



# 15 Top Health Systems

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2022

## **Competitor Report Sample**

Prepared for:  
Client Health System  
<Date of Delivery>

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- Background and approach
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## Background and Approach

In this analysis, Client Health System's performance and rate of improvement are compared to that of seven client-selected competitors, using the 15 Top Health Systems and 100 Top Hospitals® measures and methodologies.

Measures included in this analysis:

- OVERALL performance score
- Inpatient mortality
- Complications
- Healthcare-associated infections
- Mean 30-day inpatient mortality
- 30-day hospital-wide readmission
- Average length of stay
- Medicare spend per beneficiary
- HCAHPS top-box (overall rating quest)

Results are displayed as the rank percentile of each health system's performance and rate of improvement compared to all U.S. health systems within each system's 15 Top peer group.

Conversion to percentiles allows direct comparison of all selected health systems, without regard to peer group.

Profiled client  
health system  
and competitors

– **Profiled health system**

- Competitor 1
- Competitor 2
- Competitor 3
- Competitor 4
- Competitor 5
- Competitor 6
- Competitor 7

## **Overall national performance**

- Client System falls into the (41st)percentile nationally for 2020 performance and the 81st for 2016-2020 rate of improvement.
- Only one competitor system outperformed Client System in both current performance and rate of improvement. All other competitors lagged behind Client System.

## **Where client system is strong among peers and improving**

- Client System had the strongest performance with the healthcare-associated infections measure outperforming all included competitors in rate of improvement performance (95th percentile).

## **Where client system might have significant opportunity to improve nationally, and compared to these competitors**

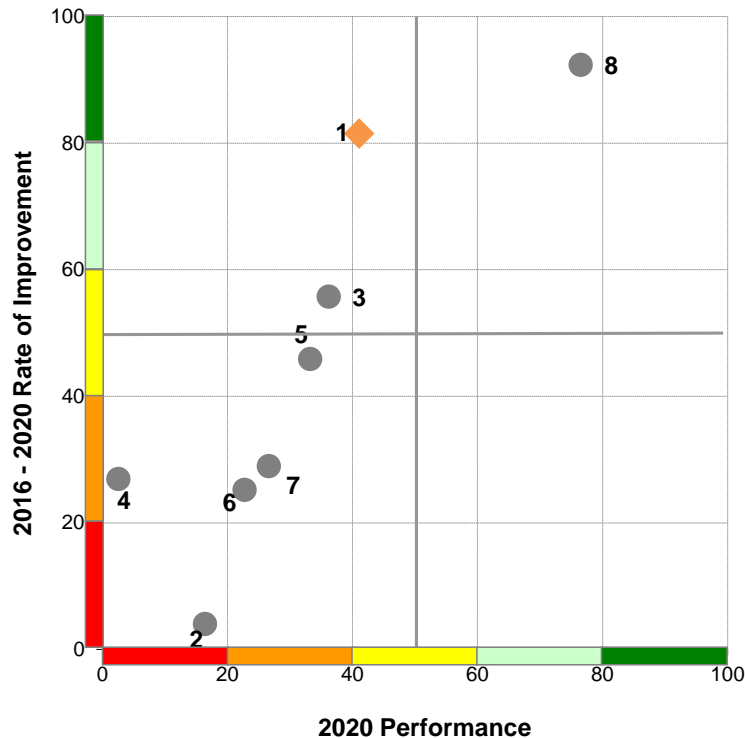
- The MSPB measure was the weakest performance for Client System with a 2020 performance in the 38th percentile and rate of improvement percentile of 17.

# Overall Performance

# 15 Top Health Systems, 2022

## Overall performance

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

- 2 Competitor 1
- 3 Competitor 2
- 4 Competitor 3
- 5 Competitor 4
- 6 Competitor 5
- 7 Competitor 6
- 8 Competitor 7

### Quintile Key

- > 80 to 100
- > 60 to 80
- > 40 to 60
- > 20 to 40
- > 0 to 20

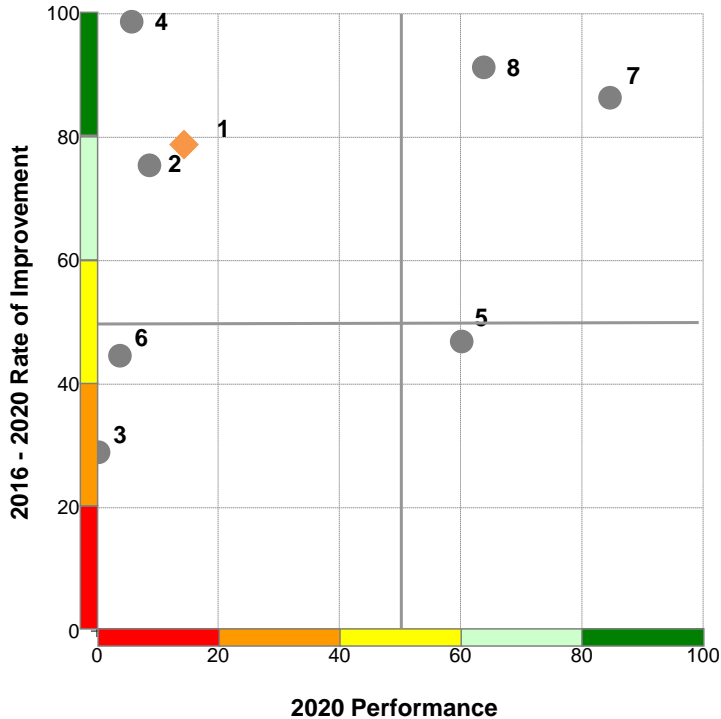
Performance measures



# 15 Top Health Systems, 2022

## Risk-adjusted inpatient mortality

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

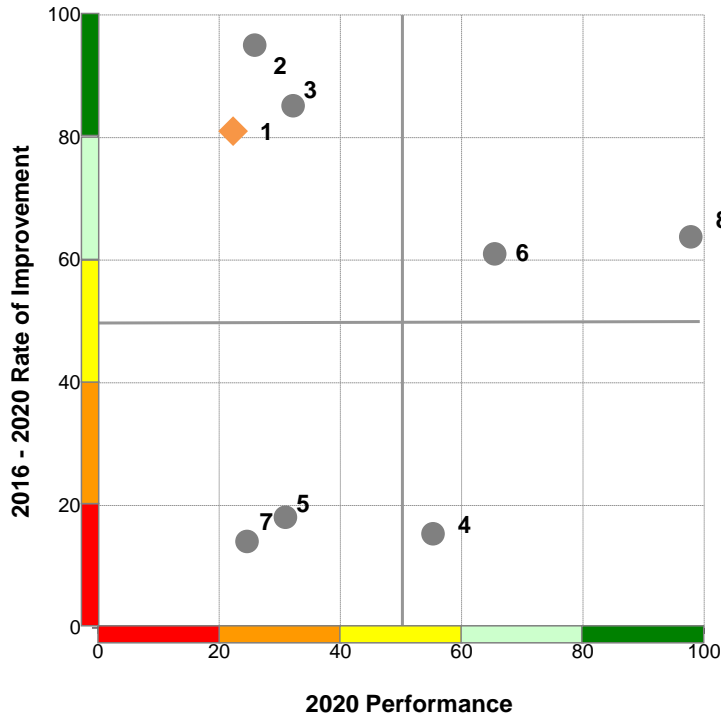
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## Risk-adjusted complications

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

- 2 Competitor 1
- 3 Competitor 2
- 4 Competitor 3
- 5 Competitor 4
- 6 Competitor 5
- 7 Competitor 6
- 8 Competitor 7

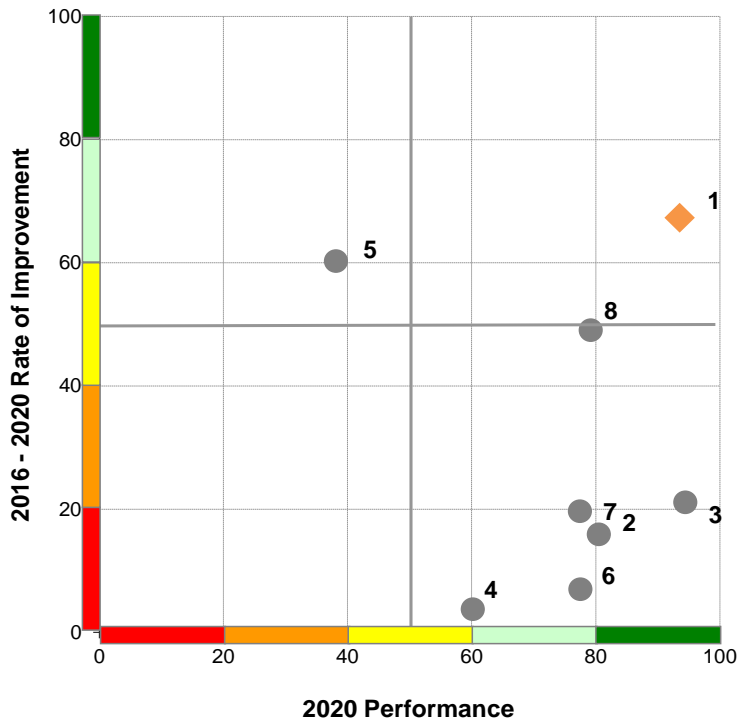
### Quintile Key

- > 80 to 100
- > 60 to 80
- > 40 to 60
- > 20 to 40
- > 0 to 20

# 15 Top Health Systems, 2022

## Healthcare-associated infections

### 2020 Performance and 2016-2020 Rate of Improvement



#### Health System Key

##### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

#### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

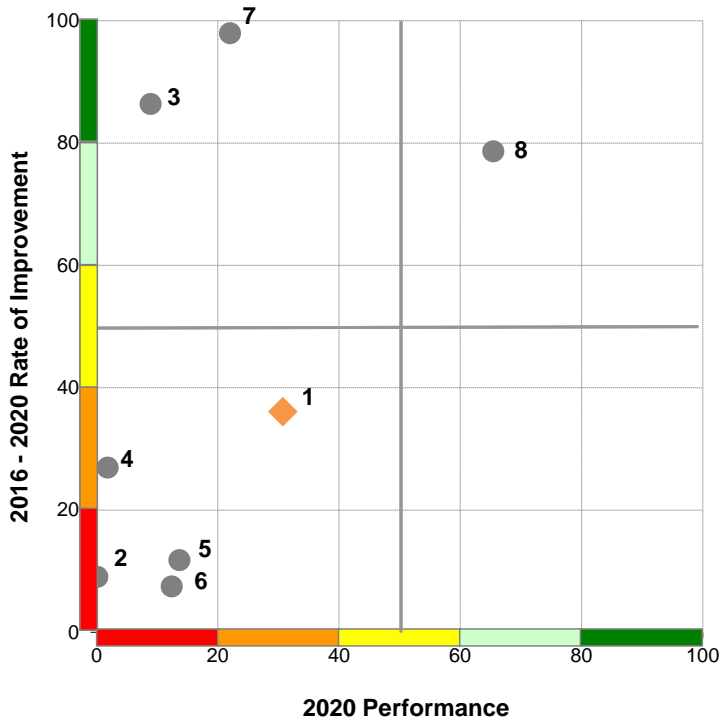
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## Mean 30-day mortality

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

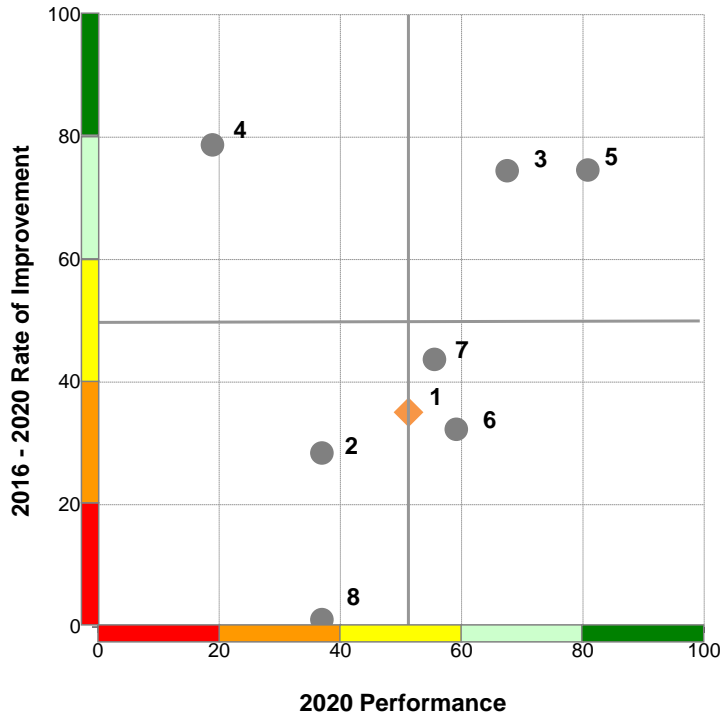
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## 30-day hospital-wide readmissions

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

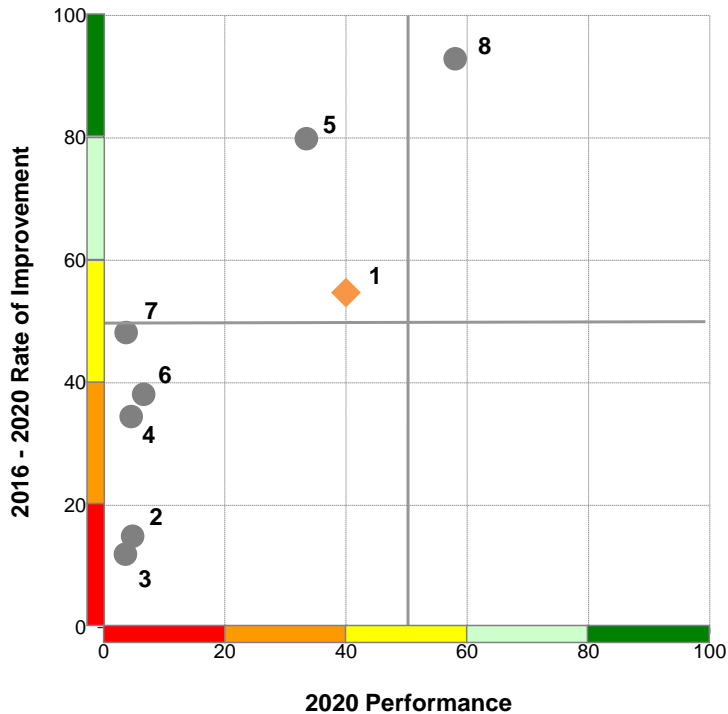
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## Severity-adjusted average length of stay

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

#### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

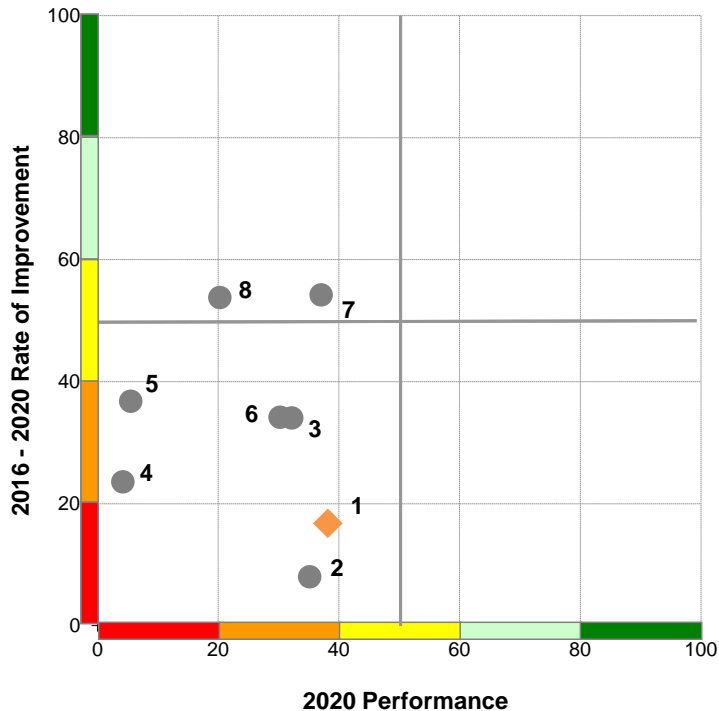
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## Medicare spend per beneficiary (MSPB)

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client System

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

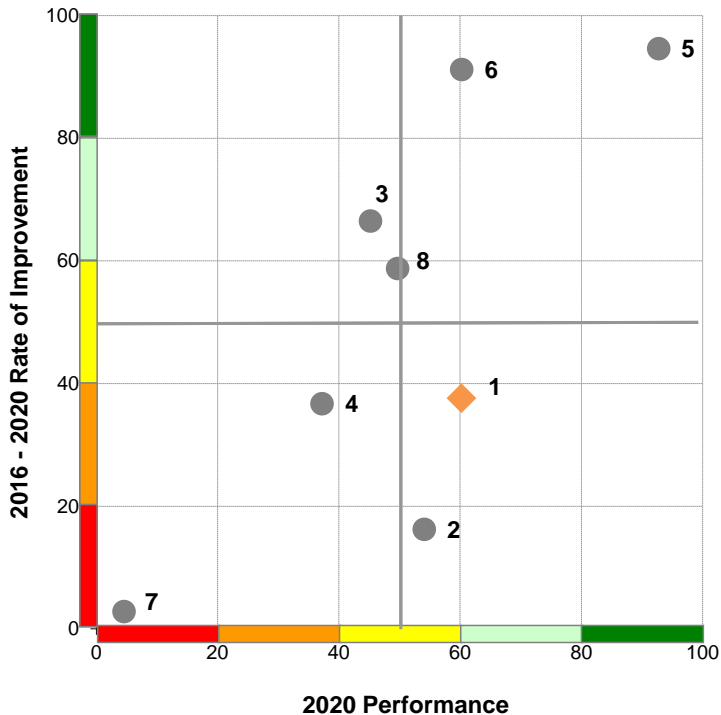
> 20 to 40

> 0 to 20

# 15 Top Health Systems, 2022

## HCAHPS Overall rating question

2020 Performance and 2016-2020 Rate of Improvement



### Health System Key

#### 1 Client Hospital

2 Competitor 1

3 Competitor 2

4 Competitor 3

5 Competitor 4

6 Competitor 5

7 Competitor 6

8 Competitor 7

### Quintile Key

> 80 to 100

> 60 to 80

> 40 to 60

> 20 to 40

> 0 to 20



# Methodology overview

# 15 Top Health Systems 2022, Overview

14 years of research

Definition of a system

- Minimum of two acute care general hospitals with separate provider IDs
- Cardiac, ortho/surg, women’s and CAH member hospitals also included
- Hospital cost reports must identify the parent system
- All identified member hospitals’ valid data are rolled-up to system level
- Uses public data to produce national norms and benchmarks (*not a convenience sample*)

Measures performance on a balanced scorecard (*clinical and extended outcomes, operational efficiency, patient experience*)

- Uses peer-reviewed Watson Health and CMS methodologies

Unique view of ‘systemness’ – measures the ability of a system to deliver consistent top performance in all member hospitals, in all communities served, over time; tracks competitive position

# General ranking methodology

## Current Performance (2020)

- We use the most current public data available for each measure (various data sets ending in 2020)
  - *Exception: CMS Hospital Compare time period for measures varies this year due to adjustment for COVID, see specific measure description for details*
- Systems are ranked on each measure, independently, by comparison group
- Ranks are weighted, summed and the sum is re-ranked by comparison group to determine each system's overall performance score
- **Winners** are the top overall performers in each comparison group

## 5-Year Rate of Improvement (2016-2020)

- 5 data points are trended for each measure
- Systems are ranked on the regression line t-statistic for each included measure, by comparison group
- Ranks are weighted, summed and the sum is re-ranked by comparison group to determine each system's overall rate of improvement score
- Trended results are presented to guide leadership decision-making. They are not used in the selection of winners

## Winner exclusion rules

Health Systems are ineligible to be considered 15 Top benchmark systems if they have:

- An observed mortality or complications rate that is statistically worse than expected (99% confidence) and above the outlier group 75th percentile trim point
- Any 100 Top Hospitals® award rescinded by IBM Watson Health within prior three years

CMS does not publish MSPB for Maryland hospitals due to a separate hospital payment system in place there for all registered insurers, including Medicare

- All Maryland systems are winner excluded for missing Medicare Spending Per Beneficiary Index
- We substitute the MSPB median by comparison group for each Maryland system to allow ranking and reporting

*Note: If a system meets a winner exclusion rule, this does NOT mean the system would have been a winner. It means they are excluded from consideration when final ranking and selection of winners occurs.*

## Methodology notes

### COVID-19 adjustments

- MEDPAR 2020 dataset excluded COVID-19 cases. Any record with the following ICD-10-CM codes were removed from the data:
  - *B97.29 Other coronavirus* (discharges prior to April 1, 2020)
  - *U07.1 COVID-19, virus identified (lab confirmed)* (discharges from April 1, 2020 and forward)

CMS Hospital Compare dataset excluded the 1<sup>st</sup> and 2<sup>nd</sup> quarter 2020:

- “CMS will not use data from January 1, 2020 through June 30, 2020 (1Q 2020 - 2Q 2020) for performance or use in quality reporting or value-based payment programs.”
- “In addition to policy exceptions and extensions granted for quality measure reporting and data submission deadlines, CMS will not publicly report data collected during 1st and 2nd quarter 2020.”

## Methodology notes

Risk adjustment models used to develop expected values for inpatient mortality and complications; severity-adjustment model for average length of stay

– Inpatient mortality model only

- Excludes records with ‘Do Not Resuscitate’ (Z66) coded as POA
- Excludes patients admitted to hospice care (discharged from acute care)

– All models

- Includes palliative care patient records (Z515)

*The proprietary risk-adjustment models for inpatient mortality, complications, and the severity-adjustment models for LOS and cost per case, are recalibrated for each annual release using the latest federal fiscal years of data available in the PIDB (for this study year the federal fiscal years (FFY) 2016-2018 were used)*

## Methodology notes

Due to the continuing high frequency of the invalid POA indicator code '0' in MEDPAR, we have modified our MEDPAR data processing.

*Note: Performing this extra step on the public data set helps to reduce the number of false “numerator events” for complications and more accurately determines the risk of death and complications, as well as expected length of stay.*

- Valid POA codes are retained (N,Y,W,U,1)
- Where invalid POA code '0' appears records are processed as follows:
  - All principal diagnosis codes (dx) are treated as 'present on admission'
  - All secondary dx on the CMS exempt list are treated as exempt
  - Secondary dx coded 'Y' or 'W' more than 50 percent of the time in the Watson Health all-payer data base are treated as 'present on admission'
  - All others are treated as not present on admission

# System-level data aggregation

## Mortality, complications and average length of stay

Mortality, complications and length of stay (LOS) indexes are calculated by summing hospital observed and expected values to the health system level. Expected values are normalized by system class. LOS indexes are converted to average length of stay in days for reporting, using the in-study health system grand mean LOS.

## Mean healthcare-associated infections index

CMS Hospital Compare patient level data (observed and expected values; eligible inpatient days or procedure counts [varies by HAI type]) for system member hospitals are summed to develop the system-level standardized infection ratios (SIRs) for each HAI measure. The ranked and reported measure value is a composite HAI SIR. We calculate an unweighted mean of the aggregated observed and expected values for the included HAIs.

*Note: included HAIs varies by system class – see table later in this section.*

## Mean 30D Mortality, 30D Hospital-wide readmissions, & HCAHPS top box rates

CMS Hospital Compare values (*score/rate/answer percent, all a percent value in the source data, by MCARE ID*) and eligible patient counts (denominator) for system member hospitals are aggregated to develop system-level rates per 100 discharges for each included 30-day metric (mean of 30-day mortality rates and 30-day readmission rates used for ranking and reporting).

## Medicare spend per beneficiary

Each system member hospital value that is not null is multiplied by the hospital's MEDPAR patient count; the weighted values are summed and the sum is divided by the number of member hospitals with valid scores to produce the system-level weighted average MSPB (used for ranking and reporting)



# Health System comparison groups

15Top Health system comparison groups	2021 Winners	2021 Total
<p><b>Large Health Systems</b> - 3 ways to qualify:</p> <ul style="list-style-type: none"> <li>• ≥ 2.5B total operating expense of member hospitals <b>OR</b></li> <li>• ≥ 1.5B total operating expense and member hospitals in ≥ 3 states <b>OR</b></li> <li>• ≥ 1.5B tot oper exp and member hospitals ≥ 5 short-term acute care</li> </ul>	5	152
<p><b>Medium Health Systems</b> - 2 ways to qualify:</p> <ul style="list-style-type: none"> <li>• ≥ 1.0B total operating expense of member hospitals <b>OR</b></li> <li>• ≥ 800M total operating expense and member hospitals &gt; 5 short-term acute care</li> </ul>	5	89
<p><b>Small Health Systems</b></p> <p>Does not meet large or medium health system criteria</p>	5	108
<b>Totals</b>	15	349

# Scorecard domains, measures and rank weights

	Domain	Performance Measure	2022 Weight	Trend Weight
Quality	Clinical Outcomes	Risk-adjusted inpatient mortality	1	1
		Risk-adjusted complications	1	1
		Healthcare-associated infections	1	1
	Extended Outcomes	Mean 30-day mortality rate (AMI, HF, PN, COPD, stroke)	1	1
		30-day hospital-wide readmission rate	1	1
Operations	Efficiency	Severity-adjusted average length of stay	1	1
		Medicare spend per beneficiary	1	1
	Patient Experience	HCAHPS overall hospital rating – top box	1	1

# Data sources and time frames

Performance Measure	2022 Performance (15 Top Award)	5-Year Trend
Risk-adjusted IP mortality	MEDPAR Federal Fiscal Year (FFY) 2019 and 2020 <sup>a</sup>	MEDPAR FFY 2016-2020 <sup>a</sup>
Risk-adjusted complications	MEDPAR Federal Fiscal Year (FFY) 2019 and 2020 <sup>a</sup>	MEDPAR FFY 2016-2020 <sup>a</sup>
Healthcare-associated infections	CMSHC Hospital Compare (CMSHC) Oct 1, 2019-March 31, 2021	CMSHC Calendar year (CY) 2016-2019; Oct 1, 2019-March 31, 2021
30-day mortality rates	CMSHC July 1, 2017-Dec 1, 2019 <sup>b</sup>	CMSHC: Three-year datasets ending in June 30, 2016, 2017, 2018, 2019 <sup>c</sup>
30-day hospital-wide readmission rate	CMSHC July 1, 2019-Dec 1, 2019 <sup>d</sup>	CMSHC: One year datasets ending in 2016, 2017, 2018, 2019 <sup>c,d</sup>
Average length of stay	MEDPAR FFY 2020	MEDPAR FFY 2016-2020
Medicare spend per beneficiary	CMSHC July 1, 2020-Dec 31, 2020 <sup>d</sup>	CMSHC CY 2016-2019; July 1, 2020-Dec 31, 2020 <sup>d</sup>
HCAHPS overall hospital rating	CMSHC July 1, 2020-Dec 31, 2020 <sup>d</sup>	CMSHC CY 2016-2019; July 1, 2020-Dec 31, 2020 <sup>d</sup>

a. Two years of data are combined for each study year data point

b. Measure has only 2 1/2 years of data instead of 3 due to CMS removal of Q1 and Q2 2020 data from measure datasets

c. Two data points end in 2019 due to CMS removal of Q1 and Q2 data from measure datasets in current year

d. Measure has only 6 months of data instead of 1 year due to CMS removal of Q1 and Q2 2020 data from measure datasets

# Inpatient mortality and complications

Two years of MEDPAR data are combined for each data point (2019, 2020 in current profile)

- Includes Medicare Advantage (HMO) encounter records

Watson Health risk models are used to produce expected values (*See methodology notes for details*)

Normalized z-score is the ranked metric

- Indicates whether the observed value is significantly different than the expected value; takes into account the effect of small numbers in eligible population

Risk-adjusted index is reported (*Ratio of observed to normalized expected value*)

Health systems with statistically poor performance on one or more of these metrics are winner excluded (*See winner exclusions*)

Health system values are sum of hospital observed and sum of hospital expected values

# Healthcare-associated infections

Data from CMS Hospital Compare January 2022 Release

- Time period of measure is Oct 1, 2019-March 31, 2021
- Standardized Infection Ratio (SIR, an observed-to-expected index) for six healthcare-associated infections (HAIs)
- Observed values relate to population count of all eligible inpatient days of service or device days or procedures for all inpatients (*eligible population counts vary by HAI measure*)

National Healthcare Safety Network (NHSN) risk models are used to produce expected values, as reported on CMS Hospital Compare

Composite measure is the mean of the six HAIs

- For each system-level HAI, we calculate an SIR
- The unweighted mean of the included SIRs is the ranked composite metric
- We report the mean of all system-level HAI SIRs as a composite SIR; we also report individual system-level HAI SIRs

Included HAIs vary by comparison group, due to data availability (*see table next page*)

## **System-level HAI measure processing:**

We sum system member hospital observed, expected, and count (eligible cases) to produce system-level observed, expected and count values for each HAI measure (system-level HAI SIRs, for reporting, are calculated by dividing summed observed by summed expected values)

The ranked and reported measure value is a composite HAI SIR. We calculate an unweighted mean of the aggregated observed and expected values for the included HAIs.

## Healthcare-associated infections, cont'd

Comparison Group	Required HAIs (minimum)
Large Health Systems	HAI-1, 2, 3, 5, 6
Medium Health Systems	HAI-1, 2, 3, 5, 6
Small Health Systems	HAI-1, 2, 6

HAI	Name	Definition
HAI-1	CLABSI	Central line-associated bloodstream infections in ICUs and select wards
HAI-2	CAUTI	Catheter-associated urinary tract infections in ICUs and select wards
HAI-3	SSI: Colon	Surgical site infection from colon surgery
HAI-4	SSI: Hyst	Surgical site infection from abdominal hysterectomy
HAI-5	MRSA	Methicillin-resistant Staphylococcus aureus blood laboratory-identified events
HAI-6	C. diff	Clostridium difficile laboratory-identified events (intestinal infections)

# 30-day mortality and hospital-wide readmission rates

CMS Hospital Compare January 2022 Release

- Mortality: July 1, 2017 – Dec 1, 2019, 2 ½ year time period\*
- Hospital-wide: July 1- Dec 1, 2019, 6-month time period\*

## Medicare Fee For Service ONLY

CMS determines pre-existing conditions for risk-adjustment from documentation in patient claims history\*\*

*\*The measure time periods for the current (2020) data point is different from the trend (2016-2019) data points due to CMS removal of Q1 and Q2 2020 data from measure datasets in current year.*

*\*\*CMS pneumonia rate includes patients with a principal discharge diagnosis of sepsis (not including severe sepsis) that have a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis coded as POA.*

- **30-day mortality:** rates for 5 patient groups are included in simple mean (heart attack, heart failure, pneumonia, COPD, stroke). Health system-level rates are the sum of member hospitals' 30-day mortality events ( $=[\text{HOSP. RATE}] \times [\#\text{ELIGIBLE CASES}]$ ), divided by the sum of the member hospital eligible cases for each patient group.
  - Class median value is substituted when individual 30-day rates are missing. *If all 30-day rates are missing, system is excluded from the study.*
- **30-day hospital-wide readmissions:** rate based upon FFS claims data from all Medicare patients who qualified from a one-year period starting in July of each year (excludes planned readmissions). Health system-level rates are the sum of member hospitals' 30-day hospital-wide readmission events ( $=[\text{HOSP. RATE}] \times [\#\text{ELIGIBLE CASES}]$ ), divided by the sum of the member hospitals' eligible cases.

## Severity-adjusted average length of stay

One year of MEDPAR data is used for each data point (2020)

- Includes Medicare Advantage (HMO) encounter records

Risk models are used to produce expected values  
*(See methodology notes for details)*

Expected values are normalized by health system comparison group

Health system values are sum of hospital observed LOS and sum of hospital expected LOS

We rank and report ALOS in days (calculated by multiplying the LOS Index by the Grand Mean ALOS of the in-study health systems)



# Medicare spend per beneficiary

CMS Hospital Compare January 2022 Release

– July 1 – December 31, 2020 \*

## **Medicare Fee for Service only**

The MSPB O/E Index is the ratio of Medicare spending per beneficiary treated in a specific hospital and the median Medicare spending per patient nationally.

– Includes Medicare Part A and Part B payments from 3 days prior to the hospital stay, during the stay, and 30 days post-discharge

*\*The measure time period for the current (2020) data point is different from the trend (2016-2019) data points due to CMS removal of Q1 and Q2 2020 data from measure datasets in current year.*

System MSPB Index is calculated by multiplying each member hospital's index by its MEDPAR discharges; summing the weighted scores, and dividing by the sum of the discharges

We rank and report the MSPB Index

*Note: Class median value substituted when the MSPB index is missing and system is winner excluded. (Maryland hospitals do not have MSPB indexes)*

# HCAHPS

HCAHPS: Hospital Consumer Assessment of Healthcare Providers and Systems inpatient survey public data set

CMS Hospital Compare January 2022 release

– All-payer dataset: July 1 - December 31, 2020

Only datapoint ranked - HCAHPS top box percent (%) for the overall hospital rating question (“*How do patients rate the hospital, overall?*”)

– **TOP BOX** = Patients who gave their hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest)

*\*The measure time period for the current (2020) data point is different from the trend (2016-2019) data points due to CMS removal of Q1 and Q2 2020 data from measure datasets in current year.*

The system-level HCAHPS top box percent was calculated by summing the number of surveyed patients for each member hospital who rated the hospital 9 or 10 ( $(=[\text{HOSP. SCORE}\%] \times [\text{SAMPLE SIZE}\#])$ ), divided by the sum of sample sizes for all system member hospitals

Note: We also report data from all individual HCAHPS survey questions for information only (*available in full 15 Top report*)