CHAPTER 8

Next steps in measuring quality of care in Medicare

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Chapter summary

In its June 2014 report to the Congress, the Commission put forth a concept for an alternative to Medicare's current system for measuring the quality of care provided to the program's beneficiaries. For reasons explained in that report, the Commission believes that there is a fundamental problem with Medicare's current quality measurement programs, particularly in fee-for-service (FFS) Medicare, which is that they rely primarily on clinical process measures for assessing the quality of care provided by hospitals, physicians, and other types of providers. Tying a portion of a providers' payment to their performance of specific clinical processes may exacerbate incentives in FFS to overprovide services. Such measures also may contribute to uncoordinated and fragmented care, while burdening providers and CMS with costs of gathering, validating, analyzing, and reporting on process measures that have little value to beneficiaries and policymakers.

Under the alternative policy discussed in the Commission's June 2014 report, Medicare would use a small set of population-based outcome measures to evaluate quality of care at the population level in a local area under each of Medicare's three payment models—traditional FFS, Medicare Advantage (MA), and accountable care organizations (ACOs). Examples of such outcome measures include rates of potentially preventable hospital admissions, emergency department visits, and readmissions; mortality; and patient experience measures. Both achievement (performance levels)

In this chapter

and improvement (changes in performance levels over time) could be measured, affording Medicare useful tools to evaluate quality.

The Commission's report drew a distinction between using this small set of population-based outcome measures for public reporting versus using it for payment policy. Public reporting of a local area's performance on these measures could be done for all three of the payment models operating in the area (traditional FFS in total, MA plans, and ACOs, if any) and for each individual MA plan and ACO in the area. However, the results could not be used for traditional FFS payment adjustments because there is no single accountable entity that would represent all of the traditional FFS providers in an area. The Commission does support using population-based outcome measures to adjust payments to the MA plans and ACOs in a local area. For example, by using the ambient level of quality in FFS Medicare as a minimum threshold, CMS could determine whether any of the MA plans and ACOs qualified for quality-based payment adjustments.

This chapter examines two measurement concepts that we are evaluating to determine whether they could eventually fit into the small set of population-based outcome measures: a "healthy days at home" (HDAH) measure and health-related quality of life measures such as patient-reported outcomes. Our initial analysis of an HDAH measure using Medicare claims data suggests that such a concept may be a meaningful way to compare differences in relative health status across populations in a way that would be relatively easy for beneficiaries, policymakers, and other stakeholders to understand. The preliminary analysis found that the measure's ability to detect differences among populations is magnified when it is focused on beneficiaries who are diagnosed with one or more chronic conditions and that the results are sensitive to the types of service use included in the measure, specifically post-acute care and, more particularly, home health services.

The Commission plans to continue exploring the HDAH measure concept, including several issues that were not included in this initial analysis such as risk adjustment, geographic variation, and relative importance of different types of service. The Commission plans to examine additional issues related to the development of the HDAH measure, including HDAH specific to beneficiaries with certain clinical conditions and an analysis of HDAH results for the beneficiary populations attributed to ACOs.

Patient-reported outcome measures also may have value in distinguishing quality among FFS Medicare, MA, and ACO populations within a local area, but more research is needed before reaching conclusions about their use in Medicare. ■

Introduction

In its June 2014 report to the Congress, the Commission presented evidence that has accumulated over the past few years, underscoring several concerns with Medicare's current approach to measuring the quality of care for beneficiaries, particularly in the traditional fee-for-service (FFS) program (see that report for details) (Medicare Payment Advisory Commission 2014).[1] The key points from that report are as follows:

- While Medicare has made improvements in the past couple of years, it currently relies on too many clinical process measures that are weakly correlated with health outcomes such as mortality and readmission rates, which are more meaningful to and understandable by beneficiaries and policymakers.
- Tying a portion of a provider's payment to that provider's performance of specific clinical processes is likely to increase the volume of, and Medicare spending for, the services encompassing those processes, which is concerning when there is evidence that such services are not associated with improved health outcomes.
- The current system is overly burdensome and complex for providers and for CMS to administer, both because it uses process measures that require labor-intensive data extractions from medical records and because Medicare's quality measures are not aligned with those required by private payers.[2,3]
- Providers are given incentives to focus their limited resources on the care processes that Medicare is measuring, whether or not those quality issues are the most significant for a particular provider or local area. As a result, providers have fewer resources available for determining their own ways to improve more relevant outcomes such as reducing potentially preventable hospital admissions and emergency department (ED) visits, readmissions, and deaths, and improving beneficiaries' experience of care.

Concept for a new approach to quality measurement

The Commission's June 2014 report explored a new approach to measuring and reporting on the quality of care within and across the three main payment models in Medicare: traditional FFS, Medicare Advantage (MA), and accountable care organizations (ACOs). This alternative would deploy a small set of population-based outcome measures, such as potentially preventable hospital admissions, ED visits, and readmissions; mortality; and patient experience surveys, to assess a local area's quality of care delivered by providers paid under Medicare's three payment models. Other experts have proposed a similar quality measurement approach that is concise and focused on the outcomes of care, explicitly giving more flexibility and more responsibility to providers and organizations to assess their own needs to improve performance on the selected outcome measures (Meyer et al. 2012).

The Commission's vision is that, over the next several years, Medicare would move away from publicly reporting on dozens of clinical process measures and toward reporting on a small set of population-based outcome measures for the beneficiary populations served by traditional FFS, ACOs, and MA plans. For payment policy, Medicare could use the same population-based outcome measures to compare a local area's quality of care in ACOs and MA plans with the quality assessed for the area's traditional FFS providers; using the area's FFS quality level as a minimum threshold, Medicare could determine quality-based payment adjustments for the ACOs and MA plans. Such adjustments would not be appropriate for payments to traditional FFS providers because they are not organized under any accountable entity such as an MA plan or an ACO. Medicare would have to continue to use other, provider-based quality measures to make traditional FFS payment adjustments—but in a much more focused and succinct way than it does today.

The Commission has considered using population-based outcome measures to assess the quality of care instead of relying on provider-based process measures, as in current practice for traditional FFS. Under this approach, Medicare would use a small set of population-based outcome measures to assess the quality of care provided under each of the program's three payment models—traditional FFS, ACOs, and MA plans—within a local area. As much as possible, these areas should be defined in a way that is consistent with the organization of local health care delivery markets and with Medicare payment policy, such as those that the Commission has recommended for local MA payment areas (Medicare Payment Advisory Commission 2005). We also note that, even if Medicare were to use population-based outcome measures to evaluate and compare quality across traditional FFS, ACOs, and MA plans in a local area, the use of these population-based measures would not preclude each area's

TABLE 8–1 **Population-based outcome measures for measuring quality in an area**

Outcome measure	Specifications	Examples of existing metrics that could be used
Potentially preventable admissions for inpatient hospital care	Risk-adjusted rates of potentially preventable admissions for beneficiaries diagnosed with ambulatory care–sensitive conditions (e.g., diabetes, CHF, COPD); may also include admissions for procedures subject to clinical appropriateness criteria (e.g., spinal fusion surgery) and admissions for short-term or long-term complications of chronic diseases	• 3M™ Potentially Preventable Admissions • AHRQ Prevention Quality Indicators
Potentially preventable ED visits	Risk-adjusted rates of potentially preventable ED visits for beneficiaries diagnosed with specified ambulatory care–sensitive conditions for the treatment of that condition; visits for conditions for which beneficiary could have been treated in a community setting (e.g., physician office)	• 3M Potentially Preventable Visits • Billings/New York University algorithm of potentially avoidable ED visits (Billings 2003)
Mortality rates after an inpatient hospital stay	Risk-adjusted 30-day postdischarge mortality rates for condition-specific (AMI, CHF, pneumonia, stroke, and COPD) and all-condition measures	• CMS/Yale 30-day risk-standardized mortality rates
Readmission rates after an inpatient hospital stay	Risk-adjusted 30-day postdischarge readmission rates for condition-specific (AMI, CHF, pneumonia, stroke, and COPD) and all-condition measures	• CMS/Yale 30-day risk-standardized readmission rates • 3M Potentially Preventable Readmissions
Healthy days at home	Risk-adjusted number of days per year (expressed as a rate, such as per thousand beneficiaries) that individuals in a population met specified criteria for "healthy and at home." Definition could include days during which a beneficiary was alive and neither was an inpatient nor had an ED visit	• Conceptual design under development by Commission staff
Patient experience	Performance on standardized patient experience surveys (e.g., CAHPS®), specifically including CAHPS Item Set for Addressing Health Literacy	• FFS CAHPS, MA CAHPS, and CG CAHPS (for ACOs)

Note: CHF (congestive heart failure), COPD (chronic obstructive pulmonary disease), AHRQ (Agency for Healthcare Research and Quality), ED (emergency department), AMI (acute myocardial infarction), CAHPS® (Consumer Assessment of Healthcare Providers and Systems®), FFS CAHPS (fee-for-service CAHPS), MA CAHPS (Medicare Advantage CAHPS), CG CAHPS (CAHPS Clinician & Group Surveys), ACO (accountable care organization).

Source: Medicare Payment Advisory Commission 2014.

individual providers, medical groups, and health systems from continuing to use other quality measures.

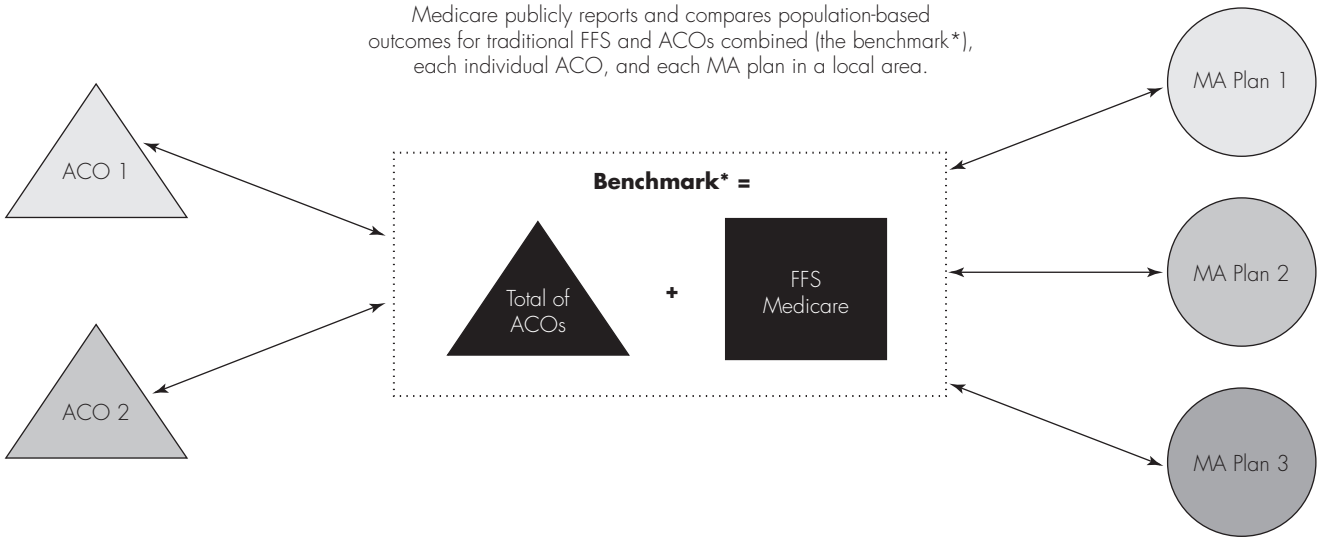
The population-based outcome measures proposed in the June 2014 report, including "healthy days at home" (highlighted in gray), are summarized in Table 8-1.

Patient-reported outcome measures, such as health-related quality of life (HRQOL) measures, also may have value in distinguishing quality among traditional FFS, MA, and ACO populations within a local area, but more research is needed before reaching conclusions about their use in Medicare (see text box, pp. 214–215).

How population-based outcome measures could be applied to traditional FFS, ACOs, and MA plans in a local area

Figure 8-1 depicts a simplified illustration of a local area in which Medicare's three payment models are active: traditional FFS, two ACOs, and three MA plans. Under the Commission's concept for using population-based outcomes to measure an area's quality, Medicare would calculate benchmark rates of outcome measures such as potentially preventable admissions, potentially preventable ED visits, mortality, and patient experience, and then at

FIGURE 8–1 **Conceptual diagram of quality reporting for Medicare payment models in a local area**



Note: FFS (fee-for-service), ACO (accountable care organization), MA (Medicare Advantage).
*The benchmark shown here includes the combined results for all ACOs and FFS Medicare in the local area.

the end of a performance year, calculate rates on the same outcome measures for each of the MA plans, the ACOs, and FFS Medicare in the local area. The benchmark would be calculated with combined data from the area's traditional FFS providers and ACOs since providers in the current ACO program continue to be paid through traditional FFS. The benchmarks for each outcome measure could be calculated and published in advance of the performance year so that all parties could know them before the performance period starts.

The Commission would distinguish between using the performance results for public reporting and for payment policy. For public reporting, Medicare would publish the benchmark and the results of each outcome measure for the area's ACOs and MA plans.[4] In this way, beneficiaries, providers, policymakers, and other stakeholders would be able to compare each ACO and MA plan's outcomes with the benchmark (Figure 8-1).

For payment purposes, the area's benchmark for each measure would be the threshold that the area's ACOs and MA plans would have to exceed to qualify for a quality-based bonus payment (Figure 8-2a, p. 212). Medicare could impose payment penalties on the ACOs and MA plans that performed below the FFS benchmark. The amount of quality-based bonus payments to individual ACOs and MA plans would be determined by comparing relative quality among the ACOs and, separately, among the MA plans (Figure 8-2b, p. 212). As discussed in the June 2014 report, the Commission believes that making payment adjustments to traditional FFS providers based on population-based outcome measures is not appropriate at this time.[5] Instead, Medicare will need to keep measuring quality in traditional FFS using provider-based measures to make quality-based payment adjustments. A more thorough discussion of this rationale is included in the Commission's June 2014 report to the Congress.

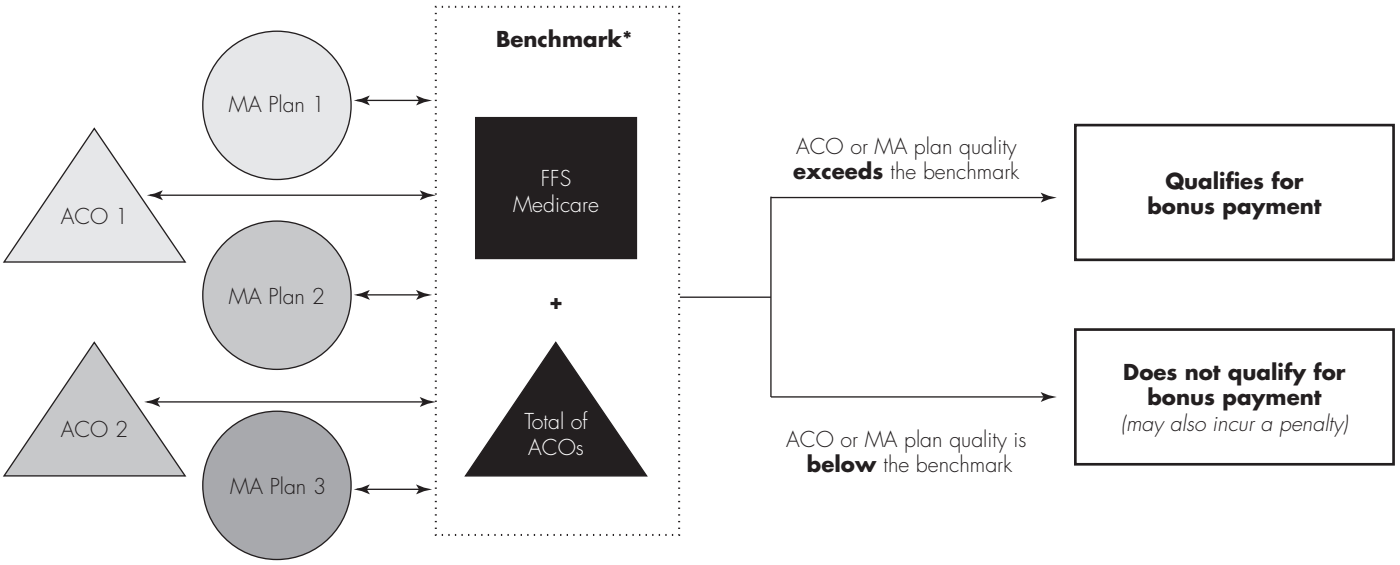
Measuring "healthy days at home"

Chapter 3 of the Commission's June 2014 report mentioned the concept of a quality measure that would count the number of days per year (expressed as a rate, such as per thousand beneficiaries) that the individuals in a given population met specified criteria for "healthy and at home," for example, days during which a beneficiary was alive and was neither an inpatient of a health care facility nor had an ED visit (Medicare Payment Advisory Commission 2014). The Commission has begun work constructing such a measure.

FIGURE 8–2

Conceptual diagram of quality-based payment for Medicare payment models in a local area

Figure 8-2a: Qualifying for quality-based bonus payment or penalty



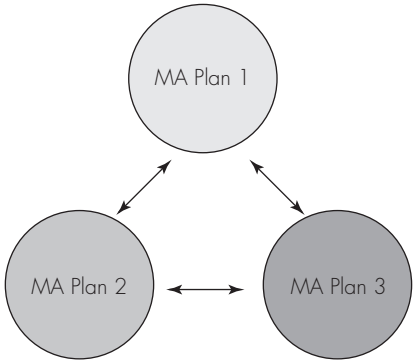
ACOs and MA plans in a local area are compared against a benchmark* calculated by combining data for FFS Medicare and all of the ACOs in the area.

Figure 8-2b: Determining the value of quality-based bonus payment or penalty

FFS Medicare uses **provider-based measures** to determine bonuses or penalties for FFS providers.

- Measures not available for all provider types, so not all providers measured
- Each provider measured separately, if measures are available
- Bonuses or penalties determined within each provider type

Each ACO that qualifies for a bonus (or penalty) is compared against other ACOs using **population-based measures** to determine bonus (or penalty) amount.



Each MA plan that qualifies for a bonus (or penalty) is compared against other MA plans using **population-based measures** to determine bonus (or penalty) amount.

Note: ACO (accountable care organization), MA (Medicare Advantage), FFS (fee-for-service).
*As shown here, the benchmark includes the combined performance of all ACOs and FFS Medicare.

"Days alive and out of the hospital" clinical trial measure

"Days alive and out of the hospital" (DAOH) is a measure that has been used in heart failure (HF) clinical trials. Researchers record hospitalizations and death in the period after an intervention such as pulmonary artery catheterization. In some trials, the recording period is for a set time—for instance, six months—and is the period defining the DAOH measure (Binanay et al. 2005). For others, DAOH is defined as the number of days before such an incident occurs, regardless of how long that takes. For instance, the Candesartan in Heart Failure–Assessment of Reduction in Mortality and Morbidity (CHARM) trial followed patients for a median of 38 months and used a linear regression of DAOH and percentage of DAOH to adjust for the differences in follow-up time (Ariti et al. 2011). These studies compare the DAOH of the intervention group with a control group; higher DAOH after an intervention compared with the control implies that the impact of the therapy was positive.

Historically, evaluation of HF interventions looked at mortality and hospitalizations independently. DAOH has become a popular endpoint for clinical trials because it captures the broader morbidity of the disease and two aspects of the potential benefits to patients (lower mortality rate and fewer hospital days) of the intervention being studied. However, some researchers caution that the composite measure may be skewed by the relative weights assigned to hospitalizations versus mortality in calculating the combined measure. That is to say, by accounting for both hospitalizations and mortality in the same measure, there is an inherent judgment call in deciding how to weight them relative to one another. If the measure is to be effective, one or the other outcome must be recognized as the primary driver of the composite score. This determination may be especially crucial when providers and patients are using the information to make a choice about the course of treatment (Cleland 2002). Furthermore, as the Commission has discussed previously in relation to readmission rates, mortality and hospitalization can be inversely correlated, acting in a way as substitutes for one another (Medicare Payment Advisory Commission 2013).

Cleland (2002) notes that a study that uses a finite time period may be more useful than those that run until an outcome endpoint is reached because patients observed in a defined time period have "an equal period of exposure to the risk of events and can attain the same potential maximum score" (p. 247). He further explains that this period could be lengthened or compressed based on patient severity, with those with acute HF being monitored for a couple of days or weeks, moderate HF patients monitored for 100–200 days, and mild HF patients followed for a year or more.

Broader concept of "healthy days at home"

The intent of a "healthy days at home" (HDAH) measure is to capture the number of days within a set period (e.g., per month, quarter, or year) that a local area's given population of beneficiaries (e.g., those in FFS Medicare, enrolled in an MA plan, or attributed to an ACO) are alive and did not have interactions with the health care system that imply less than optimal health. This concept appears consistent with the Commission's statements that Medicare ought to focus on quality metrics that are intuitively easy to understand and meaningful for beneficiaries (such as mortality and readmission rates). The HDAH concept also is in keeping with the Commission's position that measurement of quality in Medicare should be more comprehensive (that is, should encompass care delivered across settings) and more focused on evaluating care outcomes, and it should include few, if any, clinical process measures for one provider type. A comprehensive outcome measure such as HDAH eventually may be able to help beneficiaries make better informed choices about the delivery model (FFS, MA, or ACO) through which they decide to receive their care.

In developing and refining the HDAH measure, the Commission will need to grapple with which services to include in the measure to best capture the population's health over the given time period. For instance, a primary care evaluation and management visit would not necessarily suggest an unhealthy beneficiary, but a stay in a skilled nursing facility (SNF) almost always would. For the purposes of measuring population health, HDAH expresses the rate of an average beneficiary's interactions with the most therapeutically intensive parts of the health care system, that is, primarily inpatient and post-acute care. While it would not be accurate to conclude that all beneficiaries who did not have such an intensive interaction were completely healthy (e.g., many still could have chronic conditions that are treated and managed by ambulatory care providers), we sought to explore whether it was feasible to construct a measure that would allow us to compare risk-adjusted rates of HDAH across population groups.

The underlying goal is to build a measure of a population's relative health as reflected in the effectiveness of an ACO, MA plan, or local FFS Medicare delivery system in keeping its population healthy enough to avoid needing

Patient-reported outcomes: Health-related quality of life measures

One type of population-level outcome measure used in some clinical and health policy research environments is the "health-related quality of life" (HRQOL) measure. The Centers for Disease Control and Prevention (CDC) defines HRQOL as "functioning and well-being in physical, mental, and social domains of life" (Hays et al. 2009) or simply "perceived physical and mental health and function" (Centers for Disease Control and Prevention 2000). Assessed through surveys completed by patients, such as the 12-item or 36-item Medical Outcomes Study Short Forms (SF-12 or SF-36) or the National Institutes of Health (NIH) Patient-Reported Outcome Measurement Information System® (PROMIS®) Global Health Scale, an HRQOL measure attempts to quantify multiple dimensions of health and their effects on a patient's daily life (Centers for Disease Control and Prevention 2000).

CDC Healthy Days Core Module

The CDC has defined an HRQOL metric called the "Healthy Days Core Module" (HRQOL-4), which consists of four questions relating to physical and mental health:

1. Would you say that in general your health is excellent, very good, good, fair, or poor?
2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?
3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?
4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

Using these four questions, the CDC defines "healthy days" as the number of days in the past 30 days in which patients indicated that both their physical and mental health were good. (A longer form of the survey, the HRQOL-14, is also available.) Furthermore, "because people generally seek healthcare only when they feel unhealthy, self-perceptions are also predictive of the future burden on the healthcare delivery system" (Centers for Disease Control and Prevention 2000). These questions have been incorporated into the CDC's Behavioral Risk Factor Surveillance System telephone survey and are in the public domain (Moriarty et al. 2003).

National Institutes of Health's PROMIS Global Health Scale

Researchers at Dartmouth recently suggested that "an outcome-focused approach could plausibly be built on the foundation established by NIH's PROMIS initiative, which is developing health status and domain-specific nonproprietary instrument banks that can be efficiently administered through computer-adaptive testing that markedly reduces respondent burden" (Colla and Fisher

(continued next page)

to access intensive health care services. If implemented, an HDAH measure would need to be used together with the other kinds of outcome measures described in the Commission's June 2014 report (e.g., patient experience surveys and rates of potentially preventable admissions and ED visits) so as not to create undesirable incentives for MA plans, ACOs, and FFS providers to underprovide or discourage beneficiaries from seeking needed care in an ambulatory setting.

Preliminary analysis results

Commission staff worked with a team led by Ashish Jha, MD, at the Harvard School of Public Health to develop an illustration of one potential version of an HDAH measure. Instead of beginning the measurement period with a triggering event such as a hospitalization, HDAH was measured for all beneficiaries for the full year. Dr. Jha's team began with a 20 percent sample of Medicare beneficiaries from 2011, which included about 10.3 million beneficiaries. Because encounter data are not yet available for MA, those enrollees could not be included. Once beneficiaries who were enrolled in MA and those who were not enrolled in Medicare continuously throughout the year were excluded, about 6.8 million beneficiaries remained in the sample. About 4.1 million of

Patient-reported outcomes: Health-related quality of life measures (cont.)

2014). The PROMIS Global Health Scale is a 10-item survey developed to create an efficient self-reported health assessment using "global health items," which ask respondents to evaluate their health in general rather than in terms of specific elements of health (Hays et al. 2009). It asks respondents for global ratings of their physical and mental health, physical function, fatigue, pain, emotional distress, and social health (Hays et al. 2009). It was included in the 2010 National Health Interview Survey (NHIS), and the National Center for Health Statistics also plans to include it in the 2015 and 2020 NHIS (Barile et al. 2013).

Concerns about HRQOL measures

The Commission has expressed concerns about the usefulness of a particular health status assessment instrument that CMS currently uses as one piece of quality measurement in the Medicare Advantage (MA) program: the Health Outcomes Survey (HOS). In its March 2010 report to the Congress, the Commission observed that, as applied to detect changes over time in MA plan enrollees' self-reported physical and mental health status, the HOS often produced results showing no significant outcome differences among MA plans. The Commission recommended that the HOS be used as a quality measure for fee-for-service (FFS) Medicare, as well as continuing its use in MA, only if the Secretary determined that its use as a quality measure could be improved to meaningfully differentiate quality between FFS Medicare and MA, and among individual MA plans (Medicare Payment Advisory Commission 2010a, Medicare Payment Advisory Commission 2010b).

Another challenge in assessing HRQOL is that older survey tools such as the SF-36 are time-consuming to administer and, therefore, may not be practical to build into day-to-day clinical practice. A shorter, less burdensome survey might be a preferable data collection tool. Some researchers have questioned whether any HRQOL or functional status indicators can adequately reflect quality of care, at least for older adult patients with multiple chronic conditions (Dy et al. 2013). If this is a valid concern, then a HRQOL measure may not be appropriate to hold providers accountable for preventing or reversing functional decline for this population of Medicare beneficiaries. Other researchers cite evidence that responses on "global" health items, which are self-evaluations by an individual of his or her health in general rather than of specific elements of health, are predictive of future health care utilization and mortality (Hays et al. 2009).[6]

If a link between patient-reported outcomes and clinical outcomes could be established and if the statistical and administrative concerns that the Commission raised in the context of the HOS could be mitigated, then a tool like the 10-item PROMIS Global Health Scale may have value as a population-based outcome measure to compare performance across FFS Medicare, accountable care organizations, and MA plans. Further research is needed before reaching conclusions about the use of HRQOL measures in Medicare. ■

those had a diagnosis of at least one chronic condition.[7] About 1.5 million beneficiaries, or 18.4 percent of the sample, were under age 65.

For the purposes of these analyses, HDAH was defined algorithmically as follows:

Healthy days at home = 365 days – (days in short-term acute care hospital + days in inpatient rehabilitation facility (IRF) + days in long-term care hospital (LTCH) + days in inpatient psychiatric facility + days in SNF + days in observation status + days of ED use + days of home health use + mortality days)

The analysis was performed for two populations: all qualifying beneficiaries and only beneficiaries with at least one diagnosed chronic condition. For each of these populations, the Harvard team compared HDAH geographically across Dartmouth Atlas hospital referral regions (HRRs). The Commission is sensitive to the incentives that may result from excluding or including home health care from the measure since it may be argued that some of the days of home health care use cannot be clearly categorized as either "healthy and at home" or "unhealthy and not at home." Because of this ambiguity, we could consider whether some types of home health use

might not be used to indicate an "unhealthy day." For this reason, and because the analysis found that days of home health use accounted for such a large share of total days, we report the HDAH results with and without home health days separately. We will continue to consider which types of home health use, if any, should be included in an HDAH measure.

HDAH results for all beneficiaries

In 2011, about 19 percent of beneficiaries had some type of hospitalization, with an average length of stay of about five days. This results in a mean length of stay of 2.3 days in the hospital when averaged across the entire population.[8] About 5.5 percent of beneficiaries had a SNF claim, resulting in an average of 3.1 days of SNF care across the entire population. About 5 percent of beneficiaries died during 2011, which translated to about 8.1 "mortality days," defined as the average number of days between a beneficiary's death and the end of the year, across the entire population.

The total HDAH measure was built progressively, beginning with DAOH and then adding other types of service use that suggested a beneficiary was neither at home nor healthy on the day of the service. For all beneficiaries in 2011:

Days alive and out of the hospital:

= 365.0 days – 2.3 days in the hospital – 8.1 mortality days

= 354.6 days

Days alive and out of the hospital and not in a SNF:

= 354.6 days – 3.1 days in SNF

= 351.5 days

Days alive and out of the hospital and not in a SNF and without an ED visit:

= 351.5 days – 0.9 days with at least one outpatient ED visit

= 350.6 days

Days alive and out of the hospital and not in a SNF and without an ED visit or an outpatient observation stay:

= 350.6 days – 0.2 days with at least 1 outpatient observation stay

= 350.4 days

In summary, in 2011, the average Medicare beneficiary was at home 350.4 days out of the year. Note that "at home" at this point cannot be assumed to mean "healthy and at home." Certain other services provided to beneficiaries at home, such as home health care and some outpatient procedures, may be indicators that a beneficiary at home is not healthy. As the Commission further develops this work, we will examine options for incorporating these types of services, when appropriate.

Like almost all other health care quality and resource-use measures, HDAH varies geographically. Table 8-2 shows the variation in HDAH across HRRs for all beneficiaries in 2011. The use of HRRs as the geographic unit of analysis, rather than a smaller area such as the Dartmouth Health Service Areas, was driven by consideration of the limits of statistical reliability of results for areas smaller than HRRs, given the underlying dataset of a 20 percent sample of Medicare claims. In further research on the HDAH measure, the Commission will use 100 percent claims data files, which will allow for reliable analysis of smaller geographic areas.

Table 8-2 shows that, setting aside the outliers, there was not much variation in the initial HDAH results, which did not include home health use. In the lowest performing HRR, the average beneficiary was at home 344.4 days; in the highest performing HRR, 355.4 days (a 3 percent difference). In contrast, the difference between the 25th and 75th percentile was only 2.5 days. When home health use is incorporated in the measure, the variation between the minimum and maximum increases to 21 percent (from 291.1 days to 353.2 days). Again, the variation in the interquartile range is relatively small, suggesting that the wide distribution is due to outliers. Beneficiaries were healthy and at home a mean of 350.4 days, and when home health use is considered an indication of an "unhealthy day," that mean drops to 341.6 days.

By considering the distribution of each component of HDAH, we can see how each type of "unhealthy day" contributes to the overall variation (Table 8-3). Differences in post-acute care appear to drive about half of the HDAH variation across geographic regions. Excluding days associated with beneficiaries who died, at the mean, post-acute care (LTCH, IRF, SNF, and home health) accounts for about 80 percent of the remaining days not healthy and at home.

Perhaps unsurprisingly, home health use is the single largest contributor to the observed variation in HDAH across HRRs, in part because home health care tends to be used

TABLE 8–2

Little variation appears in healthy days at home across hospital referral regions for all beneficiaries, 2011

	Days						
	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
Healthy days at home, no home health use	350.4	1.9	344.4	349.0	350.2	351.5	355.4
Healthy days at home	341.6	8.4	291.1	339.3	343.8	347.0	353.2

Note: Results are not risk adjusted. The number of hospital referral regions included in this analysis is 306. Analysis includes all fee-for-service beneficiaries.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

for a longer period of time than other services and because patterns of home health utilization vary so widely across the country. This finding is consistent with previous work by the Commission and Institute of Medicine on geographic variation in health care delivery (Institute of Medicine 2013, Medicare Payment Advisory Commission 2011). The large impact of the variation in home health use on HDAH rates suggests some areas for further research as we refine the HDAH measure concept. First, would the precision of the HDAH measure be improved by treating different types of home health services differently in the measure's calculation? For example, one option could consider whether home health use that follows an inpatient stay (i.e., post-acute care) should be counted as "non-healthy days," while home health days *without* a preceding inpatient stay should count as "healthy days," with a presumption that the latter type of home health could be substituting for more intensive inpatient treatment. Second, is it feasible to parse the known variation in home health use between that which captures a positive outcome of care, in the form of the least intensive clinically appropriate care, and undesirable factors that drive some of the variation, for instance, clinically inappropriate use or fraud and abuse? Finally, how would the inclusion or exclusion of different types of home health services affect providers' incentives when they are selecting a patient's site of care?

TABLE 8–3

Post-acute care accounts for much of the variation in types of unhealthy days at home across hospital referral regions, 2011

	Days						
Type of unhealthy day	Mean	Standard deviation	Minimum	25th percentile	Median	75th percentile	Maximum
Acute care hospital	1.8	0.4	1.0	1.5	1.8	2.0	3.1
Long-term care hospital	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Inpatient rehabilitation facility	0.2	0.1	0.0	0.1	0.1	0.2	0.6
Inpatient psychiatric facility	0.2	0.1	0.0	0.1	0.2	0.2	0.6
Skilled nursing facility	3.1	1.0	0.7	2.4	3.0	3.8	7.8
Outpatient observation	0.2	0.1	0.0	0.1	0.2	0.2	0.8
Emergency department	0.9	0.2	0.4	0.8	0.9	1.1	1.7
Home health	8.8	7.9	1.0	4.1	6.2	10.5	62.3
Mortality	8.1	0.8	6.1	7.6	8.2	8.6	10.8

Note: Results are not risk adjusted. The number of hospital referral regions included in this analysis is 306.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

TABLE 8–4

Total healthy days at home, all beneficiaries and beneficiaries with at least one chronic condition HCC, 2011–2012

	Days in 2011		Days in 2012	
	All beneficiaries	Beneficiaries with at least one chronic condition HCC	All beneficiaries	Beneficiaries with at least one chronic condition HCC
Type of unhealthy day				
Acute care hospital	1.8	2.8	1.7	2.6
Long-term care hospital	0.0	0.0	0.0	0.0
Inpatient rehabilitation facility	0.2	0.2	0.1	0.2
Inpatient psychiatric facility	0.2	0.3	0.1	0.2
Skilled nursing facility	3.1	4.9	2.9	4.7
Outpatient observation	0.2	0.3	0.2	0.3
Emergency department	0.9	1.3	0.9	1.3
Home health	8.8	13.3	8.6	13.3
Mortality	8.1	10.8	7.9	10.0
Healthy days at home	**341.6**	**331.0**	**342.5**	**331.9**
Healthy days at home, no home health use	**350.4**	**344.3**	**351.2**	**345.7**

Note: HCC (hierarchical condition category). Figures shown are averages across 306 hospital referral regions. Results are not risk adjusted. "Type of day" components plus healthy days at home do not sum to 365 due to rounding.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

Focusing on healthy days at home for beneficiaries with chronic conditions

An evident challenge with the initial analysis that included all beneficiaries was that over 75 percent of the population had 365 healthy days at home, making it difficult, for example, to see much variation across geographic areas. To further explore whether the HDAH measure might be able to detect significant differences among beneficiary subpopulations, we next limited the sample to include only those diagnosed with at least one chronic condition. This analysis reduced the number of beneficiaries in the sample from about 6.8 million to about 4.1 million (i.e., 60 percent of all continuously enrolled FFS beneficiaries had at least one diagnosed chronic condition). The use of "at least one diagnosed chronic condition" as a criterion to limit the population being measured is only one of several options that could be used if policymakers decided the measurement population should be limited at all. The Commission will continue not only to explore the incentives that might be created from limiting versus expanding the population included in the measure but also to look at other options for more precisely defining the measured population, such as including only beneficiaries with specific chronic conditions that are responsive to high- or low-quality care (e.g., congestive heart failure, chronic obstructive pulmonary disease, and chronic kidney disease).

As may be expected, beneficiaries with chronic conditions were healthy and at home fewer days than the total population.[9] Twenty-seven percent had at least one inpatient admission, as opposed to 18 percent of the general population. Likewise, beneficiaries with chronic conditions were more likely to experience a SNF stay (8.2 percent vs. 5.2 percent), an ED visit (32.0 percent vs. 23.8 percent), or death within the study year (6.0 percent vs. 4.3 percent). Table 8-4 shows the differences in HDAH for these populations in more detail, for both 2011 and 2012.

Similar to the DAOH measure, one challenge in defining the measure is that, for different populations, different components of the measure may contribute more to variation than others. For this reason, we show all components of the measure in the tables that follow.

As Table 8-4 shows, having 1 or more chronic conditions is associated with about 11 fewer HDAH when home health is included in the measure and 6 fewer HDAH when home health is not included. This trend is consistent for both years analyzed. In all categories, beneficiaries with at least

TABLE 8–5

Healthy days at home by age, for beneficiaries with at least one chronic condition HCC, 2011

	Days, by age group			
	Younger than 65	**65–69**	**70–79**	**80 or older**
Number of beneficiaries	831,703	728,448	1,379,070	1,289,630
Percent of beneficiaries	20%	17%	33%	30%
Type of unhealthy day				
Acute care hospital	3.1	2.2	2.6	3.6
Other inpatient	1.2	0.3	0.4	0.5
Skilled nursing facility	2.1	1.9	3.3	9.8
Outpatient observation	0.3	0.2	0.2	0.3
Emergency department	2.4	0.9	0.9	1.1
Home health	10.8	7.6	11.3	21.6
Mortality	5.0	5.2	7.9	20.6
Healthy days at home	**340.0**	**346.6**	**338.2**	**307.4**
Healthy days at home, no home health use	**350.9**	**354.3**	**349.7**	**329.1**

Note: HCC (hierarchical condition category). "Other inpatient" includes long-term care hospital, inpatient rehabilitation facility, and inpatient psychiatric facility. Figures shown are averages across 306 hospital referral regions. Results are not risk adjusted. "Type of day" components plus healthy days at home do not sum to 365 due to rounding.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

one chronic condition are more likely than the general population to have an "unhealthy day."

Table 8-5, Table 8-6 (p. 220), and Table 8-7 (p. 221) look at HDAH for beneficiaries in terms of different demographic characteristics: age, race/ethnicity, and Medicare–Medicaid dual eligibility. For these analyses, only beneficiaries who had at least one chronic condition were included.

With the exception of beneficiaries under age 65 (which includes beneficiaries entitled to Medicare on the basis of disability, end-stage renal disease, or both), younger beneficiaries in general had fewer unhealthy days, although it must be noted that these results are not risk adjusted (Table 8-5). The greatest variation occurred among days of SNF and home health use, and mortality. The under-65 population used home health care at about the same rate as beneficiaries ages 70 to 79 and used observation stays at the same rate as the population ages 80 and older. Beneficiaries under age 65 had more ED visits and other kinds of hospitalization days (e.g., days in LTCHs and inpatient psychiatric facility days) than other age groups.[10] The age 80-and-above population had significantly more days of SNF and home health use and mortality than other age groups.

Table 8-6 (p. 220) shows that beneficiaries whose race was identified as Asian, Other, or Unknown had the highest number of HDAH. Beneficiaries identified as African American or Hispanic had the lowest total HDAH, but the underlying utilization patterns differed. African Americans had more acute inpatient hospital days than any other group, with nearly four days on average. Hispanics on average used home health care for 27.6 days, the highest by far. African Americans' home health use was also relatively high (23.2 days). Both Whites and African Americans had relatively high SNF use, with about five days for each group. However, Hispanics used more than twice as much home health care as Whites. African Americans used nearly as much home health care as Hispanics in 2011. Variation in home health use explains much of the difference in healthy days between these groups. In fact, when home health use is excluded, Hispanics experienced on average more healthy days at home than Whites. These differences could be in part a function of geography and the existing geographic distribution of FFS Medicare beneficiaries with certain race/ethnicity characteristics.

Whites also had the highest number of mortality days (11.1), a result that is consistent with other studies that Jha and colleagues have conducted (Joynt and Jha 2011,

TABLE 8–6

Healthy days at home by race/ethnicity, beneficiaries with at least one chronic condition HCC, 2011

	Days, by race/ethnicity						
	White	African American	Asian	Hispanic	Native American	Other	Unknown
Number of beneficiaries	3,523,331	453,491	68,851	90,753	23,311	57,649	11,465
Percent of beneficiaries	83%	11%	2%	2%	1%	1%	0.3%
Type of unhealthy day							
Acute care hospital	2.8	3.9	2.3	3.2	3.3	2.3	2.5
Other inpatient	0.5	0.8	0.4	0.7	0.5	0.4	0.6
Skilled nursing facility	4.9	5.0	3.0	3.5	3.4	2.5	2.8
Outpatient observation	0.3	0.3	0.2	0.2	0.3	0.2	0.5
Emergency department	1.2	1.8	0.7	1.5	1.9	0.8	1.0
Home health	12.3	23.2	10.4	27.6	14.8	9.6	8.9
Mortality	11.1	9.7	7.5	8.4	9.8	6.7	7.1
Healthy days at home	**331.8**	**320.3**	**340.5**	**319.9**	**330.8**	**342.6**	**341.5**
Healthy days at home, no home health use	**344.1**	**343.5**	**350.9**	**347.6**	**345.7**	**352.2**	**350.5**

Note: HCC (hierarchical condition category). "Other inpatient" includes long-term care hospital, inpatient rehabilitation facility, and inpatient psychiatric facility. Results are not risk adjusted. "Type of day" components plus healthy days at home do not sum to 365 due to rounding.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

Joynt et al. 2011). Possible explanations suggested by this research include differences in diagnostic coding across race/ethnicity categories, differences in the percentage of the population over age 80 by race/ethnicity, and the trade-off between readmission rates and mortality.[11]

The quarter of Medicare beneficiaries in the sample who were dually eligible for Medicare and Medicaid also had substantially fewer HDAH than those who were Medicare-only beneficiaries (Table 8-7). Dual-eligible beneficiaries received twice as much home health care, had twice as many ED and outpatient observation days, and spent twice as many days in a SNF compared with beneficiaries who were not dual eligible.

Variation in HDAH across HRRs for beneficiaries with one or more chronic conditions (Table 8-8) follows a similar pattern to that of the general population (shown in Table 8-3, p. 217), but beneficiaries with one or more chronic conditions overall had more unhealthy days. On average, the biggest differences between the general population and the chronic conditions subgroup were home health use days (8.8 vs. 13.3, respectively) and mortality days (8.1 vs. 10.8, respectively). Similarly to HDAH for the entire population, HDAH for beneficiaries with chronic conditions has outliers on both ends of the distribution and less variation between the 25th percentile and 75th percentile. However, there is more variation in this range for this subgroup.

Further directions

Our exploratory analysis thus far suggests that an HDAH measure may be a meaningful way to compare differences in relative health outcomes across populations and could be conveyed in a way that would be relatively easy for beneficiaries, policymakers, and other stakeholders to understand. The analysis found that the measure's ability to detect differences between groups is magnified when focused on beneficiaries diagnosed with one or more chronic conditions and that it is sensitive to the types of service use included in the measure, particularly the use of home health services. Risk adjustment is a critical

TABLE 8–7

Dually eligible beneficiaries with at least one chronic condition HCC generally had fewer healthy days at home than Medicare-only beneficiaries, 2011

	Days, by dual eligibility for Medicare and Medicaid	
	Dual eligible	**Not dual eligible**
Number of beneficiaries	1,043,466	3,185,385
Percent of beneficiaries	25%	75%
Type of unhealthy day		
Acute care hospital	3.8	2.7
Other inpatient	1.0	0.4
Skilled nursing facility	8.2	3.7
Outpatient observation	0.4	0.2
Emergency department	2.2	1.0
Home health	20.8	11.4
Mortality	11.9	10.4
Healthy days at home	**316.7**	**335.2**
Healthy days at home, no home health use	**337.6**	**346.6**

Note: HCC (hierarchical condition category). "Other inpatient" includes long-term care hospital, inpatient rehabilitation facility, and inpatient psychiatric facility. Results are not risk adjusted. "Type of day" components plus healthy days at home do not sum to 365 due to rounding.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

component missing from this preliminary analysis and must be developed and included in the measure before it could be used to make comparisons between geographic areas or accountable entities. Risk adjustment will also shed light on the nature of the variation in HDAH and whether those differences are clinically meaningful.

In future work, the Commission will continue to refine the measure based on:

- appropriate risk adjustment;
- stability of the measure;
- geographic variation, including level of analysis (e.g., HRR, hospital service area, etc.);
- inclusion or exclusion of service types;
- weighting of measure inputs (mortality and service types); and
- feasibility of detecting statistically significant differences among subgroups.

The Commission plans to examine additional issues related to the development of the HDAH measure, including:

- *Beneficiaries with certain clinical conditions.* The Commission's contractor has identified 15 conditions for further investigation, using a hospital discharge

TABLE 8–8

Healthy days at home across hospital referral regions, for beneficiaries with at least one chronic condition HCC, 2011

	Days						
	Mean	**Standard deviation**	**Minimum**	**25th percentile**	**Median**	**75th percentile**	**Maximum**
Type of unhealthy day							
Acute care hospital	2.8	0.5	1.6	2.5	2.8	3.1	4.5
Long-term care hospital	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Inpatient rehabilitation facility	0.2	0.2	0.0	0.1	0.2	0.3	0.8
Inpatient psychiatric facility	0.3	0.2	0.0	0.2	0.2	0.3	0.9
Skilled nursing facility	4.9	1.6	1.2	3.8	4.6	5.9	12.9
Outpatient observation	0.3	0.2	0.0	0.2	0.3	0.3	1.3
Emergency department	1.3	0.3	0.6	1.1	1.3	1.5	2.6
Home health	13.3	11.3	1.7	6.5	9.4	15.4	86.8
Mortality	10.8	1.0	8.1	10.1	10.8	11.4	13.9
Healthy days at home	**331.0**	**11.8**	**262.5**	**328.2**	**334.9**	**338.5**	**347.0**

Note: HCC (hierarchical condition category). Results are not risk adjusted. The number of hospital referral regions included in this analysis is 306.

Source: MedPAC contractor analysis of 20 percent sample of Medicare claims data.

associated with the condition as the starting point of the measurement period.

- *An analysis of HDAH results for the beneficiary populations attributed to ACOs.* Because the claims used for the analyses in this chapter were from 2011 (before ACOs had begun operating), we did not feel it was appropriate to report simulated HDAH for ACOs at this time. Further, the 20 percent sample raises questions about the effects that random variation may have on the performance of ACOs on the measure. In future work, the Commission will analyze 100 percent claims data for the beneficiaries attributed to ACOs in more recent years.
- *A comparison of the updated aggregate ACO results with the results for the HRRs (or other geographic area) in which an ACO is located.* We are interested in examining whether—and, if so, to what extent—beneficiaries attributed to ACOs have different types of healthy days at home compared with beneficiaries in traditional FFS in the same local area. ■

Endnotes

1 The Commission's June 2014 report (Chapter 3) also explored the feasibility of applying measures of potentially inappropriate service use ("overuse" measures) to FFS Medicare and described short-term steps that could be taken to improve FFS Medicare's existing provider-based quality measurement programs. Commission staff members are continuing to develop analyses in those policy areas, but they are not discussed in this report.

2 Medical record review is expensive because it requires trained personnel to abstract data from medical records in a standard format for analysis (Hicks 2003). Medical reviewers, who are typically either nurses or physicians, must interpret each record and input data findings into a standardized format collection tool. Medical records provide detailed clinical data that are required for some types of quality measures such as those that rely on laboratory values (e.g., hemoglobin A1c or cholesterol levels) or a record of a specific treatment being given within a specific time frame (e.g., primary percutaneous coronary intervention received within 90 minutes of hospital arrival or discharge instructions provided to the patient at time of discharge) (Agency for Healthcare Research and Quality 2014).

3 This evaluation is not meant to imply that Medicare would always defer to private payers' quality measures or vice versa, but the possibility of aligning measures and their specifications ought to be explicitly considered when Medicare adopts quality measures. There may be specific factors, such as certain comorbidities or age limits, that Medicare would use in its versions of outcome measures (e.g., mortality or potentially preventable admission and ED use rates) but that would not be appropriate to apply when measuring those outcomes for a commercial insurance population.

4 Defining the quality benchmark as the combined performance of a local area's FFS Medicare providers and ACOs would be necessary to create an ongoing incentive for the ACOs and MA plans in the area to continue improving quality over time. If the benchmark were defined to include *only* beneficiaries in traditional FFS Medicare, which could become smaller and less representative over time as ACOs and MA plans grow, then the resulting benchmark could be an increasingly unreasonable standard against which to evaluate the quality of the ACO and MA plans. Another approach that Medicare could consider would be to use (or phase in) national or regional performance benchmarks instead of (or combined with) the local area FFS + ACO benchmark. Under the current Medicare Shared Savings Program, CMS standardizes the risk-adjusted outcome measures for ACOs (such as the all-condition readmission measure and three acute unplanned admission measures) nationally (Centers for Medicare & Medicaid Services 2015a). In addition to greatly increasing the size of the population represented in the benchmark, a national benchmark that is phased in over time could be used to gradually eliminate regional differences in risk-adjusted outcomes that are found to reflect local or regional quality shortfalls.

5 The primary reason is that population-based quality measurement would aggregate the performance of an area's individual FFS providers to determine the area's overall FFS Medicare quality, which would combine the quality of high-performing and low-performing providers and thereby unfairly reward low performers if overall performance was high, and would penalize high performers in areas where overall performance was low (Institute of Medicine 2013).

6 Examples of global health items in PROMIS include: "In general, would you say your health is: Excellent / Very good / Good / Fair / Poor?"; "To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair? Completely / Mostly / Moderately / A little / Not at all?"; "In the past 7 days, how would you rate your pain on average? From 0 (no pain) to 10 (worst pain imaginable)." The PROMIS global health items include ratings of physical health and mental health, overall quality of life, physical function, fatigue, pain, emotional distress, and social health (National Institutes of Health 2015).

7 Diagnoses were determined from claims data, and chronic conditions were defined using CMS hierarchical condition category (HCC) diagnosis definitions.

8 For this analysis, "days in the hospital" describes acute care hospital stays only. Subsequent analyses also include stays in LTCHs, inpatient psychiatric facilities, and IRFs.

9 "Chronic condition" in this case is defined as beneficiaries with at least one chronic condition HCC that results in the risk adjustment of MA payments. These 27 chronic conditions are the following: acquired hypothyroidism; acute myocardial infarction; Alzheimer's disease; Alzheimer's disease, related disorders, or senile dementia; anemia; asthma; atrial fibrillation; benign prostatic hyperplasia; cancer/colorectal; cancer/endometrial; cancer/breast; cancer/lung; cancer/prostate; cataract; chronic kidney disease; chronic obstructive pulmonary disease; depression; diabetes; glaucoma; heart failure; hip/pelvic fracture; hyperlipidemia; hypertension; ischemic heart disease; osteoporosis; rheumatoid arthritis/osteoarthritis; stroke/transient ischemic attack (Centers for Medicare & Medicaid Services 2015b).

10 The high rate of "other inpatient" hospital days for the under-65 population may be due in part to the high proportion of those beneficiaries diagnosed with mental disorders.

11 This analysis considers only those beneficiaries with at least one chronic condition HCC. Because certain groups may be more likely than others to receive diagnostic codes, it is possible that some comparable beneficiaries were excluded from this analysis. If so, this could contribute to the observed differences in service use and mortality rates because the level of illness across groups is not comparable.

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