Comparative Health System Performance Initiative: Compendium of U.S. Health Systems, 2016, Technical Documentation

Prepared for:

Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
5600 Fishers Lane
Rockville, MD 20857
www.ahrq.gov

Contract Number: HHSA290201600001C

Prepared by:

Mathematica Policy Research, Washington, DC
Kirsten Barrett
Ken Peckham
David Jones
Rachel Machta
Jessica Heeringa
Eugene Rich
Laura Kimmey

AHRQ Publication No. 17(19)-0047-EF
September 2017 (updated January 2019)

This page has been left blank for double-sided copying.

Appendix D. Alternative Payment Models Data and Methods

Introduction

This appendix describes the data and methods used to construct the variables that indicate whether a health system participated in an accountable care organization (ACO) or a Medicare bundled payment model.

System Participation in Accountable Care Organizations

We used data from the 2016 Torch Insight™ tool to construct measures of system participation in ACOs. The Torch Insight tool is a proprietary data source[i] constructed by collecting information on value-based contracts using a mix of surveys, primary research, integration of public data, and indepth interviews.[ii] Data are collected on participation in ACO contracts at multiple levels, including hospitals, clinics, and providers.

We constructed a system-level variable equal to one if at least one non-Federal general acute care hospital within the system participated in an ACO contract. Thus, it is an indirect measure that describes system participation in ACO contracts measured via systems' hospital participation in ACO contracts.

To construct variables indicating whether a system participated in an ACO contract, we began by matching hospitals in the Torch Insight dataset to ACO contracts. Then, we matched hospitals in this dataset to hospitals in the Compendium system-hospital linkage file (referred to as the "hospital linkage file" in this document).[iii] Finally, we constructed system-level variables equal to one if at least one non-Federal general acute care hospital within the system participated in an ACO contract.

Step 1: Identifying Hospitals in the Torch Insight Data Participating in ACO Contracts

We used three files to identify hospitals participating in ACO contracts:

1. A hospital file that included one observation per hospital,
2. An ACO-hospital join file that included one observation per hospital-ACO dyad, and
3. An ACO file that provided information on ACOs and their contract types.

[i] Torch Insight is a product of Leavitt Partners, a healthcare intelligence business.

[ii] We obtained information on the Torch Insight dataset and data collection methods from the "Torch Insight: ACO and Value-based Payment Codebook and Overview."

[iii] The Compendium of U.S. Health Systems, the hospital linkage file, and their respective technical documentation can be found at https://www.ahrq.gov/chsp/Compendium/index.html.

By merging these files using unique identifiers included in the Torch Insight data, we created a file listing hospitals and their participation in ACO contract types: commercial, Medicare, and Medicaid.[iv]

Step 2: Matching Hospitals in the Torch Insight Data and the Compendium

Next, we matched hospitals in the Torch Insight data (n=7,498) to the hospitals in the hospital linkage file (n=6,762). We used two approaches to match the hospitals: (1) CMS Certification Number (CCN) matching and (2) name and address matching. We matched 5,856 hospitals in the Torch Insight data via CCN. After we removed hospitals in the Torch Insight data that matched via CCN, most of the unmatched hospitals (81 percent) did not have CCNs.

Next, we identified possible matches via name and address. We allowed a many-to-one match of hospitals listed in the Torch Insight data that did not match via CCN to match to any hospital in the hospital linkage file (including those that already had a CCN match). We took this approach to allow observations in Torch Insight data that are hospital campuses or sub-hospital facilities to match to their respective hospital in the hospital linkage file.

Using the approach described in Chapter III, we applied character-string matching using the SAS COMPGED function to compare the similarity of hospital names, and we used geocoding to determine the linear distance between hospital addresses. We accepted all name and address matches if the SAS COMPGED score was ≤150 and the State matched. In addition, we accepted matches if the linear distance between the hospital street addresses was less than 1/2 mile regardless of name. We identified an additional 1,025 Torch Insight hospital matches this way.

Most matches were one-to-one (n=5,949). We deduplicated the many-to-one matches (n = 932) to return to one observation per hospital in the hospital linkage file (n =6,762). We considered a hospital in the linkage file to participate in an ACO contract if it matched to any of the records in the Torch Insight hospital file that participated in an ACO contract. That is, if any hospital campuses or subhospital facilities in the Torch Insight data that matched to a hospital in the hospital linkage file indicated they participated in an ACO contract, we considered the hospital in the linkage file to participate in that ACO contract.

In most cases, hospitals that matched to a single hospital in the hospital linkage file had identical ACO information, so the aggregation did not change the reported ACO information. For cases in which the ACO information differed (for example, one hospital is reported to participate in an ACO contract and the other is reported to not participate in an ACO contract), we erred on the side of reporting ACO participation. In this example, we reported that the hospital in the hospital linkage file participated in an ACO contract.

After we completed all matching and deduplication, 6,386 (94 percent) of hospitals in the hospital linkage file had a hospital match from the Torch Insight data.

[iv] We merged the hospital and the ACO-hospital join files using “hospital_cms_id_and_name,” and we merged the resulting file with the ACO file using “aco_id_and_name.”

Step 3: Aggregating Hospital Participation in ACOs to the System Level

To construct the system-level ACO indicator variable, we aggregated hospital participation in ACO contracts to the system level using the hospital linkage file. We considered a system to participate in an ACO contract if any of their non-Federal general acute care hospitals participated in an ACO contract.

System Participation in a Medicare Bundled Payment Model

We used publicly available data from the Centers for Medicare & Medicaid Services (CMS) to construct a measure of system participation in a Medicare bundled payment model. Specifically, we examined system participation in the CMS Comprehensive Care for Joint Replacement (CJR) model and the CMS Bundled Payments for Care Improvement (BPCI) initiative.

We constructed a system-level variable equal to one if at least one non-Federal general acute care hospital within the system participated in the CJR model or BPCI initiative. Therefore, our measure of system participation in a Medicare bundled payment model did not capture the participation of non-acute care hospital providers, including physician group practices or rehabilitation hospitals.

The CJR model began on April 1, 2016, and was mandatory for all inpatient prospective payment system providers located in 67 metropolitan statistical areas before February 1, 2018, with few exceptions.[v] We used the "List of CJR Hospitals prior to February 2018" publicly posted on CMS's website to identify participating hospitals. This file provides each hospital's CCN, which we used to match to the hospital linkage file. Among the 800 hospitals in the "List of CJR Hospitals prior to February 2018," 793 matched hospitals in the Compendium.

BPCI comprises four models that link payments for multiple services beneficiaries receive during an episode of care. BPCI Episode Initiators can be general acute care hospitals, skilled nursing facilities, physician group practices, home health agencies, inpatient rehabilitation facilities, and long-term care hospitals. Participants entered into payment arrangements that included financial and performance accountability.

Model 1 participants participated in all Medicare Severity-Diagnosis-Related Groups.[vi] For Models 2, 3, and 4, participants could choose from 48 clinical episodes.[vii] In 2016, BPCI was voluntary and available nationwide.

We used the "Analytic file from Quarter 4 of 2016" to identify health systems with hospitals participating in BPCI. The BPCI file included one observation per awardee and clinical episode;

---

[v] Providers participating in Model 1, Model 2, or Model 4 of the BPCI initiative for lower extremity joint replacement episodes were excluded from the CJR model. For more information, go to https://innovation.cms.gov/initiatives/bundled-payments/.

[vi] Our data include one Model 1 awardee. The first cohort of awardees in Model 1 began in April 2013 and concluded on March 31, 2016. The remaining awardee ended participation on December 31, 2016.

[vii] In Model 3, the episode of care is triggered by an acute care hospital stay but begins at initiation of post-acute services with a skilled nursing facility, inpatient rehabilitation facility, long-term care hospital, or home health agency. Therefore, we are not capturing any participation in Model 3 BPCI.

that is, awardees appeared in more than one row in the file if they were participating in more than one of the 48 possible clinical episodes. Awardees are the participants in the model that assume financial liability for the episode spending.

The "Analytic file from Quarter 4 of 2016" contained 12,030 observations, which included general acute care hospitals and specialty hospitals. We excluded all observations that did not include a CCN (n=1,957) and deduplicated the file to one observation per CCN (n=1,086). We then matched the BPCI hospitals to those in the Compendium hospital linkage file via CCN. We matched 363 hospitals in the BPCI file to Compendium hospitals. This process accounted for all of the general acute care hospitals and specialty hospitals participating in BPCI.

To construct a system-level Medicare bundled payment indicator variable, we aggregated hospital participation in BPCI or CJR to the system level using the hospital linkage file. We considered a system to participate in a Medicare bundled payment model if any of their non-Federal general acute care hospitals participated in BPCI or CJR.

Caveats and Limitations

Indirect Measurement of System Participation

Our approach for measuring system participation in ACOs or Medicare bundled payment models relied on indirect measurement of system participation via systems' hospital participation. However, both ACOs and BPCI can have participants at other levels. Therefore, we are not capturing all aspects of systems' participation in these models. For example, if a system had a physician group participant in BPCI, but none of their hospitals had financial liability for the episode spending, the system's participation would not be captured in our variable.

Missing Data

Some systems were missing data on ACO contracts for one or more of their non-Federal general acute care hospitals. Missing values can occur either because a hospital was not included in the Torch Insight dataset or because our approach to matching hospitals failed to identify a relevant match. While individual hospitals had missing information on ACO contracts, when we aggregated the hospital-level information to the system level, all systems included hospital data.

On average, 98 percent of systems' non-Federal general acute care hospitals had ACO data. At the system level, the mean percentage of systems' non-Federal general acute care hospitals with ACO data was 98 percent.

Misalignment of Data Source Time Periods

The Compendium reflects health systems in the United States at the end of 2016. That period differs slightly from the periods represented by the CJR hospital list that represents all hospitals before February 2018. Thus, it is possible that hospitals opened, closed, or changed CCNs between 2016 and 2018 and are not represented in our hospital linkage file.