

2018 National Impact Assessment of the Centers for Medicare & Medicaid Services (CMS) Quality Measures Report



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Executive Summary



BACKGROUND

The U.S. Department of Health and Human Services (HHS) and the Centers for Medicare & Medicaid Services (CMS) are committed to *putting patients first*. In keeping with this commitment, CMS uses quality measures to support a patient-centered health care system anchored by quality, accessibility, affordability, innovation, and responsiveness.

Measures implemented in CMS quality programs drive improvement in the quality of care provided to patients nationwide. Every three years, CMS conducts and publishes an assessment of the quality and efficiency impact of the use of endorsed measures in a number of programs. This *2018 National Impact Assessment of CMS Quality Measures Report (2018 Impact Report)* is the third such assessment published, as required under section 1890A(a)(6) of the Social Security Act.ⁱ

METHODS

CMS used multiple methods to evaluate the quality and efficiency impact of the use of endorsed measures, including patient impact and cost-avoided analyses, national surveys of quality leaders in hospitals and nursing homes, and measure performance trends and disparity analyses. With input from a Technical Expert Panel (TEP) and a Federal Assessment Steering Committee (FASC), 62 CMS measures that align to 28 Key Indicator topics were selected. As defined in this report, Key Indicators are measures or groups of measures used to gauge performance on aspects of six CMS priorities: Patient Safety, Person and Family Engagement, Care Coordination, Effective Treatment, Healthy Living, and Affordable Care.ⁱⁱ

MAIN FINDINGS

Patient Impacts and Costs Avoided

Patient impact was estimated for 17 Key Indicators by comparing the measure rate for the most recent year with the measure rate for the baseline year. Patient impacts were then multiplied by cost estimates derived from the published literature to quantify costs avoided for a subset of Key Indicators. Examples of notable findings are highlighted.

ⁱ The 2012 and 2015 Impact Reports are 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.html>

ⁱⁱ Details on the selection of Key Indicators are available in *Methods* (Appendix D).

Patient impacts estimated from improved national rates for Key Indicators:

- 670,000 additional patients with controlled blood pressure (2006–2015)ⁱⁱⁱ
- 510,000 fewer patients with poor diabetes control (2006–2015)^{iv}
- 12,000 fewer deaths following hospitalization for a heart attack (2008–2015)
- 70,000 fewer unplanned readmissions (2011–2015)
- 840,000 fewer pressure ulcers among nursing home residents (2011–2015)
- Nearly 9 million more hospitalized patients with a highly favorable experience with their hospital (2008–2015)

Significant potential costs avoided for a subset of Key Indicators:

- \$4.2 billion–\$26.9 billion estimated for increased medication adherence (2011–2015)
- \$2.8 billion–\$20.0 billion estimated for fewer pressure ulcers (2011–2015)
- \$6.5 billion–\$10.4 billion estimated for fewer patients with poor diabetes control (2006–2015)^v

Provider Impacts in Hospital and Nursing Home Settings

CMS sought providers' perspectives on the use of CMS quality measures through national surveys and qualitative interviews in 1,313 hospitals and 1,182 nursing homes.^{vi} These settings were selected because the associated CMS reporting programs are mature, having been in place since 2004 and 2002, respectively.^{1,2} Important findings from the results include the following:

- A vast majority of the hospitals (92%) and nursing homes (91%) consider CMS measures clinically important, and 90% of the hospitals and 83% of the nursing homes reported that performance on CMS quality measures reflects improvements in care.
- Most hospitals (89%) and nursing homes (81%) responded “yes” or “mostly yes” when asked whether the facilities should be held responsible for performance on CMS measures.
- Nearly all (> 99%) hospitals and nursing homes made at least one change to improve performance on CMS measures. On average, hospitals reported making 17 of 23 changes, and nursing homes adopted 13 of 22 changes. Frequently noted changes included providing routine feedback to physicians and other clinical staff on performance regarding CMS measures (reported by 97% of hospitals) and “adopting practices to become a learning organization” (reported by 87% of nursing homes).
- A minority of hospitals (30%) and nursing homes (12%) cited barriers to reporting, including difficulty interpreting measure specifications, which led to increased reporting burden. However, 92% of hospitals and 85% of nursing homes indicated barriers to improving performance on CMS measures. Barriers to improving performance common to both settings were changing frontline clinician behavior and difficult case mix (i.e., patients who are clinically complex or of low socioeconomic status).

Performance on Measures

National performance on 226 of the 247 measures for which trend analyses were feasible (91%) demonstrated improved or stable performance, and 21 measures (9%) exhibited declining

ⁱⁱⁱ Part C: 2006–2013; Medicare Shared Savings Program: 2012–2015

^{iv} Part C: 2006–2015; Physician Quality Reporting System (PQRS) and Medicare Shared Savings Program: 2012–2015

^v Part C: 2006–2015; PQRS and Medicare Shared Savings Program: 2012–2015

^{vi} Sampled facilities included only acute care hospitals (“hospitals”) and nursing homes certified by Medicare and Medicaid (“nursing homes”) included in Hospital Compare and Nursing Home Compare, respectively. For a detailed description of the inclusion and exclusion criteria, see *Methods* (Appendix D).

performance. Performance on a majority of measures (60%, including 55% of outcome measures) improved. CMS quality priority areas with the largest percentage of measures for which performance improved were Care Coordination (73%) and Patient Safety (71%).

Among Key Indicator measures that were trended (n = 59), results were similar: National performance improved for 53% of measures, remained stable for 39%, and declined for 8%. Measure performance rates were compared with other national sources and published literature when feasible. Overall findings were similar with very few exceptions. Key Indicator measures with rapid improvement include the following:

- Nursing home rates for *Percent of Residents with a Urinary Tract Infection (Long-Stay)* improved by 35.5% between 2011 and 2015.
- Nursing home rates for *Percent of Residents with Pressure Ulcers That Are New or Worsened (Short-Stay)* improved by 42.1% between 2011 and 2015.
- Hospital rates for *Catheter-Associated Urinary Tract Infection (CAUTI)* decreased by 45.7% between 2013 and 2015.
- Rates for *Screening for Clinical Depression and Follow-Up Plan* improved by 60.4% for clinician group practices (2013–2015) and doubled for accountable care organizations (ACOs) (2012–2015).

Disparities

To determine whether disparities existed, analyses of variations associated with race/ethnicity, income, sex, urbanicity,^{vii,3} region, and age were conducted for 114 measures for which patient-level data were available. Point-in-time disparities were observed for measures for which the comparison group had lower performance than the reference group.^{viii} A trending analysis was also conducted. With few exceptions, disparities were generally consistent over time. Percentages of measures for each comparison group with significantly^{ix} lower performance than for the reference group are shown in Table 1.

Table 1: Identified Disparities for 114 CMS Measures

Disparity Category	Disparity Group	% of Measures With Lower Performance
Race/Ethnicity	Asian	24%
	American Indian/Alaska Native	32%
	Hispanic	37%
	Black	41%
	Native Hawaiian/Pacific Islanders	46%
Income	Medium-High	10%
	Medium-Low	24%
	Low	42%
Sex	Female	24%

^{vii} *Urbanicity* is a term used to define the degree to which a geographical unit is characterized by population size, density, and diversity.

^{viii} Reference groups: Race/Ethnicity: White; Income: High; Sex: Male; Urbanicity: Large central metro; Region: South Atlantic; Age: 65–74.

^{ix} A disparity was identified if the difference between measure rates met two criteria: statistical significance at the 0.05 level and relative difference greater than or equal to 0.10. This definition aligns with the Agency for Healthcare Research and Quality (AHRQ) 2015 *National Healthcare Quality and Disparities Report*.⁴

Disparity Category	Disparity Group	% of Measures With Lower Performance
Urbanicity	Large Fringe Metro	9%
	Medium Metro	11%
	Small Metro	16%
	Micropolitan (Rural)	18%
	Noncore (Rural)	23%
Region	New England	17%
	Mid Atlantic	22%
	East North Central	17%
	West North Central	26%
	East South Central	21%
	West South Central	24%
	Mountain	21%
	Pacific	19%

Differences observed for age were primarily a result of physiological factors related to aging and were not likely to be attributable to inequity in care, treatment, or access to resources.⁵ As a result, these findings are not highlighted in the report. Findings for the disparity analyses of the Key Indicator measures include the following:

- The race/ethnicity category had the highest proportion of Key Indicator measures with identified disparities (36%).
- Key Indicator measures with large relative differences between the comparison and reference groups include:
 - *30-Day Mortality Following a Heart Failure Hospitalization* – Measure rates were 23% and 18% higher for the most rural populations (noncore and micropolitan, respectively) than the measure rate for the most urban category (large central metro reference group).
 - *30-Day Mortality Following Acute Myocardial Infarction Hospitalization* – The measure rate for females was 11% higher than the measure rate for males.
 - *Proportion of Days Covered (PDC) for Diabetes Medications* – The measure rates for diabetes medication adherence ranged from 36% lower for Hispanics in Medicare Advantage-Prescription Drug (MA-PD) plans to 66% lower for Blacks in prescription drug plans (PDPs) compared with the White reference group.
 - *Annual Flu Vaccine for fee-for-service (FFS) and Part C – Vaccination* rates decreased as income levels decreased. For example, rates for Part C *Annual Flu Vaccine* were 56% lower for the low-income group and 26% lower for the medium-high income group than the vaccination rates for the high-income reference group.

Study Limitations

Quality improvement gains highlighted in this report cannot be definitively or solely attributed to the implementation of quality measures and were estimated based on available data. Attribution and quantitative analyses regarding the factors contributing to measure performance rate changes were beyond the scope of this assessment. 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.

Programs, initiatives, and other efforts across CMS and HHS were cataloged to provide context on factors that may have influenced measure performance rates.^x Examples include the Medicare Quality Improvement Organization (QIO) Program, CMS Person and Family Engagement Strategy, Million Hearts[®] initiative, HHS Initiative on Multiple Chronic Conditions, Healthy People 2020, CMS Compare sites, Partnership for Patients, and value-based programs such as the Hospital Value-Based Purchasing Program (Hospital VBP Program), Hospital Readmissions Reduction Program (HRRP), Medicare Shared Savings Program, and Center for Medicare and Medicaid Innovation (Innovation Center) models that require quality reporting.

Conclusion and Future Directions

The 2018 Impact Report demonstrates that CMS quality measures have likely contributed to improving quality and reducing expenditures while driving changes within the national health care system with respect to six CMS quality priorities. The report identifies gains in measure performance that translate into important patient impacts and potential health care costs avoided. National surveys confirmed that quality leaders in the hospital and nursing home settings recognize the clinical importance of CMS quality measures and have made changes to improve care for patients, but they also noted barriers to reporting and improving performance. Furthermore, the report findings indicate that health care disparities persist among select populations, suggesting additional room for progress.

To address these challenges, CMS recognizes the need to refine the quality measure portfolio to target high-impact areas of measurement, while minimizing the burden of reporting quality measures. Aligning measures between public and private payers may foster additional gains in quality with reduced burden. To better understand differences between populations and to target quality improvement efforts, CMS has begun to stratify some measure rates, such as stratifying Parts C and D performance data by race and ethnicity for posting on the CMS Office of Minority Health web page.^{xi} Finally, to improve the CMS customer experience and enhance the utility of the impact assessments, CMS plans to test an interactive version of the National Quality Dashboards to highlight results for Key Indicators and emerging measures. These dashboards will enable CMS stakeholders to access timely national performance rates, trends, and disparities to monitor progress on CMS quality priorities.

^x See *Related Programs and Initiatives* (Appendix H). The included programs and initiatives are intended to be examples and may not include all efforts by CMS and HHS that may have influenced performance rates of the quality measures.

^{xi} <https://www.cms.gov/About-CMS/Agency-Information/OMH/research-and-data/statistics-and-data/stratified-reporting.html>

Introduction



The Centers for Medicare & Medicaid Services, an agency of HHS, is the largest health care payer in the nation. More than 140 million Americans access health care services through Medicare, Medicaid, the Children’s Health Insurance Program, and the Health Insurance Marketplace. To ensure that these individuals receive high-quality, efficient, and affordable care, CMS uses quality and efficiency measures across these diverse health care settings as a lever for improvement. This report assesses the quality and efficiency impact of the use of endorsed measures to support a patient-centered health care system anchored by quality, accessibility, affordability, choices, innovation, and responsiveness, in keeping with the commitment of CMS and HHS to *put patients first*.

BACKGROUND

This report is required by section 1890A(a)(6) of the Social Security Act, which provides that the Secretary shall, not later than March 1, 2012, and at least once every three years thereafter, conduct an assessment of the quality and efficiency impact of the use of endorsed measures described in various programs^{xii} and make such assessment available to the public.⁶ The 2018 Impact Report is the third such report^{xiii} published to comply with this statutory requirement.

In this report, impact is defined as progress toward achieving goals and objectives related to the CMS quality priorities.⁷ Evaluating the national impact of measures in alignment with these priorities provides a comprehensive assessment of progress. Additionally, analyzing performance rates on the measures is a critical component of the measure life cycle and complements the annual program-level and measure-level evaluations that CMS conducts to gain data-driven insights for improving patient outcomes and addressing disparities.^{7,8}

CMS Quality Priority	2018 Impact Report Chapter
Make care safer by reducing harm caused in the delivery of care	1 – Patient Safety
Strengthen persons and their families as partners in their care	2 – Person and Family Engagement
Promote effective communication and coordination of care	3 – Care Coordination
Promote effective prevention and treatment of chronic disease	4 – Effective Treatment
Work with communities to promote best practices of healthy living	5 – Healthy Living
Make care affordable	6 – Affordable Care

^{xii} See *Overview of CMS Measures Included in Analyses and Description of CMS Quality Measure Programs* (Appendices A and B).

^{xiii} The 2012 and 2015 Impact Reports are 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.html>

REPORT DEVELOPMENT

To conduct the impact assessment, CMS employed the following research questions to frame a consistent and quantifiable approach to evaluating the impact of quality measures and progress on CMS quality priorities.

Research Questions

1. What measures currently implemented in CMS programs are most closely aligned with the CMS quality priorities and related goals and objectives and could be considered Key Indicators to assess progress?
2. To what extent did performance on measures implemented in CMS programs improve over time?
3. For Key Indicators, what is the impact of changes in performance on patients (e.g., number of patients affected) and health care costs likely avoided?
4. For measures implemented in CMS programs, did disparities among identified subpopulation groups exist, and did the disparities change over time?
5. What is the environmental context that may affect interpretation of the impact of measures used in CMS programs?
6. What additional measures are needed to assess progress toward achievement of the CMS quality priorities (i.e., meaningful measure gaps)?
7. What changes are providers making in response to use of performance measures by CMS?

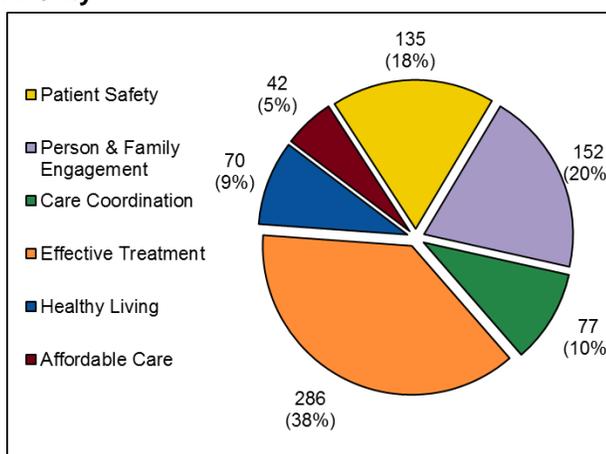
Multi-stakeholder input on the development of the report was obtained from the Impact Assessment Technical Expert Panel (TEP) convened by the contractor and from the Federal Assessment Steering Committee (FASC).^{xiv} The 16-member TEP consisted of patient and caregiver representatives and nationally credentialed health care policy analysts, researchers, and clinicians with expert knowledge of and experience with CMS quality measures. Members were recruited by the contractor through an open call for nominations on the CMS.gov website. The FASC, composed of 14 federal agency representatives, was formed to participate in the planning and oversight of the 2018 Impact Report.

Measure Classification

As of December 31, 2015, CMS had implemented 762 unique measures in 24 Medicare quality programs, initiatives, and public reporting websites.^{xv}

Programs such as the Physician Quality Reporting System (PQRS) had a large number of voluntary measures to allow clinicians to select a subset to report that are meaningful to their scope of practice and patient populations. With input from the TEP and FASC, standardized classification rules⁹ were applied to assign the measures to six CMS quality priorities (Figure 1). The assignments

Figure 1: Number and % of CMS Measures by Priority



^{xiv} See *Acknowledgments* (Appendix C) for TEP and FASC membership lists.

^{xv} See *Overview of CMS Measures Included in Analyses* (Appendix A) for a list of the 762 measures and associated programs.

were made for the purposes of the 2018 Impact Report and may vary in some instances from prior classifications of the measures in CMS rulemaking. The measures were also classified using the Donabedian categories of structure, process, or outcome,^{10,11,xvi} which are defined for this report as follows¹⁰:

- **Structure** – Features of a health care organization or clinician relevant to the capacity to provide health care.¹²
- **Process** – Steps to provide good clinical care, supported by scientific evidence that when executed well, the process increases the probability of achieving a desired outcome.^{12,13}
- **Outcome** – Results of health care that patients experience: clinical events, recovery and health status, experiences in the health system, and efficiency/cost.¹³

The National Quality Forum (NQF) Measure Applications Partnership (MAP) and other stakeholder organizations encourage greater use of outcome measures. CMS has actively prioritized the development of measures driven by clinical outcomes, including patient-reported outcome measures (PROMs), while recognizing the benefits of retaining other types of measures in the portfolio. For example, clinicians and other health care providers gauge their performance on foundational structure and process measures to improve actions that lead to better patient outcomes. Process measures with a strong evidence-based link to patient outcomes may bridge a measurement gap for a clinical specialty or condition and initiate a standardized approach to performance measurement that will support future outcome measures.

Key Indicators

Out of 762 measures in use by CMS as of 2015, 253 were expected to have a minimum of three years of data available for trend analysis. The 253 measures, categorized by CMS quality priority, were analyzed for potential use as Key Indicators. This report defines Key Indicators as measures or groups of measures used to gauge performance on aspects of CMS quality priorities (*Research Question 1*). CMS and the contractor evaluated the 253 measures by the following criteria:

- A sound conceptual basis exists for representing achievement of a specific CMS quality priority or related strategic result or objective.
- Policymakers, clinicians and providers, patients, and caregivers can easily understand the overall goal of the measure.
- The measure includes a large or representative portion of the population or a smaller subpopulation that provides a strong signal of overall quality or efficiency.
- The measure is useful for monitoring progress over time.

The measures were reviewed to identify high impact concepts, which were the basis for the Key Indicators. Using the same four criteria, the TEP and the FASC reviewed and rated the proposed Key Indicator concepts with the associated measures. After iterative deliberations, 62 measures aligned to 28 Key Indicators were selected.^{xvii}

^{xvi} Avedis Donabedian established the structure-process-outcome framework for assessing quality of health care in 1966. This framework remains in use today.¹¹

^{xvii} Details on the selection of Key Indicators are available in *Methods* (Appendix D).

Analytic Approach

Of the 762 CMS measures, trend analyses were conducted on 253 measures that had three or more annual reporting periods (*Research Question 2*).^{xviii} Results for 62 measures associated with the 28 Key Indicators are displayed in the National Quality Dashboards that are included in this report. Measures exhibiting average annual changes greater than 1%, either improving performance (green symbol) or declining performance (red symbol), are defined as such on the dashboard. If the size of the annual percentage change was less than 1%, measures were classified as stable (orange symbol).^{xix} Measures with improvements that exceeded 10% annually were defined as improving rapidly. The National Quality Dashboards appear individually in Chapters 1 through 6 and are compiled in Appendix G.

Patient impact and cost-avoided analyses were limited to Key Indicator measures for which data were available, whereas disparity analyses were conducted on all measures for which patient-level data were available (n = 111). For Key Indicators, the findings were compared with published literature and national reports to provide context for interpretation. Other initiatives were identified that may have contributed to progress related to CMS quality priorities (*Research Question 5*).^{xx} *Overall Trends and Disparities Results* (Chapter 7) summarizes additional research findings.

Patient Impact and Cost-Avoided Analyses of Key Indicator Measures

The analyses for the 2018 Impact Report addressed impacts on patients (e.g., number affected) and health care costs avoided (*Research Question 3*). When a trend was observed, patient impact was estimated for each annual reporting period by calculating the incremental number of patients experiencing an outcome or a treatment; results were rounded to avoid false precision. When a three-year rolling rate was reported or individuals could be expected to remain in the numerator over time, the difference in counts between the baseline year and the most recent year was calculated.

Health care costs avoided were estimated from the perspective of the payer. The results of the patient impact were multiplied by the estimated cost of a health care event, derived from published literature related to the associated harm, prevention strategy, or disease condition.

Health care cost-avoided estimates are presented in the report as a range from low to high. Differences in study designs, populations, assumptions, and time horizons examined in the published studies (e.g., episode, one year, lifetime) prevent identification of a definitive cost estimate for a specific disease condition, adverse event, or other outcome. For measures based on samples of the Medicare population, patient impact and health care costs avoided were estimated for the relevant total Medicare population. Not all Key Indicator measures had supporting literature or were appropriate for calculating health care costs avoided. The TEP and FASC reviewed and approved the cost-avoided methodology and the Key Indicators selected for these analyses.

^{xviii} Detailed measure inclusion criteria are available in *Methods* (Appendix D). For details about the research findings, see *Analytic Results* (Appendix E).

^{xix} Additional information about how to interpret these displays is in *Guide to the National Quality Dashboards and Graphs* (Appendix F), and all dashboards are compiled in *National Quality Dashboards* (Appendix G).

^{xx} *Related Programs and Initiatives* (Appendix H) describes other quality improvement efforts by CMS and HHS.

Disparity Analyses of All Measures

Point-in-time analyses were conducted at the patient level to investigate whether disparities exist among identified subpopulation groups, and a trending analysis was completed to determine whether the disparities change over time (*Research Question 4*). “Disparities” refers to differences in health or health care measured between groups or between a group and the larger population.⁵ Differences between provider rates were not analyzed for this report. Research demonstrates that health and health care–related disparities lead to unequal health outcomes.¹⁴ Therefore, identifying and monitoring disparities actively supports the CMS commitment to achieve equity of care.

The analytic approach of the 2018 Impact Report aligned with the Agency for Healthcare Research and Quality (AHRQ) *2015 National Healthcare Quality and Disparities Report*,⁴ which identified a disparity if the difference between measure rates met two criteria: statistical significance at the 0.05 level and relative difference greater than or equal to 0.10. Standard classification scales were used for each of six disparity categories: age, sex, race/ethnicity, ethnicity, income, urbanicity,^{xxi} and region. Urbanicity was used to identify rural health^{xxii,3} disparities. Analyses for the urbanicity category examined differences across six levels of urban-rural settings.^{xxiii} The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence was a proxy for patient-level income. Income categories were defined by dividing ZCTA incomes into four equal-sized groups.

The disparity size (magnitude of difference in rates) and trend direction were assessed to determine whether a disparity was increasing or decreasing. Three factors were considered to determine whether an identified disparity was clinically meaningful: potential for improvement, importance to the patient and provider, and size of the affected population. Appropriateness of a disparity category also was assessed. For example, age was frequently associated with a disparity, but such differences primarily result from physiological factors related to aging rather than being attributable to inequity in care, treatment, or access to resources.⁵ Published literature to support the interpretation of disparity findings is referenced when available.

Eliminating disparities in health care and health outcomes is a foundational principle that guides CMS quality improvement efforts. The goal of these disparity analyses is to identify opportunities for improvement relative to priority populations for whom performance rates on health-related quality and outcome measures tend to be lower than the norm.¹⁵ Female, low-income, minority, and rural populations are among the priority populations emphasized in the disparity findings.

Study Limitations

Quality improvement gains highlighted in this report cannot be definitively or solely attributed to the implementation of quality measures and were estimated based on available data. Attribution and quantitative analyses regarding the factors contributing to measure performance rate changes were beyond the scope of this assessment. However, quality measurement is a key component of

^{xxi} *Urbanicity* is a term defining the degree to which a geographical unit is characterized by population size, density, and diversity.

^{xxii} “Rural health,” as defined by the Health Resources and Services Administration (HRSA), relates to health and health care in areas designated by one of several classification systems as rural.

^{xxiii} The National Center for Health Statistics (NCHS) urban-rural classifications were used. See *Methods* (Appendix D) for more detail.

most quality improvement efforts, and it is plausible that measurement contributed to at least some of the observed improvements characterized in this report.

Programs, initiatives, and other efforts across CMS and HHS were cataloged to provide context on factors that may have influenced performance rates.^{xxiv} Examples include the Medicare QIO Program, CMS Person and Family Engagement Strategy, Million Hearts[®] initiative, HHS Initiative on Multiple Chronic Conditions, Healthy People 2020, CMS Compare sites, Partnership for Patients, and value-based programs such as the Hospital VBP Program, HRRP, and the Innovation Center models that require quality reporting.

Measure Gaps

Gaps in high-impact measurement areas are listed for each quality priority (*Research Question 6*). The gaps were identified by the TEP, FASC, CMS, and other stakeholders.

National Provider Surveys

To evaluate the changes providers are making in response to CMS use of performance measures (*Research Question 7*), CMS fielded national surveys and conducted qualitative interviews with quality leaders in the hospital and nursing home settings.^{xxv} Five additional research questions formed the content of the surveys and interview guides.^{xxvi}

1. What types of changes or innovations have hospitals/nursing homes made to improve their performance on CMS measures?
2. If a change or innovation was made, has it helped the hospital/nursing home improve its performance on one or more CMS measures?
3. What challenges or barriers do hospitals/nursing homes face in reporting CMS quality measures?
4. What challenges or barriers do hospitals/nursing homes face in improving performance on CMS quality measures?
5. What unintended consequences do hospitals/nursing homes report associated with implementation of CMS quality measures?

REPORT ORGANIZATION

Overview of Quality Priority Chapters (Chapters 1–6)

The first six chapters, each aligned with a CMS quality priority, summarize analysis results for the 62 measures associated with the 28 Key Indicators. These evaluations collectively depict progress on CMS quality priorities.

Key Indicators

The selection of Key Indicators is described, and results of Key Indicator analyses are organized under *National Quality Dashboards*, *Patient Impact and Cost-Avoided Analyses*, and *Disparities*.

^{xxiv} See *Related Programs and Initiatives* (Appendix H). The included programs and initiatives are intended to be examples and may not include all efforts by CMS and HHS that may have influenced performance rates of the quality measures.

^{xxv} For a detailed description of the methods, see *Methods* (Appendix D). Sampled facilities included only acute care hospitals (“hospitals”) and nursing homes certified by Medicare and Medicaid (“nursing homes”) included in Hospital Compare and Nursing Home Compare, respectively. For detailed inclusion and exclusion criteria, see *Methods* (Appendix D).

^{xxvi} See *Hospital Interview Guide and Provider Survey* (Appendix I) and *Nursing Home Interview Guide and Provider Survey* (Appendix J).

National Quality Dashboards

National Quality Dashboards summarize data analysis results for each Key Indicator by topic, along with relevant details about program use, numbers and types of providers, and counts of patients or admissions. Performance trends, if available, are shown as improved, stable, or declined. Trend results, if calculated, appear in line graphs after the dashboards.^{xxvii}

Patient Impact and Cost-Avoided Analyses

Results of these analyses are presented for Key Indicators for which data were available for this report.

Disparities

The results of these analyses provide insight into significant differences in measure results between population groups and progress in eliminating disparities. Point-in-time bar graphs and maps display categories for which significant disparities were identified.

Measure Gaps

Measure gaps identified by CMS and stakeholders are noted as topics for national improvement for each quality priority.

Overview of Trends and Disparities Results (Chapter 7)

Analytic results for the trend and disparity analyses related to the CMS quality priorities are represented with charts and graphs. The trend analyses include 253 measures for which data for three or more annual reporting periods were available. The disparities findings include point-in-time and trending analyses for 111 measures for which patient-level data were available.

National Provider Surveys (Chapter 8)

Methods used to conduct the national provider surveys and qualitative interviews are detailed. Survey responses representing 1,313 hospitals and 1,182 nursing homes, as well as interviews with 80 quality leaders in the two settings, are summarized.^{xxviii}

Conclusion and Future Directions (Chapter 9)

The report concludes with future directions for assessing the impact of quality and efficiency measures.

^{xxvii} See *Guide to the National Quality Dashboards and Graphs* (Appendix F) for a detailed description of the dashboards and line graphs.

^{xxviii} See *Hospital Interview Guide and Provider Survey* (Appendix I) and *Nursing Home Interview Guide and Provider Survey* (Appendix IJ), as well as *Methods* (Appendix D), for details about the surveys.

1 – Patient Safety



BACKGROUND

Making care safer by reducing harm caused in the delivery of care is a CMS quality priority and a key component of CMS efforts to improve the quality of care. According to the 1999 Institute of Medicine (IOM) report *To Err Is Human*, medical errors resulted in an estimated 44,000 to 98,000 annual deaths in U.S. hospitals.¹⁶ Patients in various health care settings often are vulnerable to other harms as well, including pressure ulcers, infections, falls, and adverse effects of high-risk medications. In addition to this human toll, such harms add billions of dollars to annual health care costs.¹⁷ Recent studies estimate the 2008 annual cost of measurable medical errors to be \$17.1 billion.¹⁸

KEY INDICATORS

After expert review by the TEP and FASC,^{xxix} 11 measures were selected from the 135 Patient Safety measures^{xxx} to highlight CMS progress toward achieving the objectives of the CMS quality priorities.^{xxxi,17} These 11 measures were mapped to nine Key Indicators aligned with an objective of the CMS priority of Patient Safety (Table 1-1). The 11 measures that map to the Key Indicators are included in the National Quality Dashboards that follow this section.

Table 1-1: Patient Safety Objectives and Related Key Indicator Topics

Patient Safety Objective ¹⁷	Key Indicator Topic (Number of Measures)
Prevent or minimize harm in all settings.	<u>Healthcare-Associated Infections</u>
	1 – Methicillin-resistant <i>Staphylococcus aureus</i> (1)
	2 – Central Line–Associated Bloodstream Infection (1)
	3 – Specific Surgical Site Infection (2)
	4 – <i>Clostridium difficile</i> Infection (1)
	5 – Catheter-Associated Urinary Tract Infection (1)
	6 – Residents with a Urinary Tract Infection (1)
	<u>Preventable Harm</u>
	7 – Complications Following Total Hip Arthroplasty and Total Knee Arthroplasty (1)
8 – Residents or Patients with Pressure Ulcers That Are New or Worsened (2)	
9 – Residents Experiencing One or More Falls with Major Injury (1)	

Healthcare-Associated Infections

According to the Centers for Disease Control and Prevention (CDC), about 1 in 25 hospital patients has at least one healthcare-associated infection (HAI) during any given day.¹⁹ HAIs can lead to longer stays, increased costs, and increases in morbidity and mortality.²⁰ In 2011, approximately 648,000 patients had 722,000 HAIs. Additionally, about 75,000 patients with HAIs died during their hospital stays. Dashboard 1-1 includes Key Indicators focused on six of the most common HAIs.²¹

^{xxix} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{xxx} The total number of patient safety measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{xxxi} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

National Quality Dashboard

Six Key Indicators were selected to focus on HAIs. The measures and results of analyses are shown in Dashboard 1-1. A discussion of the Key Indicators follows the dashboard.

Dashboard 1-1: Healthcare-Associated Infections^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1 – Methicillin-Resistant Staphylococcus aureus (MRSA) (NQF #1716)^e (↓ = Favorable)						
Hospital: IQR, VBP, HACRP	 2.2% ^b	3,753 Hospitals	9,179 Expected # of infections	0.92 ^c 2013	0.96 ^c 2015	0.00 ^d
2 – Central Line-Associated Bloodstream Infection (CLABSI) (NQF #0139)^e (↓ = Favorable)						
Hospital: IQR, VBP, HACRP (ICU only)	 3.5% ^b	2,003 Hospitals	19,872 Expected # of Infections	0.50 ^c 2013	0.54 ^c 2015	0.03 ^d
3 – Specific Surgical Site Infection (SSI) (NQF #0753)^e (↓ = Favorable)						
Hospital: IQR, VBP, HACRP SSI: Colon Surgery	 4.4% ^b	3,431 Hospitals	9,435 Expected # of infections	0.94 ^c 2013	1.03 ^c 2015	0.00 ^d
Hospital: IQR, VBP, HACRP SSI: Abdominal Hysterectomy	 -1.3% ^b	3,424 Hospitals	2,850 Expected # of infections	0.91 ^c 2013	0.88 ^c 2015	0.00 ^d
4 – Clostridium difficile Infection (CDI) (NQF #1717)^e (↓ = Favorable)						
Hospital: IQR, VBP, HACRP	 0.9% ^b	3,810 Hospitals	107,475 Expected # of infections	0.91 ^c 2013	0.93 ^c 2015	0.29 ^d
5 – Catheter-Associated Urinary Tract Infection (CAUTI) (NQF #0138)^e (↓ = Favorable)						
Hospital: IQR, VBP, HACRP (ICU only)	 -26.3% ^b	2,266 Hospitals	20,860 Expected # of infections	1.20 ^c 2013	0.65 ^c 2015	0.12 ^d
6 – Percent of Residents with a Urinary Tract Infection (UTI) (Long-Stay) (NQF #0684)^e (↓ = Favorable)						
Nursing Home Quality Initiative (NHQI)	 -10.8% ^b	46,719 Nursing homes	14,947,592 Population	7.6% ^c 2011	4.9% ^c 2015	1.1% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Lower rates indicate better performance.

Trend Analyses

The rates for the Key Indicators for HAIs are discussed in this section. Key Indicators #1 through #5 are calculated with data from the CDC National Healthcare Safety Network (NHSN), which tracks HAIs. Performance results are expressed as a standardized infection ratio (SIR). “SIR compares the actual number of HAIs reported to what would be predicted, given the standard population (i.e., NHSN baseline), adjusting for several risk factors that have been found to be significantly associated with differences in infection incidence. In other words, a SIR greater than 1.0 indicates that more HAIs were observed than predicted; conversely, a SIR less than 1.0 indicates that fewer HAIs were observed than predicted.”²² Differences between the CMS data (Key Indicators #1 through #5) and data presented by CDC are due to differences in patient and facility populations included in the analysis SIRs. CMS data are limited to those pertaining to the CMS Inpatient Quality Reporting (IQR) Program and reported publicly on the Hospital Compare website. For the Key Indicator #5, data are limited to patients in the ICU only to keep the facility representation in the population consistent over the three reporting periods required for trending analysis. In 2015, the CDC established a new baseline.^{23,24,25} This report uses the prior baseline for 2015 for trending purposes.

Key Indicator #1 – Hospital-Onset Methicillin-Resistant *Staphylococcus aureus* (MRSA) Bacteremia (NQF #1716) performance declined as the SIR increased from 0.92 in 2013 to 0.96 in 2015 (Figure 1-1). The 2013 National Prevention Target set by HHS was to reduce facility-onset MRSA by 25%, to 0.75 SIR. Over the period examined, the rate increased modestly, and the target was not met. In 2016, HHS announced a 2020 target of a 50% reduction in facility-onset MRSA from the new 2015 baseline.²⁶

Key Indicator #2 – Central Line–Associated Bloodstream Infection (CLABSI) (NQF #0139) performance declined as the SIR increased from 0.50 in 2013 to 0.54 in 2015 (Figure 1-2). The Partnership for Patients, a collaboration among private and public partners at the federal, state, and local level to reduce the prevalence and severity of patient safety incidents on a national basis, reported a 29.5% improvement in CLABSI SIRs for intensive care unit (ICU) patients from 2011 through 2014. The quarterly SIRs for 2013 and 2014 in the Partnership for Patients evaluation were consistent with the annual SIRs cited in this report for those years (2013 and 2014).²⁷

Figure 1-1: Key Indicator #1 Trend Graph – Hospital-Onset MRSA

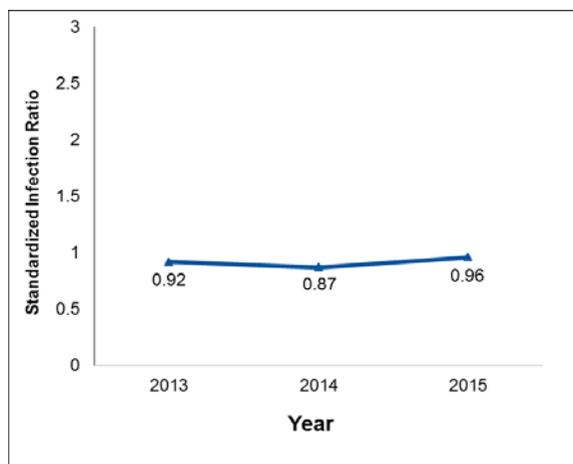
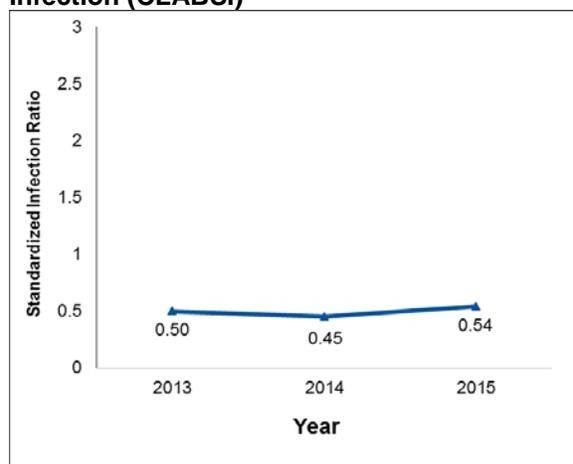


Figure 1-2: Key Indicator #2 Trend Graph – Central Line–Associated Bloodstream Infection (CLABSI)



Key Indicator #3 – Surgical Site Infection (SSI): Colon Surgery (NQF #0753) and SSI: Abdominal Hysterectomy (NQF #0753) consist of SIRs for the respective surgeries. National performance for colon surgery SSIs declined as the SIR increased from 0.94 in 2013 to 1.03 in 2015, while performance improved for abdominal hysterectomy SSIs as SIRs decreased from 0.91 to 0.88 during the same period (Figure 1-3). The Partnership for Patients reported a 21.84% decrease between first quarter 2012 and fourth quarter 2014 in SSI SIRs for abdominal hysterectomy patients.²⁷

Key Indicator #4 –Hospital-Onset Clostridium difficile Infection (CDI) (NQF #1717) performance remained stable from 2013 through 2015 (Figure 1-4). In 2016, HHS set a target for 2020 to reduce hospital-onset CDI by 30% from the 2015 baseline. The previous target had aimed to reduce CDI by 30% from the 2009 baseline by 2013; however, the CDC reported an 8% reduction from 2009 through 2014.²⁶

Figure 1-3: Key Indicator #3 Trend Graph – SSI Colon Surgery and Abdominal Hysterectomy

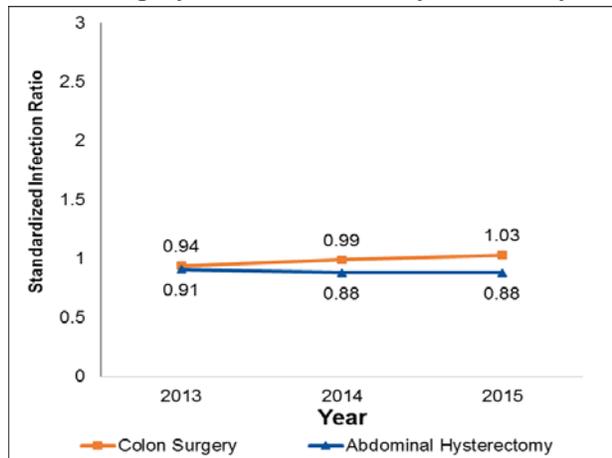
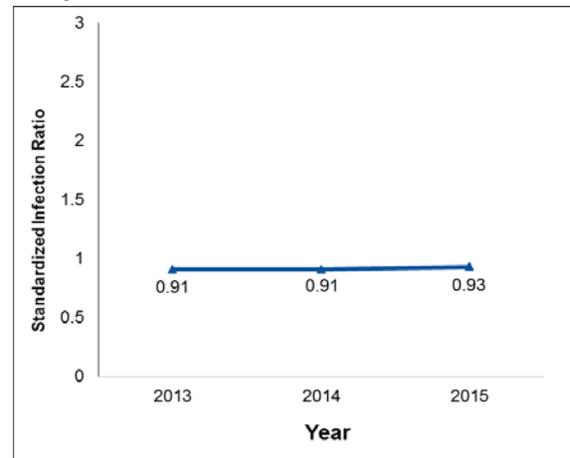


Figure 1-4: Key Indicator #4 Trend Graph – Hospital-Onset CDI



Key Indicator #5 –Catheter-Associated Urinary Tract Infection (CAUTI) (NQF #0138) performance improved rapidly, with the SIR decreasing from 1.20 in 2013 to 0.65 in 2015 (Figure 1-5). The Partnership for Patients reported no evidence of overall change in CAUTI SIRs for ICU patients between the first quarter 2012 and fourth quarter 2014.²⁷ The CDC notes that progress in CAUTI was seen in all settings toward the end of 2014.¹⁹

Key Indicator #6 – The national performance rate for Percent of Residents with a UTI (Long-Stay) (NQF #0684) improved rapidly from 7.6% in 2011 to 4.9% in 2015 (Figure 1-6). During this period, nursing homes decreased the use of indwelling catheters in long-stay patients.

Figure 1-5: Key Indicator #5 Trend Graph – Catheter-Associated Urinary Tract Infection (CAUTI)

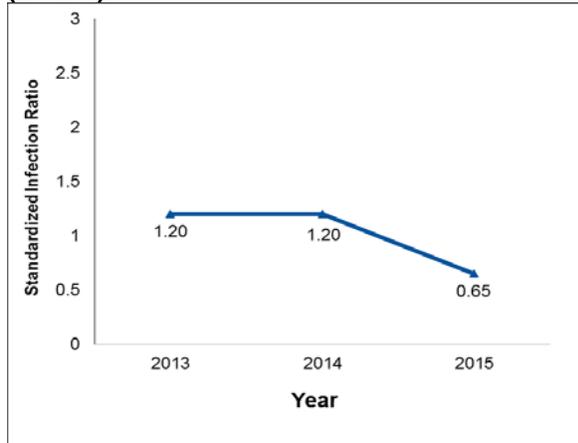
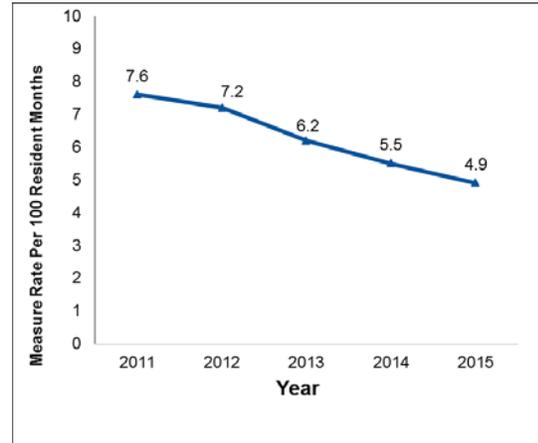


Figure 1-6: Key Indicator #6 Trend Graph – Percent of Residents With a UTI (Long- Stay)



Patient Impact and Cost-Avoided Analyses

For the Key Indicators derived from NHSN data, patient impact was not calculated because the size of the underlying patient population was not available for this report. The analysis of patient impact related to the *Percent of Residents with a Urinary Tract Infection (UTI) (Long Stay)* (NQF #0684) identified approximately 980,000 (2011–2015) fewer long-stay residents with UTIs than would be expected from the baseline rate. The estimated annual UTI health care treatment costs avoided range from \$930 million to \$7.2 billion for long-stay nursing home residents.²⁸⁻³⁰ These calculations were based on an estimated potential annual health care cost avoided per UTI event ranging from \$953 to \$7,394 (2015 dollars).^{xxxii}

Disparities

Patient-level data were not available for this report for the Key Indicators included on Dashboard 1-1; therefore, disparities analyses could not be performed for these measures.^{xxxiii}

Preventable Harm

Preventable noninfectious harms that occur during care, such as falls and pressure ulcers, are a leading cause of significant morbidity and mortality and occur in both inpatient and outpatient settings. Each year in the United States, 2.8 million people are treated in emergency departments for fall injuries, incurring associated costs of \$31 billion,³¹ and more than 2.5 million people develop pressure ulcers.³²

^{xxxii} The range in estimates is associated with severity in UTI, including catheter-associated infections. The cost to treat a UTI can be as high as \$30,600 (2015 dollars), though that amount is considered to be atypical. Because the distribution of UTI severity is not known, the higher figure was not included in the estimates.

^{xxxiii} Patient-level data are collected for NHQI and will be available for future reports.

National Quality Dashboard

Three Key Indicators were selected to focus on preventable harm, representing common safety-related events that can occur during a hospital or nursing home stay. The measures, along with results of analyses (Dashboard 1-2). A discussion of the Key Indicators follows the dashboard.

Dashboard 1-2: Preventable Harm^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
7 – Complications Following Total Hip Arthroplasty (THA) and Total Knee Arthroplasty (TKA) (NQF #1550)^e (↓ = Favorable)						
Hospital: IQR, VBP	 -4.1% ^b	3,483 Hospitals	906,663 Population	3.4% ^c 2012	3.0% ^c 2015	1.4% ^d
8 – Percent of Residents or Patients with Pressure Ulcers That Are New or Worsened^e (↓ = Favorable)						
NHQI (Short-Stay) (NQF #0678)	 -12.8% ^b	47,256 Nursing homes	18,578,724 Population	1.9% ^c 2011	1.1% ^c 2015	0.1% ^d
NHQI (Long-Stay) (NQF #0679)	 -4.3% ^b	46,527 Nursing homes	10,844,827 Population	7.8% ^c 2011	6.6% ^c 2015	1.8% ^d
9 – Percent of Residents Experiencing One or More Falls with Major Injury (Long-Stay) (NQF #0674)^e (↓ = Favorable)						
NHQI	 0.2% ^b	46,911 Nursing homes	15,200,513 Population	3.2% ^c 2011	3.3% ^c 2015	0.3% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated (◊) from beneficiary-level data or (◊◊) as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Lower rates indicate better performance.

Trend Analyses

Rates for the Key Indicators addressing preventable harm are discussed in this section.

Performance rates for Key Indicators #7, #8, and #9 are shown in Figures 1-5, 1-6, and 1-7, respectively.

Key Indicator #7 – Rates of complications decreased (improved) from 3.4% of patients in 2012 to 3.0% in 2015 for *Complications Following Elective Primary Total Hip Arthroplasty (THA) and Total Knee Arthroplasty (TKA)* (NQF #1550) (Figure 1-7).

Complications following elective total hip or knee arthroplasty include mechanical complications, bleeding, surgical site infection, pneumonia, acute myocardial infarction (AMI), sepsis, pulmonary embolism, and death.

Key Indicator #8 – Improvements in the national performance rates for *Percent of Residents with Pressure Ulcers That Are New or Worsened* for both short-stay (NQF #0678) and long-stay (NQF #0679) populations in nursing homes occurred from 2011 through 2015. Rates for pressure ulcers in the short-stay population improved rapidly during the period (Figure 1-8).

Key Indicator #9 – Rates for *Percent of Residents Experiencing One or More Falls with Major Injury (Long-Stay)* (NQF #0674) for nursing homes remained stable from 2011 through 2015 (Figure 1-9).

Figure 1-7: Key Indicator #7 Trend Graph – Complications Following THA and TKA

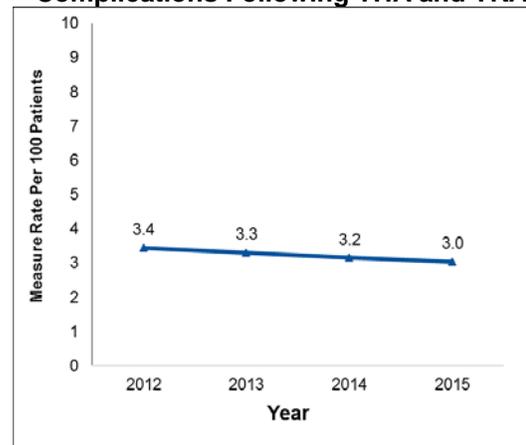


Figure 1-8: Key Indicator #8 Trend Graph – Residents or Patients with Pressure Ulcers

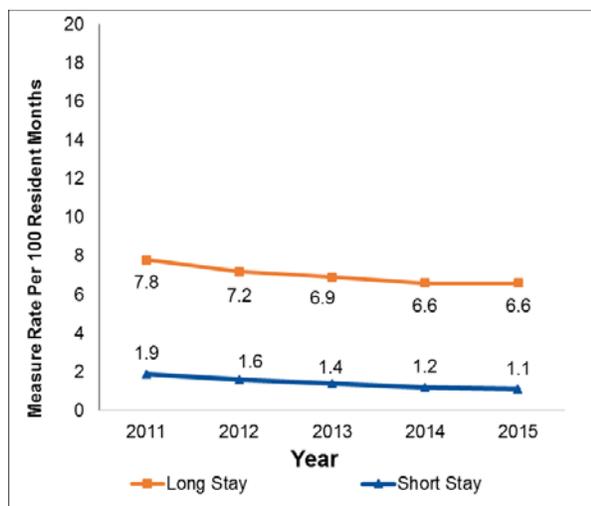
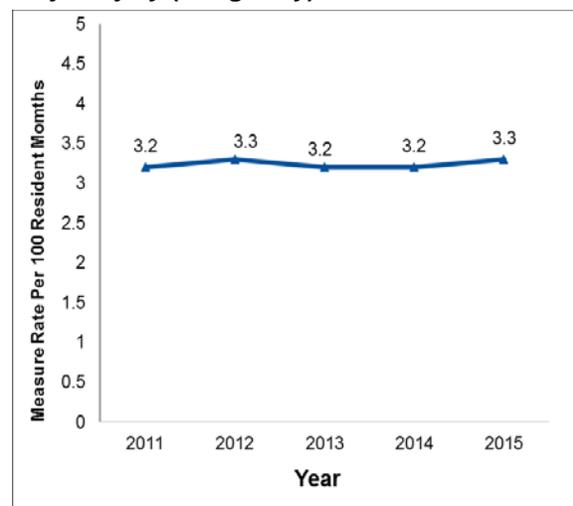


Figure 1-9: Key Indicator #9 Trend Graph – Residents Experiencing One or More Falls with Major Injury (Long Stay)



Patient Impact and Cost-Avoided Analyses

Improvement in the national performance rate for *Complications Following Elective Primary THA and TKA* (NQF #1550) resulted in approximately 7,800 (2012–2015) fewer patients with complications. Cost-avoided analyses were not performed for *Complications Following Elective Primary THA and TKA* due to the complexity of the measure. The outcome for the measure is a composite of several complication types that result from multiple procedures.

The analyses of patient impact relative to the percentage of nursing home residents with new or worsened pressure ulcers identified an estimated 420,000 (2011–2015) and 420,000 (2011–2015) fewer short-stay (NQF #0678) and long-stay (NQF #0679) residents, respectively, than would be expected from the baseline rate. The results of the patient impact analyses were applied to estimate the health care costs avoided.

The estimated annual health care treatment costs avoided because of reductions in new or worsened pressure ulcers range from \$1.4 billion to \$10.0 billion for short-stay nursing home residents and from \$1.4 billion to \$10.0 billion for long-stay residents (2015 dollars). These calculations were based on an estimated potential health care cost avoided per event per patient ranging from \$3,247 to \$23,897 (2015 dollars).^{28,33-37} The range in health care cost estimates is associated with differences in average treatment costs for Stage II–IV pressure ulcers.

Disparities

Disparities were observed for income and sex and are highlighted below. Patient-level data were not available for this report for the pressure ulcers and falls measures; therefore, disparities analyses could not be performed for Key Indicators #8 and #9.^{xxxiv} Figure 1-10 displays disparities by income. Complication rates were significantly higher for the low-income group than for the high-income reference group. Figure 1-11 displays disparities by sex. Males had significantly higher complication rates than females. Differences present for both income and sex are consistent over time, based on a four-year trend analysis.

Figure 1-10: Key Indicator #7 Disparities by Income – Complications Following THA and TKA

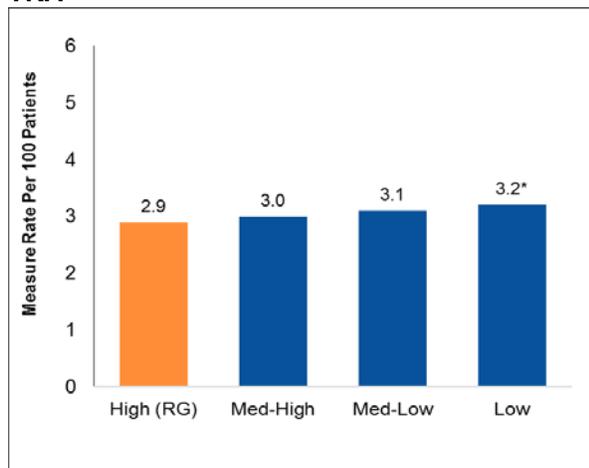
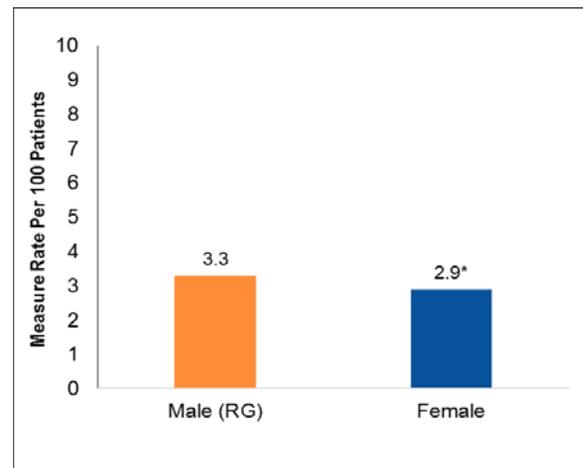


Figure 1-11: Key Indicator #7 Disparities by Sex – Complications Following THA and TKA



Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%). The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups.

MEASURE GAPS

CMS will evaluate gaps in high-impact areas when considering future measure initiatives. High-impact measurement areas for which current measures were not available were considered as future topics for national improvement. These include adverse drug events, antibiotic stewardship, ventilator-associated events, harms from failure to receive proper diagnoses, tests, or treatment, and all-cause harm.

CMS is creating an aligned set of patient safety measures for post-acute care settings—long-term care hospitals (LTCHs), skilled nursing facilities (SNFs), home health agencies (HHAs), and inpatient rehabilitation facilities (IRFs). The Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 requires aligned measures assessing major falls and skin integrity and changes in skin integrity in these settings.³⁸

^{xxxiv} Patient-level data are collected for NHQI and will be available for future reports.

2 – Person and Family Engagement



BACKGROUND

The CMS priority to strengthen person and family engagement as partners in care exemplifies national efforts by CMS to promote proactive communication, self-management, and shared decision-making between health care providers and patients, families, and caregivers. Studies have shown that patients who are actively engaged in their care and self-management are more likely to avoid unhealthy behaviors; have regular checkups, better outcomes, and fewer hospitalizations and emergency department visits; and perceive their care more favorably.³⁹ The priority emphasizes the values and preferences of patients and caregivers.⁴⁰ CMS employs quality measurement as a key lever to engage persons and families.

KEY INDICATORS

After expert review by the TEP and FASC,^{xxxv} 18 measures were selected from the 152 Person and Family Engagement measures^{xxxvi} to highlight CMS progress toward achieving the objectives of the CMS quality priorities.^{xxxvii,17} These 18 measures were mapped to four Key Indicators that align with the objectives of the CMS priority of Person and Family Engagement (Table 2-1). The 18 measures are included in the National Quality Dashboards that follow this section.

Table 2-1: Person and Family Engagement Objectives and Related Key Indicator Topics

Person and Family Engagement Objective ¹⁷	Key Indicator Topic (Number of Measures)
Ensure all care delivery incorporates person and family preferences.	<u>Shared Decision-Making</u> 1 – Shared decision-making (2)
Improve experience of care for patients, caregivers, and families.	<u>Overall Rating of Experience of Care</u> 2 – Overall rating of experience of care (8) <u>Timeliness of Care</u> 3 – Timeliness of care (2)
Promote patient self-management.	<u>Medication adherence</u> 4 – Medication adherence (6)

^{xxxv} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{xxxvi} The total number of person and family engagement measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{xxxvii} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

Shared Decision-Making

Physicians and other skilled health care professionals devote years of study to acquire authoritative knowledge of medical treatments and outcomes. Yet the suitability of health care choices for a given patient may depend upon personal preferences as well as financial and social circumstances⁴¹—information that patients and often their families and caregivers can best provide. Person-centered care is delivered in concert with the individual’s goals made through informed decisions about their care and is aligned with or inclusive of the care plan co-created with their doctor.

National Quality Dashboard

Measures selected from Medicare programs for Key Indicator #1, Shared Decision-Making, are summary composite measures from Consumer Assessment of Healthcare Providers and Systems® (CAHPS®) surveys. The measures and the results of analyses are shown in Dashboard 2-1. A discussion of the results follows the dashboard.

Dashboard 2-1: Shared Decision-Making^a

Measure Name (NOF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Respondents/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1 – Shared Decision-Making (Not Endorsed) (↑ = Favorable)						
PQRS, Physician VM CAHPS for PQRS	 0.3% ^b	460 Group practices	107,217 Sample	74.6% ^c 2013	75.0% ^c 2015	79.2% ^d
Medicare Shared Savings Program CAHPS for ACOs	 0.4% ^b	394 ACOs	104,782 Sample	73.8% ^c 2012	74.8% ^c 2015	77.5% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a simple average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

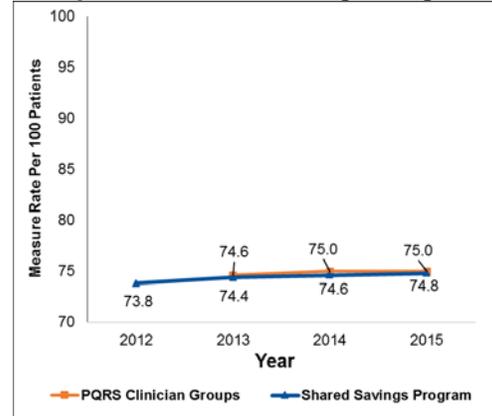
Trend Analyses

The rates for Key Indicator #1, Shared Decision-Making, are discussed in this section and shown in Figure 2-1.

Key Indicator #1 – Performance rates for the Shared Decision-Making Summary Measure remained stable from 2012 through 2015 for both the PQRS clinician group practices that used the Group Practice Reporting Option (GPRO) Web Interface reporting method and for the clinicians in the Medicare Shared Savings ACOs through 2015 (Figure 2-1).

The *Shared Decision-Making Summary Measure* consists of six questions about whether the clinician discussed medications, surgery, or procedures with the patient and asked the patient’s preferences and whether health information was shared according to the patient’s wishes. The individual survey items within the composite measure are transformed to a 0-100 scale for scoring (linear mean) and are equally weighted.^{42,43}

Figure 2-1: Key Indicator #1 Trend Graph – Shared Decision-Making – PQRS Clinician Groups and Shared Savings Program



Patient Impact and Cost-Avoided Analyses

Patient impact for the *Shared Decision-Making Summary Measure* was not calculated due to the rates remaining stable. Cost-avoided analyses for measures of patient experience were not conducted due to the inability to quantify costs averted associated with patient perceptions.

Disparities

Patient-level data were not available for this report for the measures displayed on the Shared Decision-Making dashboard; therefore, disparities analyses could not be performed.

Overall Rating of Experience of Care

Better patient-reported care experiences are often associated with greater levels of adherence to recommended treatments and preventive measures, better clinical outcomes, and less unnecessary health care utilization.⁴⁴ Patient experience surveys, such as CAHPS, focus on how patients experienced or perceived key aspects of their care. The CAHPS surveys actively engage patients in reporting their experiences with, and ratings of, their health care providers and plans, including hospitals, home health care agencies, doctors, and health and drug plans, among others.⁴⁵

National Quality Dashboard

Key Indicator #2, Overall Rating of Care, includes the overall ratings of experience of care from eight CAHPS surveys. The measures and the results of analyses are shown in Dashboard 2-2. A discussion of the results follows the dashboard.

Dashboard 2-2: Overall Rating of Experience of Care^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Respondents/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
Linear Mean – Reported as the average rating by respondents on a 0 to 100 scale						
2a – Rating of Health Care Quality (NQF #0006) (↑ = Favorable)						
FFS Medicare FFS CAHPS	 0.0% ^b	Not applicable	89,812 Sample	85.6% ^c 2007	84.6% ^c 2015	Not determined [†]
Part C Star Ratings MA/MA-PD CAHPS	 0.2% ^b	466 Contracts ^e	155,634 Sample	86.2% ^c 2007	85.7% ^c 2015	90.7% ^d
2b – Rating of Provider (NQF #0005) (↑ = Favorable)						
PQRS, VM CAHPS for PQRS	 -0.3% ^b	460 Group practices	108,955 Sample	92.0% ^c 2013	91.5% ^c 2015	94.5% ^d
Medicare Shared Savings Program CAHPS for ACOs	 0.0% ^b	394 ACOs	110,804 Sample	91.5% ^c 2012	91.7% ^c 2015	94.1% ^d
2c – Rating of Drug Plan (Not Endorsed) (↑ = Favorable)						
Part D Star Ratings PDP CAHPS	 0.5% ^b	65 Contracts ^e	33,989 Sample	80.1% ^c 2007	82.9% ^c 2015	83.5% ^d
Part D Star Ratings MA-PD CAHPS	 0.3% ^b	457 Contracts ^e	141,086 Sample	82.9% ^c 2007	84.7% ^c 2015	88.3% ^d
Top Box – Reported as percentage of respondents choosing a 9 or 10 out of 10						
2d – Rating of Hospital (NQF #0166) (↑ = Favorable)						
Hospital: IQR, VBP HCAHPS	 1.7% ^b	4,240 Hospitals	3,083,086 Sample	64.0% ^c 2008	72.3% ^c 2015	79.0% ^d
2e – Rating of Care (NQF #0517) (↑ = Favorable)						
Home Health QRP HHCAHPS	 0.1% ^b	8,828 Agencies	1,125,200 Sample	84.6% ^c 2012	84.7% ^c 2015	93.1% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).
^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.
 Indicates an average annual percentage change <= 1% per year.
 Indicates an annual percentage change > 1% per year in an unfavorable direction.
^c The result represents the national average calculated (◊) from beneficiary-level data, (◊◊) as a simple average of provider rates, or (◊◊◊) as a weighted average of provider rates.
^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals. † Data were not collected at a provider or plan level; therefore, achievable result could not be calculated.
^e Medicare Part C and D Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

Trend Analyses

The Overall Rating of Care measures reported on Dashboard 2-2 ask respondents to rate the care they received or the provider on a scale where 0 is the worst possible rating and 10 is the best possible rating. The measures are reported using two different methodologies. The “top box” scores are the percentage of respondents choosing a 9 or 10 on a scale of 0–10. In contrast, the linear mean represents the average rating by respondents, converted to a 0–100 scale. Thus, the two sets of results are not directly comparable. Rates are shown in Figures 2-2, 2-3, 2-4, and 2-5.

Key Indicator #2 – Rating of Hospital from the CAHPS Hospital Survey (HCAHPS) is the only one of eight experience of care measures for Key Indicator #2 that shows improvement (Figure 2-5). The national performance rates for *Rating of Hospital* represent the percentages of patients who gave their hospital a “9” or “10” on the “0–10” rating scale. The national performance rate for *Rating of Hospital* increased by more than 8 percentage points from 2008 through 2015, improving from 64% to 72.3%. Although the performance rate for the PQRS group practices remained stable over the period (2012-2105), reporting requirements changed for reporting CAHPS; therefore, the cohort of clinician groups represented in the data may differ across reporting periods. Figures 2-2, 2-3, 2-4, and 2-5 show the trend results for the Overall Rating of Care measures.

Figure 2-2: Key Indicator #2 Trend Graph – Rating of Health Care Quality (Linear Mean) – FFS and Part C

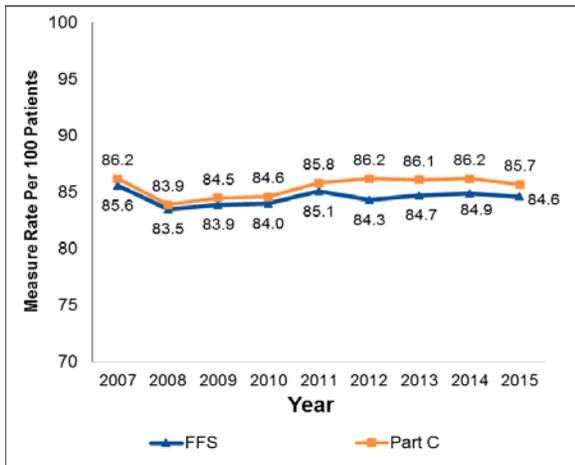


Figure 2-3: Key Indicator #2 Trend Graph – Rating of Health Care Quality (Linear Mean) – PQRS Clinician Groups and Shared Savings

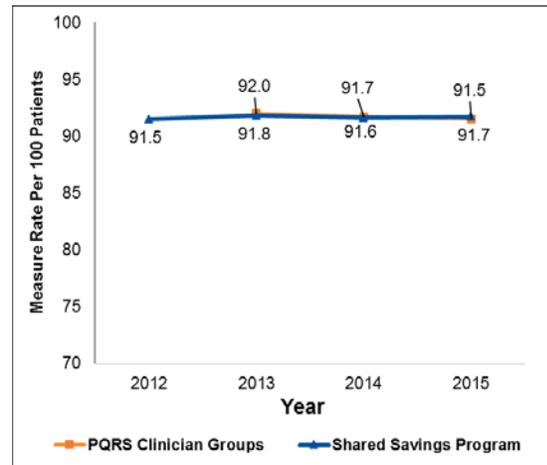


Figure 2-4: Key Indicator #2 Trend Graph – Rating of Drug Plan (Linear Mean) – PDP and MA-PD

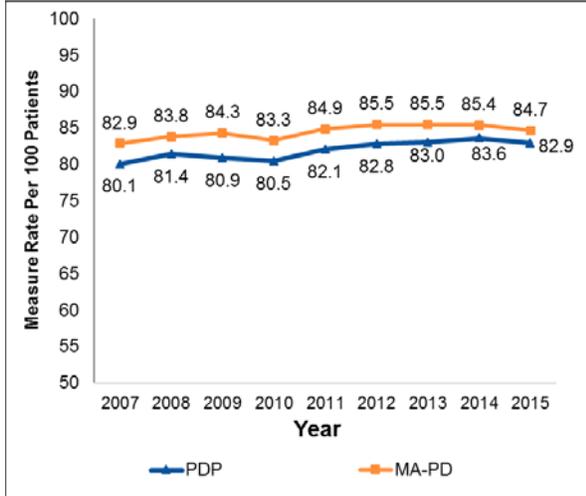
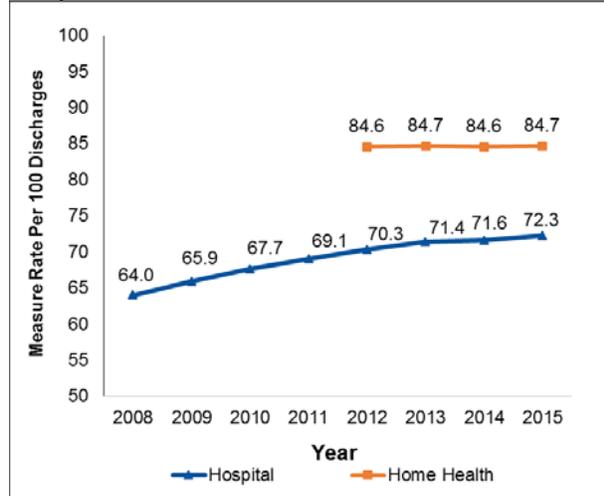


Figure 2-5: Key Indicator #2 Trend Graph – Rating of Hospital and Rating of Care (Top Box) – Home Health



Patient Impact and Cost-Avoided Analyses

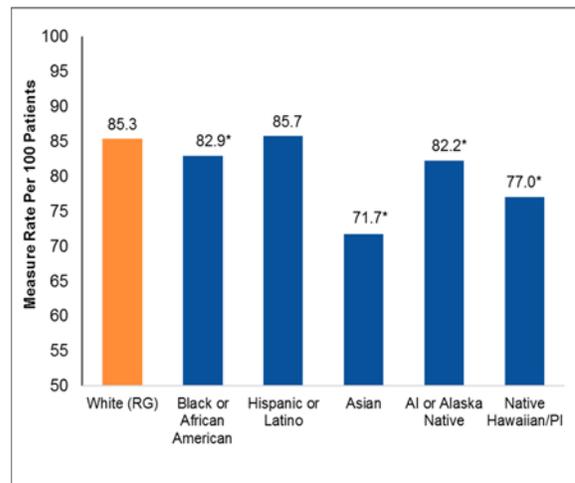
The analysis of the patient impact related to *Rating of Hospital* from the HCAHPS indicates that if the results from the patients who were surveyed and rated their hospital a “9” or “10” held true for the eligible population of patients nationwide, approximately 9.0 million more hospitalized patients would have had a highly favorable experience with their hospital. Patient impact analyses for the other measures for Key Indicator #2, Overall Rating of Experience of Care, were not conducted due to the rates remaining stable. Cost-avoided analyses were not conducted for measures of patient experience due to the inability to quantify costs averted associated with patient perceptions.

Disparities

Disparities analyses were conducted for fee-for-service (FFS) and Part C *Rating of Health Care Quality* (NQF #0006) and the top box *Rating of Hospital* (NQF #0166) and *Rating of Care* (NQF #0517) (home health). Race/ethnicity disparities were observed for the top box *Rating of Care* (home health) (Figure 2-6). All groups except Hispanics had significantly lower percentages of respondents rating the home health experience a 9 or 10 out of 10 compared with the White reference group. These differences are consistent over time based on a four-year trend analysis.

Meaningful disparities were not present for the FFS and Part C *Rating of Health Care Quality* (NQF #0006) and the top box *Rating of Hospital* (NQF #0166). Patient-level data were not available for this report for the remainder of the

Figure 2-6: Key Indicator #2 Disparities by Race/Ethnicity – Home Health Rating of Care (Top Box)



Note: The orange bar represents the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

measures displayed on the Overall Rating of Experience of Care dashboard; therefore, disparities analyses could not be performed.^{xxxviii}

Timeliness of Care

A key aspect of patient-centered care is timely access, including obtaining an appointment promptly, experiencing brief office wait time, and having needed access to the care team.⁴⁶

National Quality Dashboard

Key Indicator #3 encompasses *Getting Appointments and Care Quickly* (NQF #0006), measured in two populations. The measures and the results of analyses are shown in Dashboard 2-3. A discussion of the results follows the dashboard.

Dashboard 2-3: Timeliness of Care^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Respondents/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
3 – Getting Appointments and Care Quickly (NQF #0006) (↑ = Favorable)						
FFS Medicare FFS CAHPS	 0.3% ^b	Not applicable	84,800 Sample	74.3% ^c 2012	74.9% ^c 2015	Not determined [†]
Part C Star Ratings MA/MA-PD CAHPS	 -0.1% ^b	466 Contracts ^e	139,673 Sample	76.1% ^c 2012	75.7% ^c 2015	83.0% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated from beneficiary-level data.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

[†] Data were not collected at a provider or plan level, therefore; achievable result could not be calculated.

^e Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

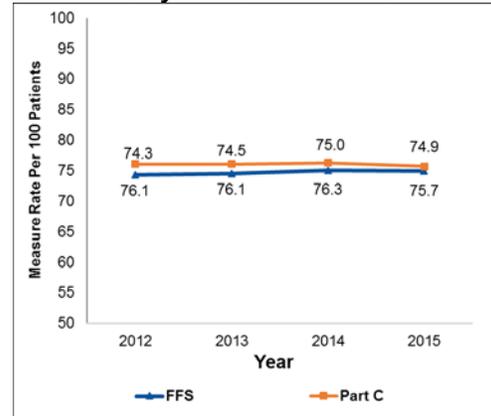
^{xxxviii} The Part C Rating of Health Care Quality and the Rating of Care for home health were age/sex adjusted. The Rating of Hospital measure was case mix adjusted for health, education, response percentile, age, service line and language spoken at home.

Trend Analyses

The rates for Key Indicator #3, Getting Appointments and Care Quickly, are discussed in this section and shown in Figure 2-7.

Key Indicator #3 – National linear mean performance rates remained stable for both FFS and Part C populations from 2012 through 2015 for *Getting Appointments and Care Quickly* (NQF #0006), which is a composite measure constructed from questions from Medicare FFS CAHPS, Medicare Advantage (MA)-only CAHPS, and MA-PD CAHPS. The measure comprises two survey questions about patient experiences in the last six months related to getting care and appointments and one question about whether the clinician saw the patient within 15 minutes of appointment time. The individual survey items within the measure are scored on a 0–100 scale (linear mean) and are equally weighted.^{42,43}

Figure 2-7: Getting Appointments and Care Quickly – FFS and Part C



Patient Impact and Cost-Avoided Analyses

Patient impact analyses for *Getting Appointments and Care Quickly* (NQF #0006) were not conducted due to the rates remaining stable. Cost-avoided analyses for measures of patient experience were not conducted due to the inability to quantify costs averted associated with patient perceptions.

Disparities

Disparities analyses were conducted for both FFS and Part C measures displayed on the Timeliness of Care Dashboard, but the differences were small and not meaningful.

Medication Adherence

The treatment of chronic disease frequently requires the prescription of long-term medications. For the medications to be effective, clinicians must prescribe the medicines properly and patients must be engaged in their treatment and take the medications, often for a lifetime, as prescribed.⁴⁷ The reasons people do not take medications as prescribed vary and include worry or illness clouding understanding, low health literacy, and possible side effects.⁴⁸

National Quality Dashboard

Key Indicator #4, Proportion of Days Covered (PDC), consists of six individually reported measures for three classes of drugs: statins used to treat high cholesterol, renin-angiotensin system (RAS) antagonists used to treat hypertension, and oral diabetes agents (Dashboard 2-4). Rates were analyzed for each of these drug categories for stand-alone PDPs and MA-PDs.

Dashboard 2-4: Medication Adherence^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
4a – Proportion of Days Covered (PDC) Statins (Cholesterol) (NQF #0541) (↑ = Favorable)						
Part D Star Ratings PDP	 2.8% ^b	58 Contracts ^e	9,666,258 Population	71.4% ^c 2011	79.7% ^c 2015	77.2% ^d
Part D Star Ratings MA-PD	 2.8% ^b	408 Contracts ^e	6,176,411 Population	69.2% ^c 2011	77.0% ^c 2015	81.6% ^d
4b – Proportion of Days Covered (PDC) RAS Antagonists (Hypertension) (NQF #0541) (↑ = Favorable)						
Part D Star Ratings PDP	 1.9% ^b	58 Contracts ^e	9,288,659 Population	77.0% ^c 2011	83.0% ^c 2015	81.4% ^d
Part D Star Ratings MA-PD	 2.2% ^b	406 Contracts ^e	6,092,168 Population	74.0% ^c 2011	80.8% ^c 2015	84.5% ^d
4c – Proportion of Days Covered (PDC) Diabetes Medications (NQF #0541) (↑ = Favorable)						
Part D Star Ratings PDP	 1.6% ^b	56 Contracts ^e	2,831,010 Population	76.1% ^c 2011	80.9% ^c 2015	81.4% ^d
Part D Star Ratings MA-PD	 1.6% ^b	394 Contracts ^e	1,996,901 Population	73.9% ^c 2011	78.8% ^c 2015	84.3% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using an average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a simple average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Medicare Part D Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

Trend Analyses

The rates for Key Indicator #4, Medication Adherence – Proportion of Days Covered, for statins, RAS antagonists, and diabetes medications are discussed in this section and shown in Figures 2-8, 2-9, and 2-10.

Key Indicator #4 – National performance rates on medication adherence (measured by the PDC^{xxxix}) improved for statins, RAS antagonists, and oral diabetes medications from 2011 through 2015. Stand-alone PDPs had higher rates of performance across the years for each of the three drug classes than rates for MA-PDs. The national results for PDPs reached the calculated achievable result rate for statins. MA-PDs nationally had not reached the calculated achievable results for any of the three drug classes as of 2015.

Figure 2-8: Key Indicator #4 Trend Graph – Medication Adherence for Statins – PDP and MA-PD

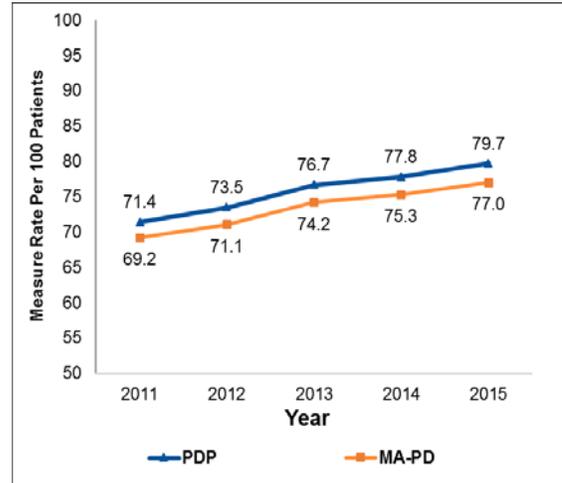


Figure 2-9: Key Indicator #4 Trend Graph – Medication Adherence for RAS Antagonists – PDP and MA-PD

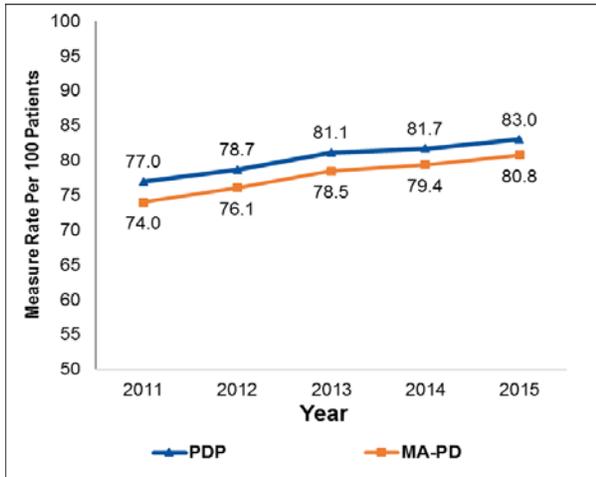
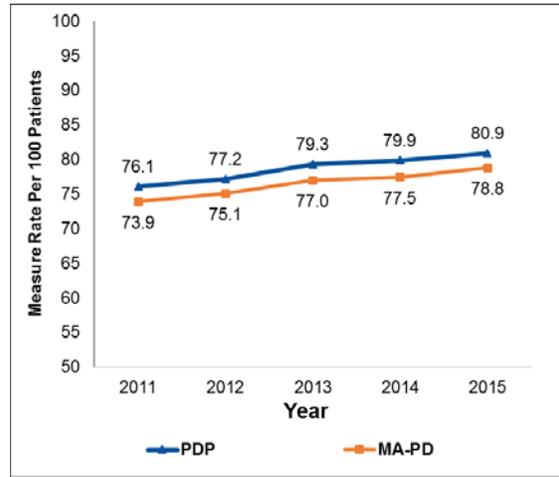


Figure 2-10: Key Indicator #4 Trend Graph – Medication Adherence for Diabetes Medications – PDP and MA-PD



Patient Impact and Cost-Avoided Analyses

Patient impact analyses and cost estimates were conducted for *PDC for Statins* (NQF #0541), *PDC for RAS Antagonists* (NQF #0541) for hypertension, and *PDC for Diabetes Medications* (NQF #0541) for PDPs and MA-PDs (2011–2015). Table 2-2 describes the estimated patient impact (i.e., additional patients taking statins for cholesterol, RAS antagonists for hypertension, and diabetes medications as directed, compared with the numbers expected from baseline) and the estimated health care costs avoided associated with the medication adherence.

^{xxxix} The proportion of days covered (PDC) is the percent of plan members with a prescription for the medication who fill their prescription often enough to cover 80% or more of the time they are supposed to be taking the medication.

Table 2-2: Medication Adherence (2011–2015) – Patient Impact and Costs Avoided Combined for PDPs and MA-PDs

	Statins (Cholesterol)	RAS Antagonists (Hypertension)	Diabetes Medications	Total
Patient Impact (Increased # of patients adherent to the medication from baseline)	2.8 million	2.5 million	520,000	N/A*
Costs Avoided (Health care costs avoided based on patient impacts)	\$1.5 billion– \$3.3 billion	\$2.1 billion– \$19.8 billion	\$659.5 million– \$3.8 billion	\$4.2 billion– \$26.9 billion

*Patient impact numbers could not be totaled due to possible duplication of patients between medication categories.

To calculate annual health care costs avoided, the results of the patient impact analyses were applied to patient health care unit costs for each of the measures. The cost estimates exclude the health care costs associated with cholesterol, hypertension, and diabetes medications, isolating the cost offset related to quality improvement. The range in health care cost estimates is primarily driven by assumptions related to sustained medication adherence, healthy lifestyle behaviors, co-morbidities, and type of medication prescribed. For the statins, the calculations were based on an estimated potential annual health care costs avoided ranging from \$532 to \$1,188 per patient for cholesterol medication adherence.⁴⁹ For RAS antagonists, the calculations were based on an estimated potential annual health care costs avoided ranging from \$825 to \$7,958 per patient for hypertension medication adherence.^{50,51} For diabetes medications, the calculations were based on an estimated potential annual health care costs avoided ranging from \$1,265 to \$8,092 per patient for diabetes medication adherence.^{x1,50-54}

Disparities

For Key Indicator #4, Medication Adherence – Proportion of Days Covered (PDC), disparity analyses were conducted on the 2015 PDP and MA-PD data for PDC for statins, RAS antagonists, and diabetes medications. Disparities by income, race/ethnicity, and region are highlighted.

Income – Medication adherence rates for patients taking statins and diabetes medications were significantly lower for the low-income group for stand-alone PDPs and MA-PDs (Figures 2-11 and 2-12) than for the high-income reference group. The medium-low income group for diabetes medication adherence also had significantly lower rates than the high-income reference group rate. These differences are consistent over time, based on a five-year trend analysis. Other research findings have identified a similar relationship between income and medication adherence.⁵⁵

^{x1} All costs are adjusted to 2015 dollars.

Figure 2-11: Key Indicator #4 Disparities by Income – Medication Adherence for Statins – PDP and MA-PD

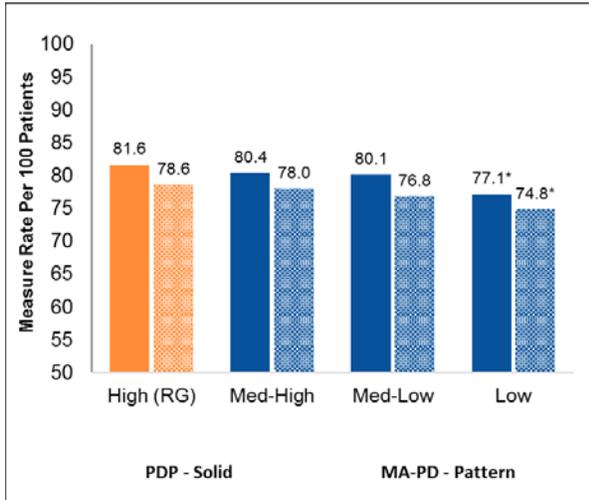
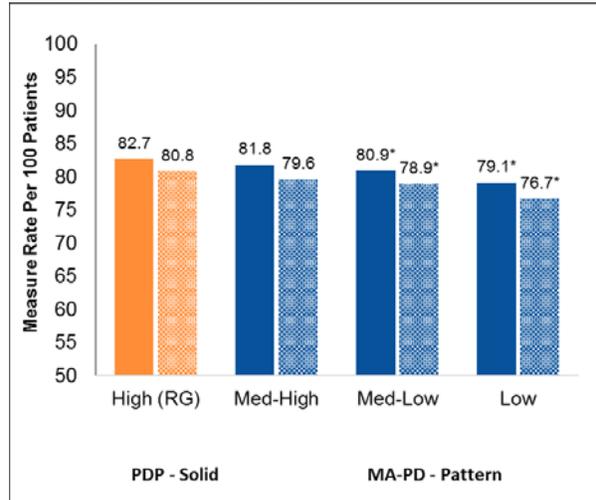


Figure 2-12: Key Indicator #4 Disparities by Income – Medication Adherence for Diabetes Medications – PDP and MA-PD



Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%). The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups.

Race/Ethnicity – For statins, RAS antagonists, and diabetes medication adherence, all groups except Asians had significantly lower rates of adherence than rates for the White reference group (Figures 2-13, 2-14, and 2-15). Published literature findings report similar racial and ethnic disparities.⁵⁵⁻⁵⁷

Figure 2-13: Key Indicator #4 Disparities by Race/Ethnicity – Medication Adherence for Statins – PDP and MA-PD

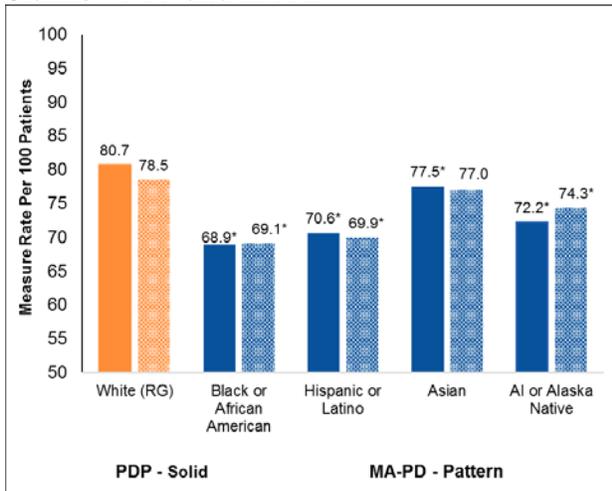
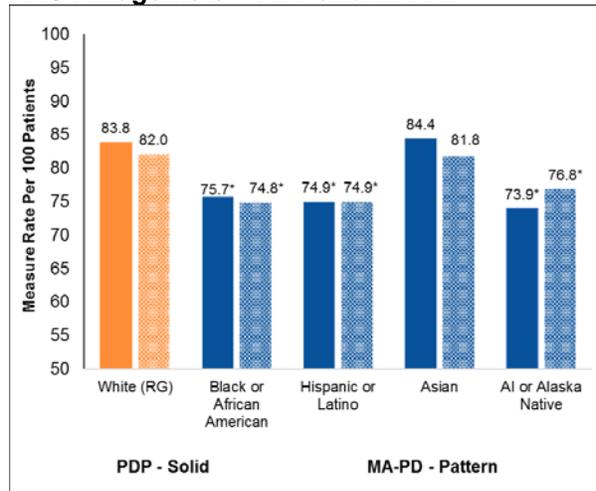
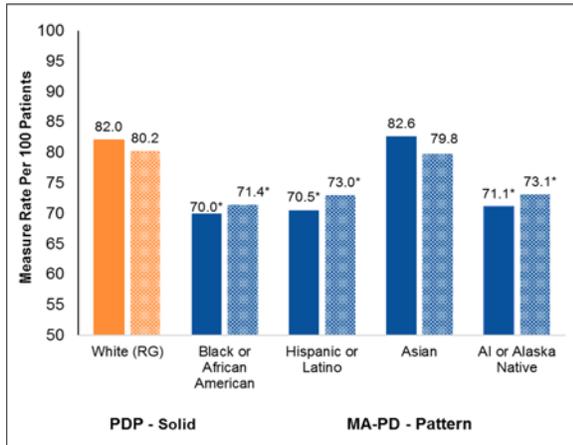


Figure 2-14: Key Indicator #4 Disparities by Race/Ethnicity – Medication Adherence for RAS Antagonists – PDP and MA-PD



Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

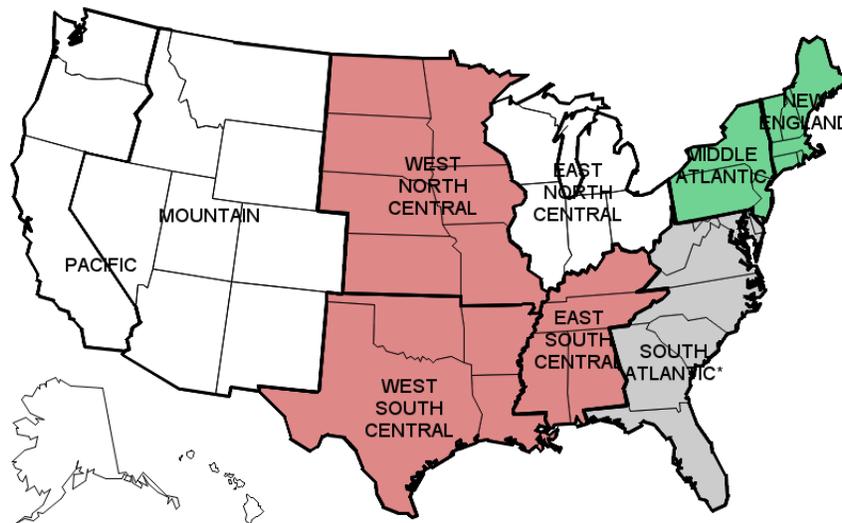
Figure 2-15: Key Indicator #4 Disparities by Race/Ethnicity – Medication Adherence for Diabetes Medications – PDP and MA-PD



Note: The orange bar represents the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

Region – For RAS antagonists, significant rate differences were noted by region for stand-alone PDPs (Figure 2-16). The East and West South Central regions and the West North Central regions had lower rates of adherence compared with the South Atlantic region, while the Middle Atlantic and New England regions had higher rates. These differences are consistent over time based on a five-year trend analysis except for the West North Central region, which shows disparities widening over time. Regional differences in adherence similar to these findings are reported in the literature.⁵⁶

Figure 2-16: Key Indicator #4 Disparities by Region – Medication Adherence for RAS Antagonists – PDP and MA-PD



Note: South Atlantic (gray shading) is the reference area for region. Map areas shaded red have lower performance than the South Atlantic reference area, which has the largest population of the regions and thus was chosen as the reference point. Map areas shaded green have higher adherence than the reference area and areas with no color have similar adherence rates compared with the reference area. *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

MEASURE GAPS

CMS will evaluate gaps in high-impact areas when considering future measure initiatives.

- Topics for high-impact measurement areas in which measures are not available were identified as future topics for national improvement. Stakeholders have identified a patient experience of care survey as an important gap in the Inpatient Psychiatric Facility Quality Reporting (IPFQR) Program, and CMS is evaluating ways to address this topic.^{58(p. 38471)} The IPFQR Program includes a structural measure asking only whether an assessment of patient experience of care is conducted. Also, no patient perspective survey for residents or their families is currently used by CMS in nursing homes, IRFs, or LTCHs.
- Stakeholders identify end-of-life counseling and care according to patient and family preferences as a priority topic for measures across Medicare quality programs. Additional measures for the Hospice Quality Reporting Program, such as goal attainment, symptom management, and outcome measures, are needed. The *CMS Quality Measure Development Plan* also identified end-of-life care as a priority area for measure development for the Quality Payment Program.⁵⁹
- Functional outcome measures, such as patient-reported outcome performance measures (PRO-PMs), have recently been developed; others are being developed to address gaps. The IMPACT Act requires the development of aligned measures for post-acute settings (IRF, LTCH, SNF, HHA) that assess functional status, cognitive function, and changes in function and cognitive function.⁶⁰ These measures will fill important gaps in Person and Family Engagement. Gaps remain for quality-of-life measures that consider a patient's life goals.

3 – Care Coordination



BACKGROUND

The coordination of care from one setting to the next has the potential to greatly impact cost and quality, especially for the Medicare population. Over a 30-day period post-hospital discharge, an estimated 13% of Medicare patients will experience three or more provider transfers.⁶¹ Costs associated with these transfers from one setting to the next are estimated to cost Medicare \$15 billion each year.^{62,63}

Integral to coordination of patient care are medication management, seamless exchange of health information between providers, and collaboration among members of health care teams within and across care settings. Accordingly, CMS has implemented quality measures associated with promoting effective communication and coordination of care throughout CMS quality programs.

KEY INDICATORS

After expert review by the TEP and FASC,^{xli} five measures were selected from the 77 Care Coordination measures^{xlii} to highlight CMS progress toward achieving goals related to the CMS quality priorities.^{xliii,17} These five measures were mapped to three Key Indicators.

The Key Indicators align with the objectives of the CMS priority of Care Coordination (Table 3-1). The five measures that map to the Key Indicators are included in the National Quality Dashboards that follow this section.

Table 3-1: Care Coordination Objectives and Related Key Indicator Topics

Care Coordination Objective ¹⁷	Key Indicator Topic (Number of Measures)
Reduce admissions and readmissions.	<u>Unplanned Hospital Readmissions</u> 1 – All-Cause Unplanned Readmissions (2)
Embed best practices to enable successful transitions between all settings of care.	<u>Patient Experience with Care Coordination</u> 2 – Care Transition (1)
Enable effective health care system navigation.	3 – Care Coordination (2)

Unplanned Hospital Readmissions

An unplanned hospital readmission refers to an admission within 30 days of a previous inpatient stay, excluding an admission for a planned procedure not associated with an acute diagnosis. Unplanned admissions and readmissions put additional burdens on patients and their caregivers and can overextend clinical resources. Effective care coordination and communication are essential to prevent avoidable hospitalizations and thus reduce burdens on patients and preserve resources.

^{xli} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{xlii} The total number of Care Coordination measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{xliii} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

National Quality Dashboard

Two measures were selected for Key Indicator #1, All-Cause Unplanned Readmissions. The measures, along with results of analyses, are shown in Dashboard 3-1, with a discussion following the dashboard.

Dashboard 3-1: Unplanned Hospital Readmissions^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1a – Hospital-Wide Readmissions (HWR) (#1789)^e (↓ = Favorable)^e						
Hospital: IQR	 -1.0% ^b	4,746 Hospitals	6,910,341 Population	16.0% ^c 2012	15.6% ^c 2015	11.1% ^d
1b – Plan All-Cause Readmissions (PCR) (#1768)^e (↓ = Favorable)^e						
Part C Star Ratings	 -2.6% ^b	359 Contracts ^f	1,846,570 Population	13.8% ^c 2011	12.5% ^c 2015	10.4% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).
^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.
 Indicates an annual percentage change > 1% per year in a favorable direction.
 Indicates an average annual percentage change <= 1% per year.
 Indicates an annual percentage change > 1% per year in an unfavorable direction.
^c The result represents the national average calculated (◊) from beneficiary-level data or (◊◊) as a simple average of provider rates.
^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.
^e Lower rates indicate better performance.
^f Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

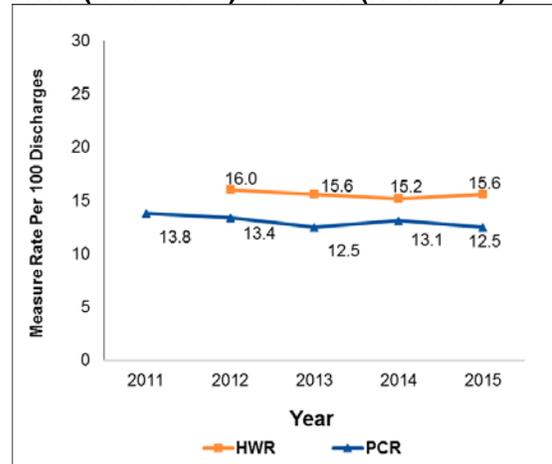
Trend Analyses

The rates for Key Indicator #1 are discussed in this section. Key Indicator #1 includes Hospital-Wide Readmissions (Key Indicator #1a) and Plan All-Cause Readmissions (Key Indicator #1b). The all-cause, all-condition readmission trends for Key Indicator #1 are shown in Figure 3-1.

Key Indicator #1 – Measure rates for *Hospital-Wide Readmissions (HWR)* (NQF #1789) were stable for the FFS population, while the *Plan All-Cause Readmissions (PCR)* (NQF #1768) measure rates decreased (improved) for the Part C population.

Rates for both measures have not reached the calculated achievable results, indicating opportunity to further reduce excess readmissions. Although the measure specifications of these two measures do not entirely align, the differences in rates are consistent with prior studies that show readmission rates for Part C to be lower than those for the FFS Medicare population.^{64,65}

Figure 3-1: Key Indicator #1 Trend Graph – HWR (NQF #1789) and PCR (NQF #1768)



The *HWR* (NQF #1789) all-cause, all-condition readmission trend remained stable for the FFS population from 2012 through 2015, and the *PCR* (NQF #1768) trend for the Part C population improved (Figure 3-1). In 2004, before CMS focused on reducing excess readmissions, nearly one in five Medicare FFS hospital discharges resulted in a readmission within 30 days, accounting for more than \$17 billion in avoidable Medicare expenditures annually.⁶¹ In 2008, CMS began to measure readmissions in the FFS population with three condition-specific readmission measures.^{xliv} CMS implemented the Hospital Readmissions Reduction Program in 2012, which coincides with the first annual reporting period for *HWR*. From 2008 through 2012, rates for readmissions for the three targeted conditions and for all readmissions improved faster than the rates from 2012 through 2015.⁶⁶

Patient Impact and Cost-Avoided Analyses

For *PCR* (NQF #1768), which measures unplanned readmissions in the Part C population, approximately 70,000 fewer unplanned readmissions occurred from 2011 through 2015 than if performance had remained at the 2011 rate. The net decrease of an estimated 70,000 all-cause readmissions for Part C patients 65 and older for *PCR* (NQF #1768) over the five-year period from 2011 through 2015 resulted in total estimated health care costs avoided of \$1.02 billion to \$1.05 billion. The analyses are based on two prior studies^{67,68} that estimated hospital costs for a single all-cause readmission stay to range from \$14,502 to \$14,882 for patients 65 and older.^{xlv}

For *HWR* (NQF #1789), patient impact and cost-avoided analyses, which are calculated over time, were not conducted due to the rates remaining stable.

Disparities

Disparities were observed for *HWR* (NQF #1789) and *PCR* (NQF #1768) (Key Indicator #1) in the areas of income, race/ethnicity, and urbanicity for 2015. Health care experts acknowledge that these social risk factors play a role in the health of a population.^{58(p. 38237)} The results are as follows:

Income – Rates were higher for the low-income groups for both *HWR* (NQF #1789) and *PCR* (NQF #1768) (Figure 3-2). Readmission rates for *HWR* (NQF #1789) were significantly higher for the low-income group (16.8%), compared with the high-income reference group (14.9%). The four-year trend analysis suggests that these significant disparities between the low-income group and the high-income reference group are consistent over time (data not shown).

Specific to *PCR* (NQF #1768), rates for both medium-low and low-income groups (12.4% and 12.3%, respectively) were significantly higher than for the high-income reference group (11.1%). The differences between both medium-low and low-income groups compared with the high-income

^{xliv} Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) Following Acute Myocardial Infarction (AMI) Hospitalization (NQF #0505), Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Heart Failure (HF) Hospitalization (NQF #330), and Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) Following Pneumonia Hospitalization (NQF #0506)

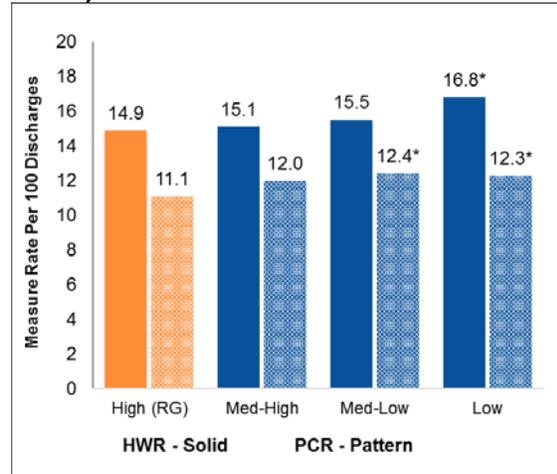
^{xlv} As cost estimates are based on data from the AHRQ Healthcare Cost and Utilization Project (HCUP) Nationwide Readmissions Database (NRD) and the State Inpatient Databases (SID), and these data sources omit costs related to physician service fees, the cost-avoided estimates may underestimate the health care costs avoided associated with reductions in hospital readmissions from the payer perspective. The calculation does not account for payment reductions resulting from the HRRP.

reference group are widening over time, based on a five-year disparity trend analysis.

Race/Ethnicity – For *HWR* (NQF #1789), Blacks and Hispanics had significantly higher readmission rates (19.4% and 17.5%, respectively) than the White reference group (15.2%). For *PCR* (NQF #1768), significantly lower readmission rates were identified for the Hispanic (10.3%), Asian (9.5%), and American Indian or Alaska Native (10.8%) groups compared with the White reference group (12.4%) (Figure 3-3). Differences in rates for these three groups are widening over time, based on a five-year trend analysis.

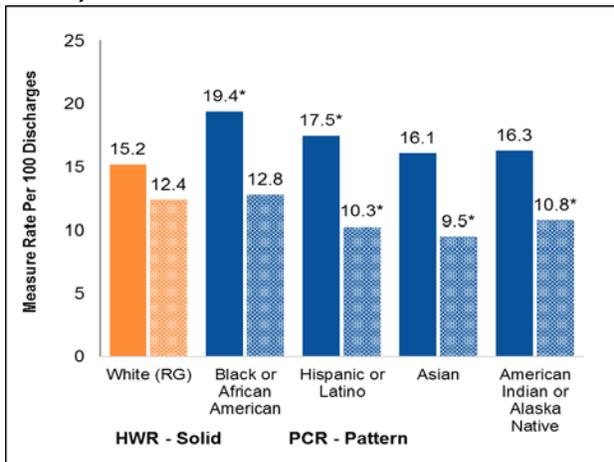
Urbanicity – Of note, readmission rates for *PCR* (NQF #1768) were lower for patients residing in more rural areas—small metro (11.0%), micropolitan (10.9%), and noncore (10.2%)—compared with the large central metro reference group (12.5%) (Figure 3-4). Variation is consistent over time, based on a three-year trend analysis for the *PCR* population. No urbanicity disparities were identified for *HWR* (NQF #1789 (data not shown).

Figure 3-2: Key Indicator #1 Disparities by Income – HWR (NQF #1789) and PCR (NQF #1768)



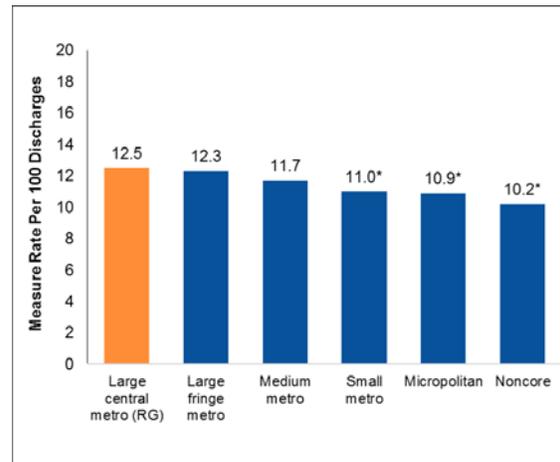
Note: The orange bars represent the reference group (RG) for income (high). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%). The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups.

Figure 3-3: Key Indicator #1 Disparities by Race/Ethnicity – HWR (NQF #1789) and PCR (NQF #1768)



Note: The orange bars represent the reference group (RG) for the disparity category. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

Figure 3-4: Key Indicator #1 Disparities by Urbanicity – PCR (NQF #1768)



Patient Experience with Care Coordination

Care coordination ensures that current, accurate information follows the person and is available across each setting and at each interaction, which can make health care safe, effective, and efficient. Care transition refers to the movement of a patient from one health care setting to the next. The care transition and care coordination Key Indicators are derived from surveys of patients recently discharged from a hospital and from surveys of Medicare beneficiaries who received care in the ambulatory setting. These Key Indicators address the improvement of communication, care coordination, and satisfaction with care.

National Quality Dashboard

One measure was selected for Key Indicator #2, Care Transition, and one measure representing two populations was chosen for Key Indicator #3, Care Coordination. The measures and results of analyses are shown in Dashboard 3-2. A discussion of the results follows the dashboard.

Dashboard 3-2: Patient Experience with Care Coordination^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Respondents/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
2 – 3-Item Care Transition Measure (CTM-3) (NQF #0228) (↑ = Favorable)						
Hospital: IQR, VBP HCAHPS	 1.1% ^b	4,239 Hospitals	3,031,740 Sample	51.3% ^{c◊◊} 2013	52.5% ^{c◊◊} 2015	63.6% ^d
3 – Care Coordination Composite (Not Endorsed) (↑ = Favorable)						
FFS Medicare FFS CAHPS	 -0.2% ^b	Not determined	77,383 Sample	85.6% ^{c◊} 2012	85.0% ^{c◊} 2015	Not determined [†]
Part C Star Ratings MA/MA-PD CAHPS	 0.0% ^b	466 Contracts ^e	132,019 Sample	85.2% ^{c◊} 2012	85.0% ^{c◊} 2015	89.6% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated (◊) from beneficiary-level data or (◊◊) as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

[†] Data were not collected at a provider or plan level; therefore, achievable result could not be calculated.

^e Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

Trend Analyses

The rates for the *3-Item Care Transition Measure* (Key Indicator #2) and *Care Coordination Composite* (Key Indicator #3) are discussed in this section.

Key Indicator #2 – HCAHPS (NQF #0166), used in the Hospital IQR Program, includes the *Care Transition Measure* (CTM-3) as a component. The results for Key Indicator #2 reflect the analysis of *CTM-3* and represent the average of the proportion of patients who responded with *Strongly agree* to three statements related to the alignment of discharge plans with the person’s preferences and the person’s understanding of his or her needs when going home from the hospital. The rate for the measure, using the “top box” method of scoring, improved from 51.3% (2013) to 52.5% (2015) (Figure 3-5).

Figure 3-5: Key Indicator #2 Trend Graph – Care Transitions Measure (CTM-3)

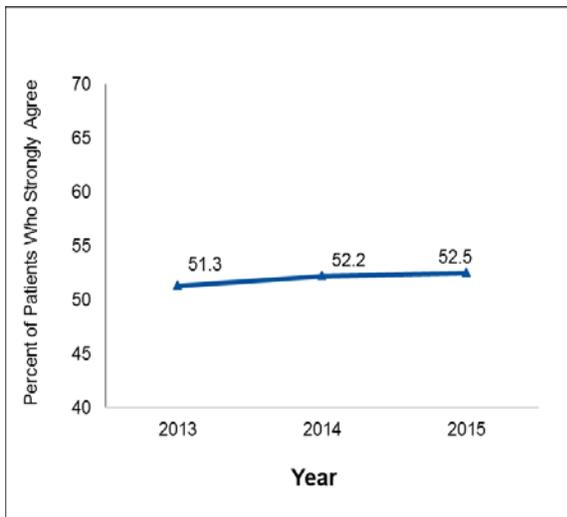
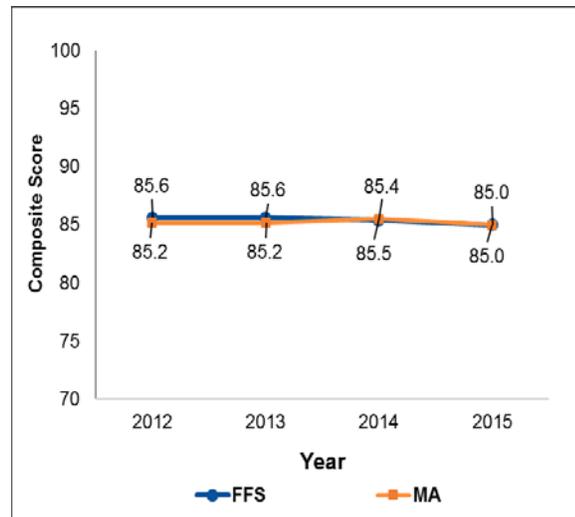


Figure 3-6: Key Indicator #3 Trend Graph – Care Coordination Composite – FFS and MA



Key Indicator #3 – Key Indicator #3 incorporates the *Care Coordination Composite* measure for Medicare FFS CAHPS and MA-PD CAHPS. The *Care Coordination Composite* comprises six survey items and is scored using the linear mean. The component items for the composite are six survey questions about patient experiences with a doctor relating to the transfer of current health information between providers and communicating with the patient, in particular with regard to test results, in the past six months.⁶⁹ Although the rate for FFS was slightly higher in 2012 (85.6%) than for MA/MA-PD, the trend lines for FFS and MA converged in 2015 (Figure 3-6).

Patient Impact and Cost-Avoided Analyses

Applying the results from patients who were surveyed and reported *Strongly agree* responses to the population of eligible patients, an estimated 470,000 more patients had favorable experiences with their care transitions. Patient impact analyses were not conducted for *Care Coordination Composite* (Key Indicator #3) because patient-level data were not available for this report. Cost-avoided analyses for measures of patient experience were not conducted due to the inability to quantify costs averted associated with patient perceptions.

Disparities

Disparities for age (Figure 3-7) and race/ethnicity (Figure 3-8) were observed for Key Indicator #2, the HCAHPS 3-Item Care Transition Measure (CTM-3) (NQF #0228). The 3-Item Care Transition Measure was adjusted for health, education, response percentile, age, services line, and language spoken at home. The 85+ group scores were significantly lower than scores for the 65–84 reference group. Notable differences were also identified for the Asian group score (47%) compared with the White reference group score (53.6%). These differences for the 85+ group and Asians compared with the reference groups are consistent over time, based on a three-year trend analysis.

Disparity analyses were conducted for Key Indicator #3, *Care Coordination Composite*, for both FFS Medicare and Part C populations. No disparities were identified.

Figure 3-7: Key Indicator #2 Disparities by Age – Care Transitions Measure (CTM-3)

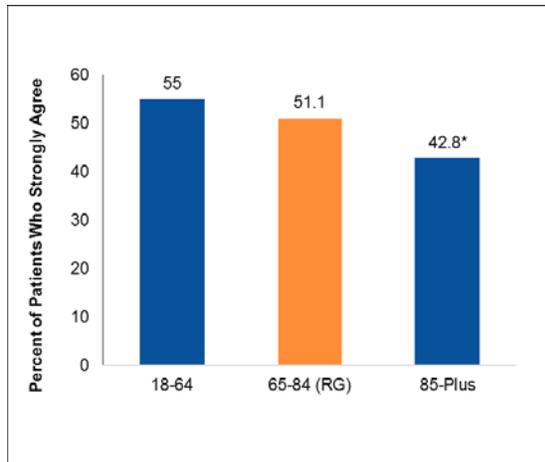
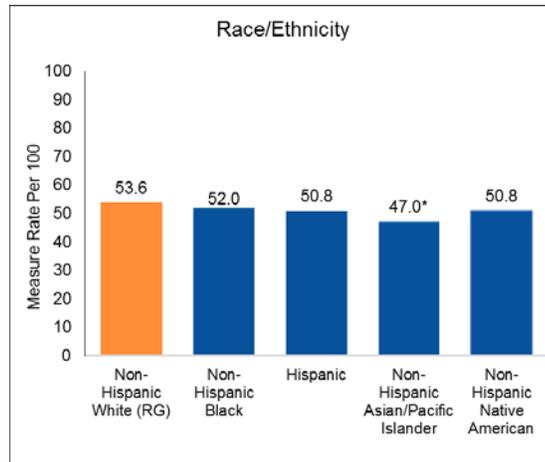


Figure 3-8: Key Indicator #2 Disparities by Race/Ethnicity – Care Transitions Measure (CTM-3)



Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

MEASURE GAPS

CMS will evaluate gaps in high-impact areas when considering future measure initiatives.

- Topics for high-impact measurement areas in which current measures were not available were considered as future topics for national improvement. Telehealth, improved interoperability of electronic health records (EHRs), transfer of health information, medication reconciliation, reduction of unexpected hospital/emergency department visits and admissions, and effective health system navigation are topics related to effective care coordination. Measures on these topics are being developed or are being considered for development.
- CMS is creating an aligned set of measures of care coordination concepts for post-acute care settings (IRF, LTCH, SNF, HHA). The Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 requires aligned measures on care coordination topics including discharge to community, all condition risk-adjusted potentially preventable hospital readmissions, and the exchange of health information and care preferences when an individual transitions between providers or settings.³⁸

4 – Effective Treatment



BACKGROUND

Two out of three Medicare fee-for-service beneficiaries have two or more chronic conditions and account for 99% of Medicare 30-day readmissions⁷⁰. These beneficiaries are at risk of dying, being hospitalized, or experiencing challenges with care coordination.¹⁷ Effective prevention and treatment lead to better patient outcomes, including improved survival, function, and quality of life for both acute and chronic conditions.

Thus, promoting effective prevention and treatment of chronic disease is a priority for CMS. CMS employs quality measurement as well as quality improvement initiatives and value-based purchasing to improve health outcomes for people with chronic conditions and to achieve the strategic result of reducing and preventing the leading causes of mortality.¹⁷

KEY INDICATORS

After expert review by the TEP and FASC,^{xlvi} nine measures were selected from the 286 Effective Treatment measures^{xlvi} to highlight CMS progress toward achieving the objectives of the CMS quality priorities.^{xlvi,17} These nine measures were mapped to five Key Indicators.

The Key Indicators align with the objectives of the CMS priority of Effective Treatment (Table 4-1). The nine measures that map to the Key Indicators are included in the National Quality Dashboards that follow this section.

Table 4-1: Effective Treatment Objectives and Related Key Indicator Topics

Effective Treatment Objective ¹⁷	Key Indicator Topic (Number of Measures)
Strengthen interventions to prevent heart attacks and strokes.	<u>Mortality</u> 1 – Heart Failure Mortality (1) 2 – Acute Myocardial Infarction Mortality (1)
Improve quality of care for people with multiple chronic conditions.	3 – Chronic Obstructive Pulmonary Disease Mortality (1) <u>Management of Chronic Conditions</u> 4 – Controlling High Blood Pressure (3) 5 – Hemoglobin A1c Poor Control (>9%) (3)

Mortality

Cardiovascular disease has been the leading cause of death in the United States for decades⁷¹ with the majority of these deaths attributed to coronary artery disease (45.1%) and heart failure (8.5%).⁷² Despite advances in cardiac care, deaths due to heart disease increased by 3.0% during

^{xlvi} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{xlvi} The total number of effective treatment measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{xlvi} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

2011–2014,⁷³ underscoring the CMS priority to implement mortality measures associated with hospitalizations for patients with heart conditions.

CMS has also implemented a mortality measure for chronic obstructive pulmonary disease (COPD), which is the third leading cause of death in the United States.⁷⁴ In 2015, 11.2% of all Medicare FFS beneficiaries had a diagnosis of COPD,⁷⁵ which has associated risks of long-term disability and death.⁷⁴

National Quality Dashboard

Three Key Indicators were selected: 30-day mortality following hospitalizations for heart failure, AMI, and COPD. The measures and the results of analyses are shown in Dashboard 4-1. A discussion follows the dashboard.

Dashboard 4-1: Mortality^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1 – 30-Day Mortality Following HF Hospitalization (NQF #0229)^e (↓ = Favorable)						
Hospital: IQR, VBP	 0.9% ^b	4,640 Hospitals	976,803 Population	11.1% ^c 2008	11.9% ^c 2015	6.6% ^d
2 – 30-Day Mortality Following AMI Hospitalization (NQF #0230)^e (↓ = Favorable)						
Hospital: IQR, VBP	 -2.1% ^b	4,365 Hospitals	494,752 Population	16.6% ^c 2008	14.3% ^c 2015	9.8% ^d
3 – 30-Day Mortality Following COPD Hospitalization (NQF #1893)^e (↓ = Favorable)						
Hospital IQR	 1.4% ^b	4,643 Hospitals	769,860 Population	7.8% ^c 2013	8.0% ^c 2015	3.7% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated from beneficiary-level data.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Lower rates indicate better performance.

Trend Analyses

The rates for the Heart Failure Mortality (Key Indicator #1), AMI Mortality (Key Indicator #2), and COPD Mortality (Key Indicator #3) are discussed in this section. Figure 4-1 shows the rates for heart failure and AMI from 2008 through 2015 and for COPD from 2013 through 2015.

Key Indicator #1 – The adjusted national rates for *30-Day Mortality Following Heart Failure Hospitalization* (NQF #0229) were stable from 2008 through 2015. During this same period, the number of Medicare FFS beneficiaries admitted for heart failure decreased by 15.9%. This decrease in admissions parallels changes in the overall prevalence of heart failure in the

Medicare FFS population over the age of 65, which decreased from 17.3% in 2008 to 14.3% in 2015.⁷⁵

Key Indicator #2 – Rates for *30-Day Mortality Following Acute Myocardial Infarction Hospitalization* (NQF #0230) showed continued improvement from 2008 through 2015. Admissions and mortality rates for AMI decreased during the same period.

The prevalence of ischemic heart disease in the Medicare FFS population over the age of 65 also decreased from 33.3% to 28.6% during the same time frame.⁷⁵ Of note, AMI admissions decreased by 96,143 from 2008 through 2015, representing a 16.2% reduction, and hospital AMI 30-day mortality decreased by 27,912 from 2008 through 2015, representing a 28.5% reduction.

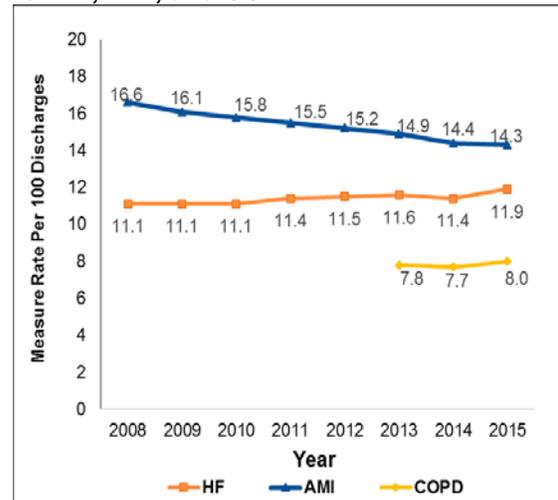
Key Indicator #3 – Rates for *30-Day Mortality Following Chronic Obstructive Pulmonary Disease Hospitalization* (NQF #1893) increased from 2013 through 2015 from 7.8% to 8.0%. Of note, while the number of COPD deaths decreased over time, the population included in the measure cohort (admissions) was reduced by a larger proportion, resulting in an increased mortality rate. The change in cohort size may indicate that patients with less severe disease are being treated in the outpatient versus inpatient setting. The prevalence of COPD in the Medicare FFS population over the age of 65 remained stable at 11.2% during the same time frame.⁷⁶

Patient Impact and Cost-Avoided Analyses

Rates for the AMI mortality measure decreased from 16.6% in 2008 to 14.3% in 2015, suggesting that improvements in AMI care resulted in an estimated 13,000 fewer deaths from 2008 through 2015 than would be expected from the baseline rate. During 2015, an estimated 1,400 more deaths occurred within 30 days of COPD discharge than would have been expected if performance had remained at the 2013 rate. Even though the number of deaths from COPD decreased by 3,052 from 2013 to 2015, the rates for COPD mortality increased from 7.8% to 8.0%. The rate increased even though the number of deaths decreased because the number of admissions (denominator) decreased by a greater proportion (6.9%) than did the number of deaths (numerator) (4.7%).

Cost-avoided analyses were not feasible for mortality measures. Other types of economic analyses, such as estimation of the value of a human life, were not conducted for this report.^{xlix}

Figure 4-1: Key Indicator #1 Trend Graph – 30-Day Mortality Following Hospitalization for HF, AMI, and COPD



^{xlix} For additional information on the methodology of patient impact or cost-avoided analyses, see *Methods* (Appendix D).

Disparities

For the three Key Indicators of 30-day mortality, the disparities highlighted for mortality are race/ethnicity, sex, and urbanicity.

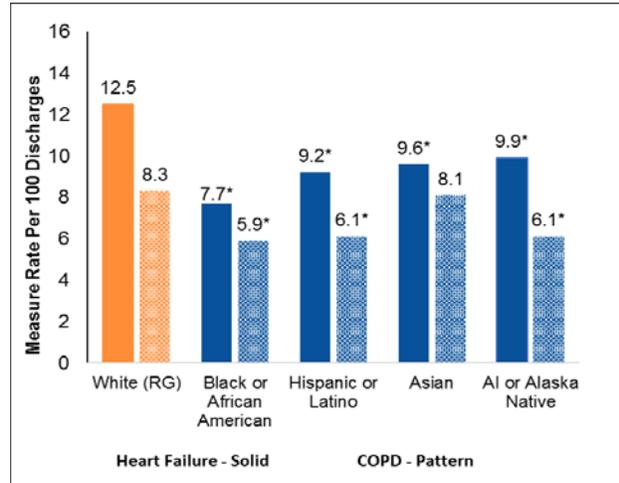
Race/Ethnicity – Disparities by race/ethnicity were observed for each of the mortality Key Indicators. These disparities are consistent over time, based on a three-year trend analysis with the exception of AMI mortality for AI/Alaska Native and COPD mortality for Asian. For these two group, disparities observed are getting smaller over time.

For heart failure (Figure 4-2), the White reference group had markedly higher mortality rates following a hospital stay than other groups identified on the graph. Relative differences in heart failure mortality rates range from 21% lower for American Indians/Alaska Natives to 39% lower for Blacks/African Americans.

For COPD (Figure 4-2), the White reference group also had statistically significantly higher mortality rates following a hospital stay than other groups except Asians. These findings are consistent with other published literature⁷⁷ and present an opportunity for further research to better understand the contributing factors.

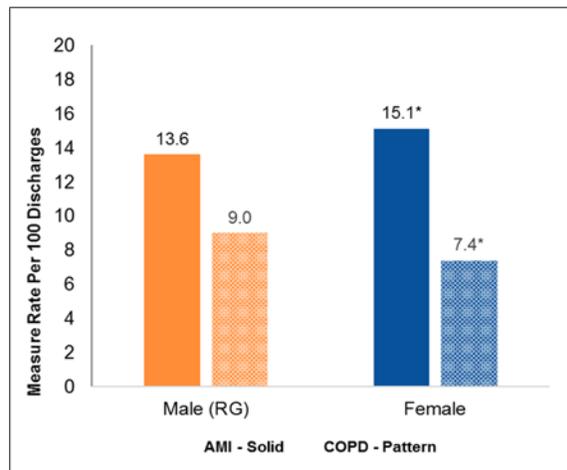
Sex – Disparities associated with sex were found for AMI and COPD mortality (Figure 4-3). AMI mortality rates were significantly higher for females than males, while COPD mortality rates were significantly higher for males than females. These differences are consistent over time, based on a three-year trend analysis. AMI mortality and COPD mortality research identifies similar disparities between males and females.^{78,79}

Figure 4-2: Key Indicator #1 Disparities by Race/Ethnicity – 30-Day Mortality Following Heart Failure and COPD Hospitalization



Note: The orange bars represent the reference group (RG). * The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10 percent).

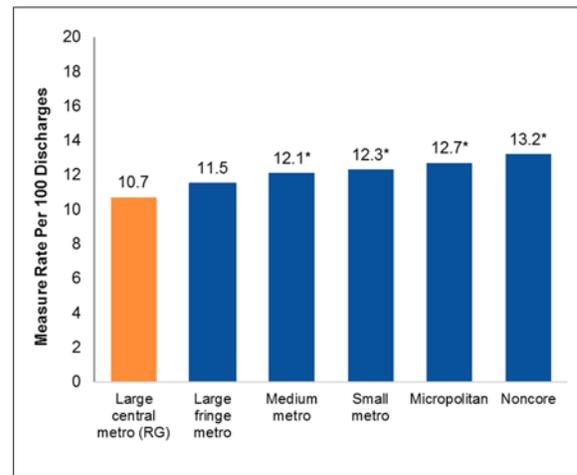
Figure 4-3: Key Indicator #1 Disparities by Sex – 30-Day Mortality Following AMI and COPD Hospitalization



Note: The orange bars represent the reference group (RG) for the disparity category. *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

Urbanicity – Disparities related to urbanicity were observed for heart failure mortality (Figure 4-4). The micropolitan and noncore (rural categories) had the highest rates (12.7% and 13.2%, respectively) of all groups included in the urbanicity category. A three-year trend analysis shows that these differences remain consistent over time. These disparities are similar to other research findings that suggest mortality rates increase with decreasing levels of urbanicity.⁸⁰

Figure 4-4: Key Indicator #1 Disparities by Urbanicity – 30-Day Mortality Following Heart Failure Hospitalization



Note: The orange bars represent the reference group (RG) for the disparity category. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore.

*The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

Management of Chronic Conditions

Hypertension and diabetes are chronic conditions that affect a large percentage of Medicare patients. In 2015, 58% of all Medicare FFS beneficiaries had a diagnosis of hypertension,⁷⁵ and 27% of all Medicare FFS beneficiaries had a diagnosis of diabetes.⁷⁵ The high prevalence of hypertension and diabetes has serious implications for the Medicare program and for patients and families. Individuals with hypertension are at risk for cardiovascular disease, stroke, and renal failure,^{81,82} and those with diabetes are two to four times more likely than people without the disease to have a stroke or die of heart disease.⁸³ Other complications from diabetes include kidney failure, lower-limb amputations, and adult-onset blindness.⁸⁴ Proper management of blood pressure and control of blood sugar can prevent or delay the onset of complications.^{85,86}

National Quality Dashboard

Two Key Indicators were selected to focus on the management of hypertension and diabetes. The measures and the results of the analyses are shown in Dashboard 4-2.

Dashboard 4-2: Management of Chronic Conditions^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
4 – Controlling High Blood Pressure (NQF #0018) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	-0.3% ^b	292 Group Practices	83,382 Sample	69.0% ^{c00} 2012	68.6% ^{c00} 2015	85.9% ^d
Medicare Shared Savings Program	2.7% ^b	392 ACOs	161,511 Sample	63.7% ^{c00} 2012	69.6% ^{c00} 2015	75.9% ^d
Part C Star Ratings	2.0% ^b	375 Contracts ^f	152,953 Sample	56.6% ^{c0} 2006	65.3% ^{c0} 2013	Not applicable

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
(New specifications – not endorsed) Part C Star Ratings (2014–2015) ^g	Insufficient data	385 Contracts ^f	141,949 Sample	70.2% ^c 2014	69.3% ^c 2015	86.4% ^d
5 – Hemoglobin A1c Poor Control (> 9%) (NQF #0059)^h (↓ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	 -2.8% ^b	280 Group Practices	70,262 Sample	18.8% ^c 2012	17.5% ^c 2015	9.3% ^d
Medicare Shared Savings Program	 -7.4% ^b	393 ACOs	161,299 Sample	25.7% ^c 2012	20.6% ^c 2015	11.6% ^d
Part C Star Ratings	 -3.5% ^b	388 Contracts ^f	246,290 Sample	31.4% ^c 2006	24.8% ^c 2015	10.0% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated (◊) as a simple average of provider rates or (◊◊) as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Data for PQRS are limited to group practices that chose the Web Interface reporting option.

^f Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

^g HEDIS® specifications revised the definition for adequate blood pressure control (< 140/90 for all individuals ages 18–85 with hypertension) to include blood pressure of < 150/90 for individuals ages 60–85 without a diagnosis of diabetes. Only two annual data points were available; therefore, a trend analysis was not performed.

^h Lower rates indicate better performance.

Trend Analyses

The rates for the Key Indicators Controlling High Blood Pressure and Hemoglobin A1c Poor Control (> 9%) are discussed in this section. The performance rates for these Key Indicators are shown in Figures 4-5 and 4-6.

Key Indicator #4 – The performance rates for *Controlling High Blood Pressure* (NQF #0018) were stable for the PQRS clinician group practices that used the GPRO Web Interface reporting method, while the performance trend for Medicare Shared Savings Program increased from 63.7% in 2012 to 69.6% in 2015. The performance rates for Part C plans improved from 56.6% in 2006 to 65.3% in 2013 (Figure 4-5). The rates for *Controlling High Blood Pressure* (NQF #0018) in the Medicare programs show more individuals with controlled blood pressure than in a nationally representative survey where the rate was 54% (2013–2014).⁸⁷

The measure specifications for *Controlling High Blood Pressure* were aligned across programs through 2013, defining “control” as a blood pressure no higher than 140/90. For 2014 and 2015, Medicare Part C used the new HEDIS® specifications that allow for a blood pressure no higher than 150/90 to be considered “controlled” for individuals over 60 years old without diabetes. Because the measure rates for Medicare Part C from 2006 through 2013 and from 2014 through 2015 are no longer comparable, only the rates for 2006 through 2013 are displayed in Figure 4-5.

Key Indicator #5 – Performance rates for *Hemoglobin A1c Poor Control (>9%)* (NQF #0059) improved for the PQRS group practices that used the GPRO Web Interface reporting method and for Medicare Shared Savings ACOs from 2012 through 2015. Rates for Part C plans improved from 2006 through 2015 (Figure 4-6). Medicare Advantage plans had more individuals with diabetes in poor control than either clinician groups or Medicare Shared Savings Program ACOs.

The rates for *Hemoglobin A1c Poor Control (>9%)* (NQF #0059), shown in Dashboard 4-2 and Figure 4-6, are similar to the 2011-2014 rate of 20.6% from the National Health and Nutrition

Figure 4-5: Key Indicator #4 Trend Graph – Controlling High Blood Pressure – Medicare Shared Savings, PQRS Group Practices, and Part C Star Ratings

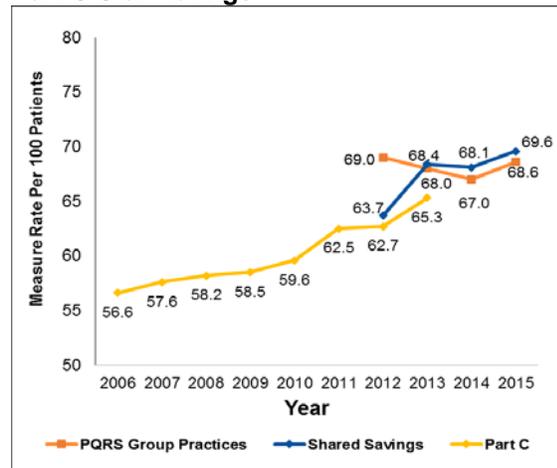
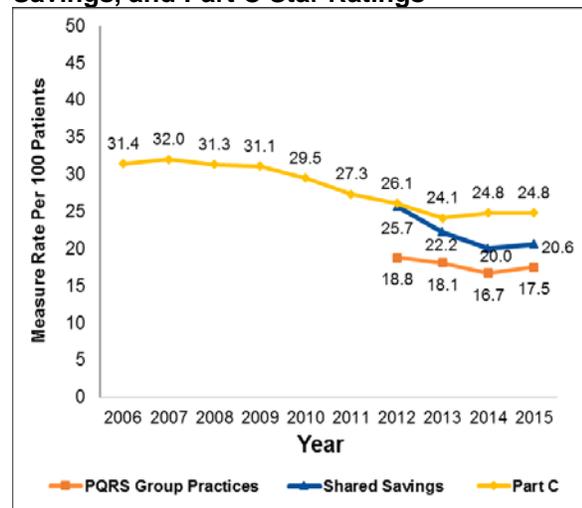


Figure 4-6: Key Indicator #4 Trend Graph – Hemoglobin A1c Poor Control – PQRS Group Practices, Medicare Shared Savings, and Part C Star Ratings



Note: Lower rate indicates better performance.

Examination Survey (NHANES). The NHANES rate includes persons with diabetes who are 20 years and older.⁸⁷(Table 40)

Patient Impact and Cost-Avoided Analyses

Patient impact and cost-avoided analyses were conducted for Key Indicator #4, Controlling High Blood Pressure, and Key Indicator #5, Hemoglobin A1c Poor Control (>9%).^{1,ii}

Key Indicator #4 – The analyses of patient impact for *Controlling High Blood Pressure* (NQF #0018) produced an estimate that an additional 210,000 patients in the Medicare Shared Savings Program (2012–2015) and 460,000 more patients in Medicare Part C (2006–2013) had controlled high blood pressure compared with the expected numbers at the baseline rate.

The estimated 10-year health care costs avoided range from \$56.9 million to \$292.2 million for the approximately 210,000 additional patients with controlled hypertension in the Medicare Shared Savings Program and from \$127.3 million to \$653.8 million for the estimated 460,000 more patients with controlled hypertension in Medicare Part C. These calculations were based on estimated potential 10-year health care costs avoided for hypertension control ranging from \$275 to \$1,411 per patient (2015 dollars).⁸⁸ The cost estimates exclude the health care costs associated with treating hypertension. The range in health care cost estimates is primarily driven by assumptions related to hypertension severity and associated risks.

Key Indicator #5 – The results of the analyses of the estimated patient impact for *Hemoglobin A1c Poor Control (>9%)* (NQF #0059) indicate that approximately 60,000 fewer patients in the Medicare Shared Savings Program (2012–2015), 440,000 fewer patients in Medicare Part C (2006–2015), and 6,800 fewer patients in the PQRS clinician group practices (2012–2015) had poor diabetic control than would be expected from the baseline rate.

For the Medicare Shared Savings Program, the health care costs avoided for the estimated 60,000 fewer patients with poor diabetic control range from \$765.7 million to \$1.2 billion. For Medicare Part C, the health care costs avoided for the estimated 440,000 fewer patients with poor diabetic control range from \$5.6 billion to \$9.0 billion. For the PQRS program, the health care costs avoided for the approximately 6,800 fewer patients with poor diabetic control range from \$87.5 million to \$139.5 million. These results were based on an estimated 10-year health care cost difference between individuals with diabetic control and those without diabetic control, ranging from \$12,790 to \$20,410 per patient (in 2015 dollars).^{89,90} The range in the 10-year health care costs avoided estimates is primarily driven by assumptions related to the prevalence of potential diabetic complications. The costs related to diabetes treatment were not included.

¹ The patient impact for *Controlling High Blood Pressure* (NQF #0018) and *Hemoglobin A1c Poor Control (>9%)* was estimated by weighting the results from the sample to the relevant total number of patients served by each of the programs. Differences were estimated between the first and last year, as opposed to a net difference over time to limit patient duplication, as the same patient could be included in the numerator over time.

ⁱⁱ For additional information on the methodology of patient impact or cost-avoided analyses, see *Methods* (Appendix D).

Disparities

Disparities analyses were conducted for both chronic conditions Key Indicators. Patient-level data were not available for this report for PQRS clinician group practices or Medicare Shared Savings ACOs; therefore, disparities analyses could not be performed for these programs.^{lii} Significant findings for Part C are detailed below.

Key Indicator #4 – Disparity analyses were conducted on the 2015 Part C Star Ratings data for *Controlling High Blood Pressure*. Disparities were observed for race/ethnicity with significant disparities present for all racial/ethnic categories relative to Whites except for the Hispanic group (Figure 4-7). These findings are similar to other published literature that found lower levels of blood pressure control in racial and ethnic minority groups.⁹¹

Key Indicator #5 – The analyses of *Hemoglobin A1c Poor Control* in the Part C Star Ratings shows disparities by race/ethnicity and region. Results for both race/ethnicity and region are discussed and displayed below.

Race/Ethnicity – In the Part C Star Ratings, both Whites and Asians had significantly better rates than all the other groups for *Hemoglobin A1c Poor Control* (Figure 4-8). In particular, the American Indian/Alaska Native Group rate of poor control, 35.4%, was significantly higher than the White reference group rate of 24.6%.

Figure 4-7: Key Indicator #4 Disparities by Race/Ethnicity – Controlling High Blood Pressure – 2015 Part C Star Ratings

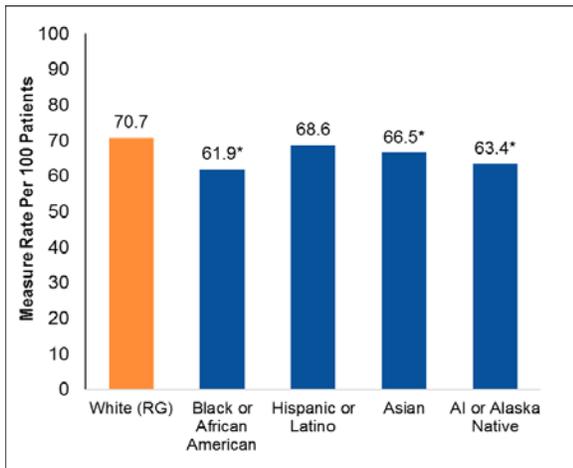
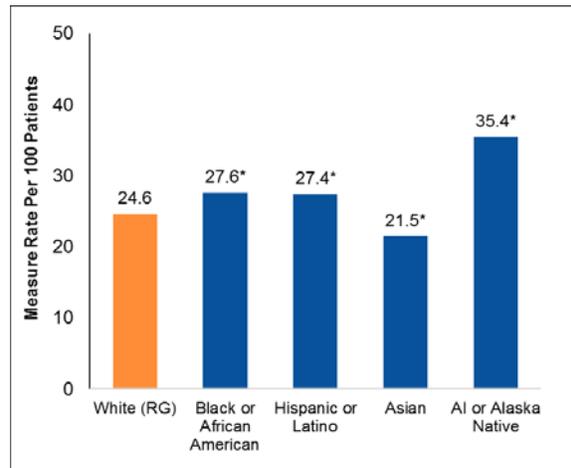


Figure 4-8: Key Indicator #5 Disparities by Race/Ethnicity – Hemoglobin A1c Poor Control (Part C)

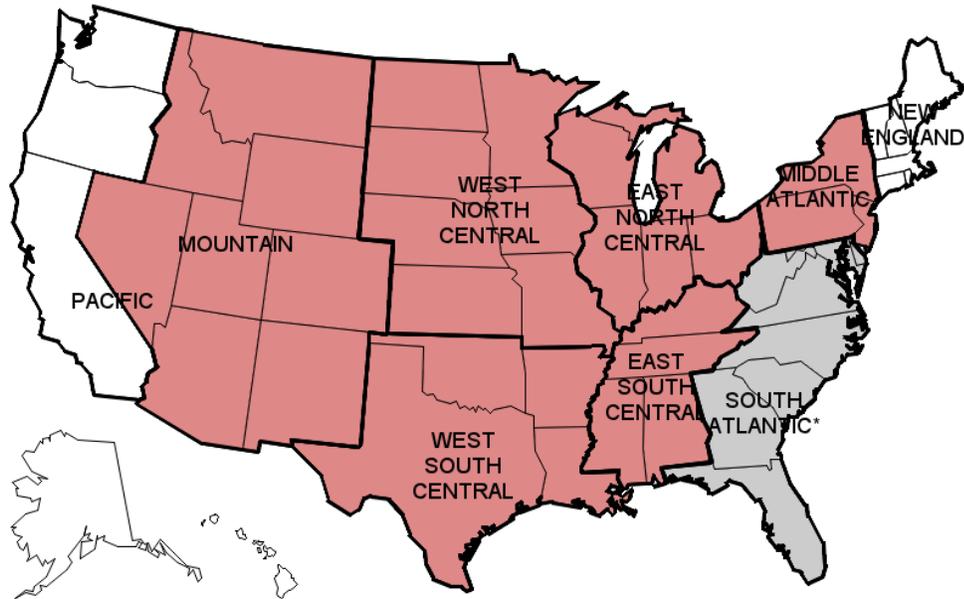


Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%). Lower values indicate better performance.

^{lii} Patient-level data are collected for PQRS clinician group practices and Medicare Shared Savings Program and will be available for future reports.

Region – Rates for *Hemoglobin A1c Poor Control* were lower in the South Atlantic (reference region), New England, and Pacific regions compared with the rest of the country (Figure 4-9). Regional disparities increased over a 10-year period for all regions except the West North Central region.

Figure 4-9: Key Indicator #5 Disparities by Region – Hemoglobin A1c Poor Control (Part C)



Note: South Atlantic (gray shading) is the reference group for region. Map areas shaded red have lower performance than the South Atlantic reference area, which has the largest population of the regions and thus was chosen as the reference point. Map areas without shading (white) represent similar performance than the reference area. *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

MEASURE GAPS

CMS will evaluate gaps in high-impact areas when considering future measure initiatives. Outcome measures specific to functional status and patient-reported outcomes, multiple chronic conditions, treatment of mental or substance use disorders (including opioid use and comorbid conditions for which patients with mental or substance use disorders are at higher risk) and end stage renal disease were identified as potential topics for national improvement. Measures recently developed address some of these gaps. Examples include *All-Cause Unplanned Admissions for Patients with Multiple Chronic Conditions*, in use in the Medicare Shared Savings Program,^{92(p. 67911-67912)} and *Opioid Therapy Follow-up Evaluation*, in use in the Quality Payment Program.^{93(p. 71161-71162)}

5 – Healthy Living



BACKGROUND

Partnerships and relationships are essential to achieving the desired outcomes of this CMS quality priority: Work with communities to promote best practices of healthy living (Healthy Living). Preventive services such as screenings for chronic conditions, immunizations for diseases such as influenza and pneumonia, and counseling about personal health behaviors can prevent disease or detect disease early, when treatment is more effective. However, less than 50% of adults age 65 years or older are up to date on preventive services.⁹⁴ CMS supports federal, state, and local efforts to prevent diseases by promoting healthy lifestyle behaviors and providing immunizations and evidence-based screenings.¹⁷

KEY INDICATORS

After expert review by the TEP and FASC,^{liii} 18 measures were selected from the 70 Healthy Living measures^{liv} to highlight CMS progress toward achieving the objectives of the CMS quality priorities.^{lv,17} These 18 measures were mapped to six Key Indicators that align with an objective of the CMS priority of Healthy Living (Table 5-1). The 18 measures that map to the Key Indicators are included in the National Quality Dashboards that follow this section.

Table 5-1: Healthy Living Objectives and Related Key Indicator Topics

Healthy Living Objective ¹⁷	Key Indicator Topic (Number of Measures)
Increase appropriate use of screening and prevention services.	<u>Influenza Immunization</u> 1 – Influenza immunizations (6) <u>Cancer Screening</u> 2 – Colorectal cancer screening (3) 3 – Breast cancer screening (3) <u>Healthy Weight</u> 4 – Healthy weight (2) <u>Depression Screening</u> 5 – Depression screening (2) <u>Tobacco Screening</u> 6 – Tobacco use (2)

Influenza Immunization

Though the effectiveness of vaccines can vary by type and subtype, the CDC estimates that from the 2005–2006 influenza season through the 2013–2014 season, immunizations prevented 40,000 influenza-related deaths, including more than 35,000 potential influenza-related deaths among adults age 65 and older.⁹⁵

^{liii} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{liv} The total number of healthy living measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{lv} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

National Quality Dashboard

Measures used in nursing homes and the ambulatory care setting were selected for Key Indicator #1, Influenza Immunization. The measures, along with results of analyses, are shown in Dashboard 5-1. A discussion of the Key Indicators follows the dashboard.

Dashboard 5-1: Influenza Immunization^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Respondents/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1a – Annual Flu Vaccine (NQF #0039) (↑ = Favorable)						
FFS Medicare FFS CAHPS	 0.7% ^b	Not applicable	124,992 Sample	70.2% ^c 2007	71.6% ^c 2015	Not determined [†]
Part C Star Ratings MA/MA-PD CAHPS	 0.7% ^b	466 Contracts ^e	153,666 Sample	70.2% ^c 2007	72.4% ^c 2015	83.2% ^d
1b – Influenza Immunization (NQF #0041) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^f	 2.8% ^b	298 Group practices	90,270 Sample	56.3% ^c 2012	63.3% ^c 2015	87.8% ^d
Medicare Shared Savings Program	 6.5% ^b	391 ACOs	167,848 Sample	49.8% ^c 2012	61.0% ^c 2015	72.9% ^d
1c – Percent of Residents Who Were Assessed and Appropriately Given the Seasonal Influenza Vaccine (↑ = Favorable)						
Nursing Home Quality Initiative (Short-Stay) (NQF #0680)	 0.7% ^b	47,058 Nursing homes	18,289,501 Population	82.1% ^c 2011	84.5% ^c 2015	98.9% ^d
Nursing Home Quality Initiative (Long-Stay) (NQF #0681)	 0.8% ^b	46,560 Nursing homes	15,072,635 Population	91.0% ^c 2011	94.6% ^c 2015	99.9% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated (◊) from beneficiary-level data or (◊◊) as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

[†] Data were not collected at a provider or plan level; therefore, achievable result could not be calculated.

^e Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.

^f Data for PQRS are limited to group practices that chose the Web Interface reporting option.

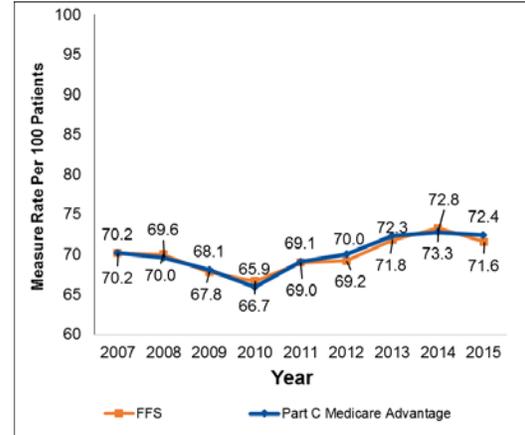
Trend Analyses

Measures reporting receipt of annual influenza immunizations were selected from Medicare quality programs for Key Indicator #1. Figures 5-1, 5-2, and 5-3 show performance trends.

Key Indicator #1 – National performance rates for the NQF #0039 and #0041 group of Key Indicator measures, which represent ambulatory populations, ranged from 61.0% to 72.4% in 2015. These rates align with CDC estimates that 66.7% of individuals 65 years and older in the United States received an influenza immunization during the 2014–2015 season.⁹⁶ The Healthy People 2020 target for annual influenza immunizations is for at least 90% of adults 65 and older to be immunized,⁹⁷ suggesting room for improvement.

Annual Flu Vaccine (NQF #0039) – National performance rates for Medicare FFS and Part C populations declined from 2007 to 2010, then rebounded after 2010. By 2015, rates were stable at the baseline level (Figure 5-1). The performance rates for *Annual Flu Vaccine* (NQF #0039) are calculated from beneficiary information obtained via the CAHPS surveys.

Figure 5-1: Key Indicator #1 Trend Graph – Annual Flu Vaccine – FFS and Part C



Influenza Immunization (NQF #0041) – National performance rates for PQRS clinician group practices and Medicare Shared Savings ACOs improved from 2012 through 2015 (Figure 5-2).

Percent of Residents Who Were Assessed and Appropriately Given the Seasonal Influenza Vaccine, Short-Stay (NQF #0680) and **Long-Stay** (NQF #0681) – Performance rates on both measures were stable from 2011 through 2015; however, rates for long-stay residents are closer to the achievable result than are the rates for short-stay residents (Figure 5-3). These measures⁹⁸ are calculated using data collected from resident assessments (MDS 3.0). Rates for both short-stay and long-stay populations are higher than for Medicare beneficiaries receiving care in the

Figure 5-2: Key Indicator #1 Trend Graph – Influenza Immunization – Group Practices and Medicare Shared Savings Program

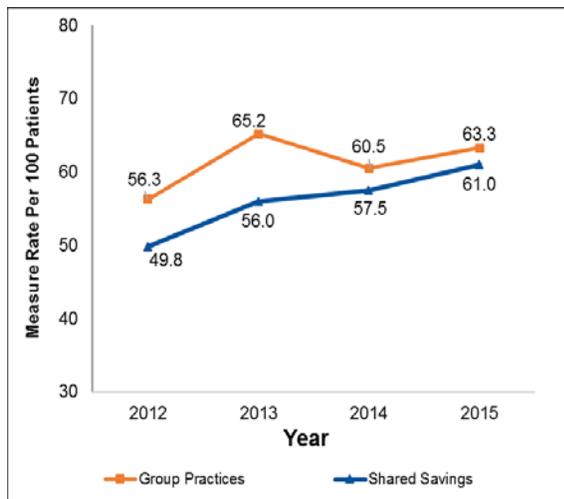
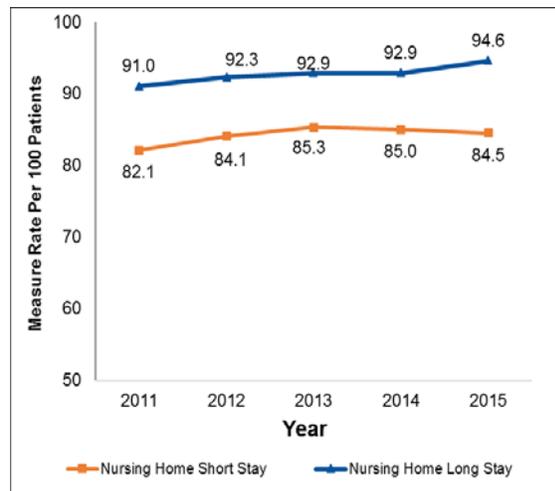


Figure 5-3: Key Indicator #1 Trend Graph – Seasonal Influenza Vaccine – Short-Stay and Long-Stay Nursing Home Residents



ambulatory setting. Rates are reported separately for *Percent of Residents Assessed and Appropriately Given the Seasonal Influenza Vaccine* (NQF #0680 and #0681) for short- and long-stay populations in nursing homes. These populations have inherent clinical differences, and nursing homes have a longer time frame to assess and immunize long-stay residents.⁹⁸

Patient Impact and Cost-Avoided Analyses

As national performance on *Influenza Immunization* (NQF #0041) improved (2012–2015) for the Medicare Shared Savings Program and PQRS clinician group practices, an estimated 1.4 million and 660,000 more patients, respectively, received the influenza vaccine. The patient impact was estimated by weighting the results from the sample to the relevant total number of patients served by each of the programs.^{lvi} The results of the patient impact analyses were applied to estimate the health care costs avoided.

The estimated annual health care costs avoided from an increase in vaccinated patients range from \$42 million to \$141 million in the Medicare Shared Savings Program and from \$19.5 million to \$65.4 million in the PQRS clinician group practices. These calculations were based on estimated annual health care treatment savings related to influenza vaccination ranging from \$29 to \$99 per person (2015 dollars).⁹⁹⁻¹⁰² These cost savings estimates exclude costs associated with administration of the vaccine.

Disparities

Disparities analyses were conducted for *Annual Flu Vaccine* (NQF #0039) for FFS and Part C. Patient-level data were not available for this report for the remainder of the measures displayed on the Influenza Immunizations dashboard; therefore, a disparities analysis could not be conducted.^{lvii} For FFS and Part C, disparities highlighted are income and race/ethnicity.

Income – All comparison groups experienced significantly lower rates for both FFS and Part C (NQF #0039) than the high-income reference group (Figure 5-4). In general, influenza immunization rates decrease as income decreases. The disparity is getting smaller over time for the low-income group for Part C, based on a nine-year trend analysis, while the remainder of the disparities are consistent over time.

Race/Ethnicity – For FFS and Part C (NQF #0039), both Blacks and Hispanics had significantly lower measure rates than the White reference group, while Asians had significantly higher rates than the White reference group (Figure 5-5). The Hispanic group differences for both programs are getting smaller over time, based on a nine-year trend analysis. For Part C, the differences also are shrinking over time for Blacks, based on a nine-year trend analysis. CDC race/ethnicity statistics show similar results.¹⁰³

^{lvi} For additional information on the methodology, see *Methods* (Appendix D).

^{lvii} Patient-level data are collected for these programs and will be available for future reports.

Figure 5-4: Key Indicator #1 Disparities by Income – Influenza Immunization – FFS (NQF #0039) and Part C (NQF #0039)

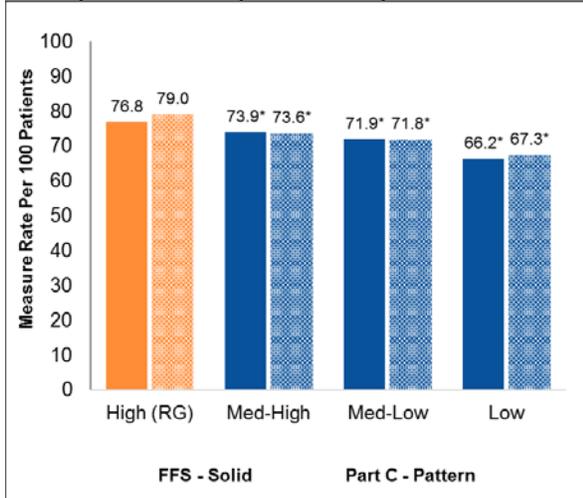
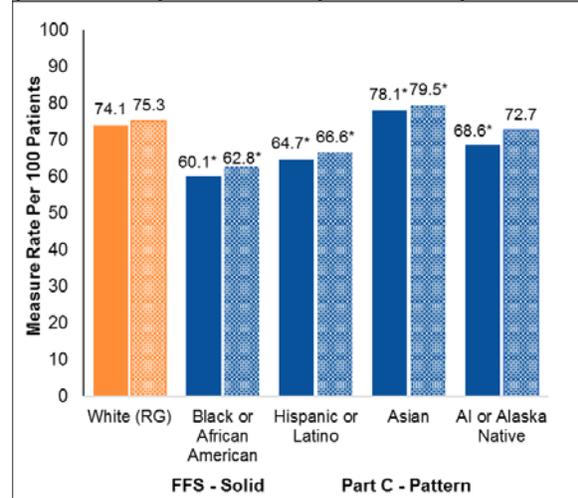


Figure 5-5: Key Indicator #1 Disparities by Race/Ethnicity – Influenza Immunization – FFS (NQF #0039) and Part C (NQF #0039)



Note: The orange bars represent the reference group (RG). *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%). The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups.

Cancer Screenings

Cancer screenings focus on both colorectal cancer, the second leading cause of cancer death in the United States, and breast cancer. Multiple screening methods are effective in detecting colorectal cancer, which is most frequently diagnosed among adults age 65 to 74 years. The various screening options account for personal preferences and can prevent an estimated 17 to 24 deaths per 1,000 individuals screened. Screening mammography decreases breast cancer mortality. Over a 10-year period, repeated screening mammograms resulted in 21 fewer breast cancer deaths out of 10,000 women ages 60 to 69 years and 13 fewer deaths out of 10,000 women ages 70 to 74.¹⁰⁴

National Quality Dashboard

Measures from Medicare quality programs were selected for Key Indicator #2, Colorectal Cancer Screening, and Key Indicator #3, Breast Cancer Screening. The measures and the results of analyses are shown in Dashboard 5-2. A discussion of the results follows the dashboard.

Dashboard 5-2: Cancer Screenings^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
2 – Colorectal Cancer Screening (NQF #0034) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	-1.7% ^b	295 Group practices	83,692 Sample	62.0% ^{c00} 2012	60.9% ^{c00} 2015	80.5% ^d
Medicare Shared Savings Program	6.0% ^b	393 ACOs	171,729 Sample	48.3% ^{c00} 2012	59.7% ^{c00} 2015	74.4% ^d

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
Part C Star Ratings	 3.8% ^b	383 Contracts ^f	809,596 Sample	52.9% ^c 2006	68.0% ^c 2015	70.9% ^d
3 – Breast Cancer Screening (NQF #2372) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	Insufficient data ^g	289 Group Practices	76,926 Sample	66.7% ^c 2014	69.3% ^c 2015	85.1% ^d
Medicare Shared Savings Program	Insufficient data ^g	391 ACOs	171,353 Sample	61.5% ^c 2014	65.2% ^c 2015	82.3% ^d
Part C Star Ratings	 1.6% ^b	355 Contracts ^f	2,922,701 Population	70.6% ^c 2013	72.9% ^c 2015	91.2% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).
^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.
 Indicates an annual percentage change > 1% per year in a favorable direction.
 Indicates an average annual percentage change <= 1% per year.
 Indicates an annual percentage change > 1% per year in an unfavorable direction.
^c The result represents the national average calculated (◇) as a simple average of provider rates or (◇◇) as a weighted average of provider rates.
^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.
^e Data for PQRS are limited to group practices that chose the Web Interface reporting option.
^f Medicare Part C Star Ratings data are collected and reported at the contract level. A contract may include one or more plan benefit packages.
^g Only two annual data points were available; therefore, a trend analysis was not performed.

Trend Analyses

National performance trend graphs for Key Indicator #2, Colorectal Cancer Screening, and for Key Indicator #3, Breast Cancer Screening, are shown in Figures 5-6 and 5-7, respectively.

Key Indicator #2 – National performance for *Colorectal Cancer Screening* (NQF #0034) improved for Part C from 2006 through 2015 and is approaching the Healthy People 2020 target rate of 70.5%.⁹⁷ The 2015 Part C rate was higher than corresponding rates for PQRS clinician group practices and Medicare Shared Savings Program ACOs. Rates for the latter improved from 2012 through 2015, while rates for PQRS clinician group practices declined; 2015 rates for PQRS clinician group practices and ACOs were 60.9% and 59.7%, respectively (Figure 5-6). Rates for *Colorectal Cancer Screening* (NQF #0034) are similar to the 2015 self-reported rate of 64.9% from the CDC National Health Interview Survey (NIHS), which includes adults age 50–75.⁸⁷(Table 72)

Key Indicator #3 – National performance rates for *Breast Cancer Screening* (NQF #2372) improved for Part C from 2013 through 2015. However, rates for PQRS group practices, Medicare Shared Savings Program ACOs, and Part C have not reached the Healthy People 2020 target of 81.1% for women age 50–74 years having a mammogram within the past two years.⁹⁷

Breast Cancer Screening (NQF #2372) has been measured in both Part C and Medicare FFS programs for several years. However, the measure was updated to reflect clinical guideline changes and was assigned a new NQF number when the revised specifications were endorsed. The new specifications for *Breast Cancer Screening* (NQF #2372) were adopted for 2014 performance for PQRS and the Medicare Shared Savings Program. Rates for these programs are shown in Figure 5-7 for comparison with Part C; however, a trend could not be calculated for either clinician group practices or ACOs. CDC NIHS self-reported mammography rates for women 65 years and older ranged from 75.3% in 2013 to 72.2% in 2015.⁸⁷(Table 70)

Figure 5-6: Key Indicator #2 Trend Graph – Colorectal Cancer Screening

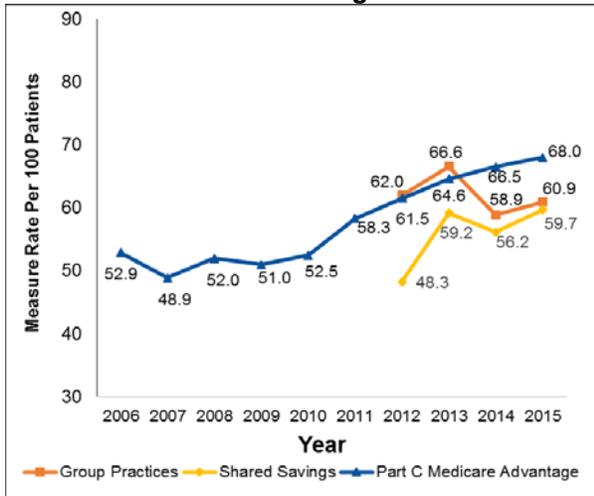
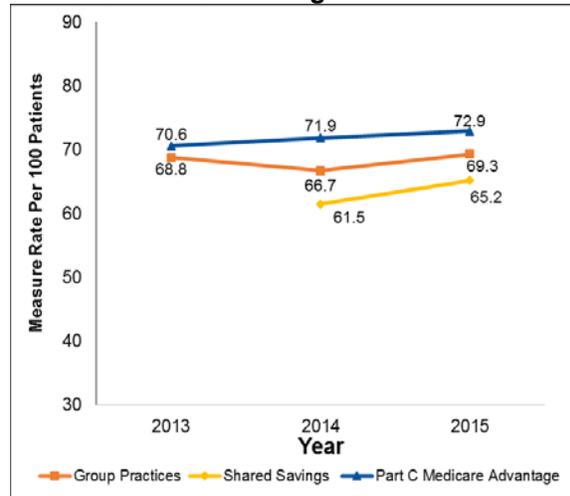


Figure 5-7: Key Indicator #3 Trend Graph – Breast Cancer Screening



Patient Impact and Cost-Avoided Analyses

For *Colorectal Cancer Screening* (NQF #0034), an estimated 490,000 more patients in the Medicare Shared Savings Program (2012–2015) and 3.5 million patients in Medicare Part C programs (2006–2015) were screened for colorectal cancer than would be expected from the baseline rates. For the PQRS clinician groups, an estimated 29,000 fewer patients were screened for colorectal cancer than would be expected from the baseline rates (2012–2015), as reflected by the declining trend for this measure.

The estimated lifetime health care costs avoided from an increase of approximately 490,000 patients screened in the Medicare Shared Savings Program and an increase of approximately 3.5 million patients screened in Part C range from \$868.0 million to \$1.2 billion and \$6.2 billion to \$8.6 billion, respectively. The estimated lifetime increase in health care costs related to the estimated 29,000 fewer patients screened in the PQRS program ranges from \$50.8 million to \$71.1 million. Based on a review of published studies, the estimated lifetime health care treatment savings associated with colorectal cancer screening range from \$1,779 to \$2,492 per person (2015 dollars).^{99,100} These cost savings estimates exclude costs associated with colorectal screening and health care costs associated with risks from invasive screening methods.

For *Breast Cancer Screening* (NQF #2372), approximately 64,000 more women were screened for the Part C (2013–2015) program than would be expected from the baseline rate.^{lviii} Relevant recent studies that met the selection criteria and that would form the basis for estimates of health care costs avoided were not identified; therefore, such analyses were not conducted for breast cancer screening measures.^{lix}

Disparities

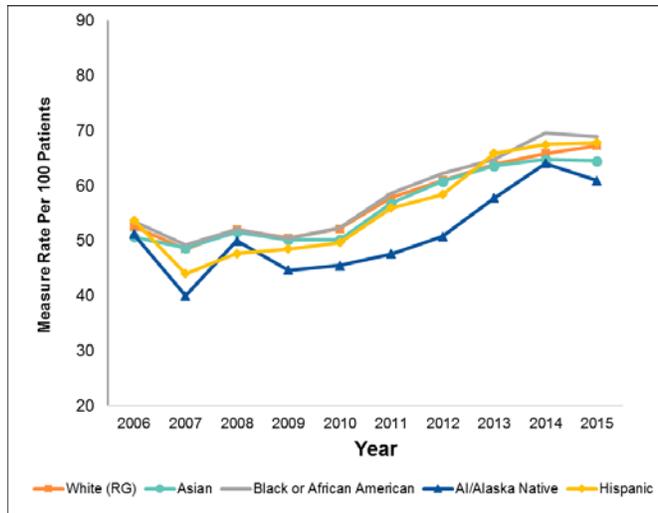
Disparities analyses were conducted for *Colorectal Cancer Screening* (NQF #0034) and *Breast Cancer Screening* (NQF #2372) measures for the Part C program. Patient-level data were not available for this report for the remainder of the measures included on the National Quality Dashboard for Cancer Screenings; therefore, disparities analyses could not be conducted.^{lx}

Colorectal Cancer Screening (NQF #0034) – Part C analysis findings identified steady improvement in screening rates across all racial and ethnic groups, except for a slight decline from 2014 to 2015 for the American Indian (AI)/Alaska Native group. Figure 5-8 displays the screening rate trend for all racial and ethnic groups. The CDC reports similar trends for 2000–2015.^{87(Table 72)}

Disparities for race/ethnicity, region, and urbanicity were observed for *Breast Cancer Screening* for Part C. Race/ethnicity and urbanicity findings are highlighted.

Race/Ethnicity – For Part C, both Blacks and Hispanics had significantly higher rates for *Breast Cancer Screening* (NQF #2372), compared with the White reference group, while the AI/Alaska Native group had significantly lower rates (Figure 5-9). Findings in published literature about breast cancer screening disparities are inconsistent, pointing to the need for additional research.^{87(Table 70),105,106} The disparities related to AI/Alaska Natives are well-documented.¹⁰⁷

Figure 5-8: Key Indicator #2 Disparities by Race/Ethnicity – Colorectal Cancer Screening, Part C



^{lviii} Patient impact was estimated by weighting the results from the sample to the relevant total number of patients served by each program. To limit patient duplication, differences were estimated between the first and last years, as opposed to a net difference over time, as the same patient could be included in the numerator over time.

^{lix} For additional information on the methodology, see *Methods* (Appendix D).

^{lx} Patient-level data are collected for PQRS clinician group practices and Medicare Shared Savings Program and will be available for future reports.

Urbanicity – For Part C, significantly lower rates for *Breast Cancer Screening* (NQF #2372) were observed for both rural categories (micropolitan and noncore), compared with the most urban category (large central metro) (Figure 5-10). These differences are consistent over time, based on a three-year trend analysis, and are similar to other published research findings that identify lower screening rates for rural populations.¹⁰⁷

Figure 5-9: Key Indicator #3 Disparities by Race/Ethnicity – Breast Cancer Screening, Part C

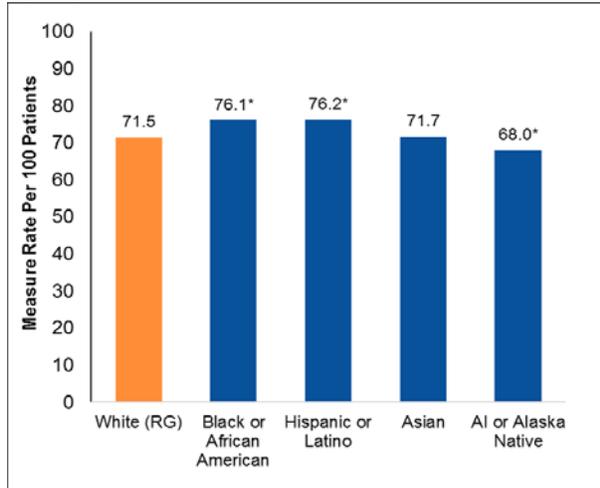
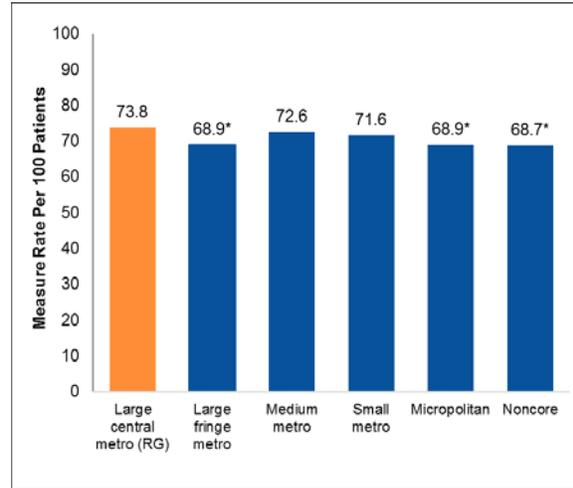


Figure 5-10: Key Indicator #3 Disparities by Urbanicity – Breast Cancer Screening, Part C



Note: The orange bars represent the reference group (RG) for the disparity category. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. *The comparison group rate exhibits a significant difference ($p < .05$) from the reference group rate ≥ 0.10 (i.e., 10%).

Healthy Weight

Among adults in the United States, the prevalence of obesity between 2011 and 2014 was estimated at more than 36%.¹⁰⁸ Obesity is directly linked to increases in chronic disease prevalence, including dementia risk¹⁰⁹; premature mortality; and impaired function.¹¹⁰ Identifying individuals who can benefit from weight loss can mitigate the impacts of excess weight and obesity on health outcomes through targeted interventions that result in weight loss for older adults.¹¹¹

National Quality Dashboard

Measures from Medicare quality programs were selected for Key Indicator #4, Body Mass Index (BMI) Screening and Follow-Up. The measures and the results of analyses are shown in Dashboard 5-3. A discussion of the results follows the dashboard.

Dashboard 5-3: Healthy Weight^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
4 – BMI Screening and Follow-Up (NQF #0421) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	 1.2% ^b	297 Group practices	91,562 Sample	60.4% ^c 2012	63.5% ^c 2015	88.1% ^d

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
Medicare Shared Savings Program	 9.1% ^b	391 ACOs	173,840 Sample	54.6% ^c 2012	71.1% ^c 2015	84.3% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

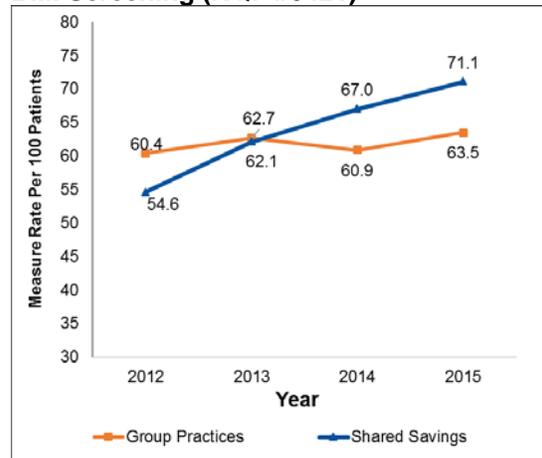
^e Data for PQRS are limited to group practices that chose the Web Interface reporting option.

Trend Analyses

National performance trends for *BMI Screening and Follow-up* are shown in Figure 5-11.

Key Indicator #4 – National performance rates from 2012 through 2015 for *BMI Screening and Follow-Up* (NQF #0421) improved for both PQRS clinician group practices and Medicare Shared Savings Program ACOs. As of 2015, performance had not reached the calculated achievable result for either group.

Figure 5-11: Key Indicator #4 Trend Graph – BMI Screening (NQF #0421)



Patient Impact and Cost-Avoided Analyses

The analysis of patient impact for *BMI Screening and Follow-Up* (NQF #0421) identified approximately 2.1 million more patients screened with appropriate follow-up as a result of improvements in performance by Medicare Shared Savings Program ACOs (2012–2015) than would be expected from the baseline rate.^{lxi}

Cost-avoided analyses were not conducted for *BMI Screening and Follow-Up* because the analysis would require assumptions about severity, treatment, and patient behavior that would limit the reliability and validity of a health care cost-avoided estimate.

Disparities

Patient-level data were not available for this report for PQRS clinician group practices or Medicare Shared Savings Program ACOs; therefore, disparities analyses could not be performed for these program measures.^{lxii}

^{lxi} For additional information on the methodology, see *Methods* (Appendix D).

^{lxii} Patient-level data are collected for PQRS clinician group practices and Medicare Shared Savings Program and will be available for future reports.

Depression

Annually, 43.8 million adults in the United States—1 in 5—experience mental illness.¹¹² Among the Medicare population, 17% of FFS beneficiaries were diagnosed in 2015 with depression.¹¹³ The U.S. Preventive Services Task Force (USPSTF) has found convincing evidence of decreased clinical morbidity as a result of treating adults and older adults with depression identified through screening in primary care settings.¹¹⁴ The USPSTF recommends depression screening for the general adult population where adequate systems are in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up. The Medicare annual wellness visit includes a depression screen.¹¹⁵

National Quality Dashboard

Measures from Medicare quality programs were selected for Key Indicator #5 to assess screening for depression. The measures and the results of analyses are shown in Dashboard 5-4. A discussion of the results follows the dashboard.

Dashboard 5-4: Depression^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
5 – Screening for Clinical Depression and Follow-Up Plan (NQF #0418) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	 26.6% ^b	295 Group practices	81,844 Sample	23.0% ^c 2013	36.9% ^c 2015	75.0% ^d
Medicare Shared Savings Program	 26.3% ^b	392 ACOs	163,680 Sample	22.4% ^c 2012	44.9% ^c 2015	65.4% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

^e Data for PQRS are limited to group practices that chose the Web Interface reporting option.

Trend Analyses

National performance trends for Screening for Clinical Depression and Follow-Up Plan are shown in Figure 5-12.

Key Indicator #5 – National performance rates improved rapidly for *Screening for Clinical Depression and Follow-Up Plan* (NQF #0418) for both PQRS clinician group practices and Medicare Shared Savings Program ACOs from 2012 through 2015 (Figure 5-12); however, rates remained less than 50% for both groups and less than the calculated achievable results, indicating room for improvement.

Patient Impact and Cost-Avoided Analyses

The results of the patient impact analysis for *Screening for Clinical Depression and Follow-Up Plan* (NQF #0418) indicate that approximately 2.8 million additional patients were screened for depression with appropriate follow-up because of improved performance for the Medicare Shared Savings Program (2012–2015) than would be expected from the baseline rate.^{lxiii, lxiv} Cost-avoided analyses were not conducted for *Screening for Clinical Depression and Follow-Up Plan* because the analysis would require assumptions about severity, treatment, and patient behavior that would limit the reliability and validity of a health care cost-avoided estimate.

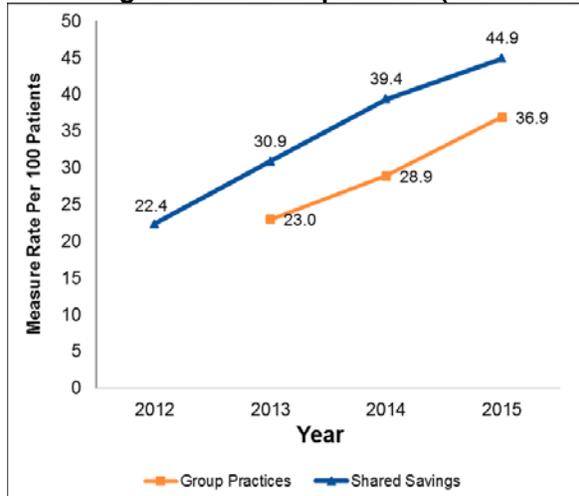
Disparities

Patient-level data were not available for this report for PQRS clinician group practices or Medicare Shared Savings Program ACOs; therefore, disparities analyses could not be performed for these measures.

Tobacco Use

The CDC estimates that 8.4% of the population age 65 and older smokes.¹¹⁶ Effective strategies to eliminate smoking reduce the risk of lung cancer, the deadliest cancer for both men and women, as well as heart disease and COPD.¹¹⁷ Cigarette smoking is the most common form of tobacco use and by far the most important risk factor, causing 80% of U.S. lung cancer deaths.¹¹⁸ Other forms of tobacco use also have health consequences, including mouth cancer, gum disease, and tooth loss.¹¹⁶ Medicare covers tobacco use screening and cessation counseling, and many states also cover cessation services in Medicaid.^{119,120}

Figure 5-12: Key Indicator #5 Trend Graph – Screening for Clinical Depression (NQF #0418)



^{lxiii} The patient impact was estimated by weighting the results from the sample to the relevant total number of patients served by the program.

^{lxiv} For additional information on the methodology, see *Methods* (Appendix D).

National Quality Dashboard

Measures from Medicare quality programs were selected for Key Indicator #6 to assess screening for tobacco use. The measures and results of the analyses are shown in Dashboard 5-5. A discussion of the results follows the dashboard.

Dashboard 5-5: Tobacco Use^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
6 – Tobacco Use: Screening and Cessation Intervention (NQF #0028) (↑ = Favorable)						
PQRS, Physician VM (Web Interface) ^e	 0.1% ^b	297 Group practices	93,135 Sample	86.6% ^c 2012	88.7% ^c 2015	99.1% ^d
Medicare Shared Savings Program	 3.4% ^b	392 ACOs	176,889 Sample	81.1% ^c 2012	89.8% ^c 2015	97.0% ^d

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

 Indicates an annual percentage change > 1% per year in a favorable direction.

 Indicates an average annual percentage change <= 1% per year.

 Indicates an annual percentage change > 1% per year in an unfavorable direction.

^c The result represents the national average calculated as a weighted average of provider rates.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology. Results may differ from benchmarks used by various CMS programs and do not reflect CMS-endorsed goals.

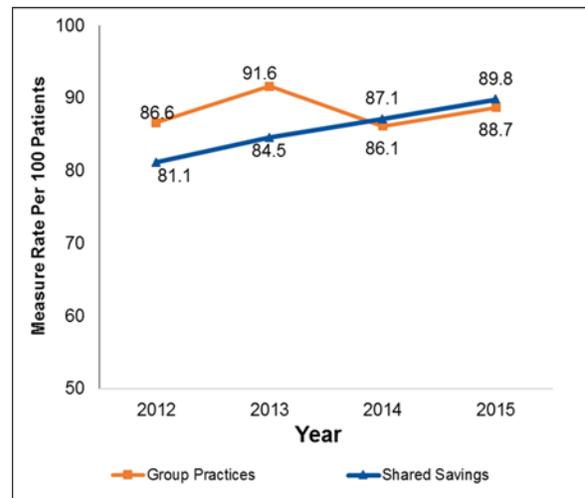
^e Data for PQRS are limited to group practices that chose the Web Interface reporting option.

Trend Analyses

National performance trends for *Tobacco Use: Screening and Cessation Intervention* (NQF #0028) are shown in Figure 5-13.

Key Indicator #6 – From 2012 through 2015, national performance by Medicare Shared Savings ACOs improved for *Tobacco Use: Screening and Cessation Intervention* (NQF #0028). Rates remained stable for PQRS clinician group practices and were nearing 90% for both populations. The performance rate for Key Indicator #6 reflect both nonsmokers who were screened and smokers who were screened and received a cessation intervention. In 2015, 65.7% of smokers (age >= 45 years) responding in the 2015 NHIS reported receiving advice to quit; 31.7% reported receiving cessation counseling or medications.¹²¹

Figure 5-13: Key Indicator #6 Trend Graph – Screening and Cessation Intervention (NQF #0028)



Patient Impact and Cost-Avoided Analyses

The analysis of patient impact for *Tobacco Use: Screening and Cessation Intervention* (NQF #0028) for Medicare Shared Savings Program ACOs indicated that approximately 630,000 more patients were screened for tobacco use and, if tobacco users, received cessation counseling interventions between 2012 and 2015 than would be expected from the baseline rate.^{lxv, lxvi}

The estimated annual health care costs avoided for patients who received a counseling intervention range from \$11.6 million to \$75.9 million for the Medicare Shared Savings Program, depending on the estimated effectiveness of the cessation counseling intervention. These calculations were based on an estimated annual difference in health care costs of \$9,562 (2015 dollars) between current and former smokers age 65 and older.¹²² The estimated range in the effectiveness of cessation counseling is 2.3% to 15%, depending on the type of intervention.¹²³⁻¹²⁸ A national estimate of smoking prevalence of 8.4% for age 65 and older¹¹⁶ was used. Of the estimated additional 630,000 patients screened and counseled, the potential patient impact of smoking cessation was estimated at almost 53,000 patients, from which the health care costs avoided were calculated.

Disparities

Patient-level data were not available for this report for PQRS clinician group practices or Medicare Shared Savings Program ACOs; therefore, disparities analyses could not be performed.^{lxvii}

MEASURE GAPS

CMS will evaluate gaps in high-impact areas when considering future measure initiatives. Topics for high-impact measurement areas in which current measures were not available include access to community based services such as behavioral health services and to kidney transplants. A measure of discharge to community was mandated by the IMPACT Act for long-term care hospitals, skilled nursing facilities, home health agencies, and inpatient rehabilitation facilities, which will address objective 4.¹²⁹

Pneumococcal immunization measures are used across multiple CMS programs; however, these measures are not currently endorsed by NQF. To address this gap, NQF-endorsed measures of pneumococcal immunizations that require minimal provider burden are needed across programs.

Measures for immunizations (other than influenza and pneumococcal disease) relevant to the Medicare population were cited by the TEP and FASC as potential topics for national improvement when such measures are developed and become widely implemented. The Core Quality Measures Collaborative identified a gap in substance use screening measures.¹³⁰ In 2017, CMS added *Evaluation or Interview for Risk of Opioid Misuse*,^{93(p. 71166-71167)} along with two related measures, to the set of clinician measures for use in the Quality Payment Program. Other gap areas include measures of appropriate screening and prevention, including screening for HIV.

^{lxv} Patient impact was estimated by weighting the results from the sample to the relevant total number of patients served by the program. To limit patient duplication, differences were estimated between the first and last years, as opposed to a net difference over time, as the same patient could be included in the numerator over time.

^{lxvi} For additional information on the methodology, see *Methods* (Appendix D).

^{lxvii} Patient-level data are collected for PQRS clinician group practices and Medicare Shared Savings Program and will be available for future reports.

6 – Affordable Care



BACKGROUND

Quality improvement and cost containment are both important in health care.¹³¹ Overuse of services is estimated to account for nearly \$300 billion a year in spending,¹³² while high-quality care has been shown to decrease Medicare costs for certain acute episodes of care.¹³³ As the largest U.S. payer for health care, CMS is driving change in the delivery system to reward high-value care with a focus on cost containment. CMS aims “to reduce the cost of quality healthcare for individuals, families, employers, government, and communities.”¹⁷

KEY INDICATOR

After expert review by the TEP and FASC,^{lxviii} one measure was selected from the 42 Affordable Care measures^{lxix} to highlight CMS progress toward achieving the objectives of the CMS quality priorities.^{lxx,17} The measure selected by the TEP and FASC is the Key Indicator for Affordable Care.

The Key Indicator aligns with an objective of the CMS priority of Affordable Care (Table 6-1) and is included in the National Quality Dashboard that follows this section.

Table 6-1: Affordable Care Objective and Related Key Indicator Topic

Affordable Care Objective ¹⁷	Key Indicator Topic (Number of Measures)
Use cost analysis data to inform payment policies.	<u>Costs Associated With Hospitalizations</u> 1 – Costs associated with hospitalizations (1)

Costs Associated with Hospitalizations

Costs associated with hospitalizations are among the highest in the full spectrum of service costs associated with the Medicare population. Approximately 21% of 2016 Medicare payments were for hospital inpatient services,¹³⁴ a percentage projected to increase as the population ages. Evaluating costs across patient-focused hospital episodes of care moves the health care system toward an approach of optimizing health outcomes and resource use associated with treating acute clinical conditions.

National Quality Dashboard

One condition-specific measure of 30-day costs associated with a hospitalization was selected as Key Indicator #1 – *Payment Associated with a 30-Day Episode of Care for Acute Myocardial Infarction (AMI)*. This Key Indicator includes only FFS Medicare payments. The measure, along with results of analyses, are shown in Dashboard 6-1. Other episode-based cost measures did not have sufficient data available for this report to include as Key Indicators.

^{lxviii} For additional details on the methods for selecting Key Indicators, see *Methods* (Appendix D).

^{lxix} The total number of affordable care measures as determined by application of the *HHS Decision Rules for Categorizing Measures of Health, Health Care Quality, and Health Care Affordability*⁹ includes measures for clinician programs (e.g., PQRS) that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{lxx} For a complete list of Key Indicators, see *Overview of CMS Measures Included in Analyses* (Appendix A).

Dashboard 6-1: Costs Associated With Hospitalizations^a

Measure Name (NQF #)/ Program Use	Progress/ AAPC ^b	Most Recent # of Providers Included/ Type	Most Recent # of Patients Included/ Method	Baseline Result ^c / Year	Most Recent Result ^c / Year	Achievable Result ^d
1 – Payment Associated with a 30-Day Episode of Care for AMI (NQF #2431)						
Hospital IQR	Increased 1.9% ^b	4,320 Hospitals	469,378 Population	\$22,345 ^{c,e} 2013	\$23,196 ^c 2015	Not determined ^{d†}

^a Additional information on how to read the dashboard is in *Guide to the National Quality Dashboards and Graphs* (Appendix F).

^b Progress was measured using the average annual percentage change (AAPC), which was calculated using a linear trend model fit to the data series. The baseline and most recent year results are shown in the dashboard for informational purposes and cannot be used to replicate the trend model results.

^c The result represents the national average calculated from beneficiary-level data.

^d The achievable result is the average performance rate across the highest-performing providers covering 10% of the eligible population, derived using the Achievable Benchmarks of Care (ABC™) methodology.

[†] The achievable result was not calculated for Affordable Care measures because the direction for improvement was not established.

^e Adjusted to 2015 dollars

Trend Analyses

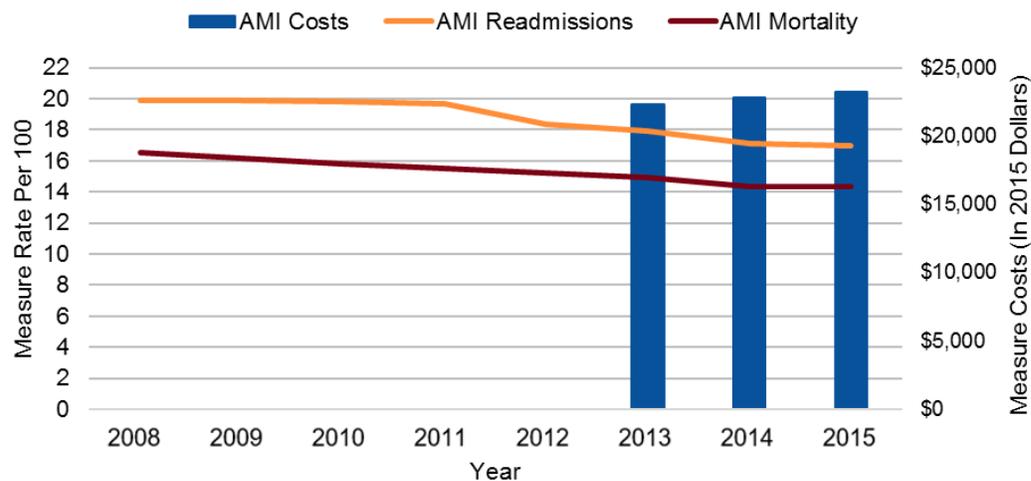
The rates for Key Indicator #1 are discussed in this section and shown in Figure 6-1.

Key Indicator #1 – National standardized rates adjusted to 2015 dollars for *Payment Associated with a 30-Day Episode of Care for AMI* (NQF #2431) increased from 2013 through 2015.

During the same period (2013–2015), 30-day AMI mortality decreased slightly from 14.9% to 14.3%, and 30-day readmissions for AMI decreased slightly from 17.9% to 17.1%. The finding of AMI payments increasing from 2013 through 2015 is consistent with trends observed in hospital costs, though the rate increase was less for AMI payments than for national health care expenditures overall. The increases in 2014 and 2015 from the prior year were attributed to the use and intensity of services.^{135,136,137}

Payment rates for *Payment Associated with a 30-Day Episode of Care for AMI* (NQF #2431) summarize payments for inpatient, outpatient, home health, hospice, physician, clinical laboratory, and ambulance services and payments for durable medical equipment for each AMI episode of care. The episode of care begins with admission to a short-stay hospital and ends 30 days post-admission. The measure includes payment by Medicare (Parts A and B), other insurers, and patients (i.e., co-payments and/or deductibles). The AMI payment measure reflects the costs for Medicare patients only, which are based on regulated pricing that has been standardized. Therefore, the results are a product of standardized prices and utilization.¹³⁸ *Payment Associated with a 30-Day Episode of Care for AMI* (NQF #2431) is aligned with the 30-day AMI mortality and readmission measures. *Payment Associated with a 30-Day Episode of Care for AMI* is reported on Hospital Compare with *Mortality Following Acute Myocardial Infarction Hospitalization* (NQF #0230) to allow patients to compare cost and quality to assess the value of care in hospitals. Figure 6-1 shows performance on *Payment Associated with a 30-Day Episode of Care for AMI* compared with performance rates for *Mortality Following Acute Myocardial Infarction Hospitalization* and *30-Day All-Cause Readmission Following Acute Myocardial Infarction (AMI) Hospitalization* (NQF # 0505).

Figure 6-1: Key Indicator #1 Trend Graph – 30-Day Episode of Care for AMI, Mortality Following AMI, and 30-Day All-Cause Readmission Following AMI



Patient Impact and Cost-Avoided Analyses

Patient impact analyses were not relevant to the AMI 30-Day Episode of Care Key Indicator. Thus, cost-avoided analyses were not conducted.

Disparities

Payment differences by age were observed for the condition-specific Key Indicator, *Payment Associated with a 30-Day Episode of Care for AMI*. Specifically, the 85-plus age group had significantly lower AMI payment compared with the 65–74 reference age group. These differences are consistent with other published literature¹³⁹ and could be due to physiological differences related to aging and not specifically to inequities in care or services received.⁵

MEASURE GAPS

Cost measures are increasingly being used in CMS quality reporting programs. The IMPACT Act requires the development of aligned measures for post-acute settings,^{lxxi} including Medicare spending per beneficiary. *Medicare Spending Per Beneficiary (MSPB)* (NQF # 2158) was developed for hospitals and is used in the Hospital IQR and value-based purchasing programs. The measure has been adapted for use at the clinician and group level and is used in the Quality Payment Program. While these Medicare quality programs use a setting-specific *MSPB*, gaps are noted in the Inpatient Psychiatric Facility and Prospective Payment System (PPS)-Exempt Cancer Hospital quality reporting programs, which do not use an *MSPB*.

Other topics for national improvement identified for Affordable Care include measures that address unnecessary health services, inefficiencies in health care delivery, and the patient's out-of-pocket payments. Measures of appropriate use are a priority for the Quality Payment Program.⁵⁹

^{lxxi} Inpatient rehabilitation facility (IRF), long-term care hospital (LTCH), skilled nursing facility, home health

7 – Overall Trends and Disparities Results



ALL CMS QUALITY MEASURES

Trends

Trend analyses were performed across the six quality priorities on 247 of the 762 measures in use in the Medicare quality programs as of December 31, 2015.^{lxxii, lxxiii} Ninety-one percent (226 measures) of these 247 measures demonstrated improved or stable performance, and 9 percent (21 measures) exhibited a declining trend. Performance on a majority of measures (60%, including 55% of outcome measures) improved. Notably, performance on 73% of Care Coordination measures, including condition-specific measures of readmissions, improved. Patient Safety also had a high percentage (71%) of measures showing improved performance, including nursing home UTI and pressure ulcer measures and surgical complications measures in both ambulatory surgery centers and hospitals. Table 7-1 displays a summary of the trend results by measure type.^{lxxiv}

Table 7-1: Trend Results for All Measures^a

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	8 (100%)	60 (64%)	80 (55%)	148 (60%)
Stable	0 (0%)	26 (28%)	52 (36%)	78 (32%)
Declined	0 (0%)	8 (9%)	13 (9%)	21 (9%)
Total	8 (100%)	94 (100%)	145 (100%)	247 (100%)

^a A performance standard could not be applied to the measures analyzed for Affordable Care; therefore, those measures are excluded.

Note: Percentages may not total to 100% due to rounding.

Disparities

Analyses of results by age, sex, race/ethnicity, income, urbanicity,^{140, lxxv} and region (*Research Question 3*) were conducted on 114 CMS measures for which patient-level data were available. Figures 7-1, 7-2, 7-3, and 7-4 provide a summary of the disparities observed from 2015 data by race/ethnicity, income, sex, and urbanicity (urban/rural). Across these four categories, performance rates for a majority of measures indicated no disparity for the comparison groups.

^{lxxii} The total portfolio includes measures for clinician programs that are applicable to several specialties; therefore, not all measures are required to be reported by any individual clinician.

^{lxxiii} *Overview of CMS Measures Included* (Appendix A) contains a complete list of all 762 measures. *Analytic Results* (Appendix E) includes results of the analyses for 301 total measures, including the 62 Key Indicator measures. Within Appendix E, Table E-1 provides a summary of the trend results and indicates which 114 measures were analyzed for disparities. Tables E-2, E-3, and E-4 provide the detailed measure results, disparities results, and disparities trend results.

^{lxxiv} Six Affordable Care measures were not characterized as improving or declining and therefore are excluded from Table 7-1. Tables E-1 and E 2 in Appendix E include trend results for Affordable Care measures.

^{lxxv} *Urbanicity* is a term used to define the degree to which a geographical unit is characterized by population size, density, and diversity.

The race/ethnicity groups with disparities in performance observed for the largest percentage of measures were Hispanics (39%), Blacks (43%), and Native Hawaiians/Pacific Islanders (PIs) (46%). Disparities were observed across all income groups for *Annual Flu Vaccine* and across all race/ethnicity groups for *Proportion of Days Covered for Statins PDP*.

**Disparities Results – Percentage of Measures
With Lower/Higher/Similar Performance Compared With Reference Group**

Figure 7-1: Disparities by Race/Ethnicity

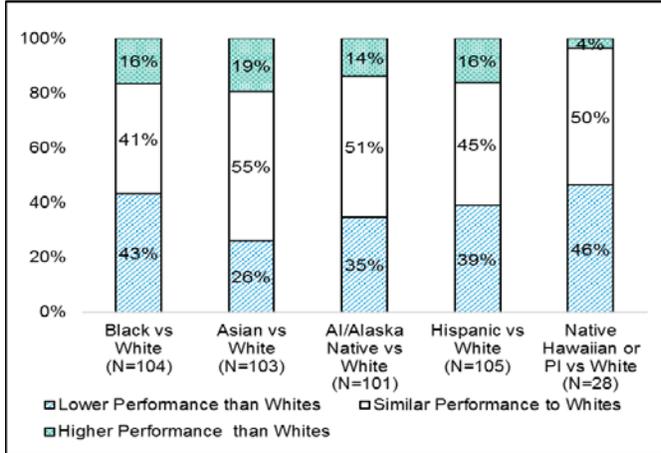


Figure 7-2: Disparities by Income

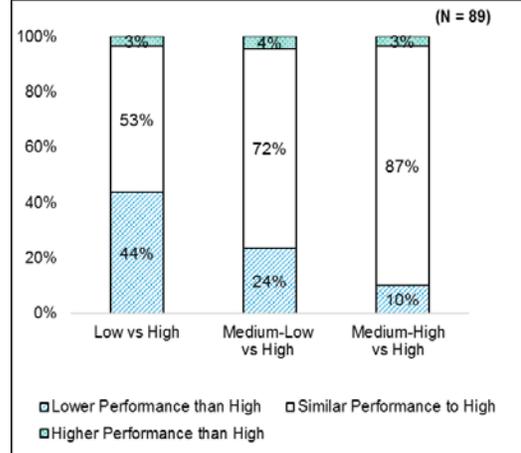


Figure 7-3: Disparities by Sex

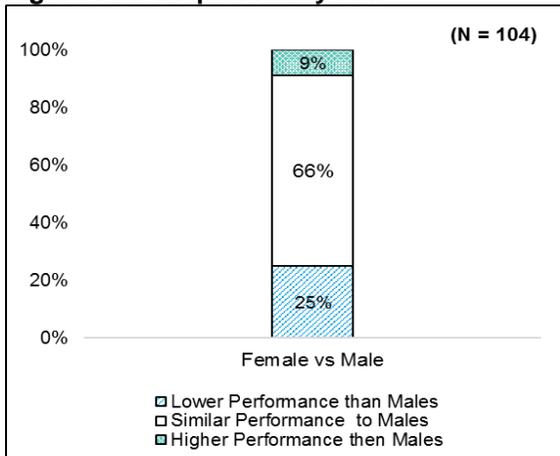
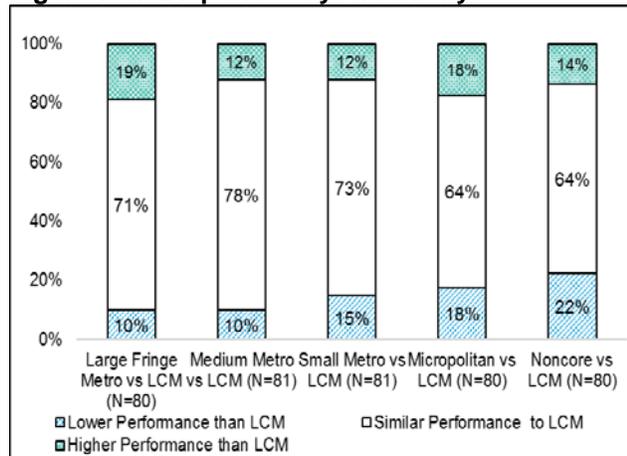


Figure 7-4: Disparities by Urbanicity



N = number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. A performance standard could not be applied to the Affordable Care goal area measures; therefore, those measures are excluded from the summary graphs. Detail may not sum to totals because of rounding.

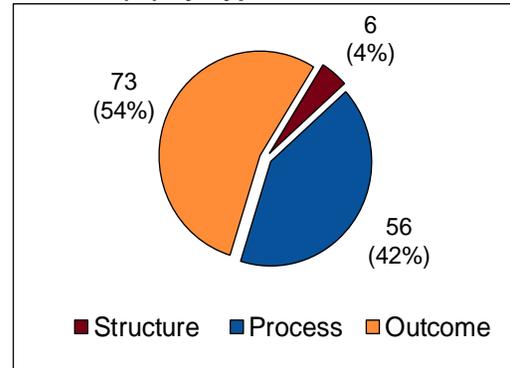
ALL PATIENT SAFETY MEASURES

As of December 31, 2015, CMS had implemented 135 unique measures representing Patient Safety in 22 Medicare quality programs.^{lxxvi} Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Patient Safety measures, which accounted for 18% of all measures in use by CMS (n = 762).^{lxxvii}

Measure Type

Evidence-based practices have been found to be effective in reducing health care–associated infections and other preventable harms. Quality measures based on clinical guidelines, therefore, can lead to avoidance of harms and contribute to patient safety. Examples include process measures that assess whether health care personnel receive influenza vaccinations and structure measures reporting use of a surgery checklist. Health care providers and clinicians use process and structure measures to improve actions that lead to better patient outcomes. Of the 135 Patient Safety measures, six (4%) were structure measures, 56 (42%) were process measures, and 73 (54%) were outcome measures (Figure 7-5).

Figure 7-5: Patient Safety Measures – Number (%) by Type



Trends

Detailed analyses were conducted for 66 Patient Safety measures (49%) in 17 Medicare quality programs and initiatives, based on the availability of data and other criteria.^{lxxviii} The results show 52 of the 66 (79%) measures had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-2). Importantly, 37 of the 52 measures (71%) demonstrated improved performance trends, including a majority (68%) of the outcome measures.^{lxxix}

Table 7-2: Trend Results for Patient Safety Measures

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	1 (100%)	10 (77%)	26 (68%)	37 (71%)
Stable	0 (0%)	1 (8%)	4 (11%)	5 (10%)
Declined	0 (0%)	2 (15%)	8 (21%)	10 (19%)
Total	1 (100%)	13 (100%)	38 (100%)	52 (100%)

Note: Percentages may not total to 100% due to rounding.

Disparities

Disparity analyses for race/ethnicity, income, sex, and urbanicity were conducted on eight Patient Safety measures for which patient-level data were available for this report (6%). Of particular note are the large number of measures for which certain race/ethnicity and income groups had lower performance rates than the reference group (Figures 7-6, 7-7, 7-8, and 7-9). Fifty-seven percent (four of seven) of the measures for the AI/Alaska Native group had lower

^{lxxvi} One setting—hospice—has no measures aimed at Patient Safety.

^{lxxvii} For a complete list of Patient Safety measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{lxxviii} For detailed measure selection criteria, see *Methods* (Appendix D).

^{lxxix} For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

performance rates than the White reference group. For the income groups, 50% (four of eight) of the measures for the low-income group had lower performance rates than the high-income reference group. In the sex and urbanicity categories, results for the majority of measures showed similar or higher performance for all groups compared with the reference groups.

**Disparities Results – Percentage of Measures
With Lower/Higher/Similar Performance Compared With Reference Group**

Figure 7-6: Patient Safety: Disparities by Race/Ethnicity

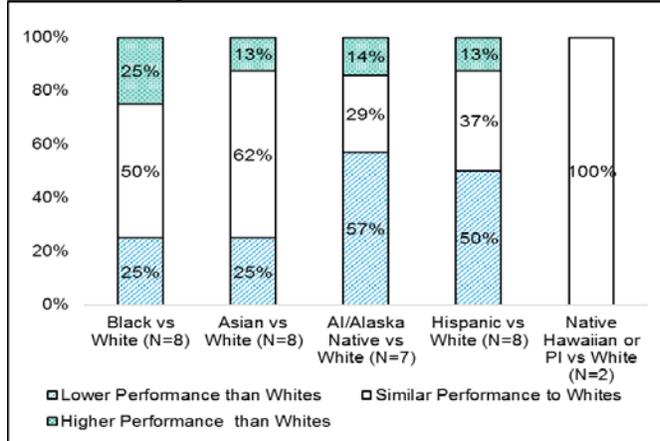


Figure 7-7: Patient Safety: Disparities by Income

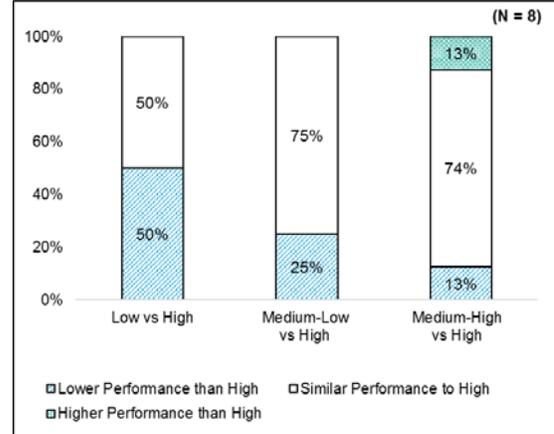


Figure 7-8: Patient Safety: Disparities by Sex

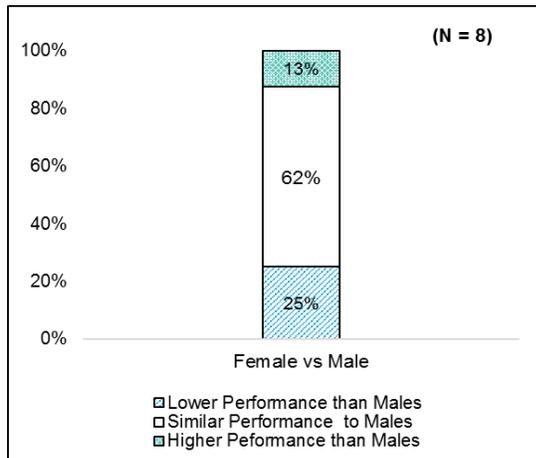
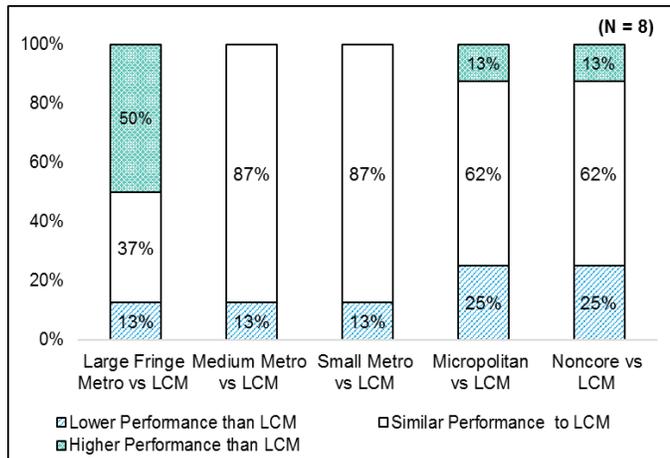


Figure 7-9: Patient Safety: Disparities by Urbanicity



N = the number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large fringe metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

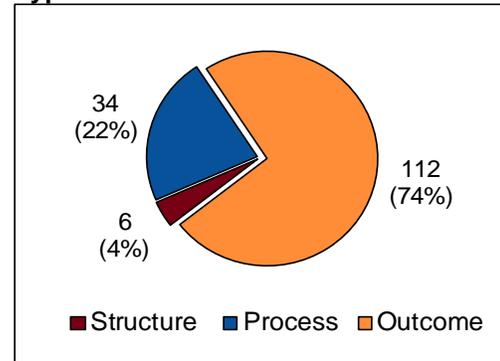
ALL PERSON AND FAMILY ENGAGEMENT MEASURES

As of December 31, 2015, CMS had implemented 152 unique measures representing Person and Family Engagement in 18 Medicare quality programs. Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Person and Family Engagement measures, which accounted for 20% of all measures in use by CMS.^{lxxx}

Measure Type

Person and family engagement requires actively engaging persons to report the status of their health conditions, such as physical and mental functioning, and their perspectives of health care, such as satisfaction with staff.^{lxxxi} A care relationship based on trust and inclusion of individual values and beliefs stems from communication and partnered decision-making by the patient and care team. Measures of structure and process (e.g., whether outcomes are being measured and functional assessment tools are being used) support the building of an infrastructure to ensure the patient’s voice is heard. Structure and process measures also lay the foundation for improved performance on outcome measures, including the survey measures that are integral to person and family engagement. Of the 152 Person and Family Engagement measures, six (4%) were structure measures, 34 (22%) were process measures, and 112 (74%) were outcome measures (Figure 7-10).

Figure 7-10: Person and Family Engagement Measures – Number (%) by Type



Trends

Detailed analyses were conducted for 61 (40%) of the Person and Family Engagement measures in 13 Medicare quality programs and initiatives, based on the availability of data and other criteria.^{lxxxii} The results show 60 of the 61 measures had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-3). Of the 60 Person and Family Engagement measures, 58 (97%) had national performance rates that improved or were stable, including all 51 outcome measures. National performance for two process measures declined.^{lxxxiii}

Table 7-3: Trend Results for Person and Family Engagement Measures

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	0 (0%)	6 (67%)	15 (29%)	21 (35%)
Stable	0 (0%)	1 (11%)	36 (71%)	37 (62%)
Declined	0 (0%)	2 (22%)	0 (0%)	2 (3%)
Total	0 (100%)	9 (100%)	51 (100%)	60 (100%)

Note: Percentages may not total to 100% due to rounding.

^{lxxx} For a complete list of Person and Family Engagement measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{lxxxii} For detailed measure selection criteria, see *Methods* (Appendix D).

^{lxxxiii} For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

Disparities

Disparity analyses for race/ethnicity, income, sex, and urbanicity were conducted on 45 Person and Family Engagement measures for which patient-level data were available for this report (30%). A majority of measures for all four disparity categories had either similar or higher performance for all groups compared with the reference groups (Figures 7-11, 7-12, 7-13, and 7-14). Within the race category, the one exception is the Native Hawaiian or Pacific Islander (PI) group, for which 62% (eight of 13) of the measures had lower performance rates than those of the White reference group.

Disparities Results – Percentage of Measures With Lower/Higher/Similar Performance Compared With Reference Group

Figure 7-11: PFE: Disparities by Race/Ethnicity

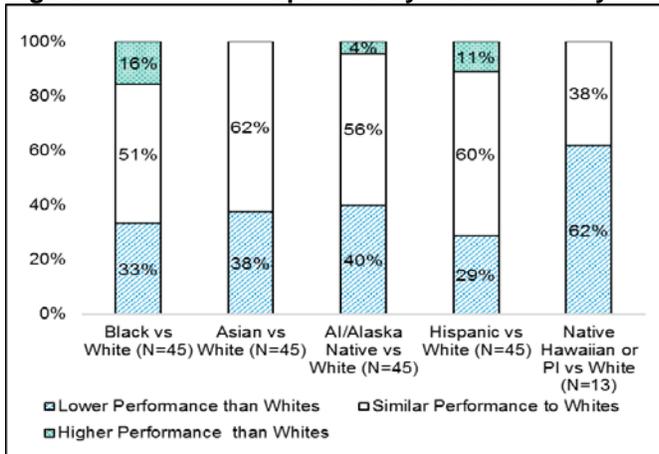


Figure 7-12: PFE: Disparities by Income

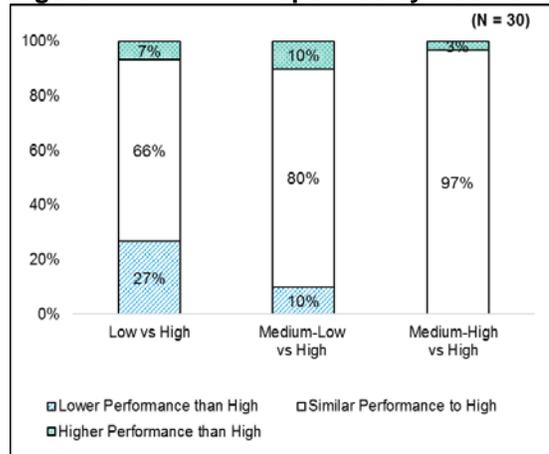


Figure 7-13: PFE: Disparities by Sex

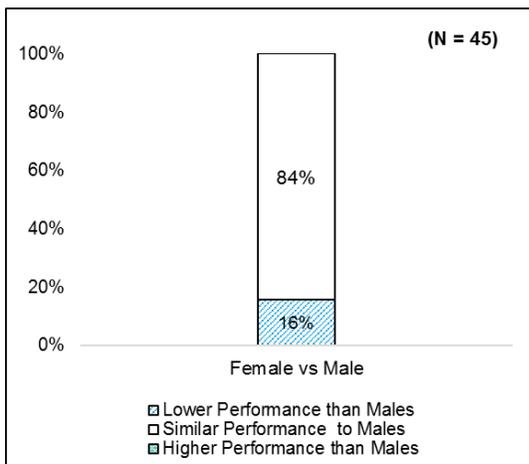
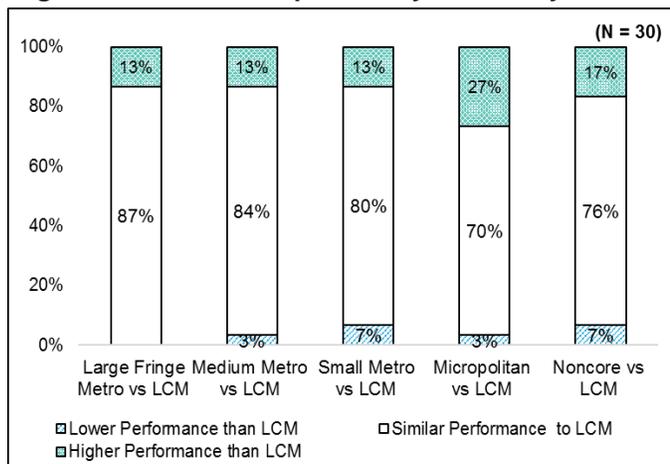


Figure 7-14: PFE: Disparities by Urbanicity



N = the number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

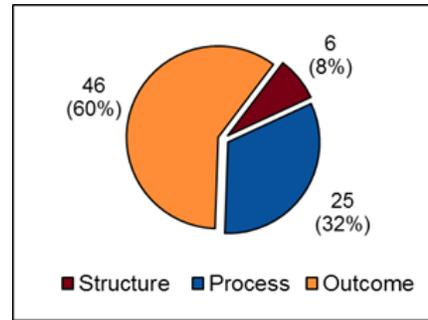
ALL CARE COORDINATION MEASURES

As of December 31, 2015, CMS had implemented 77 unique measures representing Care Coordination in 17 Medicare quality programs.^{lxxxiii} Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Care Coordination measures, which accounted for 10% of all measures then in use by CMS.

Measure Type

Care coordination requires a mixture of measure types to achieve coordinated and collaborative health care delivery. A foundation of quality-based structure measures, such as those that assess the seamless transfer of health information, and process measures, such as those that address medication review and reconciliation, allows providers to develop the infrastructure and processes needed to achieve quality goals. Process measures also provide the evidence from which outcome-based concepts can be derived. As shown in Figure 7-15, of the 77 Care Coordination measures, six (8%) were structure measures, 25 (32%) were process measures, and 46 (60%) were outcome measures.

Figure 7-15: Care Coordination Measures – Number (%) by Type



Trends

Detailed analyses were conducted for 40 (52%) of the Care Coordination measures in 12 Medicare quality programs and initiatives, based on the availability of data and other criteria.^{lxxxiv} The results showed 37 of the 40 measures (93%) had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-4). Importantly, 27 of the 37 measures (73%) demonstrated improving performance trends, including all of the structural measures and a majority (19 of 28) of the outcome measures.

Table 7-4: Trend Results for Care Coordination Measures

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	5 (100%)	3 (75%)	19 (68%)	27 (73%)
Stable	0 (0%)	1 (25%)	6 (21%)	7 (19%)
Declined	0 (0%)	0 (0%)	3 (11%)	3 (8%)
Total	5 (100%)	4 (100%)	28 (100%)	37 (100%)

Note: Percentages may not total to 100% due to rounding.

Disparities

Disparity analyses for race/ethnicity, income, sex, and urbanicity were conducted for 13 Care Coordination measures for which patient-level data were available for this report (17%) (Figures 7-16, 7-17, 7-18, and 7-19). Of particular note are the findings for race/ethnicity and income. The results for race/ethnicity show that performance on more than half of the measures was lower for Blacks (eight of 13, or 62%) than for the White reference group. With regard to income, 50% (six of 12) of the measures for the low-income group had lower performance, compared with the high-income reference group.

^{lxxxiii} For a complete list of Care Coordination measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{lxxxiv} For detailed measure selection criteria, see *Methods* (Appendix D). For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

The results for sex and urbanicity reveal fewer disparities. Relating to sex, 69% (nine of 13) of the measure rates were the same for females as for the male reference group. For urbanicity (urban-rural), performance for a majority (64% [seven of 11] to 100% [11 of 11]) of measures for each of the five comparison groups was similar to that of the most urban reference group, large central metro.

**Disparities Results – Percentage of Measures
With Lower/Higher/Similar Performance Compared With Reference Group**

Figure 7-16: Care Coordination: Disparities by Race/Ethnicity

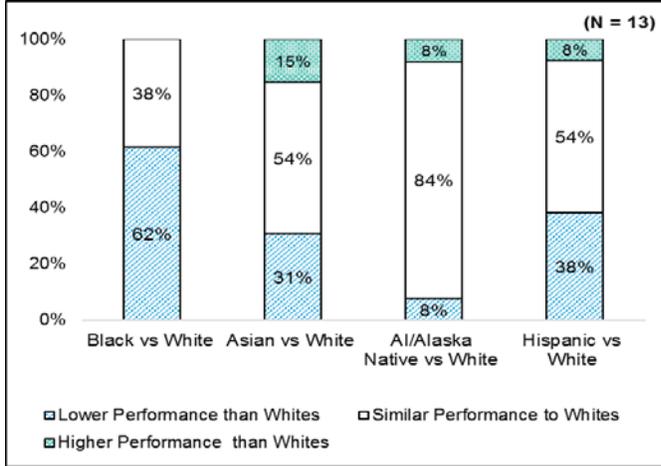


Figure 7-17: Care Coordination: Disparities by Income

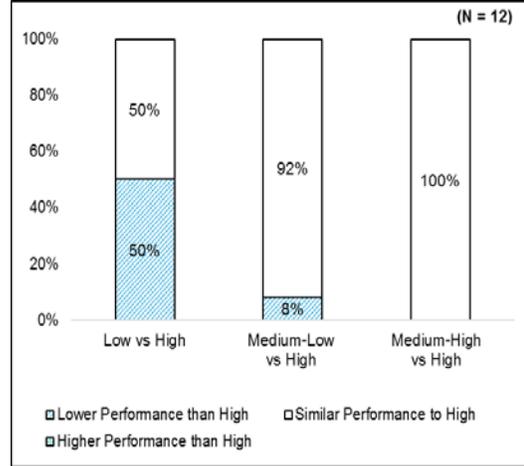


Figure 7-18: Care Coordination: Disparities by Sex

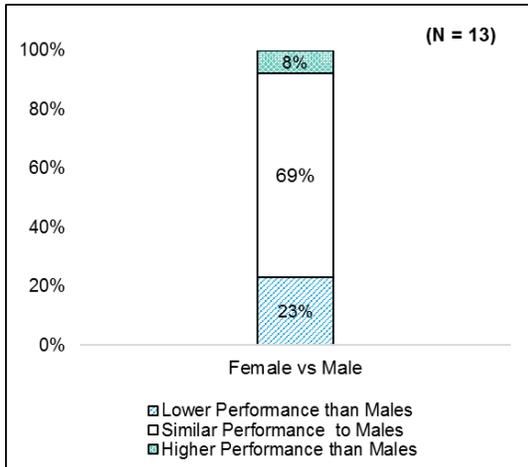
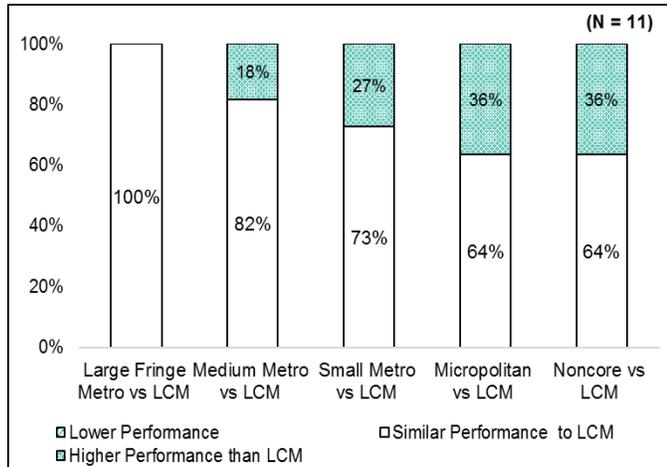


Figure 7-19: Care Coordination: Disparities by Urbanicity



N = the number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

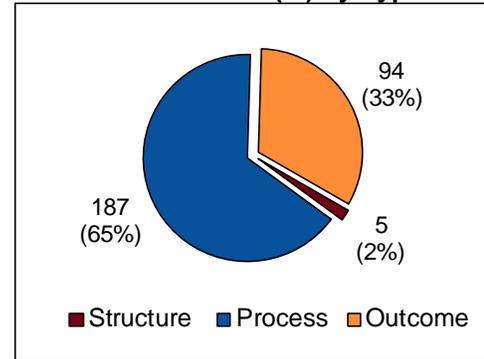
ALL EFFECTIVE TREATMENT MEASURES

As of December 31, 2015, CMS had implemented 286 unique measures representing Effective Treatment in 19 Medicare quality programs.^{lxxxv} Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Effective Treatment measures, which accounted for 38% of measures in use by CMS.

Measure Type

Effective treatment requires the use of evidence-based care that leads to positive outcomes for the patient. As such, process measures related to effective treatment incorporate a broad array of clinical guidelines applicable to multiple specialties. Clinician quality reporting programs such as PQRS had a large number of Effective Treatment process and outcome measures to allow clinicians to select and report measures meaningful to their patient population and scope of practice. Examples of process measures include assessing whether a 12-lead EKG was performed for patients with non-traumatic chest pain (Emergency Medicine) and whether anti-retroviral therapy was prescribed for patients with human immunodeficiency virus (HIV) (Infectious Disease). The process and structure measures can be used by clinicians to improve actions that lead to better patient outcomes and to initiate standardized approaches that support future outcome measures. Of the 286 Effective Treatment measures, five (2%) were structure measures, 187 (65%) were process measures, and 94 (33%) were outcome measures (Figure 7-20).

Figure 7-20: Effective Treatment Measures – Number (%) by Type



Trends

Detailed analyses were conducted for 76 (27%) of the Effective Treatment measures in 15 Medicare quality programs and initiatives, based on the availability of data and other criteria.^{lxxxvi} The results show 66 of the 76 (87%) measures had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-5). Importantly, 45 of the 66 measures (68%) demonstrated improving performance trends, including all of the structural measures and most (71%) of the outcome measures.^{lxxxvii}

Table 7-5: Trend Results for Effective Treatment Measures

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	2 (100%)	23 (64%)	20 (71%)	45 (68%)
Stable	0 (0%)	12 (33%)	6 (21%)	18 (27%)
Declined	0 (0%)	1 (3%)	2 (7%)	3 (5%)
Total	2 (100%)	36 (100%)	28 (100%)	66 (100%)

Note: Percentages may not total to 100% due to rounding.

Disparities

Disparity analyses were conducted for race/ethnicity, income, sex, and urbanicity on 32 Effective Treatment measures for which patient-level data were available for this report (11%) (Figures

^{lxxxv} For a complete list of Effective Treatment measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{lxxxvi} For detailed measure selection criteria, see *Methods* (Appendix D).

^{lxxxvii} For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

7-21, 7-22, 7-23, and 7-24). Of particular note are the small number of measures on which performance was lower for several racial and ethnic groups than for the White reference group. For example, 28 (93%) of the 30 Effective Treatment measures for the Asian group had similar or higher performance, compared with the White reference group. Of the four disparities categories represented below, the largest disparities were found for income. For this disparity category, the low-income group had lower performance for 16 (50%) of Effective Treatment measures, compared with the high-income reference group.

**Disparities Results – Percentage of Measures
With Lower/Higher/Similar Performance Compared With Reference Group**

Figure 7-21: Effective Treatment: Disparities by Race/Ethnicity

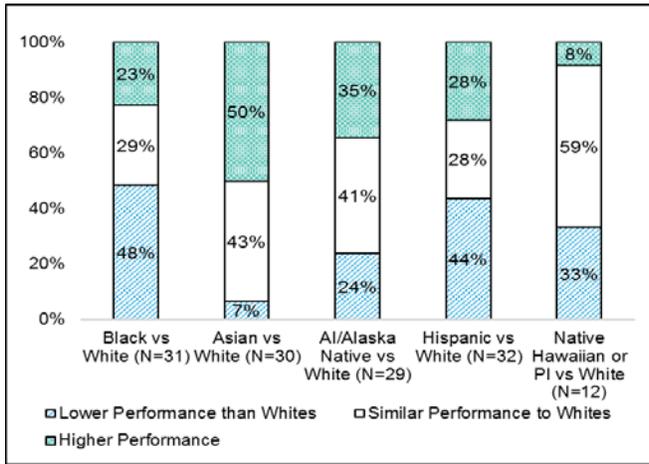


Figure 7-22: Effective Treatment: Disparities by Income

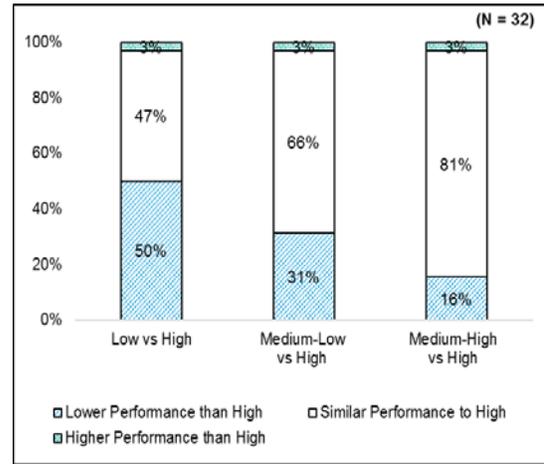


Figure 7-23: Effective Treatment: Disparities by Sex

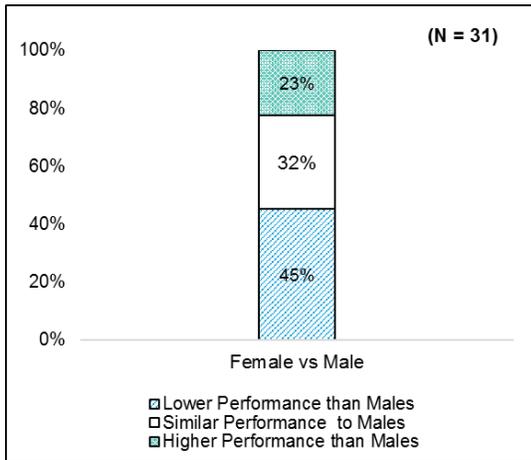
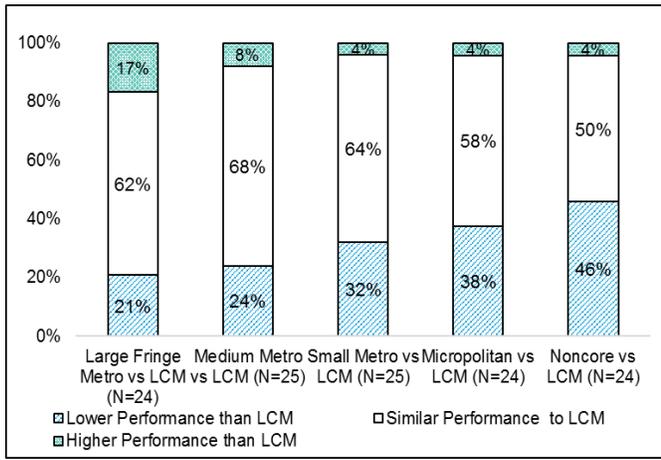


Figure 7-24: Effective Treatment: Disparities by Urbanicity



N = the number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

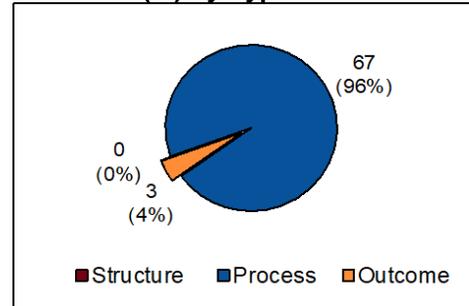
ALL HEALTHY LIVING MEASURES

As of December 31, 2015, CMS had implemented 70 unique measures representing Healthy Living in 15 Medicare quality programs.^{lxxxviii} Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Healthy Living measures, which accounted for 9% of measures then in use by CMS.

Measure Type

Current measures for Healthy Living stress immunizations and evidence-based health screenings. These activities are documented primarily through process measures closely linked to health outcomes. Such measures provide clinical evidence which clinicians can use to improve actions that lead to better patient outcomes and initiate standardized clinical approaches to support future outcome measures. Of the 70 measures, 67 (96%) were process measures, and three (4%) were outcome measures. (Figure 7-25).

Figure 7-25: Healthy Living Measures – Number (%) by Type



Trends

Detailed analyses were conducted for 44 (63%) of the Healthy Living measures reported in 13 Medicare quality programs and initiatives, based on the availability of data and other criteria.^{lxxxix} The results show that 32 of the 44 (73%) measures had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-6). Performance trends for 18 of the 32 measures (56%) demonstrated improvement.

Table 7-6: Trend Results for Healthy Living Measures^{xc}

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Improved	0 (0%)	18 (56%)	0 (0%)	18 (56%)
Stable	0 (0%)	11 (34%)	0 (0%)	11 (34%)
Declined	0 (0%)	3 (9%)	0 (0%)	3 (9%)
Total	0 (100%)	32 (100%)	0 (100%)	32 (100%)

Note: Percentages may not total to 100% due to rounding.

Disparities

Disparities analyses for race/ethnicity, income, sex, and urbanicity were conducted on seven Healthy Living measures for which patient-level data were available for this report (10%) (Figures 7-26, 7-27, 7-28, and 7-29). Significant disparities were identified for race/ethnicity, income, and urbanicity. More than 70% of these Healthy Living measures showed lower performance for the Black, AI/Alaska Native, and Hispanic groups, compared with the White reference group. The low-income group had lower performance than the high-income group for 71% (five of seven) of the measures. Compared with the most urban reference group (large central metro), the most rural group (noncore) had lower performance on 43% (three of seven) of the measures. Importantly, no significant disparities between rates for males and females were identified for 100% of the measures.

^{lxxxviii} For a complete list of Healthy Living measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{lxxxix} For detailed measure selection criteria, see *Methods* (Appendix D).

^{xc} For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

**Disparities Results – Percentage of Measures
With Lower/Higher/Similar Performance Compared With Reference Group**

Figure 7-26: Healthy Living: Disparities by Race/Ethnicity

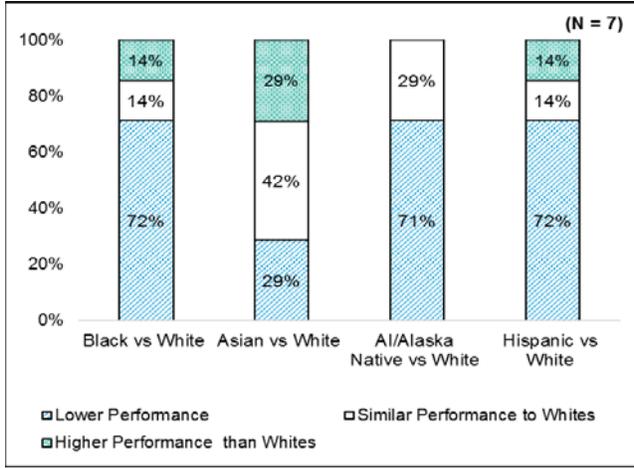


Figure 7-27: Healthy Living: Disparities by Income

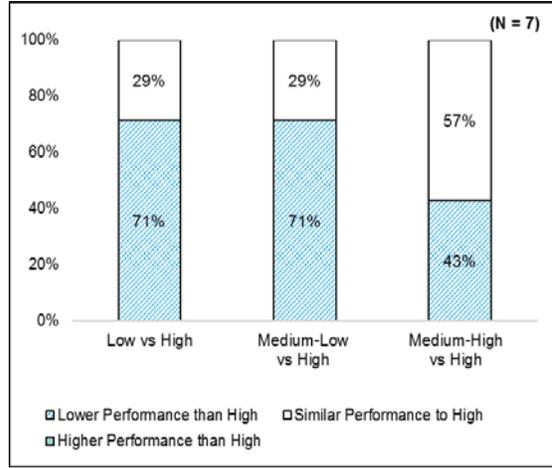


Figure 7-28: Healthy Living: Disparities by Sex

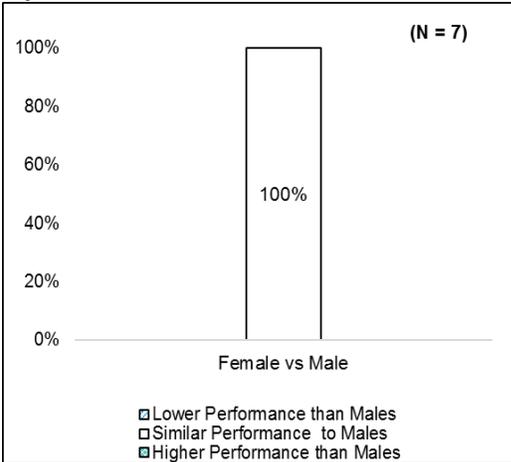
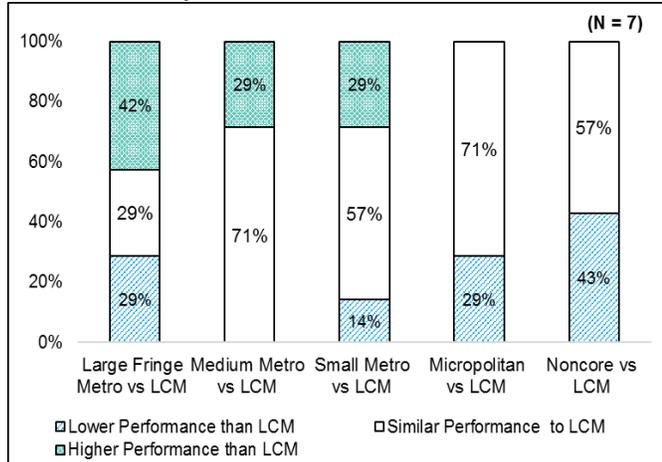


Figure 7-29: Healthy Living: Disparities by Urbanicity



N = Number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or like that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

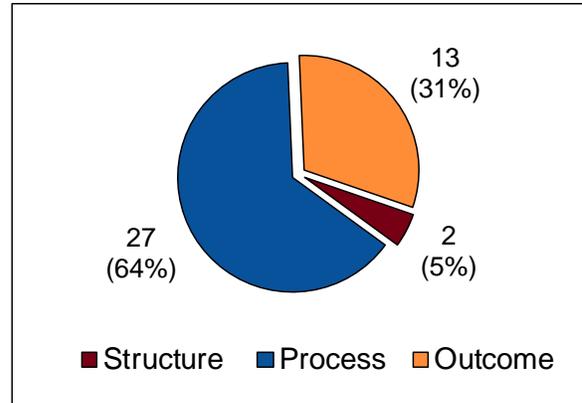
ALL AFFORDABLE CARE MEASURES

As of December 31, 2015, CMS had implemented 42 unique measures representing Affordable Care in 12 Medicare quality programs, initiatives, and public reporting websites.^{xc1} Analyses were conducted to identify measure types, evaluate performance trends, and assess disparities observed for the Patient Safety measures, which accounted for 6% of measures in use by CMS.

Measure Type

Evidence-based measures of appropriate use/potential overuse of tests and procedures can help clinicians and other providers identify services that do not lead to better patient outcomes. As such, process measures related to Affordable Care include a broad array of measures applicable to multiple specialties. Examples include *MRI Lumbar Spine for Low Back Pain* (NQF #0541) and *Avoidance of Overuse of Bone Scan for Staging Low Risk Prostate Cancer Patients* (NQF #0389). Of the 42 Affordable Care measures, two (5%) were structure measures, 27 (64%) were process measures, and 13 (31%) were outcome measures (Figure 7-30).

Figure 7-30: CMS Affordable Care Measures – Number (%) of Measures by Type



Trends

Detailed analyses were conducted for 14 (33%) of the Affordable Care measures in four Medicare quality programs and initiatives, based on the availability of data and other criteria.^{xcii} The results show six of the 14 (43%) measures had three or more annual reporting periods, providing sufficient data for a trend analysis to be conducted (Table 7-7). Of the six measures represented in the table, two measures demonstrate increasing performance trends, one measure shows no change, and three show a decreasing trend.^{xciii}

The six measures included in the trend analyses consist of five overuse measures and one cost measure. For these analyses, these measure rates are not characterized as improving or declining. Changes in costs or utilization are noted as increased or decreased.

Table 7-7: Trend Results for Affordable Care Measures

Progress	Structure Measures	Process Measures	Outcome Measures	Total Measures
Increased	0 (0%)	1 (20%)	1 (100%)	2 (33%)
Stable	0 (0%)	1 (20%)	0 (0%)	1 (17%)
Decreased	0 (0%)	3 (60%)	0 (0%)	3 (50%)
Total	0 (100%)	5 (100%)	1 (100%)	6 (100%)

Note: Percentages may not total to 100% due to rounding.

^{xc1} For a complete list of Affordable Care measures, see *Overview of CMS Measures Included in Analyses* (Appendix A).

^{xcii} For detailed measure selection criteria, see *Methods* (Appendix D).

^{xciii} For the results of the analyses for all measures, see *Analytic Results* (Appendix E).

Disparities

Disparity analyses were conducted for race/ethnicity, income, sex, and urbanicity on eight Affordable Care measures for which patient-level data were available for this report (19%) (Figures 7-31, 7-32, 7-33, and 7-34). The neutral language used in the graph legend accurately reflects the interpretation of the differences identified for cost and overuse measures. A majority of rates for all eight measures were similar to the reference group rates in all four disparity categories.

Disparities Results – Percentage of Measures With Lower/Higher/Similar Performance Compared With Reference Group

Figure 7-31: Affordable Care: Disparities by Race/Ethnicity

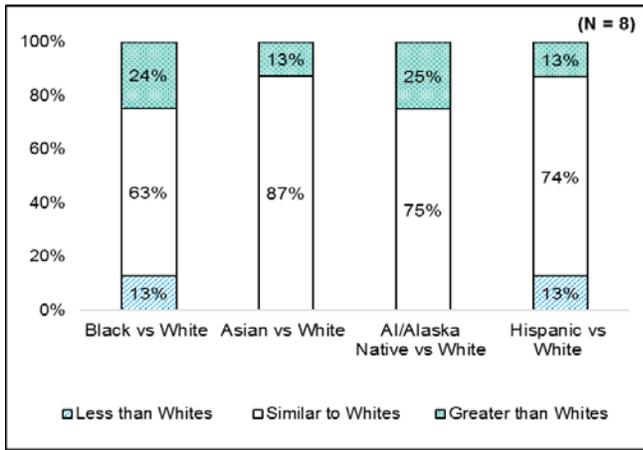


Figure 7-32: Affordable Care: Disparities by Income

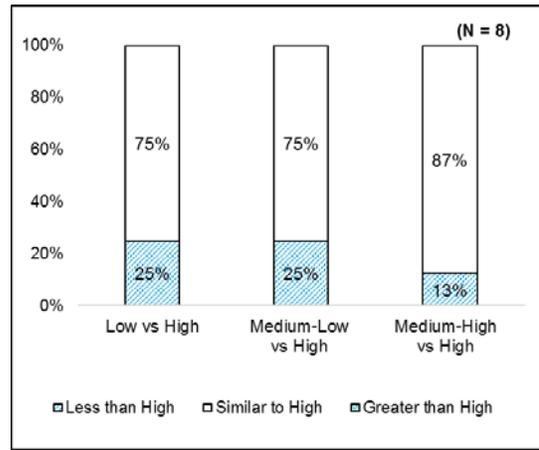


Figure 7-33: Affordable Care: Disparities by Sex

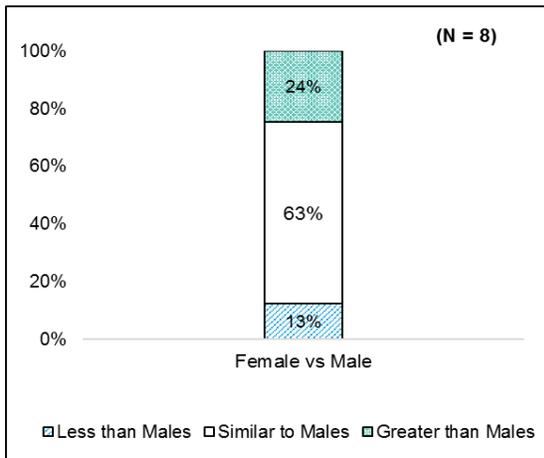
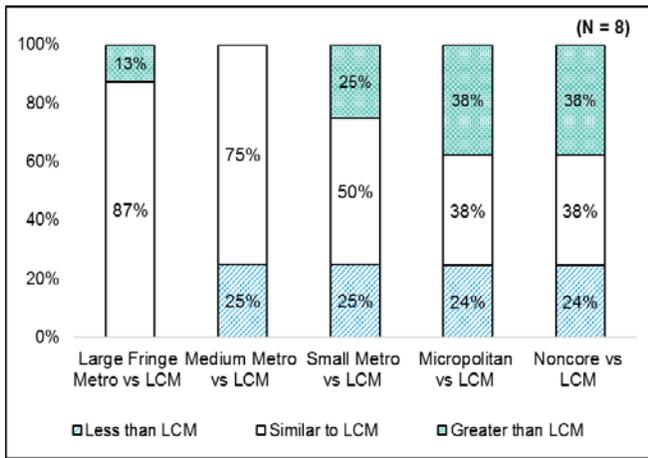


Figure 7-34: Affordable Care: Disparities by Urbanicity



N = the number of measures included in each analysis. Percentages within columns represent the percentage of measures for which performance for a group was lower, higher, or similar to that of a reference group. The median household income for the ZIP Code Tabulation Area (ZCTA) of patient residence is a proxy for patient-level income. Income categories are defined by dividing ZCTA incomes into four equal-sized groups. LCM = large central metro. Urban categories displayed on the urbanicity graph include large central metro, large fringe metro, medium metro, and small metro. Rural categories include micropolitan and noncore. Detail may not sum to totals because of rounding.

8 – National Provider Surveys



BACKGROUND

A key aspect of evaluating the impact of CMS measures is determining how health care providers are responding to the use of performance measures. The provider perspective can illustrate changes that have been made in response to CMS quality programs and the effects of those changes on 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.

To gather information on provider responses to the use of CMS performance measures, CMS conducted national surveys in hospitals and nursing homes along with qualitative interviews. For the surveys, CMS drew stratified random samples in each setting, with strata defined by facility size and overall performance on CMS measures. Of the 2,045 facilities sampled in each setting, 1,313 hospitals and 1,182 nursing homes responded to the survey. CMS also completed interviews with 40 quality leaders in each setting.^{xciv} The hospital and nursing home settings were selected for surveying because the CMS reporting programs associated with these settings are mature, having been in place since 2004 and 2002, respectively.^{1,2}

PURPOSE OF SURVEYS AND INTERVIEWS

CMS sought to determine what changes providers are making in response to the use of performance measures by CMS. This overarching question was translated into five specific research questions that formed the content of the surveys and interviews.

1. What types of changes or innovations have hospitals/nursing homes made to improve their performance on CMS measures?
2. If a change or innovation was made, has it helped the hospital/nursing home improve its performance on one or more CMS measures?
3. What challenges or barriers do hospitals/nursing homes face in reporting CMS quality measures?
4. What challenges or barriers do hospitals/nursing homes face in improving performance on the CMS quality measures?
5. What unintended consequences do hospitals/nursing homes report associated with implementation of CMS quality measures?

^{xciv} For a detailed description of the methods, see *Methods* (Appendix D). Sampled facilities included only acute care hospitals (“hospitals”) and nursing homes certified by Medicare and Medicaid (“nursing homes”) included in Hospital Compare and Nursing Home Compare, respectively. For detailed inclusion and exclusion criteria, see *Methods* (Appendix D).

SUMMARY FINDINGS

Results from the surveys show that a majority of hospitals and nursing homes viewed CMS quality measures as clinically important; reported that their facility’s performance on the CMS measures reflects the improvements in care the facility has made; and agreed that they should be held responsible for performance on the CMS measures.

1. Changes Adopted in Response to CMS Quality Measurement Programs

Hospitals and nursing homes reported having implemented many changes to improve their performance. Hospitals cited an average of 17 of 23 possible changes, while nursing homes reported an average of 13 of 22 possible changes.

- Almost all (99%) of the hospitals and nursing homes had made at least one structural or process change to improve their performance in response to CMS measures.
- In interviews, both hospitals and nursing homes indicated that many changes were focused on improving performance on the readmission measures.

2. Changes That Contributed to Improved Performance on CMS Measures

High percentages of hospitals (ranging from 63% to 96% for the 23 changes to care delivery) and nursing homes (ranging from 67% to 92% for the 22 changes to care delivery) reported that the changes they had made were “definitely or somewhat” helpful in improving performance on one or more CMS measures.

3. Barriers to Reporting CMS Quality Measures

Thirty percent of hospitals noted difficulties reporting CMS measures. These difficulties include problems with CMS reporting tools. In comparison, fewer nursing homes (12%) experienced difficulties.

4. Barriers to Improving Performance

Large majorities of hospitals (92%) and nursing homes (85%) experienced difficulties improving performance on some or many of the CMS measures. Barriers described by hospitals in interviews include changing frontline clinician behavior, having a difficult patient mix (i.e., patients who are clinically complex or of low socioeconomic status, and delays in receiving risk-adjusted scores. For nursing homes, a difficult patient mix was the most commonly cited barrier based on survey results and the most prominent theme from interviews.

5. Unintended Consequences Associated with the Implementation of CMS Quality Measures

When asked about unintended effects associated with the CMS measures, the most frequently cited unintended effects were an increased focus on documentation or coding of data to attain a higher score (64% for hospitals and 53% for nursing homes) and a focus on narrow improvement for specific measures rather than across-the-board improvement in care (59% for hospitals and 44% for nursing homes). Forty-one percent of hospitals also reported overtreatment of patients to ensure acceptable performance on a measure. Nationally, 32% of nursing homes reported avoiding sicker or more challenging patients, but in the interviews, some nursing homes described this practice as avoiding patients who were beyond their capability to treat.

DETAILED FINDINGS: HOSPITAL SURVEY AND INTERVIEW RESULTS

Hospitals were asked at the start of the survey to provide an overall assessment of CMS quality measurement programs. When asked whether the CMS measures are clinically important, 92% of hospitals responded “yes” or “mostly yes.” Furthermore, 90% reported that their hospital’s performance on the CMS measures reflects the improvements in care the hospital has made “very well” or “somewhat well.” Nearly all (89%) responded “yes” or “mostly yes” that hospitals should be held responsible for performance on the CMS measures.

1. Changes Adopted by Hospitals in Response to CMS Quality Measurement Programs

Research Question	What types of changes or innovations have hospitals made to improve their performance on CMS measures?
Source	National survey and interviews with hospital quality leaders

Survey Findings Related to Changes Adopted by Hospitals

Hospitals were asked to report whether they had made any of 23 individual changes to improve care delivery in an effort to improve performance on the CMS measures (Figure 8-1).^{xcv} The 23 individual changes were grouped into seven broad categories of change:

- Organizational culture
- Performance monitoring
- Health information technology (IT)
- Care process redesign
- Changes in staffing
- Provider incentives
- Other improvement initiatives (including measure-specific quality improvement initiatives and technical assistance)

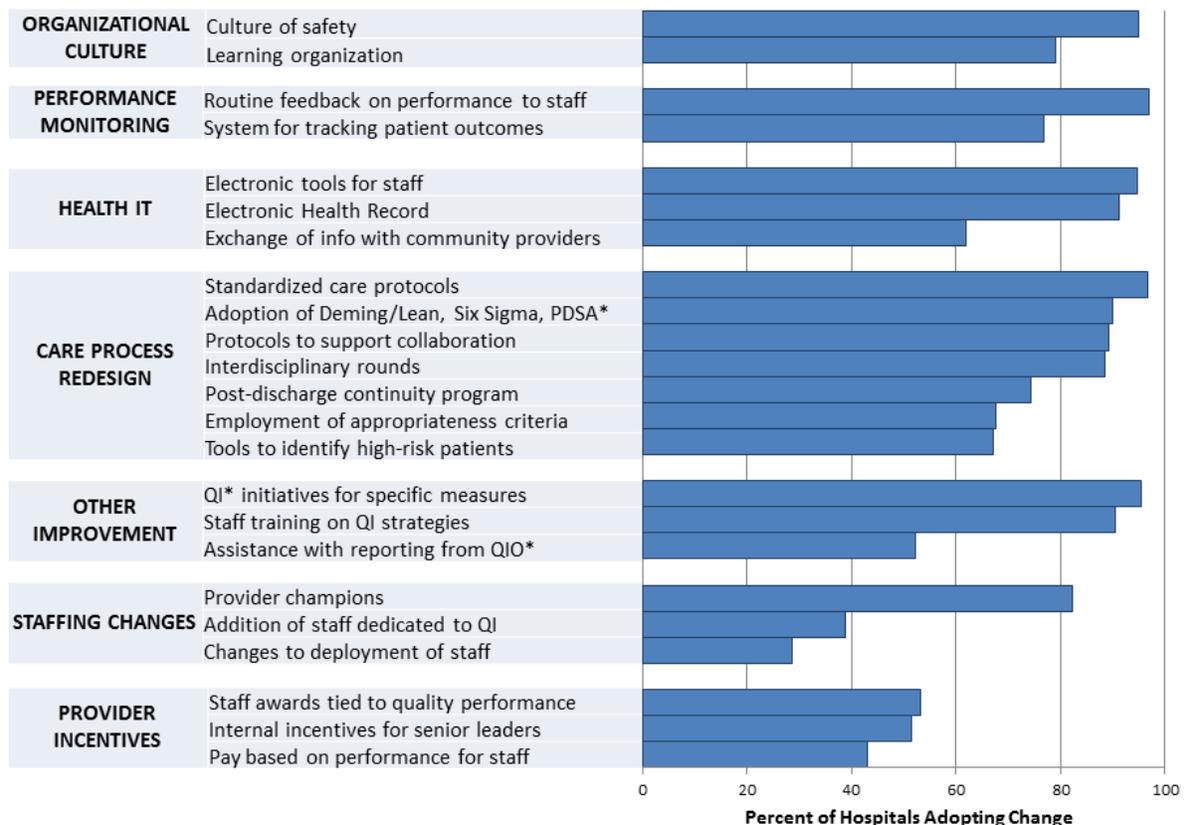
Hospitals have taken actions to improve performance on the CMS measures, with 99% of hospitals implementing at least one change and half of all hospitals reporting they have made many changes. On average, hospitals reported making 17 of 23 changes (median number of changes made was 17 of 23, with an interquartile range [25th to 75th percentile] of 15 to 20 changes). Nationally, 2% of hospitals reported adopting all 23 interventions.

Among the 23 individual changes hospitals could have reported making, providing routine feedback to physicians and other clinical staff on performance on CMS measures was the most frequently adopted change, cited by 97% of hospitals. In contrast, only 29% of hospitals described implementing changes to how nursing staff are deployed (Figure 8-1).

In the subgroup analyses,^{xcvi} large hospitals reported higher adoption rates than small hospitals for 18 of the 23 changes to care delivery.

^{xcv} For results in tabular format, see also Table EE-3 in *Analytic Results* (Appendix E).

^{xcvi} For additional details, see Table EE-3 in *Analytic Results* (Appendix E).

Figure 8-1: Changes Hospitals Reported Making to Improve Quality Performance

Notes: National estimates of the percentage of hospitals adopting the change. Results are displayed by categories of change. PDSA = Plan-Do-Study-Act; *QI = quality improvement; QIO = Quality Improvement Organization.

Interview Findings Related to Changes Adopted by Hospitals

Among the 40 hospital leaders interviewed, 38 reported their hospitals made changes in response to CMS measurement programs. The changes hospitals described in the interviews were grouped into the following categories:

1. Provided training to increase physician and staff acceptance of measures and education on methods to improve performance (such as implementing a four-hour communications curriculum on how to interact effectively with patients).
2. Used care protocols or pathways (such as adding checklists to ensure patients received statins before discharge).
3. Provided targeted feedback to providers (such as sharing department-level scorecards).
4. Changed staffing and staff roles (such as empowering nurses to perform timely removal of catheters without physician orders).
5. Implemented EHR capabilities (such as using clinical decision support, including automated alerts/reminders on administering the flu vaccine).
6. Instituted mechanisms for real-time or concurrent reviews (such as conducting concurrent chart reviews to determine whether patients were receiving prophylactic medication for venous thromboembolism).
7. Increased the focus on post-discharge planning (such as strategizing with skilled nursing facilities to prevent readmission of patients with congestive heart failure).

8. Created interdisciplinary teams to address measurement areas across specialties or departments (such as involving interdisciplinary staff in the workflow to reduce readmissions).
9. Collaborated with outside groups to identify or implement strategies for improvement (such as implementing changes in care via participation in initiatives or programs, including the Hospital Engagement Network, which contracts with hospitals to implement care bundles, and the Joint Commission Center for Transforming Care to implement procedures to improve readmission rates).
10. Used care redesign methods (such as requiring LEAN training).

In addition to taking steps to improve performance by improving care, hospitals also sought to raise performance scores by improving documentation, such as reminding clinicians to record patient comorbidities accurately.

2. Changes Made by Hospitals That Contributed to Improved Performance on CMS Measures

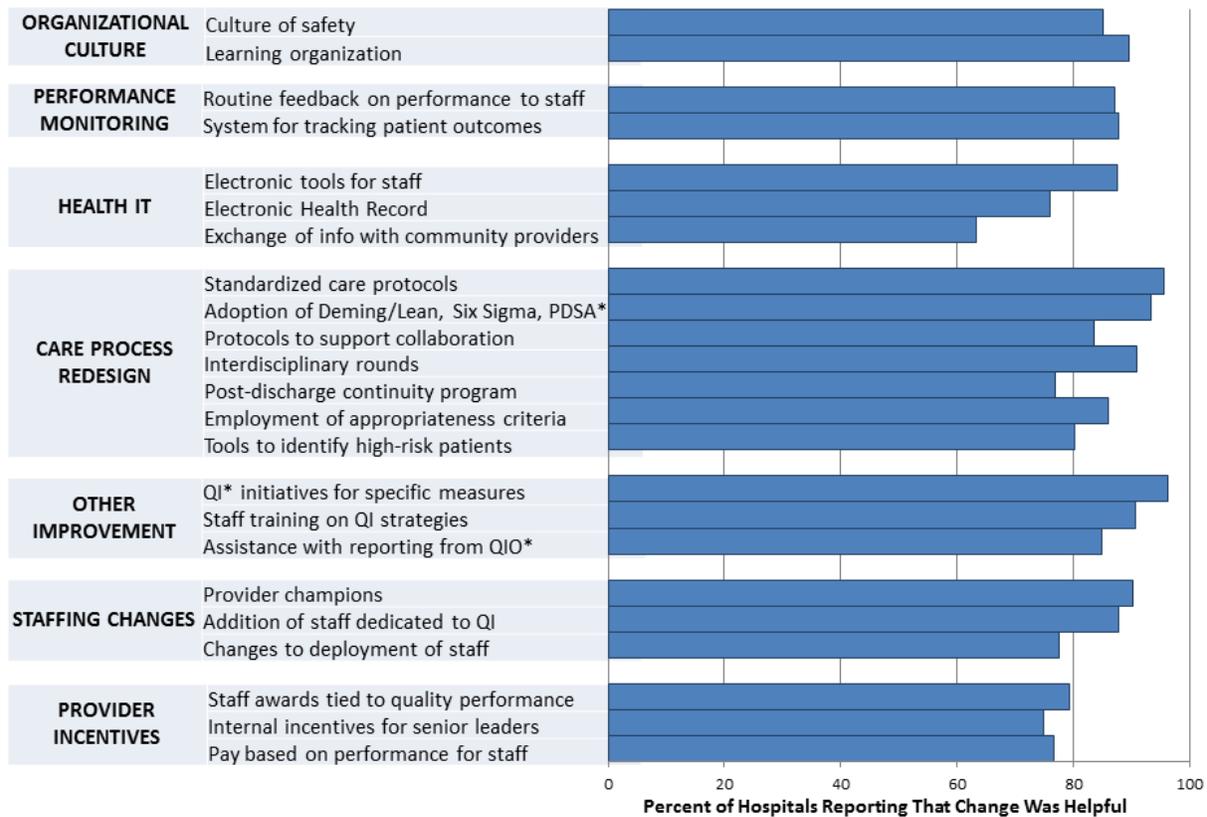
Research Question	If a change or innovation was made, has it helped the hospital improve its performance on one or more CMS measures?
Source	National survey of hospital quality leaders

Survey Findings Related to Changes That Contributed to Improved Performance

A high percentage of hospitals (ranging from 63% to 96% for the 23 changes) that reported making changes perceived that the changes were “definitely or somewhat” helpful in improving performance on one or more CMS measures (Figure 8-2).^{xcvii} The two changes that hospitals noted to be the most helpful were the use of standardized care protocols (96%) and quality improvement initiatives for specific measures (96%). The change that was the least helpful (implementing health information technology [IT] that allows exchange of clinical information with community providers) was still reported to be helpful by a majority of respondents (63%).

^{xcvii} For results in tabular format, see Table EE-3 in *Analytic Results* (Appendix E).

Figure 8-2: Percentage of Hospitals Reporting Each Change as Definitely or Somewhat Helpful in Improving Performance



Notes: National estimates of the percentage of hospitals perceiving change to be definitely or somewhat helpful among hospitals that adopted the change. Results are displayed by category of change. *PDSA = Plan-Do-Study-Act; QI = quality improvement; QIO = Quality Improvement Organization

3. Barriers Faced by Hospitals in Reporting CMS Quality Measures

Research Question	What challenges or barriers do hospitals face in reporting CMS quality measures?
Source	National survey and interviews with hospital quality leaders

Survey Findings on Barriers to Reporting

Based on survey responses, 30% of hospitals nationally reported difficulties in reporting CMS measures.

Interview Findings on Barriers to Reporting

Among the 40 hospitals interviewed, 38 were asked about difficulties reporting CMS measures, and 25 of those respondents noted difficulties in reporting. Concerns that were described by hospitals related to barriers to reporting CMS measures include the following:

1. Frequent updates to measure specifications and confusing measure definitions, which create additional reporting burdens for hospitals (such as changes to measure specifications after the start of the measurement year).

2. Internal EHR or information technology limitations (such as software not supporting specific formats and data fields required by CMS).
3. Technical difficulties or issues with CMS tools (such as difficulties with the QualityNet and National Healthcare Safety Network [NHSN] interface).
4. Labor- and/or resource-intensive reporting to CMS (such as the CMS Abstraction and Reporting Tool [CART] requiring efforts from multiple staff).
5. Issues with technical support (such as inadequate support from the QualityNet help desk and the need to correspond with different QIOs for support).
6. Issues of capturing inaccurate data (such as uncertainty on whether claims data for Patient Safety Indicators were captured accurately).

4. Barriers Faced by Hospitals in Improving Their Performance

Research Question	What challenges or barriers do hospitals face in improving performance on the CMS quality measures?
Source	National survey and interviews with hospital quality leaders

Survey Findings on Barriers to Improved Performance

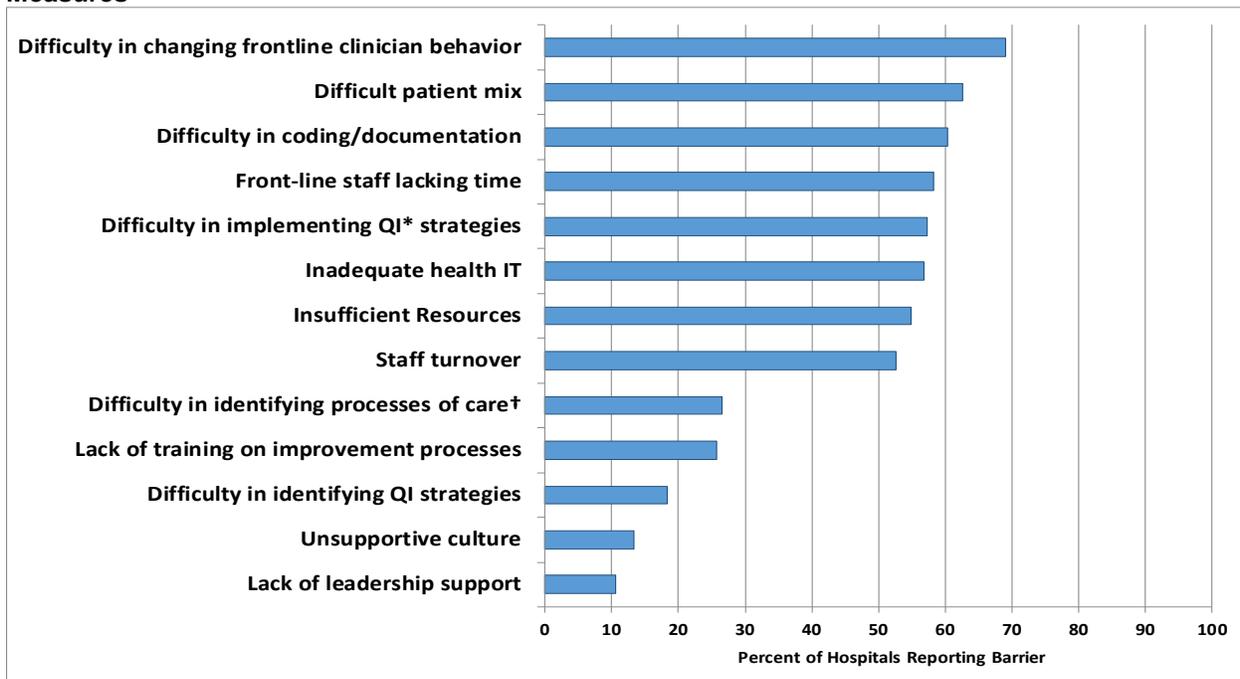
Ninety-two percent of hospitals reported difficulties with improving performance on some or many CMS measures. Among 13 barriers to improvement asked of hospitals, respondents cited experiencing an average of 5.7 barriers (median of 6 barriers, and an interquartile range [25th to 75th percentile] of 4 to 8 barriers).^{xcviii}

Barriers to improvement were organized into 13 types of barriers (Figure 8-3). Changing front line clinician behavior was the most commonly reported barrier to improving performance (69% of all hospitals), followed by difficult patient mix (i.e., patients who are clinically complex or of low socioeconomic status) (63% of all hospitals).

In subgroup analyses,^{xcix} more large hospitals noted difficulty improving performance on CMS measures than small hospitals (97% versus 88%), and more lower-quality hospitals reported difficulty improving performance than higher-quality hospitals (94% versus 84%). Large hospitals also reported having a difficult patient mix, difficulty with coding/documentation, and issues with frontline staff having sufficient time to comply with measures at higher rates (10 percentage points or more) than small hospitals.

^{xcviii} For results in tabular format, see Table EE-4 in *Analytic Results* (Appendix E).

^{xcix} For additional details, see Table EE-4 in *Analytic Results* (Appendix E).

Figure 8-3: Factors Reported by Hospitals as Barriers to Improving Performance on CMS Measures

Notes: National estimates of the percentage of hospitals reporting various factors as barriers to improving performance. *QI = quality improvement; † = processes of care to improve patient outcomes

Hospitals were asked about difficulties improving performance on six types of measures. Hospitals reported the greatest difficulty improving performance on measures of patient experience (75%), 30-day readmissions (74%), and other outcomes (63%). Hospitals noted less difficulty improving measures related to resource use (33%), patient safety (21%), and process-of-care (21%). Significant differences exist by hospital size for all six types of measures.^c Larger hospitals reported more difficulty improving performance on all types of measures (by 14–17 percentage points) except clinical process measures for which small hospitals reported more difficulty improving (by 8 percentage points).

Interview Findings on Barriers to Improved Performance

In the interviews, most hospitals (36 of 39 that were asked) also reported experiencing difficulties improving on one or more measures. The difficulties cited by hospitals to improving performance fall into the following broad categories:

1. Internal IT/EHR limitations (such as EHR systems not communicating).
2. Poor patient compliance and/or a highly comorbid patient population (such as high-risk patients developing pressure ulcers, despite good care).
3. Lack of physician engagement and difficulty changing frontline staff behavior (such as non-employee physicians lacking engagement and labor union rules preventing hospitals from giving feedback to staff members on HCAHPS survey scores).

^c For additional details, see Table EE-5 in *Analytic Results* (Appendix E).

4. Lack of integrated health system and/or care coordination (such as post-discharge care not being within the hospital’s control).
5. Receipt of performance data on CMS measures too late to guide quality improvement efforts (such as scores for mortality measures being received one to two years after care was delivered).
6. Smaller hospitals’ significantly lower scores due to the impact of a few outliers (such as small populations and few events causing performance to be poor).
7. Difficulties identifying improvement strategies (such as strategies to address HCAHPS measures on audits and audits on medication instructions being difficult to identify).
8. Lack of leadership support (such as hospital administration not devoting resources to areas of poor performance).
9. Poor documentation by staff (such as physicians under-documenting the severity of illness, leading to lower scores).
10. Complex measure specifications for some measures, making it difficult for hospitals to target quality improvement initiatives (such as the “many moving parts” of a measure that were subject to interpretation).
11. The delay in receiving risk-adjusted scores on outcome measures, including readmissions and mortality measures.

5. Unintended Consequences Associated with Implementation of CMS Quality Measures in Hospitals

Research Question	What unintended consequences do hospitals report associated with implementation of CMS quality measures?
Source	National survey and interviews with hospital quality leaders

Survey Findings on Unintended Consequences

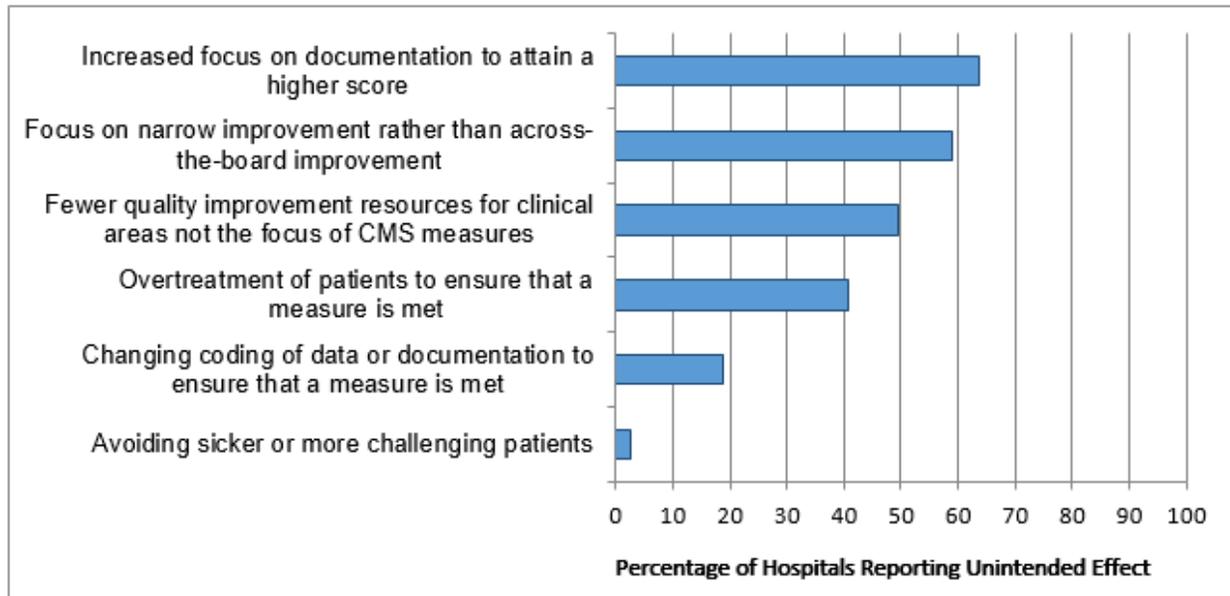
Hospital leaders were asked to comment on whether they had observed any undesired effects stemming from using or reporting CMS measures and whether any of six types of undesired effects had occurred in their hospital as a result of being held accountable for performance on CMS measures. Nationally, hospitals cited, on average, two unintended consequences out of six types that were asked (median of two unintended consequences, interquartile range of 1 to 3 unintended consequences). The most commonly reported unintended consequences were an increased focus on documentation or coding of data to attain a higher score (64%) and a focus on narrow improvement (i.e., “teach to the test”) rather than across-the-board improvement (59%) (Figure 8-4).^{ci} Overtreatment of patients to ensure acceptable performance on a measure was also commonly reported (41%). Only 3% of hospitals noted avoiding providing care to sicker or more challenging patients.

Analyses by hospital size show significant differences in the proportion of hospitals reporting unintended consequences.^{cii} In comparison to smaller hospitals, larger hospitals cited an increased focus on documentation (69% versus 57%) and more focus on narrow improvement (66% versus 55%), but lower avoidance of sicker patients (1% versus 5%).

^{ci} For results in tabular format, see Table EE-6 in *Analytic Results* (Appendix E).

^{cii} For subgroup analyses, see Table EE-6 in *Analytic Results* (Appendix E).

Figure 8-4: Percentage of Hospitals Reporting Unintended Consequences Stemming from CMS Measures and Their Use in Public Reporting and Pay-for-Performance



Note: National estimates of the percentage of hospitals reporting unintended consequences.

Interview Findings on Unintended Consequences

In the interviews, 30 out of 40 hospitals described at least one unintended consequence. Based on the discussions with hospitals, the following issues were reported:

- Ignored or paid less attention to areas of care that are not measured (such as hospitals concentrating on infections that are measured as opposed to those that are not).
- Provided inappropriate treatment due to incomplete measure specifications (such as denominator exclusions not fully addressing patients for whom the recommended treatment would be contraindicated).
- Avoided sicker or more difficult patients to achieve higher scores on the measures (such as surgeons opting against operating on sicker patients).

Hospitals described other unintended consequences not asked in the survey. These include (1) an increased use of observation stays instead of inpatient hospitalizations to avoid triggering the readmission measure and (2) implementing programs specifically targeting or identifying Medicare beneficiaries for specific interventions like prevention of readmissions, instead of applying broader strategies to all patients.

DETAILED FINDINGS: NURSING HOME SURVEY AND INTERVIEW RESULTS

In this section, the findings from the nursing home survey and interviews are summarized for each of the five research questions. At the start of the survey, nursing homes were also asked to provide an overall assessment of CMS quality measurement programs. When asked whether the CMS measures are clinically important, 91% of nursing homes responded “yes” or “mostly yes.” Furthermore, 83% reported that their nursing home’s performance on the CMS measures reflects improvements in care “very well” or “somewhat well.” Most nursing homes (81%) responded “yes” or “mostly yes” when asked whether nursing homes should be held responsible for performance on CMS measures.

1. Changes Adopted by Nursing Homes in Response to CMS Quality Measurement Programs

Research Question	What types of changes or innovations have nursing homes made to improve their performance on CMS measures?
Source	National survey and interviews with nursing home quality leaders

Survey Findings Related to Changes Adopted by Nursing Homes

In the survey, nursing homes were asked to report whether they had made any of 22 individual changes to care delivery to improve their performance on the CMS measures (Figure 8-5).^{ciii, civ} The 22 individual changes were grouped into seven broad categories of change:

- Organizational culture
- Performance monitoring
- Care process redesign
- Health information technology
- Changes in staffing
- Provider incentives
- Other improvement initiatives (including measure-specific quality improvement initiatives and technical assistance)

Nursing homes have taken actions to improve performance on the CMS measures, with 99% reporting implementing at least one change and half of all nursing homes reporting having implemented at least half of the changes (median number of changes made was 13 of 22, with an interquartile range [25th to 75th percentile] of 11 to 16 changes). Nationally, 2% of nursing homes reported adopting all 22 interventions.

Among the 22 individual changes nursing homes could have made, adopting practices to become a “learning organization” was most frequently noted by 87% of nursing homes. In contrast, only 10% of nursing homes used CMS measure performance to determine pay for nurses or other frontline staff (Figure 8-5).

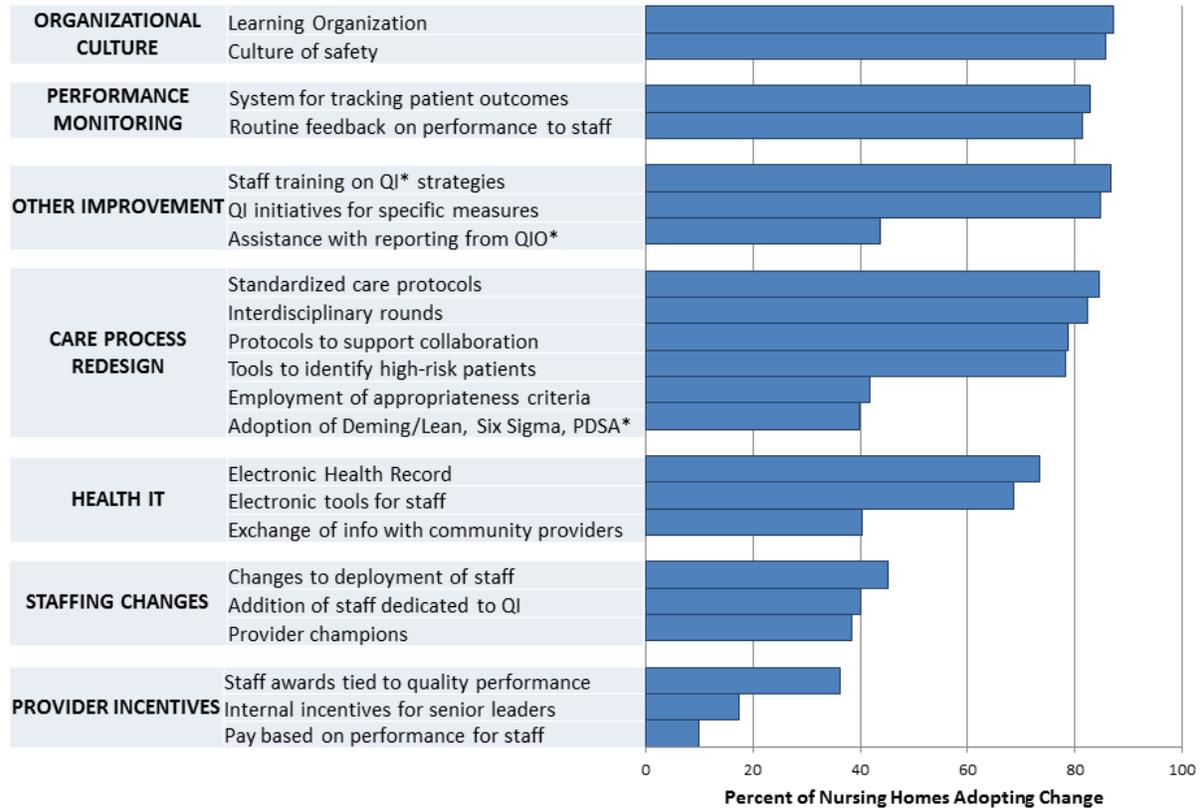
In subgroup analyses, adoption rates differed by nursing home size for 11 of 22 changes. Large nursing homes reporting greater adoption rates than smaller nursing homes in all such cases.^{cv}

^{ciii} For additional details, see survey instrument in *Methods* (Appendix D).

^{civ} For results in tabular format, see also Table EE-7 in *Analytic Results* (Appendix E).

^{cv} For additional details, see Table EE-7 in *Analytic Results* (Appendix E).

Figure 8-5: Changes Nursing Homes Reported Making to Improve Quality Performance



Notes: National estimates of the percentage of nursing homes adopting the change. Results are displayed by categories of change. *QI = quality improvement; QIO = Quality Improvement Organization; PDSA = Plan-Do-Study-Act

Interview Findings Related to Changes Adopted by Nursing Homes

Of the 40 nursing home leaders interviewed, 34 reported making changes in response to CMS measures. The changes nursing homes described during the interviews were grouped into the following categories:

1. Increased staff education efforts (such as focusing on avoiding unnecessary catheter use).
2. Provided feedback on measure performance to staff (such as tracking performance on a board in the staff room).
3. Monitored performance on measures and developed action plans to address areas where the facility is lagging (such as employing an infection control nurse to monitor urinary tract infection rates).
4. Made changes to staff roles or adding staff (such as implementing hourly rounding to reduce falls and coordinating with pharmacists to reduce antipsychotic medication use).
5. Implemented interdisciplinary treatment approaches (such as using interdisciplinary huddles to flag patients at risk of pressure ulcers).
6. Participated in external quality improvement programs (such as joining regional collaboratives).
7. Improved care transitions from hospital to nursing home, or nursing home to home (such as improving the acquisition of medical information from the hospital to reduce risk of urinary tract infections).

8. Solicited additional input from patients and family members to improve care (such as implementing a program with staff and family members to improve reporting of unusual findings with the aim of reducing hospital readmission rates).

Twelve of the 34 nursing homes also described making efforts to improve documentation to improve performance, in addition to any improvements made to care delivery.

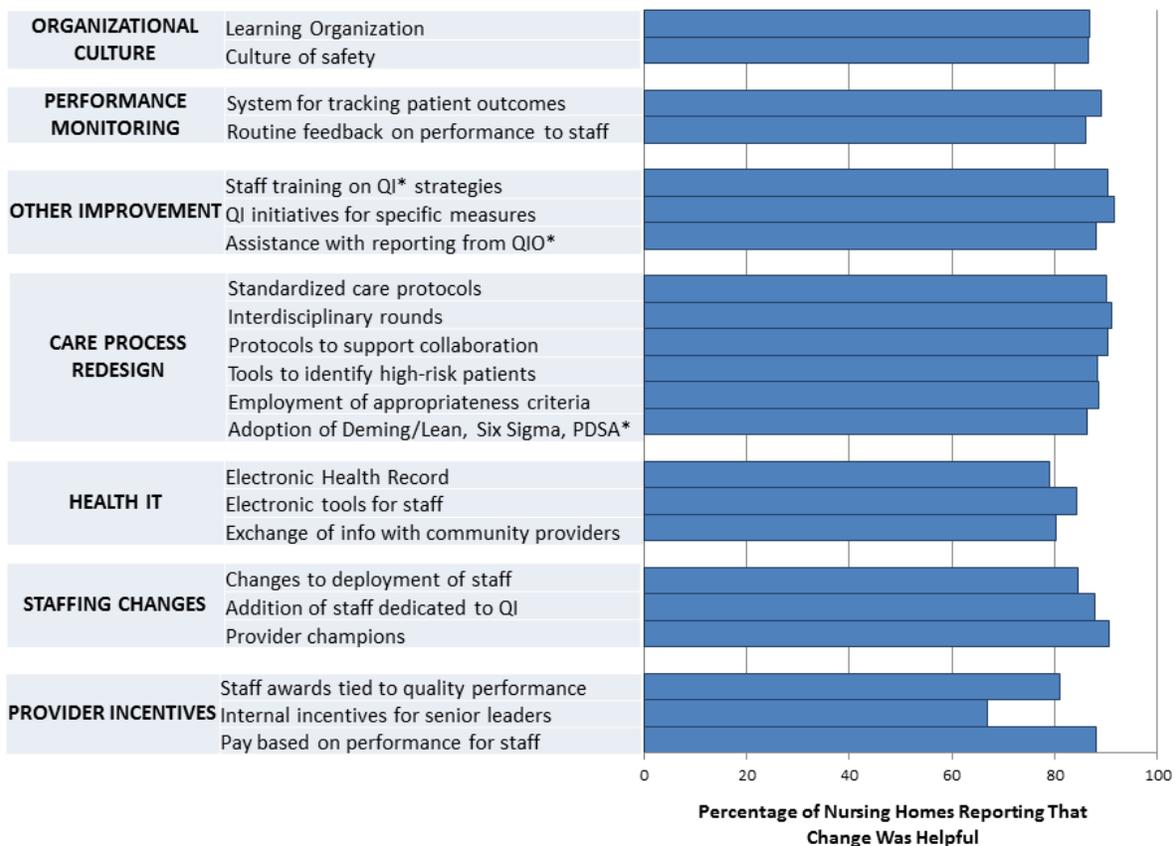
2. Changes Made by Nursing Homes That Contributed to Improved Performance on CMS Measures

Research Question	If a change or innovation was made, has it helped the nursing home improve its performance on one or more CMS measures?
Source	National survey of nursing home quality leaders

Survey Findings Related to Changes That Contributed to Improved Performance

Among the nursing homes that reported making any of the 22 individual changes to care delivery, a high percentage (ranging from 67% to 92% for the 22 changes) perceived that the changes were “definitely or somewhat” helpful in improving performance on one or more CMS measures (Figure 8-6).^{cvi} The two changes noted by nursing homes to be the most helpful were

Figure 8-6: Percentage of Nursing Homes Reporting Each Change as Definitely or Somewhat Helpful in Improving Performance



Notes: National estimates of the percentage of nursing homes perceiving change to be “definitely or somewhat” helpful, among those nursing homes adopting the change. Results are displayed by categories of change. *QI = quality improvement; QIO = Quality Improvement Organization; PDSA = Plan-Do-Study-Act

^{cvi} For results in tabular format, see also Table EE-7 in *Analytic Results* (Appendix E).

quality improvement initiatives for specific measures and instituting interdisciplinary rounds, both cited by over 90% of nursing homes. The change nursing homes reported to be the least helpful (implementing an internal incentive or bonus program for senior clinical leaders and/or senior management based on performance on CMS measures) was still found to be helpful by most adopting nursing homes (67%).

3. Barriers Faced by Nursing Homes in Reporting CMS Quality Measures

Research Question	What challenges or barriers do nursing homes face in reporting CMS quality measures?
Source	National survey and interviews with nursing home quality leaders

Survey Findings on Barriers to Reporting

In the survey, a small fraction of nursing homes (12% nationally) cited difficulties reporting CMS measures.

Interview Findings on Barriers to Reporting

Of the 40 nursing homes interviewed, 37 were asked about difficulties reporting CMS measures. Among those 37, only three noted some difficulty in reporting; nursing homes described issues with capturing inaccurate data due to staff not understanding measure specifications.

4. Barriers Faced by Nursing Homes in Improving Their Performance

Research Question	What challenges or barriers do nursing homes face in improving performance on the CMS quality measures?
Source	National survey and interviews with nursing home quality leaders

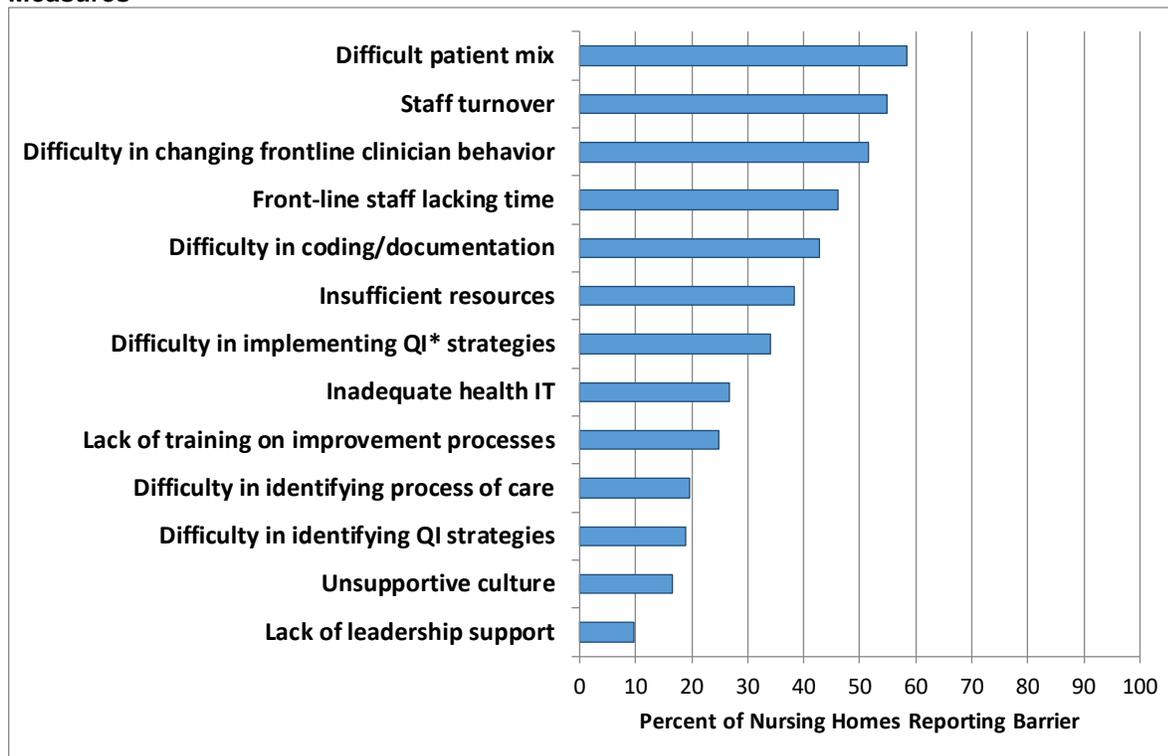
Survey Findings on Barriers to Improved Performance

Nationally, 85% of nursing homes reported having difficulty improving their performance on some or many CMS measures. Among 13 barriers to improvement asked of nursing homes, respondents reported experiencing an average of 4.5 barriers (median of 4 barriers, interquartile range of 2 to 7 barriers). Having a difficult patient mix (i.e., patients that are clinically complex or of low socioeconomic status) was the most common barrier to improving performance (58% of nursing homes), followed by staff turnover (55%) and difficulty changing frontline behavior (52%) (Figure 8-7).^{cvi}

In subgroup analyses of barriers to improvement, lower-quality nursing homes reported having a difficult patient mix and issues with staff turnover at higher rates (12 percentage points) in comparison to higher-quality nursing homes.^{cvi} Smaller nursing homes had fewer difficulties with improvement related to a difficult patient mix, inadequate health IT, and an unsupportive culture in comparison to large and medium-sized nursing homes.

^{cvi} For results in tabular format, see also Table EE-8 in *Analytic Results* (Appendix E).

^{cvi} For additional details, see Table EE-8 in *Analytic Results* (Appendix E).

Figure 8-7: Factors Reported by Nursing Homes as Barriers to Improving Performance on CMS Measures

Notes: National estimates of the percentage of nursing homes reporting various factors as barriers to improving performance. *QI = quality improvement; † = processes of care for improving patient outcomes. Nursing homes that reported no difficulty improving on any measures were considered to have not had difficulty improving on any measure type.

Nursing homes were also asked about difficulties improving on four types of measures. About half of nursing homes reported at least some difficulty improving performance on patient safety measures (55%) and outcome measures (46%). However, relatively few nursing homes reported difficulties with improving measures of patient experience (33%) or process of care (15%).^{cix}

Interview Findings on Barriers to Improved Performance

In the interviews, most nursing homes (37 out of 40) also described experiencing at least one barrier to improving performance on CMS measures. The most frequently mentioned barriers to improvement were the same as the survey: difficult patient mix, staff turnover, and difficulty changing behavior (described by respondents as resistance on the part of physicians).

Barriers described by nursing home leaders include the following:

1. Residents with more comorbidities and with conditions not amenable to care encouraged by quality measures (such as having patients with neurogenic bladders who require the use of catheters impacting the catheter use rate).
2. Staff shortages and/or high staff turnover (such as high turnover leading to inconsistent care).
3. Resistance from physicians or clinical staff on quality improvement initiatives (such as physician orders conflicting with the quality measures).
4. Lack of resources (such as the shortage of mental health professionals in rural areas, making anti-psychotic medication dose reduction difficult).

^{cix} For additional results, see Table EE-9 in *Analytic Results* (Appendix E).

5. Issues with documentation (such as inconsistent information from patients on vaccinations).
6. Performance data not reflecting current performance (such as a nursing home having a measure rate of 60% that is calculated on two-year-old data).

5. Unintended Consequences Associated with Implementation of CMS Quality Measures in Nursing Homes

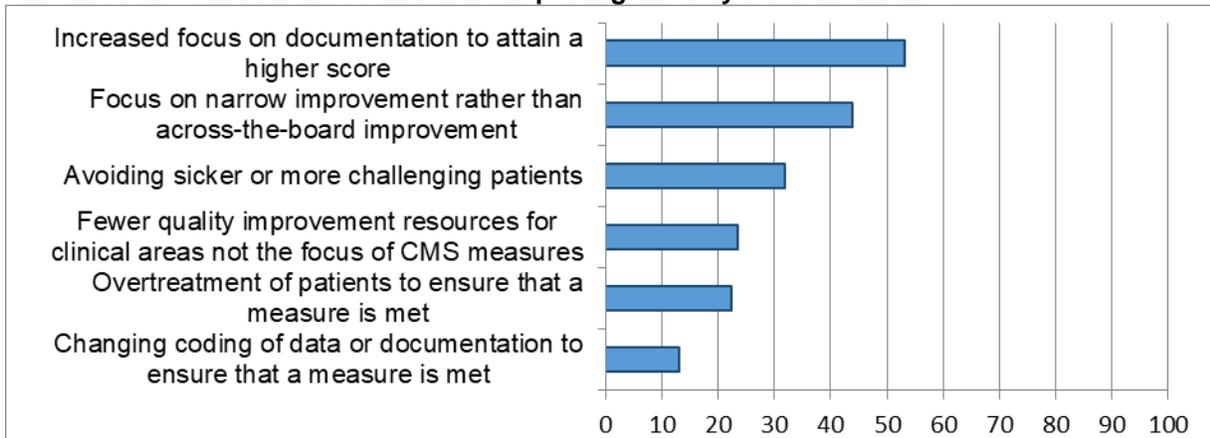
Research Question	What unintended consequences do nursing homes report associated with implementation of CMS quality measures?
Source	National survey and interviews with nursing home quality leaders

Survey Findings on Unintended Consequences

Nursing home leaders were asked to comment on whether they had observed any undesired effects stemming from using or reporting CMS measures and whether any of six types of undesired effects had occurred in their nursing home as a result of being held accountable for performance on CMS measures. Nationally, nursing homes reported, on average, two unintended consequences out of six types of unintended consequences with a median of two unintended consequences.^{cx} The most common unintended consequence was an increased focus on documentation or coding of data to attain a higher score (53%) and a focus on narrow improvement for specific measures rather than across-the-board improvement in care (44%). In addition, 32% also noted avoiding sicker or more challenging patients when providing care (Figure 8-8). A minority of nursing homes reported allocating fewer resources for quality improvement in areas of clinical care that are not the focus of CMS performance measures (24%) and overtreating patients to ensure acceptable performance on a measure (22%).

In subgroup analyses, no significant differences were found for the percentage of nursing homes reporting any of the respective unintended consequences by size.^{cxii} However, higher-quality nursing homes noted an increased focus on documentation to improve performance at lower rates than lower-quality nursing homes (47% versus 60%, respectively).

Figure 8-8: Percentage of Nursing Homes Reporting Unintended Consequences Stemming from CMS Measures and Their Use in Public Reporting and Pay-for-Performance



Note: National estimates of the percentage of nursing homes reporting unintended consequences.

^{cx} For results in tabular format, see Table EE-10 in *Analytic Results* (Appendix E).

^{cxii} For additional results, see Table EE-10 in *Analytic Results* (Appendix E).

Interview Findings on Unintended Consequences

In the interviews, 17 of 40 nursing homes had observed at least one unintended consequence in their facilities. Based on the discussions with the nursing home leaders, these categories of issues were identified:

1. Made inappropriate changes in treatment (such as staff increasing pain medications to ensure patients did not report pain).
2. Avoided sicker or more difficult patients to achieve higher scores on the measures (such as avoiding admitting patients with surgical flaps or large pressure wounds or patients taking antipsychotic medications). However, other respondents described similar actions, in part, as avoiding residents whose needs exceed the capabilities of the nursing homes.
3. Ignored or paid less attention to areas of care that are not measured (such as administrative work pulling staff away from direct patient care).

SURVEY LIMITATIONS

The National Provider Surveys capture a cross-sectional perspective on changes made by hospitals and nursing homes. These changes may have occurred over multiple years and at varying times for different hospitals and nursing homes.

Because of the sensitive nature of reporting unintended consequences, hospitals and nursing homes may have underreported negative effects associated with the use of quality measures. To minimize the likelihood of this type of response bias, the surveys contained language stating that responses to the survey were confidential and that neither the individual nor the facility would be identified. During the interviews, respondents freely shared their experiences with unintended consequences, which suggests that underreporting of unintended consequences was likely not an issue in the context of the surveys.

The increase in documentation reported by hospitals and nursing homes may capture both desired improvements in documentation of delivered care as well as undesired effects associated with an increased focus on documentation (i.e., to attain a higher score or to ensure a measure is met). However, the survey asked hospitals and nursing homes whether they had increased their focus on documentation in the context of an increased focus on documentation being an undesired effect (i.e., an unintended consequence) of measurement.

Finally, the qualitative interviews reported findings for only 40 facilities in each setting and therefore may not be generalizable to hospitals and nursing homes nationally. However, the interview sample did include hospitals and nursing homes from each of the size and performance strata to ensure balanced and broad representation of potential respondents.

9 – Conclusion and Future Directions



The 2018 Impact Report demonstrates that CMS quality measures have likely contributed to improving the national health care system with respect to six CMS quality priorities: Patient Safety, Person and Family Engagement, Care Coordination, Effective Treatment, Healthy Living, and Affordable Care. The measures selected as Key Indicators for this report are vital to providing high-quality care and improving patient outcomes. The report identifies gains in measure performance that translate into important patient impacts and potential health care costs avoided. CMS recognizes that these accomplishments are not due to measurement programs alone, but are the result of successful initiatives across HHS and the collaboration of individuals, families, caregivers, clinicians, and other providers nationally.

National provider surveys confirm that quality leaders in the hospital and nursing home settings recognize the clinical importance of quality measures and have made changes to improve care for patients. However, the surveys also identified barriers to reporting and improving performance on CMS measures. CMS recognizes the need to refine the quality measure portfolio to target high-impact areas of measurement while minimizing the burden of reporting quality measures. Aligning measures between public and private payers may foster additional gains in quality with reduced burden.

Finally, the report findings also indicate that health care disparities persist among select populations for certain measures, underscoring the challenge to ensure that health care quality continues to improve for all Americans. Specifically, disparities were identified among race/ethnicity, income, sex, urbanicity (urban versus rural), and regional populations. Efforts are needed to better understand how to effectively address these disparities, in particular for Key Indicator measures that showed large relative differences between groups.

FUTURE DIRECTIONS

Evaluating the national impact of measures in alignment with CMS quality priorities provides a comprehensive assessment of progress and is a critical component of the measure life cycle to gain data-driven insights for improving patient outcomes and addressing disparities. Consistent with a focus to put patients first, CMS will continue to assess the impact of quality measures on patients and health outcomes, as well as monitor and alleviate the burden and unintended consequences of quality measurement for clinicians and other providers so they can focus on providing high-quality health care. Aligning measures between public and private payers may foster additional gains in quality with reduced burden. In line with the findings from the 2018 Impact Report, CMS will focus future quality measure development and improvement efforts on meaningful measurement areas including the following:

- Healthcare-associated infections
- Preventable health care harm
- Care personalized and aligned with the patient's goals

- End-of-life care according to patient and family preferences
- Patient experience and functional outcomes
- Medication management
- Admissions and readmissions to hospitals
- Seamless exchange of health information
- Preventive care
- Management of chronic conditions
- Prevention, treatment, and management of mental health
- Prevention and treatment of opioid and substance use disorders
- Risk-adjusted mortality
- Equity of care
- Community engagement
- Appropriate use of health care
- Patient-focused episode of care
- Risk-adjusted total cost of care

The IMPACT Act requires CMS to develop and implement quality measures using standardized data across four post-acute settings: LTCH, SNF, HHA, and IRF. The measures focus on areas such as functional status, skin integrity, medication reconciliation, falls, transfer of health information and care preferences, and resource use. The use of standardized quality measures and standardized data will assist with interoperability and enable access to longitudinal information for providers to coordinate care and to improve outcomes, as well as for overall quality comparisons across the four post-acute care provider settings.¹²⁹ Future analyses will include measures required by the IMPACT Act as data become available.

To better understand differences between populations and to target quality improvement efforts, CMS has begun to stratify some measure rates, such as stratifying Parts C and D performance data by race and ethnicity for posting on the CMS Office of Minority Health web page.^{cxii} CMS will explore enhancing the disparity analyses conducted for this report by using demographic information or indicators of socioeconomic status that may be available, such as dual eligibility for Medicare and Medicaid and location data (i.e., rural versus urban), and include combinations of variables, such as race/ethnicity and sex.

In addition to applying lessons learned from the national provider survey findings, CMS will assess the feasibility of conducting surveys and interviews in additional care settings to gain further insights regarding burden and unintended consequences of measurement. CMS also intends to expand the analyses conducted for the 2021 Impact Report to better understand the proportion of measures that are reported electronically and performance differences between reporting methods.

CMS will further evaluate opportunities for measure alignment across Medicare quality programs and with other payers. CMS expects that the MAP, a multi-stakeholder group convened by NQF,^{cxiii} will continue to provide input on measures considered for Medicare and Medicaid quality programs, and CMS will track the performance of measures implemented through the rulemaking process.

^{cxii} <https://www.cms.gov/About-CMS/Agency-Information/OMH/research-and-data/statistics-and-data/stratified-reporting.html>

^{cxiii} More information about the MAP is available at <http://www.qualityforum.org/map/>.

Finally, to improve the CMS customer experience and enhance the utility of the impact assessments, CMS plans to test an interactive version of the National Quality Dashboards to highlight results for Key Indicators and emerging measures. These interactive National Quality Dashboards will enable CMS stakeholders to access timely national performance rates, trends, and disparities to monitor progress on CMS quality priorities.

Glossary of Acronyms and Abbreviations

Acronym/Abbreviation	Name or Term
ACA	Patient Protection and Affordable Care Act
ABC™	Achievable Benchmarks of Care™
ACO	accountable care organization
AHRQ	Agency for Healthcare Research and Quality
AI	American Indian
AMI	acute myocardial infarction
BMI	body mass index
BPCI	Bundled Payment for Care Improvement
CAHPS®	Consumer Assessment of Healthcare Providers and Systems®
CART	CMS Abstraction and Reporting Tool
CAUTI	catheter-associated urinary tract infection
CDC	Centers for Disease Control and Prevention
CDI	<i>Clostridium difficile</i> infection
CLABSI	central line–associated bloodstream infection
CMS	Centers for Medicare & Medicaid Services
COPD	chronic obstructive pulmonary disease
EHR	electronic health record
ESRD	end stage renal disease
FASC	Federal Assessment Steering Committee
FFS	fee for service
GPRO	Group Practice Reporting Option
HAC	hospital-acquired condition
HACRP	Hospital-Acquired Condition Reduction Program
HAI	healthcare-associated infection
HCAHPS®	Hospital Consumer Assessment of Healthcare Providers and Systems®
HCUP	Healthcare Cost and Utilization Project
HEDIS®	Healthcare Effectiveness Data and Information Set®
HF	heart failure
HHA	home health agency
HHS	Health and Human Services, Department of
HIV	human immunodeficiency virus
HRRP	Hospital Readmissions Reduction Program
HRSA	Health Resources and Services Administration
HWR	<i>Hospital-Wide All-Cause Unplanned Readmission</i>
ICD	International Classification of Diseases
ICU	intensive care unit
IOM	Institute of Medicine
IMPACT Act	Improving Medicare Post-Acute Care Transformation Act of 2014
IQR	Inpatient Quality Reporting
IRB	institutional review board
IRF	inpatient rehabilitation facility
IVD	ischemic vascular disease
LBBB	left bundle branch block
LCM	large central metro
LTCH	long-term care hospital
LVEF	left ventricular ejection fraction
MA	Medicare Advantage
MA-PD	Medicare Advantage-Prescription Drug
MAP	Measure Applications Partnership

Acronym/Abbreviation	Name or Term
MBSF	Master Beneficiary Summary File
MDRO	multidrug-resistant organism
MDS	Minimum Data Set
MIPS	Merit-based Incentive Payment System
MOU	memorandum of understanding
MPI	myocardial perfusion imaging
MRI	magnetic resonance imaging
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MSPB	<i>Medicare Spending per Beneficiary</i>
NCHS	National Center for Health Statistics
NHANES	National Health and Nutrition Examination Survey
NHQI	Nursing Home Quality Initiative
NHSN	National Healthcare Safety Network
NICU	neonatal intensive care unit
NIHS	National Health Interview Survey
NQF	National Quality Forum
NRD	National Readmissions Database
OMB	Office of Management and Budget
OQR	Outpatient Quality Reporting
PCMH	patient centered medical home
PCR	<i>Plan All-Cause Readmission</i>
PDC	<i>Proportion of Days Covered</i>
PDP	Prescription Drug Plan
PDSA	Plan-Do-Study-Act
PI	Pacific Islander
PIN	personal identification number
PPS	prospective payment system
PPV	pneumococcal polysaccharide vaccine
PQA	Pharmacy Quality Alliance
PQI	Prevention Quality Indicator
PQRS	Physician Quality Reporting System
PRO	patient-reported outcome
PROM	patient-reported outcome measure
PRO-PM	patient-reported outcome performance measure
QRP	quality reporting program
QRS	Quality Rating System
QI	quality improvement
QIO	quality improvement organization
QIP	quality improvement program
RAS	renin-angiotensin system
RSRR	risk-standardized readmission rate
SID	State Inpatient Databases
SIR	standardized infection ratio
SNF	skilled nursing facility
SSI	surgical site infection
TEP	technical expert panel
THA	total hip arthroplasty
TKA	total knee arthroplasty
USPSTF	U.S. Preventive Services Task Force
UTI	urinary tract infection
VBP	value-based purchasing
ZCTA	ZIP Code Tabulation Area

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