



Quality Indicator User Guide: Pediatric Quality Indicators (PDI) Composite Measures, v2022

Prepared for:

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Contract No. HHSA290201800003G

July 2022

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1.0 Overview

The goal in developing the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators™ (QI) 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 hospital/area level. Potential benefits of composite measures are to: summarize quality across multiple indicators, improve the 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, hospital use for identifying domains and drivers of quality, purchaser use for selection of hospitals or health plans to improve employee health and policymaker use for setting policy priorities to improve the health of a population. This document provides a technical overview for AHRQ QI users.

2.0 What Are the Composites?

The Pediatric Quality Indicators (PDI) consist of three area-level composite measures. The area-level PDIs 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 PDI composites are intended to exceed in statistical precision the individual PDIs, allowing for greater discrimination in performance among areas and improved ability to identify potentially determining factors in performance.

An overall composite captures the general concept of potentially avoidable hospitalization connecting the individual PDI 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 PDI composites. The PDI 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 PDI Area-Level Composite Measures, v2022

PDI 90 PEDIATRIC QUALITY OVERALL COMPOSITE
PDI 14 Asthma Admission Rate
PDI 15 Diabetes Short-Term Complications Admission Rate
PDI 16 Gastroenteritis Admission Rate
PDI 18 Urinary Tract Infection Admission Rate
PDI 91 PEDIATRIC QUALITY ACUTE COMPOSITE
PDI 16 Gastroenteritis Admission Rate
PDI 18 Urinary Tract Infection Admission Rate
PDI 92 PEDIATRIC QUALITY CHRONIC COMPOSITE
PDI 14 Asthma Admission Rate
PDI 15 Diabetes Short-Term Complications Admission Rate

3.0 How Are the Composites Created?

The PDI area-level composites were created through a workgroup¹ that discussed conceptual issues related to the composite (e.g., single composite vs. separate composites) and analyses using the 2003 State Inpatient Databases (SID) from the AHRQ Healthcare Cost and Utilization Project (HCUP).

The PDI area-level composites' components have denominators based on the local population, and the age range included in the denominator population varies by component. A single common age range (ages 6 years to 17 years) was used to define the composite's denominator population. The PDI composites are calculated by summing the number of discharges that meet the inclusion and exclusion rules for the numerator in any of a composite's component measures (i.e., a hospitalization for any of the component PDIs), because the components have a common denominator.

Descriptive statistics for the Prevention Quality Indicators (PQIs, the adult version of the area-level PDIs) 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. 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.

4.0 Steps for Creating the Composites

The composites are constructed by summing the hospitalizations across the component conditions and dividing by the population within the common age range (ages 6 to 17 years). Rates can optionally be adjusted for age, sex and socio-economic status when comparing across regions or demographic groups.

¹ Agency for Healthcare Research and Quality (2008). *Pediatric Quality Indicators (PDI) Composite Measure Workgroup Final Report*. The report is available at https://qualityindicators.ahrq.gov/Downloads/Modules/PDI/PDI_Composite_Development.pdf

5.0 How Have the Composites Changed?

The specifications of the PDI area-level composite measures have not changed since the initial release. There have been changes to the component PDIs that constitute the composite, which can be found on the AHRQ QI website in the Log of Coding Updates and Revisions (https://qualityindicators.ahrq.gov/Downloads/Modules/PDI/V2022/ChangeLog_PDI_v2022.pdf). A previous PDI hospital-level composite measure, PDI 19 Pediatric Safety for Selected Indicators Composite, was retired in Version 2019. In Versions 2020, 2021 and 2022, no additional component PDIs were retired or otherwise changed.

6.0 What Are the Current Uses of the Composites?

The PDI composites are intended 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:

1. *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.

2. *Is variability driven by poverty status?*

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

7.0 Additional Resources

See the AHRQ QI website for additional PDI resources and downloads:

https://qualityindicators.ahrq.gov/modules/pdi_resources.aspx.

Agency for Healthcare Research and Quality (2008). *Pediatric Quality Indicators (PDI) Composite Measure Workgroup Final Report*. The report is available at

https://qualityindicators.ahrq.gov/Downloads/Modules/PDI/PDI_Composite_Development.pdf