closure of Two Teaching Hospitals and Opportunity To Apply for Available Slots; Final Rule. *Fed Regist*. 2019; 84(218): 61142-61492.
5. Medicare and Medicaid Programs; CY 2020 Home Health Prospective Payment System Rate Update; Home Health Value-Based Purchasing Model; Home Health Quality Reporting Requirements; and Home Infusion Therapy Requirements; Final Rule. *Fed Regist*. 2019; 84(217): 60478-60646.
6. Medicare Program; Hospital Inpatient Prospective Payment Systems for Acute Care Hospitals and the Long-Term Care Hospital Prospective Payment System and Policy Changes and Fiscal Year 2020 Rates; Quality Reporting Requirements for Specific Providers; Medicare and Medicaid Promoting Interoperability Programs Requirements for Eligible Hospitals and Critical Access Hospitals; Final Rule. *Fed Regist*. 2019; 84(159): 42044-42701.
7. Medicare Program; Inpatient Rehabilitation Facility (IRF) Prospective Payment System for Federal Fiscal Year 2020 and Updates to the IRF Quality Reporting Program; Final Rule. *Fed Regist*. 2019; 84(153): 39054-39173.
8. Medicare Program; Prospective Payment System and Consolidated Billing for Skilled Nursing Facilities; Updates to the Quality Reporting Program and Value-Based Purchasing Program for Federal Fiscal Year 2020; Final Rule. *Fed Regist*. 2019; 84(152): 38728-38833.

9. Medicare Program; FY 2020 Hospice Wage Index and Payment Rate Update and Hospice Quality Reporting Requirements; Final Rule. *Fed Regist*. 2019; 84(151): 38484-38544.
10. Medicare Program; FY 2020 Inpatient Psychiatric Facilities Prospective Payment System and Quality Reporting Updates for Fiscal Year Beginning October 1, 2019 (FY 2020); Final Rule. *Fed Regist*. 2019; 84(151): 38424-38482.
11. Medicare Program: Changes to Hospital Outpatient Prospective Payment and Ambulatory Surgical Center Payment Systems and Quality Reporting Programs; Final Rule. *Fed Regist*. 2018; 83(225): 58818-59179.
12. Medicare Program; CY 2020 Revisions to Payment Policies Under the Physician Fee Schedule and Other Changes to Part B Payment Policies; Medicare Shared Savings Program Requirements; Medicaid Promoting Interoperability Program Requirements for Eligible Professionals; Establishment of an Ambulance Data Collection System; Updates to the Quality Payment Program; Medicare Enrollment of Opioid Treatment Programs and Enhancements to Provider Enrollment Regulations Concerning Improper Prescribing and Patient Harm; and Amendments to Physician Self-Referral Law Advisory Opinion Regulations Final Rule; and Coding and Payment for Evaluation and Management, Observation and Provision of Self-Administered Esketamine Interim Final Rule; Final Rule. *Fed Regist*. 2019; 84(221): 62568-63563.
13. Centers for Medicare & Medicaid Services. *2020 Quality Rating System Measure Technical Specifications.* Baltimore, MD: US Department of Health & Human Services; 2019. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/2020-QRS-Measure-Tech-Specs_20190925_508.pdf. Accessed April 28, 2021.
14. Centers for Medicare & Medicaid Services. CMS Announces Relief for Clinicians, Providers, Hospitals and Facilities Participating in Quality Reporting Programs in Response to COVID-19. Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/newsroom/press-releases/cms-announces-relief-clinicians-providers-hospitals-and-facilities-participating-quality-reporting. Accessed March 29, 2021.
15. Centers for Medicare & Medicaid Services. *2020 MIPS Quality Measures List.* Baltimore, MD: US Department of Health and Human Services; 2020.
16. Centers for Medicare & Medicaid Services. Nursing Home Quality Initiative. Quality Measures. Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures. Accessed April 28, 2021.
17. Centers for Medicare & Medicaid Services. *Medicare 2020 Part C & D Display Measure Technical Notes.* Baltimore, MD: US Department of Health and Human Services; 2020.
18. United States Census Bureau. *2017 FIPS Codes.* Washington, DC: US Department of Commerce; nd.
19. United States Census Bureau. *2010 ZCTA [ZIP Code Tabulation Area] to County Relationship Files.* Washington, DC: US Department of Commerce; nd.

20. United States Census Bureau. *2013–2017 American Community Survey (ACS) 5–year Estimates.* Washington, DC: US Department of Commerce; nd.

21. United States Census Bureau. *2010 FIPS Codes for Counties and County Equivalent Entities.* Washington, DC: US Department of Commerce; nd.

22. Office of Policy Development and Research. *HUD USPS zip code crosswalk files.* Washington, DC: Department of Housing and Urban Development; nd.

23. American Academy of Family Physicians. *Uniform Data System (UDS) Mapper: ZIP Code to ZCTA Crosswalk for the 2017 UDS.* US Health Resources & Services Administration; 2020. https://udsmapper.org/.

24. Centers for Disease Control and Prevention. *2013 NCHS Urban-Rural Classification Scheme for Counties.* Washington, DC: US Department of Health and Human Services; 2013. https://www.cdc.gov/nchs/data/data_acces_files/NCHSurbruralcodes2013.sas7bdat. Accessed January 20, 2021.

25. Donabedian A. Evaluating the quality of medical care. *Milbank Mem Fund Q.* 1966;44(3):Suppl:166-206.

26. Donabedian A. The quality of care. How can it be assessed? *JAMA.* 1988;260(12):1743-1748.

27. Centers for Medicare & Medicaid Services. *Patients Over Paperwork.* Baltimore, MD: US Department of Health and Human Services. https://www.cms.gov/Outreach-and-Education/Outreach/Partnerships/Downloads/JanuaryPoPNewsletter011818.pdf. Accessed January 14, 2021.

28. Medicare Program; CY 2021 Payment Policies Under the Physician Fee Schedule and Other Changes to Part B Payment Policies; Medicare Shared Savings Program Requirements; Medicaid Promoting Interoperability Program Requirements for Eligible Professionals; Quality Payment Program; Coverage of Opioid Use Disorder Services Furnished by Opioid Treatment Programs; Medicare Enrollment of Opioid Treatment Programs; Electronic Prescribing for Controlled Substances for a Covered Part D Drug; Payment for Office/ Outpatient Evaluation and Management Services; Hospital IQR Program; Establish New Code Categories; Medicare Diabetes Prevention Program (MDPP) Expanded Model Emergency Policy; Coding and Payment for Virtual Check-in Services Interim Final Rule Policy; Coding and Payment for Personal Protective Equipment (PPE) Interim Final Rule Policy; Regulatory Revisions in Response to the Public Health Emergency (PHE) for COVID–19; and Finalization of Certain Provisions from the March 31st, May 8th and September 2nd Interim Final Rules in Response to the PHE for COVID–19; Final Rule. *Fed Regist.* 2020; 85(248): 84472-85377.

29. Centers for Medicare & Medicaid Services. Measures Management System. Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/MMS-Content-Page. Accessed August 19, 2020.

30. Centers for Medicare & Medicaid Services, Center for Clinical Standards and Quality. *CMS Quality Measure Development Plan 2020 Annual Report.* Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/files/zip/2020-quality-measure-development-plan-annual-report.zip. Accessed January 14, 2021.

31. Centers for Medicare & Medicaid Services. *MACRA Funding Opportunity: Measure Development Awardees for the Quality Payment Program.* Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/9-21-18-QPP-Measures-Cooperative-Agreement-Awardees.pdf. Accessed December 15, 2020.

32. Office of the Federal Register. *Federal Register.* College Park, MD: National Archives and Records Administration. https://www.federalregister.gov/. Accessed January 14, 2021.

33. Centers for Medicare & Medicaid Services. *2020 Measures under Consideration List Program-Specific Measure Needs and Priorities.* Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/files/document/cms-measurement-priorities-and-needs.pdf. Accessed May 21, 2020.

34. National Quality Forum. Measure Applications Partnership. Washington, DC: National Quality Forum; 2020. https://www.qualityforum.org/map/. Accessed May 21, 2020.

35. Centers for Medicare & Medicaid Services, Center for Clinical Standards and Quality. *CMS Quality Measure Development Plan 2019 Annual Report.* Baltimore, MD: US Department of Health and Human Services; 2019. https://www.cms.gov/Medicare/Quality-Payment-Program/Measure-Development/2019-Quality-MDP-Annual-Report-and-Appendices.zip. Accessed January 15, 2021.

36. Agency for Healthcare Research and Quality. *2018 National Healthcare Quality and Disparities Report.* Rockville, MD: US Department of Health and Human Services; 2018. https://www.ahrq.gov/research/findings/nhqrdr/nhqdr18/index.html. Accessed January 21, 2021.

37. Efron B, Hastie T. *Computer age statistical inference (Vol. 5).* Cambridge University Press; 2016. https://web.stanford.edu/~hastie/CASI_files/PDF/casi.pdf. Accessed February 3, 2020.

38. Fleiss JL, Levin B, Paik MC. *Statistical Methods for Rates and Proportions: Third Edition*. Hoboken, NJ: John Wiley & Sons; 2003.

39. Kiefe CI, Weissman NW, Allison JJ, Farmer R, Weaver M, Williams OD. Identifying achievable benchmarks of care: concepts and methodology. *Int J Qual Health Care.* 1998;10(5):443-447.

40. Ingram DD, Franco SJ. NCHS urban–rural classification scheme for counties. National Center for Health Statistics. *Vital Health Stat.* 2014;2(166).

41. Aubert RE, Yao J, Xia F, Garavaglia SB. Is there a relationship between early statin compliance and a reduction in healthcare utilization? *Am J Manag Care.* 2010;16(6):459-466.

42. Kandilov AM, Coomer NM, Dalton K. The impact of hospital-acquired conditions on Medicare program payments. *Medicare Medicaid Res Rev.* 2014;4(4). doi: 10.5600/mmrr.004.04.a01.

43. Kymes SM, Pierce RL, Girdish C, Matlin OS, Brennan T, Shrank WH. Association among change in medical costs, level of comorbidity, and change in adherence behavior. *Am J Manag Care.* 2016;22(8):e295-301.

44. Pittman DG, Chen W, Bowlin SJ, Foody JM. Adherence to statins, subsequent healthcare costs, and cardiovascular hospitalizations. *Am J Cardiol.* 2011;107(11):1662-1666. doi: 10.1016/j.amjcard.2011.01.052.

45. US National Library of Medicine. Health Economics Information Resources: A Self-Study Course. Bethesda, MD: US Department of Health and Human Services; 2020. https://www.nlm.nih.gov/nichsr/edu/healthecon/glossary.html. Accessed February 3, 2020.

46. Centers for Medicare & Medicaid Services. *2018 National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Report.* Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityMeasures/National-Impact-Assessment-of-the-Centers-for-Medicare-and-Medicaid-Services-CMS-Quality-Measures-Reports.html. Accessed January 30, 2020.

47. US Bureau of Labor Statistics. Databases, tables, & calculators by subject. US Department of Labor; 2017. https://data.bls.gov/timeseries/CUUR0000SAM?output_view=pct_12mths. Accessed February 4, 2020.

48. Fitch K, Pyenson BS, Iwasaki K. Medical claim cost impact of improved diabetes control for Medicare and commercially insured patients with type 2 diabetes. *J Manag Care Pharm.* 2013;19(8):609-620, 620a-620d. doi: 10.18553/jmcp.2013.19.8.609.

49. Barrett ML, Wier LM, Jiang J, Steiner CA. *All-Cause Readmissions by Payer and Age, 2009–2013. HCUP Statistical Brief #199.* Rockville, MD: Agency for Healthcare Research and Quality; 2015.

50. Hines AL, Barrett ML, Jiang HJ, Steiner CA. *Conditions with the Largest Number of Adult Hospital Readmissions by Payer, 2011. HCUP Statistical Brief #172.* Rockville, MD: Agency for Healthcare Research and Quality; 2014.

51. Bailey MK, Weiss AJ, Barrett ML, Jiang HJ. *Characteristics of 30-Day All-Cause Hospital Readmissions, 2010–2016. HCUP Statistical Brief #248.* Rockville, MD: Agency for Healthcare Research and Quality; 2019. https://www.hcup-us.ahrq.gov/reports/statbriefs/sb248-Hospital-Readmissions-2010-2016.pdf. Accessed September 25, 2019.

52. Zimlichman E, Henderson D, Tamir O, et al. Health care-associated infections: a meta-analysis of costs and financial impact on the US health care system. *JAMA Intern Med.* 2013;173(22):2039-2046. doi: 10.1001/jamainternmed.2013.9763.

53. Agency for Healthcare Research and Quality. Estimating the additional hospital inpatient cost and mortality associated with selected hospital-acquired conditions. Rockville, MD: US Department of Health and Human Services; 2017. https://www.ahrq.gov/hai/pfp/haccost2017-results.html. Accessed February 25, 2020.

54. Scott II R. *The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention.* Atlanta, GA: Centers for Disease Control and Prevention; 2009. https://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf. Accessed February 11, 2020.

55. Schmier JK, Hulme-Lowe CK, Semenova S, et al. Estimated hospital costs associated with preventable health care-associated infections if health care antiseptic products were unavailable. *Clinicoecon Outcomes Res.* 2016;8:197-205. doi: 10.2147/CEOR.S102505.

56. Stevens V, Geiger K, Concannon C, Nelson RE, Brown J, Dumyati G. Inpatient costs, mortality and 30-day re-admission in patients with central-line-associated bloodstream infections. *Clin Microbiol Infect.* 2014;20(5):O318-324. doi: 10.1111/1469-0691.12407.

57. Lipp MJ, Nero DC, Callahan MA. Impact of hospital-acquired Clostridium difficile. *J Gastroenterol Hepatol.* 2012;27(11):1733-1737. doi: 10.1111/j.1440-1746.2012.07242.x.

58. Magee G, Strauss ME, Thomas SM, Brown H, Baumer D, Broderick KC. Impact of Clostridium difficile-associated diarrhea on acute care length of stay, hospital costs, and readmission: A multicenter retrospective study of inpatients, 2009-2011. *Am J Infect Control.* 2015;43(11):1148-1153. doi: 10.1016/j.ajic.2015.06.004.

59. Dubberke ER, Reske KA, Olsen MA, McDonald LC, Fraser VJ. Short- and long-term attributable costs of Clostridium difficile-associated disease in nonsurgical inpatients. *Clin Infect Dis.* 2008;46(4):497-504. doi: 10.1086/526530.

60. Centers for Disease Control and Prevention. *Vital Signs: Preventing Clostridium Difficile Infections.* Atlanta, GA: US Department of Health and Human Services; 2012. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6109a3.htm.

61. Stuart BC, Dai M, Xu J, Loh FH, J SD. Does good medication adherence really save payers money? *Med Care.* 2015;53(6):517-523. doi: 10.1097/MLR.0000000000000360.

62. Roebuck MC, Liberman JN, Gemmill-Toyama M, Brennan TA. Medication adherence leads to lower health care use and costs despite increased drug spending. *Health Aff (Millwood).* 2011;30(1):91-99. doi: 10.1377/hlthaff.2009.1087.

63. Centers for Medicare & Medicaid Services. National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Reports. Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/qualitymeasures/national-impact-assessment-of-the-centers-for-medicare-and-medicaid-services-cms-quality-measures-reports.html. Accessed January 20, 2021.

Appendix D – Key Indicator Results

Overview

The report highlights analytical findings of the impact of CMS quality measures, represented by:

- Improvement or decline in measure performance over time.
- Disparities in measure performance.
- Numbers of patients affected by improvements in measure performance over time.
- Costs avoided associated with improvements in measure performance.

This appendix, organized by health care quality priority, summarizes the results of trends, disparities, patient impact, and cost-avoided analyses for Key Indicator measures identified for this report. Detailed results for all measures are available in Appendix E.

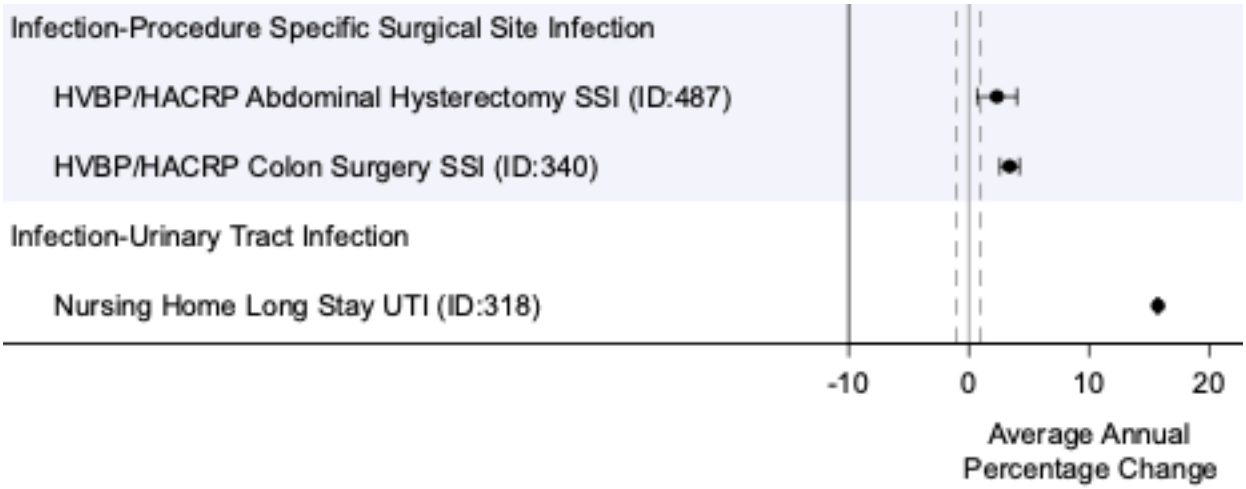
The following explains the figures and tables in this appendix. Figures D-1 through D-4 are examples of the graphical displays of Key Indicator results presented throughout this appendix. Detailed methodology can be found in Appendix C.

Trend Summary

The objective of the trend analysis was to identify whether measure scores were improving, declining, or stable based on national annual measure scores, using the most recent three to six consecutive data points (2013–2018). The displays with the trend summary findings begin with the Key Indicator name, followed by the specific measure indented below. The measure is shown with an abbreviation of the program as well as a measure ID. Display layouts require short names; therefore, to identify measure with full information, the ID can be used as a crosswalk to Appendix E for detailed measure information.

Trends in performance were measured on a *relative* scale using the average annual percentage change (AAPC) statistic, calculated using regression. The AAPC and confidence intervals (90%) for AAPC estimates are displayed in column 2 of the trend summary (Figure D-1).

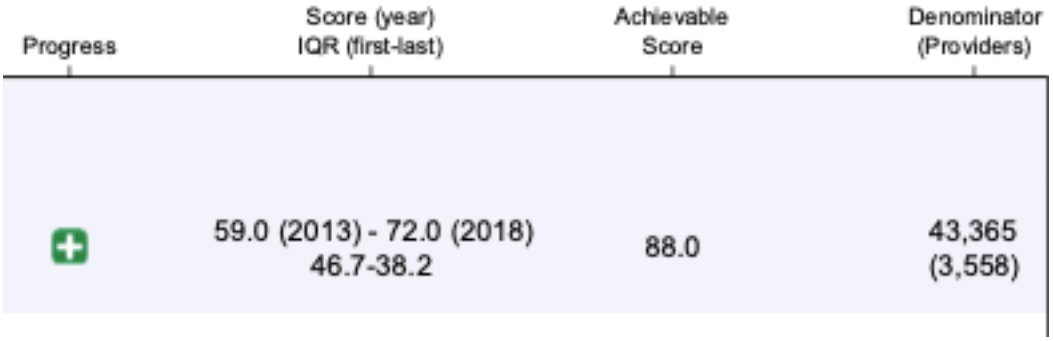
Figure D-1. Columns 1 and 2 of the Trend Summary Displays – Average Annual Percentage Change and Confidence Intervals



The scale varies by priority, depending on the highest value of an AAPC in each section. A point indicating a value represents the AAPC; a line through the point represents the confidence interval. Confidence intervals vary in length; a very narrow confidence interval should be interpreted as a value close to the AAPC itself. To ease interpretation of the display, AAPC values are framed positively such that regardless of the direction of improvement for a measure, a positive AAPC indicates improvement and a negative change indicates a decline in measure performance.

Displays summarize the results of trend analyses for each Key Indicator measure as improved ( ), declined ( ), and stable ( ), as shown in Figure D-2. To provide context to the trend results, the display also includes measure scores for the first and last year of the data series used for trending. Variation in measure performance among reporting providers is shown by the interquartile range (IQR) of provider rates for the first and last years of the data series used for trending. The score considered achievable as of the first year of measure implementation is presented as the national achievable score. The rightmost column in the display shows the number of denominator cases and reporting providers in the last year of the data series used for trend analysis.

Figure D-2. Remaining Columns of the Trend Summary Displays – Progress, Score, Year, Interquartile Range, Achievable Score, Denominator, Providers



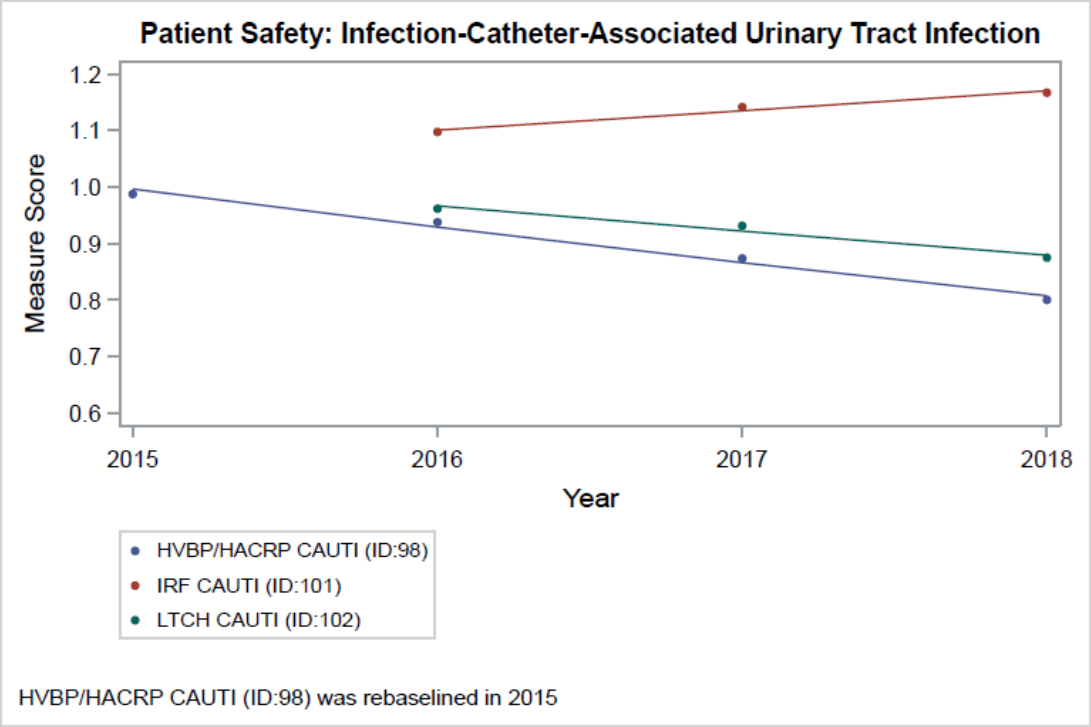
Key Indicator Measure Trend Plots

For each priority area, trend plots of individual Key Indicator measures are provided. These plots show annual data points for the entire period of record and a line of the predicted values for the log-linear regression used to estimate the AAPC, spanning only the annual data points that were part of the data series used for trend analysis.

Titles on each graph show the Key Indicator name across the top; performance periods appear across the bottom. A legend below the plot includes abbreviations for program names and Key Indicator measure identifiers. Notes include contextual information such as changes in specifications that necessitated truncation of some trend data series.

Measures constituting a Key Indicator are grouped together except when multiple plots are required for visual clarity.

Figure D-3. Example Key Indicator Measure Trend Plots

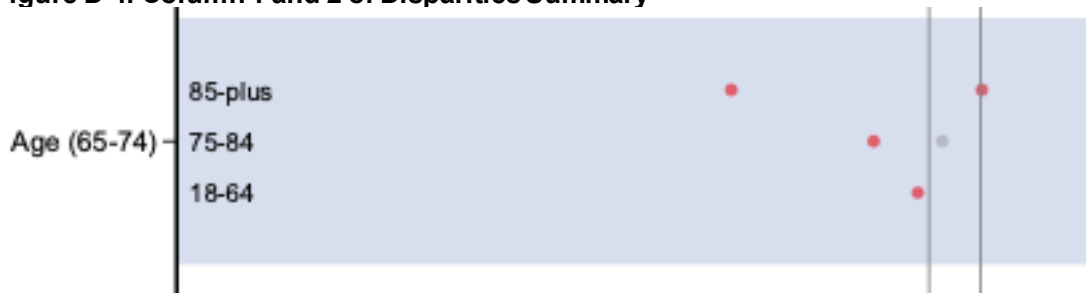


Disparities Summary

Disparities summary plots show the results of the pairwise disparities analysis described in Appendix C; results for Key Indicator measures are aggregated at the health care quality priority level by variable (e.g., age, sex). Column 1 of the display shows the variable and indicates the reference category in parentheses. Comparison groups are listed next. Comparisons were limited to the last year of the trending data series for each measure. Disparities were indicated when a z-test for proportions or a *t*-test for other measure types indicated a significant difference ($p < .05$) and the *relative* difference in scores between the reference and comparison groups was less than ¬10% or greater than 10%.

The graphic display shows the magnitude of the relative difference for each measure for which the pairwise comparison in the row could be calculated. Comparisons that were significant and reached the noted threshold for relative difference are shown in red; others, in gray. Regardless of the direction of measure improvement, significant disparities are always shown to the left of zero when the comparison group performs worse than the reference group and to the right of zero when the reference group performs worse than the comparison group.

Figure D-4. Column 1 and 2 of Disparities Summary



For each health care quality priority, the last three columns indicate the percentages of comparisons in which results are worse for the comparison group and worse for the reference group (including the number of measures associated with each percentage), as well as the total number of measures for which a comparison could be calculated. Following the Disparities Summary figure for each quality priority is a table indicating the disparity variables analyzed for a subset of Key Indicator measures. A full list of Key Indicator measures is available in Appendix B; analytic results are in Appendix E.

Patient Impact and Costs Avoided

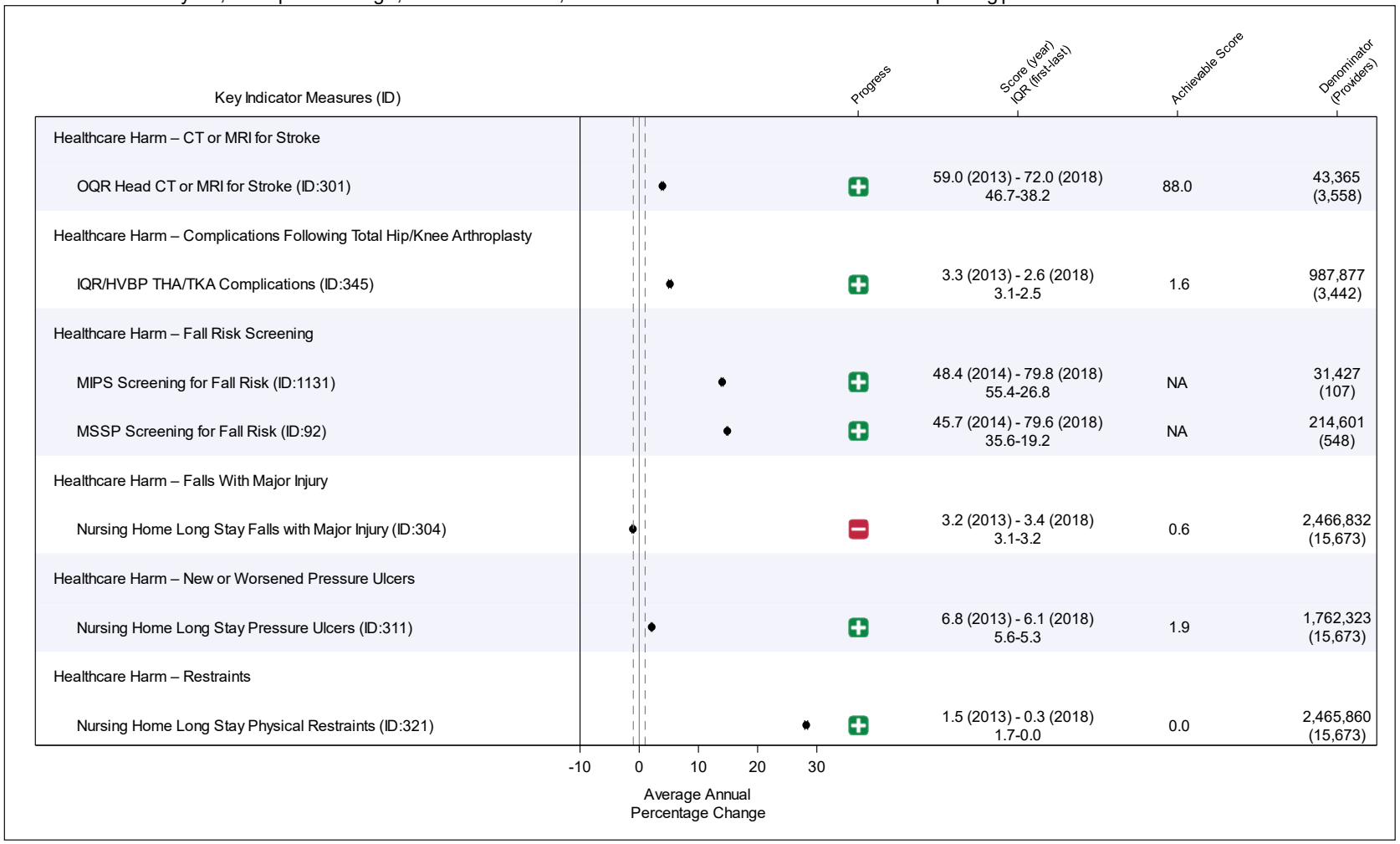
For each priority area, a list of measures with patient impact and cost-avoided analyses is provided. Patient impact is described in terms of patient-level events, such as achieving a positive outcome or avoiding an adverse event. Along with the Key Indicator and measure name, the table provides data on the time interval over which impact was calculated. Where available, the range of the unit cost of each event and the range of total costs avoided (patient impact multiplied by unit cost) are provided in the last two columns.

Health Care Quality Priority: Patient Safety

This health care quality priority has 12 Key Indicators with 19 quality measures for which an analysis was performed.

Figure D-5. Performance Summary for Patient Safety Key Indicator Measures

Results are presented as the average annual percentage change with 90% confidence intervals; indications of improved ( ), declined ( ), or stable ( ); measure score and year; interquartile range; achievable score; and number of denominator cases and reporting providers.



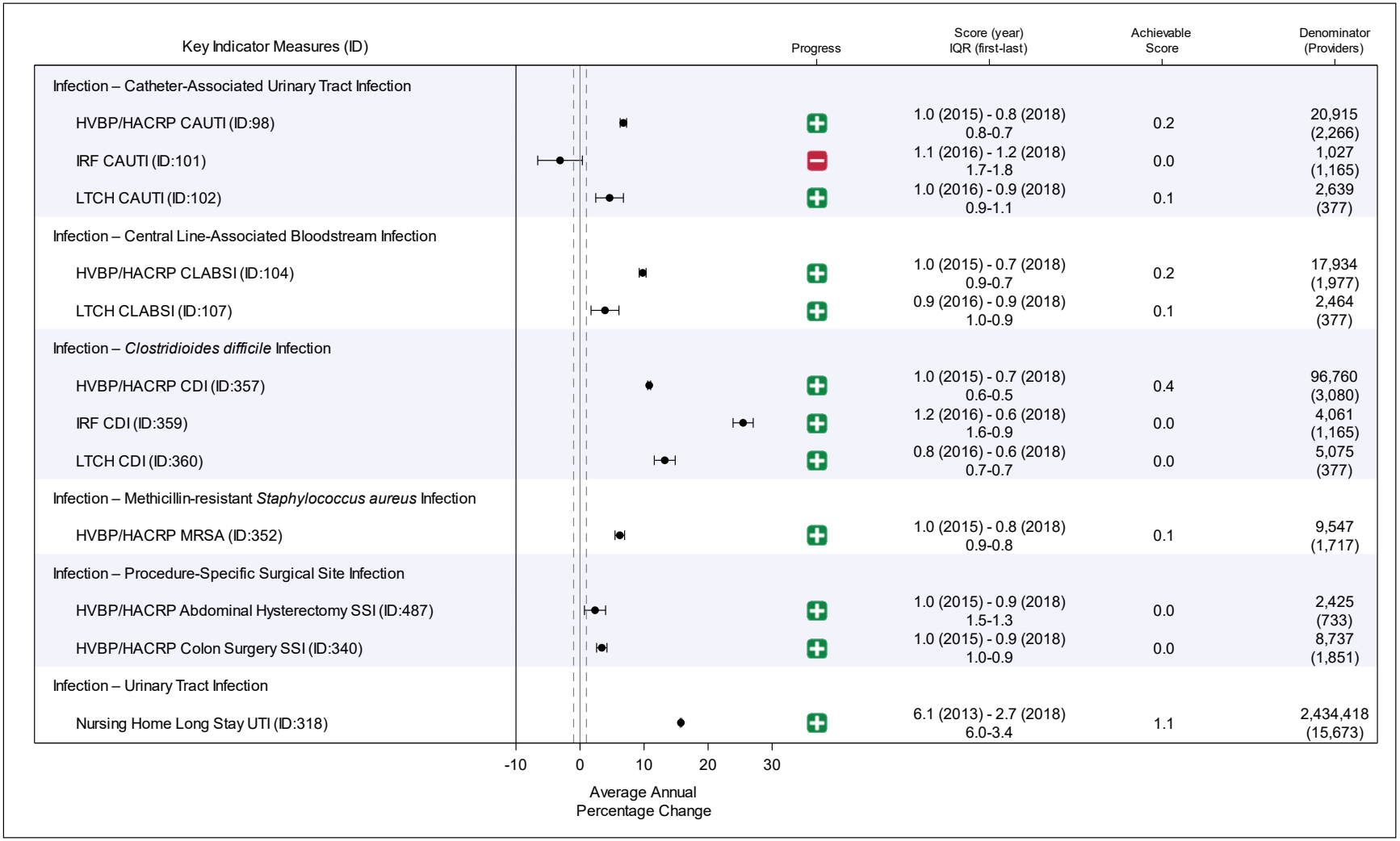
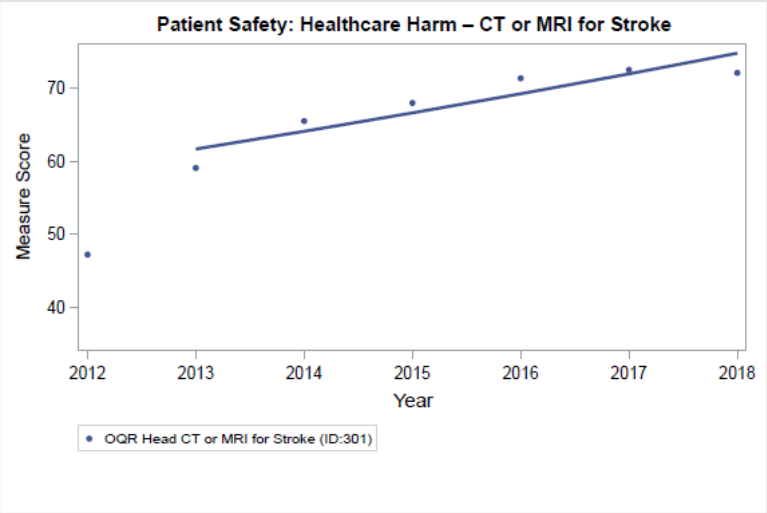
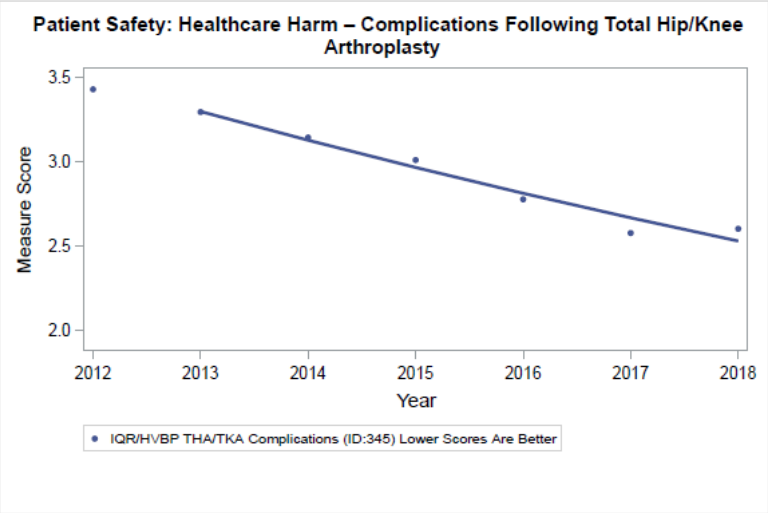
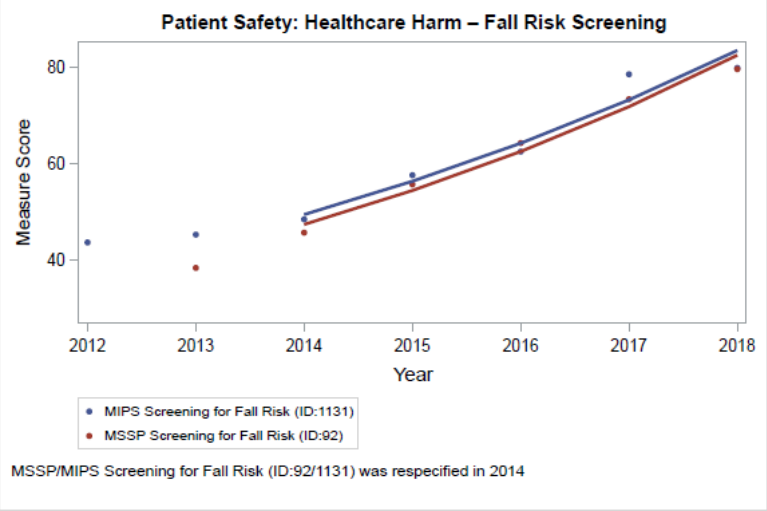

Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable
Score
Denominator
(Providers)
Infection – Catheter-Associated Urinary Tract Infection
HVBP/HACRP CAUTI (ID:98)
1.0 (2015) - 0.8 (2018)
0.8-0.7
0.2
20,915
(2,266)
IRF CAUTI (ID:101)
1.1 (2016) - 1.2 (2018)
1.7-1.8
0.0
1,027
(1,165)
LTCH CAUTI (ID:102)
1.0 (2016) - 0.9 (2018)
0.9-1.1
0.1
2,639
(377)
Infection – Central Line-Associated Bloodstream Infection
HVBP/HACRP CLABSI (ID:104)
1.0 (2015) - 0.7 (2018)
0.9-0.7
0.2
17,934
(1,977)
LTCH CLABSI (ID:107)
0.9 (2016) - 0.9 (2018)
1.0-0.9
0.1
2,464
(377)
Infection – Clostridioides difficile Infection
HVBP/HACRP CDI (ID:357)
1.0 (2015) - 0.7 (2018)
0.6-0.5
0.4
96,760
(3,080)
IRF CDI (ID:359)
1.2 (2016) - 0.6 (2018)
1.6-0.9
0.0
4,061
(1,165)
LTCH CDI (ID:360)
0.8 (2016) - 0.6 (2018)
0.7-0.7
0.0
5,075
(377)
Infection – Methicillin-resistant Staphylococcus aureus Infection
HVBP/HACRP MRSA (ID:352)
1.0 (2015) - 0.8 (2018)
0.9-0.8
0.1
9,547
(1,717)
Infection – Procedure-Specific Surgical Site Infection
HVBP/HACRP Abdominal Hysterectomy SSI (ID:487)
1.0 (2015) - 0.9 (2018)
1.5-1.3
0.0
2,425
(733)
HVBP/HACRP Colon Surgery SSI (ID:340)
1.0 (2015) - 0.9 (2018)
1.0-0.9
0.0
8,737
(1,851)
Infection – Urinary Tract Infection
Nursing Home Long Stay UTI (ID:318)
6.1 (2013) - 2.7 (2018)
6.0-3.4
1.1
2,434,418
(15,673)
-10
0
10
20
30
Average Annual
Percentage Change

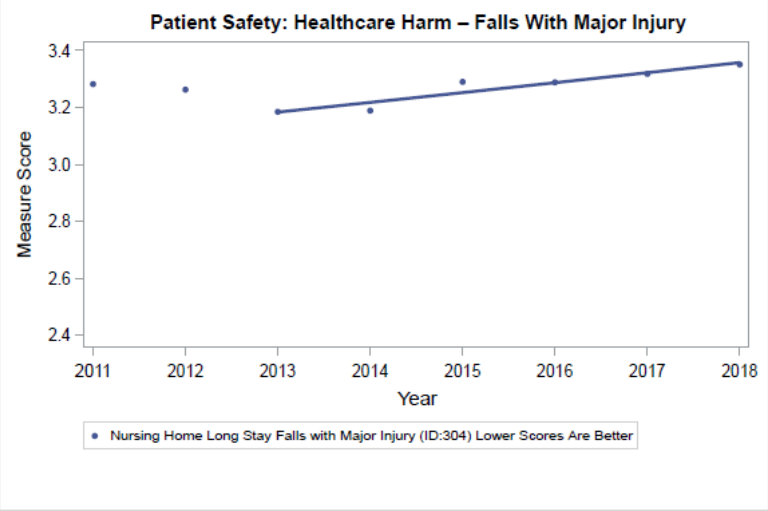
Figure D-6. Measure Trend Plots for Patient Safety Key Indicator Measures

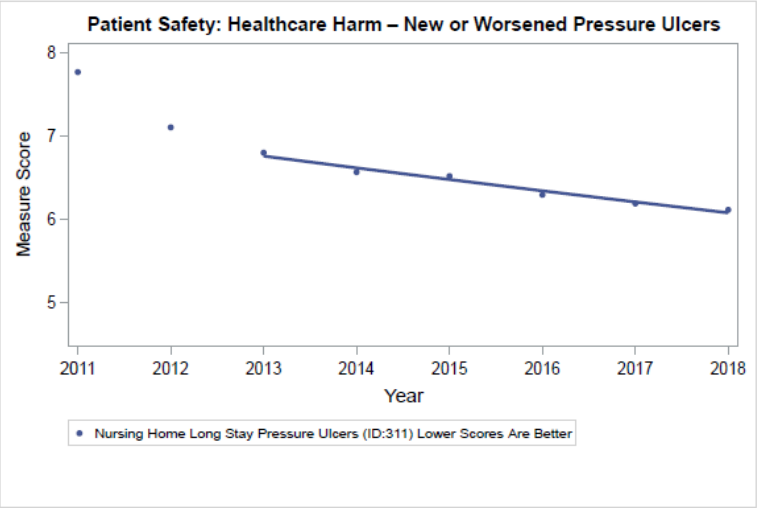
These trend plots present annual data points for the entire analytical period. Unless otherwise indicated, higher scores are better.

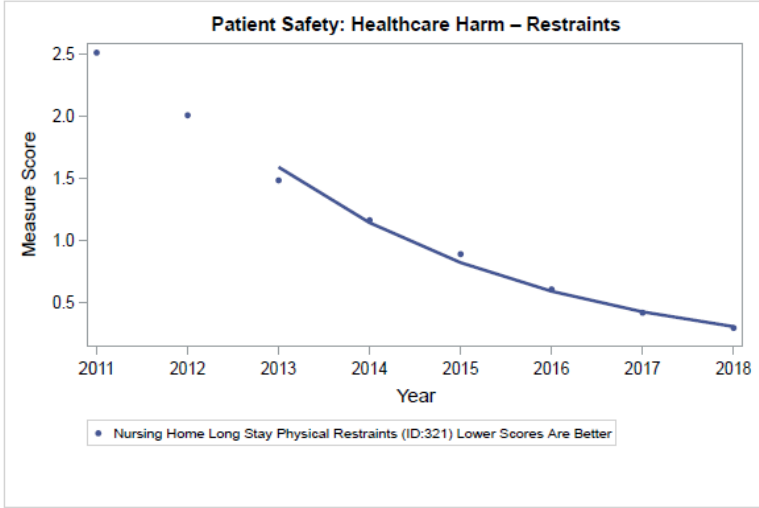


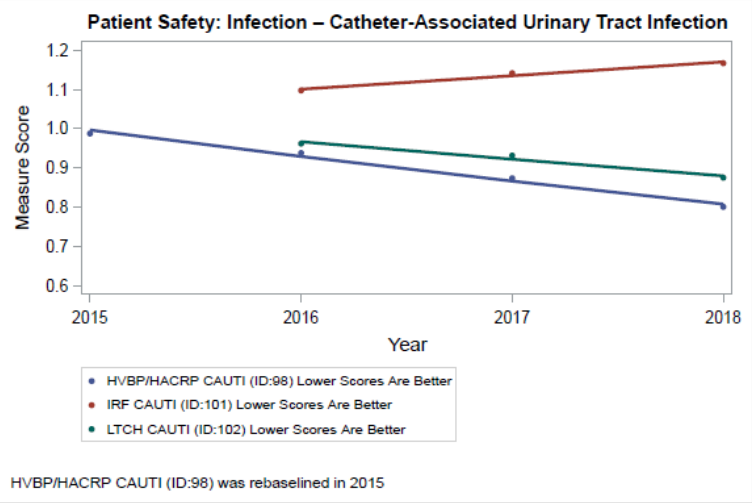


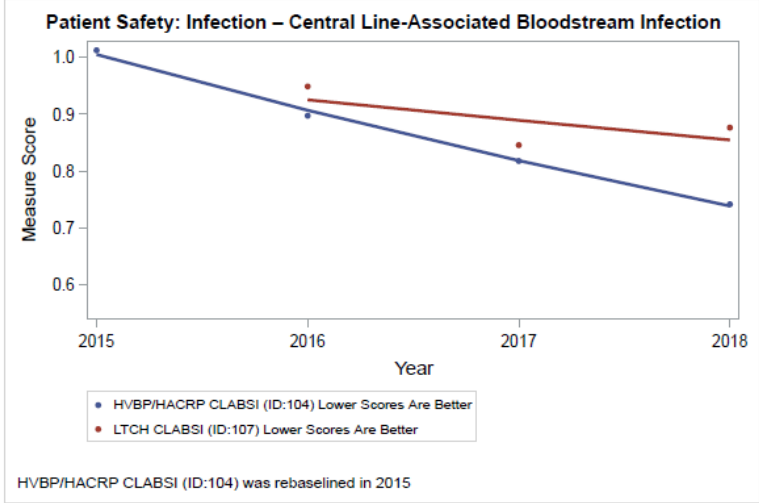


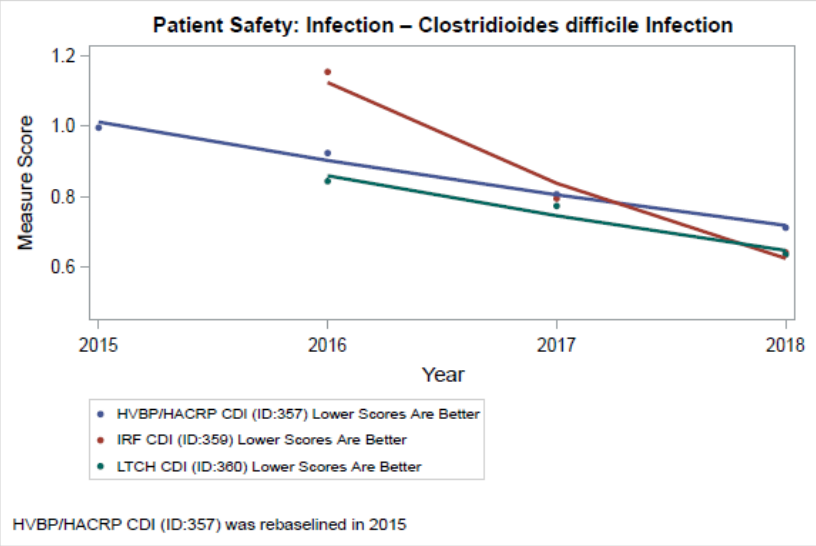



Patient Safety: Healthcare Harm – New or Worsened Pressure Ulcers
Measure Score
8
7
6
5
2011
2012
2013
2014
2015
2016
2017
2018
Year
Nursing Home Long Stay Pressure Ulcers (ID:311) Lower Scores Are Better

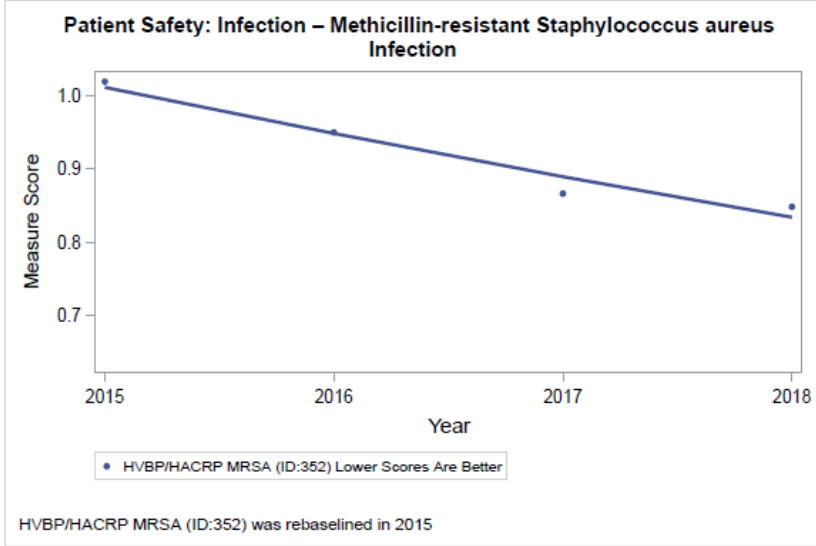

Patient Safety: Healthcare Harm – Restraints
Measure Score
2.5
2.0
1.5
1.0
0.5
2011
2012
2013
2014
2015
2016
2017
2018
Year
Nursing Home Long Stay Physical Restraints (ID:321) Lower Scores Are Better


Patient Safety: Infection – Catheter-Associated Urinary Tract Infection
Measure Score
1.2
1.1
1.0
0.9
0.8
0.7
0.6
2015
2016
2017
2018
Year
HVBP/HACRP CAUTI (ID:98) Lower Scores Are Better
IRF CAUTI (ID:101) Lower Scores Are Better
LTCH CAUTI (ID:102) Lower Scores Are Better
HVBP/HACRP CAUTI (ID:98) was rebaselined in 2015

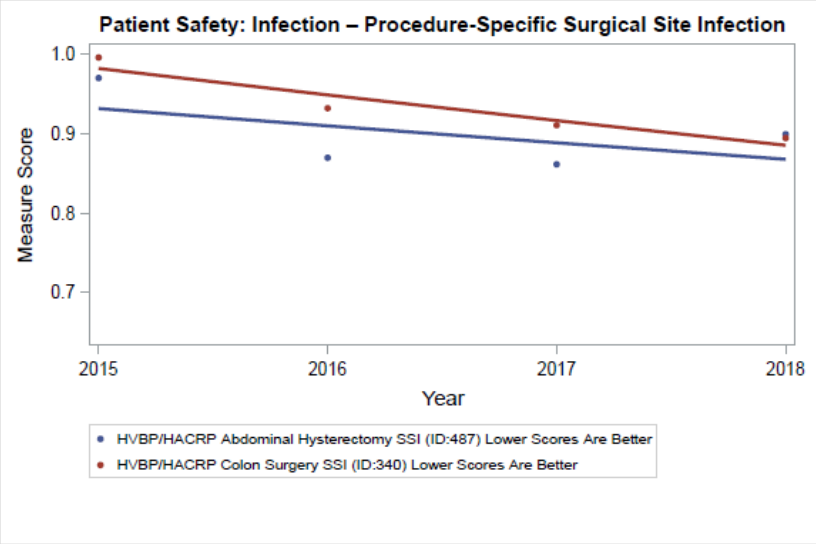

Patient Safety: Infection – Central Line-Associated Bloodstream Infection
Measure Score
1.0
0.9
0.8
0.7
0.6
2015
2016
2017
2018
Year
HVBP/HACRP CLABSI (ID:104) Lower Scores Are Better
LTCH CLABSI (ID:107) Lower Scores Are Better
HVBP/HACRP CLABSI (ID:104) was rebaselined in 2015



HVBP/HACRP CDI (ID:357) was rebaselined in 2015



HVBP/HACRP MRSA (ID:352) was rebaselined in 2015



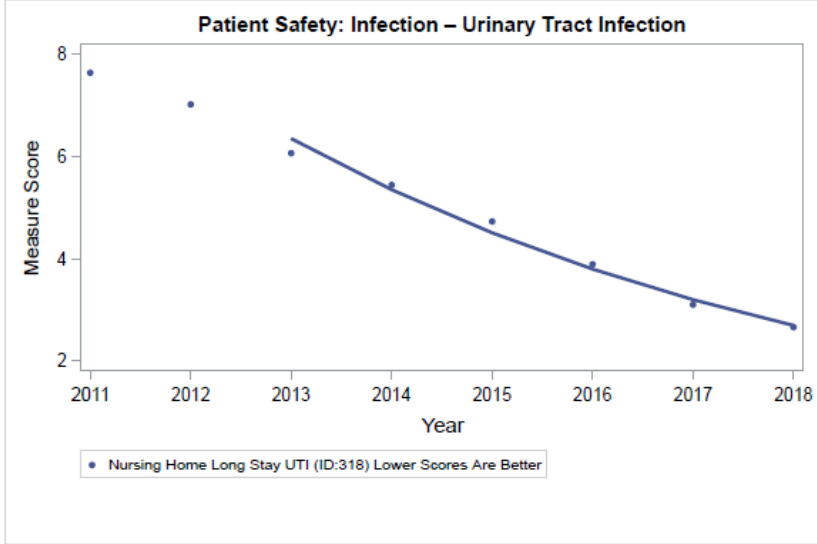
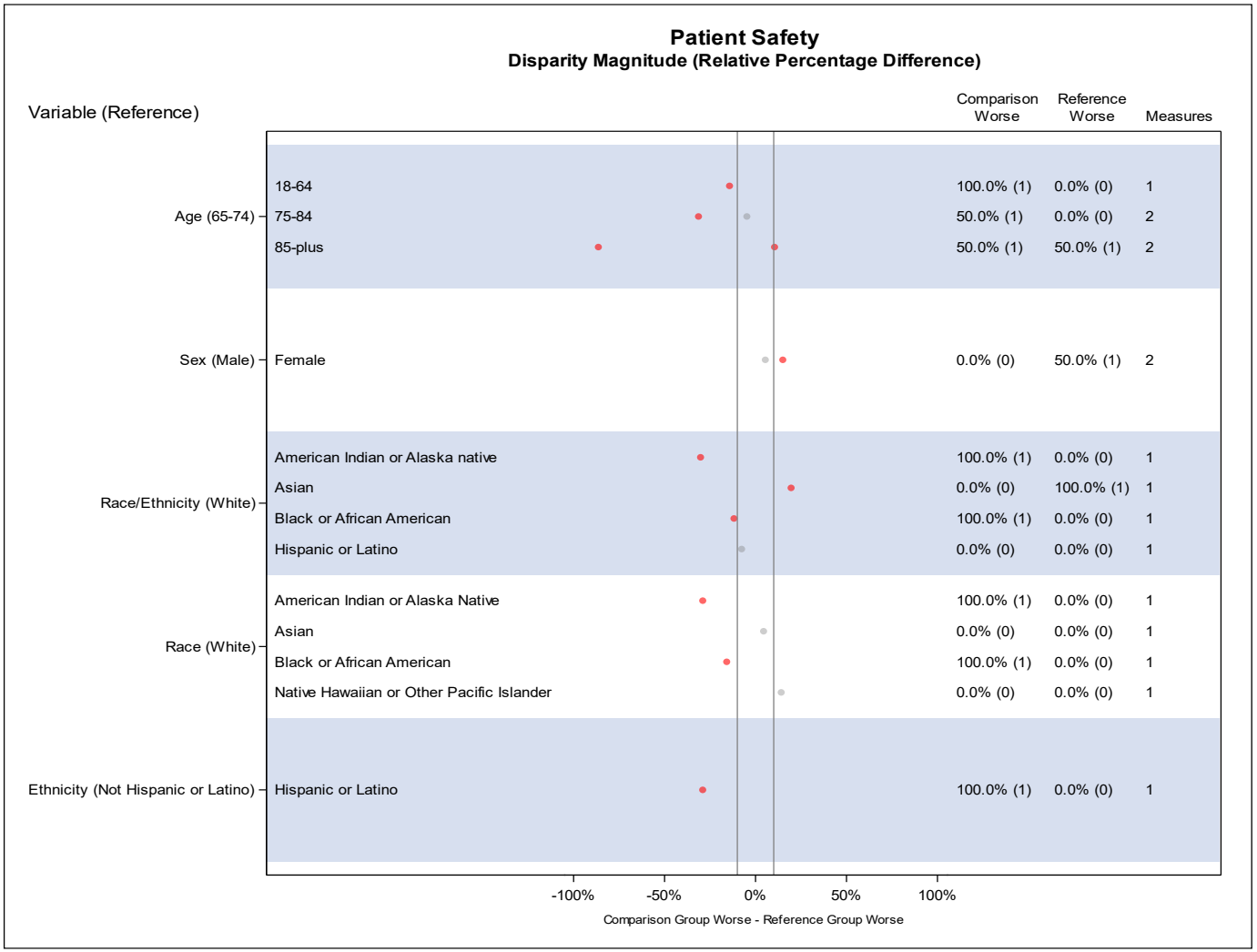


Figure D-7. Disparities Summary for Patient Safety Key Indicators

This figure presents the results of pairwise disparity analyses, aggregated by variable at the health care quality priority level and displayed as the magnitude of the relative difference for each measure. Significant comparisons are denoted in red; nonsignificant comparisons are denoted in gray. Disparity analyses were done for two of 19 Key Indicator measures; Table D-1 indicates the disparity variables analyzed for each.



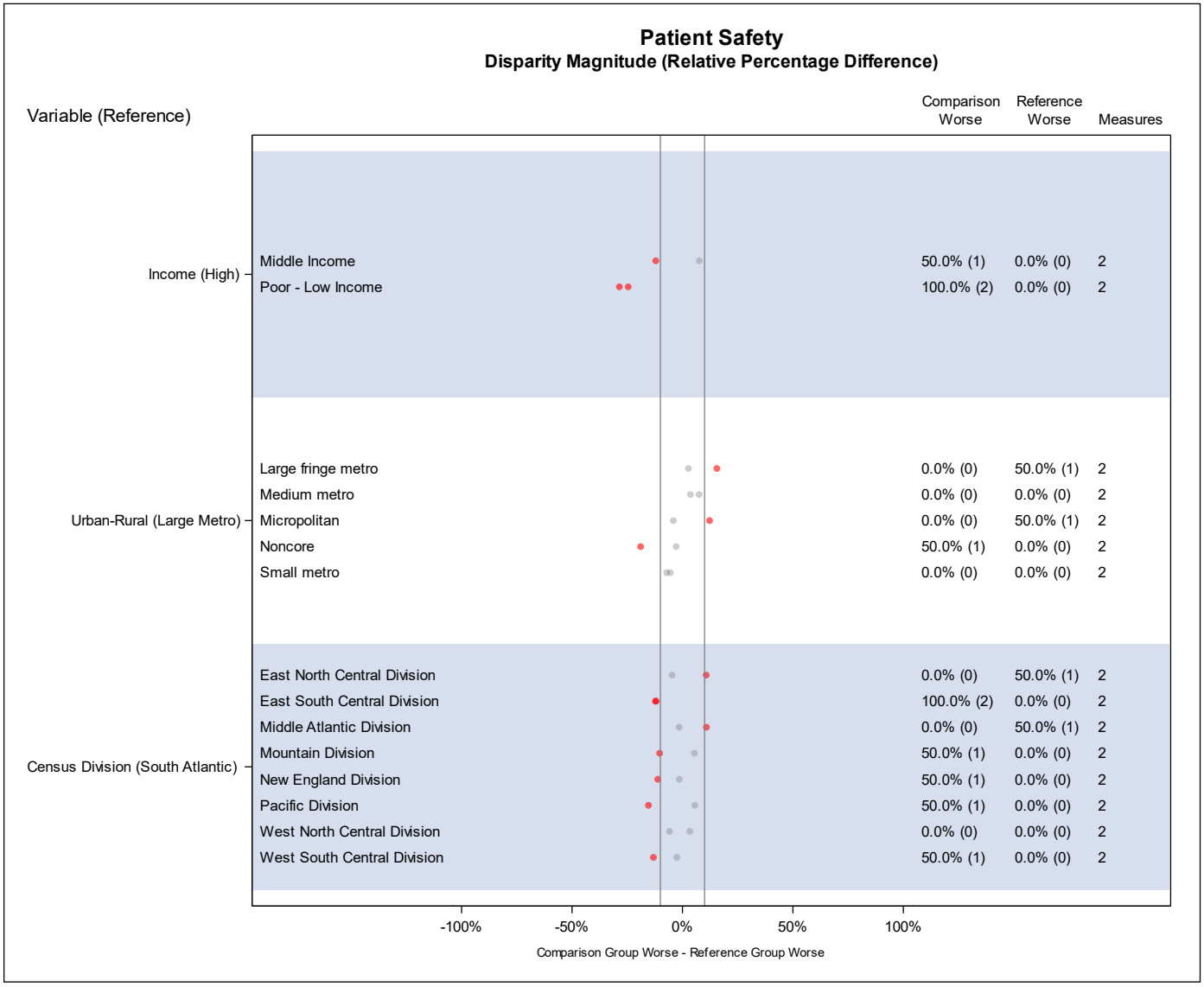

Patient Safety
Disparity Magnitude (Relative Percentage Difference)
Variable (Reference)
Comparison Worse
Reference Worse
Measures
Income (High)
Middle Income
50.0% (1)
0.0% (0)
2
Poor - Low Income
100.0% (2)
0.0% (0)
2
Urban-Rural (Large Metro)
Large fringe metro
0.0% (0)
50.0% (1)
2
Medium metro
0.0% (0)
0.0% (0)
2
Micropolitan
0.0% (0)
50.0% (1)
2
Noncore
50.0% (1)
0.0% (0)
2
Small metro
0.0% (0)
0.0% (0)
2
Census Division (South Atlantic)
East North Central Division
0.0% (0)
50.0% (1)
2
East South Central Division
100.0% (2)
0.0% (0)
2
Middle Atlantic Division
0.0% (0)
50.0% (1)
2
Mountain Division
50.0% (1)
0.0% (0)
2
New England Division
50.0% (1)
0.0% (0)
2
Pacific Division
50.0% (1)
0.0% (0)
2
West North Central Division
0.0% (0)
0.0% (0)
2
West South Central Division
50.0% (1)
0.0% (0)
2
-100%
-50%
0%
50%
100%
Comparison Group Worse - Reference Group Worse

Table D-1. Disparities Analyses Conducted for 2 of 19 Patient Safety Key Indicator Measures

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
OP-23: Head CT or MRI Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients who Received Head CT or MRI Scan Interpretation Within 45 Minutes of ED Arrival	301	0661	Hospital Outpatient Quality Reporting	Healthcare Harm – CT or MRI for Stroke	Y	Y	Y	Y	N	Y	Y
THA/TKA Complications: Hospital-level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and total knee arthroplasty (TKA)	345	1550	Hospital Inpatient Quality Reporting & Hospital Value-Based Purchasing	Healthcare Harm – Complications Following Total Hip/Knee Arthroplasty	Y	Y	Y	Y	N	Y	Y

Table D-2. Patient Impact and Costs Avoided in Patient Safety

Patient impact calculated in terms of patient-level events; costs avoided calculated as the unit cost of each patient-level event and the range of total costs avoided.

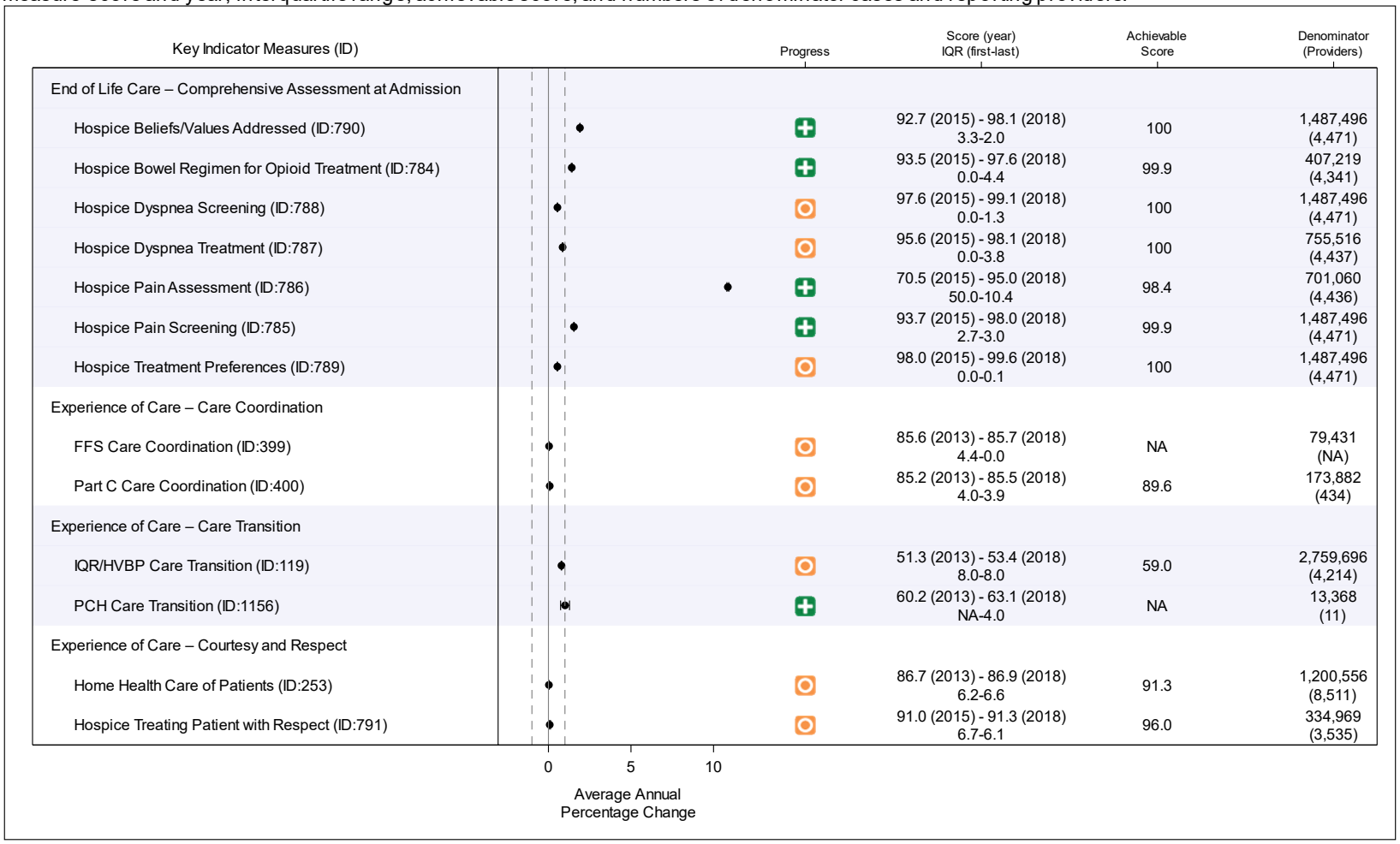
Measure	Patient Impact	Annual Data Points	Unit Cost	Costs Avoided
Healthcare Harm – CT or MRI for Stroke				
OQR Head CT or MRI for Stroke (ID: 301)	19,829 patients	6 years	NA	NA
Healthcare Harm – Complications Following Total Hip/Knee Arthroplasty				
IQR/HVBP THA/TKA Complications (ID: 345)	–6,863 admissions	6 years	NA	NA
Infection – Catheter-Associated Urinary Tract Infection				
LTCH CAUTI (ID: 102)	–532 infections	3 years	$523–$7,482	$300,000–$4,000,000
HVBP/HACRP CAUTI (ID: 98)	–8,344 infections	4 years	$523–$7,482	$4,400,000–$62,400,000
Infection – Central Line–Associated Bloodstream Infection				
LTCH CLABSI (ID: 107)	–728 infections	3 years	$4,460–$26,760	$3,200,000–$19,500,000
HVBP/HACRP CLABSI (ID: 104)	–9,912 infections	4 years	$4,460–$26,760	$44,200,000–$265,200,000
Infection – *Clostridioides difficile* Infection				
IRF CDI (ID: 359)	–2,248 infections	3 years	$2,002–$19,305	$4,500,000–$43,400,000
LTCH CDI (ID: 360)	–3,054 infections	3 years	$2,002–$19,305	$6,100,000–$59,000,000
HVBP/HACRP CDI (ID: 357)	–55,222 infections	4 years	$2,002–$19,305	$110,600,000–$1,066,100,000
Infection – Methicillin-resistant *Staphylococcus aureus* Infection				
HVBP/HACRP MRSA (ID: 352)	–3,146 infections	4 years	NA	NA
Infection – Procedure-Specific Surgical Site Infection				
HVBP/HACRP Abdominal Hysterectomy SSI (ID: 487)	–901 infections	4 years	NA	NA
HVBP/HACRP Colon Surgery SSI (ID: 340)	–2,274 infections	4 years	NA	NA

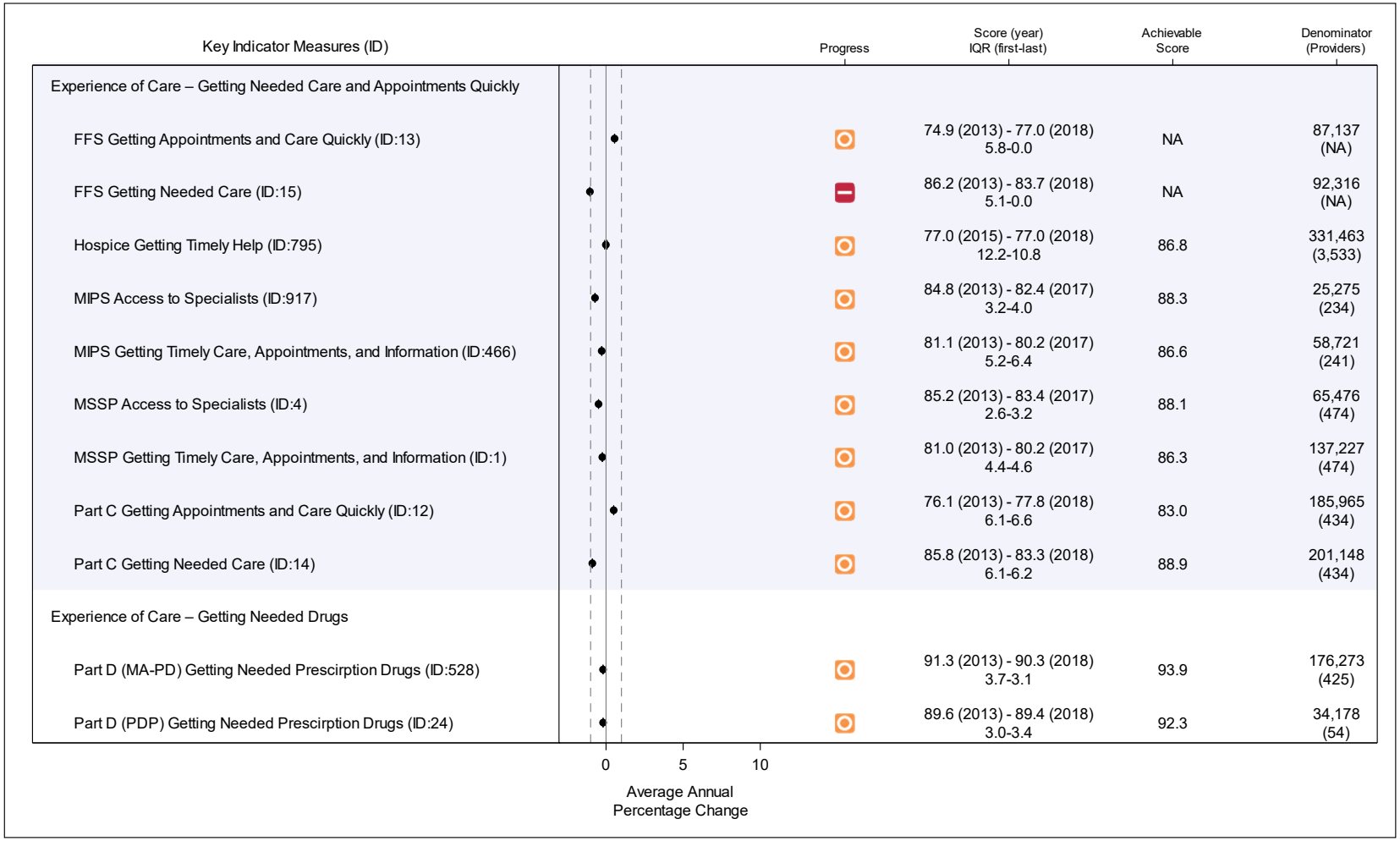
Health Care Quality Priority: Person and Family Engagement

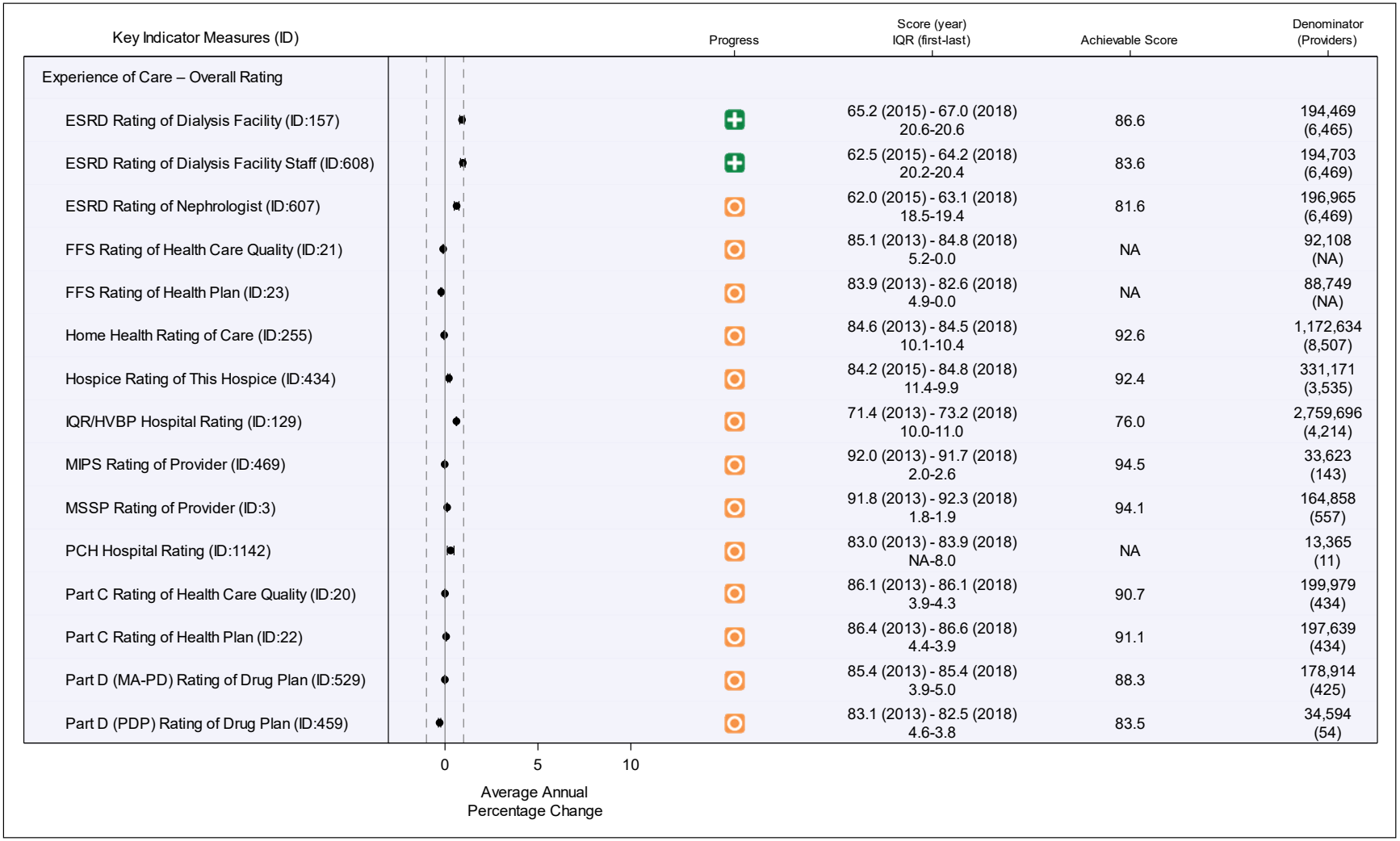
This health care quality priority has 13 Key Indicators with 68 quality measures for which an analysis was performed.

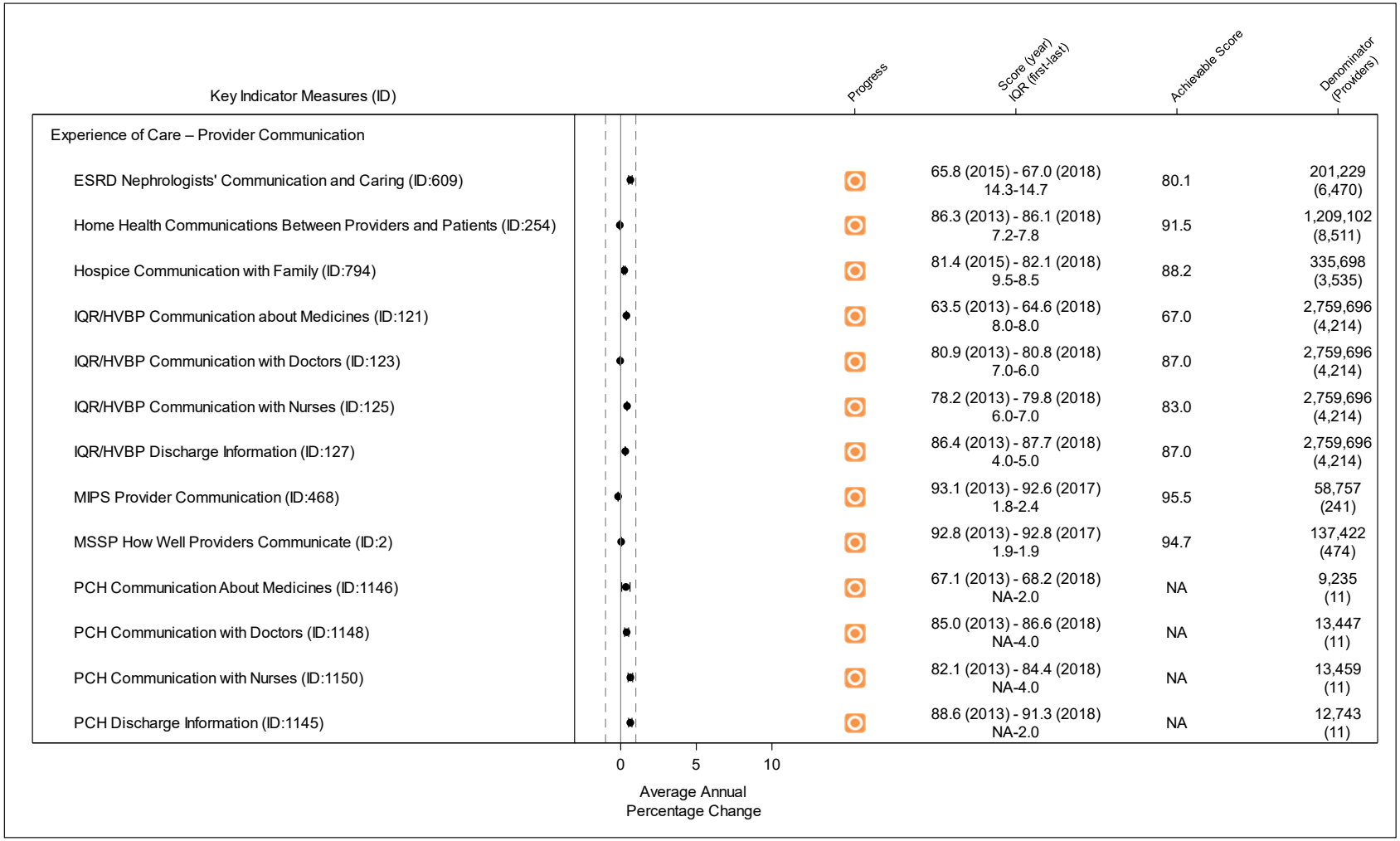
Figure D-8. Performance Summary for Person and Family Engagement Key Indicator Measures

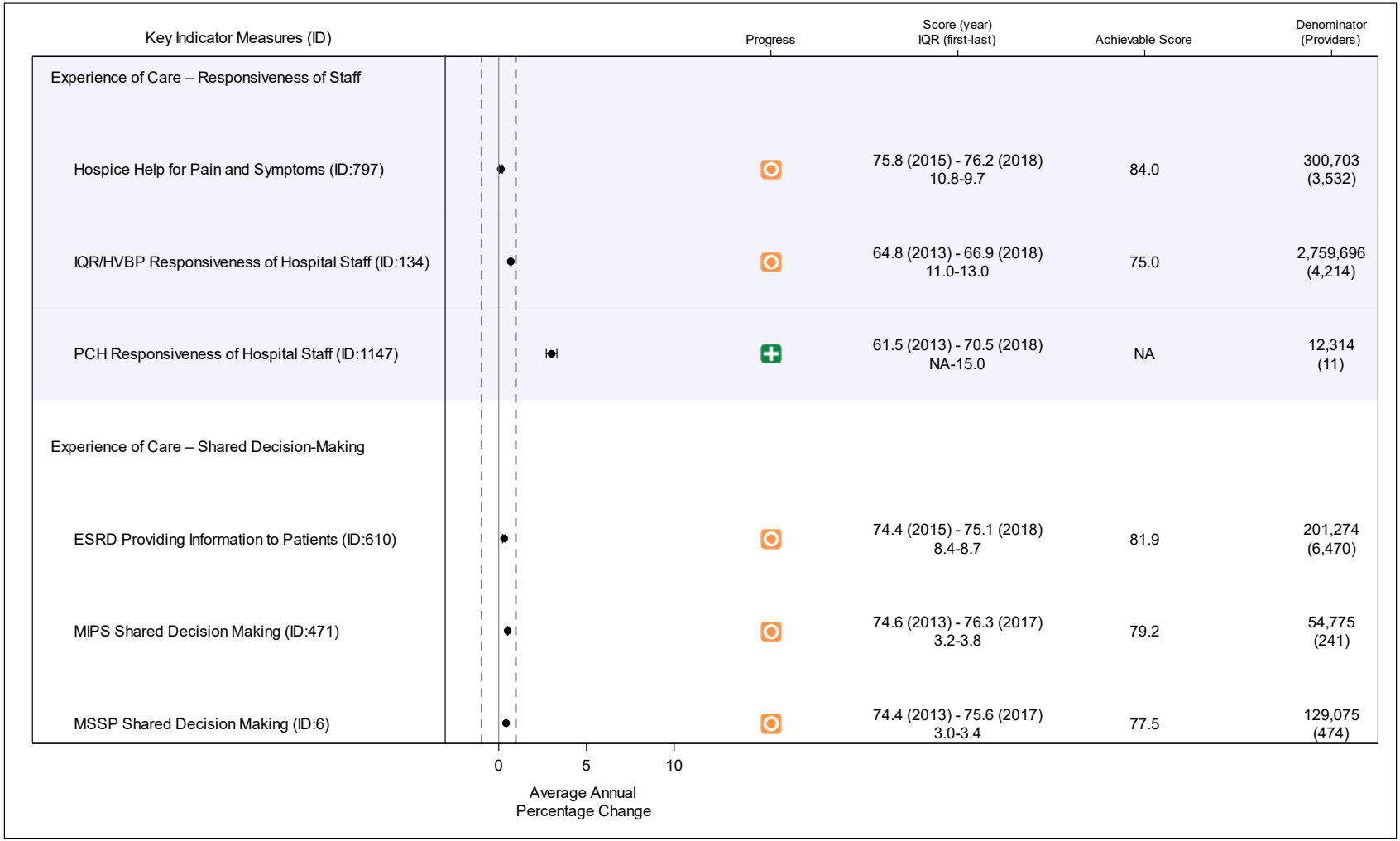
Results are presented as the average annual percentage with 90% confidence intervals, indications of improved ( ), declined ( ), or stable ( ), measure score and year, interquartile range, achievable score, and numbers of denominator cases and reporting providers.




Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable
Score
Denominator
(Providers)
Experience of Care – Getting Needed Care and Appointments Quickly
FFS Getting Appointments and Care Quickly (ID:13)
74.9 (2013) - 77.0 (2018)
5.8-0.0
NA
87,137
(NA)
FFS Getting Needed Care (ID:15)
86.2 (2013) - 83.7 (2018)
5.1-0.0
NA
92,316
(NA)
Hospice Getting Timely Help (ID:795)
77.0 (2015) - 77.0 (2018)
12.2-10.8
86.8
331,463
(3,533)
MIPS Access to Specialists (ID:917)
84.8 (2013) - 82.4 (2017)
3.2-4.0
88.3
25,275
(234)
MIPS Getting Timely Care, Appointments, and Information (ID:466)
81.1 (2013) - 80.2 (2017)
5.2-6.4
86.6
58,721
(241)
MSSP Access to Specialists (ID:4)
85.2 (2013) - 83.4 (2017)
2.6-3.2
88.1
65,476
(474)
MSSP Getting Timely Care, Appointments, and Information (ID:1)
81.0 (2013) - 80.2 (2017)
4.4-4.6
86.3
137,227
(474)
Part C Getting Appointments and Care Quickly (ID:12)
76.1 (2013) - 77.8 (2018)
6.1-6.6
83.0
185,965
(434)
Part C Getting Needed Care (ID:14)
85.8 (2013) - 83.3 (2018)
6.1-6.2
88.9
201,148
(434)
Experience of Care – Getting Needed Drugs
Part D (MA-PD) Getting Needed Prescirption Drugs (ID:528)
91.3 (2013) - 90.3 (2018)
3.7-3.1
93.9
176,273
(425)
Part D (PDP) Getting Needed Prescirption Drugs (ID:24)
89.6 (2013) - 89.4 (2018)
3.0-3.4
92.3
34,178
(54)
0
5
10
Average Annual
Percentage Change


Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable Score
Denominator
(Providers)
Experience of Care – Overall Rating
ESRD Rating of Dialysis Facility (ID:157)
65.2 (2015) - 67.0 (2018)
20.6-20.6
86.6
194,469
(6,465)
ESRD Rating of Dialysis Facility Staff (ID:608)
62.5 (2015) - 64.2 (2018)
20.2-20.4
83.6
194,703
(6,469)
ESRD Rating of Nephrologist (ID:607)
62.0 (2015) - 63.1 (2018)
18.5-19.4
81.6
196,965
(6,469)
FFS Rating of Health Care Quality (ID:21)
85.1 (2013) - 84.8 (2018)
5.2-0.0
NA
92,108
(NA)
FFS Rating of Health Plan (ID:23)
83.9 (2013) - 82.6 (2018)
4.9-0.0
NA
88,749
(NA)
Home Health Rating of Care (ID:255)
84.6 (2013) - 84.5 (2018)
10.1-10.4
92.6
1,172,634
(8,507)
Hospice Rating of This Hospice (ID:434)
84.2 (2015) - 84.8 (2018)
11.4-9.9
92.4
331,171
(3,535)
IQR/HVBP Hospital Rating (ID:129)
71.4 (2013) - 73.2 (2018)
10.0-11.0
76.0
2,759,696
(4,214)
MIPS Rating of Provider (ID:469)
92.0 (2013) - 91.7 (2018)
2.0-2.6
94.5
33,623
(143)
MSSP Rating of Provider (ID:3)
91.8 (2013) - 92.3 (2018)
1.8-1.9
94.1
164,858
(557)
PCH Hospital Rating (ID:1142)
83.0 (2013) - 83.9 (2018)
NA-8.0
NA
13,365
(11)
Part C Rating of Health Care Quality (ID:20)
86.1 (2013) - 86.1 (2018)
3.9-4.3
90.7
199,979
(434)
Part C Rating of Health Plan (ID:22)
86.4 (2013) - 86.6 (2018)
4.4-3.9
91.1
197,639
(434)
Part D (MA-PD) Rating of Drug Plan (ID:529)
85.4 (2013) - 85.4 (2018)
3.9-5.0
88.3
178,914
(425)
Part D (PDP) Rating of Drug Plan (ID:459)
83.1 (2013) - 82.5 (2018)
4.6-3.8
83.5
34,594
(54)
0
5
10
Average Annual
Percentage Change


Key Indicator Measures (ID)
Progress
Score (year) IQR (first-last)
Achievable Score
Denominator (Providers)
Experience of Care – Provider Communication
ESRD Nephrologists' Communication and Caring (ID:609)
65.8 (2015) - 67.0 (2018) 14.3-14.7
80.1
201,229 (6,470)
Home Health Communications Between Providers and Patients (ID:254)
86.3 (2013) - 86.1 (2018) 7.2-7.8
91.5
1,209,102 (8,511)
Hospice Communication with Family (ID:794)
81.4 (2015) - 82.1 (2018) 9.5-8.5
88.2
335,698 (3,535)
IQR/HVBP Communication about Medicines (ID:121)
63.5 (2013) - 64.6 (2018) 8.0-8.0
67.0
2,759,696 (4,214)
IQR/HVBP Communication with Doctors (ID:123)
80.9 (2013) - 80.8 (2018) 7.0-6.0
87.0
2,759,696 (4,214)
IQR/HVBP Communication with Nurses (ID:125)
78.2 (2013) - 79.8 (2018) 6.0-7.0
83.0
2,759,696 (4,214)
IQR/HVBP Discharge Information (ID:127)
86.4 (2013) - 87.7 (2018) 4.0-5.0
87.0
2,759,696 (4,214)
MIPS Provider Communication (ID:468)
93.1 (2013) - 92.6 (2017) 1.8-2.4
95.5
58,757 (241)
MSSP How Well Providers Communicate (ID:2)
92.8 (2013) - 92.8 (2017) 1.9-1.9
94.7
137,422 (474)
PCH Communication About Medicines (ID:1146)
67.1 (2013) - 68.2 (2018) NA-2.0
NA
9,235 (11)
PCH Communication with Doctors (ID:1148)
85.0 (2013) - 86.6 (2018) NA-4.0
NA
13,447 (11)
PCH Communication with Nurses (ID:1150)
82.1 (2013) - 84.4 (2018) NA-4.0
NA
13,459 (11)
PCH Discharge Information (ID:1145)
88.6 (2013) - 91.3 (2018) NA-2.0
NA
12,743 (11)
0
5
10
Average Annual Percentage Change


Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable Score
Denominator
(Providers)
Experience of Care – Responsiveness of Staff
Hospice Help for Pain and Symptoms (ID:797)
75.8 (2015) - 76.2 (2018)
10.8-9.7
84.0
300,703
(3,532)
IQR/HVBP Responsiveness of Hospital Staff (ID:134)
64.8 (2013) - 66.9 (2018)
11.0-13.0
75.0
2,759,696
(4,214)
PCH Responsiveness of Hospital Staff (ID:1147)
61.5 (2013) - 70.5 (2018)
NA-15.0
NA
12,314
(11)
Experience of Care – Shared Decision-Making
ESRD Providing Information to Patients (ID:610)
74.4 (2015) - 75.1 (2018)
8.4-8.7
81.9
201,274
(6,470)
MIPS Shared Decision Making (ID:471)
74.6 (2013) - 76.3 (2017)
3.2-3.8
79.2
54,775
(241)
MSSP Shared Decision Making (ID:6)
74.4 (2013) - 75.6 (2017)
3.0-3.4
77.5
129,075
(474)
0
5
10
Average Annual
Percentage Change

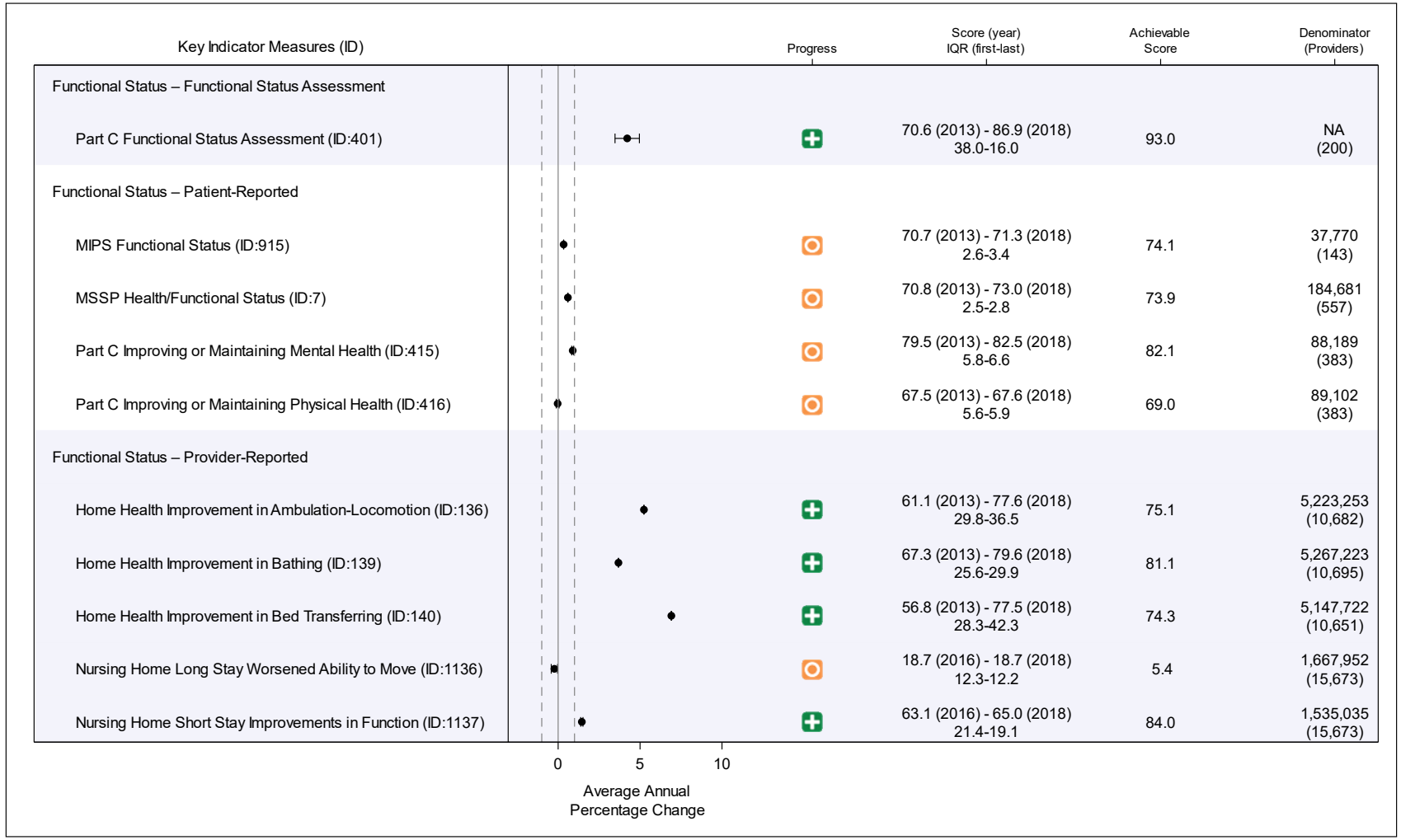
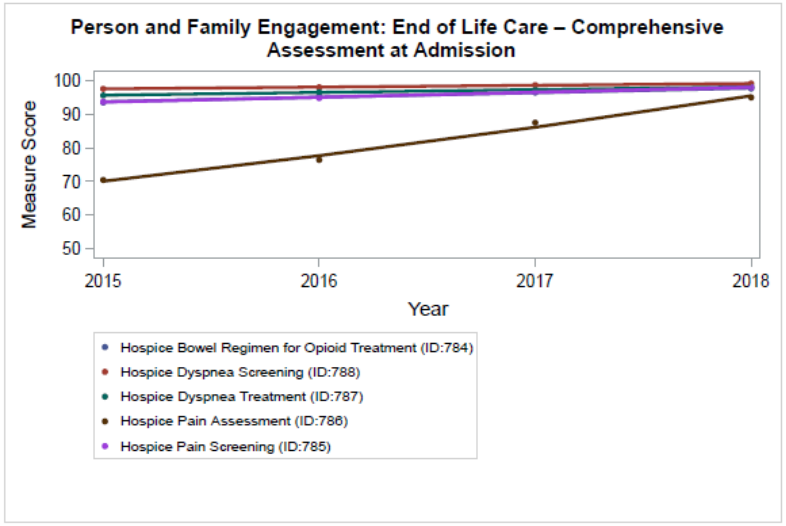
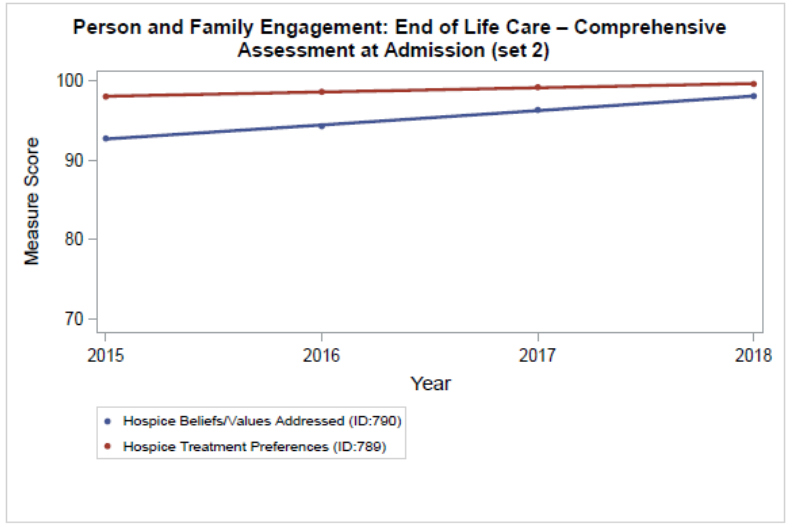
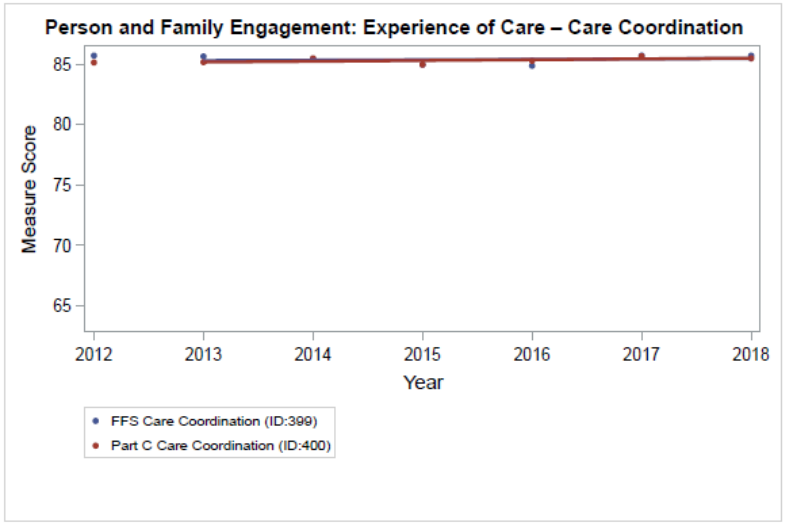

Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable
Score
Denominator
(Providers)
Functional Status – Functional Status Assessment
Part C Functional Status Assessment (ID:401)
70.6 (2013) - 86.9 (2018)
38.0-16.0
93.0
NA
(200)
Functional Status – Patient-Reported
MIPS Functional Status (ID:915)
70.7 (2013) - 71.3 (2018)
2.6-3.4
74.1
37,770
(143)
MSSP Health/Functional Status (ID:7)
70.8 (2013) - 73.0 (2018)
2.5-2.8
73.9
184,681
(557)
Part C Improving or Maintaining Mental Health (ID:415)
79.5 (2013) - 82.5 (2018)
5.8-6.6
82.1
88,189
(383)
Part C Improving or Maintaining Physical Health (ID:416)
67.5 (2013) - 67.6 (2018)
5.6-5.9
69.0
89,102
(383)
Functional Status – Provider-Reported
Home Health Improvement in Ambulation-Locomotion (ID:136)
61.1 (2013) - 77.6 (2018)
29.8-36.5
75.1
5,223,253
(10,682)
Home Health Improvement in Bathing (ID:139)
67.3 (2013) - 79.6 (2018)
25.6-29.9
81.1
5,267,223
(10,695)
Home Health Improvement in Bed Transferring (ID:140)
56.8 (2013) - 77.5 (2018)
28.3-42.3
74.3
5,147,722
(10,651)
Nursing Home Long Stay Worsened Ability to Move (ID:1136)
18.7 (2016) - 18.7 (2018)
12.3-12.2
5.4
1,667,952
(15,673)
Nursing Home Short Stay Improvements in Function (ID:1137)
63.1 (2016) - 65.0 (2018)
21.4-19.1
84.0
1,535,035
(15,673)
0
5
10
Average Annual
Percentage Change

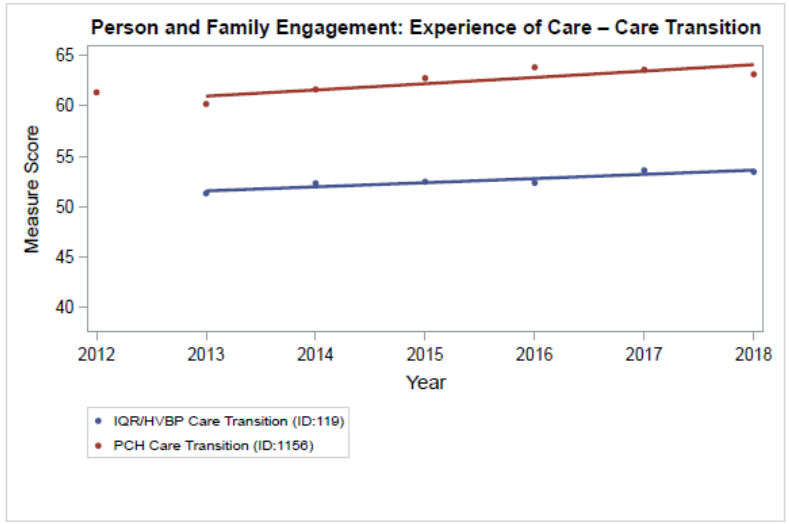
Figure D-9. Measure Trend Plots for Person and Family Engagement Key Indicator Measures

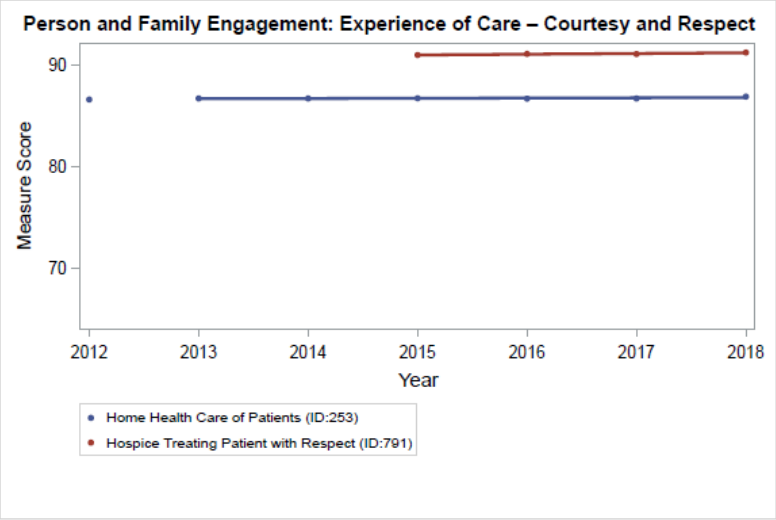
These trend plots present annual data points for the entire analytical period. Unless otherwise indicated, higher scores are better.

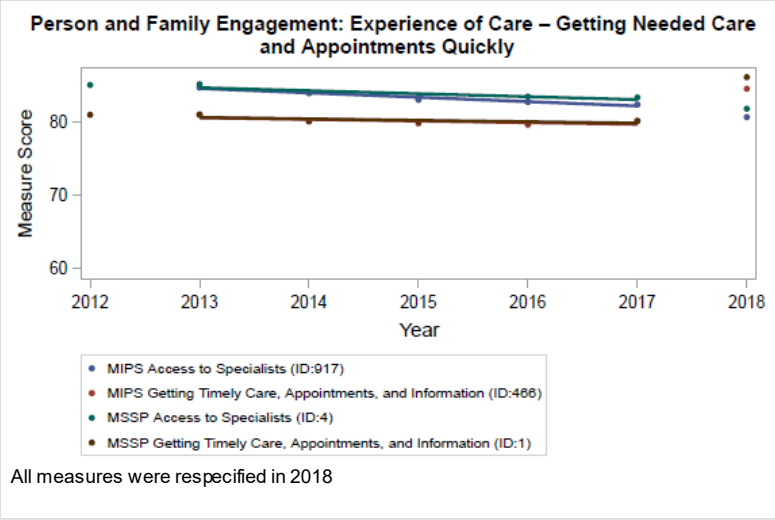




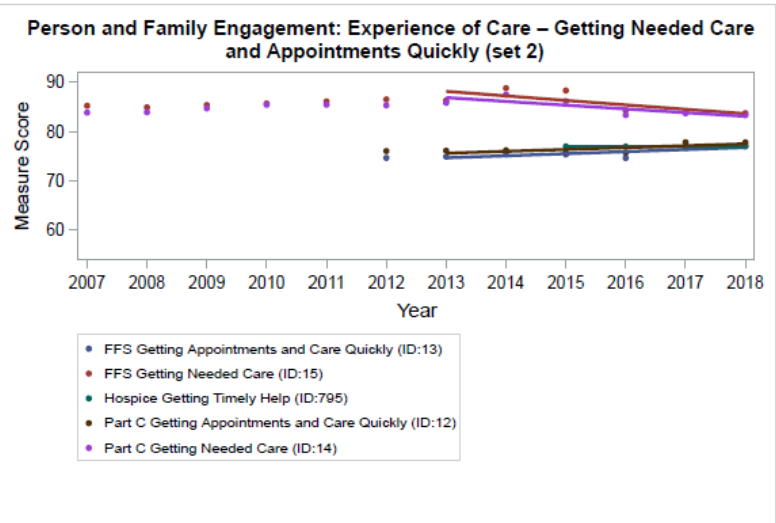


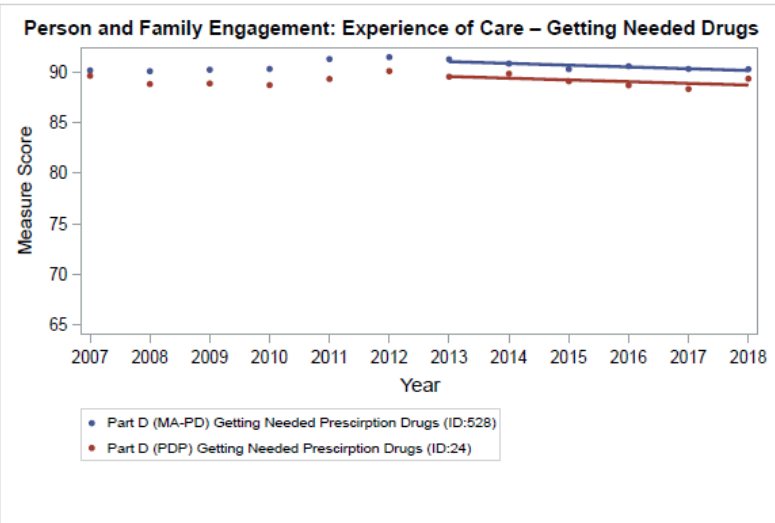


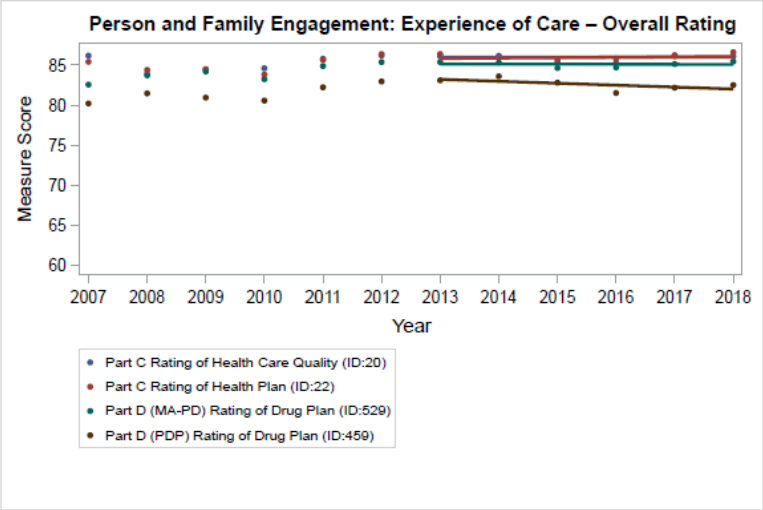


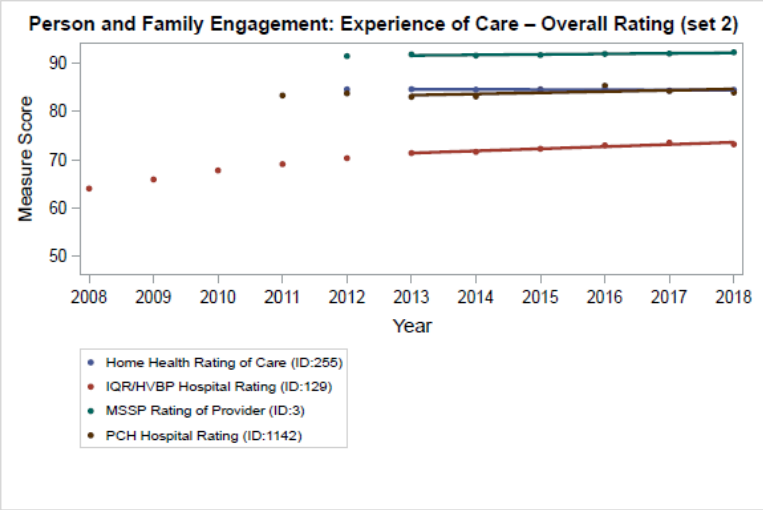


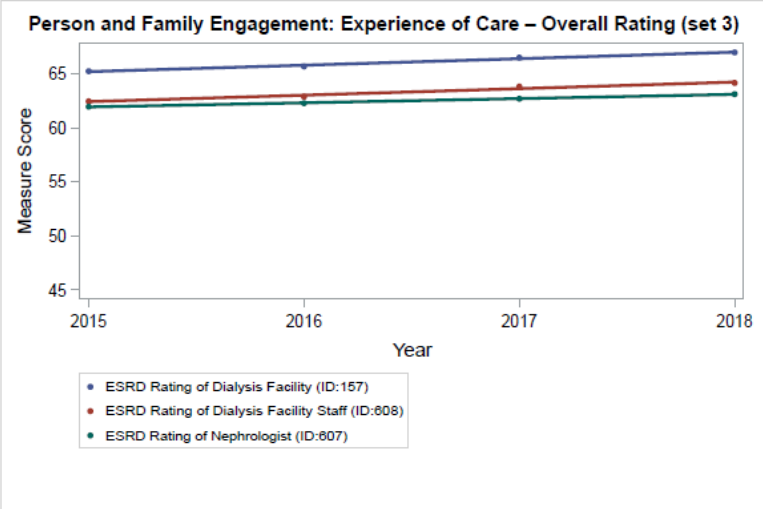
All measures were respecified in 2018

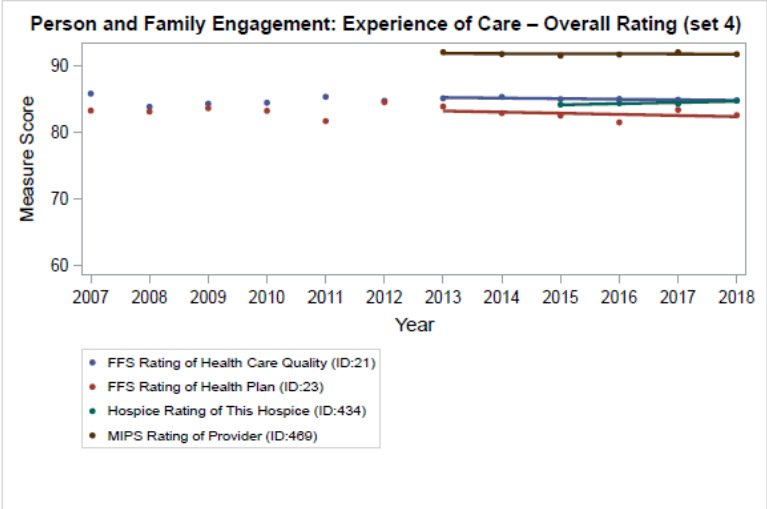


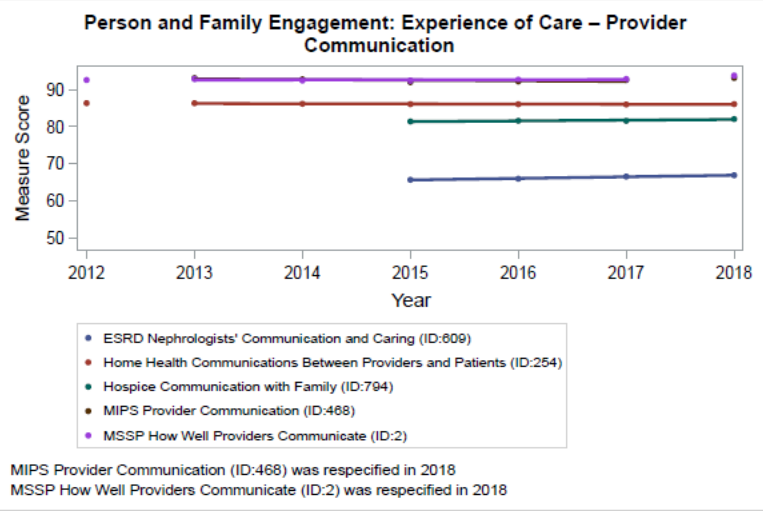



Person and Family Engagement: Experience of Care – Overall Rating
Measure Score
Year
Part C Rating of Health Care Quality (ID:20)
Part C Rating of Health Plan (ID:22)
Part D (MA-PD) Rating of Drug Plan (ID:529)
Part D (PDP) Rating of Drug Plan (ID:459)

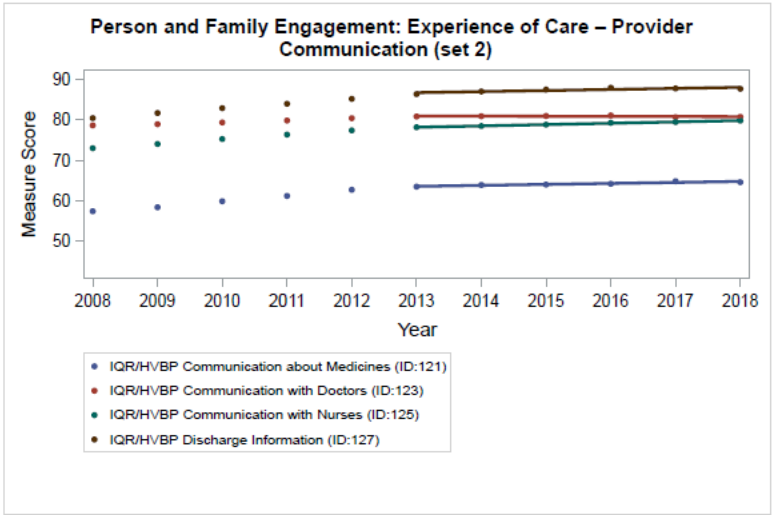

Person and Family Engagement: Experience of Care – Overall Rating (set 2)
Measure Score
Year
Home Health Rating of Care (ID:255)
IQR/HVBP Hospital Rating (ID:129)
MSSP Rating of Provider (ID:3)
PCH Hospital Rating (ID:1142)

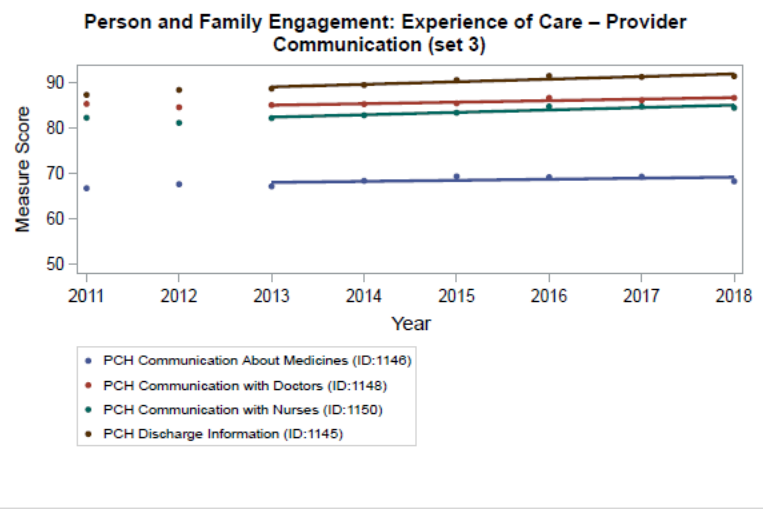

Person and Family Engagement: Experience of Care – Overall Rating (set 3)
Measure Score
Year
ESRD Rating of Dialysis Facility (ID:157)
ESRD Rating of Dialysis Facility Staff (ID:608)
ESRD Rating of Nephrologist (ID:607)

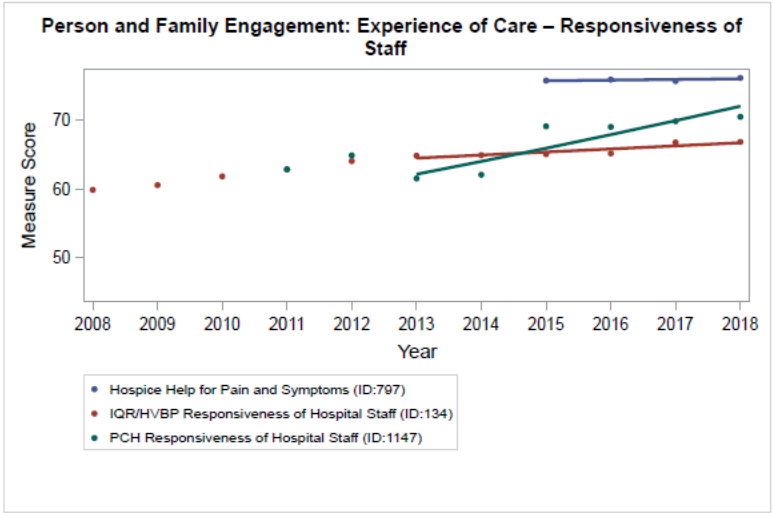

Person and Family Engagement: Experience of Care – Overall Rating (set 4)
Measure Score
Year
FFS Rating of Health Care Quality (ID:21)
FFS Rating of Health Plan (ID:23)
Hospice Rating of This Hospice (ID:434)
MIPS Rating of Provider (ID:469)

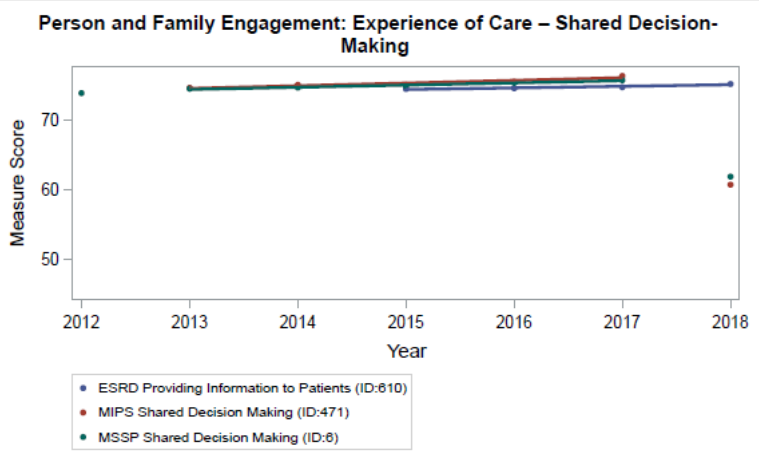


MIPS Provider Communication (ID:468) was respecified in 2018
MSSP How Well Providers Communicate (ID:2) was respecified in 2018

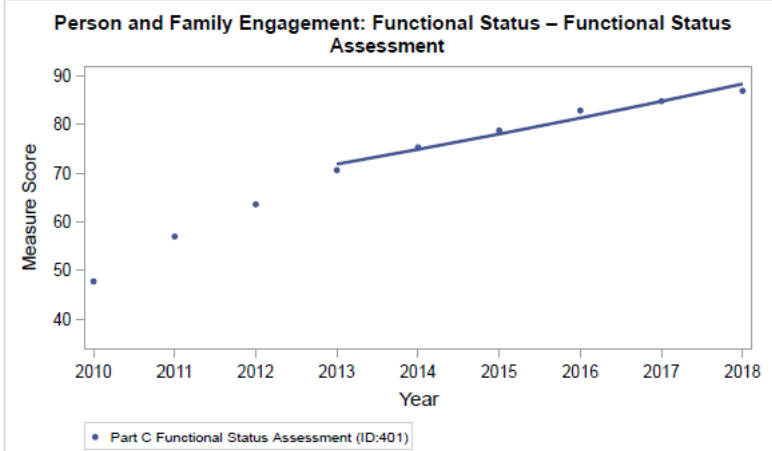


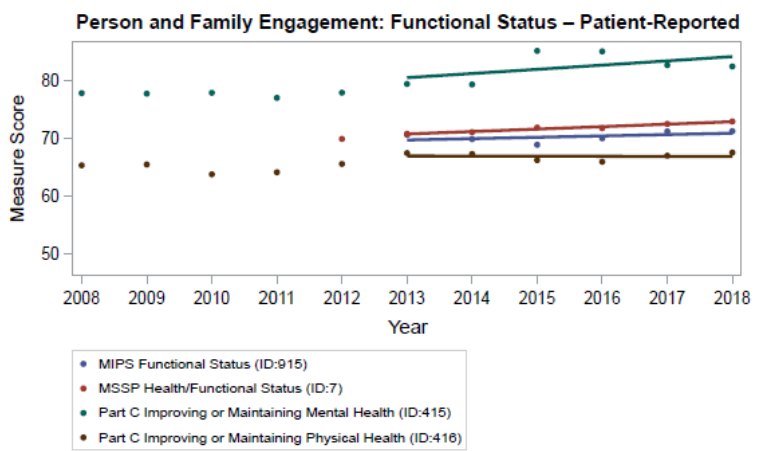






MSSP/MIPS Shared Decision Making (ID:6/471) was respecified in 2018





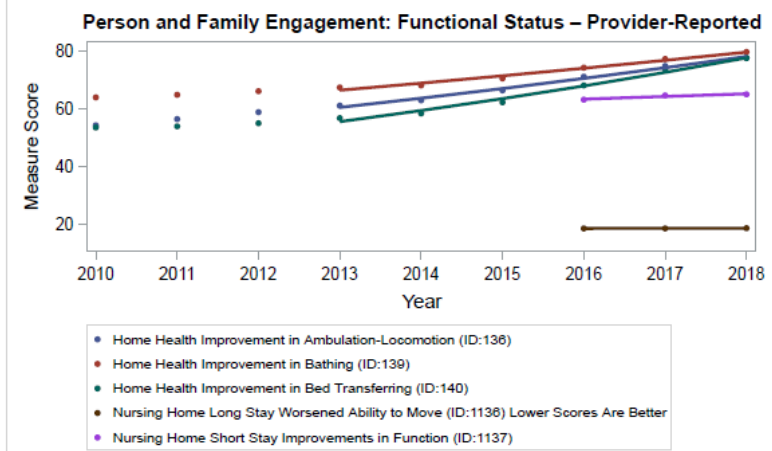
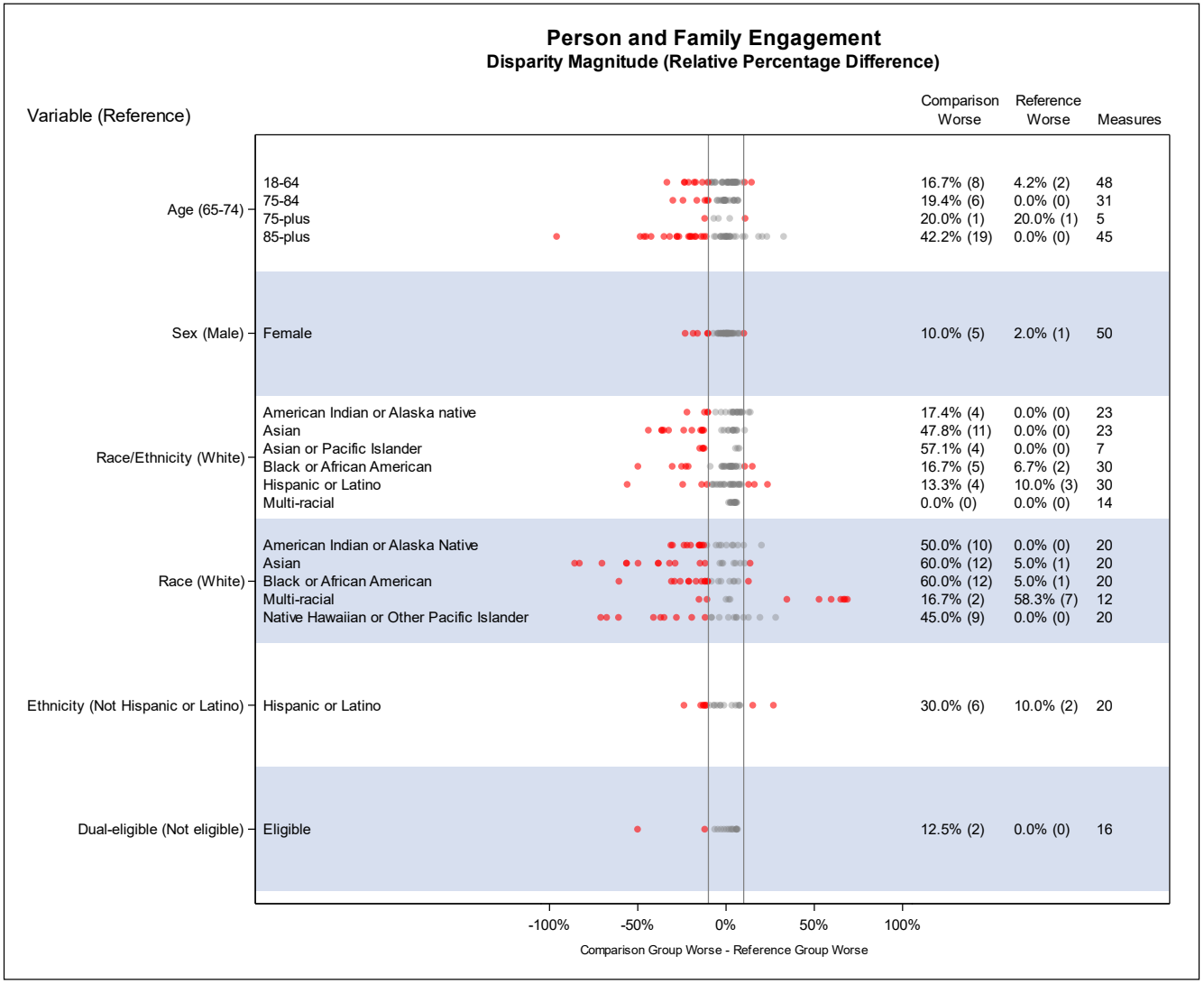


Figure D-10. Disparities Summary for Person and Family Engagement Key Indicators

This figure presents the results of pairwise disparity analyses, aggregated by variable at the health care quality priority level and displayed as the magnitude of the relative difference for each measure. Significant comparisons are denoted in red; nonsignificant comparisons are denoted in gray. Disparity analyses were done for 50 of 68 Key Indicator measures; Table D-3 indicates the disparity variables analyzed for each.



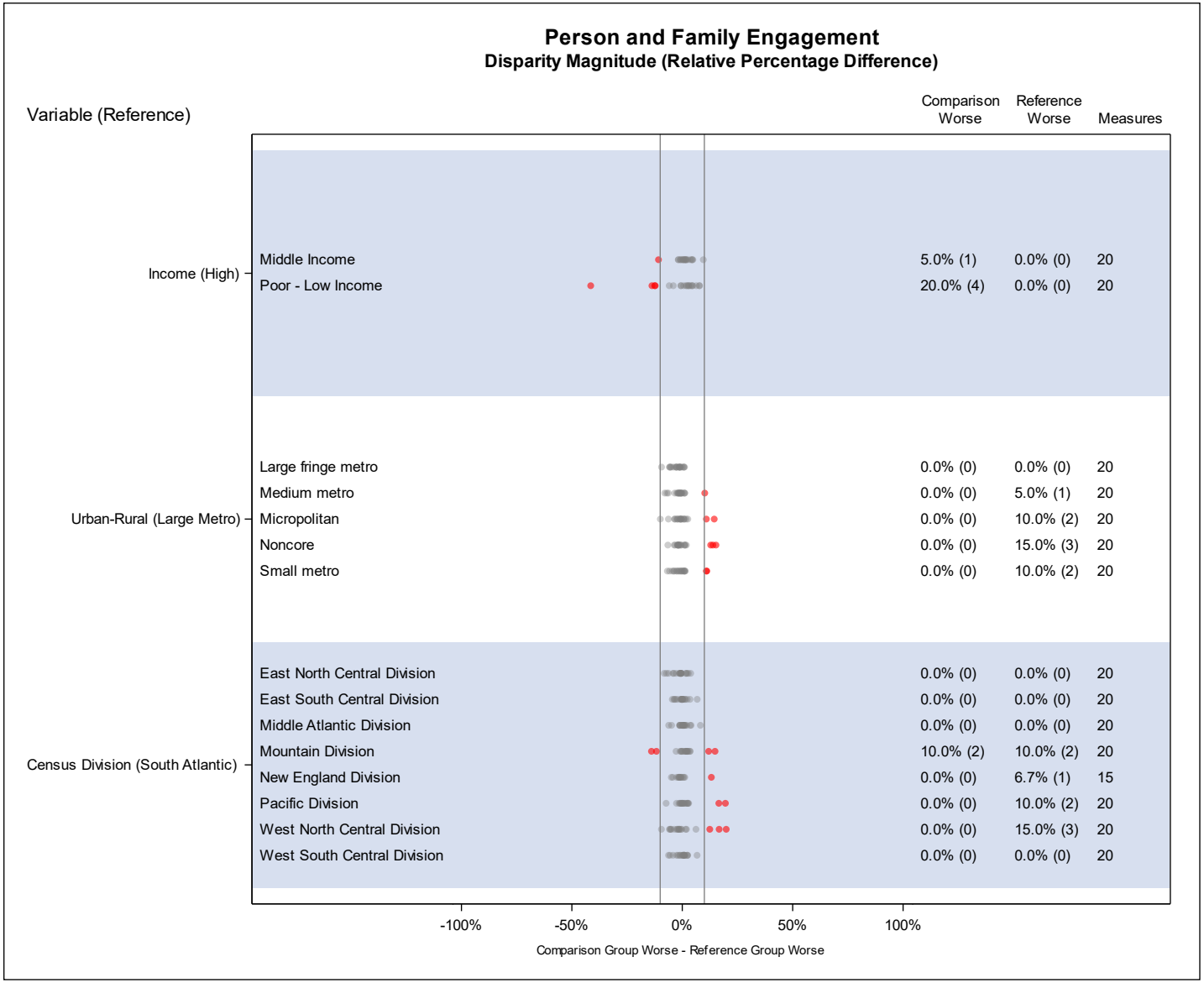

Person and Family Engagement
Disparity Magnitude (Relative Percentage Difference)
Variable (Reference)
Comparison Worse
Reference Worse
Measures
Income (High)
Middle Income
5.0% (1)
0.0% (0)
20
Poor - Low Income
20.0% (4)
0.0% (0)
20
Urban-Rural (Large Metro)
Large fringe metro
0.0% (0)
0.0% (0)
20
Medium metro
0.0% (0)
5.0% (1)
20
Micropolitan
0.0% (0)
10.0% (2)
20
Noncore
0.0% (0)
15.0% (3)
20
Small metro
0.0% (0)
10.0% (2)
20
Census Division (South Atlantic)
East North Central Division
0.0% (0)
0.0% (0)
20
East South Central Division
0.0% (0)
0.0% (0)
20
Middle Atlantic Division
0.0% (0)
0.0% (0)
20
Mountain Division
10.0% (2)
10.0% (2)
20
New England Division
0.0% (0)
6.7% (1)
15
Pacific Division
0.0% (0)
10.0% (2)
20
West North Central Division
0.0% (0)
15.0% (3)
20
West South Central Division
0.0% (0)
0.0% (0)
20
-100%
-50%
0%
50%
100%
Comparison Group Worse - Reference Group Worse

Table D-3. Disparities Analyses Conducted for 50 of 68 Person and Family Engagement Key Indicator Measures

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
1. Communication with Nurses	125	0166	Hospital Inpatient Quality Reporting (IQR) & Hospital Value-Based Purchasing (HVBP)	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
1. Communication with Nurses	1150	0166	Prospective Payment System-Exempt Cancer Hospital Quality Reporting Program (PCH QRP)	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
2. Communication with Doctors	123	0166	IQR & HVBP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
2. Communication with Doctors	1148	0166	PCH QRP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
3. Responsiveness of Hospital Staff	134	0166	IQR & HVBP	Experience of Care – Respon-siveness of Staff	Y	Y	Y	N	N	N	N
3. Responsiveness of Hospital Staff	1147	0166	PCH QRP	Experience of Care – Respon-siveness of Staff	Y	Y	Y	N	N	N	N
4. Communication About Medicines	121	0166	IQR & HVBP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
4. Communication About Medicines	1146	0166	PCH QRP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
5. Discharge Information	127	0166	IQR & HVBP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
5. Discharge Information	1145	0166	PCH QRP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
6. Care Transition	119	0166	IQR & HVBP	Experience of Care – Care Transition	Y	Y	Y	N	N	N	N
6. Care Transition	1156	0166	PCH QRP	Experience of Care – Care Transition	Y	Y	Y	N	N	N	N
9. Hospital Rating	129	0166	IQR & HVBP	Experience of Care – Overall Rating	Y	Y	Y	N	N	N	N
9. Hospital Rating	1142	0166	PCH QRP	Experience of Care – Overall Rating	Y	Y	Y	N	N	N	N
Beliefs/Values Addressed (if desired by patient)	790	1647	Hospice Quality Reporting Program (Hospice QRP)	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Care Coordination	400	9999	Medicare Part C & D Star Ratings	Experience of Care – Care Coordination	Y	Y	Y	Y	Y	Y	Y
Care Coordination (FFS CAHPS)	399	9999	Fee for Service CAHPS	Experience of Care – Care Coordination	Y	Y	Y	Y	Y	Y	Y
Care of Patients – How often the home health team gave care in a professional way CAHPS® Home Health Care Survey (experience with care)	253	0517	Home Health Quality Reporting Program (HH QRP)	Experience of Care – Courtesy and Respect	Y	Y	Y	N	N	N	N
Communication with Family	794	2651	Hospice QRP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Communications Between Providers and Patients CAHPS® Home Health Care Survey (experience with care)	254	0517	HH QRP	Experience of Care – Provider Communication	Y	Y	Y	N	N	N	N
Dyspnea Screening	788	1639	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Dyspnea Treatment	787	1638	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Getting Appointments and Care Quickly	12	0006	Medicare Part C & D Star Ratings	Experience of Care – Getting Needed Care and Appointments Quickly	Y	Y	Y	Y	Y	Y	Y
Getting Appointments and Care Quickly (FFS CAHPS)	13	0006	Fee for Service CAHPS	Experience of Care – Getting Needed Care and Appointments Quickly	Y	Y	Y	Y	Y	Y	Y
Getting Needed Care	14	0006	Medicare Part C & D Star Ratings	Experience of Care – Getting Needed Care and Appointments Quickly	Y	Y	Y	Y	Y	Y	Y
Getting Needed Care (FFS CAHPS)	15	0006	Fee for Service CAHPS	Experience of Care – Getting Needed Care and Appointments Quickly	Y	Y	Y	Y	Y	Y	Y
Getting Needed Prescription Drugs (MA-PD)	528	9999	Medicare Part C & D Star Ratings	Experience of Care – Getting Needed Drugs	Y	Y	Y	Y	Y	Y	Y
Getting Needed Prescription Drugs (PDP)	24	9999	Medicare Part C & D Star Ratings	Experience of Care – Getting Needed Drugs	Y	Y	Y	Y	Y	Y	Y

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Getting Timely Help	795	2651	Hospice QRP	Experience of Care – Getting Needed Care and Appointments Quickly	Y	Y	Y	N	N	N	N
Help for Pain and Symptoms	797	2651	Hospice QRP	Experience of Care – Respon-siveness of Staff	Y	Y	Y	N	N	N	N
Improving or Maintaining Mental Health	415	9999	Medicare Part C & D Star Ratings	Functional Status – Patient-Reported	Y	Y	Y	Y	Y	Y	Y
Improving or Maintaining Physical Health	416	9999	Medicare Part C & D Star Ratings	Functional Status – Patient-Reported	Y	Y	Y	Y	Y	Y	Y
Nephrologists' Communication and Caring ICH CAHPS Administration	609	0258	End-Stage Renal Disease Quality Incentive Program (ESRD QIP)	Experience of Care – Provider Communication	Y	Y	Y	Y	N	Y	Y
Overall rating of care measure CAHPS® Home Health Care Survey (experience with care)	255	0517	HH QRP	Experience of Care – Overall Rating	Y	Y	Y	N	N	N	N
Pain Assessment	786	1637	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Pain Screening	785	1634	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Patients Treated with an Opioid who are Given a Bowel Regimen	784	1617	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N
Providing Information to Patients ICH CAHPS Administration	610	0258	ESRD QIP	Experience of Care – Shared Decision-Making	Y	Y	Y	Y	N	Y	Y

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Rating of Drug Plan (MA-PD)	529	9999	Medicare Part C & D Star Ratings	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of Drug Plan (PDP)	459	9999	Medicare Part C & D Star Ratings	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of Health Care Quality	20	0006	Medicare Part C & D Star Ratings	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of Health Care Quality (FFS CAHPS)	21	0006	Fee for Service CAHPS	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of Health Plan	22	0006	Medicare Part C & D Star Ratings	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of Health Plan (FFS CAHPS)	23	0006	Fee for Service CAHPS	Experience of Care – Overall Rating	Y	Y	Y	Y	Y	Y	Y
Rating of the dialysis center staff ICH CAHPS Administration	608	0258	ESRD QIP	Experience of Care – Overall Rating	Y	Y	Y	Y	N	Y	Y
Rating of the dialysis facility ICH CAHPS Administration	157	0258	ESRD QIP	Experience of Care – Overall Rating	Y	Y	Y	Y	N	Y	Y
Rating of the nephrologist ICH CAHPS Administration	607	0258	ESRD QIP	Experience of Care – Overall Rating	Y	Y	Y	Y	N	Y	Y
Rating of this Hospice	434	2651	Hospice QRP	Experience of Care – Overall Rating	Y	Y	Y	N	N	N	N
Treating Patient with Respect	791	2651	Hospice QRP	Experience of Care – Courtesy and Respect	Y	Y	Y	N	N	N	N
Treatment Preferences	789	1641	Hospice QRP	End of Life Care – Comprehensive Assessment at Admission	Y	Y	Y	N	N	N	N

Table D-4. Patient Impact in Person and Family Engagement

Patient impact calculated in terms of patient-level events.

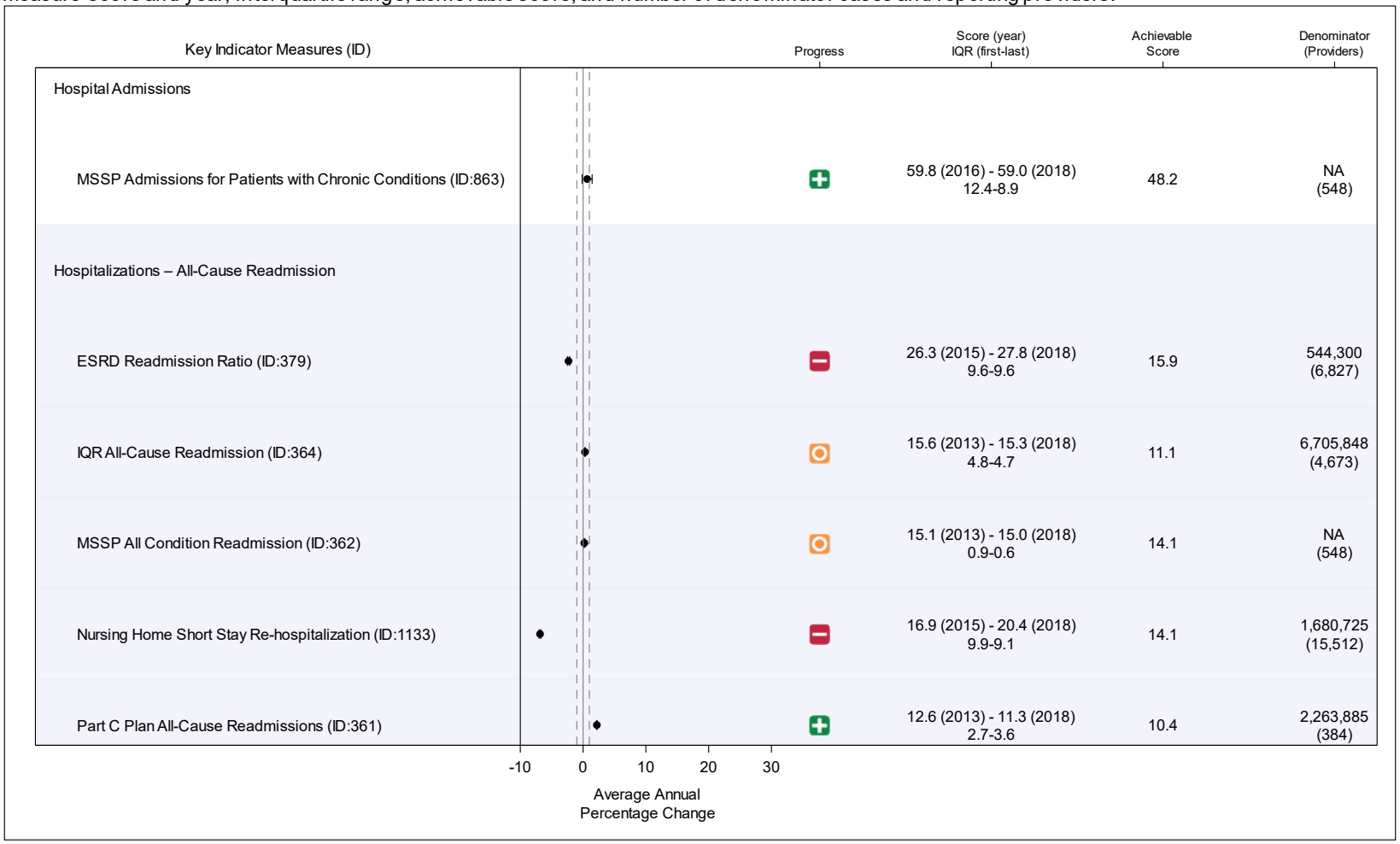
Measure	Patient Impact	Annual Data Points	Unit Cost	Costs Avoided
End of Life Care – Comprehensive Assessment at Admission				
Hospice Pain Assessment (ID: 786)	302,394 patient stays	4 years	NA	NA
Hospice Beliefs/Values Addressed (ID: 790)	148,666 patient stays	4 years	NA	NA
Hospice Pain Screening (ID: 785)	118,139 patient stays	4 years	NA	NA
Hospice Bowel Regimen for Opioid Treatment (ID: 784)	36,491 patients	4 years	NA	NA
Experience of Care – Care Transition				
PCH Care Transition (ID: 1156)	10,248 respondents	6 years	NA	NA
Experience of Care – Responsiveness of Staff				
PCH Responsiveness of Hospital Staff (ID: 1147)	24,796 respondents	6 years	NA	NA
Functional Status – Provider-Reported				
Home Health Improvement in Bed Transferring (ID: 140)	2,719,142 episodes	6 years	NA	NA
Home Health Improvement in Ambulation-Locomotion (ID: 136)	2,350,656 episodes	6 years	NA	NA
Home Health Improvement in Bathing (ID: 139)	1,655,999 episodes	6 years	NA	NA

Health Care Quality Priority: Communication and Care Coordination

This health care quality priority has seven Key Indicators with 19 quality measures for which an analysis has been performed.

Figure D-11. Performance Summary for Communication and Care Coordination Key Indicator Measures

Results are presented as the average annual percentage change with 90% confidence intervals, indications of improved ( ), declined ( ), or stable ( ), measure score and year, interquartile range, achievable score, and number of denominator cases and reporting providers.



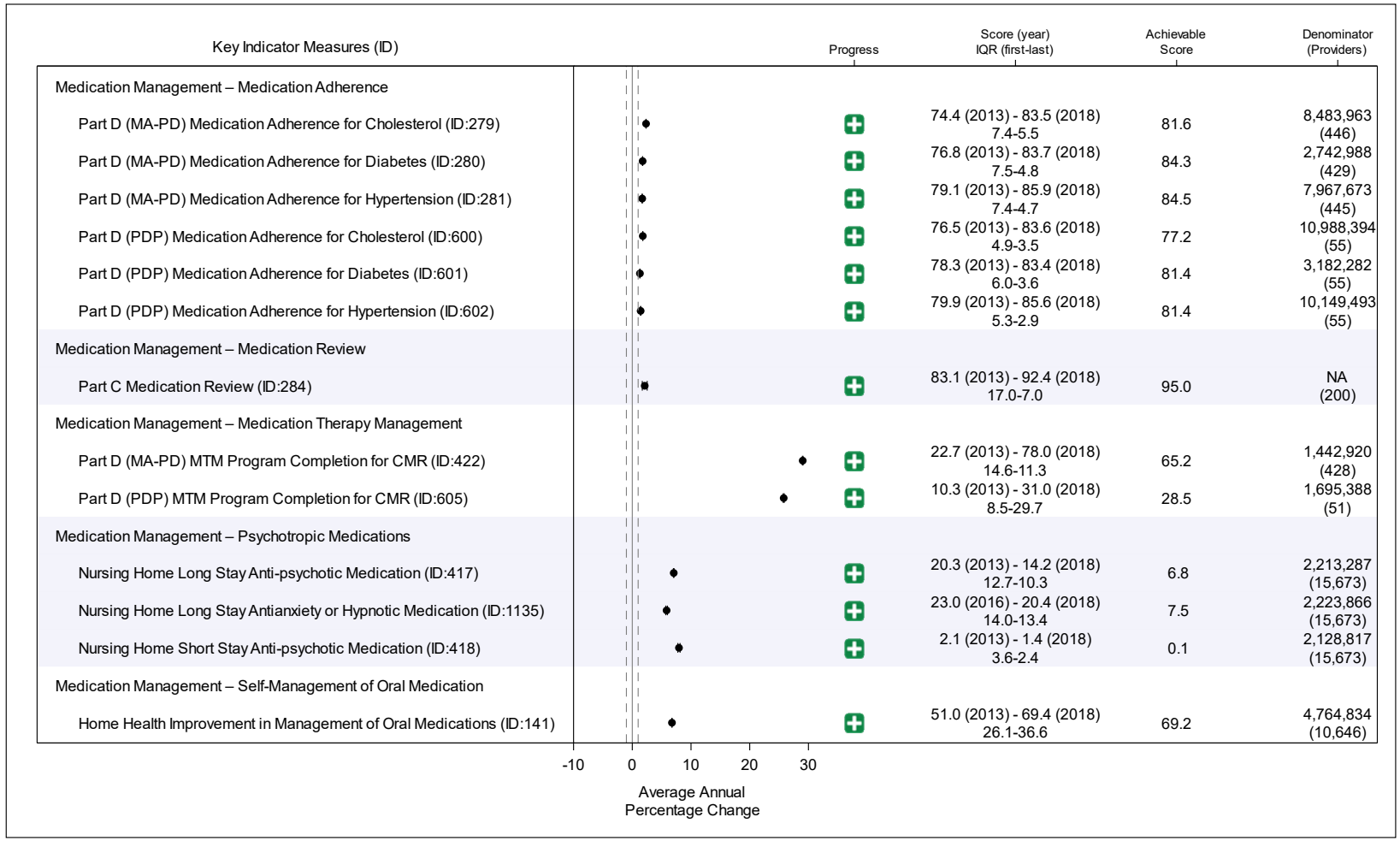
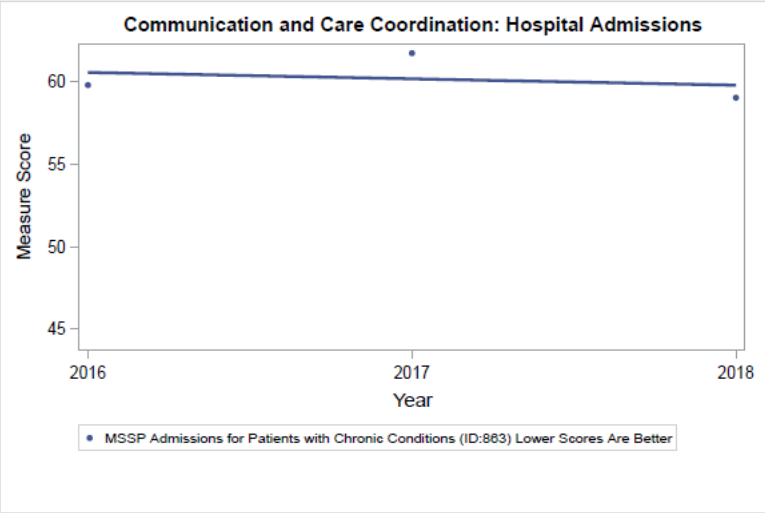
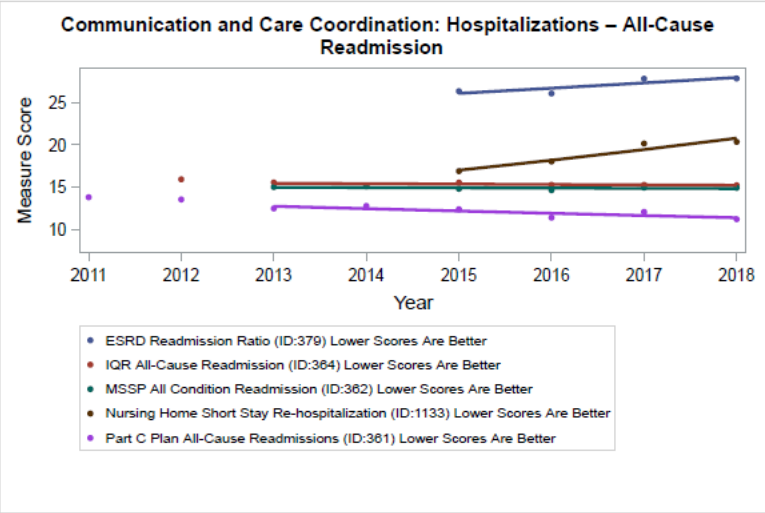
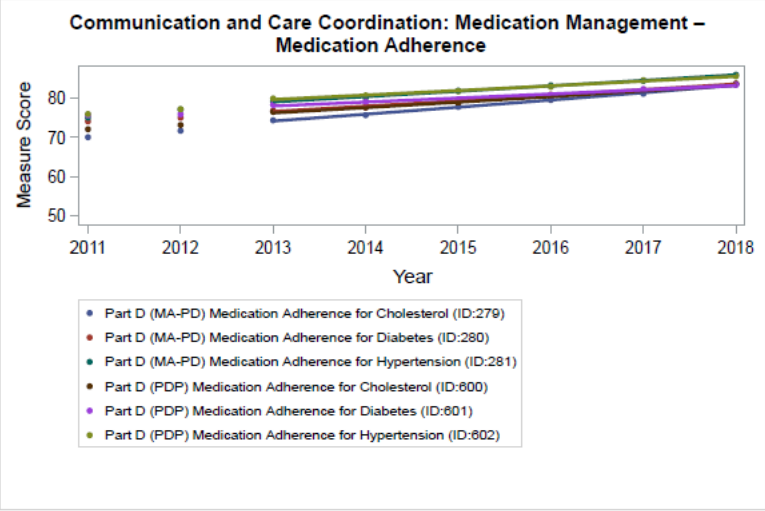

Key Indicator Measures (ID)
Progress
Score (year) IQR (first-last)
Achievable Score
Denominator (Providers)
Medication Management – Medication Adherence
Part D (MA-PD) Medication Adherence for Cholesterol (ID:279)
74.4 (2013) - 83.5 (2018) 7.4-5.5
81.6
8,483,963 (446)
Part D (MA-PD) Medication Adherence for Diabetes (ID:280)
76.8 (2013) - 83.7 (2018) 7.5-4.8
84.3
2,742,988 (429)
Part D (MA-PD) Medication Adherence for Hypertension (ID:281)
79.1 (2013) - 85.9 (2018) 7.4-4.7
84.5
7,967,673 (445)
Part D (PDP) Medication Adherence for Cholesterol (ID:600)
76.5 (2013) - 83.6 (2018) 4.9-3.5
77.2
10,988,394 (55)
Part D (PDP) Medication Adherence for Diabetes (ID:601)
78.3 (2013) - 83.4 (2018) 6.0-3.6
81.4
3,182,282 (55)
Part D (PDP) Medication Adherence for Hypertension (ID:602)
79.9 (2013) - 85.6 (2018) 5.3-2.9
81.4
10,149,493 (55)
Medication Management – Medication Review
Part C Medication Review (ID:284)
83.1 (2013) - 92.4 (2018) 17.0-7.0
95.0
NA (200)
Medication Management – Medication Therapy Management
Part D (MA-PD) MTM Program Completion for CMR (ID:422)
22.7 (2013) - 78.0 (2018) 14.6-11.3
65.2
1,442,920 (428)
Part D (PDP) MTM Program Completion for CMR (ID:605)
10.3 (2013) - 31.0 (2018) 8.5-29.7
28.5
1,695,388 (51)
Medication Management – Psychotropic Medications
Nursing Home Long Stay Anti-psychotic Medication (ID:417)
20.3 (2013) - 14.2 (2018) 12.7-10.3
6.8
2,213,287 (15,673)
Nursing Home Long Stay Antianxiety or Hypnotic Medication (ID:1135)
23.0 (2016) - 20.4 (2018) 14.0-13.4
7.5
2,223,866 (15,673)
Nursing Home Short Stay Anti-psychotic Medication (ID:418)
2.1 (2013) - 1.4 (2018) 3.6-2.4
0.1
2,128,817 (15,673)
Medication Management – Self-Management of Oral Medication
Home Health Improvement in Management of Oral Medications (ID:141)
51.0 (2013) - 69.4 (2018) 26.1-36.6
69.2
4,764,834 (10,646)
-10
0
10
20
30
Average Annual Percentage Change

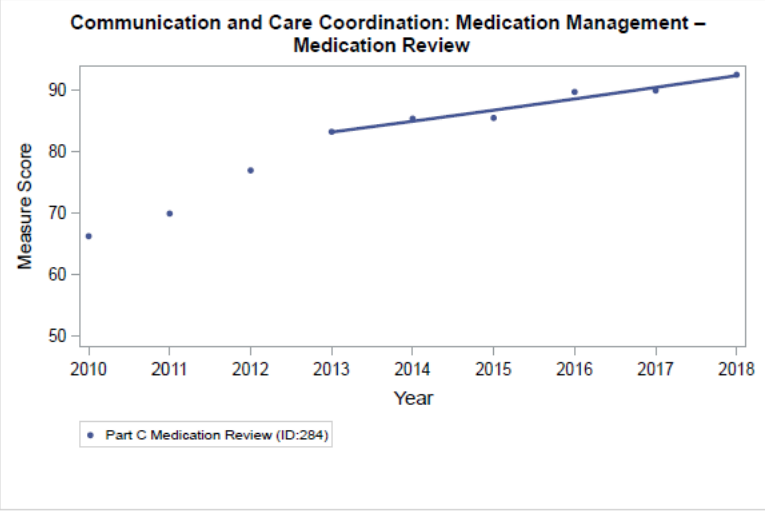
Figure D-12. Measure Trend Plots for Communication and Coordination of Care Key Indicator Measures

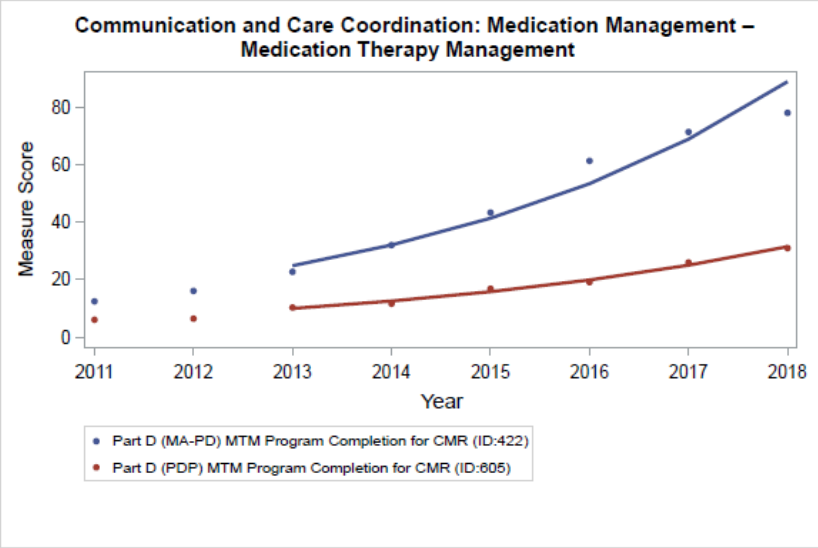
These trend plots present annual data points for the entire analytical period. Unless otherwise indicated, higher scores are better.

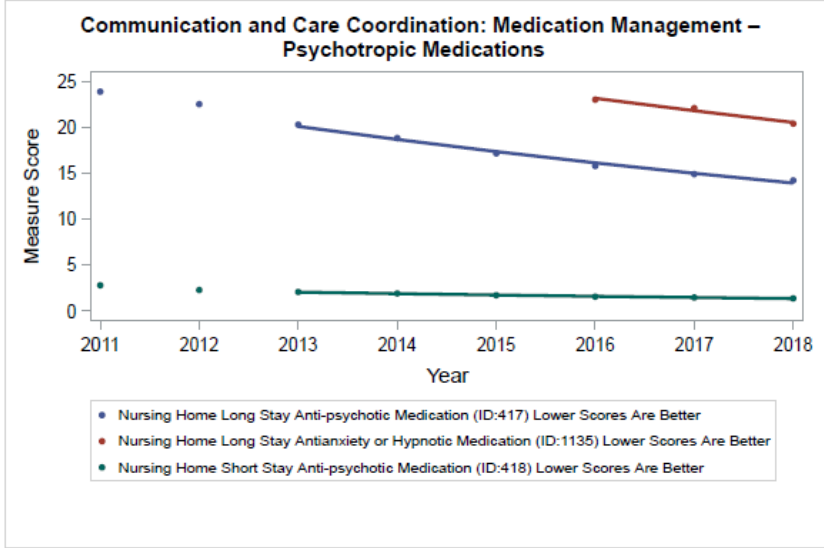









Communication and Care Coordination: Medication Management – Medication Therapy Management
Measure Score
0
20
40
60
80
2011
2012
2013
2014
2015
2016
2017
2018
Year
Part D (MA-PD) MTM Program Completion for CMR (ID:422)
Part D (PDP) MTM Program Completion for CMR (ID:605)


Communication and Care Coordination: Medication Management – Psychotropic Medications
Measure Score
0
5
10
15
20
25
2011
2012
2013
2014
2015
2016
2017
2018
Year
Nursing Home Long Stay Anti-psychotic Medication (ID:417) Lower Scores Are Better
Nursing Home Long Stay Antianxiety or Hypnotic Medication (ID:1135) Lower Scores Are Better
Nursing Home Short Stay Anti-psychotic Medication (ID:418) Lower Scores Are Better

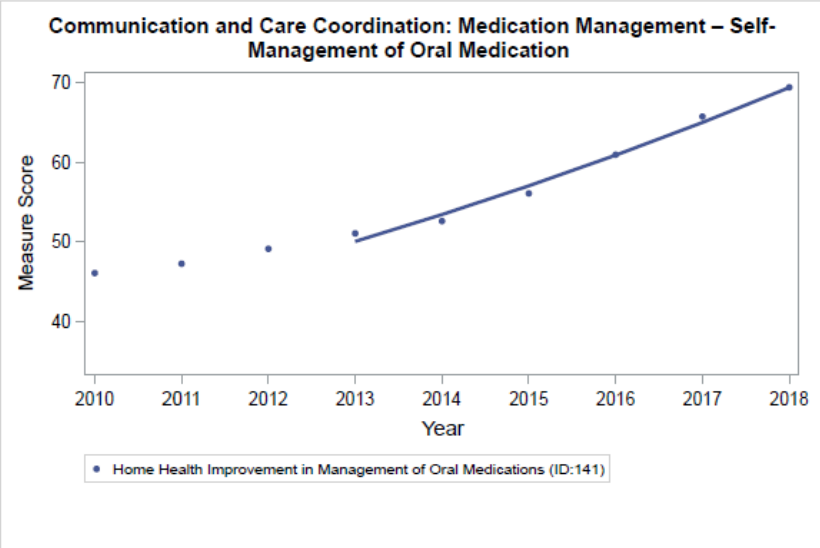
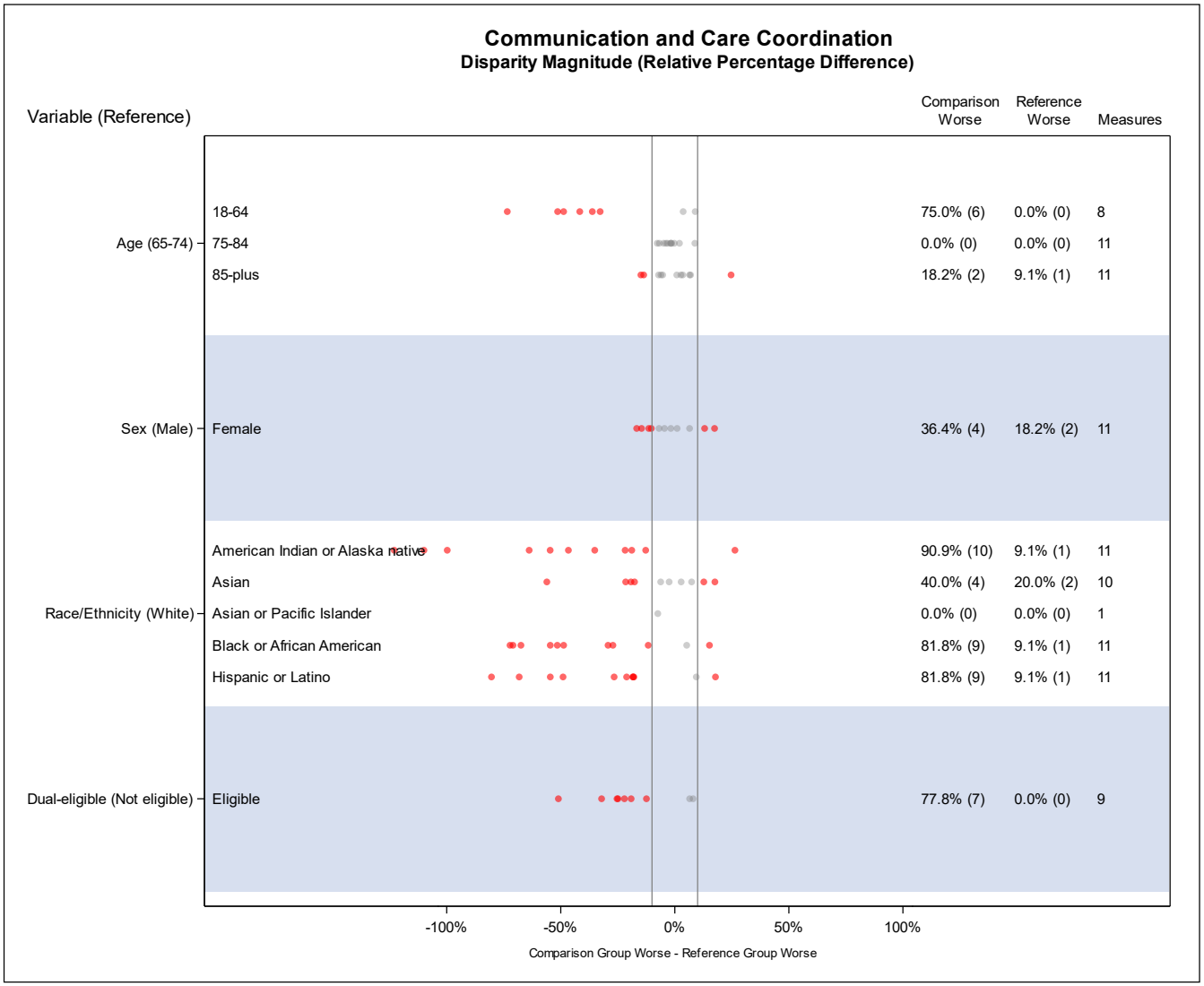

Communication and Care Coordination: Medication Management – Self-Management of Oral Medication
Measure Score
40
50
60
70
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
Home Health Improvement in Management of Oral Medications (ID:141)

Figure D-13. Disparities Summary for Communication and Care Coordination Key Indicators

This figure presents the results of pairwise disparity analyses, aggregated by variable at the health care quality priority level and displayed as the magnitude of the relative difference for each measure. Significant comparisons are denoted in red; nonsignificant comparisons are denoted in gray. Disparity analyses were done for 11 of 19 Key Indicator measures; Table D-5 indicates the disparity variables analyzed for each.



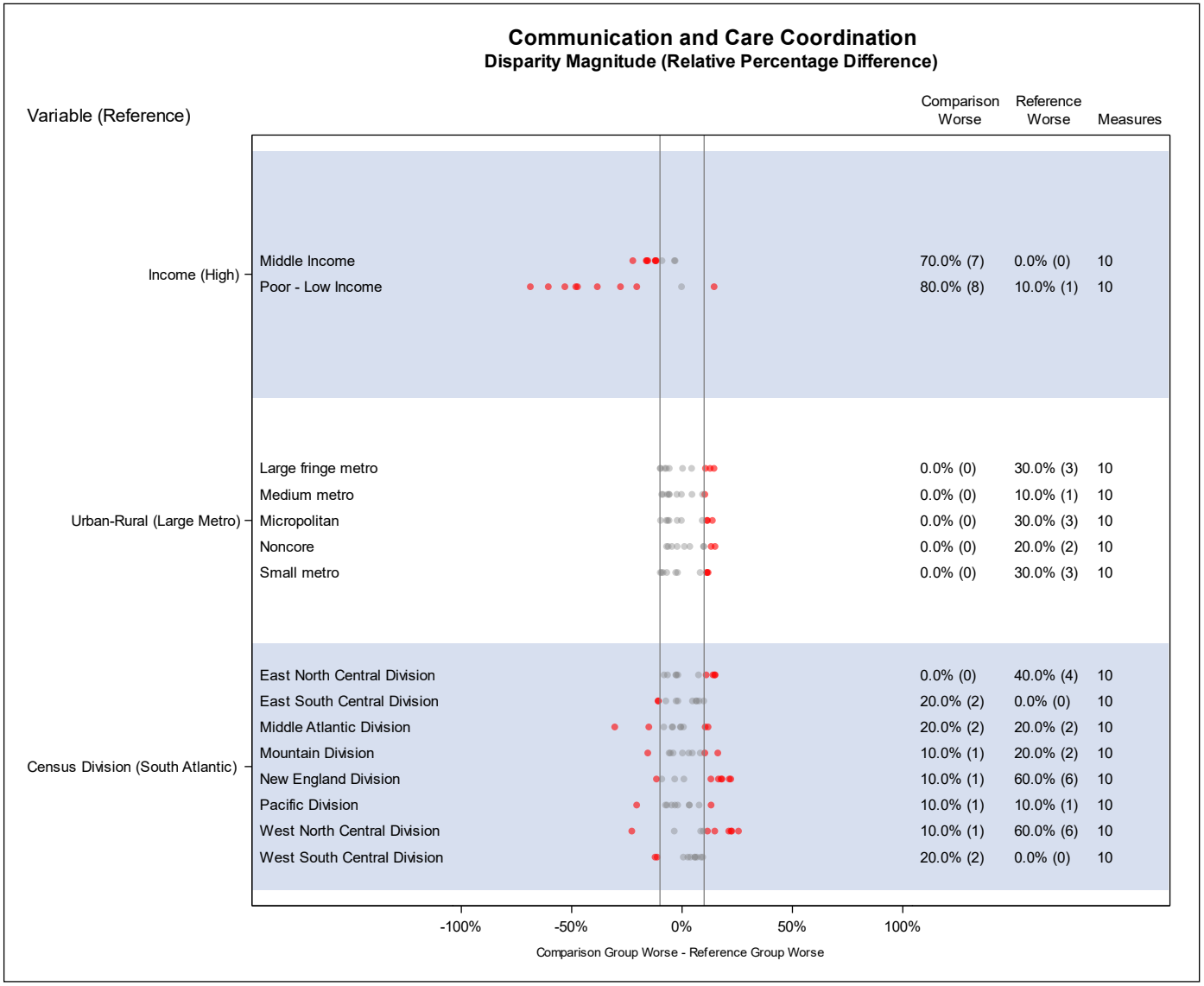

Communication and Care Coordination
Disparity Magnitude (Relative Percentage Difference)
Variable (Reference)
Comparison Worse
Reference Worse
Measures
Income (High)
Middle Income
70.0% (7)
0.0% (0)
10
Poor - Low Income
80.0% (8)
10.0% (1)
10
Urban-Rural (Large Metro)
Large fringe metro
0.0% (0)
30.0% (3)
10
Medium metro
0.0% (0)
10.0% (1)
10
Micropolitan
0.0% (0)
30.0% (3)
10
Noncore
0.0% (0)
20.0% (2)
10
Small metro
0.0% (0)
30.0% (3)
10
Census Division (South Atlantic)
East North Central Division
0.0% (0)
40.0% (4)
10
East South Central Division
20.0% (2)
0.0% (0)
10
Middle Atlantic Division
20.0% (2)
20.0% (2)
10
Mountain Division
10.0% (1)
20.0% (2)
10
New England Division
10.0% (1)
60.0% (6)
10
Pacific Division
10.0% (1)
10.0% (1)
10
West North Central Division
10.0% (1)
60.0% (6)
10
West South Central Division
20.0% (2)
0.0% (0)
10
-100%
-50%
0%
50%
100%
Comparison Group Worse - Reference Group Worse

Table D-5. Disparities Analyses Conducted for 11 of 19 Communication and Care Coordination Key Indicator Measures

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Medication Adherence for Cholesterol (MA-PD)	279	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
Medication Adherence for Cholesterol (PDP)	600	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
Medication Adherence for Diabetes (MA-PD)	280	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
Medication Adherence for Diabetes (PDP)	601	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
Medication Adherence for Hypertension (MA-PD)	281	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
Medication Adherence for Hypertension (PDP)	602	0541	Medicare Part C & D Star Ratings	Medication Management – Medication Adherence	Y	Y	Y	Y	Y	Y	Y
MTM Program Completion for CMR (MA-PD)	422	9999	Medicare Part C & D Star Ratings	Medication Management – Medication Therapy Management (MTM)	Y	Y	Y	Y	Y	Y	Y
MTM Program Completion for CMR (PDP)	605	9999	Medicare Part C & D Star Ratings	Medication Management – MTM	Y	Y	Y	Y	Y	Y	Y
Percentage of Short-Stay Residents Who Were Re-Hospitalized After a Nursing Home Admission	1133	9999	Nursing Home Quality Initiative/Nursing Home Compare	Hospitalizations – All-Cause Readmission	Y	Y	Y	N	N	N	N

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Plan All-Cause Readmissions	361	1768	Medicare Part C & D Star Ratings	Hospitalizations – All-Cause Readmission	Y	Y	Y	Y	Y	Y	Y
READM–30–HWR: Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)	364	1789	Hospital Inpatient Quality Reporting	Hospitalizations – All-Cause Readmission	Y	Y	Y	Y	N	Y	Y

Table D-6. Patient Impact and Costs Avoided in Communication and Care Coordination

Patient impact calculated in terms of patient-level events; costs avoided calculated as the unit cost of each patient-level event and the range of total costs avoided.

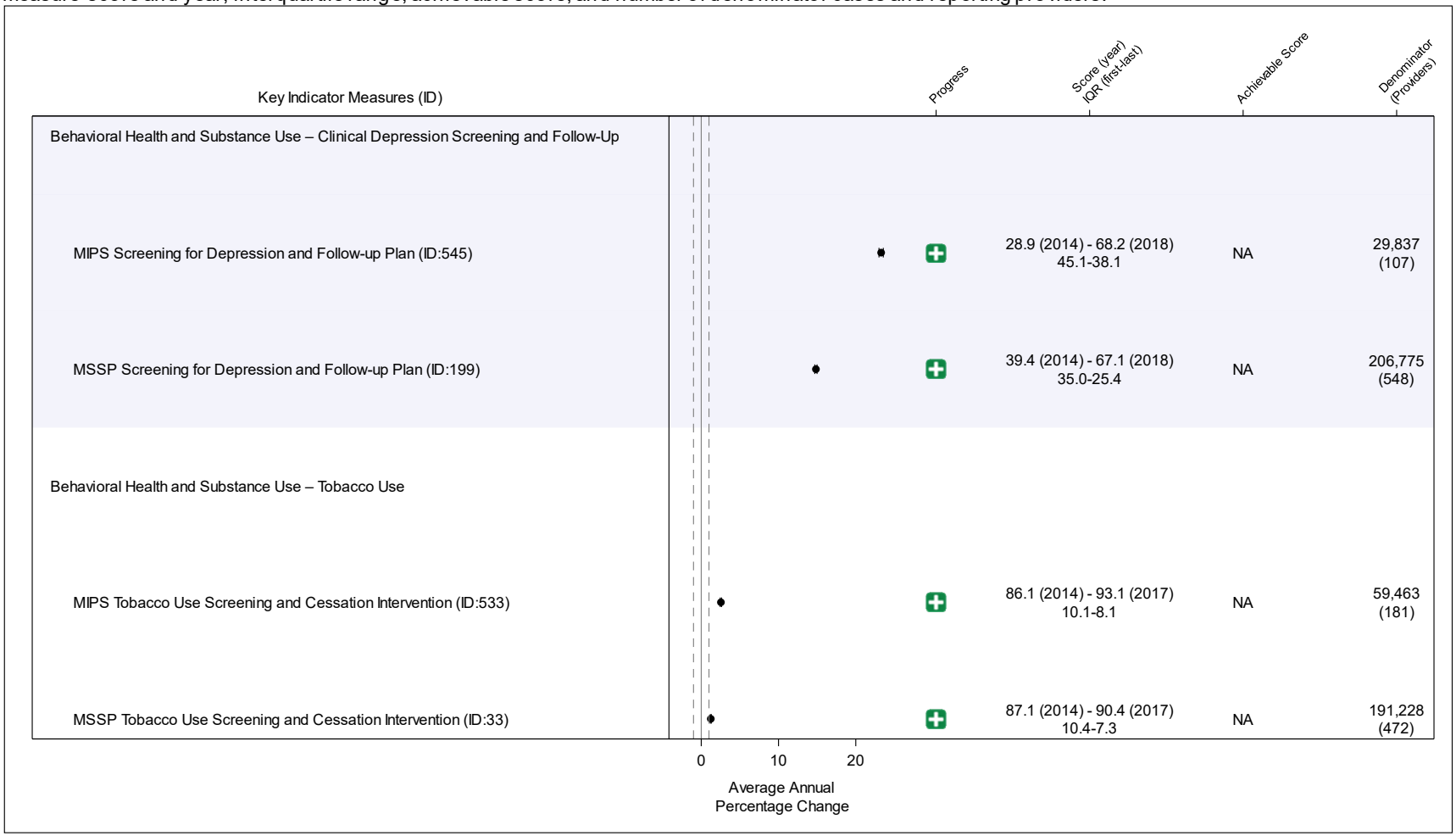
Measure	Patient Impact	Annual Data Points	Unit Cost	Costs Avoided
Hospitalizations – All–Cause Readmission				
Part C Plan All-Cause Readmissions (ID: 361)	–53,257 readmissions	6 years	$15,053–$16,146	$801,700,000–$859,900,000
Medication Management – Medication Adherence				
Part D (PDP) Medication Adherence for Cholesterol (ID: 600)	2,059,535 members	6 years	$1,357–$3,455	$2,794,800,000–$7,115,700,000
Part D (MA-PD) Medication Adherence for Cholesterol (ID: 279)	1,898,774 members	6 years	$1,357–$3,455	$2,576,600,000–$6,560,300,000
Part D (PDP) Medication Adherence for Hypertension (ID: 602)	1,572,057 members	6 years	$6,139–$8,687	$9,650,900,000–$13,656,500,000
Part D (MA-PD) Medication Adherence for Hypertension (ID: 281)	1,391,382 members	6 years	$6,139–$8,687	$8,541,700,000–$12,086,900,000
Part D (MA-PD) Medication Adherence for Diabetes (ID: 280)	466,820 members	6 years	$3,785–$8,073	$1,766,900,000–$3,768,600,000
Part D (PDP) Medication Adherence for Diabetes (ID: 601)	426,991 members	6 years	$3,785–$8,073	$1,616,200,000–$3,447,100,000
Medication Management – Medication Therapy Management				
Part D (MA-PD) MTM Program Completion for CMR (ID: 422)	2,314,853 enrollees	6 years	NA	NA
Part D (PDP) MTM Program Completion for CMR (ID: 605)	1,009,759 enrollees	6 years	NA	NA
Medication Management – Self-Management of Oral Medication				
Home Health Improvement in Management of Oral Medications (ID: 141)	2,156,334 episodes	6 years	NA	NA

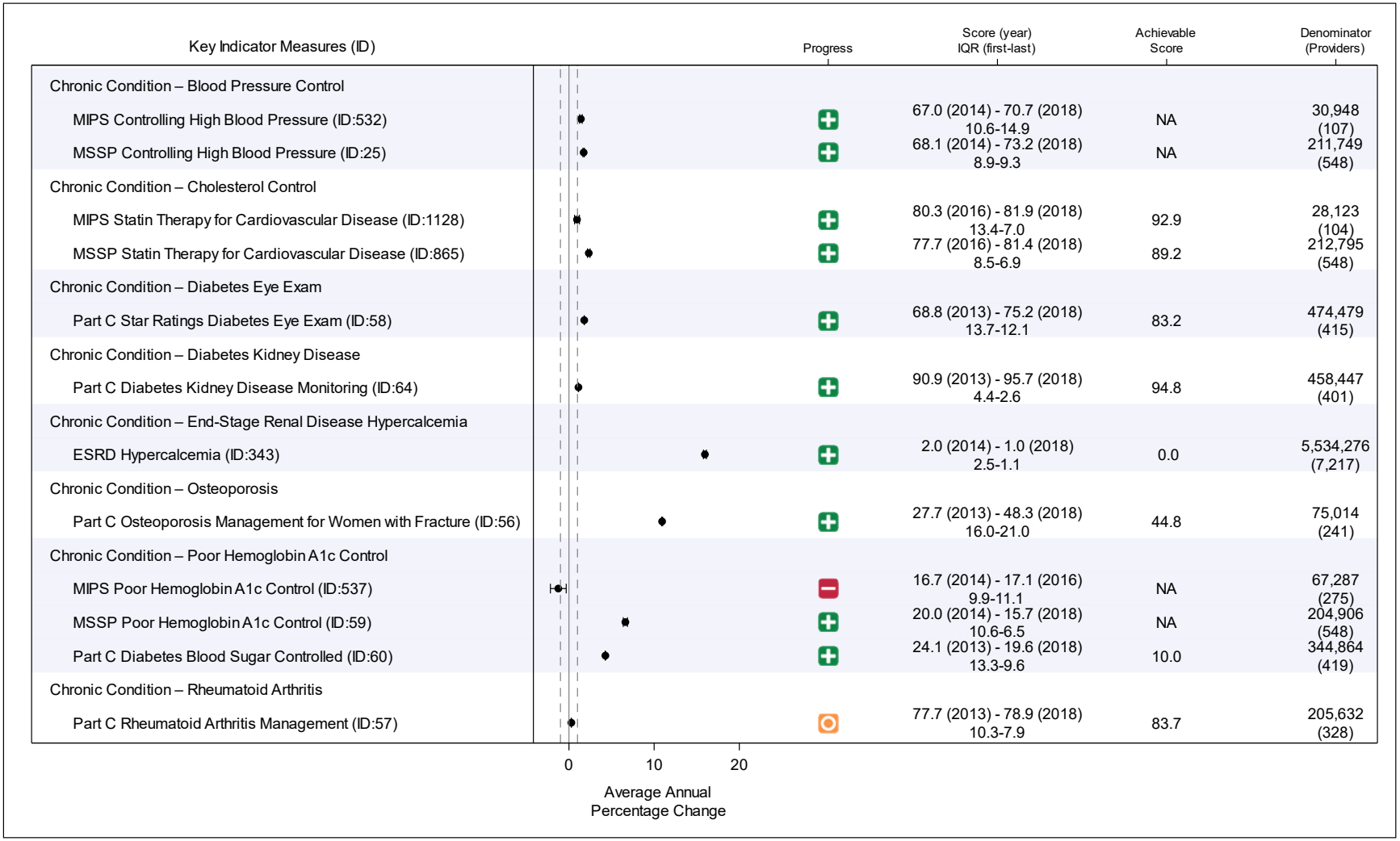
Health Care Quality Priority: Effective Prevention and Treatment

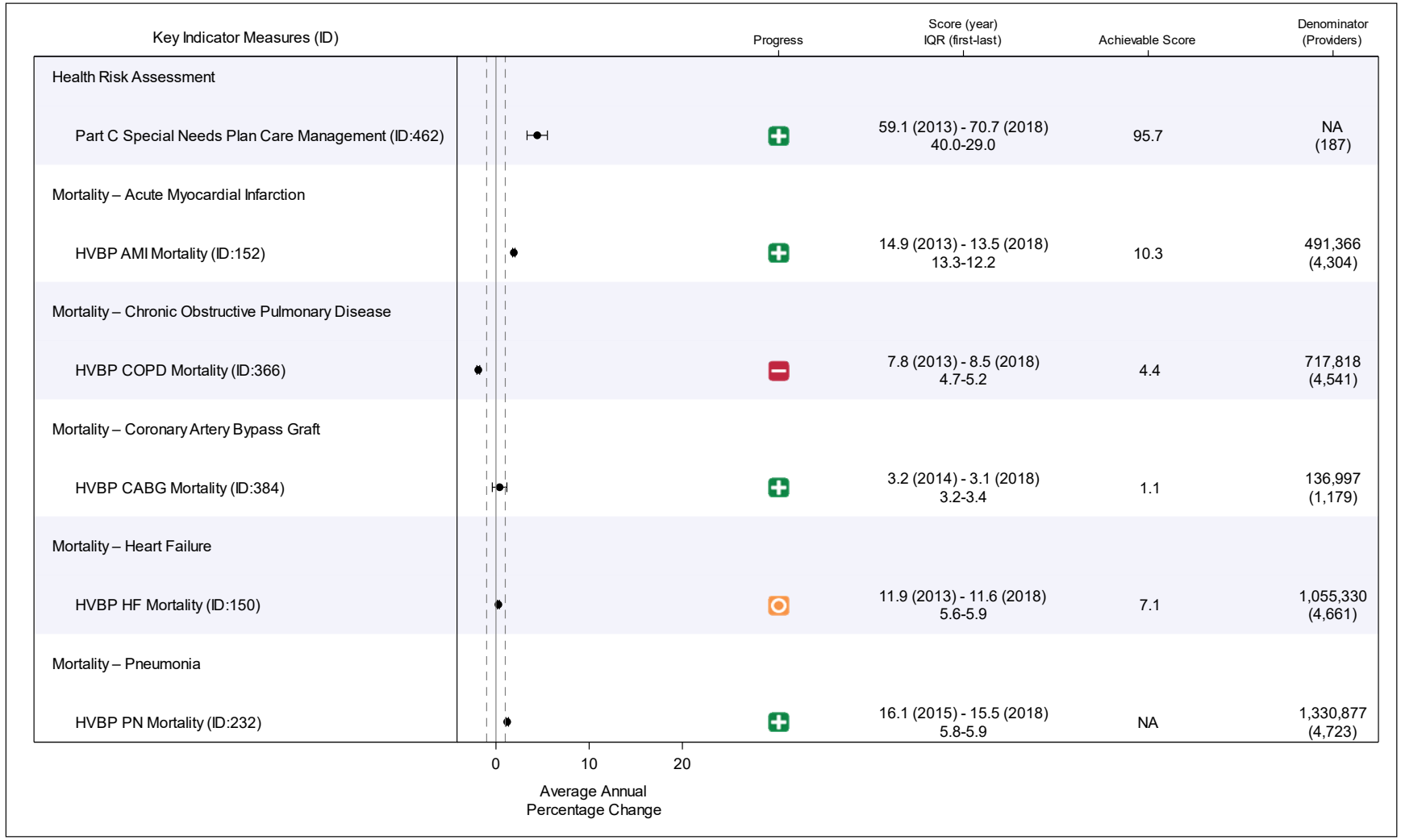
This health care quality priority has 20 Key Indicators with 38 quality measures for which an analysis has been performed.

Figure D-14. Performance Summary for Effective Prevention and Treatment Key Indicator Measures

Results are presented as the average annual percentage change with 90% confidence intervals, indications of improved ( ), declined ( ), or stable ( ), measure score and year, interquartile range, achievable score, and number of denominator cases and reporting providers.




Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable
Score
Denominator
(Providers)
Chronic Condition – Blood Pressure Control
MIPS Controlling High Blood Pressure (ID:532)
67.0 (2014) - 70.7 (2018)
10.6-14.9
NA
30,948
(107)
MSSP Controlling High Blood Pressure (ID:25)
68.1 (2014) - 73.2 (2018)
8.9-9.3
NA
211,749
(548)
Chronic Condition – Cholesterol Control
MIPS Statin Therapy for Cardiovascular Disease (ID:1128)
80.3 (2016) - 81.9 (2018)
13.4-7.0
92.9
28,123
(104)
MSSP Statin Therapy for Cardiovascular Disease (ID:865)
77.7 (2016) - 81.4 (2018)
8.5-6.9
89.2
212,795
(548)
Chronic Condition – Diabetes Eye Exam
Part C Star Ratings Diabetes Eye Exam (ID:58)
68.8 (2013) - 75.2 (2018)
13.7-12.1
83.2
474,479
(415)
Chronic Condition – Diabetes Kidney Disease
Part C Diabetes Kidney Disease Monitoring (ID:64)
90.9 (2013) - 95.7 (2018)
4.4-2.6
94.8
458,447
(401)
Chronic Condition – End-Stage Renal Disease Hypercalcemia
ESRD Hypercalcemia (ID:343)
2.0 (2014) - 1.0 (2018)
2.5-1.1
0.0
5,534,276
(7,217)
Chronic Condition – Osteoporosis
Part C Osteoporosis Management for Women with Fracture (ID:56)
27.7 (2013) - 48.3 (2018)
16.0-21.0
44.8
75,014
(241)
Chronic Condition – Poor Hemoglobin A1c Control
MIPS Poor Hemoglobin A1c Control (ID:537)
16.7 (2014) - 17.1 (2016)
9.9-11.1
NA
67,287
(275)
MSSP Poor Hemoglobin A1c Control (ID:59)
20.0 (2014) - 15.7 (2018)
10.6-6.5
NA
204,906
(548)
Part C Diabetes Blood Sugar Controlled (ID:60)
24.1 (2013) - 19.6 (2018)
13.3-9.6
10.0
344,864
(419)
Chronic Condition – Rheumatoid Arthritis
Part C Rheumatoid Arthritis Management (ID:57)
77.7 (2013) - 78.9 (2018)
10.3-7.9
83.7
205,632
(328)
0
10
20
Average Annual
Percentage Change


Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable Score
Denominator
(Providers)
Health Risk Assessment
Part C Special Needs Plan Care Management (ID:462)
59.1 (2013) - 70.7 (2018)
40.0-29.0
95.7
NA
(187)
Mortality – Acute Myocardial Infarction
HVBP AMI Mortality (ID:152)
14.9 (2013) - 13.5 (2018)
13.3-12.2
10.3
491,366
(4,304)
Mortality – Chronic Obstructive Pulmonary Disease
HVBP COPD Mortality (ID:366)
7.8 (2013) - 8.5 (2018)
4.7-5.2
4.4
717,818
(4,541)
Mortality – Coronary Artery Bypass Graft
HVBP CABG Mortality (ID:384)
3.2 (2014) - 3.1 (2018)
3.2-3.4
1.1
136,997
(1,179)
Mortality – Heart Failure
HVBP HF Mortality (ID:150)
11.9 (2013) - 11.6 (2018)
5.6-5.9
7.1
1,055,330
(4,661)
Mortality – Pneumonia
HVBP PN Mortality (ID:232)
16.1 (2015) - 15.5 (2018)
5.8-5.9
NA
1,330,877
(4,723)
0
10
20
Average Annual
Percentage Change

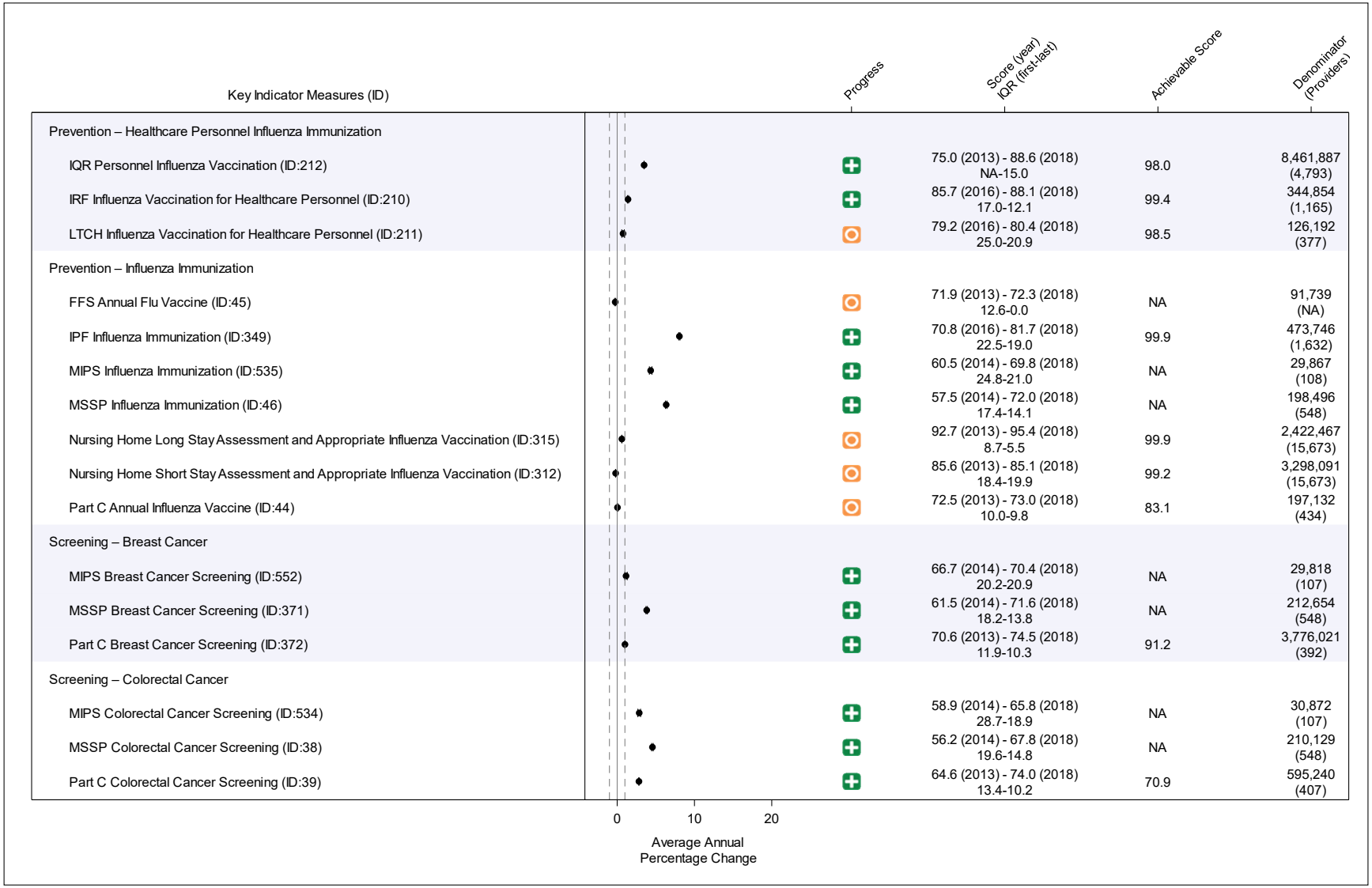
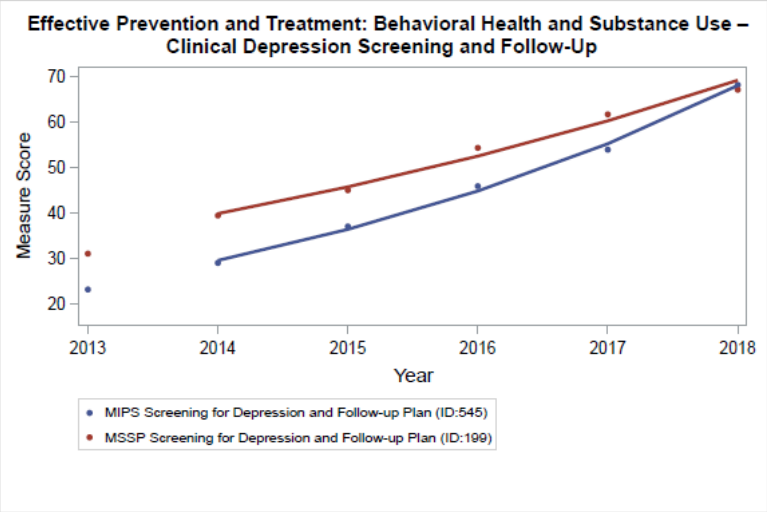
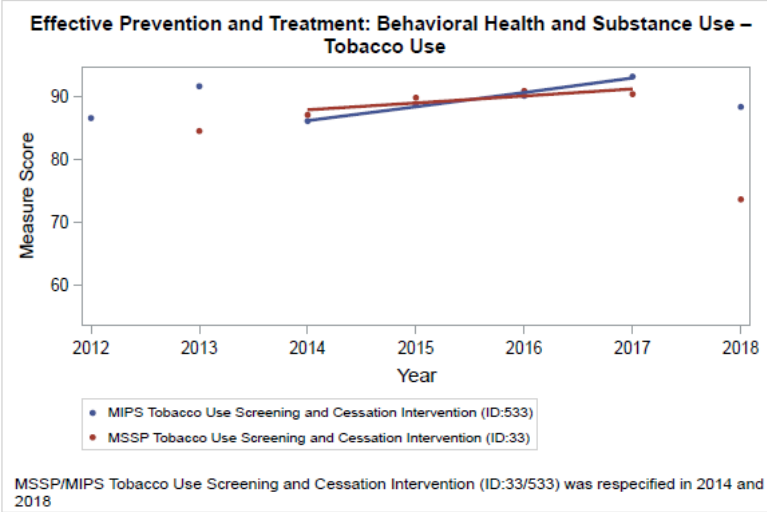
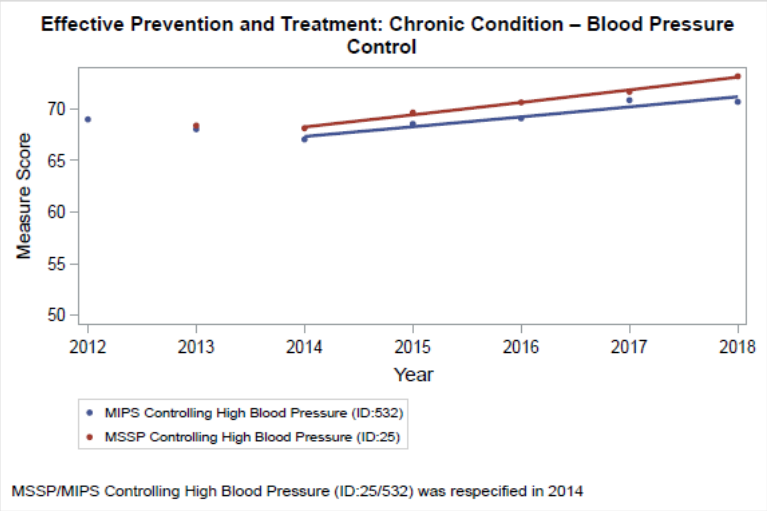

Key Indicator Measures (ID)
Progress
Score (year)
IQR (first-last)
Achievable Score
Denominator
(Providers)
Prevention – Healthcare Personnel Influenza Immunization
IQR Personnel Influenza Vaccination (ID:212)
75.0 (2013) - 88.6 (2018)
NA-15.0
98.0
8,461,887
(4,793)
IRF Influenza Vaccination for Healthcare Personnel (ID:210)
85.7 (2016) - 88.1 (2018)
17.0-12.1
99.4
344,854
(1,165)
LTCH Influenza Vaccination for Healthcare Personnel (ID:211)
79.2 (2016) - 80.4 (2018)
25.0-20.9
98.5
126,192
(377)
Prevention – Influenza Immunization
FFS Annual Flu Vaccine (ID:45)
71.9 (2013) - 72.3 (2018)
12.6-0.0
NA
91,739
(NA)
IPF Influenza Immunization (ID:349)
70.8 (2016) - 81.7 (2018)
22.5-19.0
99.9
473,746
(1,632)
MIPS Influenza Immunization (ID:535)
60.5 (2014) - 69.8 (2018)
24.8-21.0
NA
29,867
(108)
MSSP Influenza Immunization (ID:46)
57.5 (2014) - 72.0 (2018)
17.4-14.1
NA
198,496
(548)
Nursing Home Long Stay Assessment and Appropriate Influenza Vaccination (ID:315)
92.7 (2013) - 95.4 (2018)
8.7-5.5
99.9
2,422,467
(15,673)
Nursing Home Short Stay Assessment and Appropriate Influenza Vaccination (ID:312)
85.6 (2013) - 85.1 (2018)
18.4-19.9
99.2
3,298,091
(15,673)
Part C Annual Influenza Vaccine (ID:44)
72.5 (2013) - 73.0 (2018)
10.0-9.8
83.1
197,132
(434)
Screening – Breast Cancer
MIPS Breast Cancer Screening (ID:552)
66.7 (2014) - 70.4 (2018)
20.2-20.9
NA
29,818
(107)
MSSP Breast Cancer Screening (ID:371)
61.5 (2014) - 71.6 (2018)
18.2-13.8
NA
212,654
(548)
Part C Breast Cancer Screening (ID:372)
70.6 (2013) - 74.5 (2018)
11.9-10.3
91.2
3,776,021
(392)
Screening – Colorectal Cancer
MIPS Colorectal Cancer Screening (ID:534)
58.9 (2014) - 65.8 (2018)
28.7-18.9
NA
30,872
(107)
MSSP Colorectal Cancer Screening (ID:38)
56.2 (2014) - 67.8 (2018)
19.6-14.8
NA
210,129
(548)
Part C Colorectal Cancer Screening (ID:39)
64.6 (2013) - 74.0 (2018)
13.4-10.2
70.9
595,240
(407)
0
10
20
Average Annual
Percentage Change

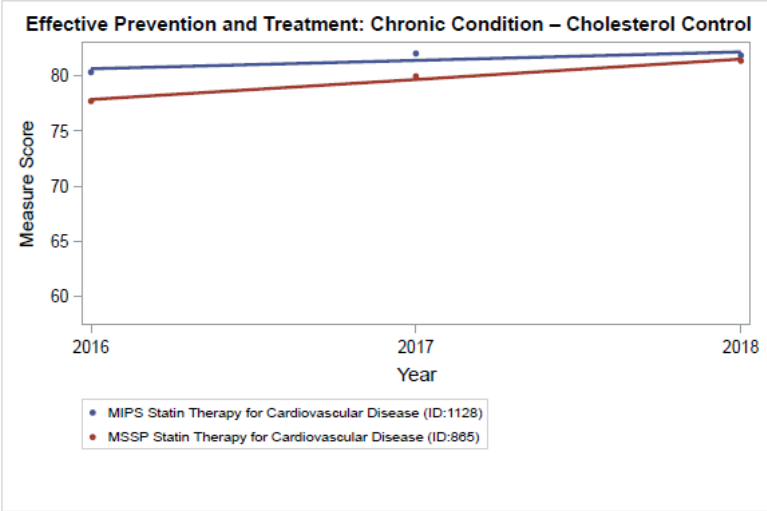
Figure D-15. Measure Trend Plots for Effective Prevention and Treatment Key Indicator Measures

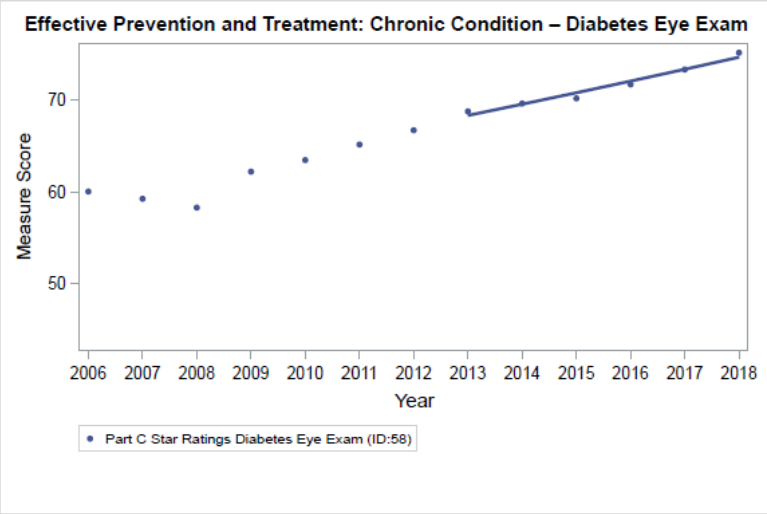
These trend plots present annual data points for the entire analytical period. Unless otherwise indicated, higher scores are better.

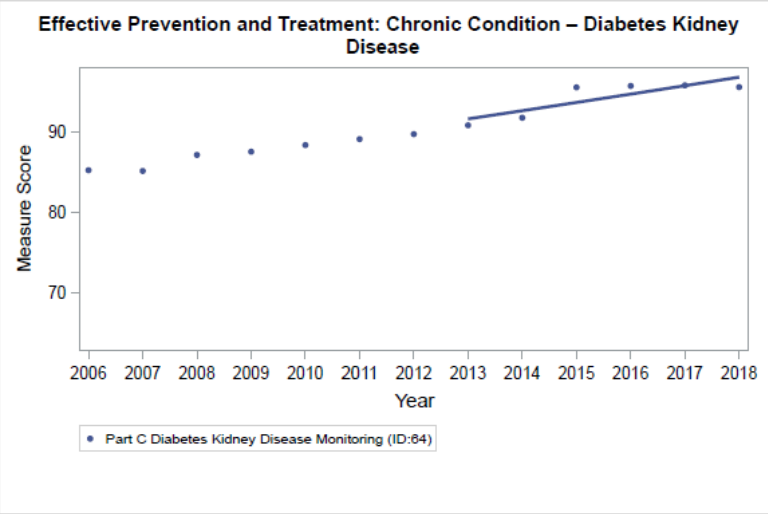


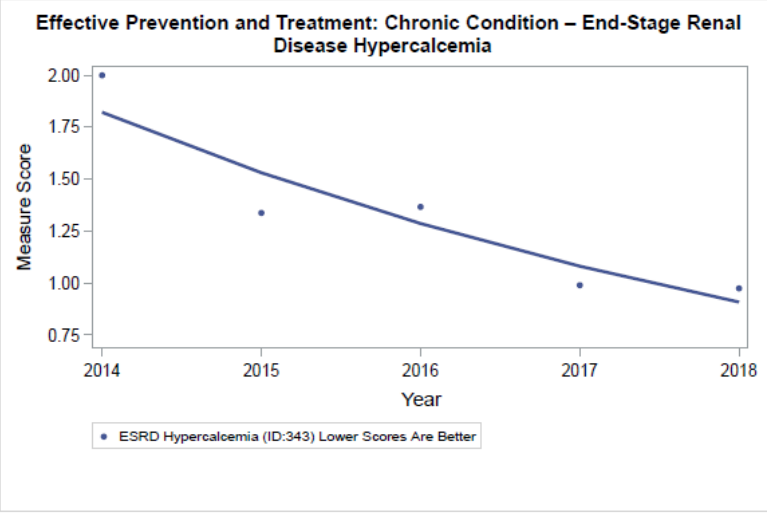


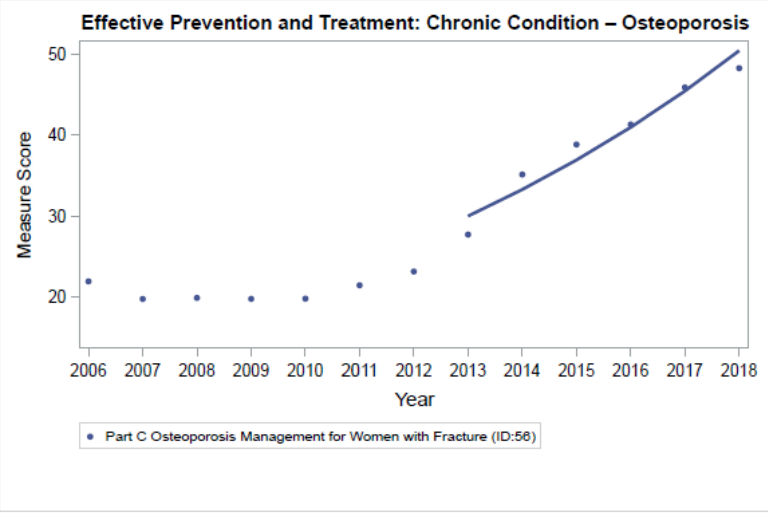


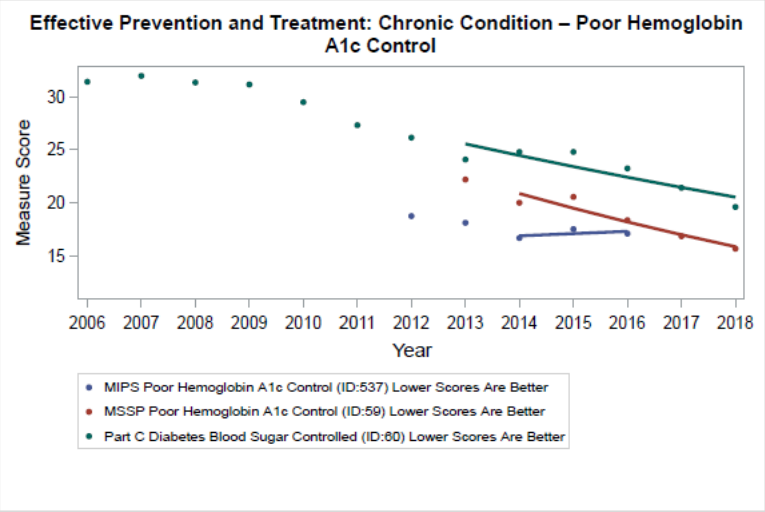


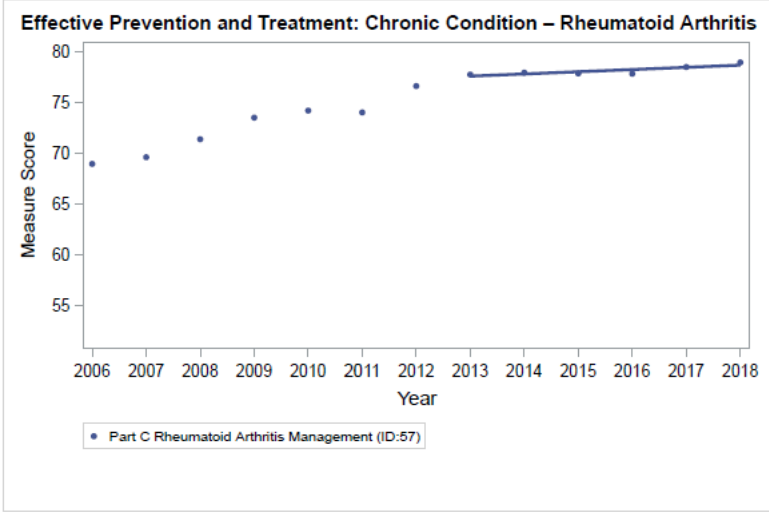

Effective Prevention and Treatment: Chronic Condition – Diabetes Eye Exam
Measure Score
70
60
50
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
Part C Star Ratings Diabetes Eye Exam (ID:58)

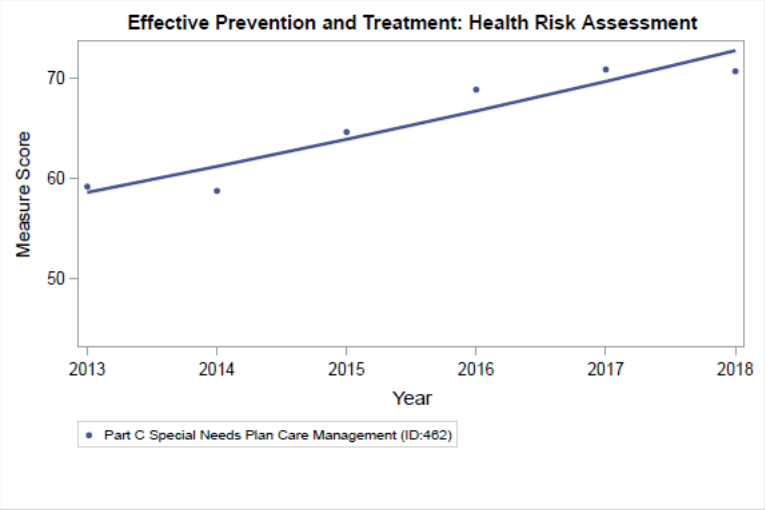

Effective Prevention and Treatment: Chronic Condition – Diabetes Kidney Disease
Measure Score
90
80
70
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
Part C Diabetes Kidney Disease Monitoring (ID:64)

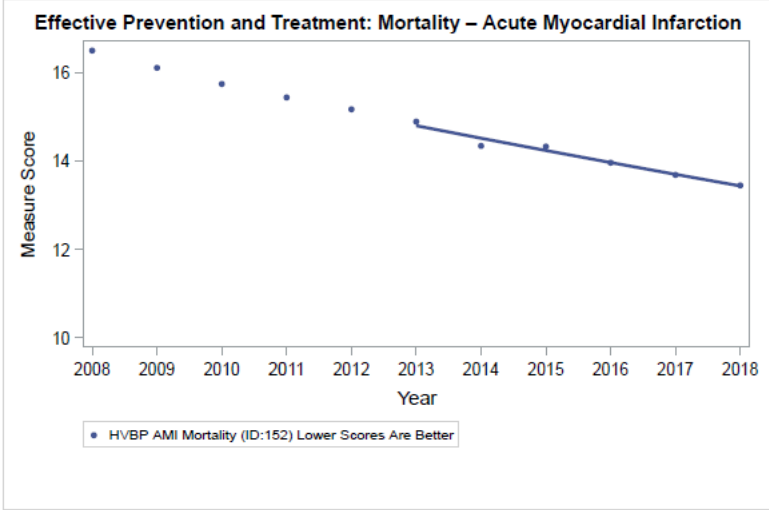

Effective Prevention and Treatment: Chronic Condition – End-Stage Renal Disease Hypercalcemia
Measure Score
2.00
1.75
1.50
1.25
1.00
0.75
2014 2015 2016 2017 2018
Year
ESRD Hypercalcemia (ID:343) Lower Scores Are Better

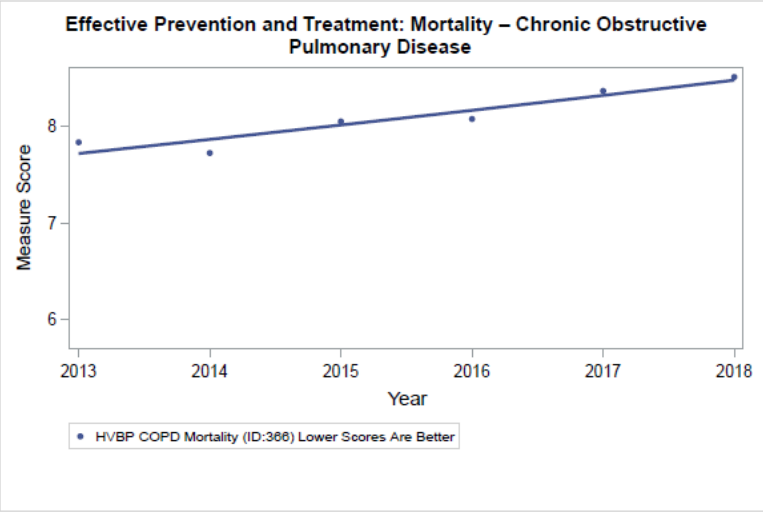

Effective Prevention and Treatment: Chronic Condition – Osteoporosis
Measure Score
50
40
30
20
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
Part C Osteoporosis Management for Women with Fracture (ID:56)

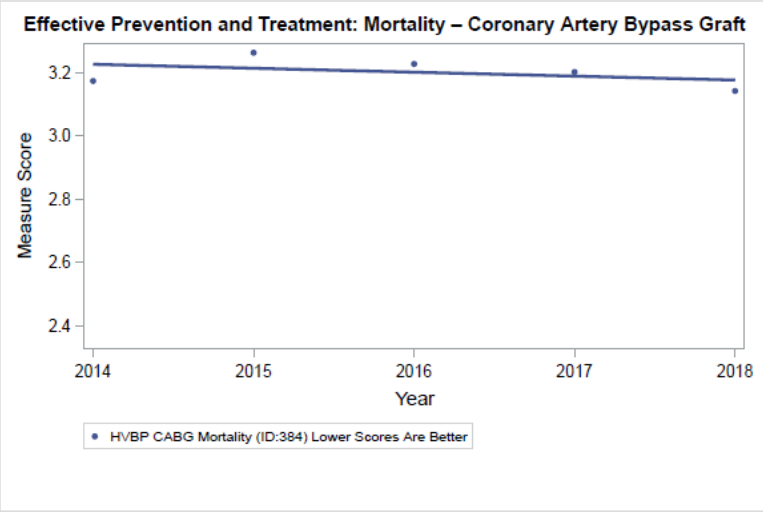

Effective Prevention and Treatment: Chronic Condition – Poor Hemoglobin A1c Control
Measure Score
30
25
20
15
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
MIPS Poor Hemoglobin A1c Control (ID:537) Lower Scores Are Better
MSSP Poor Hemoglobin A1c Control (ID:59) Lower Scores Are Better
Part C Diabetes Blood Sugar Controlled (ID:60) Lower Scores Are Better

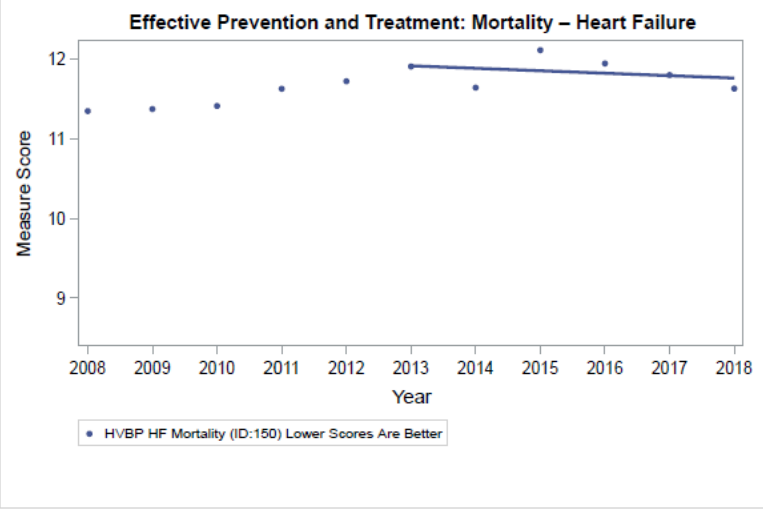

Effective Prevention and Treatment: Chronic Condition – Rheumatoid Arthritis
Measure Score
80
75
70
65
60
55
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
Part C Rheumatoid Arthritis Management (ID:57)

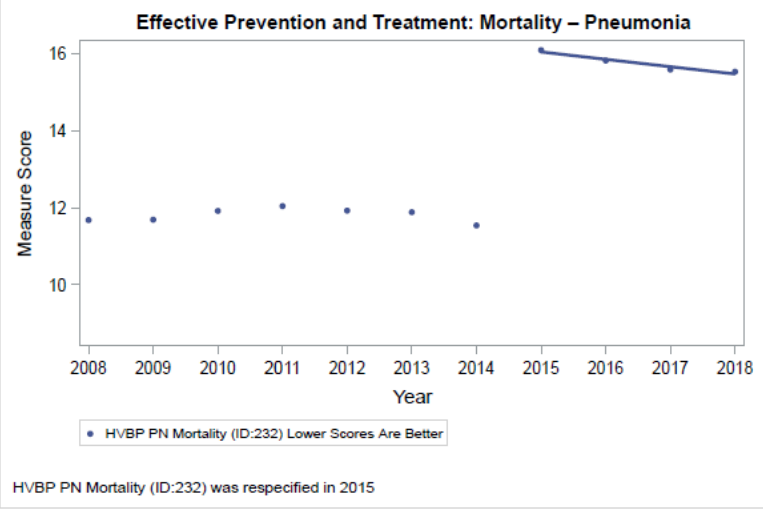

Effective Prevention and Treatment: Health Risk Assessment
Measure Score
70
60
50
2013 2014 2015 2016 2017 2018
Year
Part C Special Needs Plan Care Management (ID:462)

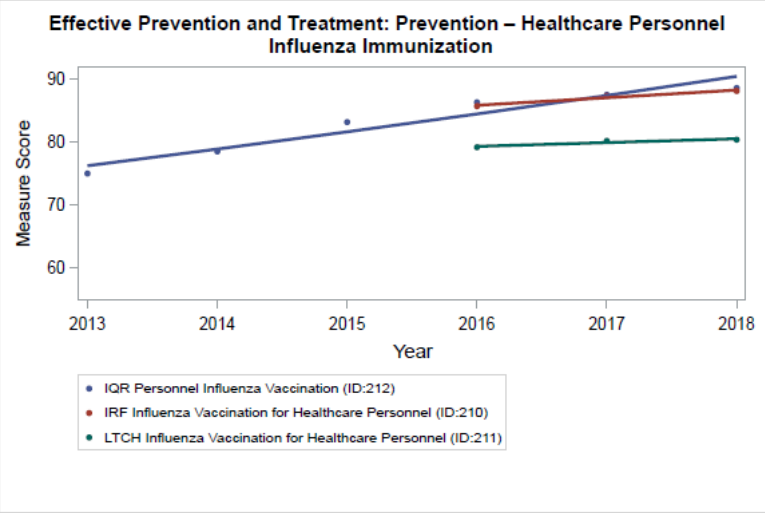

Effective Prevention and Treatment: Mortality – Acute Myocardial Infarction
Measure Score
16
14
12
10
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018
Year
HVBP AMI Mortality (ID:152) Lower Scores Are Better

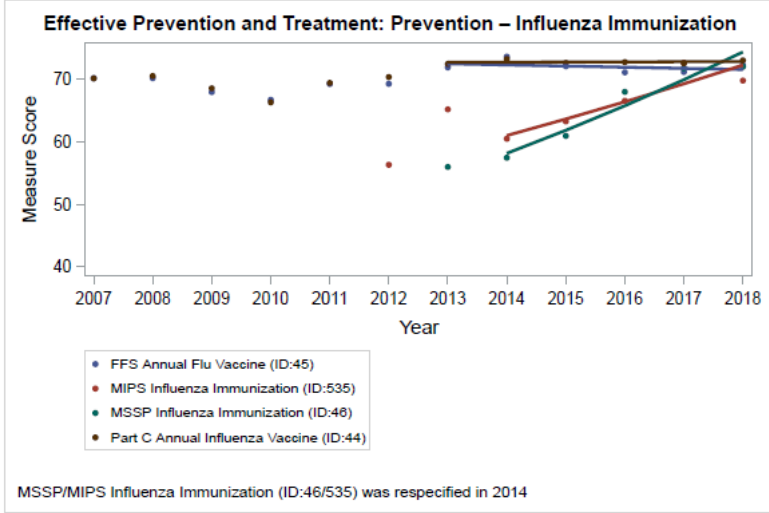

Effective Prevention and Treatment: Mortality – Chronic Obstructive Pulmonary Disease
Measure Score
8
7
6
2013
2014
2015
2016
2017
2018
Year
HVBP COPD Mortality (ID:366) Lower Scores Are Better

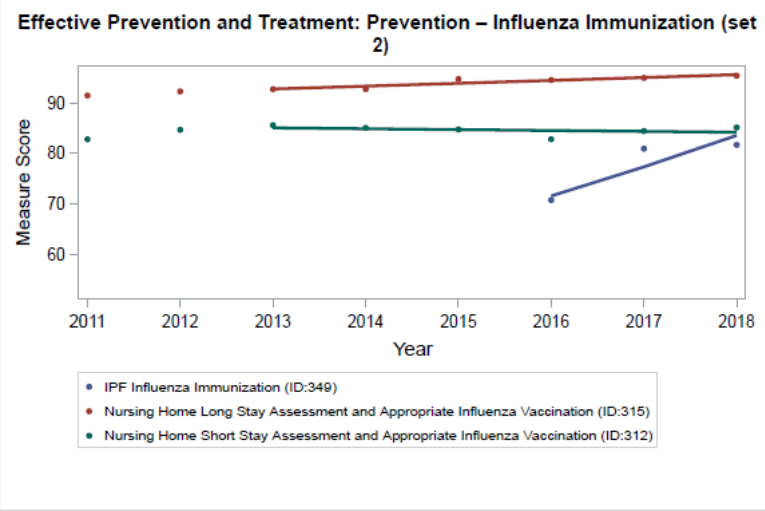

Effective Prevention and Treatment: Mortality – Coronary Artery Bypass Graft
Measure Score
3.2
3.0
2.8
2.6
2.4
2014
2015
2016
2017
2018
Year
HVBP CABG Mortality (ID:384) Lower Scores Are Better

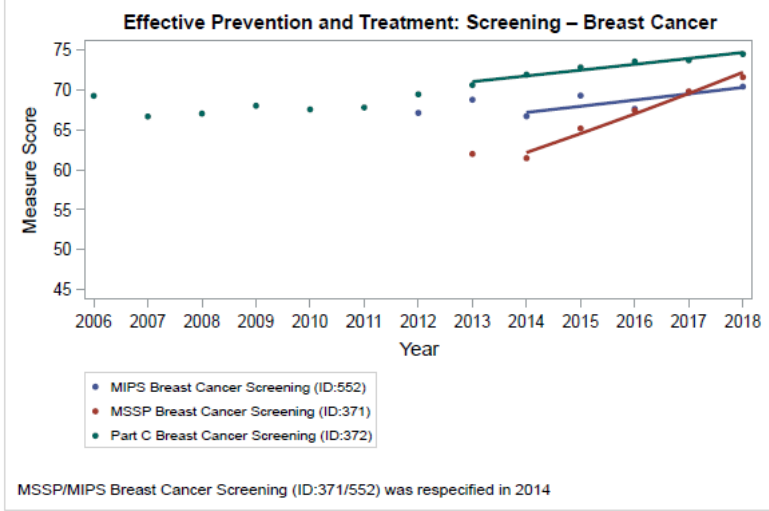

Effective Prevention and Treatment: Mortality – Heart Failure
Measure Score
12
11
10
9
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
HVBP HF Mortality (ID:150) Lower Scores Are Better

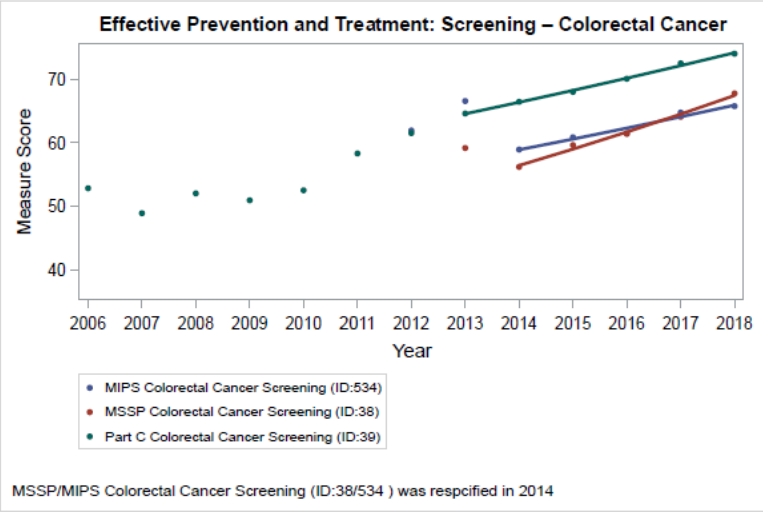

Effective Prevention and Treatment: Mortality – Pneumonia
Measure Score
16
14
12
10
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
HVBP PN Mortality (ID:232) Lower Scores Are Better
HVBP PN Mortality (ID:232) was respecified in 2015


Effective Prevention and Treatment: Prevention – Healthcare Personnel Influenza Immunization
Measure Score
90
80
70
60
2013
2014
2015
2016
2017
2018
Year
IQR Personnel Influenza Vaccination (ID:212)
IRF Influenza Vaccination for Healthcare Personnel (ID:210)
LTCH Influenza Vaccination for Healthcare Personnel (ID:211)


Effective Prevention and Treatment: Prevention – Influenza Immunization
Measure Score
70
60
50
40
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
FFS Annual Flu Vaccine (ID:45)
MIPS Influenza Immunization (ID:535)
MSSP Influenza Immunization (ID:46)
Part C Annual Influenza Vaccine (ID:44)
MSSP/MIPS Influenza Immunization (ID:46/535) was respecified in 2014


Effective Prevention and Treatment: Prevention – Influenza Immunization (set 2)
Measure Score
90
80
70
60
2011
2012
2013
2014
2015
2016
2017
2018
Year
IPF Influenza Immunization (ID:349)
Nursing Home Long Stay Assessment and Appropriate Influenza Vaccination (ID:315)
Nursing Home Short Stay Assessment and Appropriate Influenza Vaccination (ID:312)

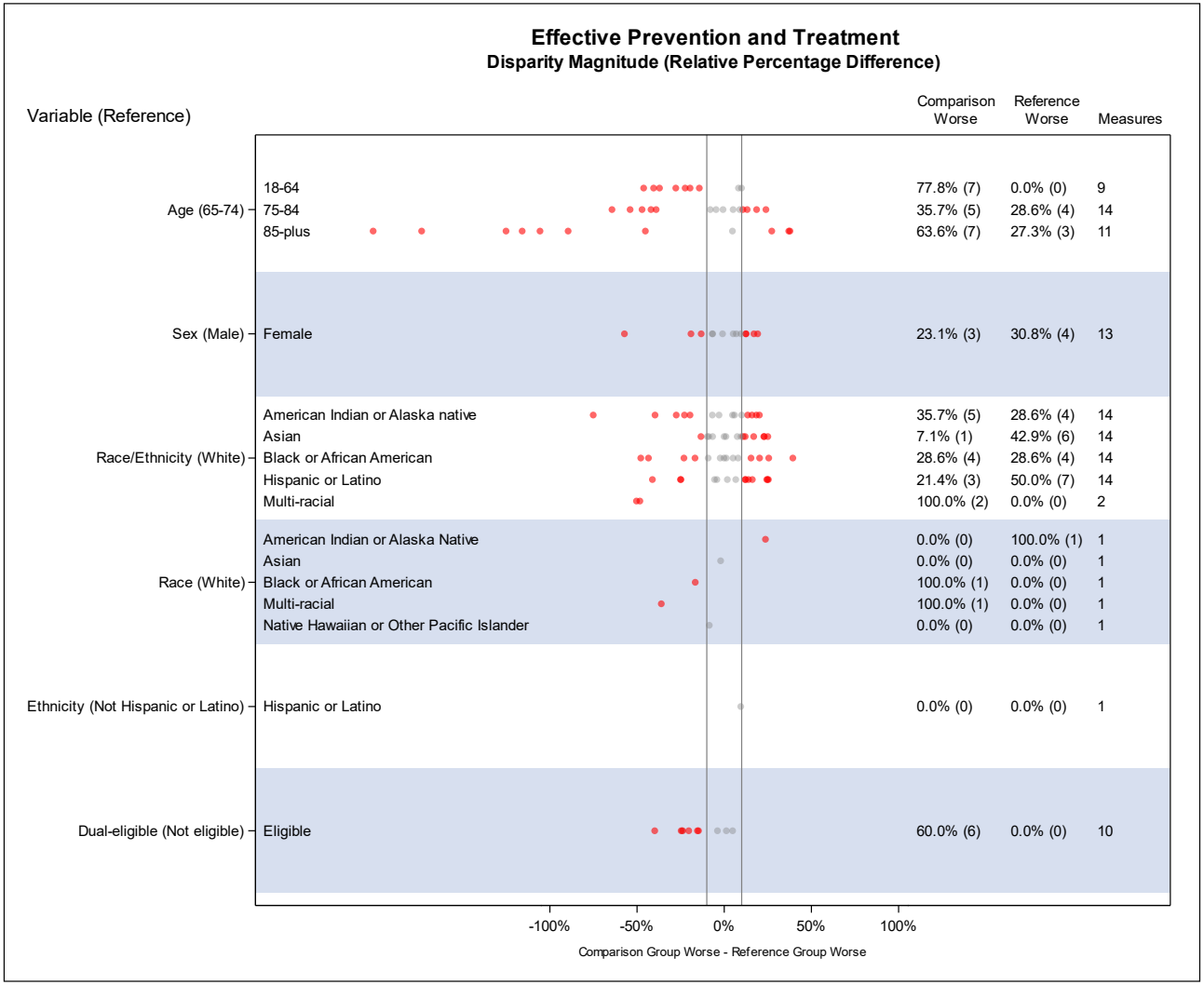

Effective Prevention and Treatment: Screening – Breast Cancer
Measure Score
75
70
65
60
55
50
45
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
MIPS Breast Cancer Screening (ID:552)
MSSP Breast Cancer Screening (ID:371)
Part C Breast Cancer Screening (ID:372)
MSSP/MIPS Breast Cancer Screening (ID:371/552) was respecified in 2014



MSSP/MIPS Colorectal Cancer Screening (ID:38/534) was respcified in 2014

Figure D-16. Disparities Summary for Effective Prevention and Treatment Key Indicators

This figure presents the results of pairwise disparity analyses, aggregated by variable at the health care quality priority level and displayed as the magnitude of the relative difference for each measure. Significant comparisons are denoted in red; nonsignificant comparisons are denoted in gray. Disparity analyses were done for 15 of 38 Key Indicator measures; Table D-7 indicates the disparity variables analyzed for each.



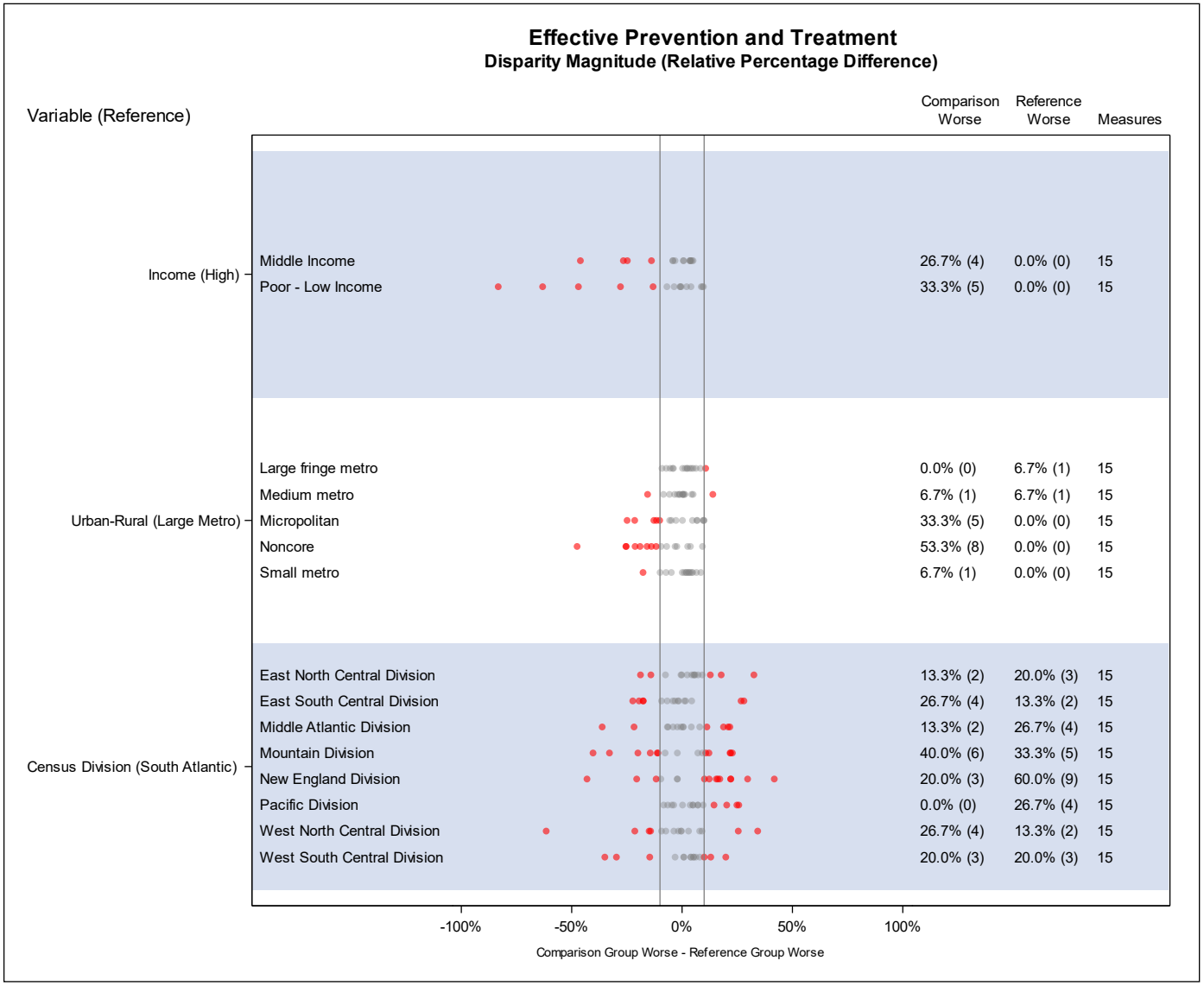

Effective Prevention and Treatment
Disparity Magnitude (Relative Percentage Difference)
Variable (Reference)
Comparison Worse
Reference Worse
Measures
Income (High)
Middle Income 26.7% (4) 0.0% (0) 15
Poor - Low Income 33.3% (5) 0.0% (0) 15
Urban-Rural (Large Metro)
Large fringe metro 0.0% (0) 6.7% (1) 15
Medium metro 6.7% (1) 6.7% (1) 15
Micropolitan 33.3% (5) 0.0% (0) 15
Noncore 53.3% (8) 0.0% (0) 15
Small metro 6.7% (1) 0.0% (0) 15
Census Division (South Atlantic)
East North Central Division 13.3% (2) 20.0% (3) 15
East South Central Division 26.7% (4) 13.3% (2) 15
Middle Atlantic Division 13.3% (2) 26.7% (4) 15
Mountain Division 40.0% (6) 33.3% (5) 15
New England Division 20.0% (3) 60.0% (9) 15
Pacific Division 0.0% (0) 26.7% (4) 15
West North Central Division 26.7% (4) 13.3% (2) 15
West South Central Division 20.0% (3) 20.0% (3) 15
-100%
-50%
0%
50%
100%
Comparison Group Worse - Reference Group Worse

Table D-7. Disparities Analyses Conducted for 15 of 38 Effective Prevention and Treatment Key Indicator Measures

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Annual Flu Vaccine (FFS CAHPS)	45	0039	Fee for Service CAHPS	Prevention – Influenza Immunization	Y	Y	Y	Y	Y	Y	Y
Annual Flu Vaccine	44	0039	Medicare Part C & D Star Ratings	Prevention – Influenza Immunization	Y	Y	Y	Y	Y	Y	Y
Breast Cancer Screening	372	2372	Medicare Part C & D Star Ratings	Screening – Breast Cancer	Y	N	Y	Y	Y	Y	Y
Colorectal Cancer Screening	39	0034	Medicare Part C & D Star Ratings	Screening – Colorectal Cancer	Y	Y	Y	Y	Y	Y	Y
Diabetes Care – Blood Sugar Controlled	60	0059	Medicare Part C & D Star Ratings	Chronic Condition – Poor Hemoglobin A1c Control	Y	Y	Y	Y	Y	Y	Y
Diabetes Care – Eye Exam	58	0055	Medicare Part C & D Star Ratings	Chronic Condition – Diabetes Eye Exam	Y	Y	Y	Y	Y	Y	Y
Diabetes Care – Kidney Disease Monitoring	64	0062	Medicare Part C & D Star Ratings	Chronic Condition – Diabetes Kidney Disease	Y	Y	Y	Y	Y	Y	Y
MORT-30-AMI: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following acute myocardial infarction (AMI) hospitalization.	152	0230	Hospital Value-Based Purchasing (Hospital VBP)	Mortality – Acute Myocardial Infarction	Y	Y	Y	Y	N	Y	Y

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
MORT-30-CABG: CABG Mortality: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following coronary artery bypass graft (CABG) surgery	384	2558	Hospital VBP	Mortality – Coronary Artery Bypass Graft	Y	Y	Y	Y	N	Y	Y
MORT-30-COPD: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	366	1893	Hospital VBP	Mortality – Chronic Obstructive Pulmonary Disease	Y	Y	Y	Y	N	Y	Y
MORT-30-HF: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following heart failure (HF) hospitalization.	150	0229	Hospital VBP	Mortality – Heart Failure	Y	Y	Y	Y	N	Y	Y
MORT-30-PN: Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization.	232	0468	Hospital VBP	Mortality – Pneumonia	Y	Y	Y	Y	N	Y	Y
Osteoporosis Management in Women who had a fracture	56	0053	Medicare Part C & D Star Ratings	Chronic Condition – Osteoporosis	Y	N	Y	Y	Y	Y	Y

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
Proportion of Patients with Hypercalcemia	343	1454	End-Stage Renal Disease Quality Incentive Program & Dialysis Facility Compare	Chronic Condition – End-Stage Renal Disease Hypercalcemia	Y	Y	Y	Y	Y	Y	Y
Rheumatoid Arthritis Management	57	0054	Medicare Part C & D Star Ratings	Chronic Condition – Rheumatoid Arthritis	Y	Y	Y	Y	Y	Y	Y

Table D-8. Patient Impact and Costs Avoided in Effective Prevention and Treatment

Patient impact calculated in terms of patient-level events; costs avoided calculated as the unit cost of each patient-level event and the range of total costs avoided.

Measure	Patient Impact	Annual Data Points	Unit Cost	Costs Avoided
Chronic Condition – Diabetes Eye Exam				
Part C Star Ratings Diabetes Eye Exam (ID: 58)	234,774 members	6 years	NA	NA
Chronic Condition – Diabetes Kidney Disease				
Part C Diabetes Kidney Disease Monitoring (ID: 64)	175,497 members	6 years	NA	NA
Chronic Condition – End-Stage Renal Disease Hypercalcemia				
ESRD Hypercalcemia (ID: 343)	–177,048 patient-months	5 years	NA	NA
Chronic Condition – Poor Hemoglobin A1c Control				
Part C Diabetes Blood Sugar Controlled (ID: 60)	–163,143 members	6 years	$10,510–$17,910	$1,714,600,000–$2,921,900,000
Mortality – Acute Myocardial Infarction				
HVBP AMI Mortality (ID: 152)	–7,108 deaths	6 years	NA	NA
Mortality – Coronary Artery Bypass Graft				
HVBP CABG Mortality (ID: 384)	–43 deaths	5 years	NA	NA
Mortality – Pneumonia				
HVBP PN Mortality (ID: 232)	–7,445 deaths	4 years	NA	NA
Prevention – Healthcare Personnel Influenza Immunization				
IQR Personnel Influenza Vaccination (ID: 212)	4,044,831 personnel	6 years	NA	NA
IRF Influenza Vaccination for Healthcare Personnel (ID:210)	14,129 personnel	3 years	NA	NA
Prevention – Influenza Immunization				
IPF Influenza Immunization (ID: 349)	103,131 patients	3 years	NA	NA
Screening – Breast Cancer				
Part C Breast Cancer Screening (ID: 372)	262,301 members	6 years	NA	NA
Screening – Colorectal Cancer				
Part C Colorectal Cancer Screening (ID: 39)	1,180,795 members	6 years	NA	NA

Health Care Quality Priority: Working With Communities

No Key Indicators have been identified for this health care quality priority.

Health Care Quality Priority: Affordable Care

This health care quality priority has seven Key Indicators with nine quality measures for which an analysis has been performed.

Figure D-17. Performance Summary for Affordable Care Key Indicator Measures

Results are presented as the average annual percentage change with 90% confidence intervals, indications of improved ( ), declined ( ), or stable ( ), measure score and year, interquartile range, achievable score, and number of denominator cases and reporting providers.

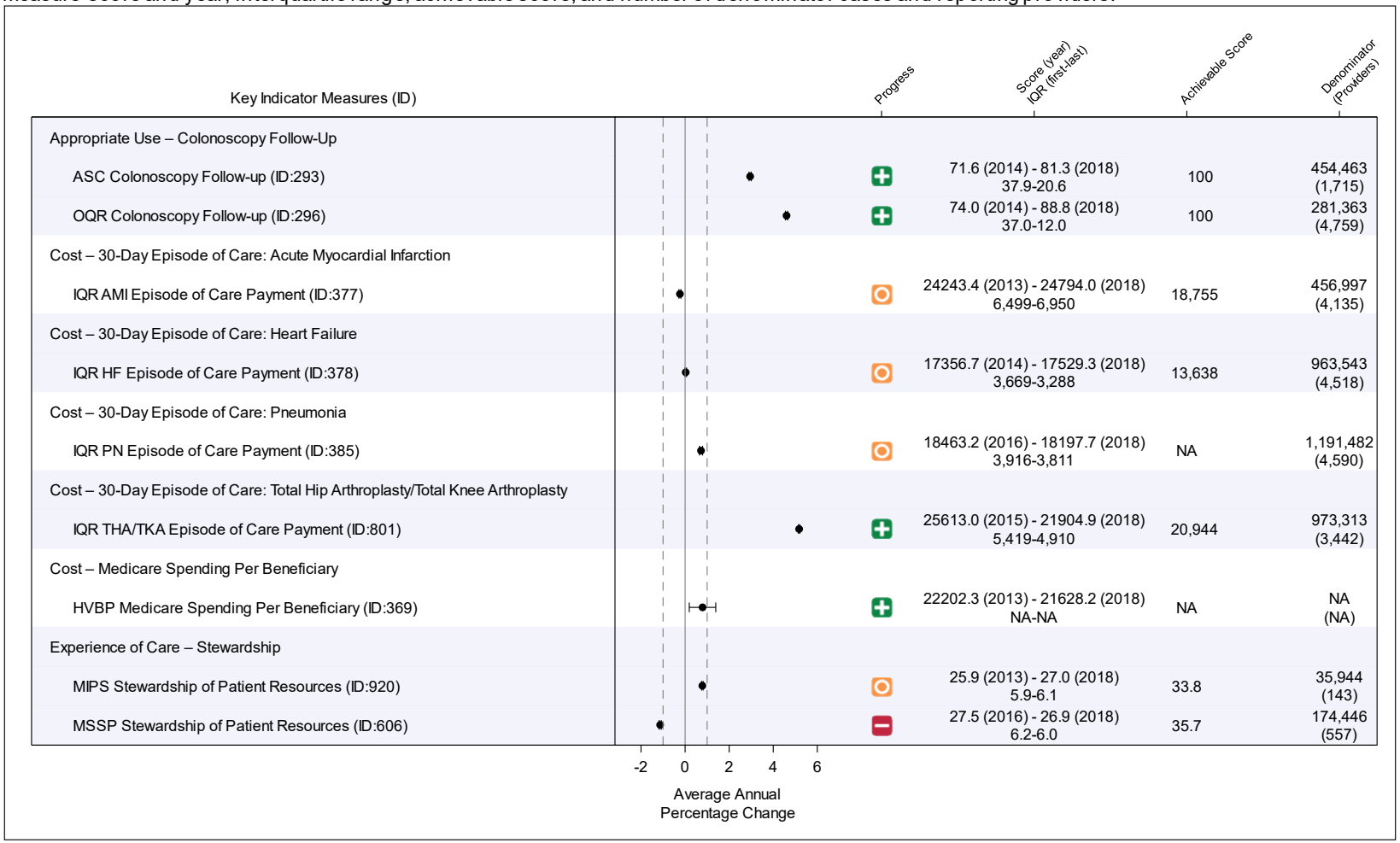
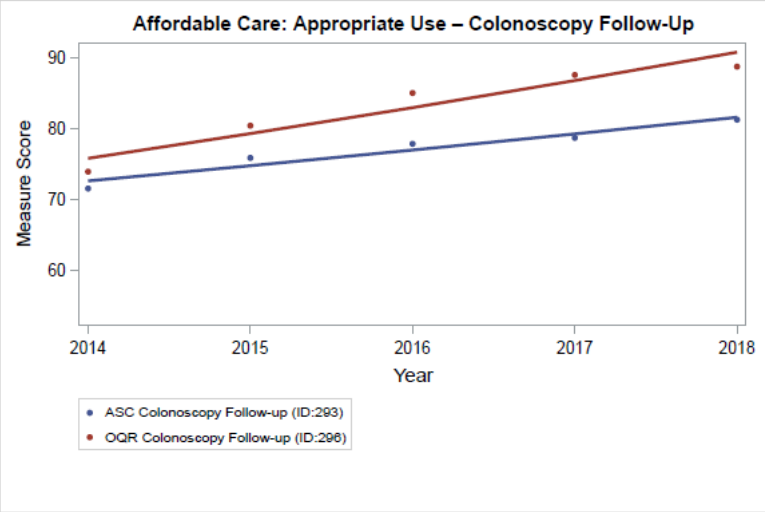
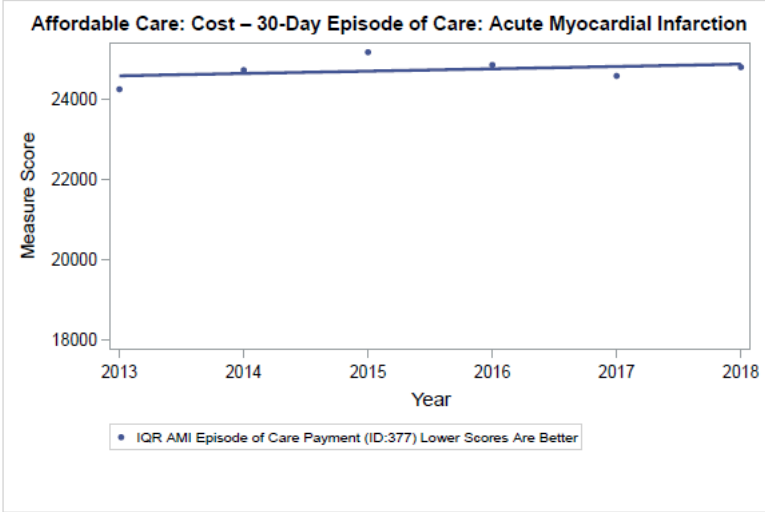
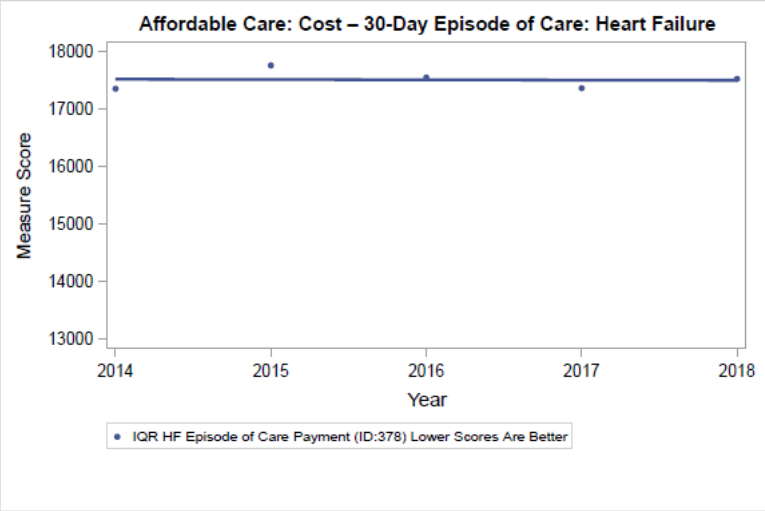


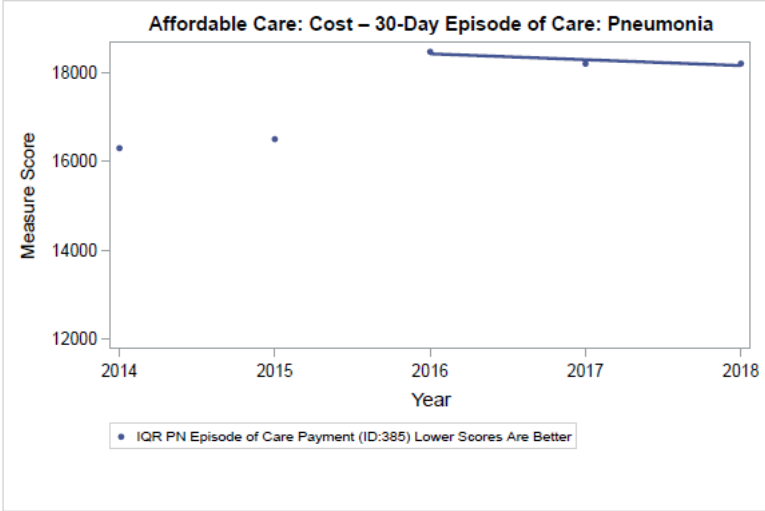
Figure D-18. Measure Trend Plots for Affordable Care Key Indicator Measures

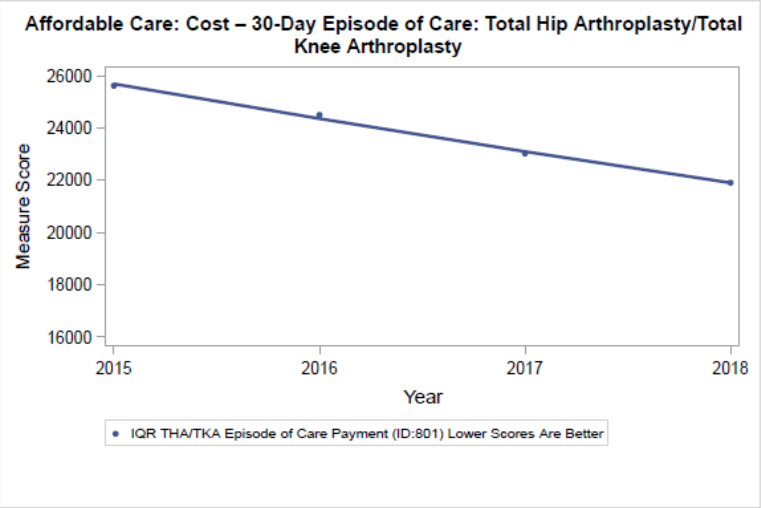
These trend plots present annual data points for the entire analytical period. Unless otherwise indicated, higher scores are better.

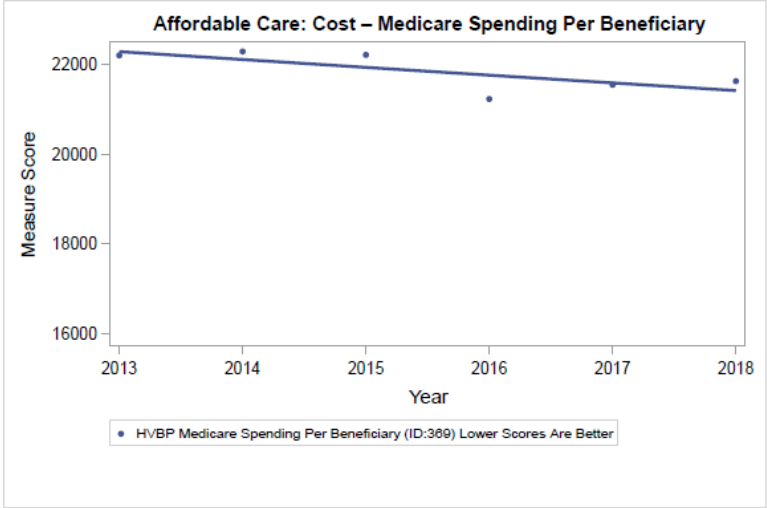









Affordable Care: Cost – 30-Day Episode of Care: Total Hip Arthroplasty/Total Knee Arthroplasty
Measure Score
26000
24000
22000
20000
18000
16000
2015
2016
2017
2018
Year
IQR THA/TKA Episode of Care Payment (ID:801) Lower Scores Are Better


Affordable Care: Cost – Medicare Spending Per Beneficiary
Measure Score
22000
20000
18000
16000
2013
2014
2015
2016
2017
2018
Year
HVBP Medicare Spending Per Beneficiary (ID:369) Lower Scores Are Better

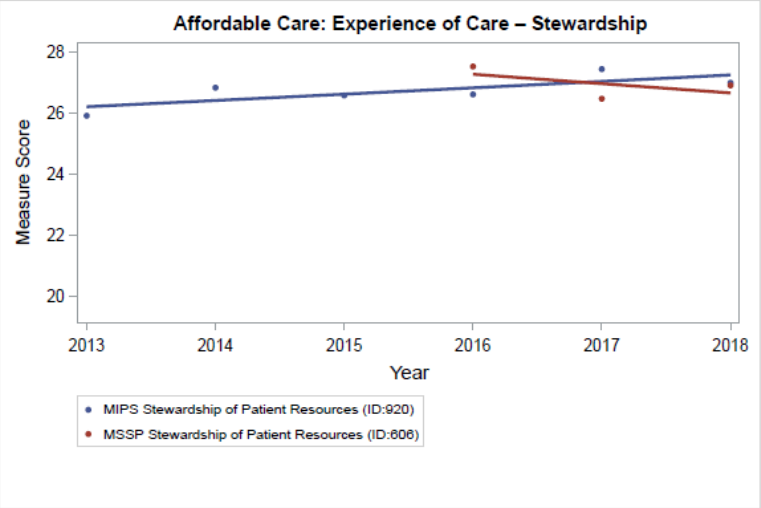
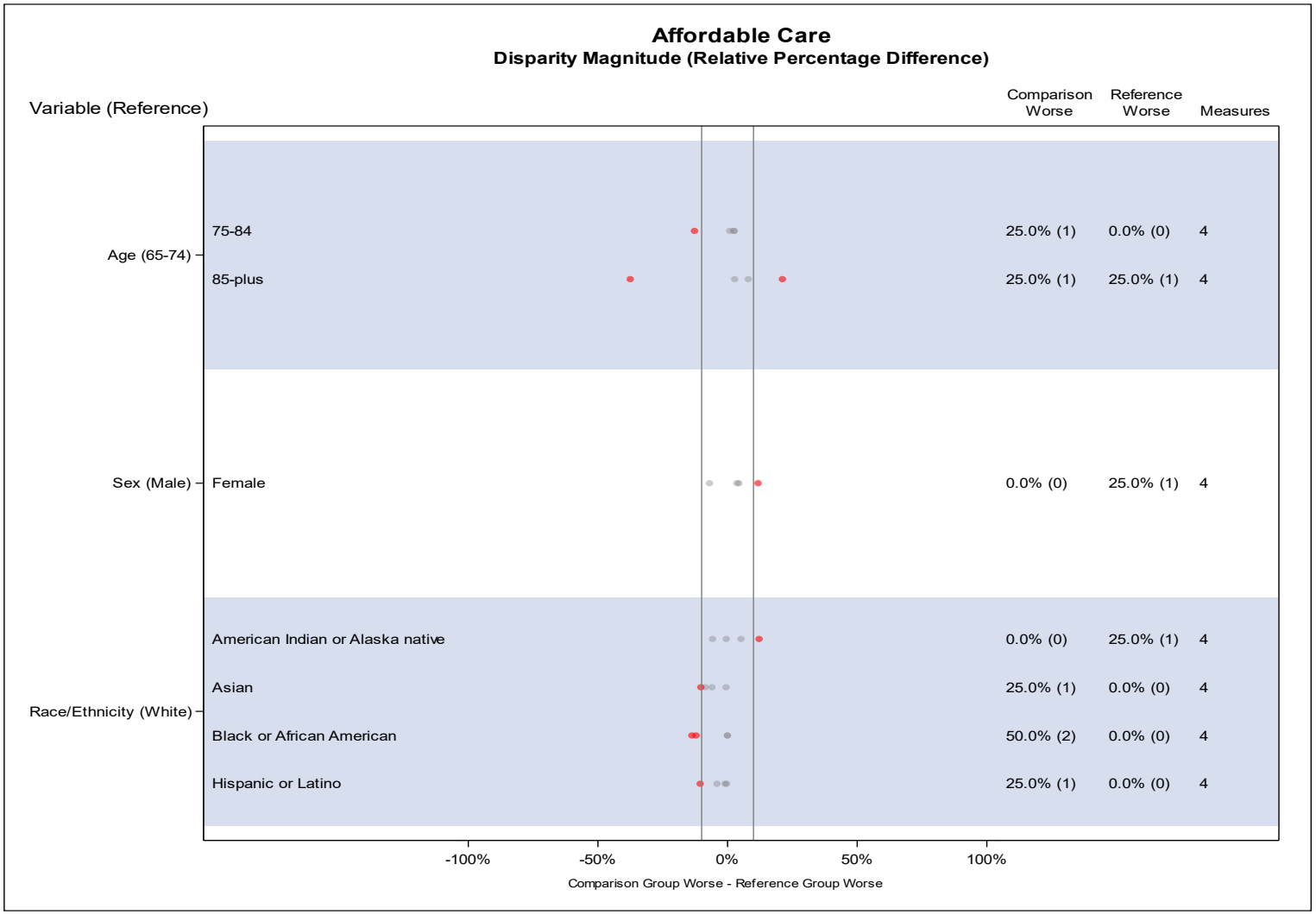

Affordable Care: Experience of Care – Stewardship
Measure Score
28
26
24
22
20
2013
2014
2015
2016
2017
2018
Year
MIPS Stewardship of Patient Resources (ID:920)
MSSP Stewardship of Patient Resources (ID:606)

Figure D-19. Disparities Summary for Affordable Care Key Indicators

This figure presents the results of pairwise disparity analyses, aggregated by variable at the health care quality priority level and displayed as the magnitude of the relative difference for each measure. Significant comparisons are denoted in red; nonsignificant comparisons are denoted in gray. Disparity analyses were done for four of nine Key Indicator measures; Table D-9 indicates the disparity variables analyzed for each.



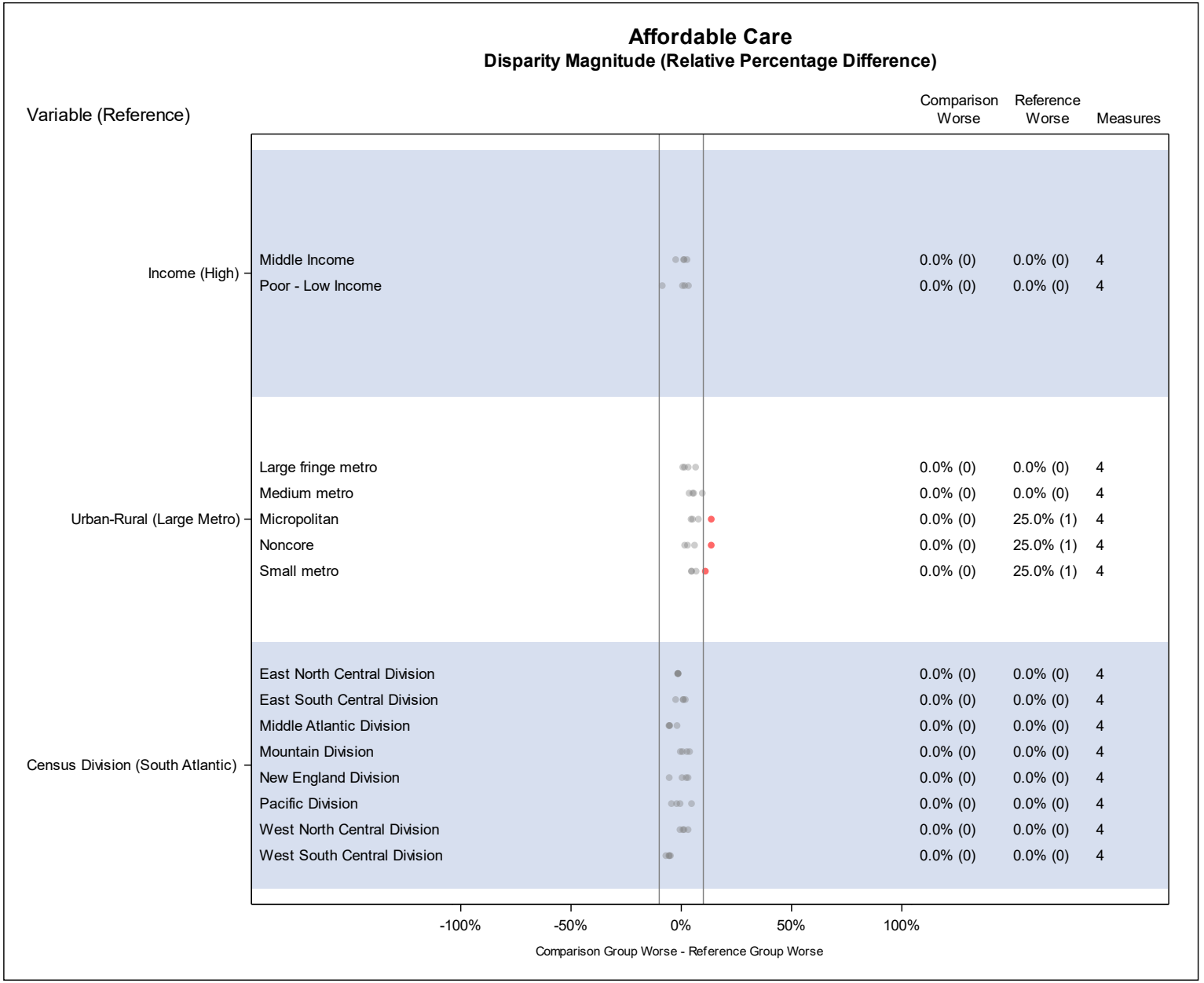

Affordable Care
Disparity Magnitude (Relative Percentage Difference)
Variable (Reference)
Comparison Worse
Reference Worse
Measures
Income (High)
Middle Income 0.0% (0) 0.0% (0) 4
Poor - Low Income 0.0% (0) 0.0% (0) 4
Urban-Rural (Large Metro)
Large fringe metro 0.0% (0) 0.0% (0) 4
Medium metro 0.0% (0) 0.0% (0) 4
Micropolitan 0.0% (0) 25.0% (1) 4
Noncore 0.0% (0) 25.0% (1) 4
Small metro 0.0% (0) 25.0% (1) 4
Census Division (South Atlantic)
East North Central Division 0.0% (0) 0.0% (0) 4
East South Central Division 0.0% (0) 0.0% (0) 4
Middle Atlantic Division 0.0% (0) 0.0% (0) 4
Mountain Division 0.0% (0) 0.0% (0) 4
New England Division 0.0% (0) 0.0% (0) 4
Pacific Division 0.0% (0) 0.0% (0) 4
West North Central Division 0.0% (0) 0.0% (0) 4
West South Central Division 0.0% (0) 0.0% (0) 4
-100%
-50%
0%
50%
100%
Comparison Group Worse - Reference Group Worse

Table D-9. Disparities Analyses Conducted for 4 of 9 Affordable Care Key Indicator Measures

Program Measure Title	IA Measure ID #	NQF ID #	CMS Program	Key Indicator Grouping	Age (Y/N)	Sex (Y/N)	Race/ Ethnicity (Y/N)	Income (Y/N)	Dual-Eligible (Y/N)	Urban-Rural (Y/N)	Census Division (Y/N)
AMI Payment: AMI episode of care (inpatient hospitalization + 30 days post-discharge)	377	2431	Hospital Inpatient Quality Reporting	Cost – 30-Day Episode of Care: Acute Myocardial Infarction	Y	Y	Y	Y	N	Y	Y
HF Payment: Hospital-level, risk-standardized 30-day episode-of-care payment measure for heart failure.	378	2436	Hospital Inpatient Quality Reporting	Cost – 30-Day Episode of Care: Heart Failure	Y	Y	Y	Y	N	Y	Y
PN Payment: Hospital-level, risk-standardized payment associated with a 30-day episode of care for pneumonia	385	2579	Hospital Inpatient Quality Reporting	Cost – 30-Day Episode of Care: Pneumonia	Y	Y	Y	Y	N	Y	Y
THA/TKA Payment: Hospital-Level, Risk-Standardized Payment Associated with an Episode-of-Care for Primary Elective Total Hip Arthroplasty and/or Total Knee Arthroplasty	801	3474	Hospital Inpatient Quality Reporting	Cost – 30-Day Episode of Care: Total Hip Arthroplasty/Total Knee Arthroplasty	Y	Y	Y	Y	N	Y	Y

Table D-10. Patient Impact in Affordable Care

Patient impact calculated in terms of patient-level events.

Measure	Patient Impact	Annual Data Points	Unit Cost	Costs Avoided
Appropriate Use – Colonoscopy Follow-Up				
OQR Colonoscopy Follow-Up (ID: 296)	132,197 patients	5 years	NA	NA

Appendix E – Analytic Results for All Measures

Please refer to the Excel file by the same name.

Appendix F – Addressing Performance Measurement Gaps

Overview

The report identifies emerging measures, those in development for future CMS consideration, and performance measurement gap areas identified from national stakeholder reports and program needs for future measure development to fill a need in the CMS measure portfolio.

- Emerging measures are those implemented in a CMS program for performance year 2019 or later through a final rule published in the *Federal Register*.
- Measures in development were identified from the CMS Measures Management System web page as of June 3, 2020,[1] the 2020 MDP Annual Report,[2] and funding announcements for Medicare Access and Children's Health Insurance Program (CHIP) Reauthorization Act of 2015 (MACRA) Cooperative Agreements.[3]
- Measurement gaps were identified by reviewing key sources (i.e., the *Federal Register; 2020 Measures under Consideration List Program-Specific Measure Needs and Priorities*[4]; reports from the Measure Applications Partnership[5]; the *2019 MDP Annual Report*[6]; and recommendations of the Impact Assessment Technical Expert Panel (TEP) and Federal Assessment Steering Committee (FASC) convened jointly by HSAG. published from January 1, 2018, to March 31, 2020. Gaps identified from the key sources are omitted from the gap tables when they could be addressed by emerging measures or measures in development.

Other performance measurement gaps or measures in development could exist but were not identified using the sources documented for this report.

Results are presented by health care quality priority, care setting, and program, as applicable. Gaps identified for specific programs are noted in each table.

Program Abbreviations		
Ambulatory Surgery Center Quality Reporting (ASCQR) Program	Hospital Readmissions Reduction Program (HRRP)	Long-Term Care Hospital Quality Reporting Program (LTCH QRP)
Dialysis Facility Compare (DFC)	Hospital Inpatient Quality Reporting (Hospital IQR) Program	Medicare Shared Savings Program (MSSP)
End-Stage Renal Disease Quality Incentive Program (ESRD QIP)	Hospital Outpatient Quality Reporting (Hospital OQR) Program	Merit-based Incentive Payment System (MIPS)
Home Health Quality Reporting Program (HH QRP)	Hospital Value-Based Purchasing (Hospital VBP) Program	Prospective Payment System–Exempt Cancer Hospital Quality Reporting (PCHQR)
Hospice Quality Reporting Program (HQRP)	Inpatient Psychiatric Facility Quality Reporting (IPFQR) Program	Quality Rating System for Qualified Health Plans (QRS)
Hospital-Acquired Condition Reduction Program (HACRP)	Inpatient Rehabilitation Facilities Quality Reporting Program (IRF QRP)	Skilled Nursing Facility Quality Reporting Program (SNF QRP)

Patient Safety

Emerging Measures

- Surgical Treatment Complications for Localized Prostate Cancer (PCHQR)

Measures in Development

- Claims-based healthcare-associated infection measure for skilled nursing facilities
- Two risk-standardized clinician-level measures for complications following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) – one electronic clinical quality measure (eCQM) and one claims-based measure
- *Excessive Radiation Dose or Inadequate Image Quality for Diagnostic Computed Tomography (CT) in Adults*
- Outcome measure of maternal morbidity and mortality to evaluate care of women hospitalized for delivery (eCQM)
- *Hemodialysis Vascular Access: Practitioner-Level Long-Term Catheter Rate*

Gaps in Performance Measurement

Table F-1. Patient Safety Measurement Gaps by Clinical Setting	Acute	Post-Acute	Clinician/ ACO	Managed Care
Enhanced measures of preventable healthcare harm[1,2] (e.g., falls,[3] hypoglycemia,[1] pressure injury[1]); ventilator-associated events[4]	X			
Harmful medication side effects, bloodstream and vascular access–related infections in ESRD patients		X		
Hospice: safety addressing falls, skin integrity; functional status		X		
Improving diagnostic quality and safety[3,4,5]	X		X	
Maternal morbidity and mortality[6] (e.g., poor birth outcomes, postpartum complications, cesarean birth rate balancing measures)				X
Measures focused on procedures performed in ambulatory surgery centers[7]	X			
Measures of infection,[7,8] complication,[7] prevention[8] and treatment[9] of sepsis; surgical site infections in additional locations[4]; refinements to current infection measures[10]	X	X		
Risk-adjusted outcomes related to HACs[4]; all-cause harm[4,11,12]	X			
Safety planning for: patients with suicidal ideation, assaults and violence[11]	X			
Structure, process, or outcome measures that address harms that occur as a result of care delivery[6]; potentially harmful drug-drug interactions[6]			X	

Key: 1 – Hospital IQR Program; 2 – Hospital VBP; 3 - Hospital OQR Program; 4 - HACRP; 5 - MIPS; 6 - Adult Medicaid; 7 - ASCQR Program; 8 - SNF QRP; 9 - LTCH QRP; 10 - IRF QRP; 11 - IPFQR Program; 12 – PCHQR

Gaps identified for the Medicaid Adult and Child Core Sets are included in the managed care column.

Person and Family Engagement

Emerging Measures

- CAHPS for ACOs: Courteous and Helpful Office Staff and Care Coordination (2 measures for MSSP)
- Functional status after lumbar fusion, primary total knee replacement, and lumbar discectomy/laminectomy (3 measures for MIPS)
- *Functional Status Change for Patients with Neck Impairments* (MIPS)
- *Leg Pain After Lumbar Fusion* (MIPS)
- National Core Indicators Survey for individuals with intellectual and developmental disabilities and their families (Medicaid Adult Core Set)
- Standardized symptom index score change after diagnosis of benign prostatic hyperplasia (MIPS)

Measures in Development

- Patient-reported outcome-based performance measures for THA and TKA, including goal achievement, for facilities and clinicians (3 measures)
- Functional status assessment and target setting for patients with heart failure, asthma, rheumatoid arthritis, and osteoarthritis (4 measures)
- Patient experience measures for palliative care patients with serious illness: feeling heard and understood; receiving desired help for pain; and overall rating of care for outpatient mental health and substance use disorders (3 measures)
- Patient-reported outcome-based measures for oncology care, including mental and physical health–related quality of life and pain following chemotherapy (4 measures)
- Patient-reported outcome-based measure for patients undergoing nonemergent percutaneous coronary intervention (PCI) (1 measure)

Gaps in Performance Measurement

Table F-2. Person and Family Engagement Measurement Gaps by Clinical Setting	Acute	Post-Acute	Clinician/ ACO	Managed Care
Care aligned with patient goals[1,2]; detailed advance directives[2]		X		
Caregiver engagement,[3] patient empowerment[3]	X			
Engagement in treatment planning and goal setting, including follow-up and reassessment[4]			X	
Maintenance, stabilization, or improvement of activities of daily living[5]		X		
Medication adherence measures that capture rational nonadherence and patient preference[6]				X
Medication management at the end of life[1]		X		
Patient-reported functional outcomes, including changes in functional status,[5] quality of life[3, 7-10]	X	X		
Support for patients in achieving follow-up instructions[4]			X	
Symptom management outcomes[1]		X		

Key: 1 - HQRP; 2 - SNF QRP; 3 - IPFQR; 4 - MIPS; 5 - HH QRP; 6 - Part C and D Star Ratings; 7 – ESRD QIP; 8 – Hospital IQR; 9 – PCHQR; 10 – ASCQR

Communication and Care Coordination

Emerging Measures

- *Facility-Level 7-Day Hospital Visits After General Surgery Procedures Performed at Ambulatory Surgical Centers* (ASCQR Program)
- *Hybrid Hospital-Wide Readmission Measure with Claims and Electronic Health Record Data* (Hospital IQR Program)
- *International Normalized Ratio Monitoring for Individuals on Warfarin* (QRS)
- *Medication Continuation Following Inpatient Psychiatric Discharge* (IPFQR Program
- Medication reconciliation measure for patients with ESRD (ESRD QIP)
- Transfer of health information between providers and with the patient in four post-acute care settings: (8 measures for HH QRP, IRF QRP, LTCH QRP, SNF QRP)

Measures in Development

- Care Coordination after Asthma-Related Emergency Department Visit (2 measures)
- Clinician and Clinician Group Risk-Standardized Hospital Admission Rates for Patients with Heart Failure
- Laboratory diagnosis measures for MIPS, including timeliness of communicating results and reporting revised pathology reports (4 measures)
- Medication safety, including opioid safety and adverse drug events for patients taking anticoagulant medications in an ambulatory setting (2 measures)

Gaps in Performance Measurement

Table F-3. Communication and Care Coordination Measurement Gaps by Clinical Setting	Acute	Post-Acute	Clinician/ ACO	Managed Care
Adverse drug events during inpatient stays[1]	X			
Efficacy of transfers from acute care hospitals to SNFs[2]; quality and safety of care transitions[2-4]	X	X		
EHR safety, such as patient matching and correct identification[4]	X			
Care coordination and handoffs using eCQMs[5]; communication between patient and provider[6]; timely transition of EHR data elements[6]			X	
Communication and care coordination,[4-10] including rural populations	X		X	X
Coordination of dialysis services for transient patients[11]		X		
Interoperability across care settings, including bidirectional exchange of clinical information	X	X	X	X
Medication review and reconciliation at time of discharge and transfers	X	X	X	X
Medication safety with emphasis on opioid prescribing and stewardship[12]	X			
Patient access to records[6]; bidirectional sharing of patient- and caregiver-generated data[6]; care visit information available via health information exchange[6]			X	
Polypharmacy[9,13]		X		X
Readmissions: Condition-specific[14]; 7-day time frame[15]; interaction with mortality[15]	X			
Telehealth: incorporate into existing measures[7]				X
Timely exchange of clinical information		X	X	
Transitions of care from provider to provider, including from cancer hospitals to other facilities and outpatient settings such as hospice	X	X	X	X

Key: 1 - HACRP; 2 - SNF QRP; 3 - HVBP; 4 - Hospital IQR; 5 - MSSP; 6 - MIPS; 7 - Part C and D Star Ratings; 8 - Hospital OQR; 9 - Adult Medicaid; 10 - Child Medicaid; 11 - ESRD QIP; 12 - ASCQR; 13 - HQRP; 14 - IPFQR; 15 – HRRP

Gaps identified for Medicaid are included in managed care.

Effective Prevention and Treatment

Emerging Measures

- *Continuity of Pharmacotherapy for Opioid Use Disorder* (MIPS)
- *HIV Screening* (MIPS)
- *Metabolic Monitoring for Children and Adolescents on Antipsychotics* (Medicaid Child Core Set)
- Multimodal pain management for surgical procedures (MIPS)
- *Percentage of Prevalent Patients Waitlisted [for kidney or kidney-pancreas transplant]* (ESRD QIP)
- *Safe Use of Opioids – Concurrent Prescribing (eCQM)* (Hospital IQR Program)
- *Standardized First Kidney Transplant Waitlist Ratio for Incident Dialysis Patients* (DFC)
- *Use of Pharmacotherapy for Opioid Use Disorder* (Medicaid Adult Core Set)

Measures in Development

- *Annual Wellness Assessment: Preventive Care (Composite)*
- *Cognitive impairment in older adults*
- *Documentation of a Health Care Partner for Patients with Dementia or Mild Cognitive Impairment*
- Evidence-based treatments for first-episode psychosis (initiation and adherence to treatment plan) and suicide safety plan (initiation, review, and update) (2 measures)
- *Medication-assisted treatment for opioid use disorder (OUD) and continuity of pharmacotherapy for OUD*
- *Opioid prescribing practices following discharge for total hip arthroplasty (THA) or total knee arthroplasty (TKA)*
- Measurement-based care for patients seen for mental health and/or opioid or other substance use, including initial standardized assessment; and monitoring of symptoms, function, and recovery (including stabilization of symptoms and functional impairments) (2 measures)
- *Use of Multimodal and Multidisciplinary Pain Management Therapies for Adults Prescribed Opioids*

Gaps in Performance Measurement

Table F-4. Effective Prevention and Treatment Measurement Gaps by Clinical Setting	Acute	Post-Acute	Clinician/ ACO	Managed Care
Cancer: personalized medicine and pharmacogenomic testing, pain management, oral chemotherapy compliance, survival	X		X	
Clinical improvement outcomes and medical comorbidities for patients treated in IPFs[1]; treatment outcomes for substance use disorders[2]	X			X
Co-prescription of opioids and benzodiazepines[3]				X
Dementia[4]	X			
ESRD: management of comorbid conditions, pediatric dialysis, palliative dialysis, rehabilitating people of working age		X		
Integration of mental health with substance use[2] and primary care[5]; substance use other than opioids[1,4,6,7,8]	X	X		X
Interpregnancy interval and interconception care to address risk factors[2]; maternity care, including experience of care and breastfeeding[2,5]				X
Mental and behavioral health[8]		X		
Opioids[8-10]: appropriate clinical prescribing; new/chronic use[2] and frequency		X		X
Nutrition[2,8]/malnutrition: screening, assessment, plan, discharge		X	X	X
Screening children for abuse and neglect[5]				X

Key: 1 - IPFQR; 2 - Adult Medicaid; 3 - Part C and D Star Ratings; 4 -Hospital IQR; 5 - Child Medicaid; 6 - PCHQR; 7 - ESRD QIP; 8 - LTCH QRP; 9 - HH QRP; 10 - IRF QRP

Gaps identified for the Medicaid Adult and Child Core Sets are included in the managed care column.

Working With Communities

Emerging Measures and Measures in Development

No emerging measures or measures in development were identified for Working With Communities.

Gaps in Performance Measurement

Table F-5. Working With Communities Measurement Gaps by Clinical Setting	Acute	Post-Acute	Clinician/ ACO	Managed Care
Access/availability of care and provider networks,[1-5] including behavioral health professionals[4]; particularly for rural communities[1]	X		X	X
Collaboration across health and nonhealth sectors to improve equity of care[1]			X	
Cultural competence[1]			X	
Equity-focused measures that stratify for disparities associated with social determinants of health[1,4,6,7]		X	X	X
Health insurance: Continuous coverage longer than 12 months[7]				X
Health literacy[1]			X	
Measures to assess disparities in rural health	X	X	X	
Referral to community supports and services[1]			X	

Key: 1- MIPS; 2 - IPFQR; 3 - PCHQR; 4 - Adult Medicaid; 5 - Part C and D; 6 – HH QRP; 7 – Child Medicaid
Gaps identified for the Medicaid Adult and Child Core Sets are included in the managed care column.

Affordable Care

Emerging Measures

- *Appropriate Use of DXA Scans in Women Under 65 Years Who Do Not Meet the Risk Factor Profile for Osteoporotic Fracture* (MIPS)
- 18 episode-based cost measures implemented in the MIPS cost performance category
  - 13 focused on procedural episodes (e.g., knee arthroplasty, cataract removal, screening/surveillance colonoscopy)
  - Five focused on acute inpatient medical conditions (e.g., intracranial hemorrhage or cerebral infarction, COPD exacerbation)

Measures in Development

No measures in development were identified for Affordable Care.

Gaps in Performance Measurement

Table F-6. Affordable Care Measurement Gaps by Clinical Setting

	Acute	Post-Acute	Clinician/ ACO	Managed Care
Appropriate preoperative testing[1]	X			
Appropriateness of transfers[2]		X		
Diagnostic efficiency[3]			X	
Emergency department utilization[4]				X
Low-value care minimization[4-8]	X	X		X
Out-of-pocket costs[9] and affordability discussions with beneficiaries[3,10]			X	X
Overuse of services, unnecessary health services, inefficiencies in health care delivery, high prices, or fraud[11]			X	
Over-/underutilization of cancer treatment modalities such as chemotherapy, radiation therapy, and imaging treatments[7]	X			
Use of optimal course of therapy to reduce patient harm and cost[11]			X	

Key: 1 - ASCQR; 2 - SNF QRP; 3 – MSSP; 4 - Adult Medicaid; 5 – Hospital IQR; 6 - IPFQR; 7 - PCHQR; 8 - ESRD-QIP; 9 - Part C and D Star Ratings; 10 – Child Medicaid; 11 – MIPS

Gaps identified for the Medicaid Adult and Child Core Sets are included in the managed care column.

Appendix F References

1. Centers for Medicare & Medicaid Services. Measures Management System. Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/MMS-Content-Page. Accessed August 19, 2020.
2. Centers for Medicare & Medicaid Services, Center for Clinical Standards and Quality. *CMS Quality Measure Development Plan 2020 Annual Report.* Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/files/zip/2020-quality-measure-development-plan-annual-report.zip. Accessed January 14, 2021.
3. Centers for Medicare & Medicaid Services. *MACRA Funding Opportunity: Measure Development Awardees for the Quality Payment Program.* Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/9-21-18-QPP-Measures-Cooperative-Agreement-Awardees.pdf. Accessed December 15, 2020.
4. Centers for Medicare & Medicaid Services. *2020 Measures under Consideration List Program-Specific Measure Needs and Priorities.* Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/files/document/cms-measurement-priorities-and-needs.pdf. Accessed May 21, 2020.
5. National Quality Forum. Measure Applications Partnership. Washington, DC: National Quality Forum; 2020. https://www.qualityforum.org/map/. Accessed May 21, 2020.
6. Centers for Medicare & Medicaid Services, Center for Clinical Standards and Quality. *CMS Quality Measure Development Plan 2019 Annual Report.* Baltimore, MD: US Department of Health and Human Services; 2019. https://www.cms.gov/Medicare/Quality-Payment-Program/Measure-Development/2019-Quality-MDP-Annual-Report-and-Appendices.zip. Accessed January 15, 2021.

Appendix G – Methods and Results of the Home Health National Provider Survey and Interviews

Background and Objectives

The Centers for Medicare & Medicaid Services (CMS) adopts quality measures to drive improvements in health care quality across the variety of settings in which Medicare beneficiaries receive care. Section 1890A(a)(6) of the Social Security Act requires the Secretary of Health and Human Services (HHS) to conduct an assessment of the quality and efficiency impact of the use of certain endorsed measures at least every three years and to make the assessment available to the public. CMS is committed to ensuring improved quality while reducing measurement burden on providers, as emphasized in the Meaningful Measures Initiative.[1]

A key aspect of assessing the impact of CMS measures is determining how health care providers respond to the use of performance measures. Providers can give CMS important insights regarding changes that have been made in response to CMS quality programs, and whether those changes have been perceived to be effective in improving quality. Feedback from providers can also identify barriers to reporting and improving performance on the measures, as well as potential unintended consequences associated with measure implementation.

Thus, CMS has conducted national surveys to assess how health care providers are responding to CMS quality measures and the impact of their use in well-established quality measurement programs. The 2018 Impact Assessment Report described the results of surveys and interviews with quality leaders from hospitals and nursing homes.[2] In those surveys, a majority of hospitals and nursing homes viewed CMS quality measures as clinically important. Hospitals reported making an average of 17 of 23 possible quality improvement (QI) changes in response to CMS quality measures, while nursing homes reported an average of 13 of 22 possible QI changes.

As part of the 2021 Impact Assessment, CMS chose to conduct a nationally representative survey and qualitative interviews of home health agencies (HHAs), which served 3.4 million Medicare beneficiaries in 2018 at a cost of $17.9 billion.[3] The survey and interviews assessed "What changes are home health agencies making in response to the use of performance measures by CMS?" This overarching question was translated into five specific research questions that both the survey and the interviews addressed:

1. What types of quality improvement (QI) changes have HHAs made to improve their performance on CMS measures?
2. If a QI change was made, has it helped the HHA improve its performance on one or more CMS measures?
3. What challenges or barriers do HHAs face in improving performance on the CMS quality measures?
4. What challenges or barriers do HHAs face in reporting CMS quality measures?
5. What unintended consequences do HHAs report associated with implementation of CMS quality measures?

Methods

The federal Office of Management and Budget (OMB) reviewed and approved the study design, survey instrument and interview guide, fielding procedures, and analytic methods and assigned control number 0938-1364. The RAND Corporation Human Subjects Protection Committee served as the institutional review board (IRB) for the project, as it did for the CMS hospital and nursing home surveys. The IRB reviewed and approved both HHA data collection instruments, as well as all confidentiality provisions, outreach and recruitment procedures, data safeguarding procedures, and analytic methods described in this section.

Data Sources

Independent samples (see below for additional details) were drawn for the qualitative interviews and for the survey from all HHAs submitting data to the Home Health Quality Reporting Program (HHQRP) in 2018 or 2019.[4,5] HHA characteristics were derived from the October 2019 Medicare Provider of Services File. Patient characteristics for each HHA were derived using three data sources to ensure a nationally representative sample: Medicare fee-for-service (FFS) claims for home health episodes, the Medicare Enrollment File, and the Medicare Hierarchical Condition Category (HCC) file—all from 2018 and 2019. FFS claims were used to identify all FFS beneficiaries treated at each HHA as well as the number of care episodes for FFS beneficiaries at each HHA. The Medicare Enrollment File provided information on the sociodemographic composition of each HHA's FFS beneficiaries – average age, proportion female, proportion Black, proportion Hispanic, proportion with end-stage renal disease (ESRD), and proportion dual-eligible for Medicare and Medicaid. The HCC file was used to compute the average HCC score among FFS beneficiaries for each HHA.

Respondent Universe and Sampling Methods

Survey

A stratified random sampling approach was used to generate nationally representative estimates of responses by HHAs. To assess for differences in response to the use of CMS quality and efficiency measures between subgroups, the random sample of HHAs was stratified into key subgroups by the following characteristics: (1) HHA size, (2) participation in the Home Health Value-Based Payment (HHVBP) model, and (3) HHA quality performance rating on the HHQRP composite quality score.

Description of Sampling Frame

The sample frame (i.e., universe from which the sample was drawn) was composed of 9,601 HHAs. The sample frame was further divided into 20 strata based on three characteristics—size, participation in the HHVBP model, and quality; as described below, using a stratified design allowed estimates for key subgroups (such as small HHAs) to have adequate precision. HHAs were grouped into small, midsize, or large categories based on the annual count of Medicare FFS episodes (10–100 home health care episodes per year, 101–1,000 episodes per year, and 1,001 or more episodes per year), as derived from the average count of FFS claims submitted by each HHA in 2018 and 2019. HHAs with fewer than 20 episodes during 2018 and 2019 and HHAs in U.S. territories were excluded (n = 1,839). HHAs were classified as HHVBP model participants based on whether their mailing address was located in one of the nine states included in the

HHVBP model operated by CMS.[iv] HHAs were classified into four quality categories using the CMS Home Health Compare Quality Star Ratings[6]: high-performing (4, 4.5, or 5 stars); medium-performing (2.5, 3, or 3.5 stars); low-performing (1, 1.5, or 2 stars); and missing quality performance data (no Star Rating available). In contrast to the sampling design used in the hospital and nursing home surveys, HHAs with missing quality performance were included in the sample; excluding such HHAs would have removed a disportionate number of small or relatively new HHAs, whose perspective is important to CMS.

Sampling Design for Survey

A sample of 2,273 HHAs was randomly drawn with the goal of achieving 1,000 responses, derived from an expected response rate of 44% and statistical power analyses suggesting that standard errors would be 1.8 percentage points or less with the selected sample size. The estimate for the response rate was based on prior surveys of providers that reported response rates of 20%–60%,[7-11] including CMS national surveys of hospitals and nursing homes[2] and a CMS survey of HHAs that achieved a response rate of 49%.[12]

The sampling design incorporated oversampling based on size and HHVBP status to ensure subgroup estimates would have a standard error of 3.5 percentage points or less for survey items expected to have 50% affirmative responses. As a result, large and small HHAs (30% each) were oversampled relative to midsize HHAs (40%) to provide greater power for evaluating differences between HHAs based on size. The HHVBP participants were oversampled (such that 30% of the sampled HHAs constituted HHVBP participants) to ensure adequate precision for comparing participants with nonparticipants. HHAs rated high-, medium-, and low-performing in quality were distributed fairly evenly across strata; therefore, oversampling based on quality was not necessary to ensure adequate power for comparisons.

Qualitative Interviews

Description of Sampling Frame and Design

A purposive sampling technique was used to obtain a diverse representation of HHAs for the interviews derived from the sampling frame for the survey (n = 9,601). Purposive sampling is a nonrandom approach to seeking representativeness across a range of respondent characteristics. Six strata were defined by HHA size (small, midsize, and large) and HHVBP participation (participant and nonparticipant). Six to seven HHAs were allocated per stratum with the goal of enrolling a total of 40 HHAs. Counts are reported for interview results as a reference but do not carry statistical significance due to the nonrandom nature of a smaller qualitative sample.

The qualitative sample frame consisted of 900 HHAs (150 per stratum) randomly selected from the total sampling frame of 9,601 HHAs. From 362 HHAs screened, 39 quality leaders consented to participate in an interview. In addition to the sampling strata, variation was sought using the CMS Home Health Compare Quality Star Ratings to represent high-performing (4, 4.5, or 5 stars), medium-performing (2.5, 3, or 3.5 stars), and low-performing (1, 1.5, or 2 stars) HHAs, as well as those serving rural and nonrural populations across all nine U.S. Census regions.

[iv] All Medicare certified HHAs providing services in Arizona, Florida, Iowa, Maryland, Massachusetts, Nebraska, North Carolina, Tennessee, and Washington are required to participate in the HHVBP model.

Procedures for Collecting Information

Survey

Data Collection Instrument

The content for the survey was informed by prior CMS surveys of hospitals and nursing homes, an environmental scan of the literature related to the five research questions (see Background), discussions with key subject matter experts and stakeholders for post-acute care at CMS as well as the Center for Medicare & Medicaid Innovation (CMMI), formative interviews with HHAs, and cognitive testing of draft survey instruments with HHAs. In addition to addressing each research question, the final survey instrument (Appendix H) included questions related to health information technology (IT) adoption and interoperability, respondent and HHA characteristics, and overall assessment of CMS measurement in HHAs.

Identification of Appropriate Survey Respondents

The research team called each HHA (n = 2,273) using the telephone number provided in the CMS Home Health Compare database file to identify the quality leader or the individual most familiar with CMS performance measures and the actions and quality improvement activities undertaken by the organization to improve performance on the measures—most commonly the administrator or chief nursing officer. To improve response rates, the quality leader's name, job title, and email address were collected to personalize the survey invitation.[13,14]

Fielding the Surveys

To promote the likelihood of survey participation, the survey used multimode data collection (Web and mail), as follows:

- **Weeks 1–10**: One initial and four follow-up invitations to complete the web-based survey were sent via email or, if no email address was available, by first class mail.
- **Week 6-9**: Six weeks after the initial invitation, nonresponding quality leaders received a paper version of the survey via first class mail. The project team sent a reminder letter for the paper survey two weeks later. Both mailed invitation letters included instructions for completing the web-based survey.
- **Weeks 7–10**: Seven weeks after the initial invitation, nonresponding quality leaders were contacted by telephone to prompt completion of the web-based survey or to return the paper survey. Note: Outreach was stopped on March 13, 2020 (week 10), to avoid burdening HHAs that were responding to the national spread of coronavirus disease 2019 (COVID-19). See Discussion for additional details regarding how COVID-19 may have affected the results.
- **Week 12**: Data collection closed at the end of week 12, which allowed 2 weeks for return of additional paper and web-based surveys after outreach efforts ceased in week 10.

Qualitative Interviews

Interview Guide Data Collection Instrument

The five key research questions informed the development of both the survey and the qualitative interview guide as listed below:

1. What types of quality improvement (QI) changes have HHAs made to improve their performance on CMS measures?
2. If a QI change was made, has it helped the HHA improve its performance on one or more CMS measures?

3. What challenges or barriers do HHAs face in improving performance on the CMS quality measures?
4. What challenges or barriers do HHAs face in reporting CMS quality measures?
5. What unintended consequences do HHAs report associated with implementation of CMS quality measures?

In particular, the interview guide asked open-ended questions inviting quality leaders to reflect on changes in care delivery the HHA made in response to CMS measures, challenges and successes, and how quality leaders felt about the measurement program as a whole. The interview guide ended with an open-ended question inviting the participant to discuss any other topics about CMS quality measures.

Identification of Appropriate Interview Respondents

The identification of study participants was organized into three phases:

- **Outreach/screen:** HHAs were contacted to identify quality leaders and obtain contact information, as well as to confirm that the HHAs were receiving Medicare funding for home health care, had provided care within the preceding 12 months, and therefore were eligible to participate in the qualitative interviews. Each quality leader was sent an email describing the study and interview purpose and an invitation to participate.
- **Recruit/consent:** The study coordinator followed up with quality leaders who indicated interest and scheduled a one-hour phone interview with those who consented to participate. A team member sent an email confirmation noting the interview date/time and interviewer name and attaching interview content and confidentially provisions, as well as a list of home health quality measures to be referenced during the interview. To assure confidentiality, each quality leader was assigned a study ID.
- **Interview:** The study coordinator sent a reminder email one day before the scheduled interview. To address any last-minute scheduling conflicts, study coordinators offered alternative times and dates to fit the participant's availability.

Conducting the Interviews

At the start of each one-hour call, the interviewer reviewed project confidentiality and respondent rights and confirmed the role of the quality leader and the characteristics of the HHA. The interview was audio recorded and uploaded to an encrypted, cloud-based server for transcription in accordance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Each audio recording was transcribed verbatim, and information identifying a participant or HHA was removed from the transcript.

Confidentiality and Data Safeguarding

Each quality leader who participated in the survey and interviews was assured confidentiality and privacy to the fullest extent allowed by law. The leader received consent and confidentiality information via invitation emails and mailed letters, which provided information on the nature of the research being conducted and the rights of survey respondents or interview participants. Those who had questions or concerns about any aspect of the study were provided instructions regarding how to call or email the project's IRB.

Strict safeguarding measures were in place to ensure privacy as follows: An anonymized data identifier was assigned to each HHA, and all electronic files directly related to the administration of the survey were stored on a restricted drive in a secure local network with limited access.

During data collection, paper surveys and interview guides with notes were secured in locked cabinets accessible only to study personnel.

Analytic Methods

Survey

After examining the distribution of answers to 18 survey items applicable to all respondents, the project team categorized HHAs that completed at least 13 items as *complete* respondents; those completing 5–12 items, as *partial* respondents. Survey items were standardized, if appropriate, through top-box scoring,[2,15] in which the most related response options of interest were recoded to 1 and all other response options were recoded as 0.

Sampling weights were then applied to ensure that the cohort of respondents was representative of the entire population of HHAs. The sample weights are the product of sampling design weights (which account for the study design, stratified by size, quality, and HHVBP status) and nonresponse weights (which account for the differential rates associated with HHA characteristics). Nonresponse weights were developed using logistic regression to ensure that the weighted sample resembled the overall population with respect to HHA-level characteristics and patient characteristics. The final model used the following predictors to estimate nonresponse weights: HHA size, quality category, census division, ownership (government, nonprofit, for-profit), mean income of HHA ZIP code, proportion black, and proportion female.[v]

Weighted means and standard deviations were then produced for each survey item using the final sampling weights (which represent the inverse of each HHA's probability of inclusion in the set of respondents). Weighted means and standard deviations were also calculated across key subgroups, including HHA size, HHVBP participation, quality performance strata, and rural status (an area of focus for CMS). F-tests were calculated to test the null hypothesis of equal means across levels of each subgroup variable. This report highlights statistically significant differences between subgroups rather than presenting each finding.

Qualitative Interviews

Interview data were analyzed using a directed content analysis approach[16,17] to develop a set of thematic codes to apply to all interview data. A subset of interview transcripts was coded line-by-line to identify emergent themes reported by quality leaders. The most frequently mentioned emergent themes were added to pre-existing themes based on study aims to produce a codebook.

Thirty-nine interview transcripts were coded with the thematic codebook using NVivo 12 qualitative analysis software as follows.[18] The team met throughout the process to achieve intercoder reliability agreement and maintain accuracy. A sample of interview transcripts commonly coded by all coders (n = 3) yielded an intercoder reliability score of 0.8, representing substantial agreement.[19] Queries, or compilations of all text coded under a given theme, were produced in NVivo 12 for all thematic categories. These queries were analyzed manually to

[v] The model for nonresponse was fitted using logistic regression with a list of predictors determined from a larger initial list via the Akaike information criterion; the model was weighted using the design weights. The initial HHA-level predictors included size, quality category, HHVBP status, ownership (government, private nonprofit, and private for-profit), census division, and urban status. (Rural status was defined using the National Center for Health Statistics [NCHS] urban-rural classification scheme for counties. Agencies in metropolitan statistical areas or micropolitan areas were considered to be urban, while agencies located in small towns or rural areas were defined as rural.) The initial patient population predictors included HHA-level means for age and HCC score, proportion female, proportion with end-stage renal disease, proportion Hispanic and Black, proportion disabled, proportion dual-eligible, and mean income for the HHA's ZIP code.

identify participant counts and quotes representative of participant experiences with quality measures for each theme.

Results

HHA Characteristics

Surveys

The overall response rate was 46% (1,052 respondents among 2,273 sampled HHAs), which was similar to the anticipated response rate (44%) and to response rates from previous CMS surveys of HHAs and other providers (see Methods for additional details). A smaller percentage of large HHAs responded to the survey than small or midsize HHAs (40% versus 47% and 50%, respectively, $p \leq 0.001$). Rural HHAs responded at higher rates than urban HHAs (52% versus 44%, $p = 0.001$), though HHAs in the South responded at a lower rate (41%) than other regions. For-profit HHAs responded at lower rates (44%) than government-owned (69%) or nonprofit HHAs (52%). No statistically significant differences in response rates were observed by quality performance, HHVBP participation, average HCC score, or percentage of dual-eligible enrollment among HHAs' patients. To account for differences, respondent weights were adjusted to ensure that the results reflected the entire HHA population.

Quality leaders reported that on average, 87% of patients had insurance through Medicare, Medicare Advantage, or Medicaid or were dual-eligible for Medicare and Medicaid. HHAs participated in accountable care organizations (27%), other alternative payment models with shared savings/risk (13%), or any non-CMS measurement program (44%). A majority (73%) of HHAs also faced a local shortage of nurses, physical therapists, and other clinical staff.

Most HHA quality leaders had been in their current positions for at least a year—23% for 1–3 years and 69% for more than 3 years. Most held a general leadership role rather than one dedicated specifically to quality, including Administrator (47%), Director of Nursing (20%), CEO (8%), and Clinical Manager (7%). Among HHA quality leaders, 77% reported no formal training/certification on QI strategies, such as courses on Plan-Do-Study-Act cycles.[20]

Qualitative Interviews

Thirty-nine quality leaders from across all nine U.S. Census regions provided insights into their experiences tracking and reporting CMS quality measures. Interview participation was distributed across small (n = 12), midsize (n = 12), and large (n = 15) HHAs; 19 HHAs were HHVBP program participants. Most HHAs had a medium (n = 17) or high (n = 13) quality rating; others were rated low-performing (n = 7) or did not have quality ratings (n = 2). Fifteen HHAs were identified as serving rural populations. Twenty HHAs were stand-alone; 19, affiliated with larger companies or hospital systems. Ten quality leaders reported training on strategies such as Lean or Six Sigma; three reported Outcome and Assessment Information Set certification.

Overall Assessment of CMS Quality Measurement Programs

Survey Findings

Results of the survey indicated that HHAs viewed CMS measures as clinically important, with 91% of HHAs responding "yes" or "mostly yes." Performance on CMS measures reflects the HHA's improvements in care "very well" or "somewhat well," 86% reported. Asked whether HHAs should be held responsible for performance on CMS measures, most HHAs (79%) responded "yes" or "mostly yes."

In subgroup analyses, a higher percentage of large HHAs than small HHAs reported that they should be mostly or partly responsible for performance (86% versus 75%, p = 0.001). Similarly, a higher percentage of high-performing than low-performing HHAs reported that their improvements in care are reflected in improved quality performance (93% versus 78% for low-performing HHAs, p < 0.001) and that HHAs should be held responsible for performance on measures (84% versus 71% for low-performing HHAs, p = 0.009).

Fewer rural HHAs reported that quality performance reflects improvements than urban HHAs did (79% versus 88%, p = 0.002), but no statistically significant urban-rural differences were observed in perceptions about clinical importance and whether HHAs should be held responsible for performance on measures.

Qualitative Interviews

Twenty of 39 HHA representatives interviewed stated that CMS quality measures were clinically useful, voicing perspectives similar to these:

> *"The measures chosen are the best ones that represent the value of home care, home health. So, focusing on those lends … itself to what we've always believed home health should be."* (large, high-performing HHA)

> *"Any time there's a [quality] measure … it gives us the ability to … improve what we're doing, teach our staff. … Quality measures are an absolutely positive way of utilizing what Medicare wants."* (large, medium-performing HHA)

HHAs (n = 2/39) reported that efforts on home health quality measures also improved other areas of care, including catheter-associated urinary tract infections and patient falls. HHAs (n = 7) noted that a focus on CMS measures contributed to improvements in communication and in quality of care overall, which increased patient satisfaction scores.

> *"[Focusing on] the patient's functional ability, we see a reduction in falls … We've seen much improvement in HHCAHPS [patient survey ratings] and even in the amount of participation as we continue to focus on quality and meeting and exceeding the patient's expectations, so it's [been] a positive ripple effect." (large, high-performing HHA)*

HHAs noted that the range of measures encourages nursing staff to take a holistic approach to patient care, helps to keep people out of the hospital, and is appropriate and relevant to the population:

> *"You're trying to get [patients] independent at home. You want them to bathe safely, walk safely, and decrease their pain, decrease their shortness of breath, because that affects their walking. You want to improve their ability to give their meds appropriately, or they'll end up back in the hospital. … I think [the measures are] all important."* (small, medium-performing HHA)

Nineteen interview participants mentioned at least one measure they considered less clinically useful.

- Nine participants cited the pneumococcal vaccine and influenza vaccine process of care measures, noting that most HHAs do not give vaccines and that HHAs do not have control over patient preferences with respect to vaccination.
- Six participants mentioned acute care hospitalization and emergency department use outcome measures, observing that HHAs do not control such utilization.
- Four participants noted that the depression assessment process of care measure is of lower value to HHAs because some do not have specialized psychiatric nurses; also, they contend that primary care providers already assess depression.

"None of my agencies in my areas provide [psychiatric] nursing. … It is an important thing to assess … but that's not a focus of ours." (large, medium-performing HHA)

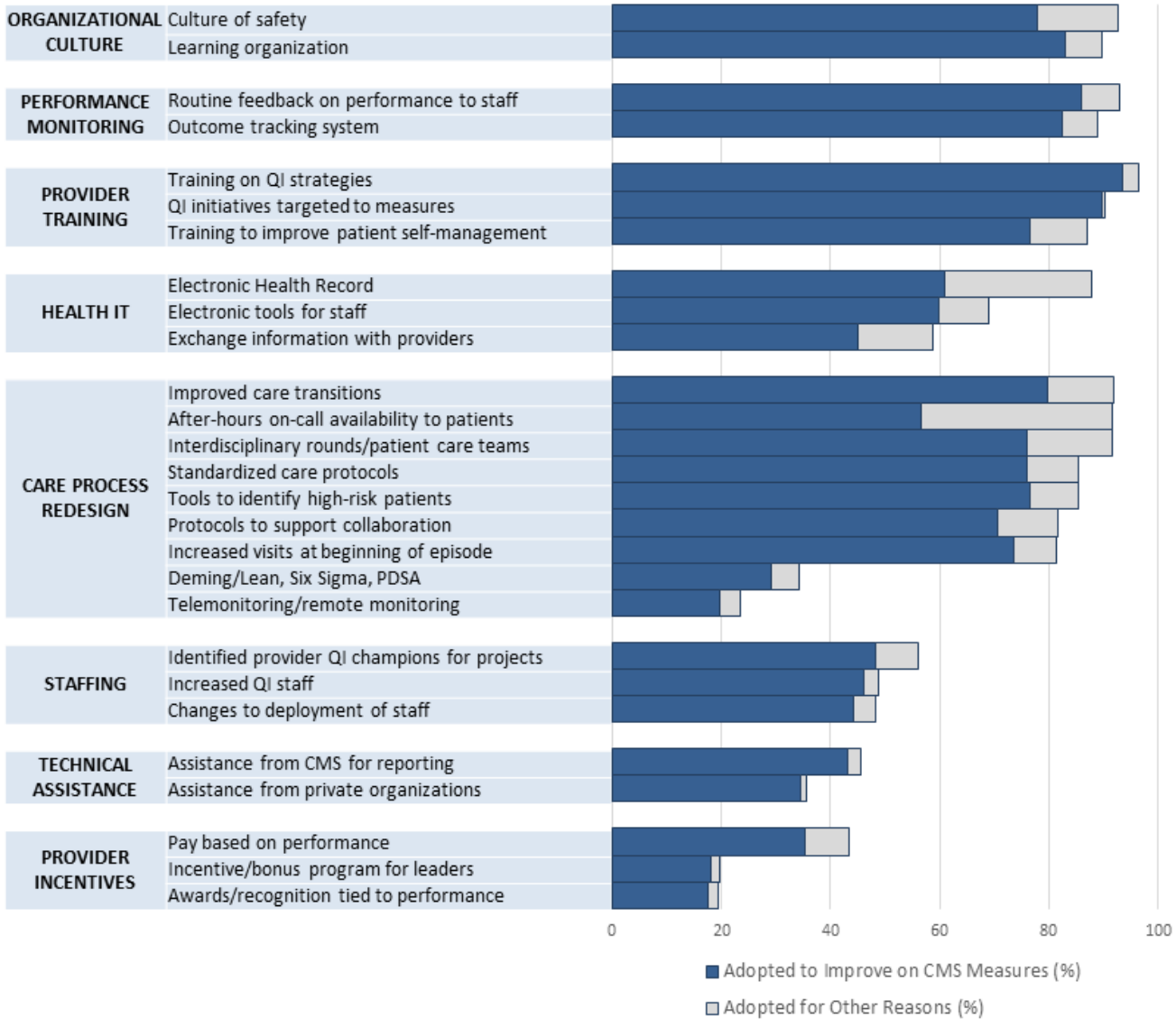
Sixteen HHAs mentioned that hospitals use CMS Home Health Compare Star Ratings as a basis for their referrals.

Changes Adopted by HHAs in Response to CMS Quality Measures

Survey Findings

HHAs were asked to report whether they had made any of 27 individual QI changes to improve care delivery, and whether these changes were intended to improve performance on CMS measures (Figure F-1). A majority of HHAs reported implementing changes partly or mostly to improve performance on CMS measures. Smaller percentages of HHA quality leaders reported that their HHAs implemented QI changes (such as after-hours HHA on-call availability [35%] and electronic health record [EHR] systems [27%]) but did not do so in response to CMS quality measures.

Figure F-1. QI Changes HHAs Reported Having implemented



On average, HHAs reported making 16 QI changes (of 27 potential QI changes) to improve performance on CMS quality measures (median of 16; interquartile range of 11 to 19); 2% of HHAs reported adopting all 27 interventions, and less than 1% of HHAs reported not implementing any QI changes. Provider training on QI strategies for CMS measures was the most frequently implemented change, cited by 94% of HHAs. The least frequently implemented QI strategy was pay/recognition based on performance for frontline staff (17%).

In the subgroup analyses, a majority of HHAs (regardless of size) adopted interventions to improve performance on quality measures, including increasing visits at the beginning of episodes, using outcome tracking systems, targeting QI to specific measures, and providing training on QI strategies. However, large HHAs reported implementing several interventions to improve performance on quality measures more frequently than small HHAs: "frontloading" (i.e., increasing visits at the beginning of an episode; 84% versus 65%, $p < 0.001$), outcome tracking systems (92% versus 76%, $p < 0.001$), QI champions for projects (57% versus 39%, $p < 0.001$), QI initiatives targeted to measures (95% versus 82%, $p < 0.001$), or provider training on QI strategies (98% versus 89%, $p < 0.001$). However, compared to small HHAs, large HHAs less often reported implementing pay based on performance for staff (13% versus 24%, $p = 0.001$).

Compared with low-performing HHAs, high-performing HHAs more often adopted outcome tracking systems (89% versus 76%, $p = 0.009$), telemonitoring or remote patient monitoring systems (26% versus 12%, $p = 0.001$), and incentives or bonuses for senior management (22% versus 10%, $p = 0.002$). More high-performing than low-performing HHAs reported implementing QI initiatives directed at improving performance on specific measures (94% versus 84%, $p = 0.01$). No statistically significant differences were found between high- and low-performing HHAs for adoption of the remaining QI changes. HHAs in rural areas adopted fewer QI changes to improve quality measures (13.7) than urban HHAs (16.4, $p < 0.001$).

Qualitative Interviews

During qualitative interviews, most HHAs reported changes to care delivery (n = 32/39) and changes to documentation (n = 28/39) in response to CMS quality measures. Similar to survey results, HHAs described care process redesign, provider education and training, technical assistance, health information technology, new patient education approaches, and provider incentives (Table F-1). With respect to provider incentives, most HHAs interviewed kept frontline staff informed of team performance on measures, and many celebrated measure achievements with a lunch or coffee break. None reported offering financial incentives to frontline employees to improve measure performance.

Table F-1: Changes Adopted by Interview Participants in Response to Quality Measures

Change Adopted	HHA Count	Interview Results	Representative Quotes
PROVIDER INCENTIVES	32	Shared quality measure performance information with staff on a regular basis. Six celebrated staff achievements with lunches and thank you bulletin boards. No monetary incentives were provided.	*"If we get a comment on a nurse, a therapist, an aide, they get a certificate that we put on the wall, and they get a copy. And it basically says that they've been caught in the act of providing exemplary care."* (small, medium-performing HHA)
OBTAINED TECHNICAL ASSISTANCE FROM THIRD-PARTY PROVIDER	26	Utilized third-party data scrubbing and analytic services to obtain up-to-date quality information and better focus agencies' QI efforts.	*"[I] run my report based on my 30-day, 60-day … see how many days the patient was on service … what certain clinicians were managing those patients … what those diagnoses were. Are there trends? [Is] there something we need to focus on? Are we deficient somewhere*?" (large, high-performing HHA)
CARE PROCESS REDESIGN	20	Took an interdisciplinary team approach, such as including physical therapists in training nursing staff on functional assessments and increasing effective provider communication.	*"A lot of the providers have given the staff their personal phone numbers … the office staff at the clinic might not always give them a message, but the nurse can call them on their cellphone and leave them a message*." (midsize, medium-performing HHA)
	12	Performed regular root cause analyses and developed performance improvement plans (PIPs).	*"We look at quality results technically on a weekly basis… We use the format of an A3 process, which is a Lean methodology of just plan, do, check, act. … Managers and frontline staff … identify what some of the issues are, what are some of the root causes, and then they work with the implementation plan."* (large, low-performing HHA)
	11	Used telehealth strategies.	*"We also developed a call system, a wellness call system, to the patient. And that has helped for our acute care hospitalization in that the nurse that's making the phone call can intervene. And every time they call, they reiterate, 'Call us if there's a problem.'"* (large, high-performing HHA)
	9	Identified high-risk patients and frontloaded visits.	*"A lot of the times, we will frontload visits for patients that we think are at higher risk for [readmission]. We'll have either the nurse or even a therapist…stop in there several days in a row, sometimes even for the first two weeks."* (large, medium-performing HHA)

Change Adopted	HHA Count	Interview Results	Representative Quotes
PROVIDER EDUCATION/ TRAINING	20	Created in-service education programs to help staff understand the intent behind OASIS questions, using role play and demonstrations to improve documentation accuracy and expanding staff's assessment skills.	*"If we see a huge trend in this clinician always [answering] this question this way, then, why?… Let's dive into that OASIS guidance book and see what justifies this answer for this patient."* (large, high-performing HHA)
IMPROVED PATIENT EDUCATION	14	Adopted new approaches to patient education, including the use of zone tools such as red/yellow/green caution teaching tools to show patients how to recognize concerning symptoms. Used print materials and teach-back methods to educate patients on medication use.	*"You want to make sure that you're educating the patient on all of the medications. We encourage them … to document in the records that these particular medications were taught to the patient, and then the patient was able to illustrate teach-back, a strategy that is often used to encourage patients to participate in their own self-learning."* (large, medium-performing HHA)
USED HEALTH INFORMATION TECHNOLOGY TO IMPROVE ACCURACY	11	Used EHR system to generate performance reports to ensure completeness of OASIS fields.	*"Whenever we enter, for example, an OASIS into the electronic software, it will do an OASIS validation for us. [It] helps us to make sure that all the key filled elements are correct and matched [with] no discrepancies."* (midsize, high-performing HHA)

Changes Made by HHAs That Contributed to Improved Performance on CMS Measures

Survey Findings

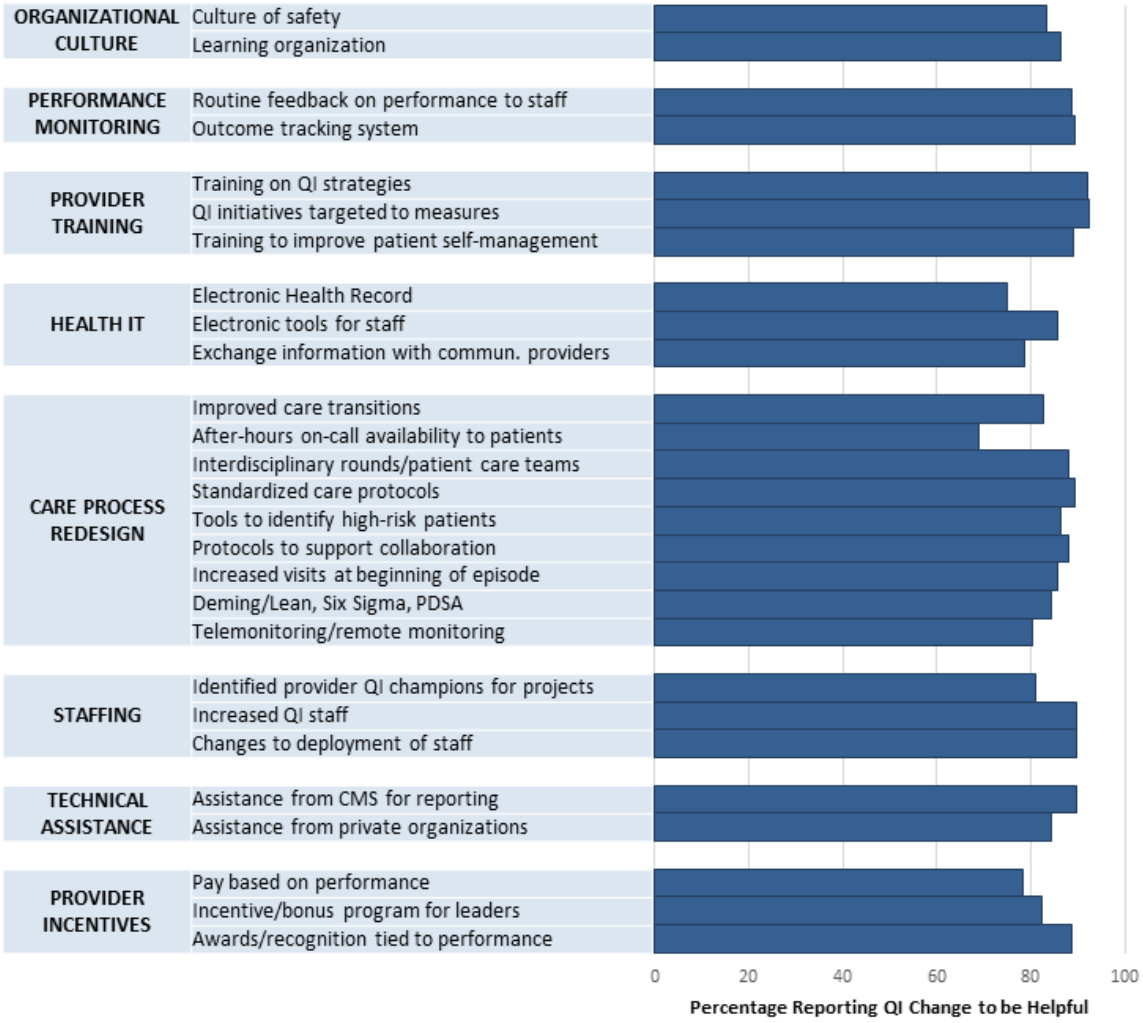
For each of the 27 changes, most HHAs that implemented a change perceived it to be "definitely or somewhat" helpful in improving performance on one or more CMS measures (Figure F-2). These proportions ranged from 69% (for after-hours on-call availability to patients) to 92% (for provider training on QI strategies and quality improvement initiatives for specific measures).

In all subgroups, most HHAs that reported adopting a specific QI change also noted that it was definitely or somewhat helpful. The most variation in the perceived helpfulness of the QI strategies was by urban-rural status; there were 17 QI changes that urban HHAs reported to be helpful more often than rural HHAs (between 6% and 15% more urban than rural HHAs reported these QI changes to be somewhat or definitely helpful , $p < 0.05$ for each QI change). Examples include implementing an EHR (79% of urban HHAs reported to be helpful versus 64% of rural HHAs, $p < 0.001$); implementing risk prediction tools (89% of urban HHAs reported to be helpful versus 80% of rural HHAs, $p = 0.009$); identifying QI champions for projects (93% of urban HHAs reported to be helpful versus 79% of rural HHAs, $p = 0.002$); and implementing a culture of safety (86% of urban HHAs reported to be helpful versus 77% of rural HHAs, $p = 0.005$).

More high-performing than low-performing HHAs reported two QI changes as helpful for improving performance: developing an outcome tracking system (93% versus 83%, p = 0.03) and routine feedback on performance to nurses and other staff (92% versus 84%, p = 0.04).

Compared with HHAs participating in HHVBP, nonparticipating HHAs reported two QI changes as helpful more often: provider training on QI (93% versus 88%, p = 0.03) and on teaching patient self-management (90% versus 84%, p = 0.02).

Figure F-2. Percentage of HHAs Reporting Each Change as Definitely or Somewhat Helpful in Improving Performance



Qualitative Interviews

Twenty-two HHAs that participated in qualitative interviews reported efforts that resulted in significant improvements in quality scores on both outcome and process measures (Table F-2). Thirteen HHAs attributed successful improvement to consistent provider education and training, particularly in educating frontline staff to understand and accurately document OASIS metrics. HHAs reported specific methods as key contributors to measure improvement, including in-service trainings, side-by-side charting, implementation of preceptor program, and collaborating with physical therapists in training efforts.

"[Staff] do succeed with the outcome measures … due in part to consistency in education and supervision of the clinicians. We do side-by-side assessments with them, [and] we may bring up a point—'Hey, did you see that they were … holding onto the chair, the couch, as they were moving around the house? That's an important piece in your assessment.' So, I think that has made a difference." (large, high-performing HHA)

Eleven HHAs attributed successful improvement in scores to care process redesign. Particularly, HHAs emphasized telehealth approaches such as calling to check in on patients and offer reminders, as well as intervening to prevent readmissions.

"They have done a fabulous job of identifying the high-risk patients at start of care … determining our visit pattern and how we're going to provide care for that patient. … Sometimes it's not just ... that we're in the house, hands-on with them, but we're making a phone call on the days that we're not there to say, 'Hey, how are you doing?' and monitoring their symptoms." (large, high-performing HHA)

Table F-2. Measure Performance That Improved for HHAs

Measure Focus	Agency Count	Representative Quote
Improvement in ambulation	6	*"[Scores have improved because of] our patient approach and making sure they're getting therapy in there earlier than later. And then therapy [staff] has done … a great job at ensuring safety and doing some different exercises, different things with our patients to get them safer in their homes."* (midsize, medium-performing HHA)
Improvement in timely initiation of care	5	*"We have real-time data scrubbing, so that's a huge benefit. … We do a good job at getting out there when we're supposed to. … If I look at my data scrubber and I see I've got a flag here because we did a start of care and we didn't go out within the 48 hours, I can go back and check on why."* (midsize, high-performing HHA)
Improvement in readmission/ ER use scores	4	*"We really have tried hard to make sure our patients are aware of calling us first and not going to the hospital … given them [instructions] when to call us versus when to call 911."* (midsize, medium-performing HHA)
Improvement in pain interfering with activity	4	*"Once we … figured out what the intent of the question was and how you truly should be answering it, giving examples of different scenarios, it was like an 'aha' moment. But we could see that we [had] probably not accurately documented people's improvement in pain historically. … It's education, education, education, reeducation."* (small, medium-performing HHA)
Improvements in influenza/ pneumococcal polysaccharide immunization	4	*"We decided…we're going to start calling every single patient and not relying on [in-home staff] to remember … to ask or rely on waiting for the patient to call us. Every time we notice a deficit, we want to intervene and come up with a solution to improve it.… We started this a few years back [and] now we're seeing the benefits."* (small, medium-performing HHA)
Improvements in management of oral medications	3	*"That's what I really focus [on with] our clinicians. … Some of the nurses… assist the patients with the pillbox every week because they're forgetful, and every visit, you have to teach … the use and side effects."* (midsize, medium-performing HHA)
Improvement in dyspnea	3	*"Just understanding … what they're asking for and what each one of those means has been a real eye-opener, and those [dyspnea and ambulation] are the two measures that I see that we can move the easiest."* (large, high-performing HHA)

Barriers Faced by HHAs in Improving Their Performance

Survey Findings

Eighty-one percent of HHAs reported difficulty improving performance on some or many CMS measures—specifically, moderate or greater difficulty improving performance on outcome measures (29%) and process measures (27%). Fewer HHAs reported such difficulty with patient experience (18%) and safety measures (7%).

- Overall, 89% of large HHAs versus 70% of small HHAs noted difficulty improving performance on CMS measures ($p < 0.0001$).
- Large HHAs reported such difficulty at higher rates than small HHAs (by 12–17 percentage points, $p < 0.01$ for each comparison) on all types except safety measures.

Asked about 13 specific barriers to improvement (Figure F-3), respondents reported experiencing an average of 3.4 barriers (median of 2; interquartile range of 0 to 5).

Figure F-3. Factors Reported by HHAs as Barriers to Improving Performance on CMS Measures

***Data relevant to quality measurement from CMS or other providers**

Difficult patient mix (e.g., clinically complex patients) was reported by 58% of HHAs, followed by changing frontline staff behavior (40%).

- Large HHAs, compared with small HHAs, on average reported more barriers (3.8 versus 2.8, $p < 0.001$) and more often reported a difficult patient mix, difficulty with coding/documentation, and staff turnover (by 10 percentage points or more, $p < 0.01$ for all comparisons).
- Low-performing HHAs reported more barriers than high-performing HHAs (4.0 versus 3.1, $p = 0.02$).
- Rural HHAs reported more barriers to improvement than urban HHAs (mean of 3.9 versus 3.2 barriers, $p = 0.01$). Significant differences were observed in reporting of difficult patient mix (68% versus 54%, $p < 0.001$), identifying process of care (25% versus 16%, $p = 0.005$), lack of training (21% versus 14%, $p = 0.03$), implementing QI strategies (33% versus 25%, $p = 0.03$), and inconsistent or insufficient documentation by staff (39% versus 31%, $p = 0.04$).

Qualitative Interviews

Staffing shortages topped the list of barriers to improvement among interview participants (n = 24/39), together with difficulties with coding and documentation and challenging patient mix. Quality leaders cited inadequate staffing as an impediment to consistent training and reliable documentation in the Outcome and Assessment Information Set (OASIS) assessment tool. Rural HHAs in particular mentioned having to rely on per diem staff and the challenge of providing adequate training to part-time workers. Together, these factors impacted quality of care and led to lower patient satisfaction scores, interview participants said.

HHAs (n = 10/39) reported difficulty understanding the intent of OASIS questions and said their performance on quality measures suffered from the resulting errors. Seventeen HHAs created special training sessions to help frontline staff understand the purpose of OASIS questions.

> *"I just feel like the questions are worded so difficult that clinicians do not answer them correctly across the board." (large, medium-performing HHA)*

> *"It takes time to learn OASIS guidance. ... Because [staff] have more of a patient load to get to ... they have to rush through the documentation." (large, medium-performing HHA)*

Documentation burden, frequently cited by interview participants as a barrier to improvement (n = 12/39), was mentioned by three participants as a contributing factor in staffing shortages because it deterred nurses from entering the field. Others suggested that overemphasis on documentation detracted from patient care.

> *"I've had multiple patients complain that 'your nose is in a computer. You're not providing quality care.' " (large, high-performing HHA)*

Finally, interview participants (n = 7/39) said a lag in public reporting of CMS quality metrics hindered their ability to respond to deficits in quality of care.

> *"[Publicly reported measures are] the only source that we have. … It would be a financial burden for the company to [obtain] actual, on-time results of our services or measures. ... [CMS reporting] is what we want to use, [but] it's not that accurate for us anymore." (large, high-performing HHA)*

Among the challenges involving patient mix cited by a majority of HHAs (n = 23/39), HHAs specifically noted the following:

- Several (n = 7/39) mentioned patients who were inappropriate for home health care and should have been discharged instead to hospice or a skilled nursing facility.

  > *"We do have a lot of … patients that are just not emotionally ready to be on hospice, but they're already getting palliative care because they're end of life … so it's really difficult to improve those scores and those patients." (midsize, medium-performing HHA)*

- Rural HHAs (n = 6/15) mentioned access to care and lack of transportation, along with low income, limited access to healthy foods, and poor reading ability. Some participants suggested risk adjustment of performance measures to account for such social determinants of health.

  > *"A client [with comorbidities] winds up with 12 doctors they only get to see every 6 months because [specialist offices are] all so full they can't get in, or they have to travel 2 hours away to see somebody." (small, medium-performing HHA)*

"Sometimes it's socioeconomic things. … I've seen patients unable to buy food because they bought their medicine, or they won't buy their medicine because they had to buy food or pay their power bill." (large, high-performing HHA)

- HHAs (n = 6/39) described patients with cognitive impairment who struggle to follow nursing instructions and maintain medication compliance, making it difficult for care providers to ensure patient safety.

  "[Doctors send] patients home with no family support, no ability to care for themselves … and expect home health to pick up the pieces." (midsize, high-performing HHA)

While the preceding concerns align with survey results, interview participants raised additional barriers to improvement not mentioned in the survey. Interviewed HHAs (n = 19/39) reported challenges such as referring physicians not returning calls promptly and sending patients to the emergency department rather than working with the agency to keep them out of the hospital.

"I can call in acute care issues that, from a liability standpoint, the physician will always direct the patient to go to the emergency room, versus getting an at-home intervention to avoid that." (large, high-performing HHA)

Interviewed HHAs (n = 19/39) also described system-level challenges to improving scores, including hospital or insurance policies that caused patients to be prematurely discharged and led to HHAs caring for sicker and more complex patients.

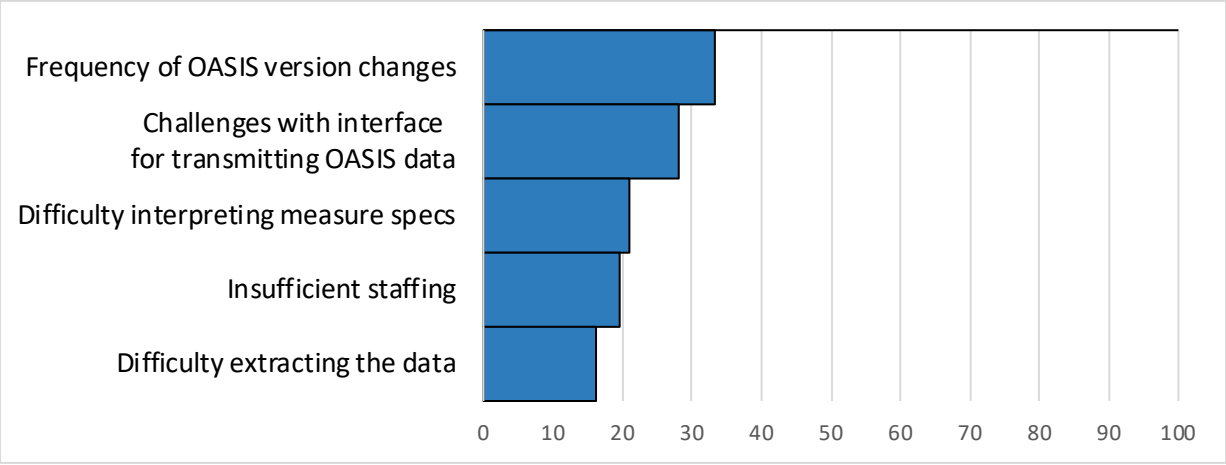
"Patients are more acutely ill. When we go there to see the patient on the initial visit ... most of the nurses are concentrating on keeping the patient stable and [avoiding] hospitalization." (large, high-performing HHA)

Barriers Faced by HHAs in Reporting CMS Quality Measures

Survey Findings

Based on survey responses, 61% of HHAs reported at least one barrier to reporting CMS measures, with 39% reporting no barriers to reporting CMS measures. As seen in Figure F-4, the most commonly mentioned barrier to reporting was frequency of changes to OASIS (reported by 33% of HHAs); least common was difficulty extracting the data (reported by 16% of HHAs).

Figure F-4. Proportions of HHAs Describing a Barrier to Reporting CMS Quality Measurement Data



In subgroup analyses, medium-performing HHAs reported more difficulty transmitting OASIS data than other quality strata (33% versus 21% for low- and high- performing HHAs, p = 0.004), while HHVBP participants more often reported greater difficulty extracting measurement data (22% versus 15%, p = 0.029). Neither HHA size nor rural status was associated with statistically significant differences in barriers to reporting.

Qualitative Interviews

During qualitative interviews, 34 HHAs were asked to discuss challenges in reporting their data to CMS. Of these, 18 reported no difficulties in reporting CMS measures. A few HHAs (n = 7/34) highlighted technical difficulties accessing the CMS site to update and submit OASIS data.

> *"Working in the CMS site … to do our actual OASIS reporting in is sometimes cumbersome and very difficult. The last time they updated that system with the firewalls and everything that the hospital has installed in my system, I couldn't get into it." (small, medium-performing HHA)*

Additionally, 23 HHAs noted numerous challenges to improving documentation in OASIS. HHAs (n = 8/23) observed that OASIS has limited options for reporting fluctuation in patient status over time and no room for supporting statements about specific patient cases. Furthermore, HHAs (n = 6/23) commented that wording of OASIS questions is complex and hard to answer, especially noting difficulties with functional assessment questions.

> *"I feel like the tools that we are given to assess or to document improvement are … not very sensitive to the changes. I can literally have the same score on my OASIS [for a patient who] takes two people [assisting] to stand up and walk 10 feet using a walker and somebody who can walk 300 feet with supervision and no device." (small, medium-performing HHA)*

Interview participants (n = 9/34) reported some difficulties in transitioning to the Internet Quality Improvement and Evaluation System (iQIES)[21] while gaining access to the site and with patient records and reports.

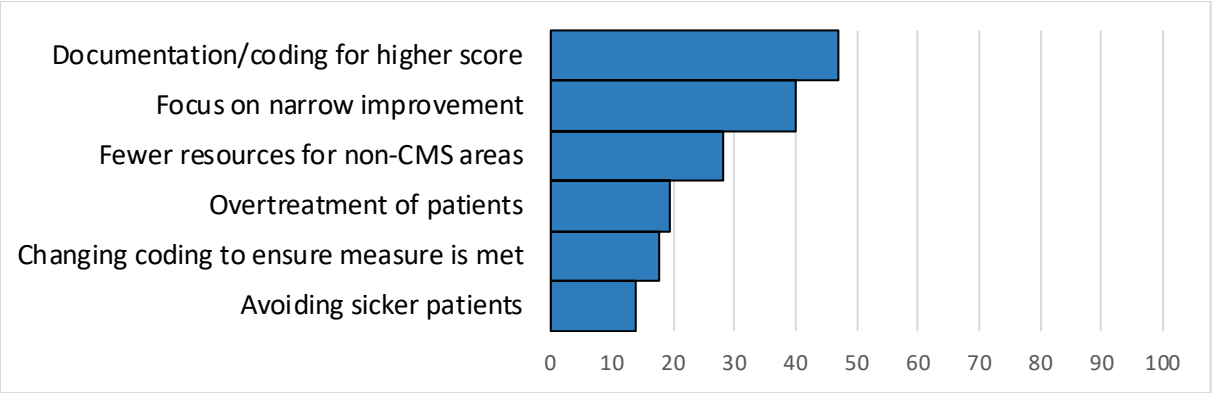
> *"We've just had a lot of issues with [iQIES], finding the proper reports. They'll say that one is rejected, but it's not clear which OASIS that is. … They still have issues that they need to resolve to make it work." (midsize, medium-performing HHA)*

Unintended Consequences Associated With Implementation of CMS Quality Measures in HHAs

Survey Findings

HHA leaders were asked to report whether they had observed any occurrence of six types of undesired effects in their HHA as a result of being held accountable for performance on CMS measures. The most commonly reported unintended consequences were an increased focus on documentation or coding of data to attain a higher score (47%) and a focus on narrow improvement (i.e., "teach to the test") rather than across-the-board improvement (40%) (Figure F-5). Avoiding sicker patients was the least commonly reported finding (14%).

Figure F-5: Percentage of HHAs Reporting Unintended Consequences Stemming From CMS Measures



In subgroup analyses, small HHAs were more likely than large HHAs to report changing coding to obtain higher scores (21% versus 14%, p = 0.02) and avoiding sicker patients (17% versus 10%, p = 0.02. No statistically significant differences between high- and low-performing HHAs were found in the proportion of HHAs reporting unintended consequences. More rural than urban HHAs reported focusing on documentation/coding to ensure that a measure is met (56% versus 44%, p = 0.001).

Qualitative Interviews

HHAs (n = 21/39) raised concerns about unintended consequences stemming from quality measures. Similar to survey results, interview participants expressed concerns for three consequences: avoiding sicker patients, focus on narrow improvement, and documentation or coding for higher scores. HHAs (n = 15/39) stated that they take patients with multiple comorbidities but expressed concerns that quality measures might induce competitors to avoid sicker or more complex patients. Similarly, some HHAs (n = 9/39) voiced concerns that other HHAs might engage in reporting practices intended to inflate OASIS scores.

> *"I know there are agencies that manipulate their data. … That makes it very unfair for an agency that's trying to give you true, objective, this-is-exactly-what-we-saw data. … You can really make yourself look great on paper, but that doesn't mean in real life, you're the best agency." (large, high-performing HHA)*

In terms of unintended consequences affecting their own operations, HHAs (n = 11/39) worried that intense focus on improving areas of care covered by CMS quality measure might cause other areas to be neglected, as expressed by this agency leader:

> *"Maybe somebody has tons of comorbidities and we're trying to monitor them all, but their blood sugar isn't being watched because we're so worried about their functional goals. And we don't get dinged if their blood sugar is not well controlled, but we do if they're not doing their home exercise program and getting better." (small, medium-performing HHA)*

Lastly, HHAs (n = 6/39) expressed concerns that the documentation burden might detract from patient care. Interview participants noted that some clinicians spent more time documenting than interacting with patients, impacting patients' satisfaction with care.

"We have 30 different boxes we have to check. … [If] the nurse is spending one hour on the patient and two hours, three hours on the documentation, that's a problem." (large, high-performing HHA)

Health Information Technology Used by HHAs

Survey Findings

Though a significant majority of HHAs (90%) reported using an EHR system, subgroup analyses established differences in EHR capabilities by size and quality ratings. Large HHAs more often reported having EHRs (98% versus 81% of small HHAs, $p < 0.001$) and greater functionality of their EHRs.

- Fewer than half (43%) of the EHR systems overall could **receive physician orders**, a capability shared by:
  - 62% of large HHAs versus 35% of small HHAs, $p < 0.001$.
  - 52% of high-performing HHAs versus 34% of low-performing HHAs, $p = 0.001$.
- A minority of HHAs (34%) reported that **community providers could receive key patient data** via the EHR system, including discharge instructions (29%), diagnostic and treatment summary (28%), prescribed medications (26%), and lab tests and imaging results (24%).
  - Large HHAs had EHRs that allowed community providers access to key patient data more often than small HHAs (46% versus 34% of small HHAs ($p = 0.007$).
  - Fewer rural than urban HHAs reported that community providers were able to access diagnostic and treatment information (23% versus 30%, $p = 0.04$) or discharge instructions (23% versus 31%, $p = 0.03$).
  - 40% of high-performing HHAs versus 27% of low-performing HHAs ($p = 0.02$) had any EHR functionalities, including for discharge instructions (33% versus 20%, $p = 0.007$); lab tests (30% versus 19%, $p = 0.02$); and prescribed medications (32% versus 18%, $p = 0.002$).
- More than half (52%) of HHAs reported that their EHR system **could access information from community providers,** including 67% of large HHAs and 43% of small HHAs ($p < 0.001$ for comparison).
- The **most frequently reported EHR capabilities** were software prompts and validation to improve OASIS accuracy (80% of HHAs), collection of measures (77%), reporting of measures (74%), medication tracking and reconciliation (74%), tracking of quality of care and patient outcomes (73%), administration of medication (60%), and clinical decision support (55%).
  - About one-quarter (24%) of EHR systems provided a secure portal for patients to access care guidance.
  - High-performing HHAs were more likely than low-performing HHAs to report several EHR features, including software prompts, reporting of measures, tracking of quality of care and patient outcomes, and patient portals.

Apart from EHR systems, **other electronic tools** for collecting measure data were used by 60% of HHAs—large more than small (77% versus 54%, $p < 0.001$), high-performing more than low-performing (67% versus 43%, $p < 0.001$), and HHVBP participants more than nonparticipants (67% versus 58%, $p = 0.02$).

Qualitative Interviews

While all 39 HHAs participating in the qualitative interviews reported having an EHR system, EHR capabilities differed for rural and nonrural HHAs. Because the qualitative dataset is a small, nonrepresentative sample, no statistical tests of significance were conducted.

Table F-3. Differences in EHR Capabilities by HHA Rural and Performance Characteristics

EHR Capability	Rural	Non-Rural	High-Performing	Medium-Performing	Low-Performing
Electronic exchange of information with providers in community	3	12	4	8	3
Automatic reporting of OASIS data for CMS quality measures	5	12	7	6	4
Clinical decision support	9	9	5	8	4
Documenting or monitoring of patient status, even if not related to quality measures	12	15	9	13	4
Point-of-care electronic documentation system	14	19	11	17	5

Discussion

In a national survey of HHAs, most HHAs reported that CMS measures are clinically important, that HHAs should be responsible for their performance on quality measures, and that their performance on CMS measures reflected their care improvements at least somewhat well. HHAs also broadly adopted QI changes in response to quality measures, and most HHAs found such changes to be helpful in improving performance. EHR usage was widespread among HHAs (90%), as was use of electronic tools for measure collection and reporting, medication tracking, and software prompts for OASIS data validation (> 70%).

Sixty percent of HHAs reported one or more barriers to reporting quality measure data, most commonly citing frequent OASIS changes. Three-fourths of HHAs reported barriers to improving performance on quality measures, including a difficult patient mix (58%) and difficulty changing staff behavior (41%). HHAs also mentioned unintended consequences: excessive focus on documentation (47%) or narrow improvements (40%) and, to a lesser extent, avoiding sicker patients (14%).

In subgroup analyses, rural HHAs reported substantial differences in several categories in comparison with urban HHAs: Rural HHAs on average adopted fewer QI changes (13.7) than urban (16.4.), and fewer rural HHAs found such QI changes to be effective in improving performance. Rural HHAs reported more barriers to improvement; difficult patient mix was reported by 68% of rural HHAs. Other barriers for rural HHAs included identifying processes of care, lack of training, implementing QI strategies, and inconsistent or insufficient documentation by staff. Fewer differences by agency size, HHVBP participation, or quality rating were observed.

Interview data mirrored survey results in most areas. Although HHAs reported adopting provider incentives to address quality measures in both survey and interviews, interview participants emphasized that their HHAs did not provide monetary incentives to frontline staff. Unlike survey respondents, none of the interview participants reported difficulty changing frontline staff behavior, lack of senior leadership support, or unsupportive culture as a barrier to measure improvement.

The qualitative results in this study highlight additional themes not addressed in survey findings:

- Interview participants reported adopting novel low-tech approaches to patient education (e.g., teach-back method, zone tools) in response to home health quality measures. These approaches were noted to be beneficial when assisting patients with chronic conditions such as chronic obstructive pulmonary disease and congestive heart failure.
- Interview participants mentioned additional barriers to quality improvement, specifically challenges in working with referring physicians, system-level issues involving hospitals and insurers, and the concern that certain measures were outside of HHAs' purview. These barriers were perceived as impacting not only quality scores, but also patient experience and care satisfaction.
- Several interview participants mentioned specific process and outcome measures that they viewed as of lower value to collect. Measures suggested for removal included three process measures (influenza/pneumococcal polysaccharide immunization and depression assessment) and two outcome measures (acute care hospitalization outcome and emergency department use). CMS has already removed some of these measures,[vi] effectively mitigating concerns about measures of lower value to home health providers. Several interview participants suggested clinically valuable alternatives such as measures for tracking infections, including specifically urinary tract infections, as potential new measures for HHAs.

Like rural survey respondents, rural interview participants mentioned difficult patient mix as a barrier to improvement. However, certain aspects of patient mix not discussed in the survey results were mentioned. In particular, rural interview participants disproportionately voiced concerns about patients who were too sick or cognitively impaired to live independently and needed hospice or a skilled nursing facility rather than home health care. They also mentioned social determinants of health, including low income, limited access to healthy foods, and lack of access to care in ways that their urban counterparts did not. Together, the survey findings and interview results suggest that rural HHAs perceive their patients as facing distinct challenges regarding access to care and basic necessities.

This survey and interviews add significant new findings to prior studies and reports regarding HHA responses to quality measures, including several studies that noted HHAs' QI changes but did not study them systematically.[22-29] While a 2018 survey of HHAs conducted by the Center for Medicare and Medicaid Innovation (CMS Innovation Center) noted that 85% to 95% of HHAs appeared to be investing in QI strategies, the Impact Assessment survey queried HHAs nationwide on their adoption of specific QI changes in response to quality measurement programs, as well as confirming widespread adoption of technology. This survey and interviews also show that many HHAs observe challenges in improving performance (including a difficult patient mix) but find little self-reported "cherry-picking" (i.e., avoiding sicker patients). Finally,

[vi] The following measures were removed from the program: *Influenza Immunization Received for Current Flu Season, Pneumococcal Polysaccharide Vaccine Ever Received, Depression Assessment Conducted, Emergency Department Use Without Hospital Readmission During the First 30 Days of HH,* and *Rehospitalization During the First 30 Days of HH*. Reference: Medicare and Medicaid Programs; CY 2019 Home Health Prospective Payment System Rate Update and CY 2020 Case-Mix Adjustment Methodology Refinements; Home Health Value-Based Purchasing Model; Home Health Quality Reporting Requirements; Home Infusion Therapy Requirements; and Training Requirements for Surveyors of National Accrediting Organizations; Final Rule. *Fed Regist*. 2018; 83 FR 56406: 56406-56638.

both the survey and interviews indicate that rural HHAs face substantial challenges in responding to CMS quality measurement programs.

The survey and interviews complement similar studies in hospitals and nursing homes that were reported in the 2018 Impact Report.[2] The nursing home and hospital quality leaders had generally similar views on CMS quality measurement programs; they also noted that CMS measures were clinically important and that performance on these measures reflected their QI efforts very well or somewhat well. Furthermore, the previous surveys also showed that providers were broadly adopting QI changes in response to CMS quality measurement programs and noted that such changes were helpful in improving performance. Similarly, large majorities of hospitals and nursing homes faced difficulties improving performance on some or many of the CMS measures; difficult patient mix was reported to be a key barrier across settings. Together the three surveys suggest that CMS quality measurement programs are having broad effects on how these providers deliver care to CMS beneficiaries and other patients.

The survey and interviews were associated with the following limitations:

- The survey does not provide information regarding how QI changes were implemented. Additional in-depth qualitative studies examining a representative cross-section of HHA staff would be necessary to fully describe implementation of QI changes at particular HHAs, particularly a complex, multi-faceted change such as becoming a learning organization or adopting a culture of safety. However, most QI changes represented specific strategies, and HHA quality leaders exhibited good understanding of similar questions in the cognitive interviews.
- The self-reported responses are subject to social-desirability bias, which may have led respondents and participants to overreport QI changes. The project team attempted to mitigate bias by assuring survey respondents and interview participants of confidentiality; HHAs reported several potential unintended consequences and barriers to CMS reporting, which suggests that they were not subject to substantial social-desirability bias.
- The survey could not fully assess how HHAs fit into the broader health care system because it was not feasible to survey all persons necessary to conduct such an assessment, which might include multiple staff within both HHAs and partner organizations. However, the survey did highlight potential gaps in EHR interoperability with community providers. In addition, the interviews suggest that care delivery might be improved by facilitating better communication between HHAs and referring providers in the community (including clinicians and hospitals).

In addition to these limitations, ongoing changes related to the Home Health Patient-Driven Groupings Model (PDGM, effective January 1, 2020) may make the results less generalizable to HHAs in the future. PDGM changed the basis for HHA reimbursements from utilization to pre-existing diagnoses, functional status, and incidence of prior home health or inpatient services,[30] with the aim of encouraging HHAs to serve patients with medically complex conditions.[31] However, industry newsletters suggest that small HHAs might not be able to adapt their workflows to accommodate PDGM,[31,32] which could lead to such HHAs closing or merging with larger ones.

In the interviews, several small and midsize HHAs characterized the advent of PDGM as a challenge; other small HHAs declined to be interviewed, saying they would be closing or merging with another agency because of PDGM. Therefore, the survey and interview findings may not entirely reflect the evolving HHA population as small HHAs close or are sold to very large HHAs or chains.

The COVID-19 pandemic also led CMS to make substantial regulatory changes in March 2020 to give HHAs flexibility in countering the pandemic's effects,[33] including allowing greater HHA use of telehealth services, suspending quality reporting requirements, reducing training requirements, and narrowing the scope of the Quality Assurance and Performance Improvement program. Given that the interviews had concluded and the majority of data collection for the surveys occurred before the pandemic and subsequent regulatory changes took effect, the survey and interview findings reflect HHA responses to the pre-pandemic regulatory environment. If regulations related to COVID-19 become permanent, then HHA views on CMS quality measures may change. For example, reducing training requirements may decrease HHA perceptions of burden, while increased use of telehealth services might change how HHAs implement some QI activities. However, the pandemic likely did not affect the survey's response rate or the accuracy of the results.

The HHA survey and interviews found that most HHAs reported CMS measures to be clinically important and were making widespread QI changes in response to them. In conjunction with similar findings in nursing homes and hospitals, this study shows that CMS quality measurement programs are having broad effects on how providers deliver care to CMS beneficiaries and other patients, although direct causation between the changes and improvements on quality performance measures cannot be inferred. The survey and interviews also highlight some areas that require additional attention.

To promote greater improvements, reducing documentation requirements (including frequent OASIS changes) and maintaining processes for identifying and removing lower-value measures could reduce provider burden while helping HHAs focus on care improvements. In addition, rural HHAs, while still undertaking substantial QI efforts, may face disadvantages in making improvements and achieving good performance in comparison with urban HHAs. Support for rural HHAs and others caring for underserved populations could assist HHAs in surmounting local challenges and providing the best care possible for their patients.

Appendix G References

1. Centers for Medicare & Medicaid Services. Meaningful Measures Hub. Baltimore, MD: US Department of Health and Human Services; 2019. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/MMF/General-info-Sub-Page. Accessed Oct 1, 2020.
2. Centers for Medicare & Medicaid Services. *2018 National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Report.* Baltimore, MD: US Department of Health and Human Services; 2018. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityMeasures/National-Impact-Assessment-of-the-Centers-for-Medicare-and-Medicaid-Services-CMS-Quality-Measures-Reports.html. Accessed January 30, 2020.
3. Medicare Payment Advisory Commission. Chapter 9: Home health care services. *March 2020 Report to the Congress: Medicare Payment Policy*. Washington, DC: MedPAC; 2020:251-266.
4. Centers for Medicare & Medicaid Services. Home Health Quality Reporting Program. Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits. Accessed June 25, 2020.
5. Centers for Medicare & Medicaid Services. Home Health Compare Datasets. Baltimore, MD: US Department of Health and Human Services; 2020. Accessed June 25, 2020.
6. Centers for Medicare & Medicaid Serivces. Home Health Star Ratings. Baltimore, MD: US Department of Health and Human Services; 2020. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/HHQIHomeHealthStarRatings. Accessed January 14, 2021.
7. Backinger CL, Koustenis GH. Analysis of needlestick injuries to health care workers providing home care. *Am J Infect Control.* 1994;22(5):300 - 306. doi: 10.1016/0196-6553(94)90017-5.
8. Bercovitz A, Moss AJ, Sengupta M, et al. Design and operation of the national home health aide survey: 2007 - 2008. *Vital Health Stat.* 2010;1(49):1-94.
9. Godden E, Paseka A, Gnida J, Inguanzo J. The impact of response rate on Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS) dimension scores. *Patient Exp J.* 2019;6(1):105-114. doi: 10.35680/2372-0247.1357.
10. Jepson C, Asch DA, Hershey JC, Ubel PA. In a mailed physician survey, questionnaire length had a threshold effect on response rate. *J Clin Epidemiol.* 2005;58(1):103-105. doi: 10.1016/j.jclinepi.2004.06.004.

11. Rebmann T, Citarella B, Subramaniam DS, Subramaniam DP. A home health agency's pandemic preparedness and experience with the 2009 H1N1 pandemic. *Am J Infect Control.* 2011;39(9):725-731. doi: 10.1016/j.ajic.2010.12.014.

12. Pozniak A, Turenne M, Mukhopadhyay P, et al. *Evaluation of the Home Health Value-Based Purchasing (HHVBP) Model: Second Annual Report.* Centers for Medicare & Medicaid Services; 2019. https://innovation.cms.gov/files/reports/hhvbp-secann-rpt.pdf.

13. Baruch B, Holton B. Survey response rate levels and trends in organizational research. *Human Relations.* 2008;61(8):1139-1160. doi: 10.1177/0018726708094863.

14. Dillman D, Smyth J, Christian L. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method.* Hoboken, NJ: Wiley & Sons; 2009.

15. Damiano PC, Elliot M, Tyler MC, Hays RD. Differential use of the CAHPS® 0–10 global rating scale by Medicaid and commercial populations. *Health Serv Outcome Res Meth.* 2004;5(3-4):193-205. doi: 10.1007/s10742-006-6828-x.

16. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15(9):1277-1288. doi: 10.1177/1049732305276687.

17. Elo S, Kyngas H. The qualitative content analysis process. *J Adv Nurs.* 2008;62(1):107-115. doi: 10.1111/j.1365-2648.2007.04569.x.

18. QSR International. NVivo. QSR International; nd. https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home. Accessed January 22, 2019.

19. O'Connor C, Joffe H. Intercoder reliability in qualitative research: debates and practical guidelines. *Int J Qual Methods.* 2020;19. doi: 10.1177/1609406919899220.

20. Institute for Healthcare Improvement. Plan-Do-Study-Act (PDSA) Worksheet. Boston, MA: Institute for Healthcare Improvement; 2020. http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx. Accessed July 9, 2020.

21. Centers for Medicare & Medicaid Services. iQIES. Baltimore, MD: US Department of Health and Human Services; 2020. https://iqies.cms.gov/. Accessed July 9, 2020.

22. Ganaden RE, Mitchell L. Implementing a comprehensive unit-based safety program (CUSP) to enhance a culture of patient safety and improve medication safety in a regional home care program. *Qual Manag Health Care.* 2018;27(3):130-135. doi: 10.1097/QMH.0000000000000180.

23. Ellenbecker CH, Samia LW, Cushman MJ, et al. Patient safety and quality in home health care. In: Hughes RG, ed. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses.* Rockville, MD: Agency for Healthcare Research and Quality; 2008.

24. Resnick HE, Alwan M. Use of health information technology in home health and hospice agencies: United States, 2007. *J Am Med Inform Assoc.* 2010;17(4):389-395. doi: 10.1136/jamia.2010.005504.

25. Parker E, Zimmerman S, Rodriguez S, Lee T. Exploring best practices in home health care. *Home Health Care Manag Pract.* 2013;26(1). doi: 10.1177/1084822313499916.

26. Dowding DW, Russell D, Onorato N, Merrill JA. Technology solutions to support care continuity in home care: a focus group study. *J Healthc Qual.* 2018;40(4):236-246. doi: 10.1097/JHQ.0000000000000104.

27. Schade CP, Esslinger E, Anderson D, Sun Y, Knowles B. Impact of a national campaign on hospital readmissions in home care patients. *Int J Qual Health Care.* 2009;21(3):176-182. doi: 10.1093/intqhc/mzp013.

28. Husebo AM, Storm M. Virtual visits in home health care for older adults. *Scientific World Journal.* 2014;2014:689873. doi: 10.1155/2014/689873.

29. Esslinger EE, Schade CP, Sun CK, et al. Exploratory analysis of the relationship between home health agency engagement in a national campaign and reduction in acute care hospitalization in US home care patients. *J Eval Clin Pract.* 2014;20(5):664-670. doi: 10.1111/jep.12198.

30. Medicare and Medicaid Programs; CY 2019 Home Health Prospective Payment System Rate Update and CY 2020 Case-Mix Adjustment Methodology Refinements; Home Health Value-Based Purchasing Model; Home Health Quality Reporting Requirements; Home Infusion Therapy Requirements; and Training Requirements for Surveyors of National Accrediting Organizations; Final Rule. *Fed Regist.* 2018; 83 FR 56406: 56406-56638.

31. Graham J. Why Home Health Care is Suddenly Harder to Come by for Medicare Patients. Kaiser Health News; 2020. https://khn.org/news/why-home-health-care-is-suddenly-harder-to-come-by-for-medicare-patients/. Accessed June 18, 2020, 2020.

32. Dolan A. Home Health Agencies Conquering Fear of PDGM Boogeyman. Home Health Care News; 2020. https://homehealthcarenews.com/2020/03/home-health-agencies-conquering-fear-of-pdgm-boogeyman/. Accessed June 25, 2020.

33. Centers for Medicare & Medicaid Services. COVID-19 Emergency Declaration Blanket Waivers for Health Care Providers. Baltimore, MD: US Department of Health and Human Services; April 8, 2021. https://www.cms.gov/files/document/summary-covid-19-emergency-declaration-waivers.pdf. Accessed May 25, 2021.

Appendix H – Survey Instrument and Interview Guide for the Home Health National Provider Survey

Home Health Agency Survey Instrument

[INITIAL OR SPLASH SCREEN]

[PROGRAMMING NOTE: Survey needs to allow user to move forward without answering questions, as we assume that some users will want to review all the questions prior to answering them.]

NATIONAL PROVIDER SURVEY OF HOME HEALTH AGENCIES
Welcome

Thank you for agreeing to complete the National Provider Survey of Home Health Agencies. This survey asks about your home health agency's experience implementing the CMS quality and efficiency measures, such as clinical processes and outcomes, patient experience with care, patient safety, resource use or cost of care, and structural measures. The information you provide will help CMS understand the impact of the use of these measures and to identify opportunities for program improvement.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is 0938-1364. The time required to complete this information collection is estimated to average 60 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to: CMS, 7500 Security Boulevard, Attn: PRA Reports Clearance Officer, Mail Stop C4-26-05, Baltimore, Maryland 21244-1850.

Confidentiality
This survey is conducted by the [CMS CONTRACTOR(s)]. This survey is hosted on [CMS CONTRACTOR's] secure website. Your answers will be kept strictly confidential and will not be shared with any persons outside this research project.

Survey Instructions
Participation in this survey is voluntary, but we encourage you to participate, as your home health agency was chosen at random to represent the experiences of similar agencies. As you answer the questions, please do not use your browser's BACK and FORWARD buttons. Only use the BACK and NEXT buttons that are located below the questions to move backward and forward through the questionnaire.

INSERT CONTRACTOR INSTRUCTIONS FOR WEB SURVEYS, INCLUDING CONTACT EMAIL OR PHONE NUMBER FOR TECHNICAL ASSISTANCE.

To begin the survey, please enter the PIN provided in the letter you received.

[PROGRAMING NOTE: ADD LINK TO DOWNLOAD PDF SURVEY]

PROGRAMMING NOTE: THESE DEFINITIONS NEED TO BE ACCESSIBLE DURING COMPLETION OF THE WEB SURVEY]

DEFINITION OF KEY TERMS IN THIS SURVEY

CMS quality measures: CMS home health quality measures include measures of clinical processes and outcomes, patient experience with care, patient safety, resource use or cost of care, and structural measures (such as a home health agency's use of EHRs). These measures are reported by home health agencies to the Centers for Medicare & Medicaid Services (CMS) and can be found at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HomeHealthQualityInits/Home-Health-Quality-Measures.html. Measures come from patient assessment data that home health agencies routinely collect on the patients at specified time intervals during their stay as well as Medicare claims data.

Accountable care organizations (ACO): ACOs are networks of healthcare providers and organizations (usually hospitals and ambulatory care physician groups, and possibly including nursing homes, home health agencies, and hospice organizations) that agree to take some financial responsibility for reducing the costs and improving the quality of care for a defined patient population.

Clinical decision support (CDS): CDS encompasses a variety of tools to enhance decision-making in the clinical workflow. These tools include computerized alerts and reminders to care providers and patients; clinical guidelines; condition-specific order sets; focused patient data reports and summaries; documentation templates; diagnostic support; and contextually relevant reference information, among other tools.

Culture of safety: Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures. The Agency for Healthcare Research and Quality notes the following key features: acknowledgment of the high-risk nature of an organization's activities and the determination to achieve consistently safe operations; a blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment; encouragement of collaboration across ranks and disciplines to seek solutions to patient safety problems; and organizational commitment of resources to address safety concerns.

Integrated delivery system (IDS): An IDS is an integrated network of healthcare providers and organizations such as nursing homes, primary and specialty care, hospitals, rehabilitation centers, home health care agencies, and hospice services that provides or arranges to provide a coordinated continuum of services to a defined population. It may own or be closely aligned with an insurance product, usually a form of managed care.

Lean/Six Sigma Engineering: Redesign or re-engineering concepts that were originally developed to increase the efficiency of production and reduction of errors within manufacturing companies. Lean/Six Sigma has been adopted by healthcare organizations to identify problems or inefficiencies and take actions to address these issues. "Lean" and "Six Sigma" emphasize focusing on customer satisfaction, problem solving, and elimination of waste and involving employees in identifying and resolving the problem.

Learning Organization: An organization that encourages and supports continuous employee learning, critical thinking, and risk-taking with new ideas.

Plan, Do, Study, Act Improvement Cycles (PDSA): PDSA is a tool that is used for accelerating quality improvement that involves developing a plan to test the change (**Plan**), carrying out the test (**Do**), observing and learning from the consequences (**Study**), and determining what modifications should be made to the test (**Act**).

Situation Background Assessment Recommendation (SBAR): SBAR is a standardized way of communicating that promotes patient safety by helping individuals communicate with each other with a shared set of expectations. Staff and physicians can use SBAR to share patient information in a concise and structured format.

Electronic Health Record (EHR) systems. An EHR is an electronic version of a patient's medical history that is maintained by the provider over time and may include all of the key clinical data relevant to that person's care under a particular provider, including demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports.

YOUR HOME HEALTH AGENCY'S EXPERIENCE WITH CMS MEASURES

In this survey, we will ask about your home health agency's experience with **CMS quality measures,** which broadly include measures of clinical processes and outcomes, patient experience with care, patient safety, resource use or cost of care, and use of EHRs.

1. How would you describe your home health agency's performance on CMS quality measures in 2019 compared to 2018?

   [PROGRAMMING NOTE – MARK ONE ITEM]

   1 ☐ Improved across the board on all measures
   2 ☐ More measures improved than declined
   3 ☐ Most measures stayed about the same
   4 ☐ More measures declined than improved
   5 ☐ Declined across the board on all measures

2. In your opinion, how well does your home health agency's performance on the CMS quality measures reflect the improvements in care that your home health agency makes?

   [PROGRAMMING NOTE – MARK ONE ITEM]

   1 ☐ Very well
   2 ☐ Somewhat well
   3 ☐ Not well at all

3. Thinking about all of the CMS home health quality measures, do you think the CMS quality measures are clinically important?

   [PROGRAMMING NOTE – MARK ONE ITEM]

   1 ☐ Yes
   2 ☐ Mostly yes
   3 ☐ Mostly no
   4 ☐ No

4. Do you think home health agencies should be held responsible for performance on the CMS quality measures?

   [PROGRAMMING NOTE – MARK ONE ITEM]

   1 ☐ Yes
   2 ☐ Mostly yes
   3 ☐ Mostly no
   4 ☐ No

5. Have you experienced difficulties with improving performance on any of the CMS quality measures?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes on many of the measures

2☐ Yes on some of the measures

3☐ No [GO TO QUESTION 8]

6. Based on your home health agency's experience, how difficult has it been for your home health agency to improve on the following types of measures?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM]

	Not Difficult	Slightly Difficult	Moderately Difficult	Difficult	Very Difficult
Clinical process measures (for example: How often the home health team made sure that their patients have received a flu shot for the current flu season)					
Patient outcome measures (for example: How often patients got better at walking or moving around?)					
Patient experience measures (for example: Home Health CAHPS Survey measure "*How often the home health team gave care in a professional way*")					
Patient safety measures (for example: How often the home health team checked patients' risk of falling)					
Other (please specify): [TEXT BOX 140 CHARACTERS]					

7. Have any of the following contributed to your home health agency's difficulties with improving performance on the CMS measures?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–N]

a. Difficulty identifying improvement strategies ..... Yes No

b. Difficulty implementing improvement strategies ..... Yes No

c. Difficulty identifying processes of care that lead to improved patient outcomes ..... Yes No

d. Difficulty getting front-line staff to change behavior to improve performance ..... Yes No

e. Insufficient staffing to implement quality improvement strategies ..... Yes No

f. Inadequate health information technology (IT) capabilities (e.g., clinical decision support or longitudinal tracking of outcomes, or electronic medication administration system) ..... Yes No

g. Staff turnover ..... Yes No

h. Lack of senior leadership support ..... Yes No

i. Difficulty with coding or documentation (e.g., inconsistent or insufficient documentation by staff) ..... Yes No

j. Lack of training on improvement processes ..... Yes No

k. A difficult patient mix (e.g., low socioeconomic status, clinically complex) ..... Yes No

l. Your home health agency's organizational culture not supporting improvement efforts ..... Yes No

m. Inability to retrieve timely data from CMS or data from other providers such as hospitals..... Yes No

n. Other reason (please specify): [TEXT BOX 140 CHARACTERS] ..... Yes No

INNOVATIONS IN THE DELIVERY OF CARE

8. We are interested in understanding what changes your home health agency has made in the way care is being delivered to improve its performance on CMS quality measures.

[PROGRAMMING NOTE: IF "YES" RESPONSE IN COLUMN (I) A RESPONSE IS ALLOWED IN COLUMN (II). IF "NO" RESPONSE IN COLUMN (I) A RESPONSE IS NOT ALLOWED IN COLUMN (II). IF "YES" RESPONSE IN COLUMN (II) A RESPONSE IS ALLOWED IN COLUMN (III). IF "NO" RESPONSE IN COLUMN (II) A RESPONSE IS NOT ALLOWED IN COLUMN (III)]

	(I)	(II)	(III)
Type of change or innovation	**Has your home health agency implemented this change?**	**Was this change implemented to improve performance on CMS quality measures?**	**Did the change help performance on CMS quality measures?**
Organizational Culture			
a. Adopted practices to become a "learning organization" that encourages and supports continuous employee learning, critical thinking, and risk-taking with new ideas.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
b. Implemented a "culture of safety" characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
Health Information Technology			
c. Implemented an electronic health record (EHR).	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
d. Implemented electronic tools to support frontline clinical staff, such as clinical decision support, or medication administration system.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure

	(I)	(II)	(III)
Type of change or innovation	**Has your home health agency implemented this change?**	**Was this change implemented to improve performance on CMS quality measures?**	**Did the change help performance on CMS quality measures?**
e. Implemented systems for electronically exchanging clinical information with providers in the community (e.g., other post-acute care providers, hospitals and ambulatory care providers).	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
Care Process Redesign			
f. Implemented risk prediction tools to identify and manage high-risk patients.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
g. Implemented standardized care protocols or checklists.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
h. Implemented telemonitoring or remote patient monitoring	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
i. Adopted care redesign/re-engineering (e.g., Lean Engineering; Six Sigma; Plan, Do, Study, Act improvement cycles).	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
j. Implemented interdisciplinary rounds, case conferences, or multispecialty patient care teams.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
k. Implemented or changed communication protocols to support or improve collaboration between referring providers and agency staff	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure

	(I)	(II)	(III)
Type of change or innovation	**Has your home health agency implemented this change?**	**Was this change implemented to improve performance on CMS quality measures?**	**Did the change help performance on CMS quality measures?**
l. Increased coordination with hospitals, nursing homes, and other providers to improve care transitions and reduce hospitalization rates.	☐ Yes → ☐ No ↓	☐ Yes, mostly → ☐ Yes, partly → ☐ No ↓	☐ Yes, definitely ☐ Yes, somewhat ☐ No ☐ Don't know/Not sure
m. Increased number of visits at beginning of care episode (i.e., "frontloading") so that patients have greater contact with clinicians earlier in care episode.	☐ Yes → ☐ No ↓	☐ Yes, mostly → ☐ Yes, partly → ☐ No ↓	☐ Yes, definitely ☐ Yes, somewhat ☐ No ☐ Don't know/Not sure
n. Addition of after-hours on-call availability to patients.	☐ Yes → ☐ No ↓	☐ Yes, mostly → ☐ Yes, partly → ☐ No ↓	☐ Yes, definitely ☐ Yes, somewhat ☐ No ☐ Don't know/Not sure
Feedback and Monitoring of Performance			
o. Developed a system for tracking patient outcomes.	☐ Yes → ☐ No ↓	☐ Yes, mostly → ☐ Yes, partly → ☐ No ↓	☐ Yes, definitely ☐ Yes, somewhat ☐ No ☐ Don't know/Not sure
p. Provided routine feedback on your home health agency's performance on CMS measures to nurses, physical therapists, and other staff.	☐ Yes → ☐ No ↓	☐ Yes, mostly → ☐ Yes, partly → ☐ No ↓	☐ Yes, definitely ☐ Yes, somewhat ☐ No ☐ Don't know/Not sure

	(I)	(II)	(III)
Type of change or innovation	**Has your home health agency implemented this change?**	**Was this change implemented to improve performance on CMS quality measures?**	**Did the change help performance on CMS quality measures?**
Changing Provider Incentives			
q. Used performance on CMS measures as a basis for determining pay for nurses or other frontline staff.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
r. Implemented an internal incentive or bonus program for senior management based on performance on CMS measures.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
s. Gave staff awards or other special recognition tied to quality performance.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
Changes in Staffing			
t. Increased the number of staff dedicated to quality improvement or quality management.	□Yes → □No ↓	□Yes, mostly → □Yes, partly → □No ↓	□Yes, definitely □Yes, somewhat □No □Don't know/Not sure
u. Identified champions for quality improvement initiatives or projects among clinical staff.	□Yes → □No ↓	□Yes, mostly → □Yes, partly → □No ↓	□Yes, definitely □Yes, somewhat □No □Don't know/Not sure
v. Implemented changes to how clinical staff are deployed (e.g., change in staffing levels or clinical roles/ responsibilities).	□Yes → □No ↓	□Yes, mostly → □Yes, partly → □No ↓	□Yes, definitely □Yes, somewhat □No □Don't know/Not sure

	(I)	(II)	(III)
Type of change or innovation	**Has your home health agency implemented this change?**	**Was this change implemented to improve performance on CMS quality measures?**	**Did the change help performance on CMS quality measures?**
Obtained Technical Assistance			
w. Obtained technical assistance from CMS (e.g., via a CMS Quality Improvement Organization or the CMS Home Health Quality Improvement initiative) to collect and report CMS quality measures.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
x. Obtained technical assistance from private organizations (e.g., quality improvement collaboratives, consulting firms).	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
Provider Education and Training			
y. Implemented quality improvement initiatives targeted to specific CMS measures.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
z. Provided training to nurses, physical therapists, and other clinical staff on quality improvement strategies.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
a1. Provided training to clinical staff on teaching patient self- management techniques.	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure
Other Improvements			
a2. Other change or innovation. (please specify): [TEXT BOX 140 CHARACTERS]	□ Yes → □ No ↓	□ Yes, mostly → □ Yes, partly → □ No ↓	□ Yes, definitely □ Yes, somewhat □ No □ Don't know/Not sure

FACTORS ASSOCIATED WITH CHANGE IN QUALITY PERFORMANCE

9. There are many factors that influence a home health agency's decision to invest in efforts to improve its quality performance. Please rank the importance of the following six external factors in your home health agency's decision to invest in quality improvement efforts for CMS measures.

(Please rank by order of importance where 1 is the most important and 6 is the least important. Do not use the same rank number more than once)

[PROGRAMMING NOTE: 0–6 ITEMS IN A–F CAN HAVE ONE RESPONSE]

a. Potential to receive financial incentives for improved performance (i.e., pay for performance)

b. Risk of financial penalties for low performance (e.g., nonpayment for home health agency readmissions within 30 days or for home health agency-acquired infections)

c. Public reporting of your home health agency's performance results on the CMS Home Health Compare website

d. Participation in alternative payment models (e.g., ACOs, bundled payment arrangements) or managed care contracts where there is an opportunity for shared reward (savings) and shared financial risk

e. State or federal regulatory requirements regarding certification/accreditation

f. Addition of Quality Assessment and Performance Improvement (QAPI) requirements to conditions of participation

10. Has your home health agency improved its performance on any of the CMS measures?

[PROGRAMMING NOTE – MARK ONE ITEM]

[1] ☐ Yes

[2] ☐ No [GO TO QUESTION 11]

10a. Many different factors may help a home health agency improve its performance. How **important** are the factors below in helping **your** agency improve performance on CMS measures?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–I]

	Not Important	Slightly Important	Moderately Important	Important	Very Important	Not applicable
a. Your home health agency's organizational culture						
b. Effective relationship between management and staff						
c. Internal accountability for performance on CMS measures						
d. Having strong data systems						
e. Having a system-wide focus on quality and quality improvement						
f. Networking with other home health agencies and health systems to identify elements of high-performing organizations						
g. Investments in patient safety						
h. Focus on improved documentation						
i. Other (please specify): [TEXT BOX 140 CHARACTERS]						

CHALLENGES TO REPORTING THE CMS MEASURES

11. Has your agency experienced any of the following challenges in submitting and reporting OASIS data (for CMS measures)?

[PROGRAMMING NOTE – MARK ONE OR MORE]

1☐ Difficulty extracting the data from the EHR or other data systems/registries for OASIS
2☐ Difficulty interpreting measure specifications
3☐ Frequency of OASIS version changes
4☐ Insufficient or inadequate staffing or other resources
5☐ Challenges with interface for transmitting OASIS data
6☐ Other reason (please specify): [TEXT BOX 140 CHARACTERS]
7☐ Has not experienced any difficulties

UNDESIRED EFFECTS OF CMS QUALITY MEASUREMENT PROGRAMS

The use of quality and efficiency measures may result in undesired effects. The next questions ask about your home health agency's knowledge of or experience with undesired effects of the CMS measures and their use in public reporting and pay for performance. All of the responses you provide are confidential and are intended to help CMS in modifying reporting programs so as to avoid the programs' causing undesired effects. Responses to these questions will be aggregated across all home health agencies. CMS will not see identifiable data from any individual home health agency. Your candid feedback is important in helping CMS improve these programs so that they work well for providers and their patients.

12. Has <u>your home health agency</u> observed any undesired effects stemming from using or reporting CMS measures?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes, definitely
2☐ Yes, somewhat
3☐ No

13. In your opinion, do you think any of the following has occurred in <u>your home health agency</u> as a result of your home health agency being held accountable for performance on CMS measures?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–F]

a. Fewer resources for quality improvement in areas of clinical care that are not the focus of CMS performance measures ..... Yes No

b. Focus on narrow improvement for specific measures rather than across the board improvement in care ..... Yes No

c. Overtreatment of patients to ensure that a measure is met ..... Yes No

d. Increased focus on documentation or coding of data to attain a higher score ..... Yes No

Changing coding of data or documentation to ensure that a measure is met ..... Yes No

e. Avoiding sicker or more challenging patients when providing care ..... Yes No

14. Have the changes your home health agency has made in response to the CMS measures resulted in broader improvements in areas of care beyond what is measured by the CMS quality measures?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No [GO TO QUESTION 16]
3☐ Don't know [GO TO QUESTION 16]

15. Has your home health agency measured or documented the actual improvements in the areas of care not measured by CMS?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

PERSPECTIVES OF YOUR HOME HEALTH AGENCY'S LEADERSHIP AND OTHER STAKEHOLDERS

16. Does your home health agency have a board of directors?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No [GO TO QUESTION 20]

17. How often do meetings of your home health agency's board of directors include a review and discussion of the home health agency's performance on the CMS measures?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ More than four times per year
2☐ Quarterly
3☐ Twice per year
4☐ Annually
5☐ Less than once per year

18. Which of the following best describes your home health agency's board of directors?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Board is more engaged in financial performance issues than quality performance Issues.
2☐ Board is equally engaged in financial performance issues and quality performance issues.
3☐ Board is more engaged in quality performance issues than financial performance issues.

19. On a scale from 0 to 10, where 0 is not at all supportive and 10 is extremely supportive, how would you describe your home health agency's board of directors' support of your home health agency's efforts to improve performance on CMS measures? Please check a number.

[PROGRAMMING NOTE – MARK ONE ITEM]

Not at all supportive				Somewhat supportive						Extremely supportive
0	1	2	3	4	5	6	7	8	9	10

20. On a scale from 0 to 10, where 0 is not at all supportive and 10 is extremely supportive, how would you describe the home health agency leadership's (e.g., the C-Suite executive management) support of your home health agency's efforts to improve performance on CMS measures? Please check a number.

[PROGRAMMING NOTE – MARK ONE ITEM]

Not at all supportive				Somewhat supportive						Extremely supportive
0	1	2	3	4	5	6	7	8	9	10

21. On a scale from 0 to 10, where 0 is not at all supportive and 10 is extremely supportive, how would you describe the clinical staff's support of your home health agency's efforts to improve performance on CMS measures? Please check a number.

[PROGRAMMING NOTE – MARK ONE ITEM]

Not at all supportive				Somewhat supportive						Extremely supportive
0	1	2	3	4	5	6	7	8	9	10

22. On a scale from 0 to 10, where 0 is not at all and 10 is a great deal, how much does your home health agency leadership promote a culture of quality? Please check a number.

[PROGRAMMING NOTE – MARK ONE ITEM]

Not at all				Somewhat						Great deal
0	1	2	3	4	5	6	7	8	9	10

USE OF HEALTH INFORMATION TECHNOLOGY

These next questions are about your home health agency's use of, and outside providers' access to, Health Information Technology.

23. Does your home health agency have an electronic health record (EHR)?

[PROGRAMMING NOTE – MARK ONE ITEM]

1 ☐ Yes
2 ☐ No [GO TO QUESTION 29]

24. Is your home health agency able to receive physician orders using its EHR?

[PROGRAMMING NOTE – MARK ONE ITEM]

1 ☐ Yes
2 ☐ No

25. Are healthcare providers in your community (e.g., ambulatory care physicians, hospitals, other clinicians, and post-acute providers) able to access or electronically receive key patient clinical data from your home health agency's EHR or health information system?

[PROGRAMMING NOTE – MARK ONE ITEM]

1 ☐ Yes, all key clinical data
2 ☐ Yes, some key clinical data
3 ☐ No [GO TO QUESTION 27]

26. Which of the following types of information are healthcare providers in your community (e.g. ambulatory care physicians, hospitals, other clinicians, and post-acute providers) able to access or electronically receive from your home health agency's EHR or health information system?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–D]

a. Diagnostic/treatment summary	Yes, All	Yes, Some	No
b. Discharge instructions	Yes, All	Yes, Some	No
c. Lab tests/imaging results	Yes, All	Yes, Some	No
d. Prescribed medications	Yes, All	Yes, Some	No

27. Is your home health agency able to electronically access information on your patients from other providers in your community (e.g., ambulatory care physicians, hospitals) via health information exchange, a common EHR system, or other methods?

[PROGRAMMING NOTE – MARK ONE ITEM]

1 ☐ Yes, for all or most patients
2 ☐ Yes, for some patients
3 ☐ No

28. Does your home health agency's EHR have an interface or other tools that help with …

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–G]

a. Medication tracking and reconciliation?	Yes	No
b. Evidence-based treatment or clinical decision support?	Yes	No
c. Collection of data for CMS measures (including OASIS "scrubbing" programs)?	Yes	No
d. Software prompts or validation to improve OASIS accuracy?	Yes	No
e. Reporting of CMS measures?	Yes	No
f. Tracking or monitoring of quality of care and/or patient outcomes?	Yes	No
g. Administration of medication?	Yes	No
h. Allowing patients access to key clinical information and care guidance via a secure patient portal?.....	Yes	No

29. Not including an EHR, does your home health agency use any other software or electronic tools that help with …

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A–B]

a. Collection of data for OASIS (including "scrubbing" programs for OASIS data).....	Yes	No
b. Reporting of CMS measures.....	Yes	No

CHARACTERISTICS OF YOUR HOME HEALTH AGENCY

These next questions will help us to describe the home health agencies that participate in this survey.

30. Is your home health agency freestanding (and not owned by or affiliated with a larger system/chain, hospital, or integrated delivery system)?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes, freestanding [GO TO QUESTION 34]
2☐ No, owned by or affiliated with a larger entity

31. Is your home health agency affiliated with or owned by a home health agency system or chain?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

32. Is your home health agency owned by a hospital?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

33. Is your home health agency part of an integrated delivery system?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

34. Do you face a shortage of nurses, physical therapists, or other practicing clinicians in your area?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

35. Does your home health agency participate in any of the following types of Accountable Care Organizations (ACOs)?

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A-F]

a.	Medicare Shared Savings Program	Yes	No
b.	Medicare Pioneer ACO	Yes	No
c.	Medicare's Advanced Payment Model ACO	Yes	No
d.	Medicare's Next Generation ACO Model	Yes	No
e.	Medicaid ACO	Yes	No
f.	A private, commercially insured ACO arrangement (within an HMO or PPO)	Yes	No

36. Is your home health agency participating in any other type of alternative payment model that may have shared savings or shared risk (e.g., global budgets, bundled payments for selected procedures)?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes
2☐ No

37. Does your home health agency participate in other non-CMS quality and efficiency measure reporting programs sponsored by:

[PROGRAMMING NOTE – MARK ONE FOR EACH ITEM A-D]

a.	Medicaid	Yes	No
b.	The state where your home health agency is located	Yes	No
c.	Commercial insurers	Yes	No
d.	Employer or multistakeholder collaboratives	Yes	No

38. Across your home health agency's entire book of business, approximately what percentage of your patients use the following forms of health insurance? (Please provide your best estimate. Your percentages should sum to 100%.) In addition, please indicate whether you conduct OASIS assessments on patients with each form of insurance.

[PROGRAMMING NOTE – PERCENTAGES MUST SUM TO 100]

Form of Health Insurance	Percentage of patients	Are patients with this health insurance assessed using OASIS? (Yes/No)
Medicare only (excluding Medicare Advantage)		
Medicare Advantage		
Medicaid only and dual eligible (Medicare and Medicaid)		
Commercial insurance		
Veterans Health Administration		
Private pay		
Uninsured/self-pay patients		
TOTAL	100%	N/A

RESPONDENT BACKGROUND

38. Which of the following best describes your job title or position within this home health agency?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Chief Executive Officer
2☐ Administrator
3☐ Director of Nursing
4☐ Senior leader responsible for quality of clinical care (e.g., VP for Quality)
5☐ Clinical Manager
6☐ Member of a team responsible for measuring and reporting quality of clinical care
7☐ Some other role (please specify): [TEXT BOX 140 CHARACTERS]

39. How many years have you been in your current position within this home health agency?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Less than one year
2☐ One to three years
3☐ More than 3 years

40. Do you have a clinical background?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes, indicate clinical background: [TEXT BOX 140 CHARACTERS]
2☐ No

41. Has your home health agency quality team received formal training/certification on quality improvement strategies (e.g., CMS Home Health Quality Initiative educational programs or Institute for Healthcare Improvement training courses, which include courses for Plan-Do-Study-Act cycles)?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes, indicate strategy and certification: [TEXT BOX 140 CHARACTERS]
2☐ No

42. Did anyone else help you complete this survey?

[PROGRAMMING NOTE – MARK ONE ITEM]

1☐ Yes [GO TO QUESTION 43a]
2☐ No [GO TO END SCREEN]

43a. What is the job title or position of the person or persons who helped you complete the survey?

[TEXT BOX 140 CHARACTERS]

[GO TO END SCREEN]

[PROGRAMMING NOTE – DISPLAY AS END SCREEN]

Thank you for taking the time to complete this survey.

PRESS ENTER TO SUBMIT YOUR ORGANIZATION'S DATA

Home Health Agency Qualitative Interview Guide

Organization Name:

Respondent Name:

Respondent Position:

Interviewer Name:

Interview Date:

INTRODUCTION AND PURPOSE OF THE INTERVIEW

Thank you for agreeing to participate. I'd like to briefly review the purpose of this interview and the confidentiality provisions that were described in the email we sent you.

→ We are conducting interviews with home health agencies on behalf of the Centers for Medicare & Medicaid Services (CMS).

→ CMS implements a variety of performance measures in the home health setting to assess the quality and efficiency of care provided to Medicare beneficiaries. CMS reports home health agency performance scores on its Home Health Compare website (i.e., Star Ratings).

→ The purpose of today's interview is to learn about your agency's experiences in reporting and working to improve performance on the CMS measures and your efforts to improve the quality and efficiency of care at your home health agency.

→ As I ask you questions today, I would like you to be thinking specifically about the CMS performance measures and actions your agency has taken in response to those measures.

→ Before getting started, I just want to confirm that you are familiar with the CMS measures. [YES/NO] We sent you a list of current measures, which we will refer to later in the interview, did you receive those? [YES/NO; If NO: Please forward measures to R before starting interview]

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is 0938-1364. The time required to complete this information collection is estimated to average 60 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and conduct the interview. If you have comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to: CMS, 7500 Security Boulevard, Attn: PRA Reports Clearance Officer, Mail Stop C4-26-05, Baltimore, Maryland 21244-1850.

CONSENT/CONFIDENTIALITY PROVISIONS

[INTERVIEWER: You must read the consent language and obtain verbal consent both for participation and for audio recording]

→ All of your responses are confidential to the extent permitted by law.

→ No one outside of the project will have direct access to the information you provide. The evaluation team will only produce summary information from the set of interviews. You will not be identified by name or home health agency affiliation.

→ You do not have to participate in the interview. You can stop at any time for any reason. Your decision regarding whether to participate will not affect your agency's Medicare reimbursement or quality scores.

→ You can decline to discuss any topic that we raise.

Do you have any questions? (YES/NO)

Do you agree to participate in the interview? (YES/NO)

As we mentioned in our email, we would like to audio-record the interview if that is all right with you. This is to help with note-taking after the interview is done, and we will not share the recording with CMS. **Do you agree to have this interview be audio-recorded? (YES/NO)**

[If yes:] Great. Let's get started. I'll start the recording, there might be a momentary pause while it gets going.

*[For the interviewer: Press *2 to start recording, note it may take a few moments.] [If no:]* That's fine. We will take notes and not tape the discussion. Let's get started.

[*Note to interviewer:* [POTENTIAL ITEM TO SKIP] *indicates a question that may be skipped if the interviewer estimates that there will not be sufficient time to complete all questions.]*

I'd like to start by asking you to very briefly describe your position and background, as well as answer a few background questions about your agency.

Respondent Background

1. We understand that you are the [position] at [home health agency]. Is that correct? (YES/NO)
2. Briefly, what is your professional background? [how long in clinical role? How long in current role?]
3. Have you or any member of your home health agency staff quality team received formal training/certification on quality improvement strategies (LEAN, Six Sigma, etc.)

   [If Yes: *indicate strategy and certification*:]

Home Health Agency Characteristics and Organizational Structure

I would now like to discuss your organization's structure.

4. Is your home health agency freestanding or is it affiliated with (or owned by) a larger entity? (YES/NO) Examples of larger entities might include a chain of agencies, a hospital, or an integrated delivery system.[7]
    a. *[If necessary:]* Is your agency owned by or affiliated with this [larger entity]?"
5. Does your home health agency have a quality improvement department or specific quality improvement personnel? (YES/NO/DON'T KNOW)
    b. *[If yes:]* To whom does the Director of Quality (or similar position) report?
6. [If part of a larger entity or corporation (answered "No" to being a freestanding agency on Question 4)]: You indicated earlier that your home health agency is affiliated with a larger entity or corporation.

    Does the larger corporation have a quality improvement department or specific quality improvement personnel? (YES/NO/DON'T KNOW)
7. Does your agency have an electronic health record (EHR)[8]? (YES/NO)

    [If yes:] Can you tell me whether your EHR has any of the following features or functions?

EHR Features/Functions	Does EHR Have? (Yes/No/Don't Know)
Ability to electronically exchange information with providers in community (e.g., receiving orders and feedback from hospitals or sending care summaries to ambulatory physicians)	
Clinical decision support functions (If yes: for what clinical areas or functions?)	
Ability to automatically report OASIS data for CMS quality measures	
Documenting or monitoring patient status, even if not related to quality measures (prompts: changes in patient functioning, summary results)	

[7] An IDS is an integrated network of healthcare providers and organizations such as nursing homes, primary and specialty care, hospitals, rehabilitation centers, home health care agencies, and hospice services that provides or arranges to provide a coordinated continuum of services to a defined population.

[8] An electronic health record (EHR) is an electronic version of a patient's medical history that is maintained by the provider over time, and may include all of the key clinical data relevant to that person's care under a particular provider, including demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports.

[If "don't know" for the above:] Is there someone we can speak with in your organization who might be able to answer some of these questions about your EHR?

[*if no:]* Does your agency use a point-of-care electronic documentation system to collect data for OASIS, such as using software based on mobile devices to document and upload data to third party vendors or CMS?

How has implementation of EHRs helped/hindered your agency with regard to quality measurement and quality improvement (QI) activities? *(Prompts: better care coordination with other providers, reduced staff burden, better data collection and analysis, identification of QI activities, decreased /increased costs, etc.)*

Quality Improvement (QI) Changes to Improve Care Delivery and Patient Outcomes

[OPTIONAL, CAN SKIP INTRO IF R HAS GOOD FAMILIARITY] As we discussed at the outset, CMS measures the performance of home health agencies, using measures of quality and resource use. These measures are publicly reported on Home Health Compare and are used in the Home Health Quality Reporting Program; they are also tied to financial incentives and payments as part of the Home Health Value-Based Purchasing Model. The next few questions will be specifically about the CMS measures.

8. In your experience, have the CMS quality measures led your agency to change how it delivers care? (YES/NO)
    a. *[If yes:]* Please describe the changes your home health agency has made in response to CMS quality measures.
        i. [If needed (mention no improvement strategies or only mention improving documentation), prompts include using standardized checklists, clinician training, telehealth strategies, data exchange or coordination with hospitals and other providers, financial incentives to clinical staff, education on how to teach patient self-management strategies, collaboration with quality improvement organizations]
    b. *[If no:]* Why do you believe that CMS quality measurement of your Home Health Agency's performance have not led to changes in care delivery at your agency? *[If needed, prompts include improvement not needed, lack of resources, quality initiative fatigue].*
9. Do you think any of the changes your home health agency has made have affected your agency's performance specifically on the CMS performance measures? (YES/NO)
    a. [If yes:] Please describe which of the changes have had the largest impact on your performance.

10. Does your home health agency provide nurses, physical therapists, and other clinical staff with information about your agency's performance on the CMS measures? (YES/NO/DON'T KNOW

11. Does your home health agency provide nurses, physical therapists, and other clinical staff with information about your agency's performance on the CMS measures? (YES/NO/DON'T KNOW)

    [If yes:] How often do nurses and clinicians receive feedback on their performance on the measures?

12. Have the changes your home health agency has made in response to the CMS measures led to improvements in quality of care outside of the clinical areas that the CMS measures cover (i.e., spillover effects)? *[Example, if needed: For example, adopting an EHR system including reminders for flu vaccines that you were also able to use for an area not subject to measurement (reminders regarding IV catheter care).]* (YES/NO) *[If yes:* Please describe.]

    a. *[If yes:]* What measures has your home health agency used to track improvements in other areas?

13. *[POTENTIAL ITEM TO SKIP:]* Has your home health agency used any of the following care redesign methods to improve performance?[9] (YES/NO) Examples include Deming/Lean processes (*constantly improve the system of production and service to improve quality and decrease cost)*, Six Sigma *(measurement-based strategy/data-driven approach for eliminating defects; focuses on process improvement and variation reduction)*, Plan, Do, Study, Act (PDSA) improvement cycles.

14. Have you received assistance in improving care delivery, either directly from CMS or from a Quality Improvement Organization (QIO)?

    a. *[If yes:}* Was assistance from CMS or QIOs helpful in improving performance?

    b. *[If no to 5a:]* Why was it not helpful?

15. *[If better documentation not mentioned as cause of better performance in previous answers:]* In addition to improving care, have you tried to improve documentation of care or other patient information to improve performance scores on the CMS quality measures?

    a. [If yes:] About how much of your agency's improvement would you attribute to improved documentation as opposed to improved patient care?

[9] Some organizations use specific methodologies or frameworks to guide and ensure consistency in improvement activities throughout the organization. Examples include the Model for Improvement or Plan, Do, Study, Act (PDSA); Cycle or Deming Cycle; Lean Improvement adapted from the Toyota Production System; Six Sigma DMAIC (which stands for define, measure, analyze, improve, control); and the Seven-Step Method Problem-Solving Model. Other organizations have not adopted a specific improvement methodology.

Factors Associated with Change in Quality Performance

For the next couple of questions, I am going to ask you to focus on specific measures. Can you please look at the list of measures we sent you?

[Note to interviewer: If respondent does not have the list, please direct him/her to the reminder email. If respondent is not able to find it, please forward it.]

16. For the CMS performance measures where your home health agency is performing well *[interviewer to have home health agency performance list ready, can provide examples if needed],* what factors do you think help your agency perform highly*? [If needed, examples include overall resources, data systems, the organization's culture, internal incentives, leadership engagement, frontline staff engagement, investments in care redesign.]*
17. For those measures where your home health agency's performance is lagging *[interviewer to have home health agency performance list ready, can provide examples if needed]*, what factors do you believe inhibit higher performance?
    a. [If needed, examples include overall resources, data systems, lack of timely data from CMS, lack of data from other providers, the organization's culture, insufficient internal incentives, lack of leadership or frontline staff engagement, few investments in care redesign.]
    b. [*If respondent describes areas in which performance has been lagging:]* Has your home health agency experienced difficulties getting nurses, and other clinical staff to change their behavior related to any of the CMS measured areas of performance? (YES/NO)
        i. [If yes,] Please describe which areas. [Possible probes: Why do you think it was difficult to achieve changes in behavior? Did your home health agency work to address these barriers, and if so, how?]
    c. [If respondent describes areas in which performance has been lagging:] How much of your agency's lagging performance would you attribute to inadequate documentation by staff? [Examples, if necessary: inconsistent documentation of improvement, under- coding of comorbidities]
18. From your perspective, is it harder to improve scores on some CMS measures than others? [YES/NO] *[Follow-up, if not answered as part of the response:*] Which measures, and why?
19. Thinking about the full list of CMS measures we are discussing, do you think these CMS measures are clinically important? (YES/NO) Why or why not?
20. Do you think home health agencies have sufficient control over care to be held responsible for performance on these measures? (YES/NO)

    [If no:] Who do you think should be responsible?

21. CMS is interested in understanding how it could streamline the set of measures used in quality measurement programs to reduce provider burden. Based on your experience to date using CMS home health agency measures:
    a. Which measures are of lower value to collect—i.e., lower clinical utility given the effort to collect the data?
        i. [Interviewer: If any are noted to be low-value, ask respondents as to why they think that. Potential prompts if needed: Topped out; minimal patient benefit]
    b. Should any clinical areas that are not subject to measurement be addressed in future quality measures?
        i. [Interviewer: If any areas mentioned, ask respondents as to why they think these clinical areas would benefit from additional measures.]

Many external factors may influence your home health agency to invest in improving performance on the CMS measures. Examples of external factors include: public reporting of quality scores (including the Star Rating), financial incentives or penalties (including those expected/incurred due to the Home Health VBP model), receipt of feedback reports with quality results, regulatory compliance and survey visits, and pressure from external organizations that make referrals.

22. What do you see as the most important factors guiding your home health agency's investments for improving performance on the CMS quality measures at your agency? [Interviewer: repeat above list as a prompt if needed.] What are the most important external factors that are influencing investments by your home health agency to improve on the CMS quality measures?
    a. Have you noticed hospitals or other providers in your area changing their home health agency referral patterns in response to CMS quality measures? *[Example: if needed: for example, the readmissions measure makes hospitals financially responsible for patients who are readmitted within 30 days of discharge. It may be that hospitals change their referral patterns to home health agencies with better readmission scores to avoid financial penalties for excess readmissions.]*
23. Have other factors besides CMS measurement and reporting programs led your home health agency to make changes in care delivery? (YES/NO) [*Follow-up if needed:]* Please describe the initiatives and the changes you have made in response. *[Examples: regulations from state government or commercial insurance]*

Challenges to Reporting CMS Measures

I'd like to talk about what you see as challenges to reporting the data/measures to CMS.

24. Have you experienced difficulties in reporting the CMS measures? (YES/NO/DON'T KNOW) [If needed, prompts include challenges with CMS reporting tools, difficulty capturing or extracting the data, difficulty uploading OASIS data, insufficient resources, confusing measure specifications, or measure specifications changing each year.]
    a. *[If yes:]* Please describe the difficulties and whether and how you addressed them.

Effects of Performance Measurement Programs

Some providers and other stakeholders have expressed concern that CMS measurement programs might lead to negative, or undesirable, unintended consequences. CMS is interested in learning about possible unintended consequences related to measurement, so that measurement and reporting programs can be modified to minimize these effects.

[Note to interviewer: Be sure to state the following:] All of the responses you provide are confidential. Your candid feedback will be especially important in helping CMS improve these programs so that they work well for providers and patients.

25. Are you aware of any unintended consequences in your home health agency that stem from the CMS measures and the use of the measures in public reporting and payment/value-based purchasing efforts? (YES/NO/DON'T KNOW)
    a. *[If yes:]* Please describe these undesired effects.
        i. Why do you think these unintended consequences have occurred?
        ii. What do you think could be done to mitigate those unintended consequences?

    [If no, if respondent is vague on specific undesired effects, or if the unintended consequences are different from those described below]

Possible Unintended Consequence	Yes/ No	Specific Measure Examples?
Inappropriate changes in treatment *(example if needed: For example, "Improvement in Pain Interfering with Activity" measure might lead to overuse of scheduled narcotics to ensure metric is met)*		
Significant effort on data coding to increase reimbursement *(example if needed: documenting more comorbidities, under-coding baseline function or over-coding post-treatment function)*		
Avoid sicker or more difficult patients to achieve higher scores on measures		
Ignore or pay less attention to areas of care that are not measured		

Perspectives of Different Stakeholders and Leaders

We're interested in how different leaders and groups within your home health agency have viewed and approached CMS quality measures and related public reporting and payment programs.

26. [*POTENTIAL ITEM TO SKIP]* On a scale of 0 to 10, with 0 being extremely unsupportive and 10 being extremely supportive, how would you characterize the following groups' support of the CMS measurement programs:

[Interviewer to fill in table with ranking:]

Stakeholder Group	Ranking from 0 to 10
Executive management team (CEO, "C-suite" leaders) at agency	
Nursing/clinical leadership	
Board of directors (if agency has one)	
Clinical staff [SKIP if already noted as impediment]	

[POTENTIAL ITEM TO SKIP] [If home health agency has a board of directors:] Is performance on the CMS quality measures on the board agenda at each board meeting? (YES/NO)

Additional Home Health Agency Market Characteristics

I'd like to take a few moments to ask a few additional questions about your home health agency's organizational structure.

27. *[POTENTIAL ITEM TO SKIP]* How many competitor home health agencies exist within your agency's service area? [*Interviewer: This is an estimate. If needed:*] Are there 0, 1, 2, 3, or more home health agencies that are considered competitive?

28. Do you face a shortage of nurses, physical therapists, or other clinicians in your area that makes it difficult to staff your agency? (YES/NO)

    a. *[If YES to "face a nursing shortage":]* Is the nursing shortage for a particular type of nurse, for example, Registered Nurses, Licensed Vocational Nurses, or Certified Nursing Assistants?

    b. *[If YES to "face a shortage of other clinicians":]* Are there shortages of physical therapists, occupational therapists, dietitians, social workers?

29. What source of insurance coverage do your patients hold, for example, Medicare, Medicaid, commercial insurance, self-pay? Can you provide approximate percentages? *[Note: should total ~100%]*

30. [POTENTIAL ITEM TO SKIP:] Does your home health agency participate in any alternative payment models, for example, accountable care organizations (ACOs)[10] or bundled payments? (YES/NO/DON'T KNOW)

    [If yes:]

Alternative payment model type	Does agency participate? (Yes/No/ Don't Know)	Does agency have a risk-sharing arrangement? (Yes/No/Don't Know) If yes: What is it (upside only – gainsharing, or gainsharing and downside financial risk)?	Do agency's referral sources participate?
Medicare ACO (SSP, Pioneer, Advanced Payment Model)			
Medicaid ACO			
Private commercial insurer ACO (if yes, how many different ACOs?)			
Bundled payments			
Global payments			

31. Does your home health agency care for patients referred by nurse practitioners?

    [If yes:] Have you faced delays in adjusting medication or other treatment plans due to current CMS requirements that nurse practitioners obtain physician approval for any treatment changes for home health patients?

Closing

Thank you very much for your time.

[10] Accountable care organizations are networks of health care providers and organizations (usually hospitals and physician groups, and possibly including nursing homes, home health, and hospice organizations) that agree to take some financial responsibility for reducing the costs and improving the quality of care of enrollees.