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Welcome!

This month's newsletter provides a closer look at the different types of measures, from process to outcome, as well as an introduction to what is meant by risk adjustment for outcome measures. Every edition includes links to the CMS Blueprint (the version in use at the time of publication), as well as a calendar of upcoming opportunities and events.

We hope you find this newsletter useful and we welcome any feedback or suggestions to make it even better. Please send comments or suggestions for future newsletters to MMSSupport@battelle.org.

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Measure Type Series

Moving from Process to Outcome Measures

Healthcare providers report quality measures as a way to measure efficient, effective, and safe care. In 1966, Donabedian explained three basic types of quality measures: structure, process, and outcome[1]. Structure measures show the availability, accessibility, efficiency, effectiveness, and usability of clinical resources. Process measures examine the provision of health care evidence-based processes used for effective and safe care. Outcome measures indicate the results of care, such as pain control and survival. This article will only focus on process and outcome measures.

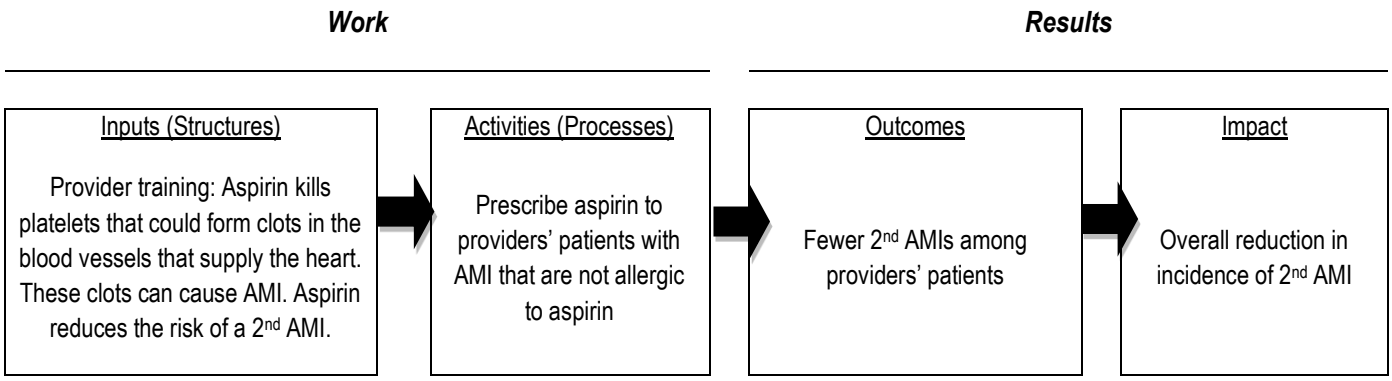
As of July 2017, the CMS Measures Inventory includes 2,180 measures, including 1,085 (50%) process measures and 573 (26%) outcome measures*. Process measures dominate in part because they indicate what providers can do to improve care[2]. Thus, much of the focus of measurement continues to drive improvements in the provider processes[3]. Today, there is an increased emphasis on measuring outcomes of care. Although multiple influences affect outcomes, stakeholders can trace many outcomes back to the processes and quality of care provided.

One way to see the influences processes have on outcomes is to build a simple logic model. Logic models not only show the progression of inputs to impacts, but also show the increasing complexity across the types of measures.

Outcome measurement is complex as multiple influences may affect an outcome, and also because the data may be difficult to obtain. In the Figure below, research evidence shows a strong relationship between aspirin use after a first AMI and reduced risk of another AMI[4]. Providers use that knowledge to prescribe aspirin (process) to patients who have had an AMI to prevent a second AMI (outcome). An outcome measure would count the number second

AMIs among patients in a provider's patient population. Because of the challenges of obtaining data on another AMI, the evidence base allows for the use of the process measure to act as a proxy for the outcome measure of interest.

Figure. Logic Model for Aspirin use in Acute Myocardial Infarction (AMI)



Not all outcomes have tightly-linked processes. The Crohn's and Colitis Foundation found that even when developed together process measures and outcomes measures of irritable bowel syndrome might not have clear relationships[5]. For example, there are several processes associated with an outcome measure like 30-day readmissions, but no process is linked so tightly that it could act as a proxy. Instead, it is the only the outcome measure that can provide information about the quality of the processes.

Baker and Chassin[6] recommend considering several points when developing measures:

1. Is there strong evidence to show a relationship between healthcare processes and improvements in a measured outcome?
2. Is the measure constructed precisely enough to measure that outcome?
3. Does the measure adjust adequately for risk? (Note: See previous article)
4. What are the possible unintended consequences of using this as a measure, and what can providers do to mitigate these risks?

In addition, measure developers should be confident that the quality measure will not interfere with care delivery.

In summary, process measures provide information on whether activities were conducted and sometimes, how well they were conducted. The expectation is that those processes identified in measures are closely linked to outcomes of interest. Outcomes are what stakeholders ultimately want to know the most about. Combined, processes that are tightly linked to outcomes and outcomes that really matter to stakeholders form the bulk of quality measures.

*These counts from July 2017 include all measures in the inventory, regardless of CMS reporting or National Quality Forum endorsement status.

References

1. Donabedian A. Evaluating the quality of medical care. The Milbank Memorial Fund Quarterly. 1966 Jul 1;44(3):166-206.
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3. Jencks SF, Cuerdon T, Burwen DR, Fleming B, Houck PM, Kussmaul AE, Nilasena DS, Ordin DL, Arday DR. Quality of medical care delivered to Medicare beneficiaries: A profile at state and national levels. JAMA. 2000 Oct 4;284(13):1670-6.
4. Melmed GY, Siegel CA, Spiegel BM, Allen JI, Cima R, Colombel JF, Dassopoulos T, Denson LA, Dudley-Brown S, Garb A, Hanauer SB. Quality indicators for inflammatory bowel disease: development of process and outcome measures. Inflammatory bowel diseases. 2013 Mar 1;19(3):662-8.
5. Lindenauer PK, Lagu T, Ross JS, Pekow PS, Shatz A, Hannon N, Rothberg MB, Benjamin EM. Attitudes of hospital leaders toward publicly reported measures of health care quality. JAMA internal medicine. 2014 Dec 1;174(12):1904-11.
6. Baker DW, Chassin MR. Holding Providers Accountable for Health Care Outcomes. Ann Intern Med. [Epub ahead of print 2017 Aug 15].

Measures Development In-Depth

Risk Adjustment: Introduction

The words "risk-adjusted" or "risk-standardized" often appear in the title of outcome measures used in CMS programs, as in "30-day risk-standardized mortality measure for acute myocardial infarction." Besides mortality, other outcome measures that are commonly risk-adjusted include readmission or complication measures.

The purpose of risk-adjustment is to enable the fair and accurate comparison of clinician or facility performance. Outcome measures may be risk-adjusted to ensure that the comparisons accurately reflect the provider's care rather than the characteristics of the provider's patients. For example, a provider treating a population with a larger percentage of high risk or the sickest patients would be expected to have less positive outcomes (higher mortality rates) than a provider treating a population with a larger percentage of low risk or the healthiest patients. Without risk-adjustment, providers could be dis-incentivized to provide care to high risk patients as even excellent care (of the sickest patients) could reflect poorly in the outcome measures data. Therefore, risk-adjusted outcome measures account for patient characteristics, and allow for two providers to be compared despite the differences in their patient populations.

Example characteristics used in risk-adjustment might include the patient's age, past medical history, and other diseases or conditions (comorbidities) the patient had prior to the episode of care. These characteristics are those that are known to impact the risk or chance of an outcome independent of the provider's care. The specific selection of which patient characteristics to use for risk-adjustment is based on evidence about the relationship between those characteristics and the outcome of interest. For example, the relationship between age and mortality rates.

How does risk-adjustment work? A common formula for calculating a risk-adjusted outcome measures for a clinician or facility is the following:

Risk-adjusted rate = (observed rate / expected rate) * reference group rate

Both the observed and expected rates describe the number of patients in the target population with the outcome of interest (patients who die within 30-days of a myocardial infarction) divided by the total number of patients in the target population (patients with a myocardial infarction). However, the expected rate is the rate based on a more generalizable population, a reference point (eg. national, state). The observed rate is based on a subset of the population (ex. clinician, hospital, city). Simplistically, what would you have expected to be the number of deaths within 30-days (based on what is happening across the country), in comparison to what you actually observed within hospital A?

The measure developer uses these rates (observed/expected) in the first part of the formula to determine if the subset of the population has a significant variance from the generalized population. If hospital A serves older, sicker patients you would see an observed-to-expected ratio higher than 1. Similarly, if hospital B serves a younger, healthier population, you would see an observed-to-expected ratio less than 1 — the further from 1, the more significant the variation.

In the *reference group rate*, both the characteristics of the patients in the target population and the proportion of patients in that population with the outcome of interest are that of the reference group. The result of the formula is the *risk-adjusted rate*, where the characteristics of the patients in the target population are that of the reference group, but the proportion of patients in that population with the outcome of interest are that of the measured entity.

	Measured Entity		**Reference Group**	
	Outcome of Interest	**Target Population**	**Outcome of Interest**	**Target Population**
Observed Rate	X	X		
Expected Rate		X	X	
Reference Population Rate			X	X
Risk-adjusted rate	X			X

For example, assume that for hospital A the observed rate is 0.12 but the expected rate is 0.10. Therefore, the observed-to-expected ratio is (0.12/0.10) = 1.2, meaning that the observed proportion of outcomes were 20% higher than what was expected. The risk-adjusted rate then assumes that the outcomes for hospital A would be at the same relative level (20% higher than expected) had the provider had the same patient population as the reference group. So, if the reference group rate is 0.30, then the provider's risk-adjusted rate is (1.2 x 0.30) = 0.36. Note that the observed rate, expected rate, reference group rate and risk-adjusted rate for the reference group are all the same (that is, the observed-to-expected ratio is 1.0).

How does one know whether the assumption of same relative performance is valid? The answer will depend on the outcome, the population, and the set of patient characteristics available and used in the calculation. We have two metrics that help us decide: discrimination and calibration. Discrimination tells one how well our patient characteristics distinguish between those that had the outcome of interest and those that did not. Calibration tells one how close the observed rate is to the expected rate across low risk and high-risk groups in the target population.

Future issues of the newsletter will investigate these concepts in more detail, and explain the relationship between risk-adjustment and standards of scientific acceptability – reliability, validity, and intended use.

CMS Announcement: New MMS Website

We are pleased to announce the updated Measures Management System website is now live and we invite you to check it out. The website was redesigned to be accessible for ***all*** stakeholders whether you are from the public and want to understand what quality measures are and how they are developed, you are a clinician who wants to be involved in measure development, or an experienced measure developer. It is also focused on providing one authoritative, central location to access things like the measure programs or the inventory.

- **Measure System Overview:** an introduction to the Measures Management System, a discussion of Quality Measures & You where you will find links for our variety of our stakeholders, the Quality Measures Inventory and information on Pre-Rulemaking (MUC)
- **Measure Development**: the Blueprint, the measure development lifecycle by each phase, and information on stakeholder engagement
- **Get Involved**: information on TEPs, public comments, calls for measures, and the MMS Listserv
- **Tools & Resources**: information on Quality Programs (the complete list in one place!), Strategic Planning Documents and Reports, Resources such as webinars and tools useful for measure development, and links to related CMS sites
- **New to Measures**: discussions on quality measures, how a measure becomes a measure, the relationship between quality measures and quality improvements, and how to get started in being involved in measure development
- **Popular Links**: your shortcuts to Getting Involved, Calls for Measures, TEPs, Public Comments, the ListServ, and how to Contact Us.

We welcome your feedback on these changes, please share them in an email to Kimberly Rawlings: Kimberly.Rawlings@cms.hhs.gov, or our support email at MMSsupport@battelle.org.

Upcoming Events

All times shown are Eastern Time zone

- Your Data Is Showing: Public Reporting on September 20, 2017 at 10:00 AM and 2:00 PM
  - Register for the event here
- Reporting Hospice Quality Data: Tips for Compliance Call on September 20, 2017 at 1:30 - 3:00 PM
  - Register for the event here
- PQRS: Feedback Reports and Informal Review Process for PY 2016 Results Call on September 26, 2017 at 1:30 - 3:00 PM
  - Register for the event here
- Your Data Is Showing: Public Reporting for ASCs on September 27, 2017 at 2:00 PM
  - Register for the event here
- Physician Compare Call on September 28, 2017 at 1:30 - 3:00 PM
  - Register for the event here
- PCHQR Program: Practical Impacts of the FY 2018 IPPS/LTCH PPS Final Rule webinar on September 28, 2017
  - Register for the event here
- Home Health Agencies: Quality of Patient Care Star Rating Algorithm Call on October 10, 2017
  - Register for the event here

Upcoming Opportunities

Opportunities for Public Comment on quality measures

- Hospital Quality Star Ratings on Hospital Compare
  - Public Comment period opened on August 29, 2017 and closes on September 27, 2017.
- Inpatient Psychiatric Facility (IPF) Outcome and Process Measure Development and Maintenance
  - Public Comment period opened on September 8, 2017 and closes on September 29, 2017.
- Quality Measure Development and Maintenance for CMS Programs Serving Medicare-Medicaid Enrollees and Medicaid-Only Enrollees
  - Public Comment period opened on September 14, 2017 and closes on October 5, 2017.

Please check the CMS Quality Measures Public Comment Web Page for current Public Comment announcements and summary reports.

Opportunities to participate in a Technical Expert Panel (TEP)

- Development, Reevaluation, and Implementation of Outcome and Efficiency Measures
  - The TEP nomination period opened on September 5, 2017 and closes on October 5, 2017.

Please check the CMS Quality Measures Call for TEP Web Page for current TEP membership lists and meeting summaries.

New to the listserv or miss a month? Find all our announcements here.

Please send comments and suggestions to MMSSupport@battelle.org.