AHRQ Quality Indicators

Quality Indicator User Guide: Prevention Quality Indicators (PQI) Composite Measures
Version 4.3

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Contents

Tables

Chapter 1. Overview

The goal in developing composite measures was to provide a measure that could be used to monitor performance over time or across regions and populations using a method that applied at the national, regional, State or provider/area level. Potential benefits of composite measures are to: summarize quality across multiple indicators, improve ability to detect differences, identify important domains and drivers of quality, prioritize action for quality improvement, make current decisions about future (unknown) health care needs and avoid cognitive "shortcuts". Despite these potential advantages there are concerns with composite measures, such as: masking important differences and relations among components, not being actionable, not being representative of parts of the health care system that contribute most to quality or detracting from the impact and credibility of reports. In weighing the benefits and concerns of composite measures there are also a number of potential uses to consider, such as: consumer use for selecting a hospital or health plan, provider use for identifying domains and drivers of quality, purchasers use for selection of hospitals or health plans to improve employee health and policymakers use for setting policy priorities to improve the health of a population. This document provides a technical overview for AHRQ QI users.

What Are the Composites?

The Prevention Quality Indicators (PQI) are measures of potentially avoidable hospitalizations for Ambulatory Care Sensitive Conditions (ACSCs), which, though they rely on hospital discharge data, are intended to reflect issues of access to,and quality of, ambulatory care in a given geographic area. The PQI composites are intended to improve the statistical precision of the individual PQI, allowing for greater discrimination in performance among areas and improved ability to identify potentially determining factors in performance.

Area-Level Composites (overall, acute, and chronic)

An overall composite captures the general concept of potentially avoidable hospitalization connecting the individual PQI measures, which are all rates at the area level. Separate composite measures were created for acute and chronic conditions to investigate different factors influencing hospitalization rates for each condition. See Table 1 for the measures that comprise each of the three PQI composites. The PQI composites provide the following advantages:

- Provide assessment of quality and disparity
- Provide baselines to track progress
- Identify information gaps
- Emphasize interdependence of quality and disparities
- Promote awareness and change

Table 1. AHRQ PQI Composite Measure

Overall Composite (PQI #90)	
PQI #01 Diabetes Short-Term Complications Admission Rate	PQI #11 Bacterial Pneumonia Admission Rate
PQI #03 Diabetes Long-Term Complications Admission Rate	PQI #12 Urinary Tract Infection Admission Rate
PQI #05 Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate	PQI #13 Angina without Procedure Admission Rate
PQI #07 Hypertension Admission Rate	PQI #14 Uncontrolled Diabetes Admission Rate
PQI #08 Congestive Heart Failure (CHF) Admission Rate	PQI #15 Asthma in Younger Adults Admission Rate
PQI #10 Dehydration Admission Rate	PQI #16 Rate of Lower-Extremity Amputation Among Patients With Diabetes
Acute Composite (PQI #91)	
PQI #10 Dehydration Admission Rate	PQI #12 Urinary Tract Infection Admission Rate
PQI #11 Bacterial Pneumonia Admission Rate	
Chronic Composite (PQI #92)	
PQI #01 Diabetes Short-Term Complications Admission Rate	PQI #13 Angina without Procedure Admission Rate
PQI #03 Diabetes Long-Term Complications Admission Rate	PQI #14 Uncontrolled Diabetes Admission Rate
PQI #05 Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate	PQI #15 Asthma in Younger Adults Admission Rate
PQI #07 Hypertension Admission Rate	PQI #16 Rate of Lower-Extremity Amputation Among Patients With Diabetes
PQI #08 Congestive Heart Failure (CHF) Admission Rate	

Chapter 2. Calculation

How Are the Composites Created?

The composites were created through a workgroup[1] that included discussion of conceptual issues related to the composite (e.g., single composite vs. separate composites) and analyses using 2003 State Inpatient Data (SID) from the Healthcare Cost and Utilization Project (HCUP)[2].

[1] Agency for Healthcare Research and Quality Quality Indicators. (April 7, 2006). *Prevention Quality Indicators (PQI) Composite Measure Workgroup Final Report.* Available: http://www.qualityindicators.ahrq.gov/modules/pqi_resources.aspx.

[2] The state data organizations that participated in the 2003 HCUP SID: Arizona Department of Health Services; California Office of Statewide Health Planning & Development; Colorado Health & Hospital Association; Connecticut - Chime, Inc.; Florida Agency for Health Care Administration; Georgia: An Association of Hospitals & Health Systems; Hawaii Health Information Corporation; Illinois Health Care Cost Containment Council; Indiana Hospital & Health Association; Iowa Hospital Association; Kansas Hospital Association; Kentucky Department for Public Health; Maine Health Data Organization; Maryland Health Services Cost Review; Massachusetts Division of Health Care Finance and Policy; Michigan Health & Hospital Association; Minnesota Hospital Association; Missouri Hospital Industry Data Institute; Nebraska Hospital Association; Nevada Department of Human Resources; New Hampshire Department of Health & Human Services; New Jersey Department of Health & Senior Services; New York State Department of Health; North Carolina Department of Health and Human Services; Ohio Hospital Association; Oregon Association of Hospitals & Health Systems; Pennsylvania Health Care Cost Containment Council; Rhode Island Department of Health; South Carolina State Budget & Control Board; South

The PQI composites' components are combined by summing the component numerators (i.e., hospitalizations) because each PQI measure has a common denominator . Beginning in Version 4.3, COPD/Asthma in Older Adults (PQI #05) and Asthma in Younger Adults (PQI #15) have complementary denominators (age greater than or equal to 40; age less than 40) so the rationale still applies. The Low Birth Weight (LBW) and Perforated Appendix indicators (PQI #09 and PQI #02 respectively) are excluded because their denominators differ (i.e., based on a discharge structure) and because LBW can be measured with vital statistics.

Weights. The number of hospitalizations (i.e., prevalence of the condition) was used as the "weight" for combining the component indicators. Both hospital days and costs were also examined as possible approaches for weighting the data and yielded substantively similar results.

Calculation. Descriptive statistics for 12 of the PQIs were calculated as hospitalizations per 100,000 persons for the entire dataset and by county. Correlations and factor loadings for the county level rates (adjusted for age and gender) were examined. Ultimately, the composites are constructed by summing the hospitalizations across the component conditions and dividing by the population. Rates can optionally be adjusted for age, sex and socio-economic status when comparing across regions or demographic groups.

Validation. The relation between the composite and other area measures potentially related to access to care (e.g., hospital beds per population and primary care physician density) were examined.

Chapter 3. Use

How Have the Composites Changed?

The specifications of the PQI Composites have not changed since the initial release. There have been changes to the component PQI that constitute the composite, which can be found on the AHRQ QI website in the Fiscal Year Coding Changes and Log of Changes Made to the Measure Software documents (http://www.qualityindicators.ahrq.gov/modules/pqi_resources.aspx).

What Are the Current Uses of the Composites?

The PQI composites are intended to be used to provide national estimates that can be tracked over time and to provide state and county level estimates that can be compared with the national estimate and to each other.

The following two questions were examined in the initial creation of the composite:

Dakota Association of Healthcare Organizations; Tennessee Hospital Association; Texas Health Care Information Council; Utah Department of Health; Vermont Association of Hospitals and Health Systems; Virginia Health Information; Washington State Department of Health; West Virginia Health Care Authority; Wisconsin Department of Health & Family Services. http://hcup-us.ahrq.gov.

Does disease prevalence impact variability?

As anticipated, areas with higher rates of diabetes and hypertension show higher hospitalizations, particularly in the chronic composite. However, for asthma the contrary relation is true suggesting other confounding factors. Notably in V4.3, the diabetic population serves as the denominator for PQI #01, PQI #03 and PQI #14.

Is variability driven by poverty status?

Areas with low levels of poverty also show lower hospitalization rates for each of the PQI composites, which is independent of access to care.

Additional Resources

See the AHRQ QI website for additional resources and downloads
http://www.qualityindicators.ahrq.gov/modules/pqi_resources.aspx

Agency for Healthcare Research and Quality, "Patient Quality Indicators (PQI) Composite Measure Workgroup Final Report," (April 2006).