

# Lessons from the Field: Measuring Intermediate Progress

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Prepared for the Agency for Healthcare Research and Quality by L&M Policy Research, LLC with guidance from the Pediatric Quality Measure Program (PQMP) Grantees

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## List of Acronyms

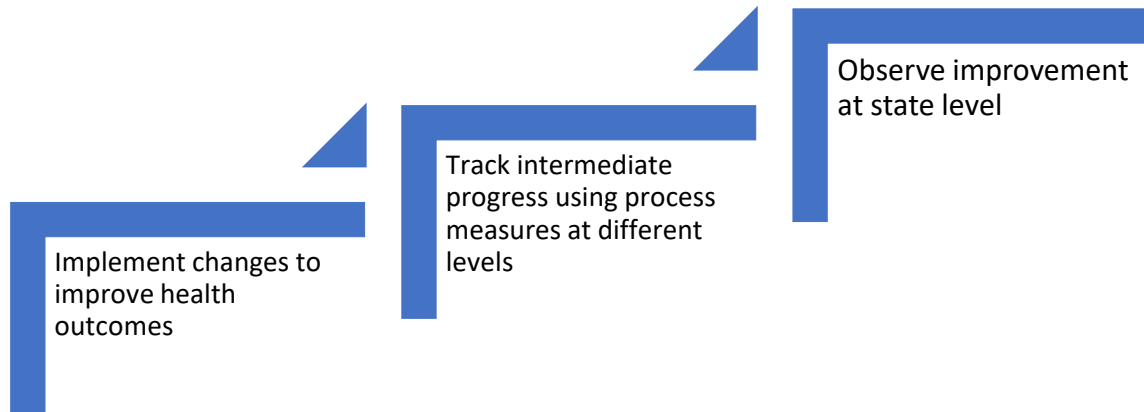
AHRQ	Agency for Healthcare Research and Quality
CEPQM	Children's Hospital Boston/Center of Excellence for Pediatric Quality Measurement
DCAT	Discharge Confidence Assessment Tool
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
IMPLEMENT	University of California, San Francisco/IMPLEmenting MEasures NeTwork (IMPLEMENT) for Child Health Network
KI	Key Informant
KII	Key Information Interviews
LBW	Low Birth Weight
P-HIP	Seattle Children's Hospital/Pediatric Hospital Care Improvement Project
PQMP	Pediatric Quality Measure Program
PQMP-LC	Pediatric Quality Measure Program Learning Collaborative
QI	Quality Improvement
Q-METRIC	University of Michigan/Quality Measurement, Evaluation, Testing, Review, and Implementation Consortium
RF	Research Foci

## Lessons from the Field: Measuring Intermediate Progress

### Introduction

This lesson from the field report examines one of the Research Foci (RF) central to the Pediatric Quality Measures Program (PQMP) grantees' work. This RF broadly focuses on how to measure intermediate progress at different levels to predict improvement at the state level, as depicted in Figure 1.

*Figure 1: Using Intermediate Measures to Observe Improvement*



The specific question is:

- For those measures for which improvement is unlikely to be seen within the CMS annual reporting cycle (calendar year), how might “intermediate” progress be measured at other levels which would predict improvement at the state-level, with a high predictive value?

In examining this question across two distinct data sources—literature reviews and key informant interviews (conducted by the PQMP Learning Collaborative)—a set of key considerations emerged that relate to using intermediate measures to observe improvement. There is less information on how intermediate progress can be observed at one level and then used to predict changes or improvements at other levels. Findings from both the literature and key informants focus largely on whether intermediate progress measures related to longer term health outcomes can be identified. While improvement for many of these measures is frequently assessed at the state level, this is not always explicitly noted. Each of these key considerations and supporting findings from the literature and key informants are discussed below.

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### Strength of relationship between an intermediate indicator and a long-term outcome.

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Clinical processes and intermediate outcomes are commonly used as surrogate indicators of distal outcomes, because they are more feasible (easier) to measure and more likely to respond to interventions in shorter timeframes. However, their value in driving overall performance on outcomes is directly tied to the strength of the relationship between the intermediate processes/outcomes and distal outcomes of interest. The adequacy of this relationship should be fully vetted before implementation as an indicator of intermediate progress.

The literature points to a number of considerations when evaluating the link between intermediate outcomes and distal outcomes, including biologic plausibility, proximity, adjustment for confounding, benefits for other outcomes, duration of studies, evidence from other interventions/exposures or populations, magnitude of association, and positive (but not statistically significant) direction of effects on health outcomes (Wolff et al. 2018). Following a review of USPSTF recommendations, authors suggested a series of approaches to standardizing the assessment of linkages between intermediate and distal outcomes, such as including relevant intermediate outcomes in analytic frameworks, describing plans *a priori* for evaluating intermediate-distal outcome links, and specifying and justifying evidence thresholds for sufficiency (Jonas et al. 2018). Overall, there was a call for more rigor in establishing strong relationships before measure implementation.

Often these long-term outcomes are measured at a higher level – at the health plan or state level rather than at the provider or practice level. For example, mortality is not usually assessed at the provider level, rather process measures are used to inform expectations at the health plan or state level. Although the following is an example from an adult setting, it illustrates how process measures can inform long-term outcome measures. While monitoring the number of mammograms provided to women age 50 and over may provide useful data to improving a state’s mortality rate from breast cancer, states may also conduct or facilitate process activities thought to be related to breast cancer mortality rates, such as requiring and monitoring the extent to which health plans include coverage for mammography or postoperative follow-up care from surgery. Additionally, states can use *capacity indicators* to identify particular service mechanisms that are present in their delivery systems, such as the number of (or the increase in the number of) facilities and trained staff offering mammography screenings in the state, which may impact the trend in the outcome measure of interest (National Research Council, 1999).

One state Medicaid Director described how the state was trying to lower its mortality rate from opioid use. The state uses two intermediate goals to assess progress—office-based opiate treatment in rural clinics and whether individuals continue treatment for at least 180 days.

The state Medicaid Director also discussed low birthweight (LBW) – a population health outcome measure on the Child Core Set used at the state level. He noted that one could use prescribing of long-acting reversible contraceptives or recommendations about inter pregnancy spacing, which can both be impacted and measured at the provider level, as intermediate measures of progress towards improvement in LBW at the state level.

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### Expected time interval for detecting observable change.

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Selecting measures for tracking intermediate progress should consider the expected time interval for detecting observable change. There is typically a lag time between making an improvement in clinical

practice and observing change in outcome measures. Measures selected for tracking intermediate progress should be indicators that can be expected to produce a signal attributable to practice change in a short timeframe (real-time, monthly, quarterly).

The literature points to the important consideration of selecting time intervals between baseline and follow-up time points, particularly when assessing outcomes. The interval must be long enough that change can be expected, but short enough to increase the likelihood that observed change is a result of antecedent clinical practice (versus change due to natural progression or confounding factors) (IOM 2001; Mainz et al. 2003-1; Shaughnessy et al. 1994). Time interval needs can also vary by context of measure use. Measures being applied in rapid-cycle or continuous quality improvement settings should be capable of detecting signals in shorter time periods (e.g., weekly, monthly, quarterly) than measures used for accountability and/or reporting purposes (e.g., annually).

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#### Data availability and lags.

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Data availability and lags impact the feasibility of tracking intermediate progress. The availability of timely, valid data is a determining factor in evaluating whether tracking intermediate progress in shorter timeframes (e.g., quarterly, annually, etc.) for an outcome of interest is feasible. The frequency of clinical processes as well as the time needed for data quality assurance, such as chart audits or claims processing, should be considered when specifying and selecting measures for tracking intermediate progress.

The literature discusses the various data sources used for quality measurement. Common data sources include administrative (claims) data, medical record data, and other primary data such as surveys. Each have their own limitations in terms of timeliness (collection and processing lags), overall completeness and/or consistency, and specificity to measure concepts (Mainz et al. 2003-2; Rubin et al. 2001; Shaughnessy et al. 1994). These characteristics can determine whether or not it is feasible to implement a performance measure, and they can drive selection of measures in certain contexts (IOM 2001). For example, utilization outcomes have been used more frequently than intermediate outcomes for tracking progress, because data are more readily available from secondary sources (Shaughnessy et al. 1994).

Several of the key informants commented that the availability of timely data is one of the main challenges associated with measuring intermediate progress. One informant—a state director of quality improvement—emphasized the need to quickly collect information while also having confidence in the validity of the data. His state is focusing on urging providers to implement new approaches that streamline data quality assurance protocols and reduce time for activities such as chart audits by shifting toward electronic extraction and reporting.

One informant working in quality improvement at the state level discussed one method they use to address data lags. As an intermediate measure, the state often reviews data for a 12-month period on a rolling basis; based on those data, measures are then calculated on a quarterly or a monthly basis. The problem with this approach is that the data carry the history forward, so it can take almost a year to see the true effects of an implemented change.

The remainder of this lessons from the field report provides examples of how the work conducted by three of the grantees relates to the considerations described above for one or more of the pediatric quality measures. As with the literature and key informants, the examples provided primarily address the issue of how to measure intermediate progress. For each key consideration, the grantees described:

(1) the challenges they faced during implementation, (2) the approach(es) they took to address the challenges, and (3) their team’s specific findings and implications for measure implementation.

### Challenges to Implementation

The grantees identified a number of challenges to measuring intermediate progress at multiple levels. While not all grantees faced the same set of challenges, multiple grantees experienced challenges in obtaining timely claims or survey data. To address data lags, grantees attempted to identify feasible measures for more rapid data collection that did not sacrifice completeness or association with longer term outcomes. Several specific examples are presented in Figure 2.

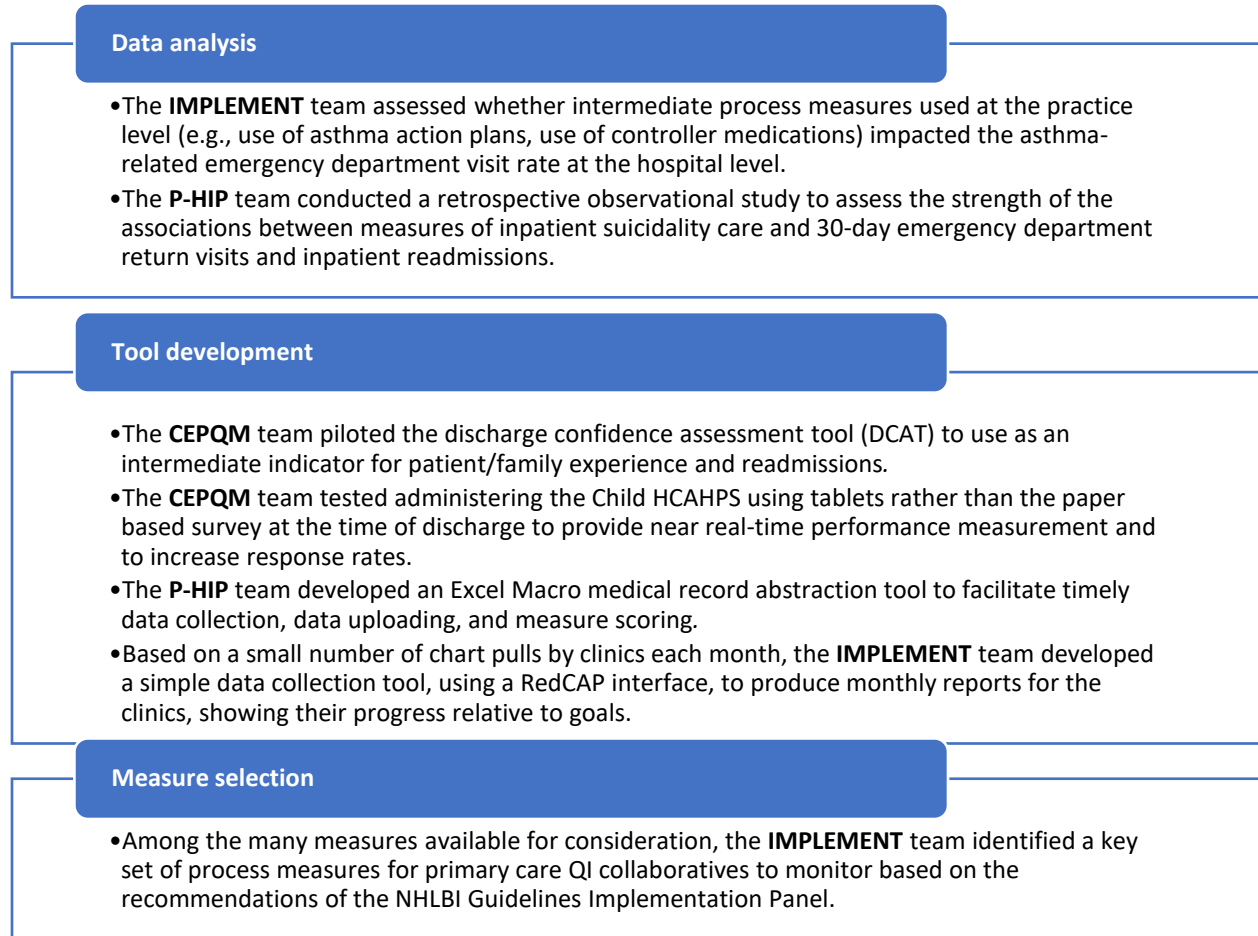
Figure 2. Examples of Grantee Implementation Challenges, by Key Consideration

Strength of the relationship between an intermediate indicator and a long-term outcome	<ul style="list-style-type: none"> <li>• <b>IMPLEMENT:</b> identifying a <i>single process</i> measure from primary care settings to predict change in asthma ED utilization.</li> <li>• <b>P-HIP:</b> low frequency of related events made it difficult to identify an intermediate indicator that could link to suicidality care process measures.</li> </ul>
Expected time interval for detecting observable change	<ul style="list-style-type: none"> <li>• <b>IMPLEMENT:</b> difficult to determine how long intermediate actions in the primary care setting would take to affect changes in asthma ED utilization.</li> <li>• <b>CEPQM:</b> multifactorial nature of patient experience requires many changes over time to affect scores.</li> </ul>
Data availability and lags	<ul style="list-style-type: none"> <li>• <b>P-HIP:</b> lack of timely metrics (monthly or otherwise) and number of incident-eligible events for QI collaboratives to target improvement activities.</li> </ul>

### Grantee Approaches

The grantees used a wide array of approaches to produce information that supported their efforts to explore the use of appropriate intermediate measures. Both quantitative and qualitative approaches were used, separately and in combination with each other. Selected examples of the grantee approaches that focused on data analysis, tool development and stakeholder interactions are shown in Figure 3.

Figure 3. Grantees used varied approaches to addressing implementation challenges



### Grantee Key Findings and Implications

Based on their information gathering and analytic activities, grantees provided findings for each of the key considerations that can be used to expand evidence about the use of intermediate measures to track progress in performance. Across grantees and measures, the most pervasive challenges were data related, specifically lags in data availability for measurement and reporting. Generally, grantees found that creating their own tools for more rapid data collection and/or relying on electronic health records as a data source improved their ability to use intermediate measures. More of the key findings and their implications are presented in the following series of tables.



Figure 4: The strength of the relationship between an intermediate indicator and a long-term outcome should be considered before relying on an intermediate indicator to predict progress on achieving the long-term outcome of interest.

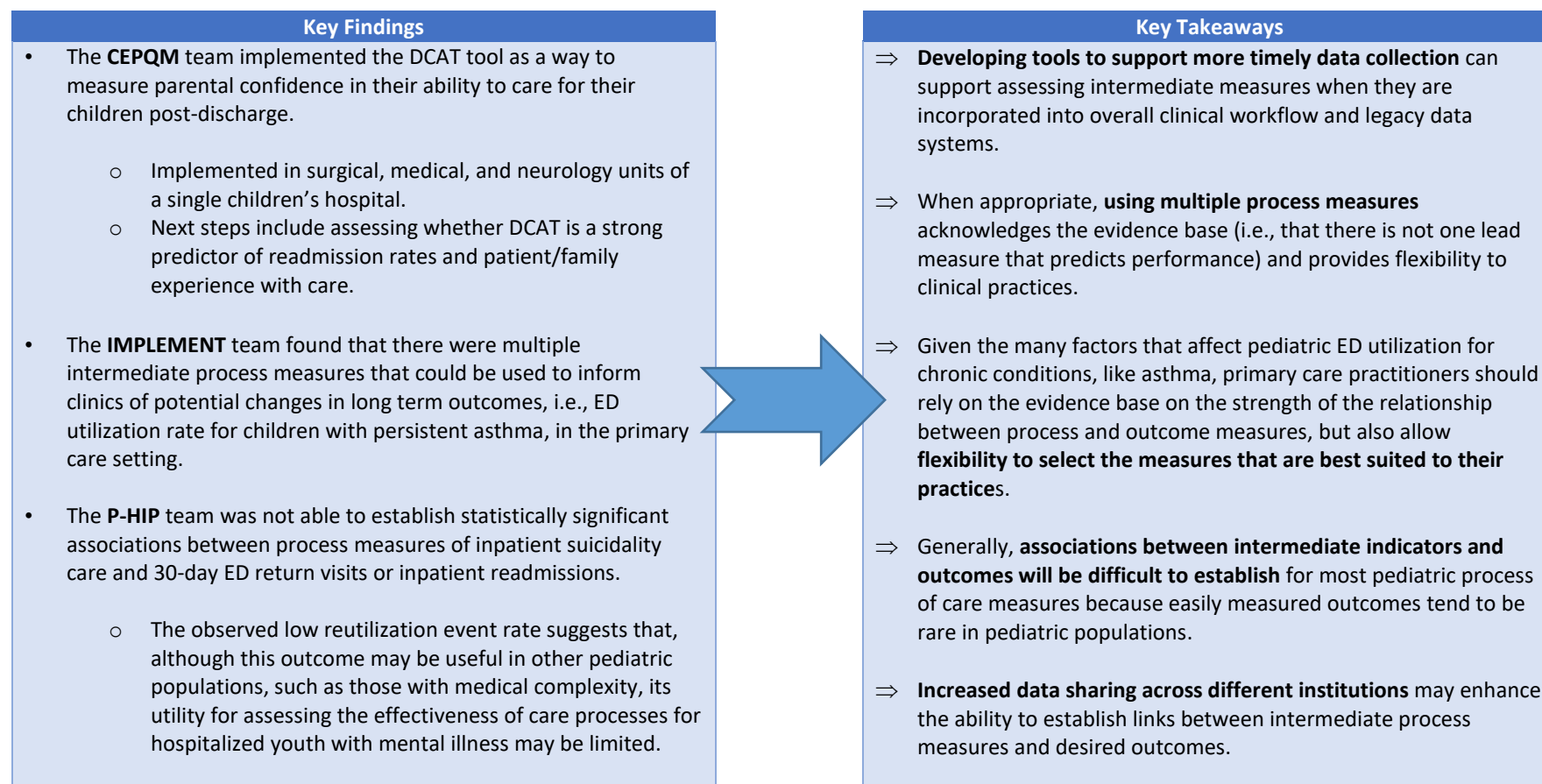


Figure 5: Selecting measures for tracking intermediate progress should consider the expected time interval for detecting observable change.

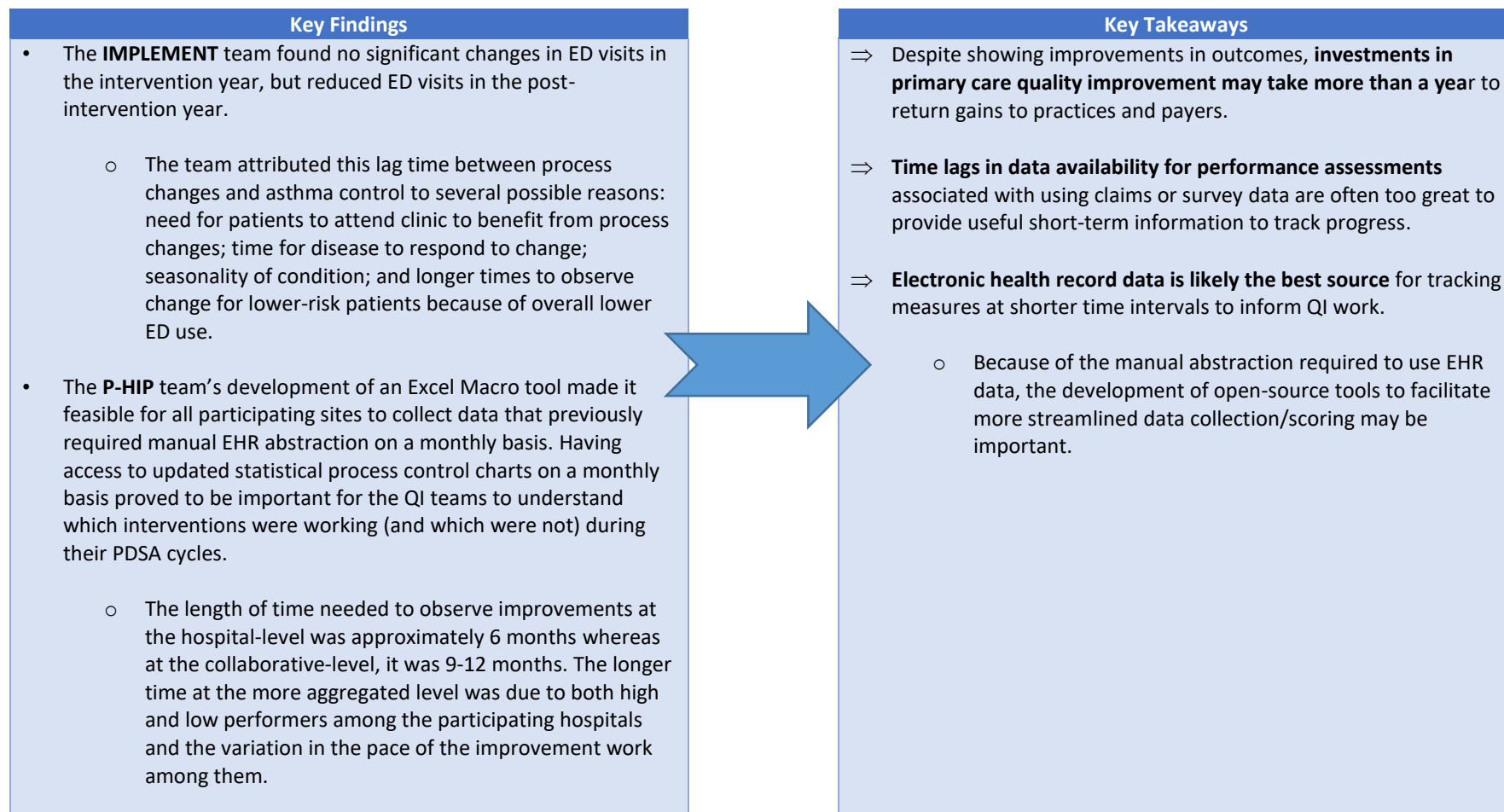
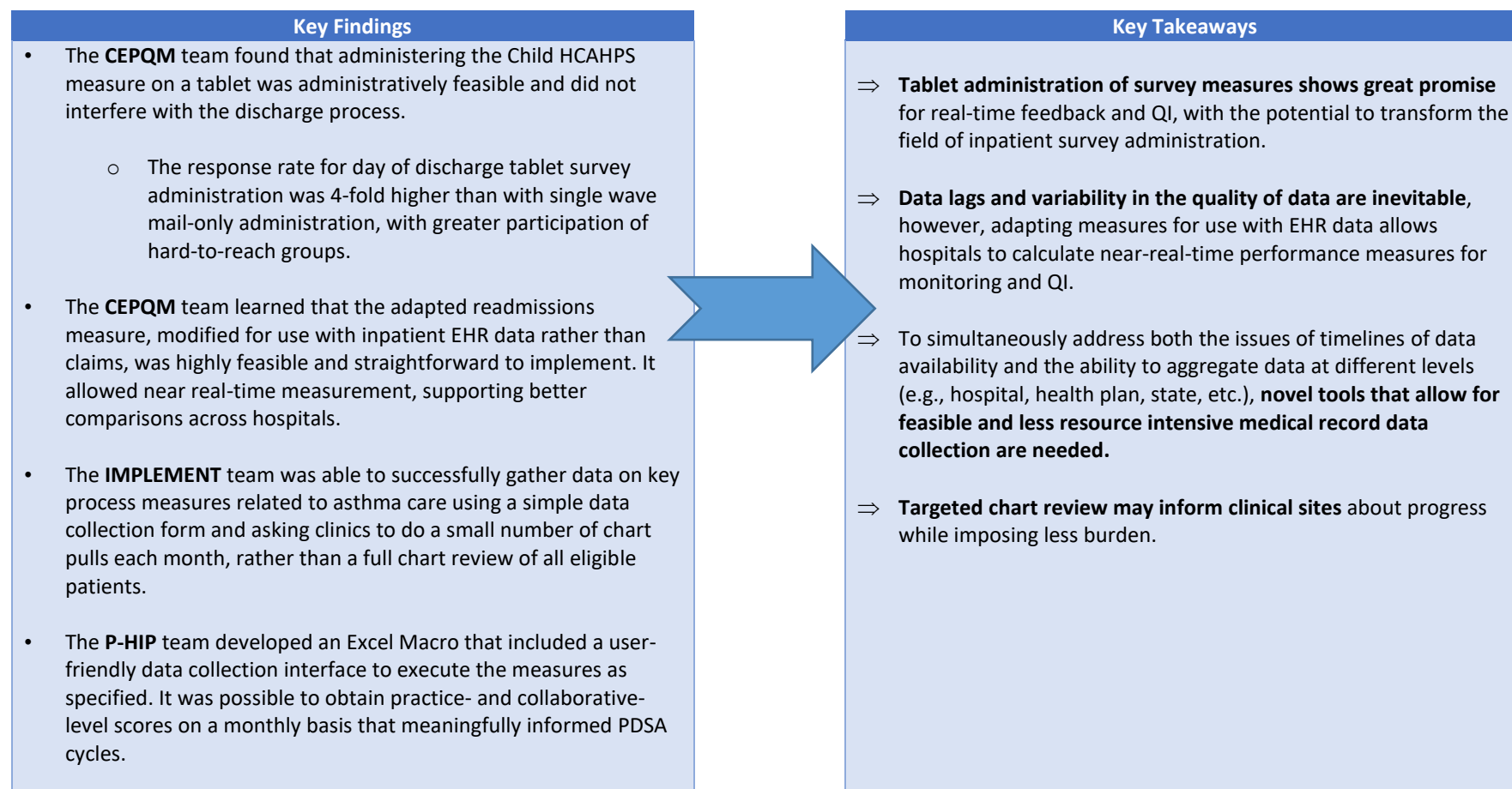


Figure 6: Data availability and lags impact the feasibility of tracking intermediate progress.



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