

50 Top Cardiovascular Hospitals, 2020

A National Benchmarks Report

Prepared for:
Sample Hospital
City, ST
Medicare ID: 999999

Report Methodology Notes

COMPARISON GROUPS

So that we can compare your hospital with others most like it, we assign each hospital to one of three comparison groups according to size, teaching status, and residency/fellowship program involvement:

- Teaching hospitals with cardiovascular residency programs (CARDIO TEACHING)
- Teaching hospitals without cardiovascular residency programs (TEACHING)
- Community hospitals (COMMUNITY)

BENCHMARK AND PEER GROUPS

In the Watson Health™ 50 Top Cardiovascular Hospitals study, we select 50 **Benchmark hospitals** (winners) based on overall performance in the most recent year of data available:

CARDIO TEACHING	15
TEACHING	15
COMMUNITY	20

Peer group hospitals include all U.S. hospitals in our study database, *excluding* benchmark hospitals.

INCLUDED PATIENT GROUPS

The focus of the study is on hospitals that offer both medical and surgical treatment options for patients with two of the most common cardiovascular conditions — coronary atherosclerosis and heart failure. We include data for acute myocardial infarction (AMI), heart failure (HF), coronary artery bypass graft (CABG) and primary percutaneous coronary intervention (PCI) patients in our analysis. Patients are assigned to mutually exclusive groups, as follows:

- CABG patients (primary or secondary)
- PCI patients (excludes open chest coronary artery angioplasty)
- AMI patients (restricted to non-surgical)
- HF patients (restricted to non-surgical)

Patients with both PCI and CABG are grouped as CABG. Patients with both AMI and HF are excluded.

POA METHODOLOGY NOTES

Present on Admission (POA) coding is used in risk models for inpatient mortality, complications, average LOS, and cost per case. Due to increasing numbers of diagnoses with invalid POA code ‘0’, we made the following

adjustments to the MEDPAR data:

- 1) Original, valid (Y, N, U, W, or 1) POA codes assigned to diagnoses were retained
- 2) Where a POA code of ‘0’ appeared, we took the next four steps:
 - a. We treated all principal diagnoses (dx) as ‘present on admission’
 - b. We treated all secondary dx on the CMS exempt list as ‘exempt’
 - c. We treated secondary diagnoses for which the POA code ‘Y’ or ‘W’ appeared more than 50 percent of the time in Watson Health’s all-payer database, as ‘present on admission’
 - d. All others were treated as ‘not present’

RANK WEIGHTS AND PUBLIC DATA SOURCES

Ranked Performance Metric	Current Wt	Trend Wt	Source
Risk-Adjusted IP Mortality (AMI, HF, CABG, PCI)	1/2 ea	1/2 ea	MEDPAR FFY ¹ 2013-2018
Risk-Adjusted Complications (CABG, PCI)	1/4 ea	1/4 ea	MEDPAR FFY ¹ 2013-2018
Percent CABG Patient with IMA Use	1/2	1/2	MEDPAR FFY ¹ 2013-2018
30-Day Mortality Rate (AMI, HF, CABG)	1/6 ea	1/6 ea	CMS Hospital Compare: 3-yr datasets ending Jun 30 in 2014, 2015, 2016, 2017, 2018
30-Day Readmission Rate (AMI, HF, CABG)	1/6 ea	1/6 ea	CMS Hospital Compare: 3-yr datasets ending Jun 30 in 2014, 2015, 2016, 2017, 2018
Severity-Adjusted ALOS (AMI, HF, CABG, PCI)	1/4 ea	1/4 ea	MEDPAR FFY ¹ 2014-2018
Wage- and Severity-Adjusted Average Cost per Case (AMI, HF, CABG, PCI)	1/4 ea	1/4 ea	MEDPAR FFY ¹ 2014-2018
30-Day Episode Payment (AMI, HF)	1/2 ea	1/2 ea	CMS Hospital Compare: 3-yr datasets ending Jun 30 in 2014, 2015, 2016, 2017, 2018

¹ Federal Fiscal Year is Oct 1 through Sep 30.

FOR MORE INFORMATION

For a Study Overview, with full details on performance measures, methods used and winner list, visit www.100tophospitals.com.

50 Top Cardiovascular Hospitals Performance Matrix

INTEGRATED HOSPITAL PERFORMANCE COMPARISON

The 50 Top Cardiovascular Hospitals Performance Matrix, in a single view, compares your hospital's current level of performance achievement and five-year rate of improvement in percentiles. These percentiles are based on your hospital's rank, overall and by measure, within your comparison group. This integrated performance comparison provides insight into the success of hospital performance improvement strategies relative to other similar hospitals.

INTERPRETING HOSPITAL PERFORMANCE

The matrix "Overall" dot displays your national rank percentile for current overall performance with your national rank percentile for five-year overall rate of improvement. Rank percentiles for each individual measure are also graphed. Measures may fall into any one of four quadrants: Declining (lower left), Improving (upper left), Leading (upper right), or At-Risk (lower right).

Overall hospital performance in the most current year is a composite score based on the weighted sum of the ranks of individual measures. This sum is used to rank your hospital within your comparison group and produce your 2018 Performance Percentile.

Overall hospital performance on five-year rate of improvement is also a composite score based on the sum of the weighted ranks of individual measures on improvement. This sum is used to rank your hospital within your comparison group and produce your 2014-2018 Rate of Improvement Percentile.

50 Top Cardiovascular Hospitals award winners are selected based on highest **current** overall performance. Winners fall into either the "Leading" or "At-Risk" quadrants, depending on their five-year rate of improvement. Those with a high rate of improvement will be "Leading" performers, and those who have fallen behind their comparison group mean are "At Risk" for falling out of the winner circle, if performance improvement continues to be stalled.

PERFORMANCE MATRIX NOTES

Overall Dot

Due to the number of individual measures in this study, two matrix graphs are provided to better visualize the performance of each measure. One graph shows the medical patient group measures (AMI and HF) and the other shows the surgical patient group measures (CABG and PCI). **However**, the "Overall" dot on each matrix graph represents the hospital overall performance and rate of improvement based on **all** measures and patient groups, combined (AMI, HF, CABG, PCI). Therefore, it is identical on each matrix graph.

Missing Matrix Graphs

The matrix graphs will be missing if your hospital did not have enough years of data to be trended. A minimum of four years of data, including the most current year, are required. There also will be no trend graphs in the report.

If there were too few years of data for one or more measures, but not all, there will be no matrix graphs; but there will be trend graphs for the measures that were not missing. Notes on excluded data points are in the Appendix following the Trend Profile.

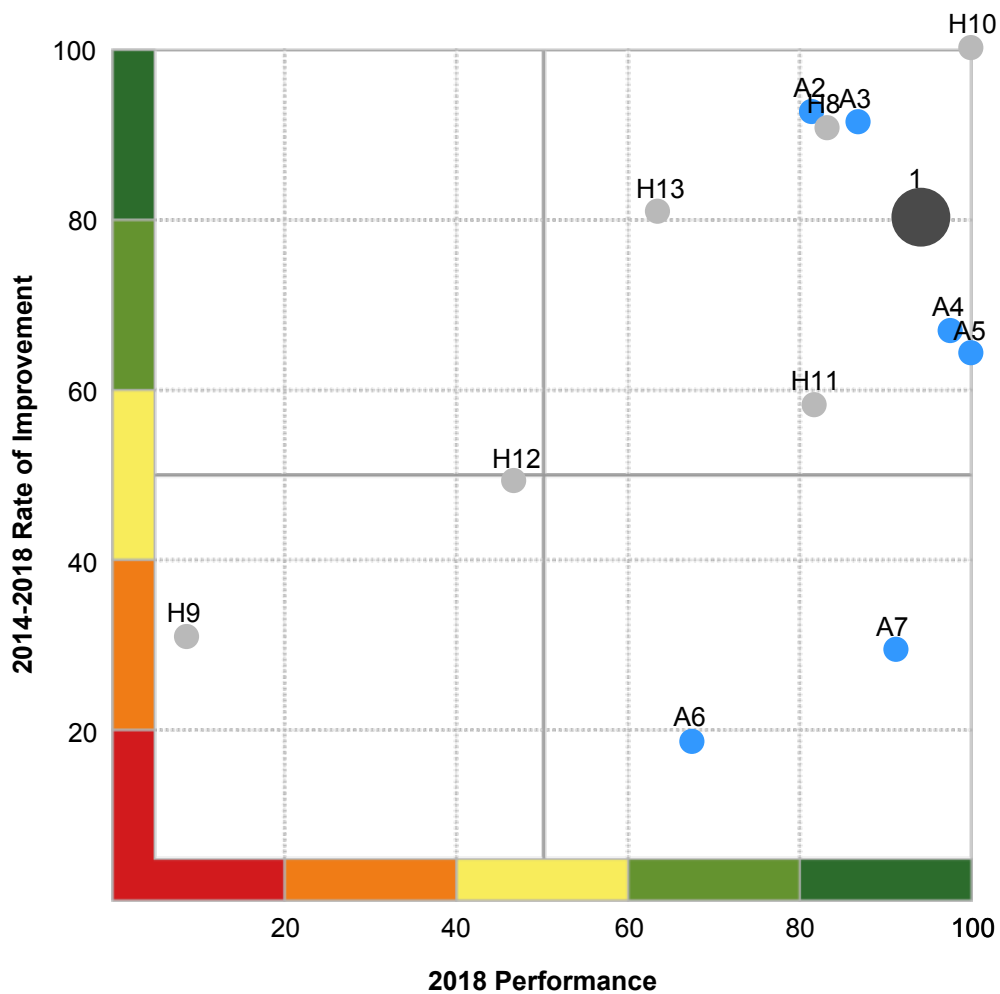
Missing Measure Dots

A measure dot will be missing from the matrix if your hospital had too few usable data points (after outlier exclusions) to calculate a regression line t-statistic, which is the ranked variable. If this occurs, the dot for the affected measure(s) will be missing on the matrix graph **and** there will be no "Overall" dot. In addition, data points will be missing from the affected trend measure graphs. Notes on excluded data points are in the Appendix following the Performance Matrix graph and the current and trend graphs.

50 Top Cardiovascular Hospitals Performance Comparison Group

Profiled hospital compared to cardio teaching hospitals

AMI and HF patients: 2018 Performance and Five-Year Rate of Improvement Matrix



DATA POINT KEY

- 1 **OVERALL***
- A2 AMI IP Mortality
- A3 AMI 30-Day Mortality
- A4 AMI 30-Day Readmit
- A5 AMI Avg LOS
- A6 AMI Cost per Case
- A7 AMI 30-Day Payment
- H8 HF IP Mortality
- H9 HF 30-Day Mortality
- H10 HF 30-Day Readmit
- H11 HF Avg LOS
- H12 HF Cost per Case
- H13 HF 30-Day Payment

QUINTILES

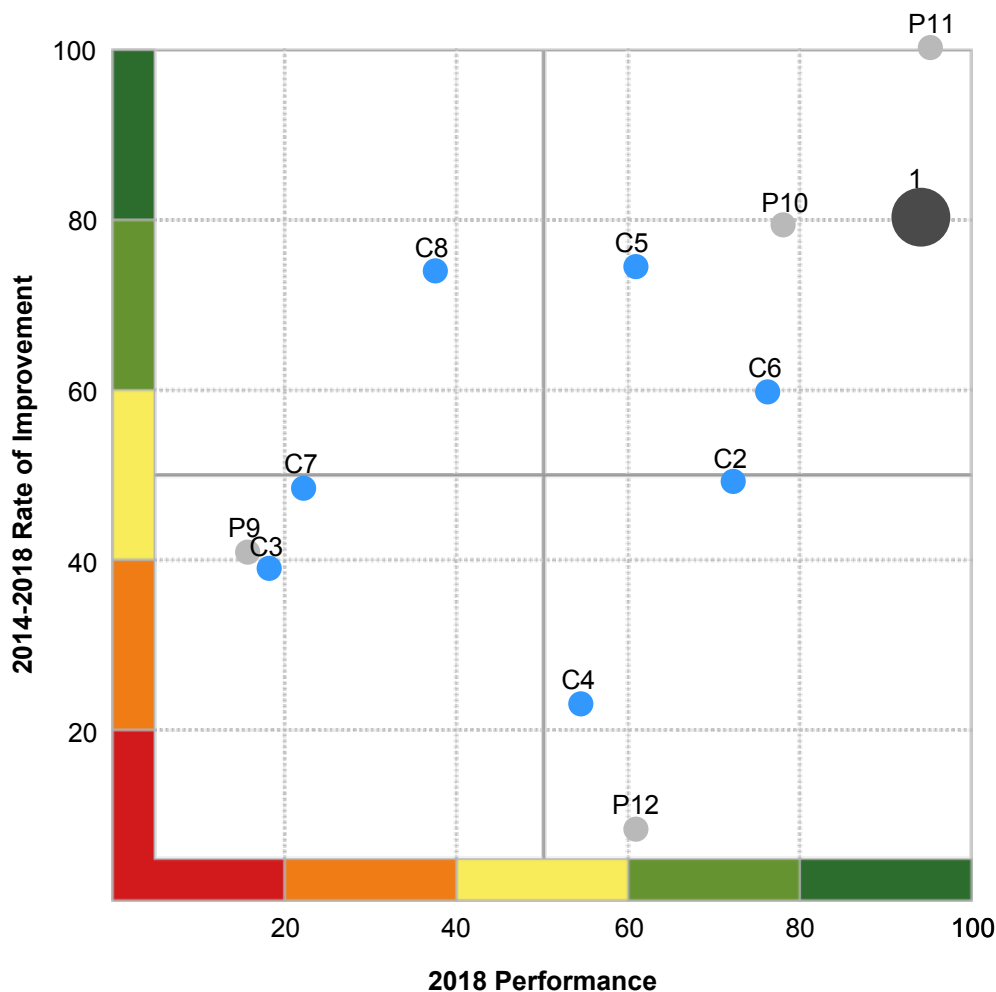
- 80 TO 100
- 60 TO 80
- 40 TO 60
- 20 TO 40
- 0 TO 20

*Overall Measure includes all 4 patient groups of measures: AMI, HF, CABG, PCI

PROFILED HOSPITAL compared to:

2018 cardio teaching hospitals: n = 275
 2014-2018 cardio teaching hospitals: n = 265

CABG and PCI patients: 2018 Performance and Five-Year Rate of Improvement Matrix



DATA POINT KEY

- 1 **OVERALL***
- C2 CABG IP Mortality
- C3 CABG Complications
- C4 CABG w IMA
- C5 CABG 30-Day Mortality
- C6 CABG 30-Day Readmit
- C7 CABG Avg LOS
- C8 CABG Cost per Case
- P9 PCI IP Mortality
- P10 PCI Complications
- P11 PCI Avg LOS
- P12 PCI Cost per Case

QUINTILES

- 80 TO 100
- 60 TO 80
- 40 TO 60
- 20 TO 40
- 0 TO 20

*Overall Measure includes all 4 patient groups of measures: AMI, HF, CABG, PCI

PROFILED HOSPITAL compared to:

2018 cardio teaching hospitals: n = 275
 2014-2018 cardio teaching hospitals: n = 265

Performance and Improvement – Rank Percentiles Graphs

UNDERSTANDING THE GRAPHS

2018 Performance Rank Percentiles

This bar graph shows your hospital's performance on each measure, in the most current year of data we analyzed, reported as rank percentiles. Individual measure percentiles are calculated by dividing your measure rank within your comparison group by the number of hospitals in the group and multiplying by 100.

2014-2018 Rate of Improvement Rank Percentiles

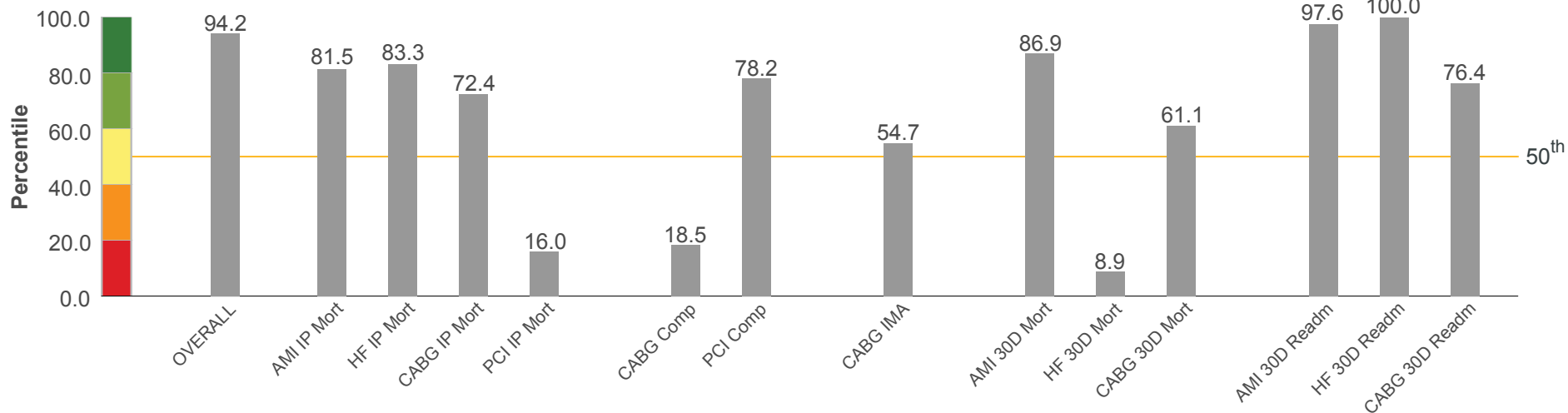
This bar graph shows your hospital's relative rate of improvement on each measure, and overall, reported as rank percentiles. Individual measure percentiles are calculated by dividing your measure rank within your comparison group by the number of hospitals in the group and multiplying by 100. The overall rank percentile is based on the sum of your individual measure ranks, re-ranked by comparison group. The overall rank sum is then converted into a percentile. The overall rank percentile is not the average of the individual measure percentiles.

Hospitals with overall and measure-specific rank percentiles above the median are likely to move ahead of peers on performance in the future, if those rates of improvement have continued.

Hospitals with overall and measure-specific rank percentiles below the median are likely to fall behind peers on performance in the future, if those low rates of improvement have continued. And, winners with a low overall rate of improvement are at future risk of dropping out of the winner circle entirely.

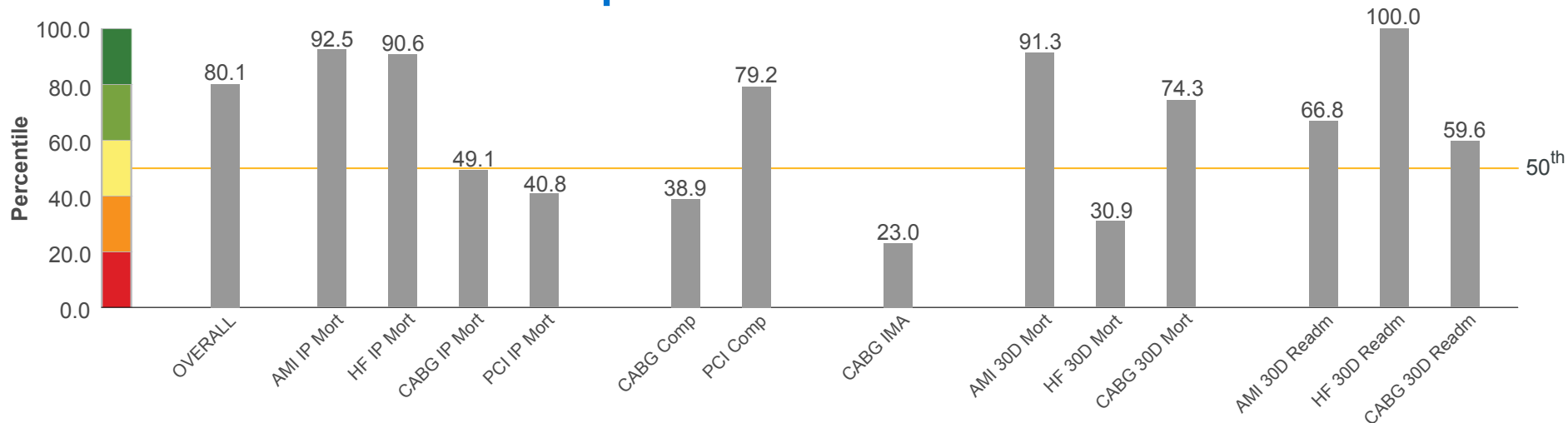
The 50 Top Cardiovascular Hospitals benchmark hospitals (winners) are selected based only on 2018 performance.

2018 Clinical Performance Rank Percentiles



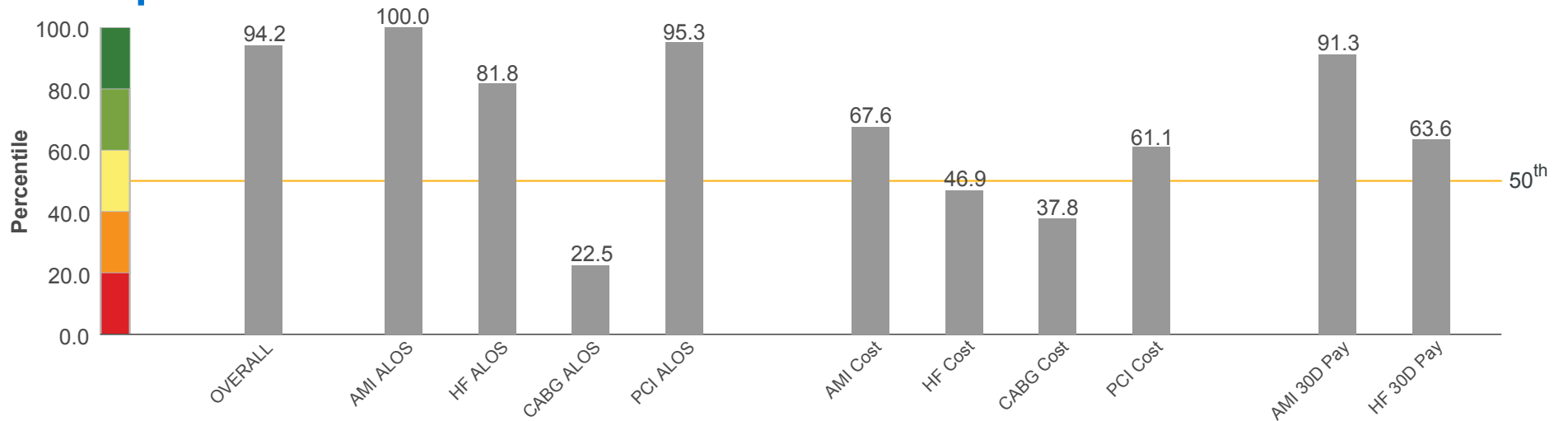
Profiled hospital compared to cardio teaching hospitals: n = 275

2014-2018 Clinical Rate of Improvement Rank Percentiles



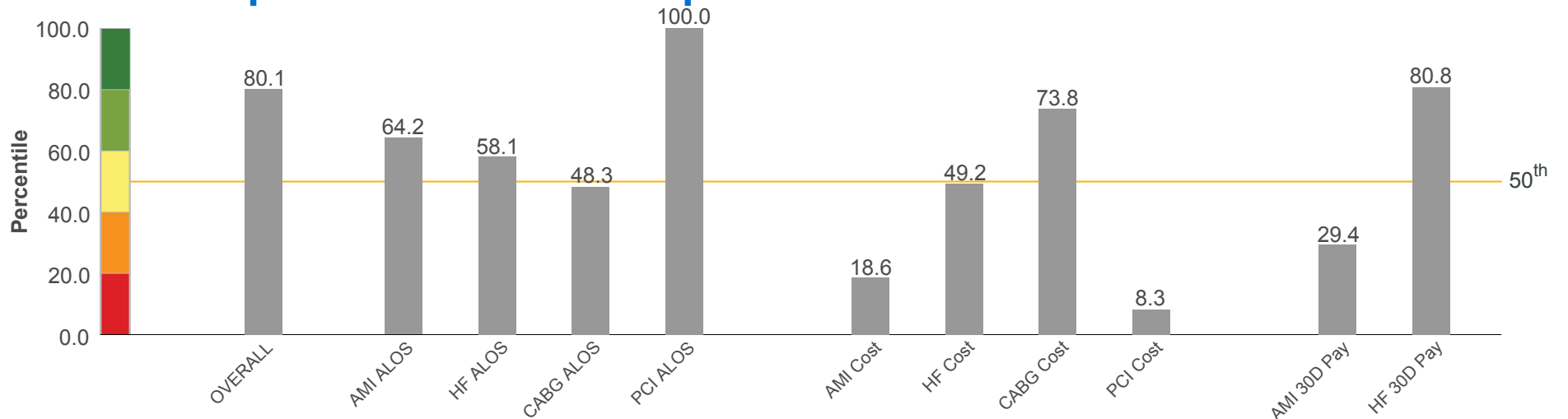
Profiled hospital compared to cardio teaching hospitals: n = 265

2018 Operational Performance Rank Percentiles



Profiled hospital compared to cardio teaching hospitals: n = 275

2014-2018 Operational Rate of Improvement Rank Percentiles



Profiled hospital compared to cardio teaching hospitals: n = 265

50 Top Cardiovascular Hospitals Current Profile Notes

CURRENT PROFILE

The 50 Top Cardiovascular Hospitals winners are selected based on performance in the most current year of the Study (Current Profile).

The Current Profile analyzes your hospital's performance in the most recent year available, using a national balanced scorecard of critical performance metrics:

- Risk-Adjusted Inpatient Mortality Index
- Risk-Adjusted Complications Index
- Percent CABG Patient with IMA Use
- 30-Day Mortality Rate (AMI, HF, CABG)
- 30-Day Readmission Rate (AMI, HF, CABG)
- Severity-Adjusted Average Length of Stay
- Wage- and Severity-Adjusted Average Cost per Case
- 30-Day Episode Payment (AMI, HF)

Using this Profile, you can identify your hospital's level of performance achievement by individual measure and overall, and target higher performance. In addition, the Profile shows the median level of achievement of national **award-winning** ("benchmark") hospitals and the median performance of **non-winning** ("peer") hospitals in your comparison group.

UNDERSTANDING THE GRAPHS

Profiled Hospital Compared with Benchmark and Peer

The hospital's current performance is represented by individual bar graphs for each of the performance measures included in the 50 Top Cardiovascular Hospitals balanced scorecard, organized by patient group. **Each bar graph shows performance achievement levels for three groups: your hospital, the benchmark group median, and the peer group median.**

Binomial Measures

The graphs for the binomial measures – inpatient mortality and complications – have a statistical significance note that indicates whether your hospital's performance is better than expected, as expected, or worse than expected (99% confidence). For binomial measures, we rank your hospital on the z-score calculated from your observed and normalized expected values. Z-scores take statistical significance into account. If your note indicates your performance is "as expected," your performance is 'normal', regardless of how high or low the index value.

Missing Bars and Measure Rank Percentiles

A measure's performance bar and its associated rank percentile value are not displayed if one or more of the following conditions apply:

- Measure data for a specific year was missing in the source data file (CMS Hospital Compare; HCRIS hospital cost reports)
- Measure was in calculable due to insufficient MEDPAR POA coding (impacts inpatient mortality, complications, ALOS, cost per case)
- Measure was based on fewer than 11 patient records (HIPAA)

Measure Data Periods

Measure	Data Period Used for 2018 Performance
Inpatient Mortality, Complications and % CABG w IMA	FFY 2017-2018
30-Day Mortality, Readmissions and Episode Payment	July 1, 2015-June 30, 2018
ALOS; Cost per Case	FFY 2018

50 Top Cardiovascular Hospitals Current Profile Notes

USE OF MEDIAN VALUES

When individual measures are missing or the reported value is insufficiently precise (patient count too low), we substitute class median values so your hospital can be ranked. This was done only for the following measures:

- 30-day mortality rates (AMI, HF, CABG)
- 30-day readmission rates (AMI, HF, CABG)

Note: Hospitals missing all 30-day mortality rates or all 30-day readmission rates are excluded from the study.

WINNER EXCLUSIONS

A hospital was not eligible to be a winner if one of the following applied in the most current year:

- Statistically poor performance on any inpatient mortality or complications measure (99% confidence interval).
- One or more outliers for the cost per case measures (IQR methodology).
- Less than 11 cases in any of the patient groups (AMI, HF, CABG, PCI) in the most current year.
- One or more 30-day mortality measures missing.
- One or more 30-day readmission measures missing.

NEW MEASURES FOR INFORMATION ONLY

We are including new measures in this report, to allow you to compare your performance relative to your peer and benchmark groups. These measures are **not** included in your overall performance rating and are not used to select the 50 Top award-winning hospitals. You will find these measures in a separate section of this Current Profile.

MORE INFORMATION ON METHODOLOGIES

The Methodology and Appendix sections of the 50 Top Cardiovascular Hospitals Study Overview provide more detail on the calculation of each performance measure. The Overview also describes the methodology used to calculate IQR outliers and to determine statistically poor performance on the inpatient mortality and complications measures.

See Study Overview for more details. Visit www.100tophospitals.com.

50 Top Cardiovascular Hospitals Trend Profile Notes

TREND PROFILE

The Trend analysis is intended to provide insight into progress toward performance improvement. Its results are **not** used to select winners.

The 50 Top Cardiovascular Hospitals Trend Profile analyzes your hospital's rate of performance improvement over five years, using a balanced scorecard of critical performance metrics:

- Risk-Adjusted Inpatient Mortality Index
- Risk-Adjusted Complications Index
- Percent CABG Patient with IMA Use
- 30-Day Mortality Rate (AMI, HF, CABG)
- 30-Day Readmission Rate (AMI, HF, CABG)
- Severity-Adjusted Average Length of Stay
- Wage- and Severity-Adjusted Average Cost per Case
- 30-Day Episode Payment (AMI, HF)

UNDERSTANDING THE GRAPHS

Five Year Trend Graphs – Profiled Hospital and Comparison Group Quintiles

The hospital's rate of improvement for each of the individual performance measures is represented by graphs showing your hospital's actual data points for each year. These data points are displayed against a background of quintile ranges for the data points of all hospitals in your comparison group. Each range is color-coded to indicate level of performance, from dark green (best quintile) to red (worst quintile). You can use these graphs to see whether you are moving ahead of or falling behind other similar hospitals.

Missing Data Points

Data points will be missing from a trend graph if one or more of the following conditions apply:

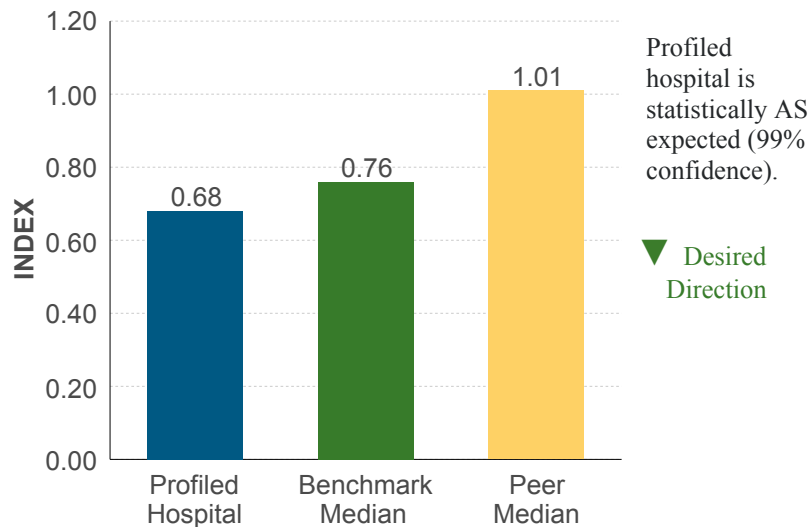
- Measure data for a specific year was missing in the source data file (CMS Hospital Compare; HCRIS hospital cost reports)
- Measure was in calculable due to insufficient MEDPAR POA coding (impacts inpatient mortality, complications, ALOS, cost per case)
- Measure was excluded from trend analysis as a high or low outlier. We apply an interquartile range (“IQR”) methodology to identify high and low outlier trim points (impacts cost per case measures).
- Measure was based on 11 or fewer patient records (HIPAA Privacy Rule-based exclusion applied to MEDPAR as a Limited Data Set)

Measure Data Periods

Measure	Data Point	Data Period
Inpatient Mortality, Complications and % CABG w IMA	2018	FFY 2017-2018
	2017	FFY 2016-2017
	2016	FFY 2015-2016
	2015	FFY 2014-2015
	2014	FFY 2013-2014
30-Day Mortality, Readmissions and Episode Payment	2018	July 1, 2015-June 30, 2018
	2017	July 1, 2014-June 30, 2017
	2016	July 1, 2013-June 30, 2016
	2015	July 1, 2012-June 30, 2015
	2014	July 1, 2011-June 30, 2014
ALOS, Cost per Case	2014-2018	FFY 2014-2018

AMI patients: Risk-adjusted inpatient mortality index

2018 IP MORTALITY PERFORMANCE

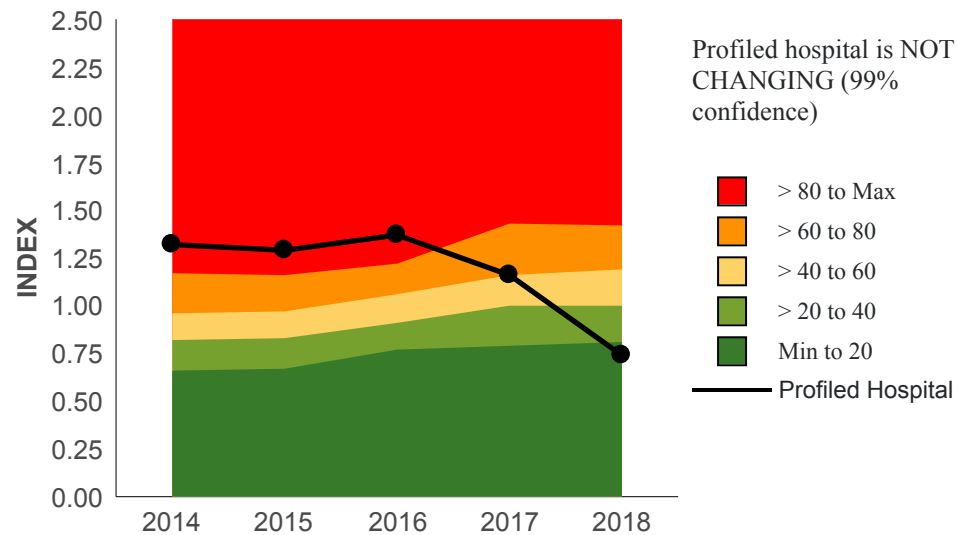


Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 IP MORTALITY RATE OF IMPROVEMENT

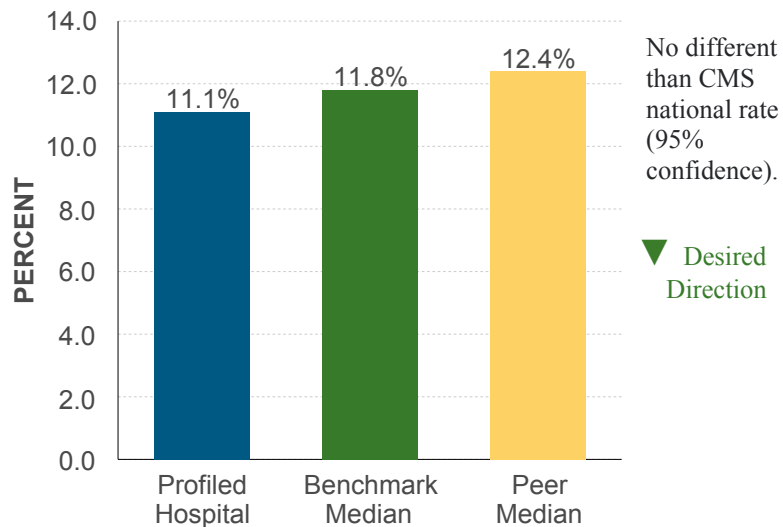


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.66	0.82	0.96	1.17	1.32	2.54	0.59
	2015	0.67	0.83	0.97	1.16	1.29	2.34	0.63
	2016	0.77	0.91	1.06	1.22	1.37	2.48	0.67
	2017	0.79	1.00	1.16	1.43	1.16	2.34	0.48
	2018	0.81	1.00	1.19	1.42	0.74	1.85	0.21

AMI patients: 30-day mortality rate

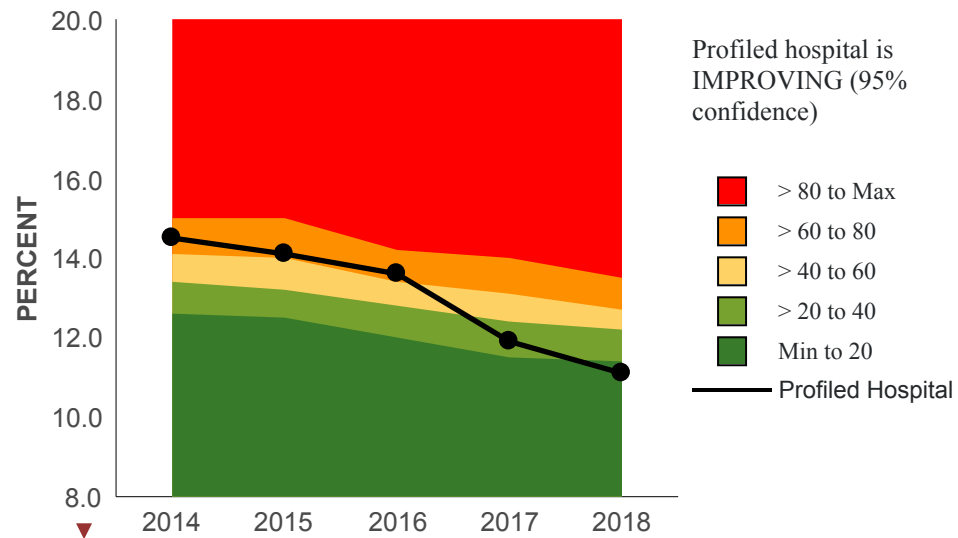
2018 30D MORTALITY PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

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2014-2018 30D MORTALITY RATE OF IMPROVEMENT

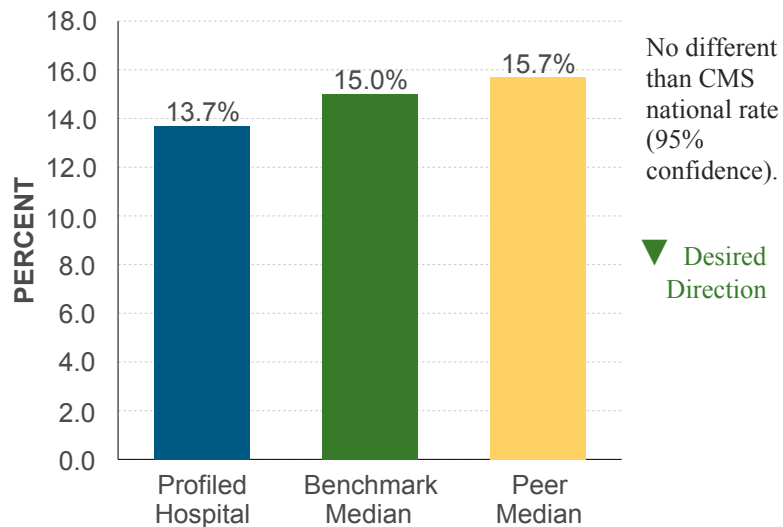


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	12.6	13.4	14.1	15.0	14.5
	2015	12.5	13.2	14.0	15.0	14.1
	2016	12.0	12.8	13.4	14.2	13.6
	2017	11.5	12.4	13.1	14.0	11.9
	2018	11.4	12.2	12.7	13.5	11.1

AMI patients: 30-day readmission rate

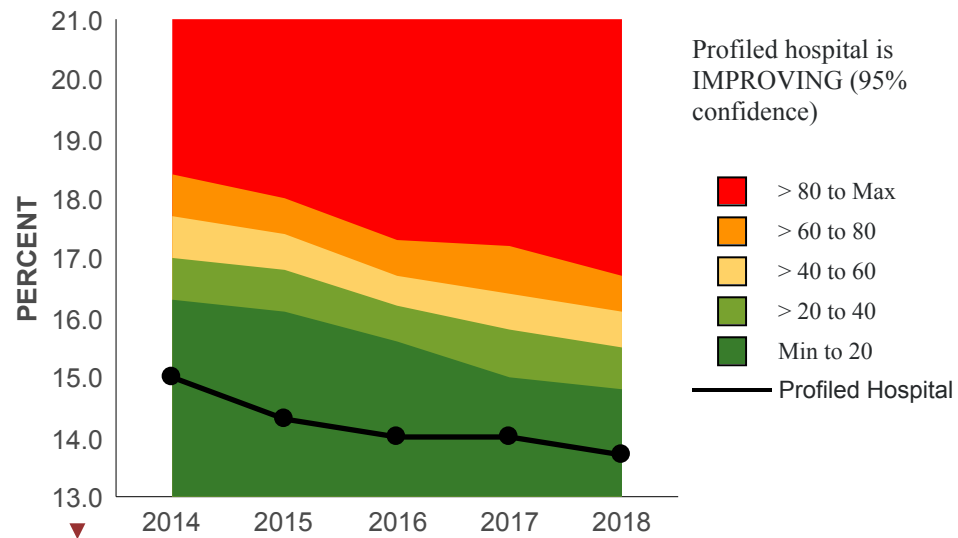
2018 30D READMISSION PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D READMISSION RATE OF IMPROVEMENT

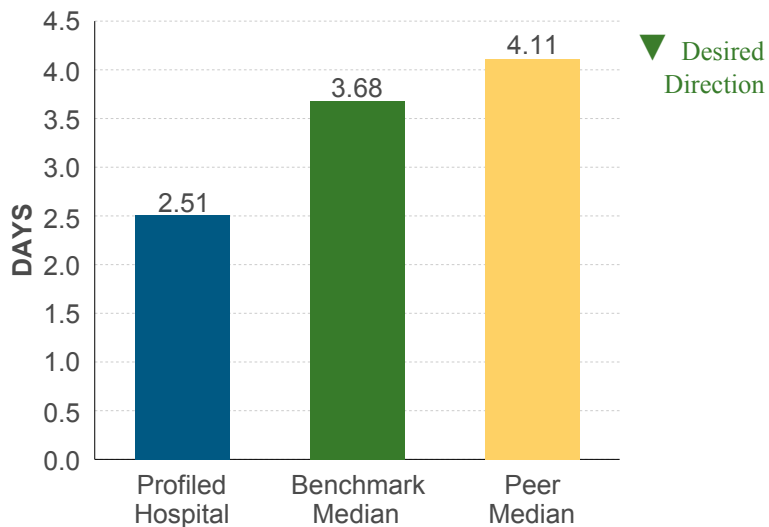


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	16.3	17.0	17.7	18.4	15.0
	2015	16.1	16.8	17.4	18.0	14.3
	2016	15.6	16.2	16.7	17.3	14.0
	2017	15.0	15.8	16.4	17.2	14.0
	2018	14.8	15.5	16.1	16.7	13.7

AMI patients: Severity-adjusted average length of stay

2018 ALOS PERFORMANCE

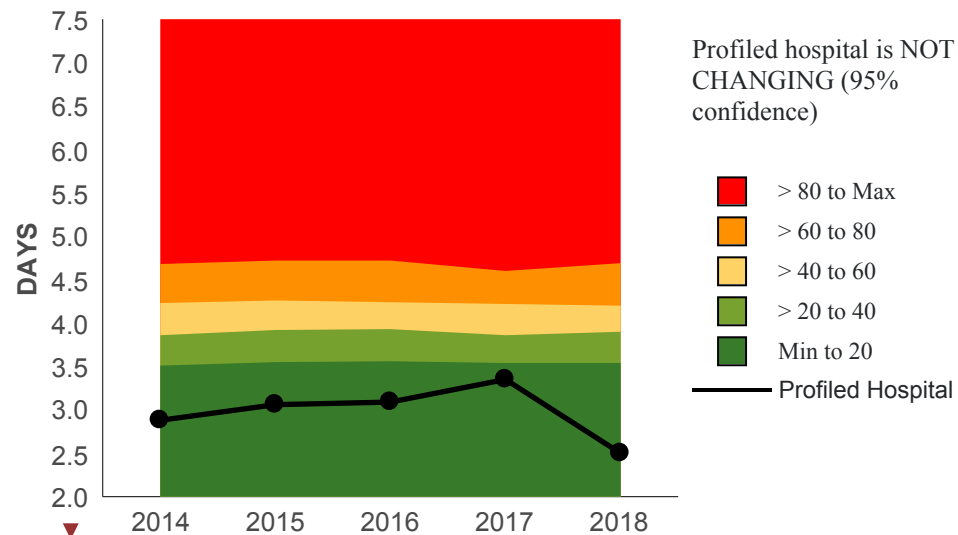


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 ALOS RATE OF IMPROVEMENT

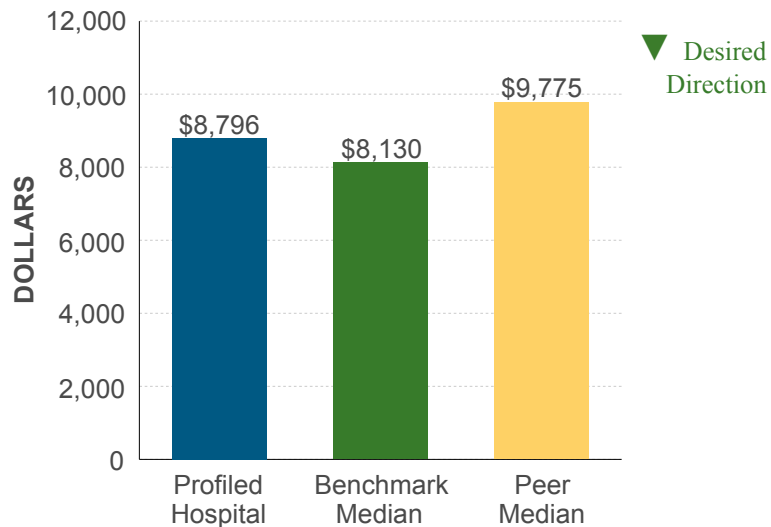


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	3.51	3.86	4.23	4.68	2.88
	2015	3.55	3.92	4.26	4.72	3.06
	2016	3.56	3.93	4.24	4.72	3.09
	2017	3.54	3.86	4.22	4.60	3.35
	2018	3.54	3.90	4.20	4.69	2.50

AMI patients: Wage- and severity-adjusted cost per case

2018 COST PER CASE PERFORMANCE

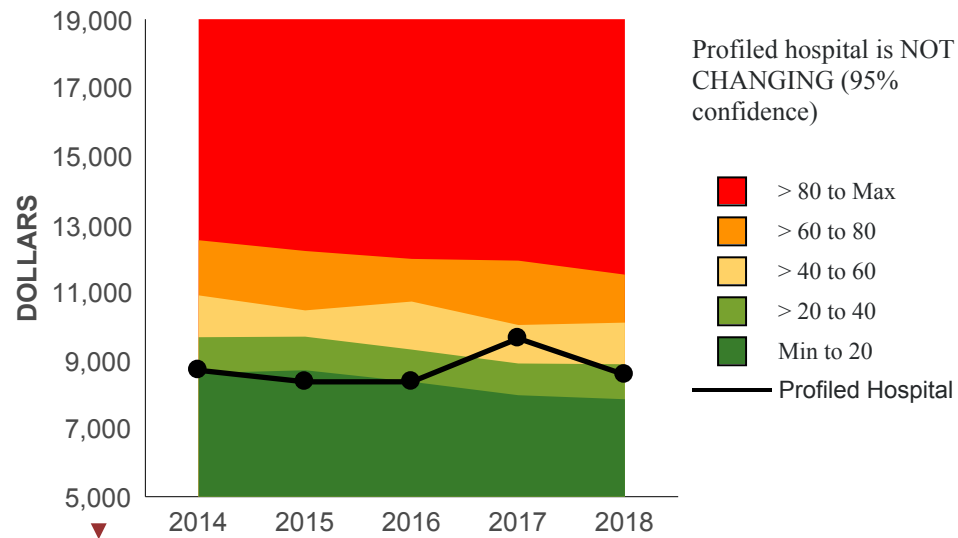


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2014-2018 COST PER CASE RATE OF IMPROVEMENT

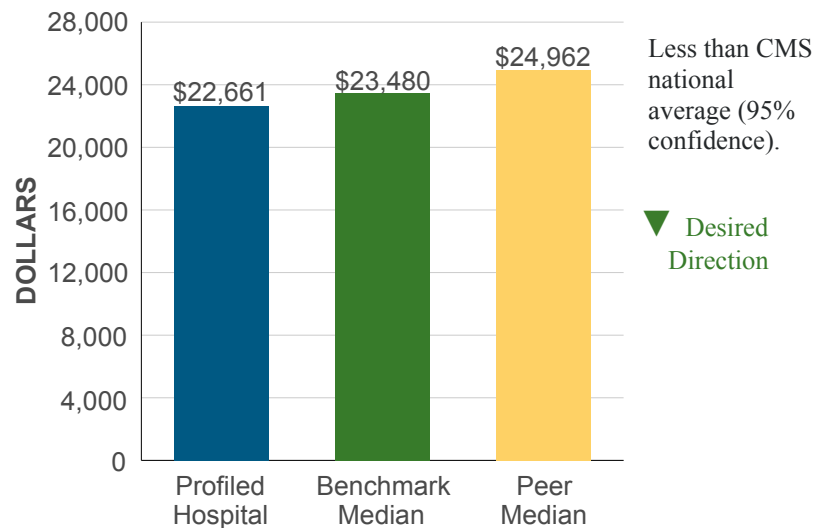


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	8,622	9,675	10,902	12,519	8,706
	2015	8,707	9,692	10,462	12,204	8,367
	2016	8,369	9,313	10,721	11,972	8,369
	2017	7,975	8,905	10,034	11,921	9,639
	2018	7,857	8,883	10,104	11,510	8,575

AMI patients: 30-day episode payment

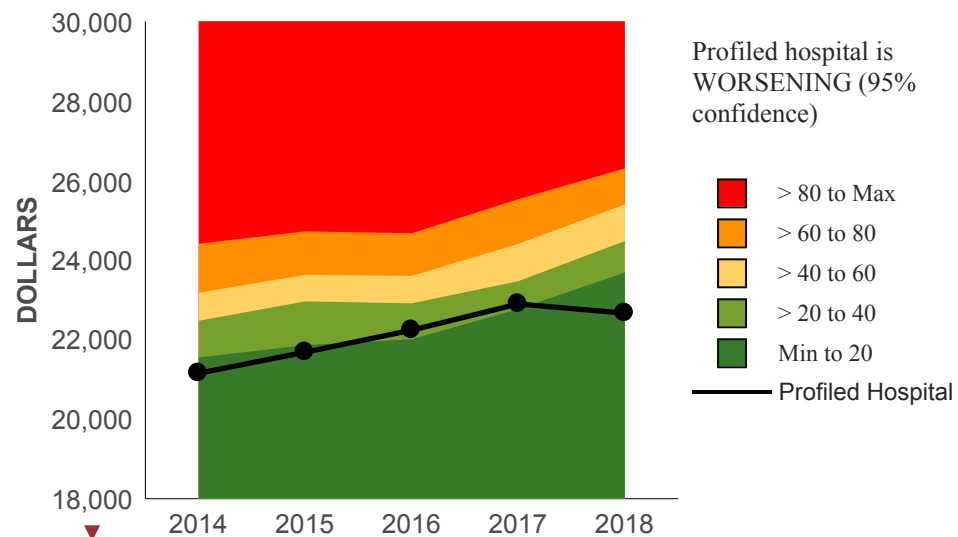
2018 30D EPISODE PAYMENT PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D EPISODE PAYMENT RATE OF IMPROVEMENT

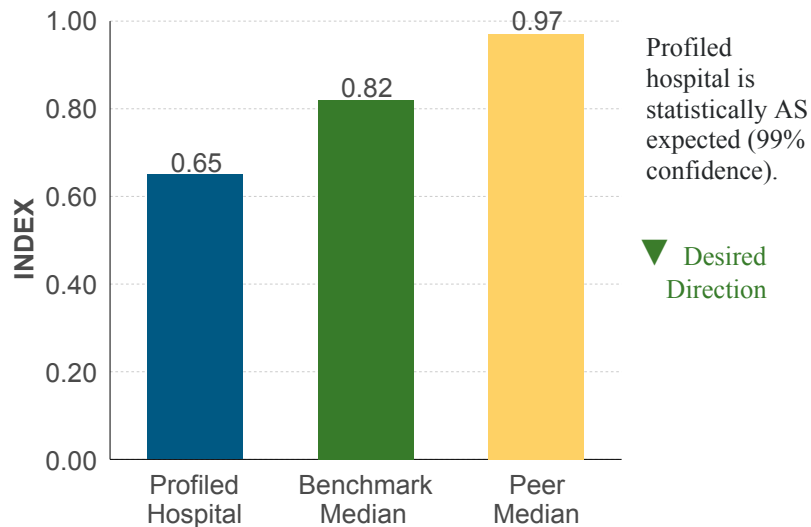


Hospital performance compared to peer hospital quintiles: n = 265

		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
PERCENTILE POINTS ►		20th	40th	60th	80th	Value
YEARS	2014	21,548	22,471	23,176	24,407	21,153
	2015	21,860	22,958	23,625	24,718	21,681
	2016	22,007	22,909	23,599	24,670	22,236
	2017	22,766	23,466	24,404	25,529	22,894
	2018	23,684	24,475	25,394	26,299	22,661

HF patients: Risk-adjusted inpatient mortality index

2018 IP MORTALITY PERFORMANCE

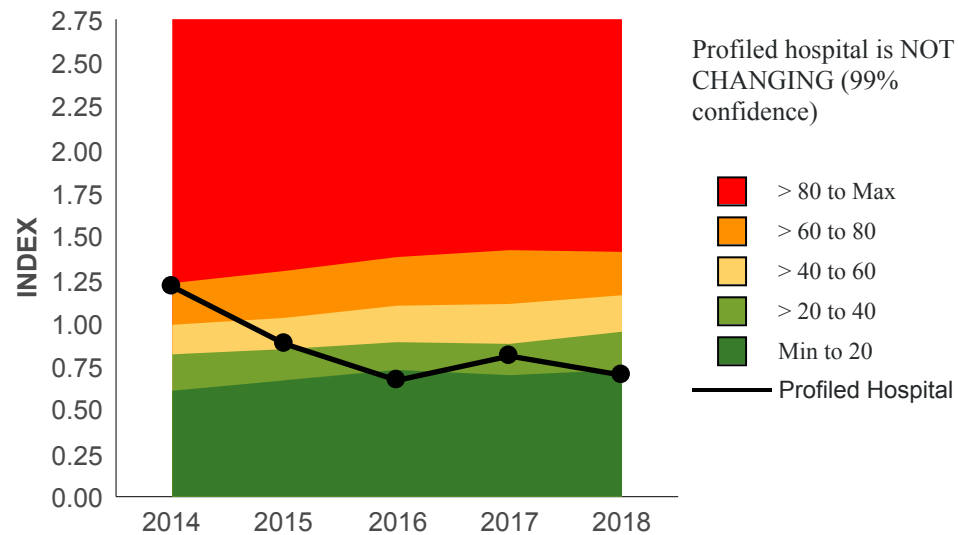


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2014-2018 IP MORTALITY RATE OF IMPROVEMENT

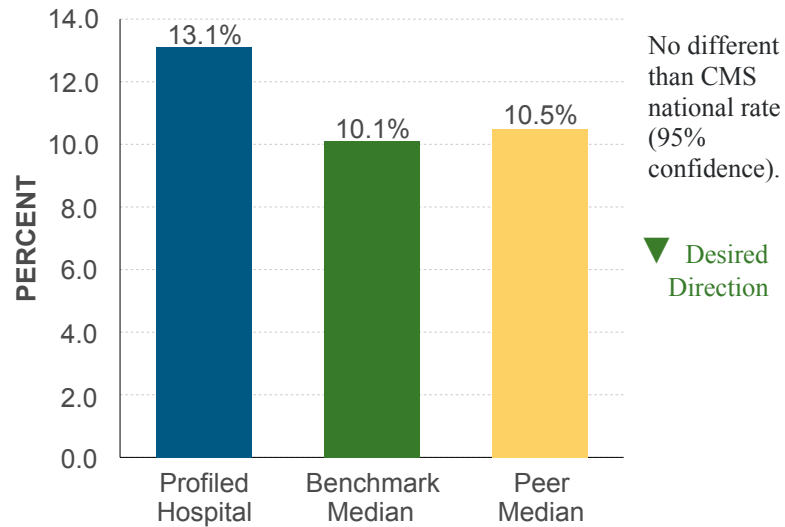


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.61	0.82	0.99	1.23	1.21	2.23	0.58
	2015	0.67	0.85	1.03	1.30	0.88	1.72	0.38
	2016	0.73	0.89	1.10	1.38	0.67	1.39	0.26
	2017	0.70	0.88	1.11	1.42	0.81	1.59	0.35
	2018	0.73	0.95	1.16	1.41	0.70	1.41	0.29

HF patients: 30-day mortality rate

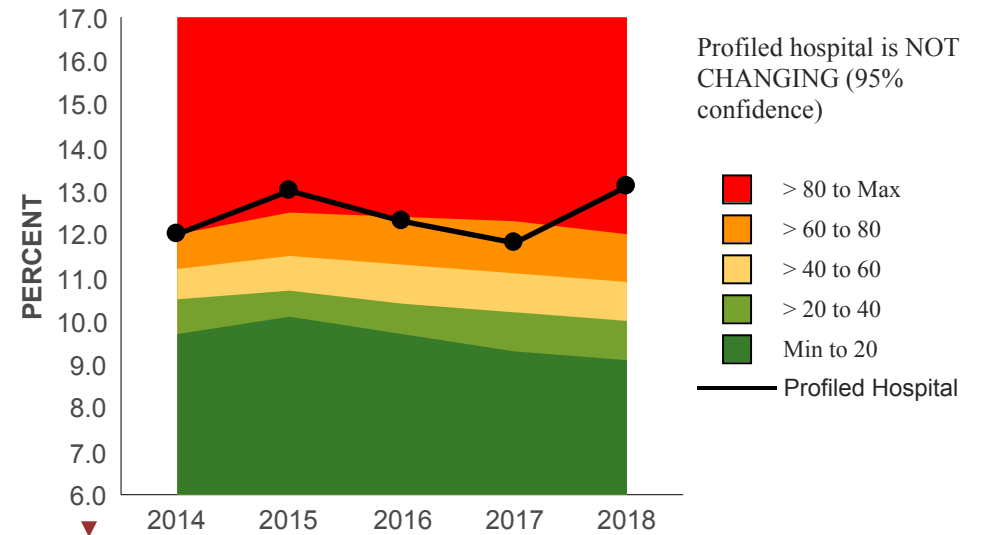
2018 30D MORTALITY PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D MORTALITY RATE OF IMPROVEMENT

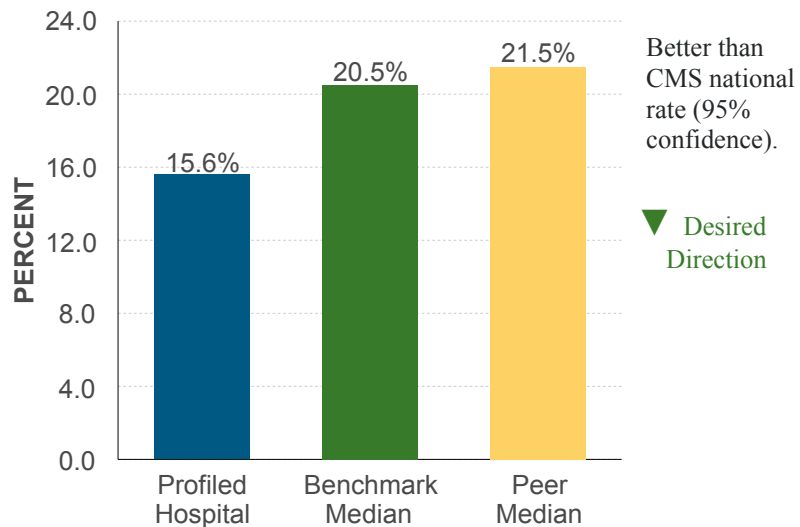


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	9.7	10.5	11.2	12.0	12.0
	2015	10.1	10.7	11.5	12.5	13.0
	2016	9.7	10.4	11.3	12.4	12.3
	2017	9.3	10.2	11.1	12.3	11.8
	2018	9.1	10.0	10.9	12.0	13.1

HF patients: 30-day readmission rate

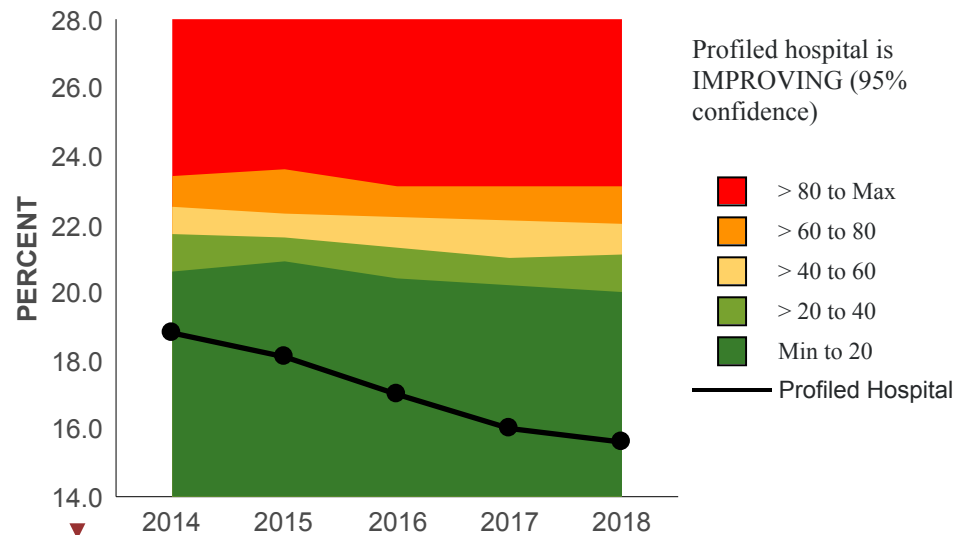
2018 30D READMISSION PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D READMISSION RATE OF IMPROVEMENT

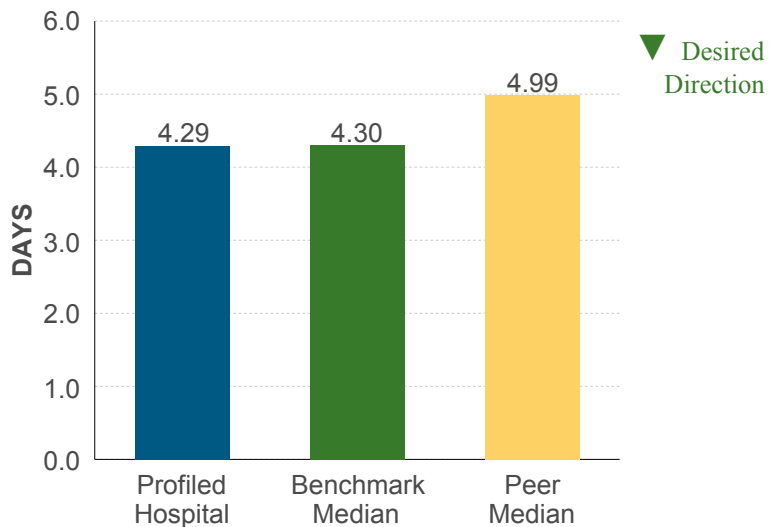


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	20.6	21.7	22.5	23.4	18.8
	2015	20.9	21.6	22.3	23.6	18.1
	2016	20.4	21.3	22.2	23.1	17.0
	2017	20.2	21.0	22.1	23.1	16.0
	2018	20.0	21.1	22.0	23.1	15.6

HF patients: Severity-adjusted average length of stay

2018 ALOS PERFORMANCE

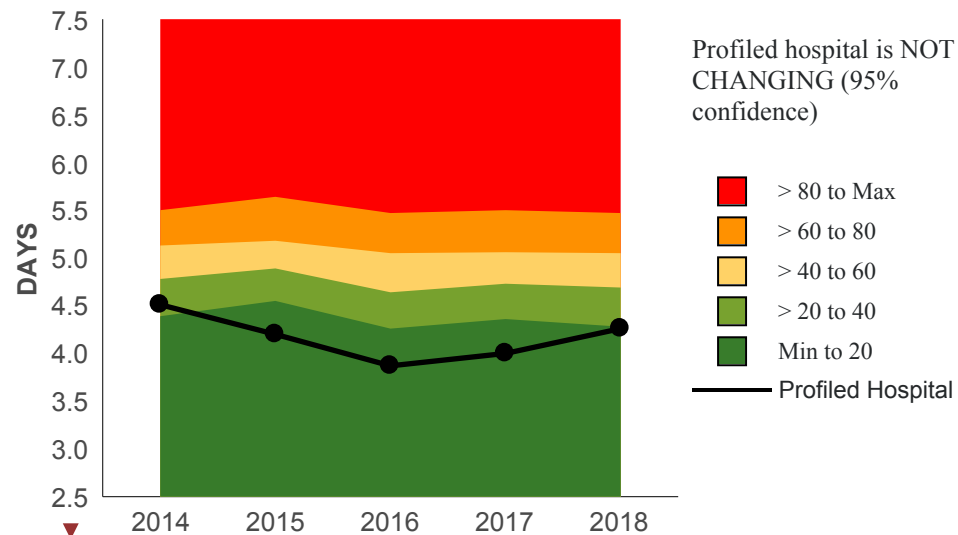


Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 ALOS RATE OF IMPROVEMENT

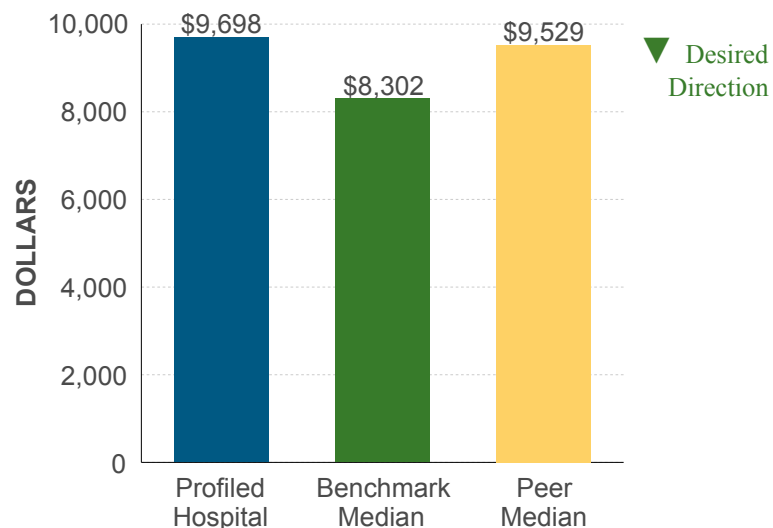


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	4.39	4.78	5.13	5.50	4.51
	2015	4.55	4.89	5.18	5.64	4.20
	2016	4.26	4.64	5.05	5.47	3.87
	2017	4.36	4.73	5.06	5.50	4.00
	2018	4.28	4.69	5.05	5.47	4.26

HF patients: Wage- and severity-adjusted cost per case

2018 COST PER CASE PERFORMANCE

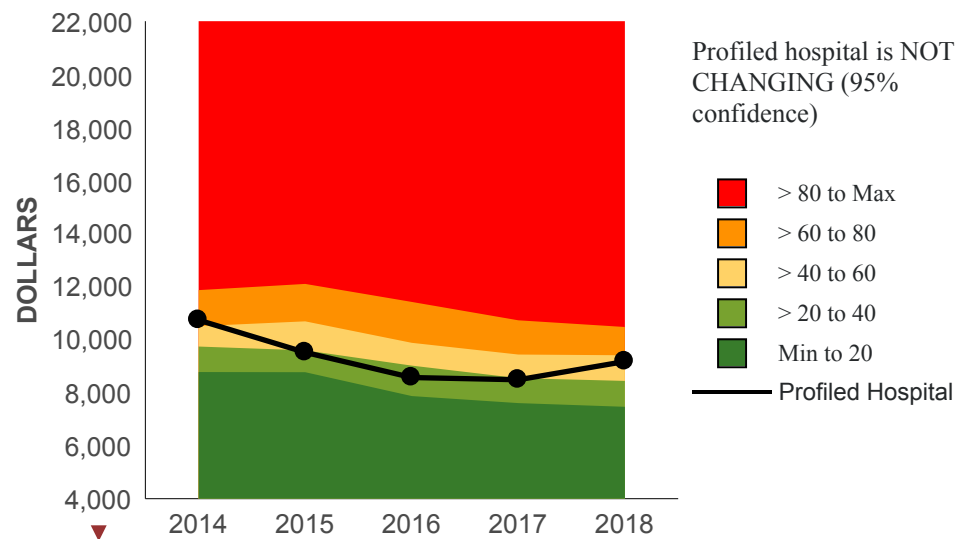


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 COST PER CASE RATE OF IMPROVEMENT

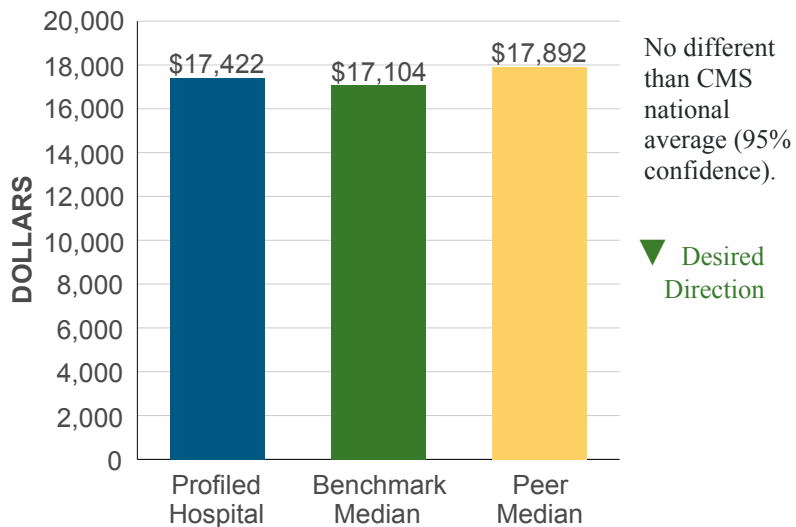


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	8,774	9,735	10,505	11,862	10,731
	2015	8,768	9,591	10,685	12,096	9,514
	2016	7,868	9,016	9,876	11,417	8,567
	2017	7,603	8,543	9,434	10,724	8,483
	2018	7,464	8,440	9,407	10,472	9,171

HF patients: 30-day episode payment

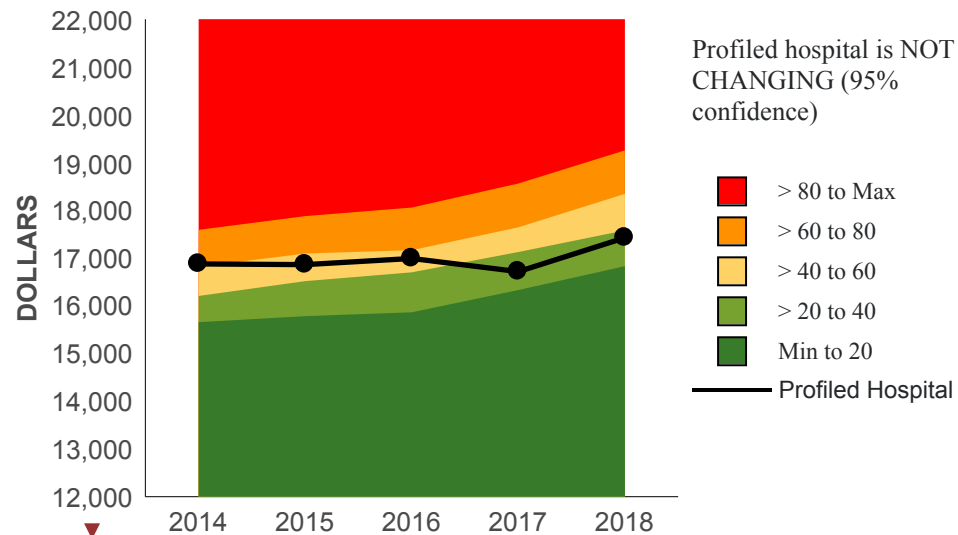
2018 30D EPISODE PAYMENT PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D EPISODE PAYMENT RATE OF IMPROVEMENT

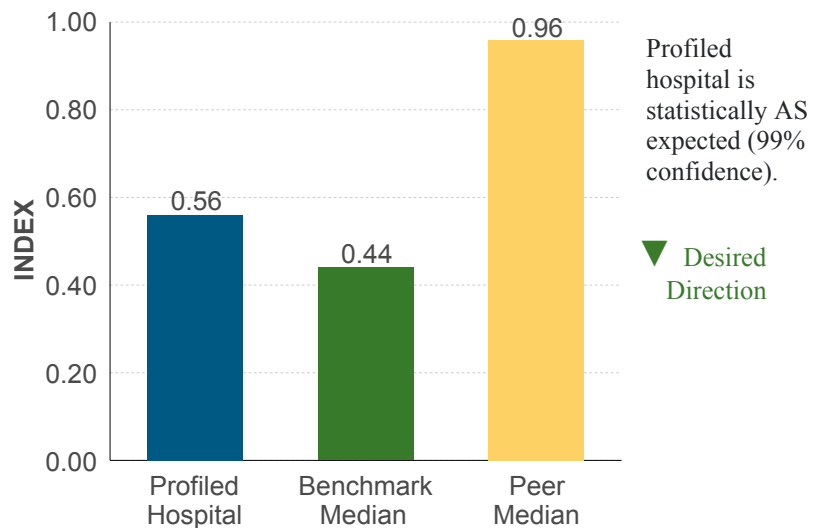


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	15,655	16,204	16,813	17,588	16,874
	2015	15,781	16,514	17,093	17,876	16,860
	2016	15,862	16,699	17,162	18,055	16,989
	2017	16,328	17,124	17,641	18,559	16,714
	2018	16,827	17,577	18,342	19,253	17,422

CABG patients: Risk-adjusted inpatient mortality index

2018 IP MORTALITY PERFORMANCE

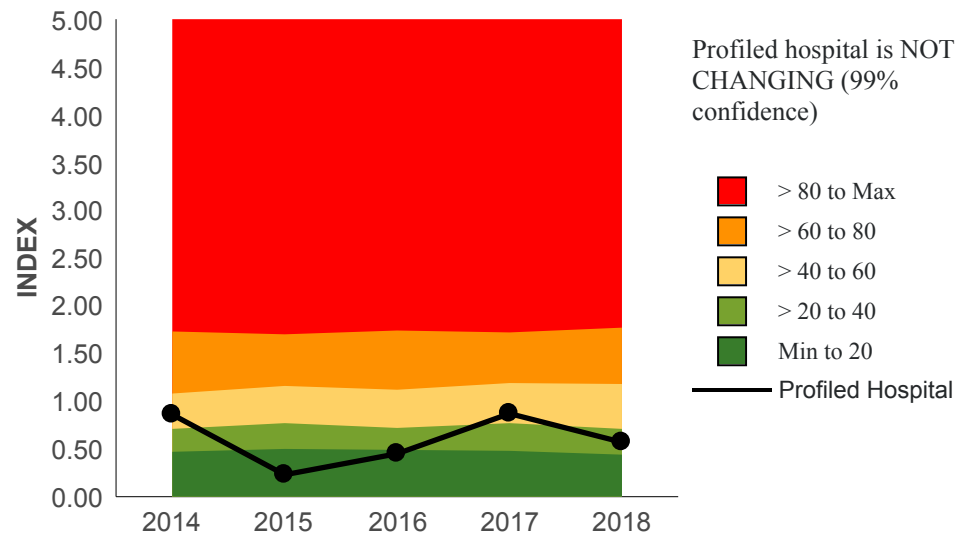


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 IP MORTALITY RATE OF IMPROVEMENT

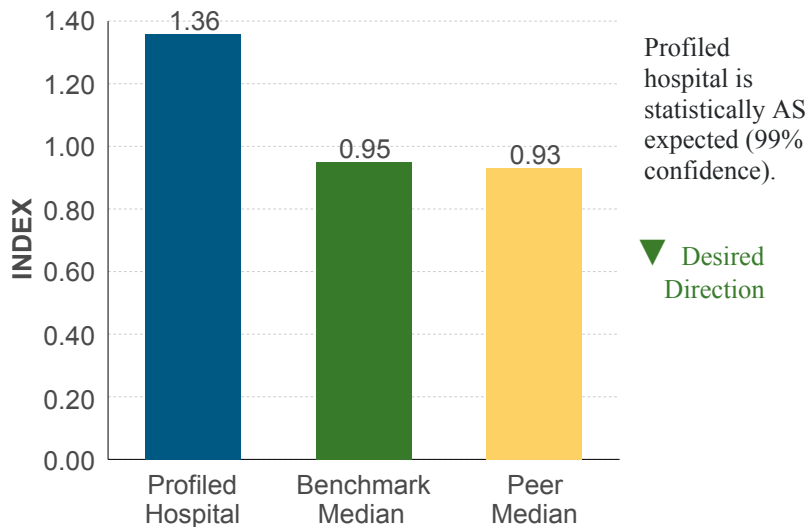


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.47	0.71	1.08	1.73	0.86	3.73	0.06
	2015	0.50	0.77	1.16	1.70	0.23	1.56	0.00
	2016	0.49	0.72	1.12	1.74	0.45	1.96	0.03
	2017	0.48	0.77	1.19	1.72	0.87	3.00	0.12
	2018	0.44	0.71	1.18	1.77	0.57	2.45	0.04

CABG patients: Risk-adjusted complications index

2018 COMPLICATIONS PERFORMANCE

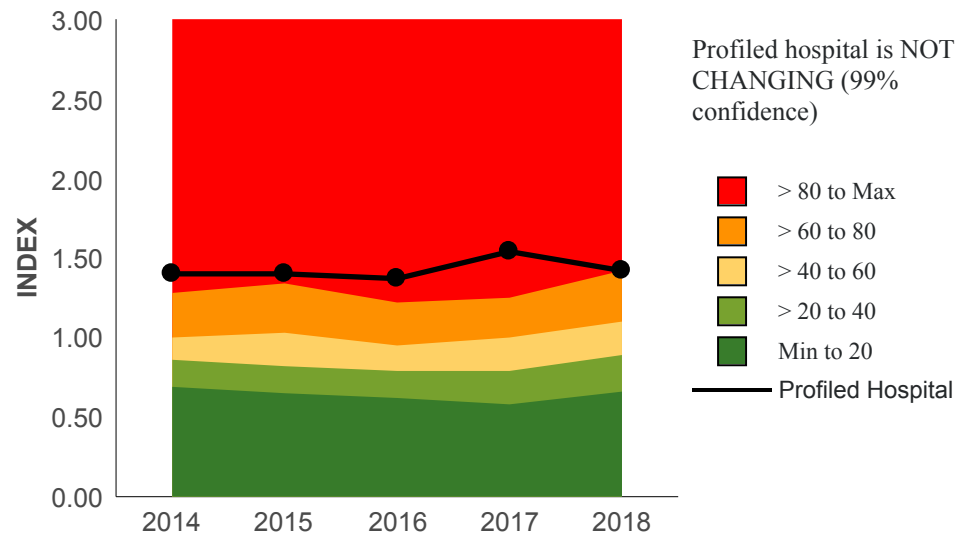


Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 COMPLICATIONS RATE OF IMPROVEMENT

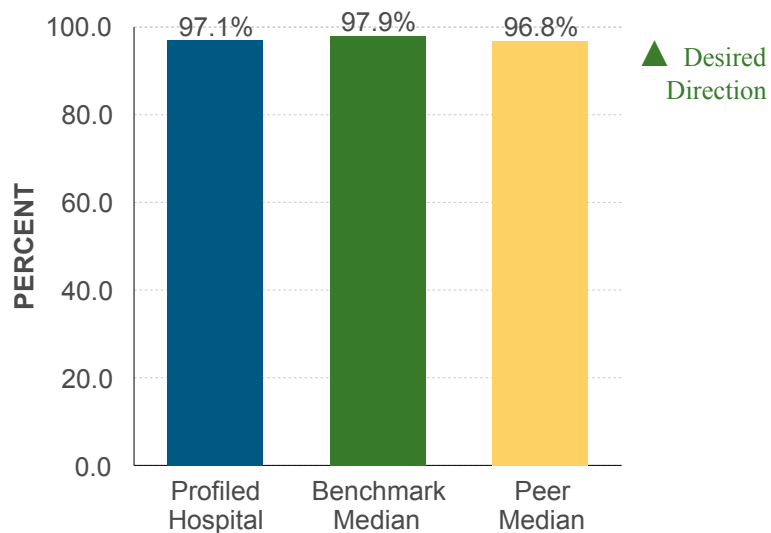


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.69	0.86	1.00	1.28	1.40	2.50	0.71
	2015	0.65	0.82	1.03	1.34	1.40	2.52	0.68
	2016	0.62	0.79	0.95	1.22	1.37	2.48	0.67
	2017	0.58	0.79	1.00	1.25	1.54	2.78	0.75
	2018	0.66	0.89	1.10	1.42	1.42	2.48	0.73

CABG patients with internal mammary artery use (%)

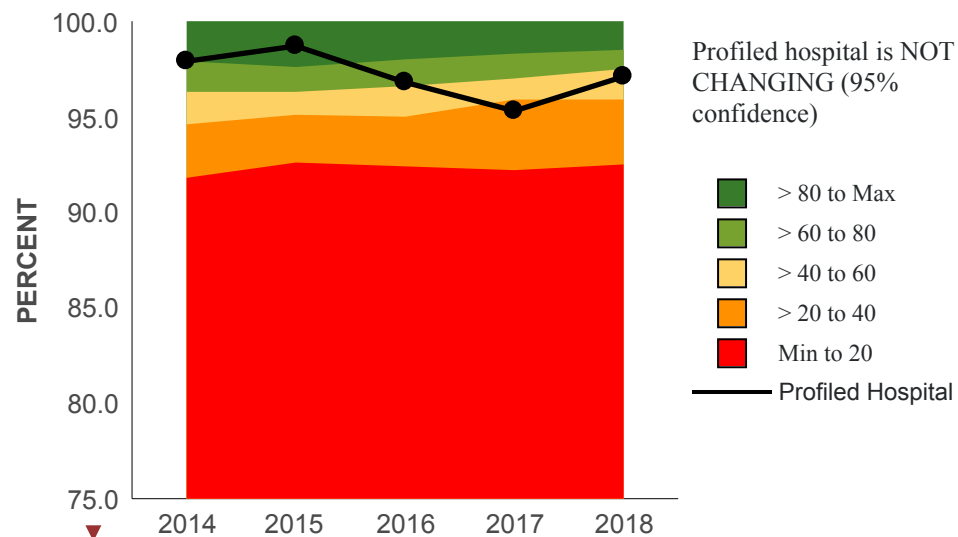
2018 CABG W IMA PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

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2014-2018 CABG W IMA RATE OF IMPROVEMENT

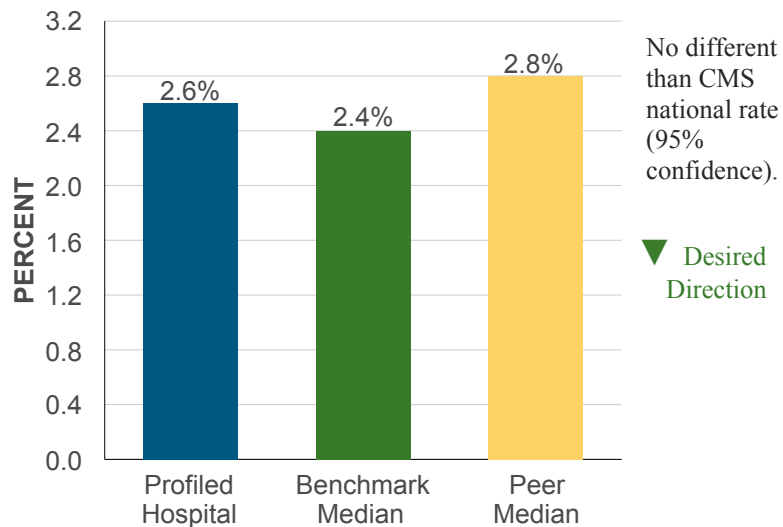


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	91.8	94.6	96.3	97.9	97.9
	2015	92.6	95.1	96.3	97.6	98.7
	2016	92.4	95.0	96.6	98.0	96.8
	2017	92.2	95.9	97.0	98.3	95.3
	2018	92.5	95.9	97.5	98.5	97.1

CABG patients: 30-day mortality rate

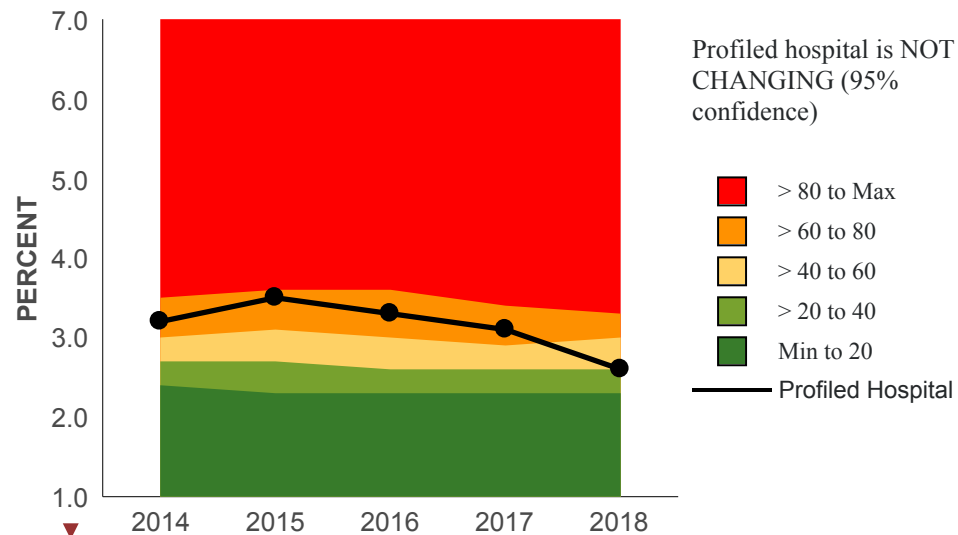
2018 30D MORTALITY PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

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2014-2018 30D MORTALITY RATE OF IMPROVEMENT

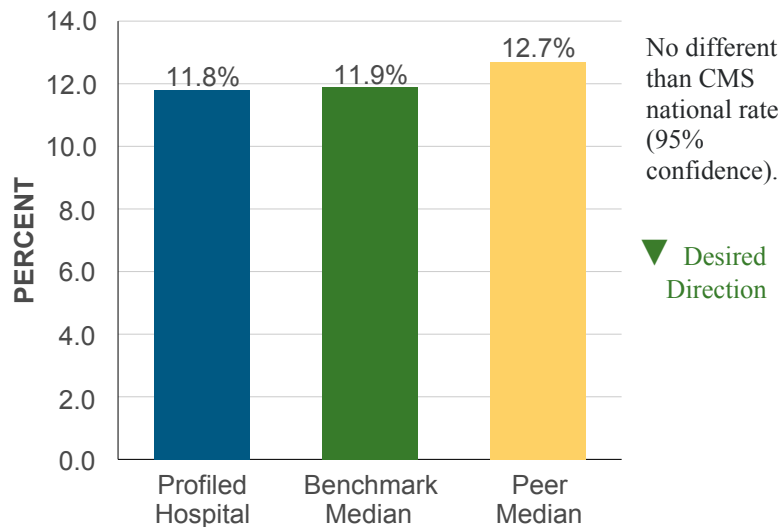


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	2.4	2.7	3.0	3.5	3.2
	2015	2.3	2.7	3.1	3.6	3.5
	2016	2.3	2.6	3.0	3.6	3.3
	2017	2.3	2.6	2.9	3.4	3.1
	2018	2.3	2.6	3.0	3.3	2.6

CABG patients: 30-day readmission rate

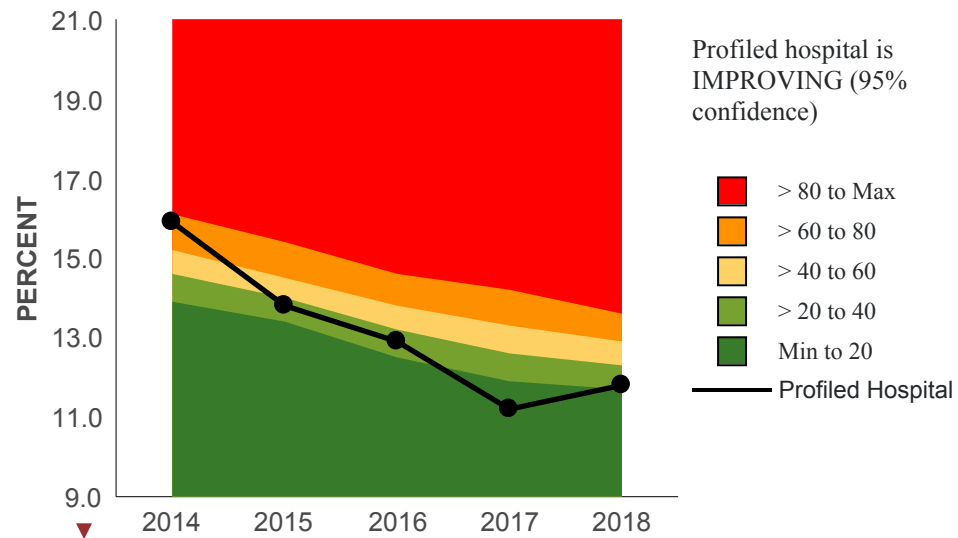
2018 30D READMISSION PERFORMANCE



Benchmark hospitals are the winners in the comparison group: n = 15

Peer hospitals are the non-winners in the comparison group: n = 260

2014-2018 30D READMISSION RATE OF IMPROVEMENT

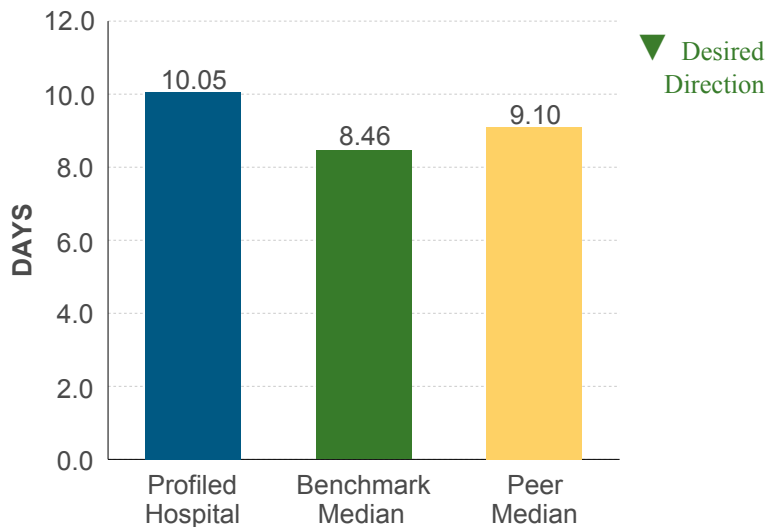


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	13.9	14.6	15.2	16.1	15.9
	2015	13.4	14.0	14.5	15.4	13.8
	2016	12.5	13.2	13.8	14.6	12.9
	2017	11.9	12.6	13.3	14.2	11.2
	2018	11.7	12.3	12.9	13.6	11.8

CABG patients: Severity-adjusted average length of stay

2018 ALOS PERFORMANCE

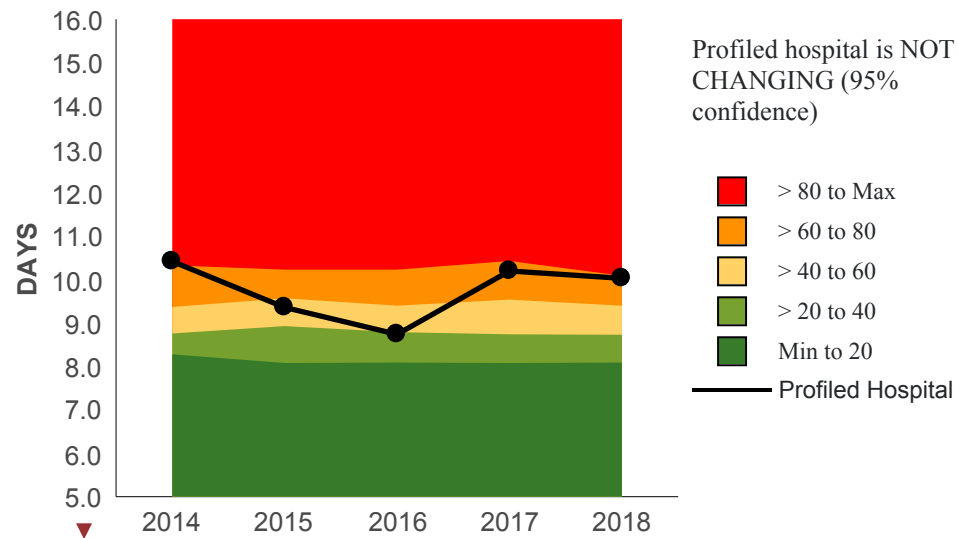


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 ALOS RATE OF IMPROVEMENT

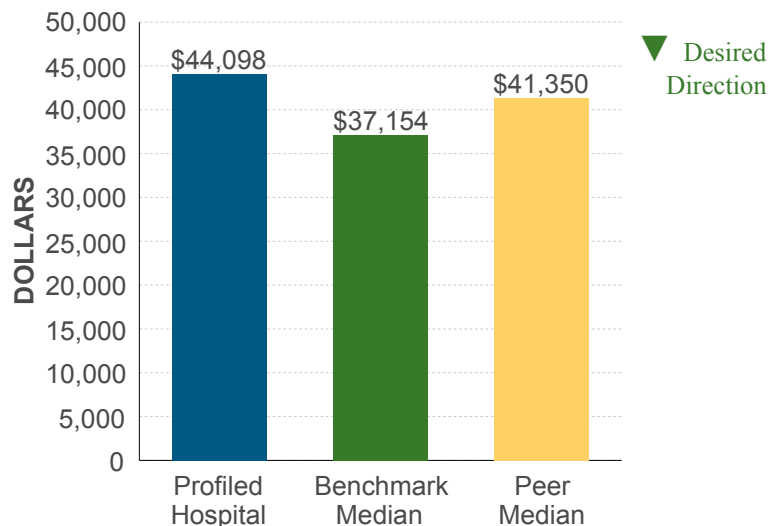


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	8.28	8.76	9.37	10.33	10.42
	2015	8.08	8.93	9.57	10.23	9.36
	2016	8.09	8.79	9.40	10.23	8.74
	2017	8.08	8.74	9.54	10.43	10.20
	2018	8.09	8.73	9.40	10.09	10.03

CABG patients: Wage- and severity-adjusted cost per case

2018 COST PER CASE PERFORMANCE

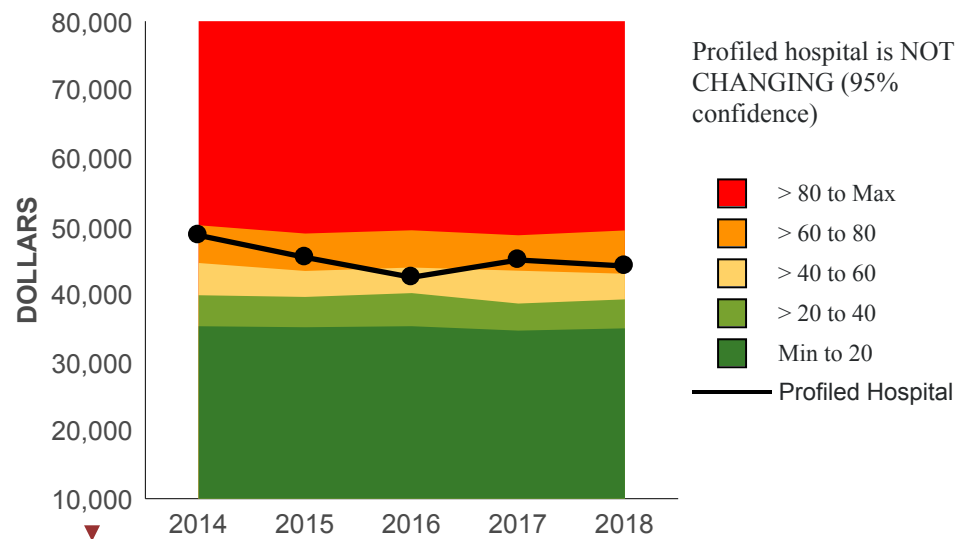


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 COST PER CASE RATE OF IMPROVEMENT

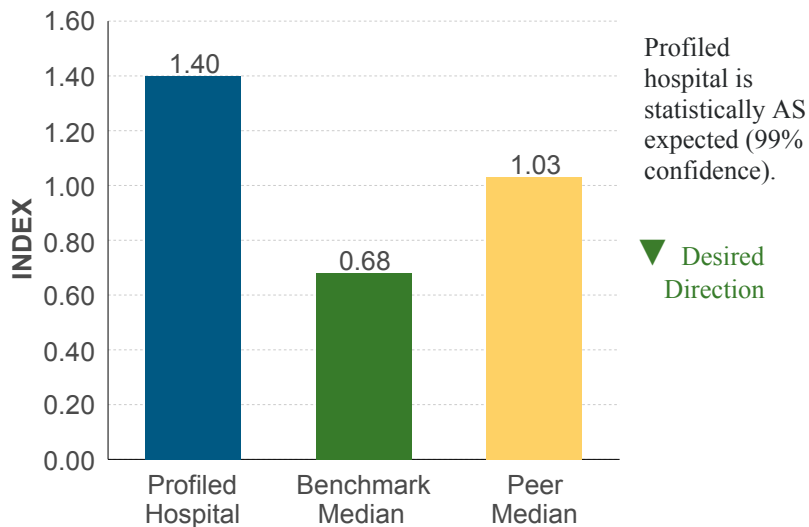


Hospital performance compared to peer hospital quintiles: n = 265

		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
PERCENTILE POINTS ►		20th	40th	60th	80th	Value
YEARS	2014	35,279	39,824	44,552	50,085	48,606
	2015	35,135	39,574	43,383	48,869	45,378
	2016	35,283	40,136	43,889	49,345	42,454
	2017	34,638	38,608	43,424	48,614	44,994
	2018	34,970	39,219	42,979	49,324	44,106

PCI patients: Risk-adjusted inpatient mortality index

2018 IP MORTALITY PERFORMANCE

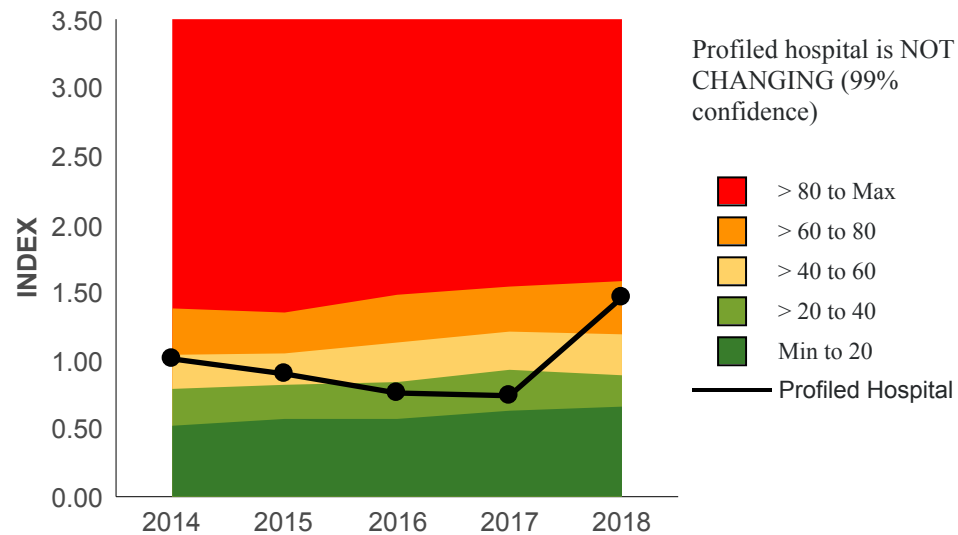


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2014-2018 IP MORTALITY RATE OF IMPROVEMENT

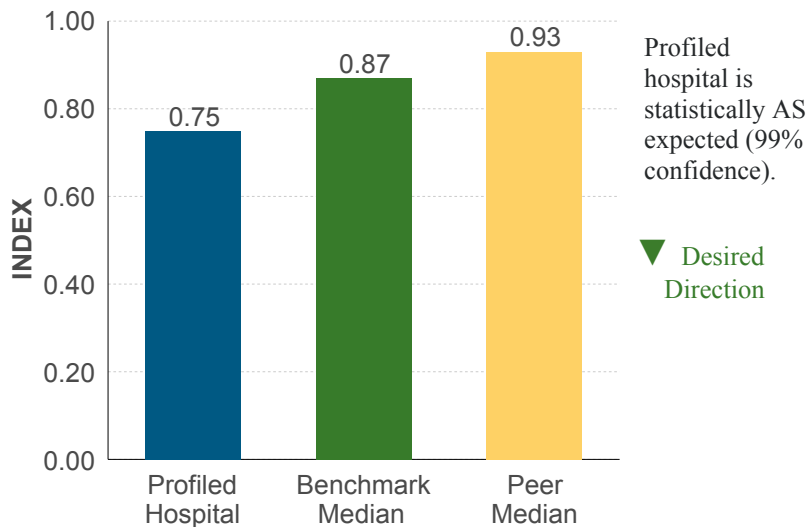


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.52	0.79	1.04	1.38	1.01	1.98	0.44
	2015	0.57	0.82	1.05	1.35	0.90	1.88	0.36
	2016	0.57	0.84	1.13	1.48	0.76	1.79	0.24
	2017	0.63	0.93	1.21	1.54	0.74	1.74	0.23
	2018	0.66	0.89	1.19	1.58	1.46	2.75	0.68

PCI patients: Risk-adjusted complications index

2018 COMPLICATIONS PERFORMANCE

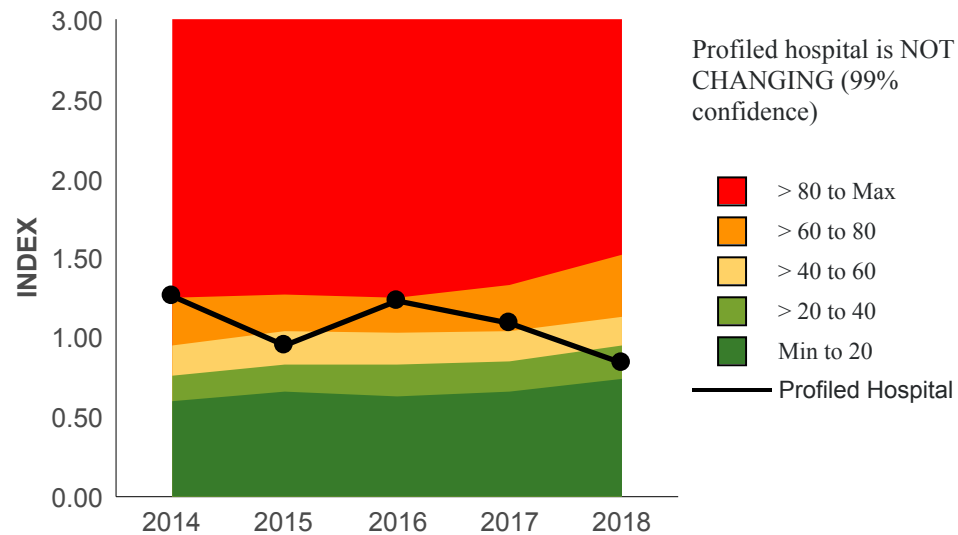


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 COMPLICATIONS RATE OF IMPROVEMENT

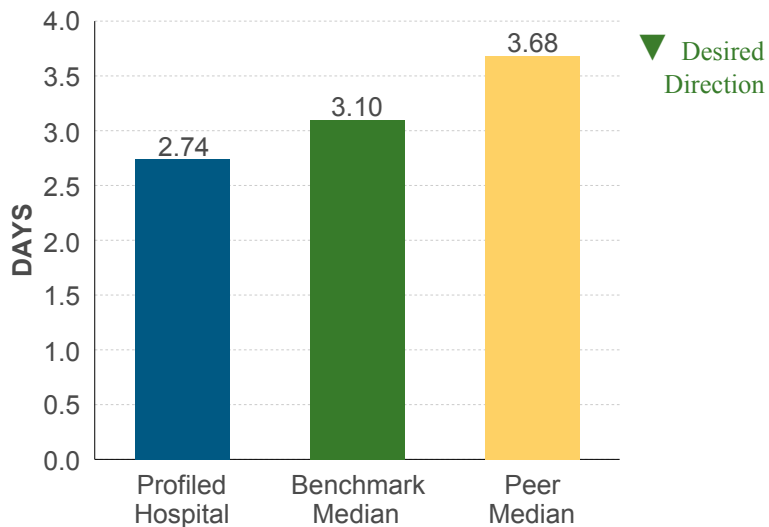


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL		
		20th	40th	60th	80th	Value	Upper C.I.	Lower C.I.
YEARS	2014	0.60	0.76	0.95	1.25	1.26	1.94	0.77
	2015	0.66	0.83	1.04	1.27	0.95	1.60	0.52
	2016	0.63	0.83	1.03	1.25	1.23	1.98	0.72
	2017	0.66	0.85	1.04	1.33	1.09	1.82	0.60
	2018	0.74	0.95	1.13	1.52	0.84	1.52	0.41

PCI patients: Severity-adjusted average length of stay

2018 ALOS PERFORMANCE

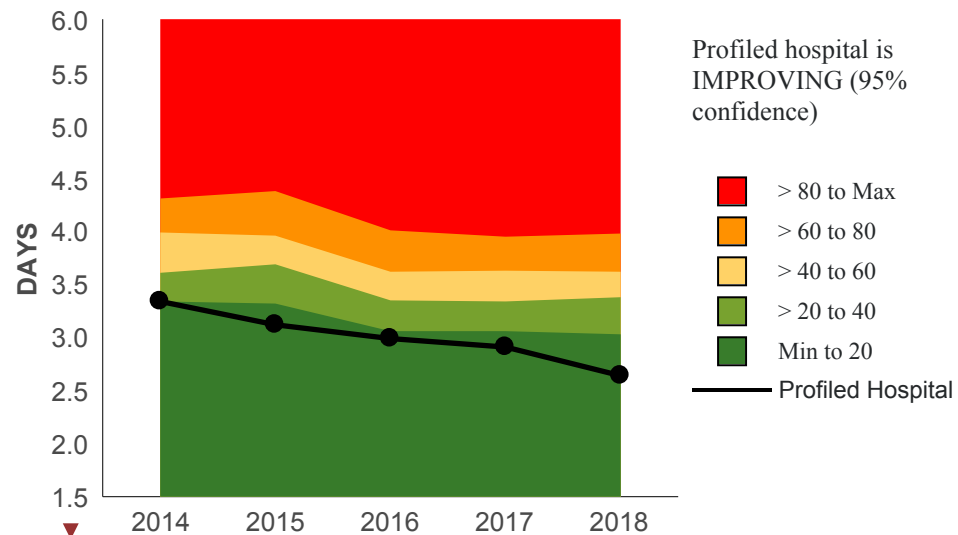


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2014-2018 ALOS RATE OF IMPROVEMENT

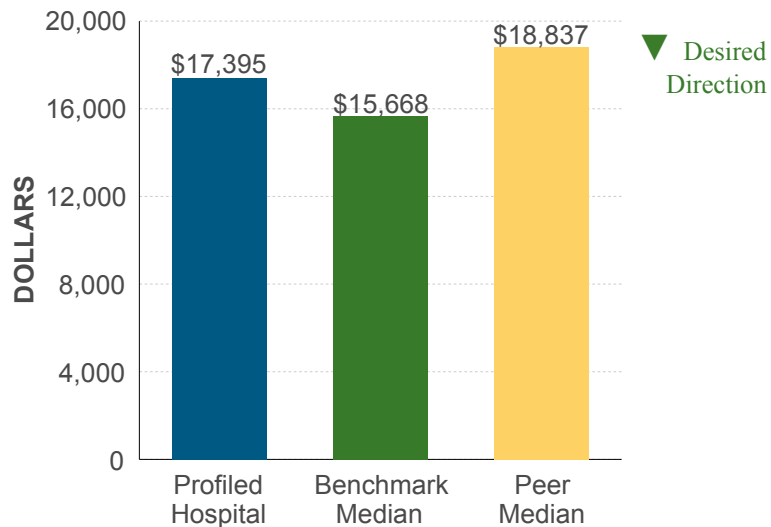


Hospital performance compared to peer hospital quintiles: n = 265

PERCENTILE POINTS ►		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
		20th	40th	60th	80th	Value
YEARS	2014	3.34	3.61	3.99	4.31	3.34
	2015	3.32	3.69	3.96	4.38	3.12
	2016	3.06	3.35	3.62	4.01	2.99
	2017	3.06	3.34	3.63	3.95	2.91
	2018	3.03	3.38	3.62	3.98	2.64

PCI patients: Wage- and severity-adjusted cost per case

2018 COST PER CASE PERFORMANCE

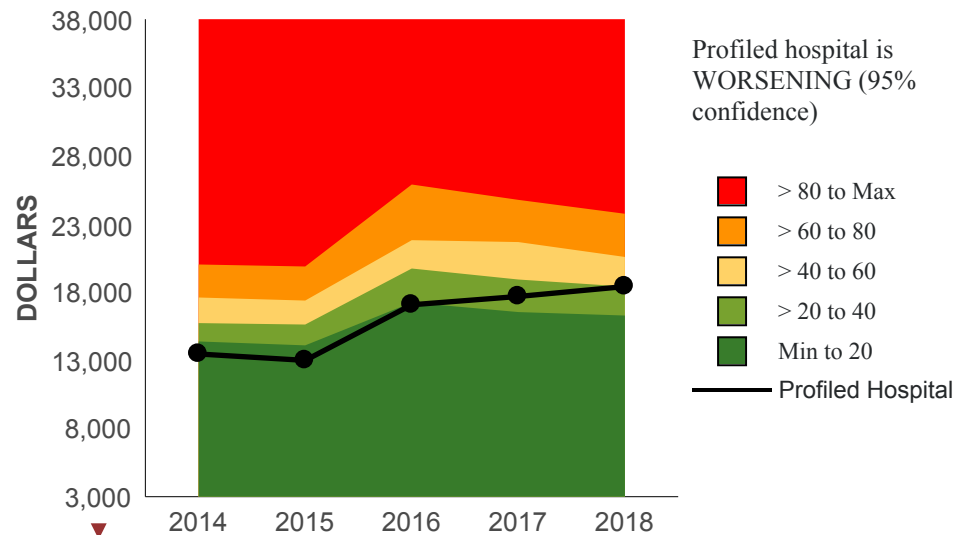


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Note: 2018 values on the current and trend graphs will not match due to different norm factors used to normalize the expected values.

2014-2018 COST PER CASE RATE OF IMPROVEMENT



Hospital performance compared to peer hospital quintiles: n = 265

		HOSPITAL COMPARISON GROUP				PROFILED HOSPITAL
PERCENTILE POINTS ►		20th	40th	60th	80th	Value
YEARS	2014	14,379	15,723	17,600	20,019	13,460
	2015	14,092	15,619	17,376	19,873	12,990
	2016	17,230	19,725	21,802	25,881	17,066
	2017	16,533	18,917	21,664	24,757	17,676
	2018	16,278	18,403	20,573	23,738	18,403

Supplemental information-only measures

This section of your report contains measures that we are profiling only for informational purposes; they were not included in ranking or determination of winners. We welcome your comments and feedback on the usefulness and relevance of these measures in assessing leadership's ability to drive high-level, balanced performance.

- **Excess days in acute care (EDAC) measures:**
 - 30-day excess days in acute care for AMI patients
 - 30-day excess days in acute care for HF patients

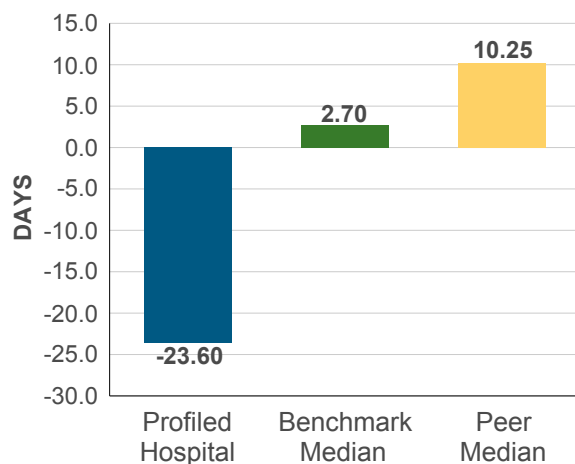
As defined by the Centers for Medicare & Medicaid Services (CMS), the “EDAC measures capture excess days that a hospital’s patients spent in acute care within 30 days after discharge.”

The values of these measures are the number of risk-adjusted days a hospital’s patients spend in an emergency department (ED), a hospital observation unit, or a hospital inpatient unit (“days in acute care”) during 30 days following a hospitalization for AMI or HF.”

The measures report the difference (“excess”) between each hospital’s average days in acute care (“predicted days”) and the number of days in acute care that each hospital’s patients would have been expected to spend if discharged from an average-performing hospital (“expected days”). The measure is reported as excess days per 100 discharges.

AMI and HF patients: 2018 Performance Compared to Benchmark¹ and Peer² Hospitals

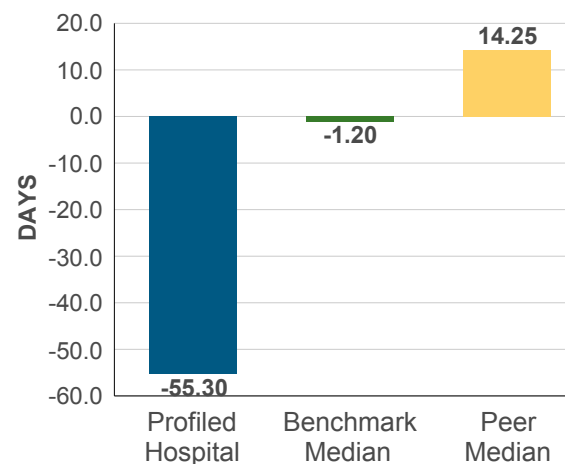
AMI 30D EXCESS DAYS IN ACUTE CARE



Fewer days than CMS national average (95% confidence).

▼ Desired Direction

HF 30D EXCESS DAYS IN ACUTE CARE



Fewer days than CMS national average (95% confidence).

▼ Desired Direction

Note: Profiled hospital compared to cardio teaching hospitals

¹ Benchmark hospitals are the winners in the comparison group: n = 15

² Peer hospitals are the non-winners in the comparison group: n = 260

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outside your enterprise. Improper
access can result in information being
altered, destroyed or misappropriated
or can result in damage to or misuse
of your systems, including to attack
others.

No IT system or product should be
considered completely secure and no
single product or security measure can
be completely effective in preventing
improper access. IBM systems and
products are designed to be part of a
comprehensive security approach,
which will necessarily involve
additional operational procedures, and
may require other systems, products
or services to be most effective. IBM
does not warrant that systems and
products are immune from the
malicious or illegal conduct of any
party.