



maryland
health services
cost review commission

Final Quality-Based Reimbursement Program for Rate Year 2024

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This document contains the final staff recommendations for updating the Quality-Based Reimbursement Program for RY 2024.

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LIST OF ABBREVIATIONS

CDC	Centers for Disease Control & Prevention
CAUTI	Catheter-associated urinary tract infection
CDIFF	Clostridium Difficile Infection
CLABSI	Central Line-Associated Bloodstream Infection
CMS	Centers for Medicare & Medicaid Services
DRG	Diagnosis-Related Group
ED	Emergency Department
FFY	Federal Fiscal Year
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HSCRC	Health Services Cost Review Commission
MRSA	Methicillin-Resistant Staphylococcus Aureus
NHSN	National Health Safety Network
PQI	Prevention Quality Indicators
QBR	Quality-Based Reimbursement
RY	Maryland HSCRC Rate Year (Coincides with State Fiscal Year (SFY) July-Jun; signifies the timeframe in which the rewards and/or penalties would be assessed)
SIR	Standardized Infection Ratio
SSI	Surgical Site Infection
THA/TKA	Total Hip and Knee Arthroplasty Risk Standardized Complication Rate
VBP	Value-Based Purchasing

POLICY OVERVIEW

Policy Objective	Policy Solution	Effect on Hospitals	Effect on Payers/ Consumers	Effect on Health Equity
The quality programs operated by the Health Services Cost Review Commission, including the Quality-Based Reimbursement (QBR) program, are intended to ensure that any incentives to constrain hospital expenditures under the Total Cost of Care Model do not result in declining quality of care. Thus, HSCRC's quality programs reward quality improvements and achievements that reinforce the incentives of the Total Cost of Care Model, while guarding against unintended consequences and penalizing poor performance.	The QBR program is one of several pay-for-performance quality initiatives that provide incentives for hospitals to improve and maintain high-quality patient care and value within a global budget framework.	The QBR policy currently holds 2 percent of hospital inpatient revenue at-risk for Person and Community Engagement, Safety, and Clinical Care outcomes.	This policy ensures that the quality of care provided to consumers is reflected in the rate structure of a hospital's overall global budget. The HSCRC quality programs are all-payer in nature and so improve quality for all patients that receive care at the hospital.	The quality programs that assign hospitals credit for the better of attainment or improvement on the measures (QBR and RRIP) better allow the policies to target improvements in hospitals that serve patient populations impacted more by disparities in care. In the future, the QBR policy may provide direct hospital incentives for reducing disparities, similar to the approved readmission disparity gap improvement policy.

RECOMMENDATIONS

This document puts forth the RY 2024 Quality-Based Reimbursement (QBR) final policy recommendations. This recommendation proposes changes to the program measures to address areas where Maryland has consistently performed poorly and where CMMI has been concerned about performance, as outlined below. It also makes several recommendations for the development of monitoring reports and building of infrastructure that will support expansion of the QBR program in future rate years. Staff greatly benefits from Commissioner support on these longer-term initiatives.

Final Recommendations for RY 2024 QBR Program:

1. Continue Domain Weighting to determine hospitals' overall performance scores as follows: Person and Community Engagement (PCE) - 50 percent, Safety (NHSN and AHRQ Patient Safety Index composite) - 35 percent, Clinical Care - 15 percent.
 - A. Within the PCE domain, pilot including four linear measures weighted at 10% of QBR score; remove associated revenue at risk from top box.
 - B. Within the PCE domain, continue to include timely follow-up after acute exacerbation of a chronic condition weighted at 5% of QBR score; currently, Medicare only measure.
2. Collaborate with partners to implement statewide HCAHPS improvement initiative, which can focus on root causes of HCAHPS performance and the sharing of best practices for improvement.
3. Develop monitoring reports for measures that expand the scope of the policy and align with the goals of the TCOC Model that will be considered for adoption in RY 2025:
 - A. 30-day all-payer, all-cause mortality;
 - B. Follow-up for acute exacerbation of chronic conditions for Medicaid; and
 - C. Follow-up after hospitalization for mental illness.
4. Collaborate with CRISP to develop infrastructure for collection of hospital electronic clinical quality measures (eCQMs) and core clinical data elements:
 - A. Require hospitals to submit the CY 2022 ED-2 eCQM and consider for re-adoption in future rate years; and
 - B. Explore development of hospital eCQM for inpatient/outpatient all-payer THA-TKA complications.
5. Maintain the pre-set scale (0-80 percent with cut-point at 41 percent), and continue to hold 2 percent of inpatient revenue at-risk (rewards and penalties) for the QBR program.
6. Adjust retrospectively the RY 2024 QBR pay-for-performance program methodology as needed due to COVID-19 Public Health Emergency and report any changes to Commissioners.

INTRODUCTION

Maryland hospitals have been funded under a population-based revenue system with a fixed annual revenue cap under the All-Payer Model agreement with the Centers for Medicare & Medicaid Services (CMS) beginning in 2014, and continuing under the current Total Cost of Care (TCOC) Model agreement, which took effect in 2019. Under the global budget system, hospitals are incentivized to shift services to the most appropriate care setting and simultaneously have revenue at risk in Maryland's unique, all-payer, pay-for-performance quality programs; this allows hospitals to keep any savings they earn via better patient experiences, reduced hospital-acquired infections, or other improvements in care. Maryland systematically revises its quality and value-based payment programs to better achieve the state's overarching goals: more efficient, higher quality care, and improved population health. The revisions include annual updates to each program policy, which must be approved by the Health Services Cost Review Commission (HSCRC), and have also included more recent large-scale overhauls of the Maryland Hospital Acquired Condition Program and Readmissions Reduction Incentive Program to better align program policies with the expanded and evolving goals of the TCOC Model agreement.

Under the TCOC Model, Maryland must request exemptions each year from CMS pay-for-performance programs, e.g., the Value Based Purchasing (VBP) program for which the Quality Based Reimbursement (QBR) is the state analog. CMS assesses and grants these exemptions based on a report for each program showing that Maryland's results continue to meet or surpass those of the nation. CMS notified the HSCRC on September 29, 2020, that Maryland's exemptions were granted for federal fiscal year 2021. However, CMS raised concerns about Maryland's subpar performance on measures in two QBR Program domains: (1) the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) measures in the Person and Community Engagement domain and (2) the Centers for Disease Control and Prevention's (CDC's) National Health Safety Network infection measures in the Safety domain. CMS also noted its support for re-adoption of ED wait time measurement due to Maryland's historical poor performance. Finally, as part of exemption approval, CMS stipulated that Maryland develop a high-level work plan to redesign the QBR program and then a report summarizing the potential changes that would be recommended to the Commission.

This RY 2024 policy recommendation summarizes the state's efforts to redesign the QBR Program, which was the first hospital pay-for-performance program implemented by the HSCRC. Specifically, it describes the work done by the HSCRC and a stakeholder workgroup, the QBR Redesign Subgroup, which convened monthly over five months to examine and consider revisions to the QBR Program. The Performance Measurement Workgroup (PMWG) also reviewed the subgroup's findings. This policy includes recommended changes to the program for RY 2024 and beyond based on those two engagements. The following action items and topics listed in Figure 1 represent the main findings of both workgroups:

Figure 1. Action items and discussion topics for the PMWG for RY 2024 and future program years

Measure	RY 2024	Future program years
Person and Community Engagement domain		
HCAHPS	<ul style="list-style-type: none"> Create criteria for and determine which HCAHPS measures' linear scores to include in the Person and Community Engagement (PCE) domain 	<ul style="list-style-type: none"> Develop state infrastructure to collect patient-level data and more timely hospital HCAHPS scores to provide opportunities for additional analytics, including on disparities, and hospital improvement Work with stakeholders to facilitate more sharing of best practices
Emergency department (ED) wait times	<ul style="list-style-type: none"> Conduct more research and analyses, such as an analysis of ED median times during the COVID-19 pandemic if the data are publicly released by CMS Continue work on avoidable ED utilization in parallel as part of Potentially Avoidable Utilization (PAU) measurement 	<ul style="list-style-type: none"> Develop infrastructure for electronic clinical quality measures (eCQMs) to enable the collection of data for an ED wait time measure; this will enable such a measure to be included again in the QBR Program in future years Determine components to allow inclusion of measure in program (such as performance standards)
Follow-up measure	<ul style="list-style-type: none"> To align with and support achievement of the State Integrated Health Improvement Strategy (SIHIS) goal, identify strategies for all hospitals in Maryland to rise above the national average for the current Medicare-only follow-up measure in the QBR PCE domain. Develop monitoring reports for Medicaid and behavioral health for the Timely Follow-Up measures 	<ul style="list-style-type: none"> Evaluate the results in the monitoring reports for the Medicaid and behavioral health follow-up measures; consider adding a measure that includes Medicaid and/or behavioral health to the QBR Program in RY 2025
Safety domain		
CDC National Health Safety Network	<ul style="list-style-type: none"> In light of the work group's findings that demonstrate that Maryland is on par with national performance, maintain alignment with national VBP Program; focus on improvement on current measures 	<ul style="list-style-type: none"> Explore working with CDC to add more innovative and less burdensome "digital" measures (such as the hospital-onset bacterium measure)
Clinical Care domain		
30-day mortality	<ul style="list-style-type: none"> Review additional analyses related to 30-day measure (e.g., reason for lack of correlation with inpatient measure, updates to hospice flag) Continue to develop the 30-day measure for monitoring or adoption in RY 2024 	<ul style="list-style-type: none"> Continue to evaluate 30-day measure Consider developing a hybrid measure using eCQM infrastructure
Total hip arthroplasty/total knee arthroplasty	<ul style="list-style-type: none"> Consider expansion of the current inpatient total hip arthroplasty/total knee arthroplasty measure to all-payers 	<ul style="list-style-type: none"> When eCQM infrastructure is developed, explore adaptation of provider measures to assess all-payer inpatient and outpatient complications Explore opportunities for Patient Reported Outcome Measures (PROMs)

Implications of COVID-19

Like the rest of the United States, Maryland has spent the past year and a half battling the COVID-19 pandemic. First responders, nurses, doctors, hospitals, and health care providers have worked heroically to combat this dangerous virus. Emergency measures have transformed our health care landscape, in some cases temporarily and in others permanently.

We previously recognized this time of disruption and uncertainty by discontinuing the assessment of quality in the RY 2022 performance period across all pay-for-performance programs. To the extent possible, staff also acknowledged the ongoing effects of the COVID-19 pandemic when considering changes to the QBR policy with the QBR Redesign Subgroup and PMWG. However, further analysis of data or unforeseen complications related to COVID-19 may affect Maryland’s ability to assess quality performance as outlined in this policy. Given the expected persistence of COVID-19, Maryland might decide that more adjustments are needed to further account for the effects of the pandemic. Thus, staff is recommending to the Commission that we will retrospectively assess whether any changes are needed for the RY 2024 policy and report those changes to the Commission.

BACKGROUND

Overview of the QBR Program

The QBR Program, implemented in 2010, includes potential scaled penalties or rewards of up to 2 percent of inpatient revenue. The program assesses hospital performance against national standards for its Safety domain and Person and Community Engagement domain. For the Clinical Care domain, the program uses Maryland-specific standards for the inpatient mortality measure and national standards for the measure of total hip arthroplasty/total knee arthroplasty (THA/TKA) complications. Figure 2 compares RY 2023 QBR measures and domain weights to those used in the VBP Program.

Figure 2. RY 2023 QBR measures and domain weights compared with those used in the VBP Program

	Maryland QBR domain weights and measures	CMS VBP domain weights and measures
Clinical Care	15 percent Two measures: All-cause inpatient mortality; THA/TKA complications	25 percent Five measures: Four condition-specific mortality measures; THA/TKA complications
Person and Community Engagement	50 percent Nine measures: Eight HCAHPS categories; follow-up after chronic conditions exacerbation	25 percent Eight HCAHPS measures
Safety	35 percent	25 percent

	Maryland QBR domain weights and measures	CMS VBP domain weights and measures
	Six measures: Five CDC NHSN hospital-acquired infection (HAI) measure categories; all-payer PSI 90	Five measures: CDC NHSN HAI measures
Efficiency	n.a.	25 percent One measure: Medicare spending per beneficiary

With the selected measures from above, the QBR Program assesses hospital performance based on the national threshold (50th percentile) and benchmark (mean of the top decile) values for all measures, except the HSCRC calculated in-hospital mortality rate (which uses state data to calculate performance standards). Each measure is assigned a score of zero to ten points, then the points are summed and divided by the total number of available points, and weighted by the domain weight. Thus, a score of 0 percent means that performance on all measures is below the national threshold and has not improved, whereas a score of 100 percent means performance on all measures is at or better than the mean of the top decile (about the 95th percentile). This scoring method is the same as that used for the national VBP Program. But unlike the VBP Program, which ranks all hospitals relative to one another and assesses rewards and penalties to hospitals in a revenue neutral manner retrospectively based on the distribution of final scores, the QBR Program uses a preset scale to determine each hospital's revenue adjustment. This gives Maryland hospitals predictability and an incentive to work together to achieve high quality of care, instead of competing with one another for better rank.

The preset scale for revenue adjustments is 0 to 80 percent, regardless of the score of the highest-performing hospital in the state, and the cut-point at which a hospital earns rewards or receives a penalty is 41 percent. This reward and penalty cut-point is based on an analysis of the national VBP Program scores for federal fiscal years 2016–2018, which indicated the average national score using Maryland domain weights (without the Efficiency domain) was around 41 percent (ranging from 39.9 to 42.7).

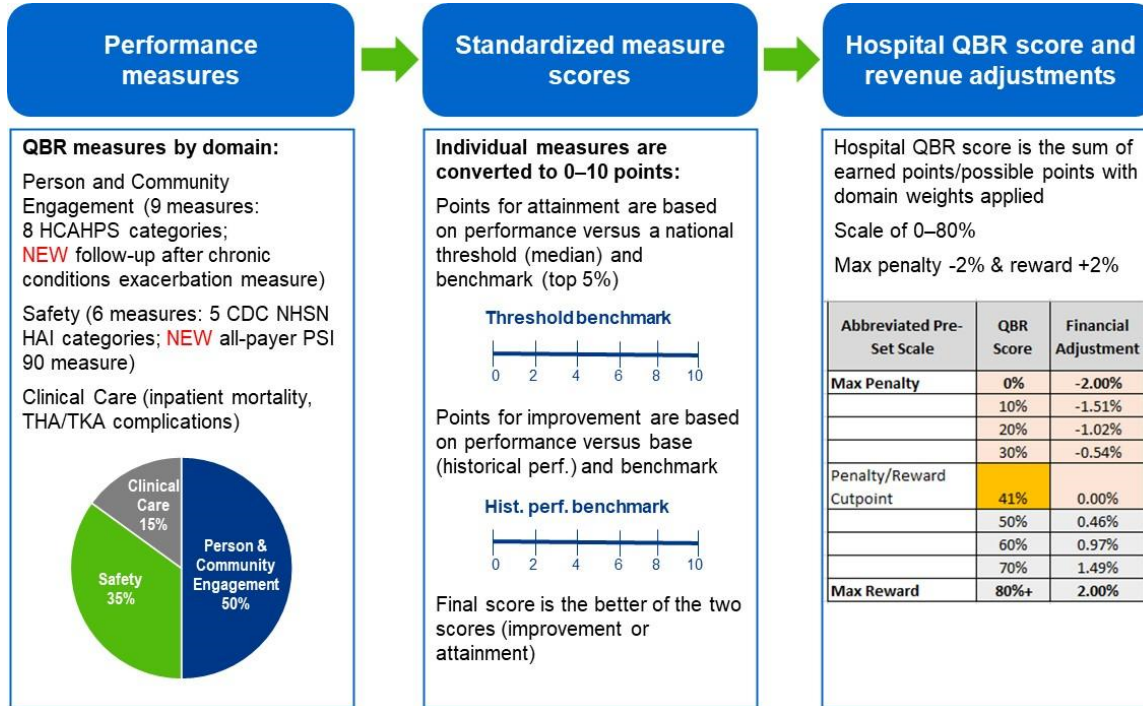
As a recap, the method for calculating hospital QBR scores and associated inpatient revenue adjustments has remained essentially unchanged since RY 2019. It involves:

1. Assessing performance on each measure in the domain
2. Standardizing measure scores relative to performance standards
3. Calculating the total points a hospital earned divided by the total possible points for each domain
4. Finalizing the total hospital QBR score (0 to 100 percent) by weighting the domains, based on the overall percentage or importance the HSCRC placed on each domain

- Converting the total hospital QBR scores into revenue adjustments using the preset scale (range of 0 to 80 percent)

This method is shown in Figure 3.

Figure 3. Process for calculating RY 2023 QBR scores



Appendix A contains more background and technical details about the QBR and VBP Programs.

Overview of QBR Redesign Subgroup

The HSCRC convened a QBR Redesign Subgroup, comprising key stakeholders from the PMWG and broader Maryland healthcare system community, from March through July 2021. The subgroup considered options for overhauling the QBR Program to meet or exceed the cost and quality outcomes of the national VBP Program, to explore opportunities for innovation in the hospital quality arena, and to ensure the state achieves the goals of the TCOC Model. Members of the subgroup were appointed based on their expertise and potential contribution to the defined scope of work. Subgroup feedback was collected through discussion and written feedback. Appendix A contains the list of subgroup members.

The HSCRC established subgroup goals to help ensure success under the TCOC Model. As a result, the goals focused on (1) quality and safety areas where Maryland underperforms, relative to the VBP Program or to national or historic performance in other measurement areas, and (2) opportunities for innovation in hospital measurement and improvement. The goals are as follows:

- Review and suggest options for updating measures in the QBR Program

2. Review and suggest options for measurement data sources
3. Review and suggest options for updating scoring and incentives

ASSESSMENT

The purpose of this section is to present an assessment, using the most current data available, of Maryland's performance on measures used in QBR as well as other measures where national comparisons are available. It also includes additional analytics and summarizes the discussion of possible changes to the program that were considered by the QBR Redesign Subgroup. The assessment together with the deliberations of the QBR Redesign Subgroup and Performance Measurement Workgroup (PMWG) serve as the basis for the final recommendations for the RY 2024 QBR program. In addition, staff has modeled the QBR revenue adjustments with the recommended changes.

Person and Community Engagement Domain

The Person and Community Engagement domain currently measures performance using the HCAHPS patient survey and a measure of follow-up after discharge for an acute exacerbation of a chronic condition. This domain accounts for 50 percent of the overall QBR score. In addition this domain previously included the emergency department (ED) wait time measures for admitted patients, which were retired in CY 2019 and CY 2020 due to federal discontinuance of these measures. The workgroup discussed options for obtaining data for ED wait time measures as summarized below.

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

The HSCRC incorporated HCAHPS top-box survey results into the QBR Program in RY 2013, as part of the program's Person and Community Engagement domain. This domain, largely composed of the HCAHPS top-box scores, was weighted at 40 percent of a hospital's total QBR score in FY 2016. In RY 2017, the domain weight increased to 45 percent and in FY 2018, to 50 percent. HSCRC Commissioners agreed to this increase, which is double the 25 percent weight in the national VBP Program, due to concerns regarding lower statewide HCAHPS performance relative to the nation. Over the years, the HSCRC has implemented additional methodological changes (for example, switching from state to national performance standards where feasible in 2016, removing revenue-neutral reward- penalty scale, and so on) to strengthen the improvement incentives relative to the nation. The QBR Program scores hospitals on either improvement or attainment, whichever is highest, across the following HCAHPS measures: (1) communication with nurses, (2) communication with doctors, (3) responsiveness of hospital staff, (4) communication about medicine, (5) hospital cleanliness and quietness, (6) discharge

information, (7) a composite care transition measure, and (8) overall hospital rating. In keeping with the national VBP Program, the QBR Program also scores hospitals separately on consistency¹; a range of 0-20 consistency points are awarded by comparing a hospital's HCAHPS survey lowest performing measure rates during the performance period to all hospitals' HCAHPS survey measure rates from a baseline period.

Over the last several years, the Center for Medicare and Medicaid Innovation (CMMI) has raised concerns about Maryland's HCAHPS performance in response to the HSCRC's annual request for exemption from the federal VBP Program. Compared to national VBP hospitals, Maryland hospitals perform lower overall on all HCAHPS measures except for discharge information, despite a higher weight than the VBP Program and despite applying higher all-payer revenue adjustments. While Maryland has improved on five of the eight HCAHPS measures over time (from 2015 to 2019), VBP performance standards (threshold and benchmark) have also increased slightly over time for all measures except doctor communication. Figure 4 provides the Maryland HCAHPS top-box performance results for the 2015 to 2019 performance periods compared to the nation's VBP thresholds and benchmarks.² Despite improvements, the State's average performance is not better than the nation's 50th percentile. Appendix B shows graphs of Maryland's performance on each HCAHPS measure compared to the national threshold and benchmark.

Figure 4. VBP thresholds, benchmarks and Maryland HCAHPS top-box scores (2015–2019)

		CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
Nurse communication	Threshold (National Median)	78.19%	78.52%	78.69%	79.08%	79.06%
	Benchmark (National mean of top decline)	86.61%	86.68%	86.97%	87.12%	87.36%
	MD top box (State average performance)	76.00%	75.00%	76.00%	76.00%	76.00%
Doctor communication	Threshold	80.51%	80.44%	80.32%	80.41%	79.91%
	Benchmark	88.80%	88.51%	88.62%	88.44%	88.10%
	MD top box	78.00%	77.00%	78.00%	77.00%	77.00%
Staff responsiveness	Threshold	65.05%	65.08%	65.16%	65.07%	65.77%
	Benchmark	80.01%	80.35%	80.15%	80.14%	81.00%
	MD top box	59.00%	60.00%	61.00%	60.00%	61.00%
Communication about medicines	Threshold	62.88%	63.37%	63.26%	63.30%	63.83%
	Benchmark	73.36%	73.66%	73.53%	73.86%	74.75%

¹ For more information on the national VBP Program's performance standards, please see <https://qualitynet.cms.gov/inpatient/hvbp/performance>.

² CMS uses a threshold (50th percentile) and benchmark (mean of the top decile) to determine how many points to award for Achievement and Improvement scores.

		CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
	MD top box	60.00%	59.00%	60.00%	61.00%	61.00%
Discharge information	Threshold	85.91%	86.60%	87.05%	87.44%	87.38%
	Benchmark	91.23%	91.63%	91.87%	92.11%	92.17%
	MD top box	86.00%	86.00%	86.00%	87.00%	86.00%
Care transition	Threshold	-	51.45%	51.42%	51.14%	51.87%
	Benchmark	-	62.44%	62.77%	62.50%	63.32%
	MD top box	48.00%	47.00%	49.00%	49.00%	49.00%
Hospital rating	Threshold	70.02%	70.23%	70.85%	71.59%	71.80%
	Benchmark	84.60%	84.58%	84.83%	85.12%	85.67%
	MD top box	65.00%	65.00%	67.00%	65.00%	66.00%
Average cleanliness and quietness	Threshold	65.30%	65.60%	65.58%	65.72%	65.61%
	Benchmark	79.39%	79.00%	79.06%	79.42%	79.58%
	MD top box	61.50%	62.50%	62.00%	63.00%	63.50%

The HSCRC presented the following analyses to the subgroup:

- Analyzed the **change in HCAHPS scores over time** by hospital. For each HCAHPS measure except for doctor communication, more than half of Maryland hospitals improved on top-box scores from 2013 to 2018. Fewer hospitals saw improvements from 2018 to 2019, but some hospitals saw a substantial one-year change (> 3 percent increase). Overall staff believe this indicates annual increases in hospital HCAHPS performance are possible.
- HSCRC staff analyzed whether HCAHPS **improvement differed for low- versus high-performing hospitals**. This was done by first grouping hospitals into quartiles of performance using 2013 top-box scores.³ Staff next examined the average improvement in each quartile through 2018. On average, hospitals in the worst-performing quartile (4th) show the largest improvement within each HCAHPS category, while hospitals within the top quartile get slightly worse. These trends are not surprising given factors such as relative opportunity for improvement, regression to the mean, and incentives tied to both improvement and attainment.
- A **literature review** conducted by Mathematica summarizing successful HCAHPS improvement strategies implemented by other states or individual hospitals (for example, organizational factors

³ The same analysis was also done for linear scores using 2014 as the starting year.

associated with a culture of “patient focus,” best practices for patient-physician communication, hospital interventions, and so on).⁴

- A preliminary **survey conducted by the HSCRC staff of Maryland hospitals’ HCAHPS practices and improvement initiatives** (n = 20), found the following:
 - All respondents indicated that their leadership, frontline staff, and board of directors systematically review HCAHPS results.
 - All but one respondent rated HCAHPS prominence in their mission or vision as a 4 or 5 (1 = not at all, 5 = core component).
 - Half of respondents indicated that some form of staff direct (e.g., performance bonus) or indirect (e.g., performance points for leadership participation in patient rounding) incentives were used to improve on HCAHPS; leadership and management staff were mentioned most frequently as included in the incentive programs as opposed to direct care providers.
 - Respondents indicated they most often used unit meetings (83.3 percent, department meetings (77.8 percent), and electronic communication (83.3 percent) to communicate HCAHPS goals and performance.
- An **HCAHPS Spearman rank-order correlation analysis** ($p < 0.05$) was conducted looking at the relationship between HCAHPS domain scores and various quality measures and hospital characteristics (for example, staffing ratio, Potentially Preventable Complication rate, readmission rate, survival rate, length of stay, and so on) and found:⁵
 - While most Maryland quality measures and hospital characteristics for CYs 2017 to 2018 have low (not statistically significant) correlations with HCAHPS, those that have statistically significant correlations are notable:
 - There is a positive, moderate, and statistically significant correlation between survival rate and several HCAHPS categories.
 - Higher HCAHPS scores are associated with better quality outcomes. Specifically, higher HCAHPS scores are associated with lower readmissions and mortality. Thus, there may be complementary investments hospitals can make (for example, increasing the number of productive hours worked by RNs with direct patient care responsibilities per patient day) to improve on the HCAHPS.

⁴ For the HCAHPS literature review, please see https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/Ry2023/Literature%20Review%20Summary%20for%20HCAHPS%20Improvement.pdf.

⁵ For the HCAHPS Spearman rank-order correlation analysis on the relationship between domain scores and various quality measures and hospital characteristics, please see Figures B.3.a. and B.3.b. in Appendix B.

Strengthening HCAHPS Incentives in QBR

The HSCRC staff and subgroup explored innovative ways to address low HCAHPS performance through the QBR Program. The HSCRC presented the following levers to the subgroup as potential ways to target improvement: revenue at risk, performance standards, timing of incentives, scoring, measures, and domain weights.⁶ Across subgroup meetings, the HSCRC detailed redesign options, including the following:

- Adding an HCAHPS linear scoring component⁷
- Changing the timing of incentives by providing up-front rewards with the same at-risk dollars for anticipated improvements
- Adding complementary measures
- Further increasing the domain weight
- Requiring hospitals to expand on sharing best practices⁸

The subgroup had the most in-depth discussions about the first two policy levers. These discussions are further detailed below. In addition to these levers, the Maryland Health Care Commission advised the PMWG in the September meeting that they were setting up a data infrastructure and process to collect HCAHPS case level data directly from hospitals which will allow additional analysis in the future on patient characteristics that impact HCAHPS performance; this will help to identify disparities and improve health equity.

Linear scoring

Stakeholders have previously suggested that incentivizing linear scoring may encourage improvement across all levels of performance. Because only the most positive responses (“always”) receive any points under top-box scoring,⁹ there may be a cliff effect occurring that does not recognize more granular gradations in HCAHPS performance and therefore discourages further investment in improvement. Linear scoring, however, gives partial credit for intermediate response options (“sometimes” and “usually”) and

⁶ For an HCAHPS policy lever diagram, please see Figure B.4 in Appendix B.

⁷ CMS Star Ratings use linear scores that score all possible scores with equal intervals between each option (always, usually, sometimes, and never) in a 0 to 100 scale that is weighted by discharge and response rate.

⁸ The HSCRC asked the Maryland Hospital Association to present at the March 2021 meeting. The presentation detailed how the organization identified Maryland’s top HCAHPS performers, interviewed these hospitals, and shared best practices with other hospitals. The HSCRC is exploring whether to require the sharing of best practices. For further Maryland Hospital Association data and initiatives surrounding HCAHPS, please see https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/Ry2023/MHA%20HCAHPS%20Presentation%20at%20March%202021%20QBR%20Redesign%20Subgroup.pdf.

⁹ Top-box scoring: never = 0 points; sometimes = 0 points; usually = 0 points; always = 100 points.

inclusion of linear scores could motivate hospitals that earn low points on top-box scoring. Figure 5 shows the concept of the linear scoring methodology.

Figure 5. CMS star rating linear scoring methodology



Given the high correlation between top-box and linear scores,¹⁰ incentivizing improvements in linear scores could have the potential to raise top-box scores over time, and in certain cases could recognize better health care outcomes, as linear performance for select measures demonstrated stronger, statistically significant correlation with reduced readmission, length of stay and mortality rate. Figure 6 details the results of the Spearman correlation analysis.¹¹ There is also some evidence that while patients prefer top-box scores, providers feel that the linear scores better reflect the quality of care being provided. Moreover, Dr. Dale Schumacher from the Rockburn Institute presented an analysis that indicates the Mid-Atlantic region generally performs worse on HCAHPS and better on clinical care when compared with all other hospitals nationally, thereby suggesting an unaccounted for regional bias.¹² The addition of linear scores may ameliorate this regional bias in HCAHPS scores. Lastly, while top-box scores are used for VBP, linear scores are used by CMS in the Hospital Star Ratings, thus Maryland hospitals will continue to be evaluated by measures of national import if linear performance is introduced into the QBR program.

¹⁰ For the Maryland HCAHPS top-box and linear scores correlation analysis, please see Figure B.5 in Appendix B.

¹¹ Mathematica, on behalf of the HSCRC, repeated a correlation analysis looking at the relationship between Maryland hospitals' linear scores and various quality measures and hospital characteristics. The analysis found increases in the correlations between higher linear scores and other favorable quality outcomes (for example, lower mortality, lower readmissions, and so on).

¹² For the regional bias analysis conducted by the Rockburn Institute that compared mid-Atlantic to national HCAHPS and VBP scores, please see [https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/Ry2023/Rockburn%20Institute%20HCAHPS%20VBP%20QBR%20Redesign%20Presentation%204-21-21\(3\)%20\(1\).pdf](https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/Ry2023/Rockburn%20Institute%20HCAHPS%20VBP%20QBR%20Redesign%20Presentation%204-21-21(3)%20(1).pdf).

Measure	Nurse Communication	Doctor Communication	Staff Responsiveness	Communication About Medicines	Discharge Information	Care Transition	Overall Hospital Rating	Recommend Hospital	Average Clean and Quiet
Linear Measures									
PPC Rate	-0.05	0.07	-0.04	-0.02	0.04	-0.11	-0.14	-0.19	-0.12
Readmission Rate	-0.52*	-0.16	-0.42*	-0.1	-0.14	-0.34*	-0.32*	-0.28	-0.24
Survival Rate	0.37*	0.09	0.34*	0.24	0.14	0.23	0.1	0.1	0.38*
Length of Stay	-0.38*	-0.1	-0.37*	-0.17	-0.23	-0.43*	-0.29	-0.24	-0.16
Top Box									
PPC Rate	0	0.05	0.01	0.08	0.04	-0.11	-0.12	-0.19	-0.03
Readmission Rate	-0.46*	-0.01	-0.24	-0.01	-0.14	-0.22	-0.27	-0.23	-0.05
Survival Rate	0.36*	0.09	0.2	0.22	0.14	0.26	0.06	0.06	0.28
Length of Stay	-0.38*	-0.05	-0.21	-0.07	-0.23	-0.23	-0.21	-0.17	-0.02
(*) indicates statistical significance at $p < 0.05$.									
Both Statistically Significant						Linear Only Significant			

Staff supports inclusion of linear measures in the HCAHPS domain because linear scores accomplishes the following:

- Recognizes finer gradations in hospital performance; makes additional sense to providers
- More highly correlated with desirable quality outcomes than top-box scores, many of which are currently incentivized in existing HSCRC pay-for-performance programs
- May encourage iterative improvement on HCAHPS under the QBR Redesign that could lead to improvement in HCAHPS top box scores

Subgroup members agreed with adding linear scores as part of the HCAHPS domain. They believe a linear approach could help recognize HCAHPS performance that is trending in the right direction and could spur greater improvement. As shown in Figure 7, staff is proposing a reweighting of the Person and Community Engagement domain to include 10 percent of the domain (5 percent of overall QBR score) on linear scoring by reducing the weight on top-box scores. While some members stated that it could be worth weighting linear measures greater than 10 percent of the overall QBR score, they recognized that hospitals should still be incentivized to improve their top-box scores. Some subgroup members cautioned against putting too much weight on linear scores so as to maintain top-box weighting of at least 25 percent of the QBR score to stay aligned with the VBP Program—which weights top box scores, along with consistency scoring, at 25 percent—and because it is not clear how adding incentives to linear scoring will drive behavior change. Furthermore, staff is concerned about diluting or lowering the standards on HCAHPS too much with the addition of linear scores. As discussed further in the stakeholder response section, the addition of linear scores should be considered a pilot approach for HCAHPS improvement that should be phased out if positive changes are not seen in the next 2-3 years.

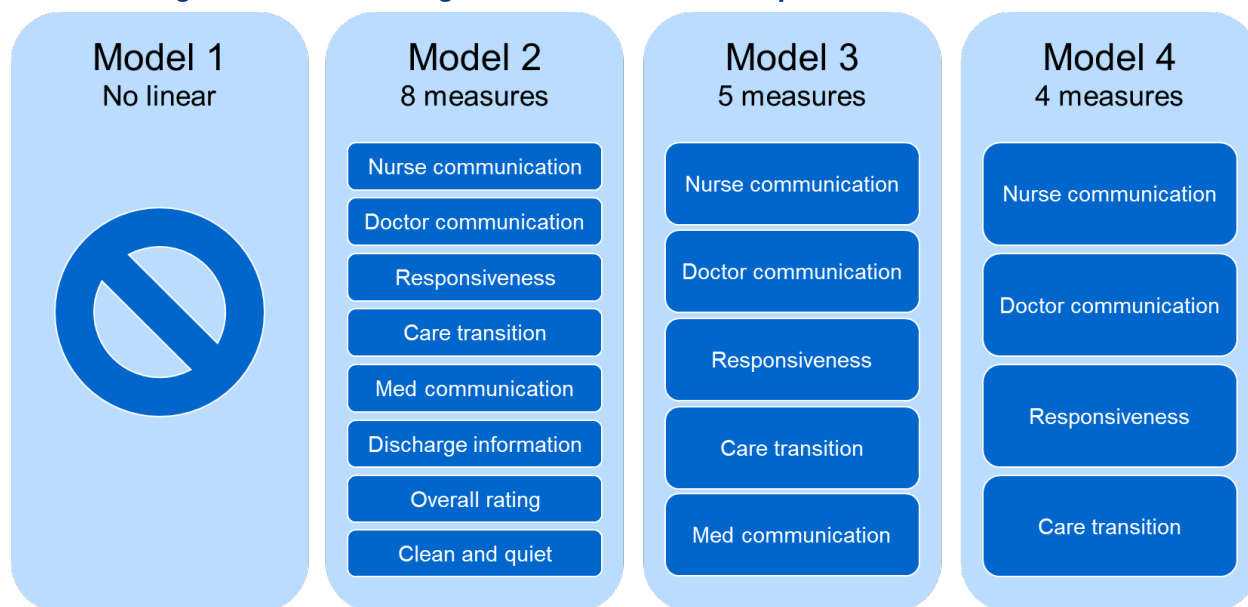
Figure 7. HSCRC proposal for reweighting the Person and Community Engagement domain to include linear scoring at 10 percent

Person and Community Engagement subdomain	Weight of QBR score
Top-box measures	25 percent
Consistency scores	10 percent
Follow-up	5 percent
Linear measures	10 percent
Total for domain	50 percent

Staff also asked for feedback on whether the linear portion of the domain weight should be focused on linear scores for all HCAHPS measures (eight total) or on specific measures (for example, measures where Maryland wants to be a leader, measures with the biggest gaps from the national average, measures with correlations to other important outcomes, measures aligned with other ratings such as Leapfrog, and so on). Subgroup members favored a more focused approach using a subset of HCAHPS measures as they believed it would increase focus and be more likely to ultimately raise top-box scores.

Thus, the HSCRC modeled three approaches that included the addition of linear scores to the HCAHPS domain. Figure 8 displays the various options modeled, with linear scoring representing 10 percent of the total QBR score for each of the models 2 through 4. The HSCRC used the following considerations for narrowing down measures: (1) Leapfrog alignment, (2) correlations with other outcomes, (3) comprehensiveness, (4) parsimony, and (5) importance to the TCOC Model. The workgroups primarily debated about the inclusion of responsiveness. Some stakeholders were concerned about responsiveness scores in the time of COVID and preferred the overall hospital rating (which is not included in Leapfrog Survey). However, another member shared that responsiveness is linked to patient safety, which is corroborated by the stronger correlations seen for the linear responsiveness measure and other quality outcomes. Ultimately the PMWG agreed to recommend to the Commission Model 4 with nurse communication, doctor communication, responsiveness, and the 3-part care transition measure.

Figure 8. Linear scoring measures modeled at 10 percent of total QBR score



Subgroup members had conflicting views on which linear score model to implement. In discussing Model 2 results, one member believed that having more measures could allow for greater flexibility for hospitals that do better in some measures than others. Another member, who supported Model 4, stated that if the goal of implementing linear scoring is to focus on improvement, it would help to limit the number of measures and to focus on clinically meaningful and modifiable measures. In general, however, the subgroup supported a focused approach but debated on whether to include the responsiveness measure. One member suggested it would be better to focus on measures that would result in quality outcome improvements, such as communication about medicines.

Voluntary up-front investment

Staff also explored the idea of voluntary, up-front financial investment or support to spur improvements in HCAHPS scores. The up-front investment, which would be a loan based on anticipated improvements, would allow participating hospitals to make investments in activities to improve HCAHPS and thus reduce penalties or increase rewards at the end of the rate year. Staff believes loss aversion is a salient negative consequence and, thus, the incentive for improvement could be greater if hospitals have upfront financial support (without raising the percentage of revenue at risk) that would be taken back fully if improvements were not made. Moreover, given the Maryland hospital survey results that indicated a low percentage of hospitals provide direct incentive payments to frontline staff to improve HCAHPS performance and literature reviews suggest direct incentive payments do improve patient satisfaction scores, an up-front investment may also finance changes in hospital operations to fund frontline staff incentives that lead to permanent improvements in patient experience. However, hospital workgroup members expressed

hesitancy about this approach due to the risk and one year timeframe for improvements. For example, some stakeholders were concerned that if a hospital did not reach the anticipated improvement that it would have spent money it did not originally have and be worse off. Because of these concerns along with the staff level of effort to administer this upfront investment, staff is not recommending that this offer be formally available to hospitals. However, going forward the Commission is open to discussing proposals from any hospital that believes an upfront investment opportunity is needed to support better HCAHPS performance.

Adding complementary measures

Another topic discussed was adding in complementary measures that are correlated with HCAHPS, with the idea that if there are incentives to improve on these other measures that HCAHPS scores may improve as well. In RY 2021 and RY 2022 the Commission approved the addition of inpatient ED wait times and timely follow-up after exacerbation of a chronic condition (Medicare only), respectively, as complementary measures to QBR. The Subgroup discussed adding back into the Person and Community Engagement domain an ED wait time measure when the data are available (See ED Wait Time Section). Analysis, which was supported by some of the subgroup members, has shown that ED wait time has a high correlation with the HCAHPS measures. The subgroup also discussed the addition of the Medicaid population to the follow-up measure and expanding the measure to behavioral health, also in the Person and Community Engagement domain (See Timely Follow-up Section). At this time, the staff and subgroup did not discuss or suggest additional complementary measures, but this could be revisited in future years.

Increasing the domain weight

Staff asked the subgroup to discuss the potential of increasing the Person and Community Engagement domain's weight, and subsequently, the HCAHPS weight. However, staff and subgroup members said they did not think this would be a good option for the QBR Program because the Person and Community Engagement domain's weight was already higher than it is weighted in the VBP program and this higher weight has not resulted in narrowing the gap between Maryland and national performance. In addition, higher weight would require reducing other already lower weighted domains and further take away incentives from other important measures in the QBR Program.

Expansion of sharing best practices

HSCRC staff also discussed increasing the opportunities for hospitals to share HCAHPS best practices and initiatives that have successfully raised HCAHPS scores. The Maryland Hospital Association (MHA) has facilitated some opportunities for such sharing; however, several subgroup members were supportive of more opportunities to share best practices. Under the design of the QBR Program, it is advantageous for all hospitals to perform well because a prospective scale is used and hospitals are not relatively

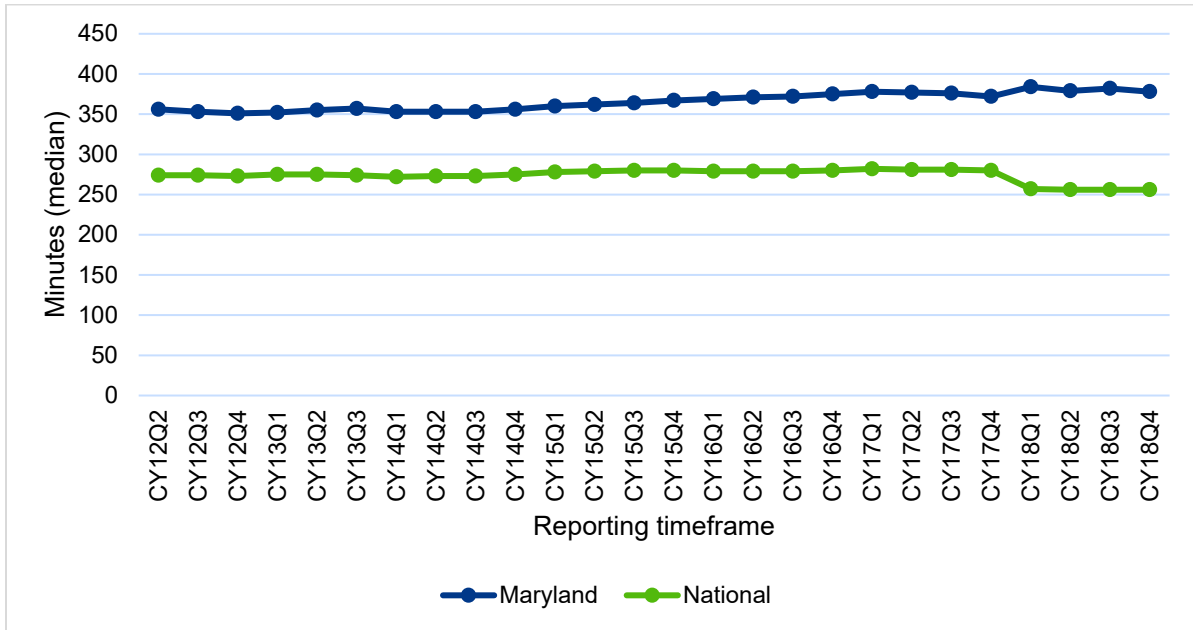
ranked after the performance period. The subgroup, however, did not offer specific suggestions on ways to increase sharing of best practices; this could be further explored by the MHA as an extension of its previous work, and the PMWG.

Emergency Department Wait Time Measure

Long ED wait times are an enduring issue in Maryland, which has had longer wait times than the national average pre-dating the start of global budgets in 2014. Figures 9—11 depict Maryland performance compared to national performance on measures ED-1b: Arrival to Admission for Admitted Patients, ED-2b: Decision to Admit to Admission for Admitted Patients, and OP-18b: Arrival to Departure for Discharged ED Patients. Concerns about unfavorable ED throughput data have been shared by many Maryland stakeholders, including the HSCRC, the Maryland Health Care Commission, payers, consumers, emergency room physicians, the Maryland Institute of Emergency Medical Services Systems, and the Maryland General Assembly.¹³ Under alternative payment models, such as hospital global budgets or other hospital capitated models, there may be an incentive to reduce staffing that leads to ED throughput issues. Measuring ED wait times is one way to monitor for unintended consequences of the Model on hospital throughput. In general, ED staff supported including the inpatient wait time measures to address the issue of ED boarding and hospital throughput.

¹³ For the “Emergency Department Overcrowding Update” November 2019 Joint Chairman Report, please see <http://www.miemss.org/home/Portals/0/Docs/LegislativeReports/miemss-ed-overcrowding-update-10-31-19.pdf?ver=2019-11-19-174743-763>.

**Figure 9. Maryland performance compared to national performance on ED-1b:
Arrival to Admission for Admitted Patients**



**Figure 10. Maryland performance compared to national performance on ED-2b:
Decision to Admit to Admission for Admitted Patients**

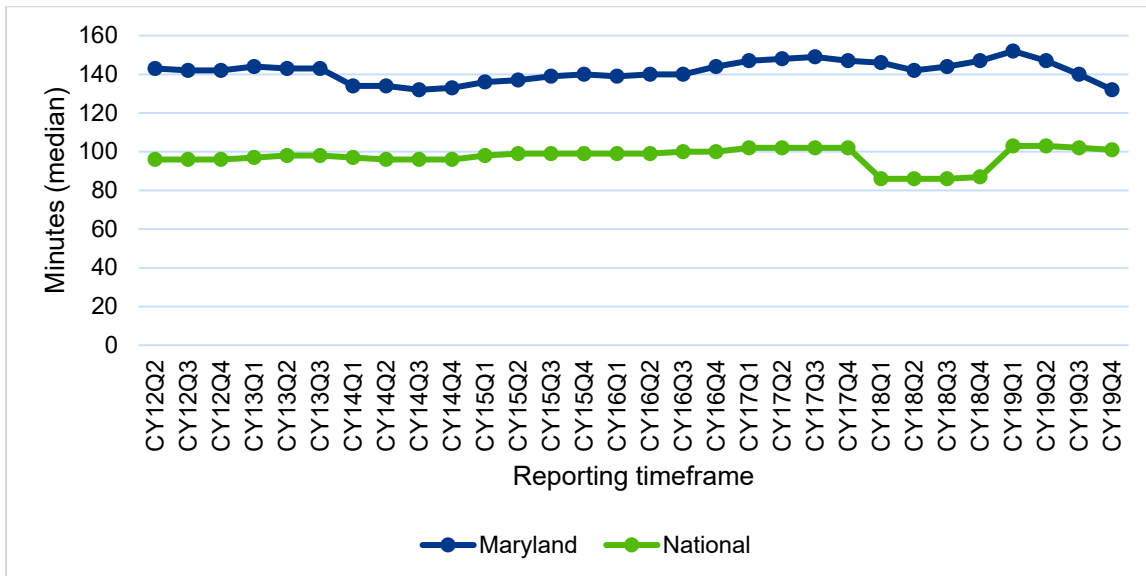
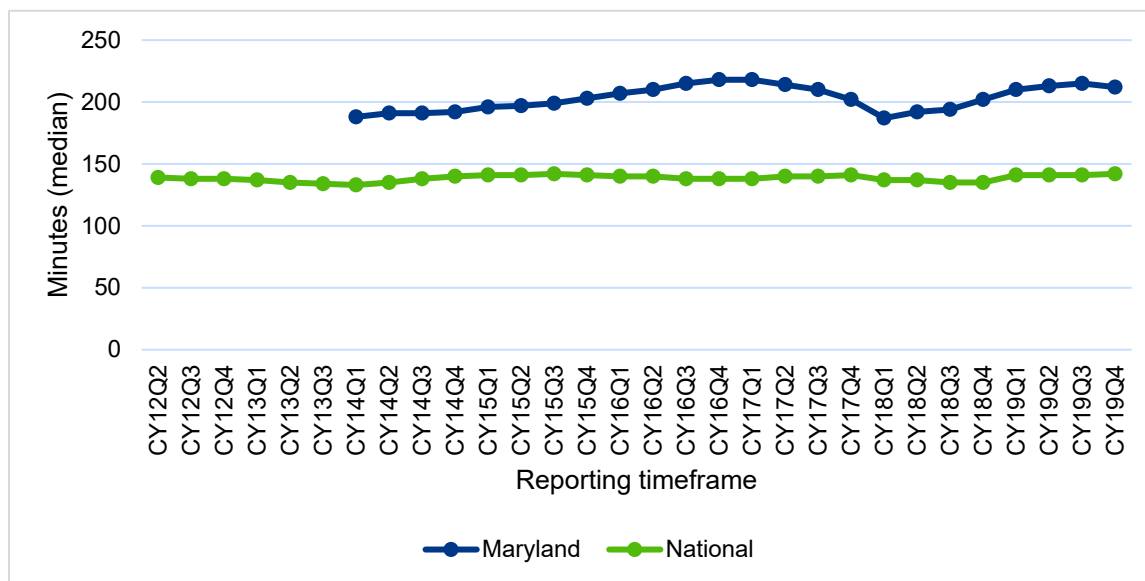


Figure 11. Maryland performance compared to national performance on OP-18b: Arrival to Departure for Discharged ED Patients



In RY 2020 (CY 2018 measurement period), the QBR Program introduced the use of the two inpatient ED wait time measures (ED-1b and ED-2). The HSCRC included the measures as part of the QBR Person and Community Engagement domain because of the correlation between ED wait times and HCAHPS performance. To ensure fairness in performance assessment Maryland hospitals are compared to national peer groups based on ED volume. Stakeholders have also voiced concern about whether the measures should be risk adjusted for occupancy. Staff analysis of 2019 data do indicate that ED visit volume and occupancy are both statistically significantly associated with ED-2b in univariate regression analyses ($p < .05$). However, after controlling for ED volume, occupancy is no longer statistically significant. Based on this analysis, hospitals with greater volumes should be given a higher time threshold, and staff also suggested considering continuous volume adjustment in the future. Lastly, the HSCRC provided protections to hospitals by removing the measure from the total QBR score if the hospital saw improvement in ED wait times but had a lower QBR score when the measure was included (Appendix C).¹⁴

In CYs 2019 and 2020, CMS’s Hospital Inpatient Quality Reporting Program stopped requiring submission of the ED-1b and ED-2b measures, respectively, which meant that the HSCRC had to remove the measures from the QBR Program. However, the Commissioners requested that staff pursue other options to obtain ED wait time data. The two options for measuring ED wait times staff identified are to use CRISP Admission-Discharge-Transfer (ADT) data feeds or the CMS electronic clinical quality measure (eCQM) version of the ED-2 measure, which is optional for hospitals to submit. However, in the

¹⁴ For preliminary regression results that risk adjusted ED wait time measures to account for volume and occupancy, please see Figure C.2 in Appendix C.

FY 2022 IPPS Final Rule, CMS finalized plans to remove this measure beginning with CY 2024 reporting. Despite its removal from the Inpatient Quality Reporting program, HSCRC staff believes it may be possible for hospitals to continue to report the measure electronically since the measure is already nationally specified and continues to be used voluntarily by hospitals for submission to CMS for CYs 2022 and 2023, and is part of the Joint Commission measure set. An ADT-based measure is a less preferable option as it would need to be specified, and there are concerns about the consistency of ADT feeds across hospitals and the potential lack of data elements for establishing a valid and reliable measure using ADT data.

As shown above there is also a sustained trend of longer wait times than the national average for outpatient ED visits (OP-18b), which CMS is continuing to report for hospitals. However, historically stakeholders have not been supportive of including this outpatient measure in the QBR Program. Some stakeholders, including HSCRC staff, have voiced support for including an ED wait time measure for patients not admitted to the hospital because patients should receive timely care and the outpatient ED wait times are correlated with the inpatient ED wait times. However, HSCRC Commissioners did not vote to adopt OP-18b because of the concerns that the time spent on care management in the ED is preferable to an avoidable admission. And while some stakeholders might say that care management should be becoming more efficient, staff did not explore the inclusion of OP-18 as part of the QBR redesign and instead focused on how to obtain inpatient ED wait times for inclusion.

Collection of ED Wait Time Data

The QBR Redesign Subgroup considered options for readopting ED wait time measures in the future to address the persistently long wait times that patients face in Maryland. Because ED wait times are positively correlated with HCAHPS performance, staff believe the Commissioners are interested in including an ED wait time measure for inpatient admissions again, because it could help improve HCAHPS scores. Currently the staff are collaborating with CRISP to build infrastructure for Maryland to collect electronic clinical quality measures (eCQMs) and clinical core data elements for hybrid measures since CMS is signalling this the direction for quality measurement. This investment in eCQM infrastructure also provides an avenue to collect wait times because there is an eCQM specified (ED-2 eCQM). The eCQM ED-2 measure has several advantages:

- Nationally specified measure
- National historical data will be available for establishing performance standards
- Aligns with CMS requirements for submitting eCQMs through CY 2023, and is still used voluntarily by the Joint Commission

Staff also presented Admit, Discharge, and Transfer (ADT) feeds from the CRISP infrastructure system as an alternative data source to eCQMs. CRISP is currently working with hospitals through the Reporting

and Analytics Committee to increase utilization of ADT feeds for other use cases, such as flagging acute exacerbation of chronic conditions for the SIHIS follow-up measure. However, “Decision to admit” is not a specified field within ADT; at best, the ADT feed would have the capability to approximate ED-1b. There were no subgroup comments surrounding ADT feeds.

The subgroup was supportive of monitoring the eCQM ED-2 measure, appreciating that it correlates with patient experience and serves as a broad measure of hospital efficiencies: many departments have to be working properly for a decrease to take place in the time between the decision to admit and actual admission. Broadly, subgroup members noted that eCQM measures are simple, perform better than other collected measures (for example, abstraction measures), and give hospitals the ability to look at data in real time.

The subgroup members had some concerns about implementing eCQM ED-2 into payment, including the lack of comparable historical or national data on all hospitals for creating a benchmark since reporting is voluntary. Because it is a voluntary metric nationally, poor performing hospitals may choose not to report. Noting the concerns around implementing ED-2 into payment, staff believe that there are ways to develop performance standards. For example, staff note that we could continue with the same performance standards as we had with the chart abstracted measure or develop a scoring methodology that only looks at improvement. Staff noted that it will take time for CRISP to develop an eCQM infrastructure, but that the work is underway and they have hired a contractor to assist with the implementation. Thus, for this policy we are asking Commissioners to approve the recommendation to require hospitals to submit the ED-2 eCQM for CY 2022 performance and then in future policies consider readopting the measure for payment.

Follow-Up After Discharge

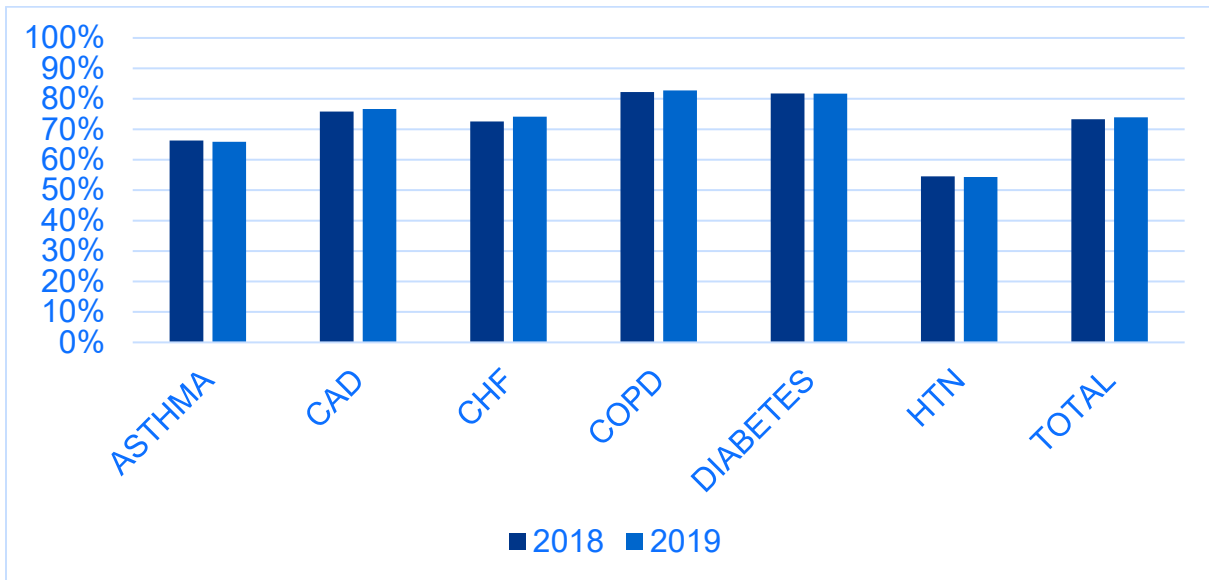
On March 17, 2021, CMS approved Maryland's proposed SIHIS, which included a National Quality Forum-endorsed health plan measure of timely follow-up after an acute exacerbation of a chronic condition in the Care Transition domain. The SIHIS goal is to achieve a 75 percent "timely" follow-up rate for Medicare across the six specified conditions and respective time frames. To hold hospitals accountable for meeting this goal, the HSCRC introduced this measure for Medicare beneficiaries into the RY 2023 QBR Program within the Person and Community Engagement domain and recommend continuing it in the RY 2024 QBR program weighted at 5 percent of the overall QBR score.

The measure assesses the percentage of ED visits, observation stays, and inpatient admissions for one of six conditions in which a follow-up was received within the time frame recommended by clinical practice:

- Hypertension (follow-up within seven days)
- Asthma (follow-up within 14 days)
- Heart failure (follow-up within 14 days)
- Coronary artery disease (follow-up within 14 days)
- Chronic obstructive pulmonary disease (follow-up within 30 days)
- Diabetes (follow-up within 30 days)

Figure 12 shows Maryland's performance over time for each chronic condition. These numbers have recently been updated due to corrections to the measure specifications. Given that the TCOC Model has both hospital and primary care components, CMMI has suggested that Maryland should perform well on follow-up, which is included as one of the care transformation measures in the Statewide Integrated Health Improvement Strategy (SIHIS). Furthermore, Maryland's robust health information exchange, CRISP, has been working to develop tools to help hospitals and providers identify patients using real-time Admission-Discharge-Transfer (ADT) data to alert providers of a patient with one of the chronic conditions being discharged. However, CRISP analyzed the (ADT) data and found that only 14 of 49 hospitals (28.6 percent) are sending 90 percent or more of their discharges with diagnosis codes in their ADT data at the time of discharge, and most hospitals (51.0 percent) are sending 32 percent or less of their discharges with diagnosis codes in their ADT data at the time of discharge. Thus, CRISP is working with the hospitals to understand this issue and how the data might be improved to better track discharges for the chronic conditions follow-up measure. In the meantime, staff notes that the hospitals do have access to the Medicare Claim and Claim Line Feed data to do their own tracking of follow-up.

Figure 12. Medicare-only: Maryland performance by chronic condition (CY 2019)



Note: Maryland numbers are claims-based and built on the Claim and Claim Line Feed with a four-month runout.

CAD = coronary artery disease, CCW = Chronic Conditions Data Warehouse; CHF = coronary heart failure; COPD = chronic obstructive pulmonary disease; HTN = hypertension.

As part of the SIHIS proposal, it was noted that staff would explore expanding the follow-up rates for chronic conditions to other payers and adding follow-up after a hospitalization for mental illness. Thus, the QBR subgroup discussed the goal of moving towards multiplayer or all-payer tracking of follow up. However, given data concerns that have been identified in the Medicare follow-up measure, staff and subgroup members are recommending continuing with Medicare only for RY 2024 and developing monitoring reports for Medicaid and behavioral health. Then in future years the Medicaid and behavioral health can be considered for future payment policy.

Safety Domain

The QBR Safety domain contains five measures from six CDC NHSN HAI categories and the AHRQ Patient Safety Index Composite (PSI-90).¹⁵ It is weighted at 35 percent of the QBR score.

CDC NHSN HAI measures

The CDC's National Healthcare Safety Network (NHSN) tracks healthcare-associated infections such as central-line associated bloodstream infections and catheter-associated urinary tract infections. In the latest exemption approval, CMMI raised concerns about NHSN performance based upon analyses of state-level results compared to national results using the weighted mean, which were submitted by the HSCRC. However, based on additional analysis of available data that removes size of the hospital from influencing the assessment, Maryland's performance on NHSN measures has trended on par with the national average over time.

Figure 13 shows that performance varies by NHSN measure and by the calculated statistic using CY 2019 data.¹⁶ Of note, for four of six NHSN measures, the median hospital in Maryland performed better, i.e. had lower standardized infection ratios (SIRs), than the national median hospital; SSI hysterectomy and C. Diff. are the exceptions.¹⁷

Figure 13. Maryland performance on CDC NHSN HAI measures (CY 2019)

CDC NHSN HAI measure	Maryland weighted mean (SIR)	Non-Maryland weighted mean (SIR)	Maryland median (SIR)	Non-Maryland median (SIR)
Central Line-Associated Bloodstream Infection (CLABSI)	0.711	0.681	0.469	0.592
Catheter-Associated Urinary Tract Infection (CAUTI)	0.732	0.717	0.535	0.653
Surgical Site infection (SSI) Colon	0.938	0.865	0.651	0.717
SSI Hysterectomy	1.372	0.918	1.371	0.735
Methicillin-Resistant Staphylococcus Aureus (MRSA)	0.752	0.821	0.696	0.726
C. Diff.	0.607	0.579	0.531	0.524

¹⁵ For use in the QBR Program, as well as the VBP program, the SSI Hysterectomy and SSI Colon measures are combined.

¹⁶ For further descriptive statistics for each NHSN measure, please see Figures E.2–E.7 in Appendix E.

¹⁷ CMMI's VBP analysis uses unweighted means, whereas the HSCRC's analysis looks at unweighted means, weighted means (weighted based on hospital volume), and medians using CMS Hospital Compare data.

Other studies included a trend analysis¹⁸ and a peer-group analysis and reviewing data from the CDC 2019 National and State HAI Progress Report.¹⁹ The HSCRC conducted a trend analysis from CY 2016–2019 that shows most NHSN measures improved over time (except for the two SSI measures); see Appendix D. Mathematica also conducted a peer-group analysis, using the K-nearest neighbor approach to assign a peer group of 15 national hospitals most similar to a particular Maryland hospital on a number of key hospital characteristics. This analysis shows that Maryland performed worse than its peers 50 to 60 percent of the time in CY 2016–2018. However in 2019 across all measures the hospitals improved and performed better than its peers 52 percent of the time. This improvement was largely driven by improvements in CLABSI, CAUTI, and MRSA. Figure 14 shows the findings from the peer-group analysis.

Figure 14. Percentage of Maryland hospitals with SIRs above and below peer-group median

Measure	Maryland SIR vs. peer group		2016	2017	2018	2019
	Above	Below				
CLABSI	Above		47.2%	56.4%	56.4%	47.4%
	Below		52.8%	43.6%	43.6%	52.6%
CAUTI	Above		69.4%	59.0%	54.1%	39.5%
	Below		30.6%	41.0%	45.9%	60.5%
SSI Colon	Above		56.3%	62.9%	46.9%	54.5%
	Below		43.8%	37.1%	53.1%	45.5%
SSI Hysterectomy	Above		62.5%	55.6%	70.0%	70.0%
	Below		37.5%	44.4%	30.0%	30.0%
MRSA	Above		71.9%	63.9%	54.5%	42.9%
	Below		28.1%	36.1%	45.5%	57.1%
C. Diff.	Above		61.0%	68.2%	63.6%	50.0%
	Below		39.0%	31.8%	36.4%	50.0%
Average^a	Above		61.1%	61.9%	56.4%	48.0%
	Below		38.9%	38.1%	43.6%	52.0%

^a The average was calculated as the number of Maryland hospitals with an SIR above (or below) its peer-group median divided by the number of Maryland hospitals with an SIR across the six HAI measures.

Figure 15 below shows the CDC findings from the 2019 CDC National and State HAI Progress Report for Maryland versus the nation. Of note, CDC statistical analysis of the data indicate that (1) most Maryland hospitals (64 to 94 percent, depending on the measure) have SIRs that are not statistically different from

¹⁸ For a trend analysis (CY 2016–2019) comparing non-Maryland weighted SIR means to Maryland weighted SIR means, please see Figures E.2–E.7 in Appendix D.

¹⁹ For more information on the CDC 2019 National and State HAI Progress Report, please see <https://www.cdc.gov/hai/data/portal/progress-report.html>.

the national rate and (2) there was no statistically significant change on any NHSN measure between 2018 and 2019 for Maryland.

Figure 15. CDC assessment of the statistical significance of Maryland versus national hospital SIRs²⁰

Measure	Number of infections		95% confidence interval for SIR		Facility-specific SIRs				Facility-specific SIRs at key percentiles					
	Observed	Predicted	SIR	Lower	Upper	No. of facilities with at least one predicted infection	% of facilities with SIR sig. higher than national SIR	% of facilities with SIR sig. lower than national SIR	% of facilities with SIR similar to national SIR	10th	25th	Percentile 50th	75th	90th
CLABSI	328	449.26	0.730	0.654	0.812	42	10%	7%	83%	0.000	0.173	0.548	0.860	1.267
CAUTI	348	443.58	0.785	0.705	0.870	41	7%	2%	90%	0.017	0.294	0.631	0.908	1.176
SSI Hysterectomy. ^a	44	37.20	1.183	0.870	1.573	8	NA	NA	NA	NA	NA	NA	NA	NA
SSI Colon	137	160.74	0.852	0.718	1.004	32	3%	6%	91%	0.000	0.000	0.676	1.244	1.746
MRSA	143	186.91	0.765	0.647	0.898	35	6%	0%	94%	0.000	0.309	0.574	0.863	1.252
C. Diff.	1,107	1,778.81	0.622	0.586	0.660	47	21%	15%	64%	0.130	0.304	0.546	0.797	0.903

^a Not enough hospitals reporting for comparison to nation or percentile analysis.

Subgroup members also discussed surveillance bias for NHSN measures in great detail. Mathematica, on behalf of the HSCRC, conducted a literature review on surveillance bias.²¹ Studies indicate that HAI rates vary across facilities, in part because of differences in the application of NHSN criteria, clinical definitions, and surveillance bias, but that auditing and clinical education can reduce over- and under-reporting of HAIs. Some subgroup members said investing more resources in NHSN measures could result in finding more infections and thus reduce performance. Among the solutions to reduce surveillance bias, the subgroup discussed using EHR metrics or claims-based measures that yield appropriate rank-order comparisons across hospitals on infection rates postoperatively.

Patient Safety Index (PSI-90)

To align with the VBP program and expand the QBR program’s measurement of preventable complications that cause patient harm and increase the cost of hospital care, the Commission approved the adoption of the all-payer version of the PSI-90 measure in the RY 2023 QBR program at the recommendation of staff and PMWG stakeholders. The Agency for Healthcare Research and Quality

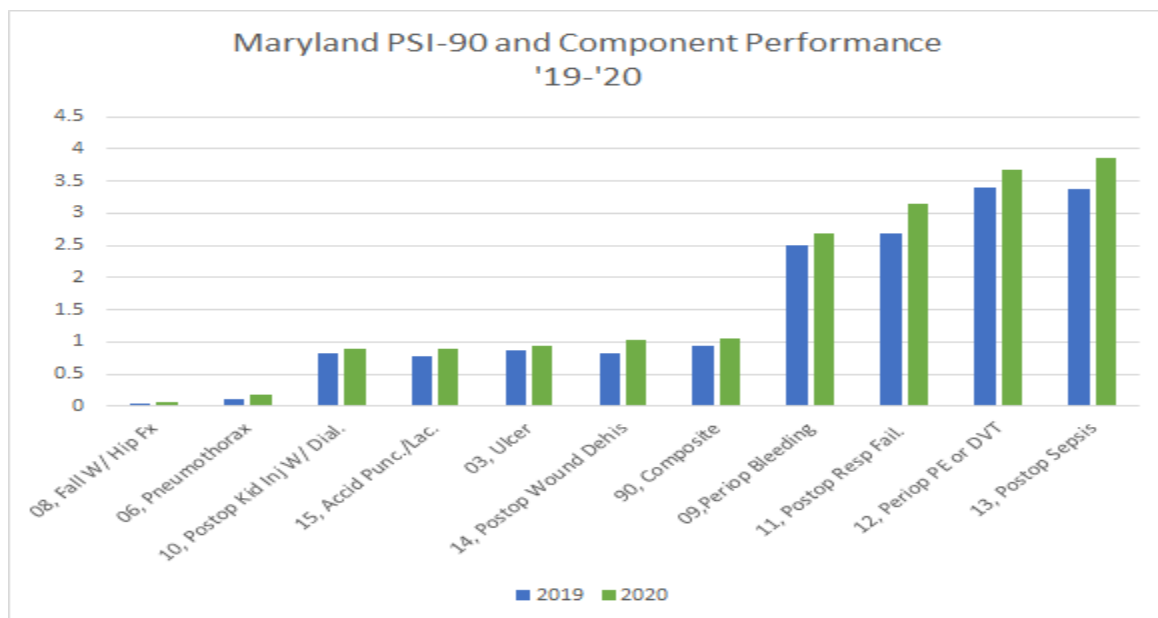
²⁰ Ibid.

²¹ For more information on the HAI measure environmental scan, please see https://hscrc.maryland.gov/Documents/HAI%20Measure%20Lit%20Rev%20%20Environmental%20Scan_4.13.21.pdf.

(AHRQ) Patient Safety Indicators were developed²² and released in 2003 to help assess the quality and safety of care for adults in the hospital. PSI-90 focuses on a subset of ten AHRQ-specified PSIs of in-hospital complications and adverse events following surgeries, procedures, and childbirth. The PMWG noted that CMS is removing the PSI-90 measure from the VBP program but will retain the measure in the Hospital Acquired Conditions Reduction Program for FY 2024. Since Maryland does not have PSI-90 in the MHAC program, staff is recommending to retain it in the QBR program.

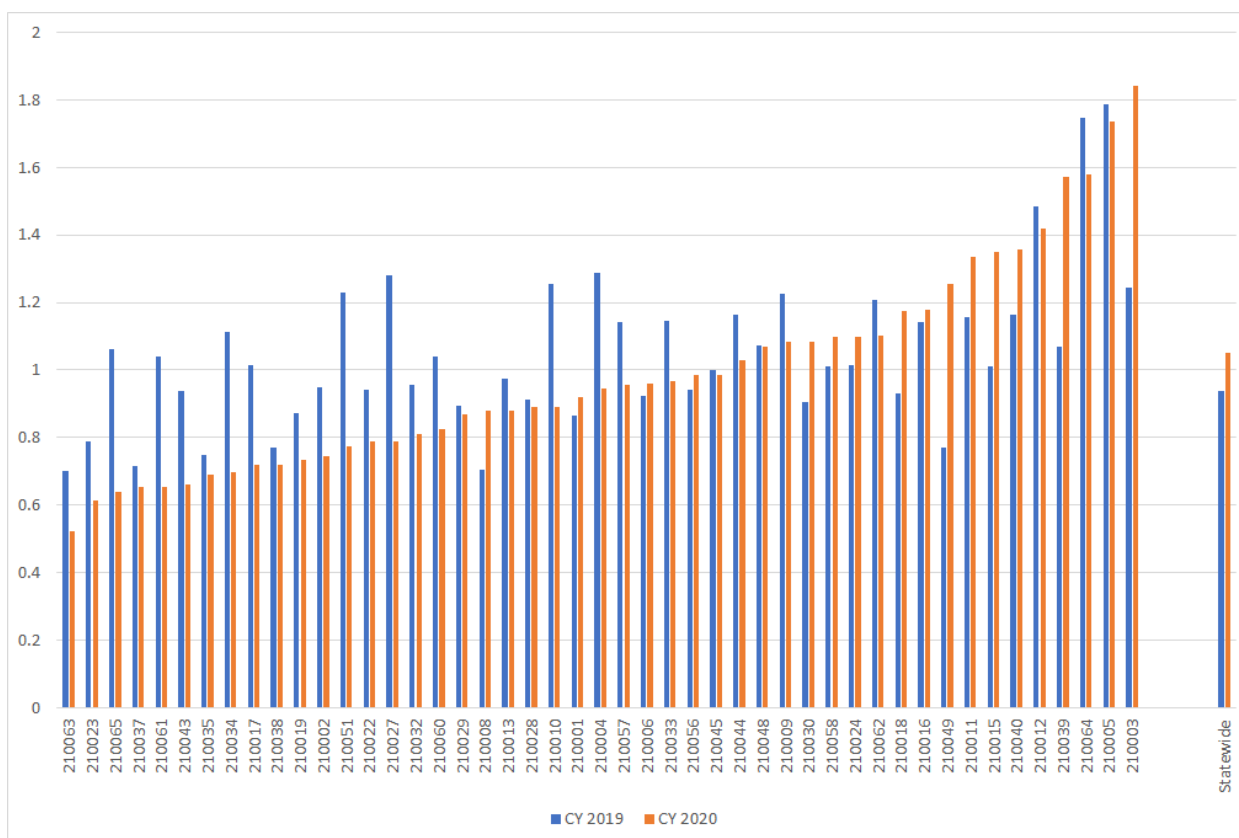
Maryland statewide performance has declined slightly on the PSI-90 composite as well as the component measures for 2020 compared to 2019 as illustrated in Figures 16 and 17 with some variation across hospitals as illustrated in Figure 17. Staff notes this is not unanticipated, as hospital stakeholders have noted increases in other complication measures, such as infections related to the COVID pandemic in 2020.

Figure 16. Performance on All-Payer PSI 90 Composite and Component Measures



²² AHRQ contracted with the University of California, San Francisco, Stanford University Evidence-based Practice Center, and the University of California Davis for development. For additional information: https://www.qualityindicators.ahrq.gov/Modules/psi_resources.aspx

Figure 17. Maryland By-Hospital PSI Rates CYs 2019 and 2020



Other potential measures

Despite various analyses indicating Maryland is performing on par with the nation for the NHSN measures, subgroup members and staff expressed commitment to continued improvement across these measures to improve the safety of Maryland hospitals. Staff also explored potential ways to expand the Safety domain to other measures, including some that are existing and emerging NHSN measures not currently in the VBP program.^{23,24} While staff is tracking NHSN measures, they are also exploring other quality measures from CMS Care Compare Inpatient Quality Reporting (IQR) measures Program to see where CMS is moving and whether Maryland has an opportunity to improve in those areas. Measures discussed are listed below.

- **Sepsis bundles** (CMS-required measure in the Hospital Inpatient Quality Reporting Program): Sepsis bundle (SEP_1) came online in CY 2017, and additional process measures (such as the

²³ For CDC NHSN SSI procedure code lists and protocols, please see https://www.cdc.gov/nhsn/psc/ssi/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnhsn%2Facute-care-hospital%2Fssi%2Findex.html.

²⁴ For CDC NHSN VAE measures, please see https://www.cdc.gov/nhsn/pdfs/pscmanual/10-vae_final.pdf.

septic shock three-hour bundle [SEP_SH_3HR]) were added in CY 2019. For the sepsis bundle, subgroup members expressed concern that the measure definitions were not consistently applied by hospital staff and therefore the measures were not strong QBR measure candidates.

- **Severe maternal morbidity:** The CDC-defined measure uses administrative discharge data and diagnosis and procedure codes from the International Classification of Diseases (ICD) submitted to the HSCRC by hospitals as “case mix” data.²⁵ Maryland has SIHIS goals related to cutting the number of severe maternal morbidity (SMM) events and reducing disparities. Staff is working to develop hospital-level SMM reports for hospitals. In the IPPS FY 2022 Final Rule, CMS finalized its requirements for hospital reporting on a Structural Measure indicating whether the hospital participates in a Statewide and/or National Perinatal Quality Improvement Collaborative Program aimed at improving maternal outcomes during inpatient labor, delivery and postpartum care, and has implemented patient safety practices or bundles related to maternal morbidity to address complications, including, but not limited to, hemorrhage, severe hypertension/preeclampsia or sepsis. Some members expressed support for an SMM measure but recommended monitoring since the measure is not risk adjusted.
- **Hospital-onset bacteremia (HOB):** CDC is developing a HOB measure that is broader than CLABSI in that a central line is not needed as the source of infection. The Society for Healthcare Epidemiology of America Research Network administered a web-based, multiple-choice survey to 133 hospitals and found that HOB is perceived as preventable, reflective of quality of care, and potentially acceptable as a publicly reported quality metric.²⁶ Further studies of HOB are needed, including validation as a quality measure, assessment of risk adjustment, and formation of evidence-based bundles and tool kits to facilitate measurement and improvement of HOB rates. Some subgroup members noted there is a push to move quality reporting away from certain NHSN metrics currently in use because they only capture a small number of infections and patient factors that are not properly risk adjusted. For instance, subgroup members said they expect HOB to replace CLABSI soon, given that HOB is a more comprehensive and valid way to measure hospital acquired blood infections

²⁵ For more information on CDC’s severe maternity morbidity indicators, please see <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html#icd>.

²⁶ For more information on the HOB pilot, please see <https://pubmed.ncbi.nlm.nih.gov/30932802/>.

Although some members agreed that investments in implementation and improvement should be made in valid new safety measures, many members stressed the need to focus on improving existing NHSN measures rather than adding more measures to QBR's Safety domain at this time. They noted that improving existing measures would help maintain a level of comparability to the national VBP model. The subgroup did not comment on changing the Safety domain weighting from 35 percent. Staff will continue with immediate next steps toward understanding and improving safety measurement:

- Discuss with CMMI the opportunity to help the CDC pilot HOB or other new digital measures in Maryland hospitals
- Consider modifying how scores are assessed due to the COVID-19 pandemic increasing hospital infections
- Complete development of reports by hospital on SMM for monitoring and to support SIHIS-related goals

Clinical Care Domain

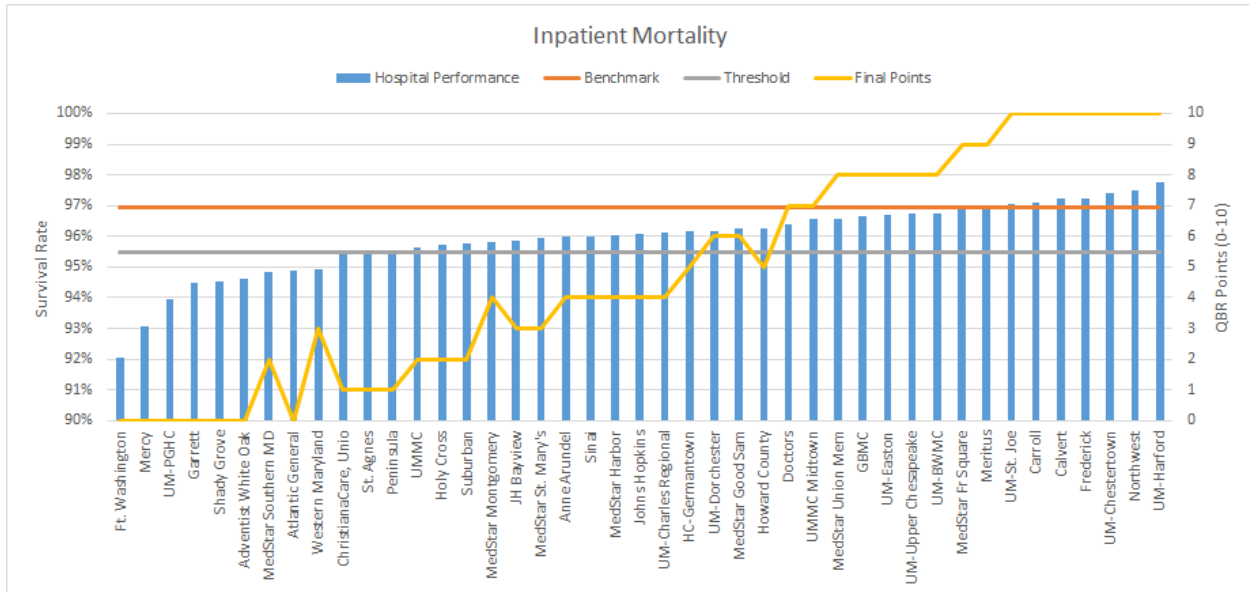
This domain, weighted at 15 percent of the QBR score, currently includes:

- A broader inpatient, all-payer, all-condition mortality measure that is weighted at 10 percent. This differs from the CMS VBP Program that uses four condition-specific, 30-day mortality measures for Medicare beneficiaries. The HSCRC is in the process of developing an all-payer, all-cause 30 day mortality measure for future rate years.
- The inpatient Medicare Total Hip Arthroplasty-Total Knee Arthroplasty (THA/TKA) Complications measure is weighted at 5 percent. This is also used by the CMS VBP program.

Inpatient mortality

The current mortality measure in the QBR Program is an all-cause, all-payer measure that captures patients who die while in the hospital. It was designed as an inpatient measure due to a lack of data on post discharge mortality at the time of development. Figure 18 shows the RY 2021 by hospital performance (blue bars), along with the threshold (grey; state median) and benchmark (orange; State mean of top decline) lines. The yellow line indicates the number of points each hospital would earn based on their performance relative to the threshold and benchmark. The line is jagged in parts since hospitals could earn the better of attainment or improvement. In total 16 percent (7 out of 44) hospitals earn the full 10 points. Furthermore, staff believes the current inpatient measure might be topped out due to the shrinking distance between benchmark and threshold values and because most Maryland hospitals (34 of 44) are either earning equal improvement and attainment credit (n = 14) or are earning attainment credit (n = 20). Figure 18 shows the threshold and benchmark values for the current inpatient mortality measure.

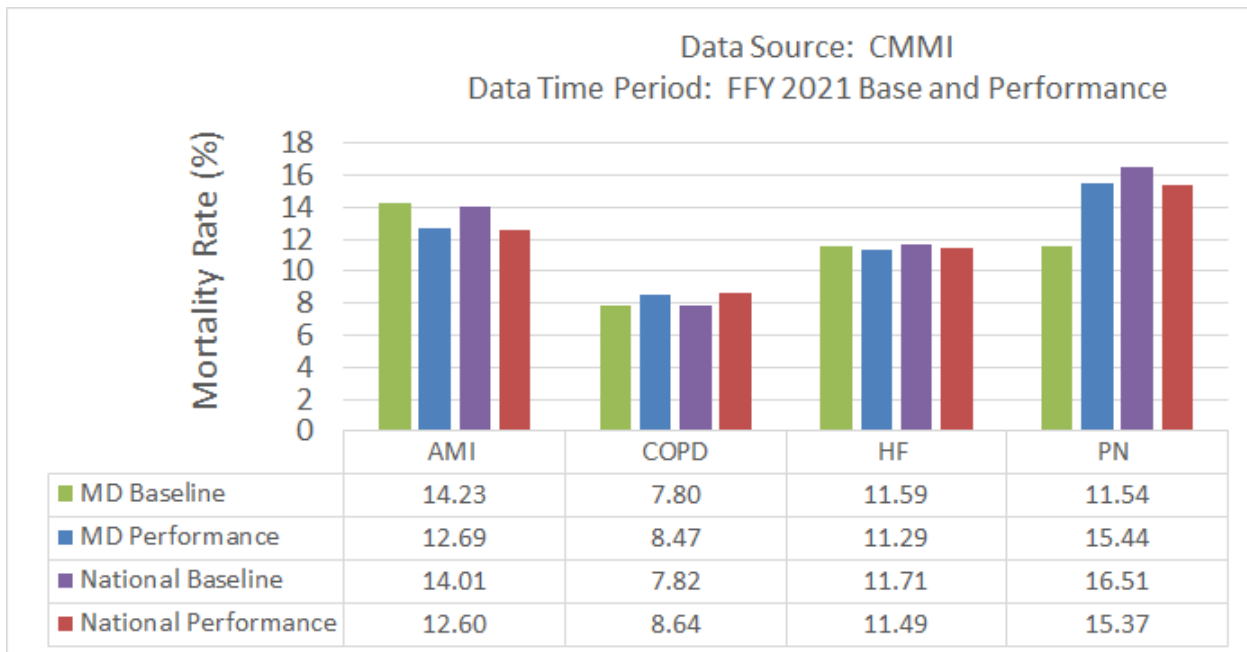
Figure 18. Maryland inpatient mortality and QBR scores



CMS 30-Day condition-specific mortality measure

CMS uses condition-specific 30-day mortality measures based on Medicare claims data in its VBP program. Although Maryland does not use these measures in the QBR program since they apply to Medicare patients only, Maryland performance data is available for comparison. As illustrated in Figure 19 below, Maryland performs slightly better than the National VBP hospitals on Chronic Obstructive Pulmonary Disease and Heart Failure, and slightly worse on Acute Myocardial Infarction and Pneumonia.

Figure 19. Maryland 30-day Condition Specific Mortality Compared to the Nation



30-Day All-Payer Mortality Measure

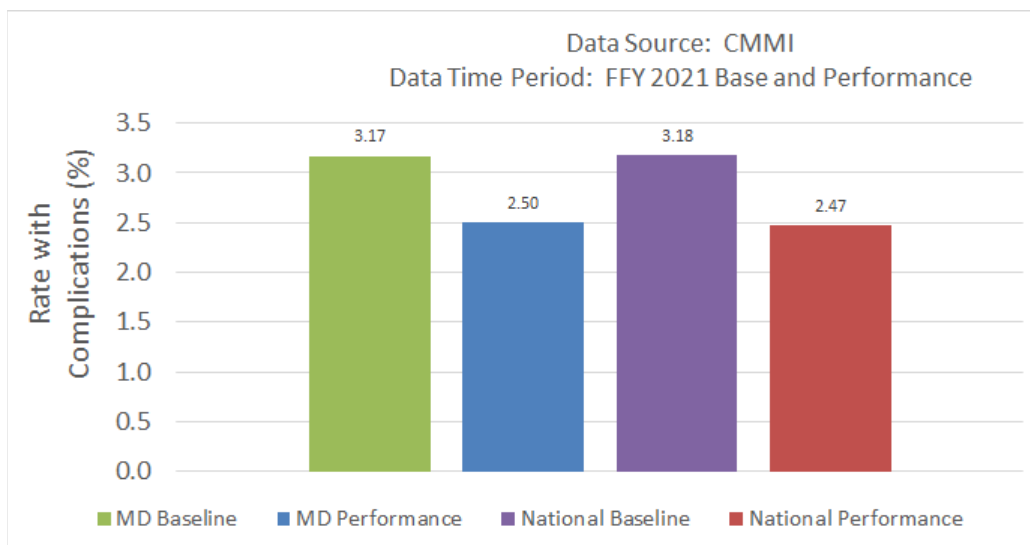
Recent legislative changes have allowed HSCRC to get access to death data from Maryland Vital Statistics. Although it is estimated that two-thirds of deaths occur in hospitals, staff believes post-hospitalization deaths are an important indicator of quality and that moving to a 30-day measure better aligns with CMS's measures. Furthermore, staff believes the current inpatient measure might be topped out. Thus, staff has been working with Mathematica to develop a 30-day all-payer, all-cause mortality measure based on CMS's measures. Appendix E provides details on the specification of the measure and validity and reliability tests to be applied. Currently staff is awaiting a revised case-mix file with a 30-day death flag from CRISP to continue measure development. For RY 2024 the workgroup members²⁷ recommend developing summary level monitoring reports and hospital specific discharge level files so that the hospitals can review the measure and the trends in 30-day mortality, and considering adoption of the measure for payment in RY 2025.

²⁷ Medstar, UMMS, and Johns Hopkins have written letters in support of moving to a 30-day mortality measure.

Total Hip Arthroplasty-Total Knee Arthroplasty (THA/TKA) Complications

The QBR Program currently includes an inpatient THA/TKA complications measure for Medicare beneficiaries under the QBR Program's Clinical Care domain and, similar to the THA/TKA complications measure in the national VBP Program, is weighted at 5 percent. Hip/knee complications in the inpatient measure include various post-operative infections, pulmonary embolism, heart attack, bleeding, mechanical complication, and death. Maryland performs on par with the nation on the THA/TKA measure, as illustrated in figure 20 below.

Figure 20. THA/TKA complication rates FFY 2021 base and performance periods: Maryland vs. the nation



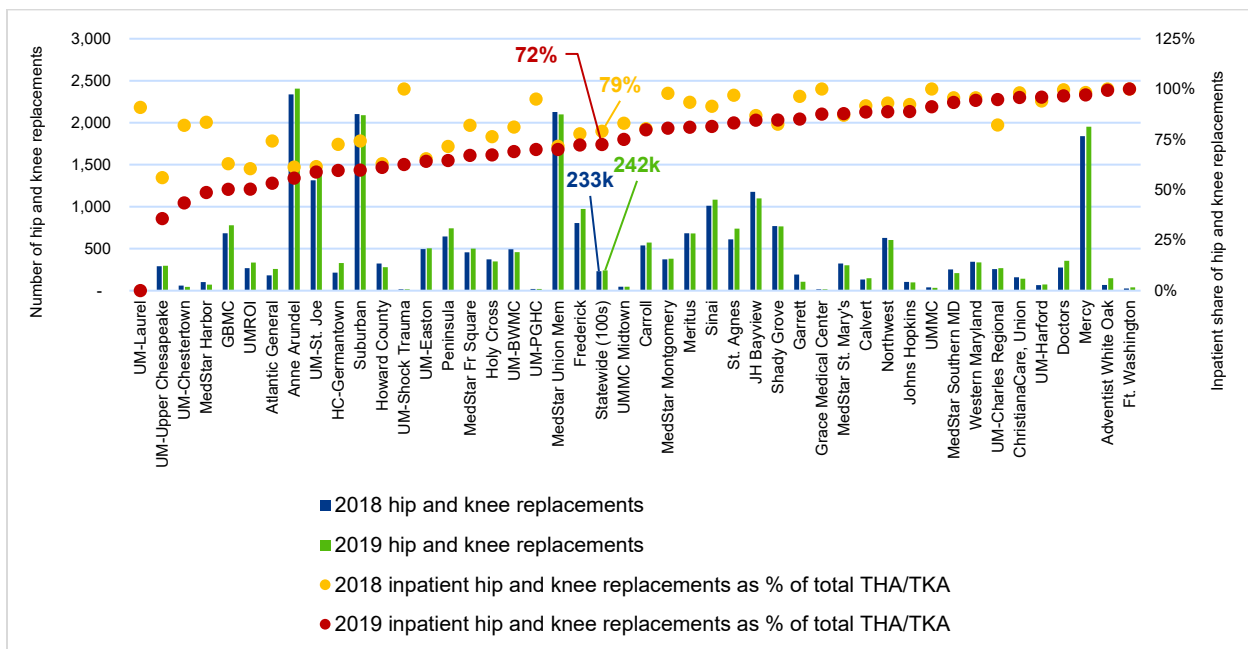
Staff presented three issues for the subgroup to consider related to updating the THA/TKA measure.

1. There is **movement of THA/TKA procedures from the inpatient setting to the outpatient hospital setting**, nationally and statewide
2. The current measure does not account for **non-Medicare THA/TKA procedures**
3. There are **other potential THA/TKA measures**, such as a provider level eCQM for THA/TKA complications and a hospital-level patient-reported outcome performance measure (PRO-PM) that could be adopted for hospital use

Inpatient to outpatient THA/TKA procedure movement

Based on analysis of Maryland THA/TKA procedure volume for 2018 and 2019, the percentage of all-payer inpatient procedures dropped from 79 percent in 2018 to 72 percent in 2019, while the total volume of THA/TKA procedures rose from 23,300 to 24,200. Figure 21 shows the movement of THA/TKA procedures per Maryland hospital from 2018 to 2019.

Figure 21. Total number of hip and knee replacements and inpatient share across Maryland hospitals



Subgroup members cautioned against using 2019 data when analyzing the shift from the inpatient to the outpatient setting, given the even larger shift in 2020 and 2021 (especially at academic medical centers) due to the COVID-19 pandemic and CMS regulatory requirements. In addition, staff and subgroup members noted that some surgery centers where THA/TKA procedures are done are not hospital owned or regulated, and hospitals are seeing complications after procedures performed in these alternate locations. In light of this, subgroup members also advised gaining better understanding of how a new THA/TKA measure would specifically affect the QBR Program and how best to structure financial incentives to achieve better outcomes for hospitals when procedures are done at non-affiliated/regulated sites.

Accounting for non-Medicare THA/TKA procedures

With the current Medicare-only measure, the quality of care is not assessed for many patients undergoing these procedures (~40 percent).²⁸ The subgroup discussed options for expanding to a multi-payer or all-payer measure as outlined below.

Potential THA/TKA measure options

Staff and the subgroup discussed other measure options and their applicability. The current Medicare-only measure could be expanded to include Medicaid procedures, while retaining CMS's risk adjustment model, which relies on non-hospital claims preceding the index stay. This would entail use of the full Medicaid claims data set, for which the HSCRC has access through CRISP. Alternatively, a measure including all payers could be specified, replacing CMS's risk adjustment approach with one based on case-mix from the index stay.

The subgroup discussed an eCQM for THA/TKA complications measure created in 2020 by Brigham and Women's Hospital. CMS developed this measure for the Merit-Based Incentive Payment System, and it uses the same complications as the current CMS claims-based measure. The measure would need to be specified as a hospital-level measure since it is currently specified at the provider level. It is an all-payer measure that includes both inpatient and outpatient procedures (ages 18+), which would align with the HSCRC's current strategy and investment to begin collecting eCQMs. Subgroup members noted the need to establish a new baseline as a result of a potential increase in the inpatient complications rate (with a shift to the outpatient setting, the more complex patients may have procedures in inpatient settings, leading to an increase in the complications rate).

The subgroup expressed enthusiasm for exploring patient-reported outcomes (PRO) and believes PROs are critical to driving value for patients. If pursuing a patient-reported outcome measure (PROM), staff could use the hospital-level PRO performance measure suggested in the FY 2022 IPPS proposed rule.²⁹ This PROM, developed by the Joint Commission, consists of two (preoperative and postoperative) process measures and captures the share of patients for which patient-reported outcome (PRO) data were collected. The measure was also used as part of the CMS Comprehensive Care for Joint Replacement (CJR) model. If the HSCRC wants to add a PROM, the necessary infrastructure would need to be created for collecting PROs. Subgroup members noted a potential challenge for community-based hospitals in working with provider groups affiliated with multiple hospitals. Community hospitals should do

²⁸ 56 percent of THA/TKA procedures in 2018 and 57 percent of THA/TKA procedures in 2019 were from Maryland Medicare fee-for-service and Medicare Advantage patients, which indicates the measure could account for over 40 percent more patients.

²⁹ For the section in the FY 2022 IPPS proposed rule on "Potential Future Inclusion of a Hospital-Level, Risk-Standardized Patient-Reported Outcomes Measure Following Elective Primary Total Hip and/or Total Knee Arthroplasty," please see <https://www.govinfo.gov/content/pkg/FR-2021-05-10/pdf/2021-08888.pdf> (pp. 519–523).

their best to help these provider groups meet multiple standards, especially if there is a shift toward outpatient measures. Some subgroup members noted that the real value in the PRO measure is not necessarily on the hospital side but on the physician practice side, adding that capturing patient outcomes at certain points after surgery was important for discerning whether a patient’s functioning and quality of life had improved.

Subsequently, members expressed an overall concern with an inpatient-only measure. They also advised caution in adapting an eCQM measure designed for the outpatient/clinician level and attributing it to the hospital level without first looking at the research on the measure’s validity.

Figure 22 summarizes the measures considered and the programs that currently use the measures. Figure 23 shows the measure options and how they would achieve the shift from inpatient to outpatient, from Medicare to all-payer, or from inpatient to outpatient *and* Medicare to all-payer—which would require the most resources from staff.³⁰

Figure 22. THA/TKA quality measures and programs

Measure	Program
1. Inpatient risk-standardized complications measure based on Medicare claims data	CMS Hospital Inpatient Quality Reporting Program, VBP, CMS CJR program
2. Inpatient PROM based on claims and surveys	CJR program
3. Inpatient and outpatient complications measure based on EHRs	CMS Measuring Outcomes in Orthopedics Routinely (MOOR) project ^a
4. Inpatient and outpatient PROM based on EHRs and a survey (MOOR project)	CMS MOOR project
5. Outpatient/ambulatory PROM, a process measure based on chart abstraction and a survey	Joint Commission Certification for Hip and Knee Replacement

^a The MOOR project is measured at the physician level, but it also includes development of a PROM and two post-discharge drug measures.

Figure 23. THA/TKA quality measures and adoption options summary

	Inpatient	Inpatient and outpatient
Medicare	<ol style="list-style-type: none"> 1. CMS THA/TKA complications claims measure (Hospital Inpatient Quality Reporting Program, VBP, CJR) 2. CMS inpatient PROM (CJR) 	Measures 1 and 2 (adapted for outpatient)
All-payer	Measures 1 and 2 (adapted for all-payer) <ol style="list-style-type: none"> 5. Joint Commission outpatient/ ambulatory PROM, a process measure based on chart abstraction and a survey; 	3. CMS inpatient and outpatient complications measure based on EHRs (adapt for hospital)

³⁰ For a more thorough list describing hip/knee hospital measure options, please see https://hsrc.maryland.gov/Documents/Quality_Documents/QBR/R2023/THA-TKA%20Measure%20Expansion%20Options%20for%20Discussion.pdf.

	Inpatient	Inpatient and outpatient
	the outcome is administration of the PROM survey, not the results	4. CMS's inpatient and outpatient PROM based on EHRs and a survey (adapt for hospital)

Going forward, Commission staff will work with the PMWG and other stakeholders to continue building a multiyear, multipronged, broad strategy for inclusion of outpatient measures in the HSCRC's quality programs. Specifically, for a THA/TKA measure, staff and stakeholders should explore approaches to adapting CMS's current claims-based inpatient THA/TKA measure to the all-payer population, and the feasibility, validity and reliability of specifying the eCQM version of the measure at the hospital level. Further in the future, staff and stakeholders should explore the feasibility of developing an infrastructure to collect and use a hospital-level PRO-PM for elective primary THA/TKA procedures.

Outpatient new measures

As alluded to earlier, the QBR Program currently consists of quality measures limited to the inpatient setting. The HSCRC is exploring how to expand pay-for-performance programs, including QBR, to include outpatient quality measures for the following reasons:

- CMS and CMMI have expressed interest in this shift, particularly as care delivery previously completed in an inpatient setting is shifting to the outpatient setting.³¹
- Maryland's All-Payer Model established incentives to move care down the continuum as clinically appropriate, and these incentives continue with even greater emphasis under the TCOC Model.
- An outpatient expansion would align well with other TCOC initiatives, such as the Episode Quality Improvement Program,³² SIHIS population health goals, and timely follow-up after inpatient/ED/observation visits.
- Development of an outpatient quality strategy is broader than the QBR redesign and could overlap with other Maryland quality programs.

³¹ Last year, CMS finalized plans to eliminate its "inpatient-only" list over a three-year period starting in CY 2021. But in the Outpatient Prospective Payment System CY 2022 proposed rule, CMS walked back its plan to eliminate this list and, after clinical review of the 298 services removed from the list in CY 2021, proposes to add these services back to the inpatient-only list starting in CY 2022. For more information, see <https://www.cms.gov/newsroom/fact-sheets/cy-2022-medicare-hospital-outpatient-prospective-payment-system-and-ambulatory-surgical-center>.

³² The voluntary Episode Quality Improvement Program uses an episode-based approach to engage specialist physicians treating Maryland Medicare beneficiaries in care transformation and value-based payment. The program holds participants accountable for achieving cost and quality goals for one or more clinical episodes. With enrollment beginning in July 2021 and implementation planned for January 1, 2022, the first performance year of the Episode Quality Improvement Program will cover a range of initial clinical episodes in the areas of cardiology, gastroenterology, and orthopedics.

As noted above regarding outpatient measure expansion for THA/TKA, staff acknowledge that a shift to include outpatient measures would be a multipronged, multiyear effort. To prepare, staff has been researching existing outpatient measures—such as federal Hospital Outpatient Quality Reporting Program measures; National Quality Forum-endorsed measures; Joint Commission-required measures; and measures from outpatient monitoring or regulatory groups such as MedPAC, the Maryland Health Care Commission, or Leapfrog.³³ Staff has also been looking for opportunities beyond what is available in the measurement space by reviewing CMS Claim and Claim Line Feed data and inpatient and outpatient data, with a focus on known shifts to the outpatient care setting, and trying to understand overlapping regulatory authorities for care across the system.

With readily available data for Maryland and the nation for comparison, HSCRC has analyzed a subset of seven of the CMS Hospital Outpatient Quality Reporting (OQR) Program measures using CY 2019 data. As illustrated in the summary of the analysis below in Figure 24, Maryland statewide performs worse than the nation on the OP -18b ED Arrival to ED Departure for Discharged ED Patients, and the OP-32 Seven-day Hospital Visit Rate after Colonoscopy. Detailed results for each measure are included in Appendix F.

Figure 24. CMS OQR Program Measures, Maryland vs the Nation (CY 2019)

Measure	Maryland's performance compared with the nation's
OP-18b: Median Time from ED Arrival to ED Departure for Discharged ED Patients	Worse
OP-23: Head CT or MRI Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients Who Received Head CT or MRI	Same
OP-29: Appropriate Follow-Up Interval for Normal Colonoscopy in Average-Risk Patients	Better
OP-32: Facility Seven-Day Risk Standardized Hospital Visit Rate After Outpatient Colonoscopy	Worse
OP-35ADM: Admissions for Patients Receiving Outpatient Chemotherapy	Slightly better
OP-35ED: ED Visits for Patients Receiving Outpatient Chemotherapy	Slightly worse
OP-36: Hospital Visits After Hospital Outpatient Surgery	Slightly worse

Staff also conducted a selective study using Claim and Claim Line Feed data to determine the volume of elective services by place of service. Figure 25 shows a sample of the study results.³⁴ Although

³³ Staff has researched the following existing data sources for creating an outpatient expansion measure: CMS Hospital Compare outpatient data, outpatient case-mix data, and CMS's Claim and Claim Line Feed TCOC data. They have also researched nursing home data from the Minimum Data Set, home health data from the Outcome and Assessment Information Set, and data from the Ambulatory Surgical Center Quality Reporting Program for further down the line.

³⁴ For additional procedures, see [https://hscrc.maryland.gov/Documents/CY2019%20Surgeries%20by%20POS%20\(1\).xlsx](https://hscrc.maryland.gov/Documents/CY2019%20Surgeries%20by%20POS%20(1).xlsx).

colonoscopy procedures mostly occur in ambulatory surgical centers, which are outside the HSCRC's regulatory authority, hip and knee procedures mainly occur in hospitals. Staff saw this as an indicator that creating or adapting an outpatient measure for elective hip and knee procedures could be a way to improve quality in the hospital outpatient space. However, staff also wants to acknowledge Maryland's relatively worse performance on OP-32: Hospital Visit Rate After Outpatient Colonoscopy combined with the large volume of colonoscopy services provided in hospitals, despite a larger percentage of these services occurring in ambulatory surgical centers.

Figure 25. Volume of elective services by place of service among Maryland hospitals (CY 2019)

Surgeries by POS CY2019 Current Procedural Terminology category	Claims				Percentage		
	Inpatient	Outpatient	Ambulatory surgical centers	Total	Inpatient	Outpatient	Ambulatory surgical centers
Elective knee arthroplasty-partial	81	787	246	1,114	7%	71%	22%
Elective knee arthroplasty-total	5,215	8,931	413	14,559	36%	61%	3%
Elective knee arthroplasty-revision	1,125	116	67	1,308	86%	9%	5%
Elective hip arthroplasty (non-fracture)-total	5,937	132	155	6,224	95%	2%	2%
Elective hip arthroplasty (non-fracture)-revision	770	5	32	807	95%	1%	4%
Colonoscopy-diagnostic/therapeutic	1,108	18,972	42,289	62,369	2%	30%	68%
Combo: Colonoscopy & endoscopy	1,464	8,225	19,953	29,642	5%	28%	67%
Colonoscopy-screening	766	7,842	21,435	30,043	3%	26%	71%

Staff believes both volume and percentage of services, as well as quality performance where measures exist, should be considered when strategically deciding to include an outpatient measure in a pay-for-performance program. And, as previously stated, some of these measures might fit better in other quality programs (such as revisit-type measures in Maryland's Readmissions Reduction Incentive Program or Potentially Avoidable Utilization Savings Policy). Thus, at this time the staff is not recommending any immediate changes to the QBR policy but will be working over the coming years to develop a comprehensive outpatient hospital quality strategy and policy updates.

Score and Revenue Adjustment Modeling

For this policy, staff modeled scores and revenue adjustments using data from RY 2021 time periods. The two models presented below in Figure 26 are with and without the addition of linear scores. It shows that hospital scores increase slightly when linear HCAHPS scores are included rather than only top box scores for HCAHPS; staff notes this would be expected since the linear scores somewhat lower the standards in HCAHPS with the idea it will reinvigorate efforts to focus on these important measures. It is

worth noting again that 35 percent of the QBR score remains on HCAHPS top box and consistency, which is still higher than the 25 percent in the national VBP program.

Figure 26. Hospital Score Modeling

Statistic	Total QBR Score	
	Model A RY23 Measures, No Linear	Model B RY23 Measures + 4 Linear*
Median	32.96%	33.49%
Average	34.25%	34.82%
25th Percentile	27.79%	28.02%
75th Percentile	39.23%	39.65%
Min	13.02%	12.90%
Max	51.23%	53.52%

* The four HCAHPS measures are: nurse communication, doctor communication, responsiveness, and the 3-part care transitions measure

Beyond the addition of linear measures, the QBR scores and revenue adjustments were calculated using the methodology approved for RY 2023. This includes maintaining the reward/penalty cut-point at 41 percent. This cut point is estimated by calculating the average VBP score nationally if the VBP program had the QBR domains and weights. Staff updated this calculation by bringing in linear scores for national hospitals for FFY 20 and FFY 21. While the national average scores also increased slightly with linear measures included, the average VBP score for the last six years is 40.39 percent, which supports the cutpoint remaining at 41 percent. Using the scores presented above, staff modeled revenue adjustments using the RY 2021 preset scale. This scale is designed to not reward hospitals for performance that lags behind the nation. Figure 27 provides the estimated statewide revenue adjustments and counts of hospitals receiving a reward and penalty. Overall, the estimated revenue adjustments are fairly similar across the models, although penalties are the lowest and rewards the highest when linear scores are added (Model B). However, adding the linear scores does not result in any hospital going from the penalty to the reward zone (i.e., the 9 hospitals rewarded are the same for both models).

Figure 27. Revenue Adjustment Modeling

Descriptive Statistics	Model A RY23 Measures, No Linear		Model B RY23 Measures + 4 Linear	
	\$	%	\$	%
Net Adjustments	-\$51,276,346	-0.52	-\$47,724,587	-0.48
Penalties	-\$53,679,444	-0.01	-\$50,850,934	-0.01
Rewards	\$2,403,098	0.00	\$3,126,347	0.00
# Hospitals Penalized	33		33	
# Hospitals Rewarded/ Not Penalized	9		9	

FUTURE OF QBR

While the RY 2024 QBR redesign is focused on immediate changes in HCAHPS incentives, it also is laying the foundation for future program improvements. As staff we value Commissioner input and support on these longer-term initiatives to ensure the policy will be evolving in the direction of the Commission strategy. Furthermore, support from Commissions is especially helpful as we balance various stakeholders' perspectives.

As a recap these longer-term initiatives include:

- Developing an electronic clinical quality measure infrastructure with CRISP that will allow collection of ED wait times but also open up opportunities for new measures to be collected with minimum effort long term. Furthermore, this infrastructure will also allow us to collect EHR data for better risk adjustment of measures across our programs. Developing this infrastructure will also show Maryland as a state leader in digital quality measures as we leverage the flexibility in adopting innovations under our model with CMS/CMMI to help achieve better quality and efficiency.
- Developing monitoring reports that will help hospitals begin to understand quality issues, such as 30-day mortality or follow-up after a hospitalization for mental illness. The monitoring reports also serve as a way for hospitals to help validate the measures and any changes that may need to be made. However, the ultimate goal of the monitoring is to then consider these measures for payment.
- Building on Maryland's early work to implement a comprehensive outpatient measurement and pay-for-performance strategy that is a multipronged, multiyear effort that considers volume and

percentage of services, as well as quality performance where measures exist; outpatient measures may be applicable across our current quality programs or in a new program policy.

- Determining any policy adjustments that are needed given the occurrence and expected persistence of COVID-19; staff is recommending to the Commission that we will retrospectively assess whether any changes are needed for the RY 2024 policy and report those changes to the Commission.
- Leveraging new data sources with patient, environmental, and/or clinical characteristics to identify health disparities and improve health equity, e.g., work with MHCC to analyze the case-level HCAHPS data they plan to receive to identify opportunities to adjust hospital performance incentives to improve equity.

STAKEHOLDER FEEDBACK AND RESPONSES

Comment letters were submitted to the Commission in response to the QBR Re-design process and direction by Medstar Health and by the Johns Hopkins health System and the University of Maryland Medical Systems combined (JHHS/UMMS). Subsequently, comments on the draft QBR recommendations were submitted by Adventist Health Care, JHHS, and the Maryland Hospital Association (MHA). Commenters were generally supportive of the RY 2024 QBR policy and direction and continued use of the current QBR methodology. This included working to: expand the hip/knee complication measure to the outpatient space, expand the mortality measure to 30 days, and collaborate with entities such as the CDC on piloting new hospital acquired infection measures not as prone to small volume event statistical anomalies. However, some targeted concerns were raised and suggestions provided for modifying specific aspects of the draft recommendations. These comments and suggestions are summarized below along with staff's responses.

Reward/Penalty Cut-point of 41%

In their letter, MHA raised concerns that the cut-point may be too aggressive since it was determined in large part on 2019 pre-COVID quality data from CMS, and updated data has not become available.

Staff Response: Staff agrees and will retrospectively evaluate the cut-point as part of the work to make retrospective adjustments to the methodology because of the COVID pandemic.

HCAHPS

Providing Up-front Loan Investment for Improving HCAHPS

In their letter, MedStar indicated they would not request an up-front investment as did many hospital representatives on the QBR Subgroup and the PMWG. In addition, CMS notes, in their quality exemption approval letter for RY 2022 dated October 29, 2021, that they believe that providing hospitals with a voluntary up-front investment in efforts to facilitate improvements in HCAHPS would offer limited benefit. They continue that the global budgets currently provide hospitals with enhanced financial stability and congruent opportunities to invest in transformative activities, including quality performance activities, which is an expectation under the Model.

Staff Response: Staff has evaluated stakeholder feedback on the initial draft recommendation to provide a voluntary up-front investment and agrees with the arguments that the effort to administer a program with no apparent hospital interest is not a good use of staff resources. Therefore, staff has removed this from the final recommendations. However hospitals who believe that they may benefit from this approach are welcome to submit proposals to the HSCRC for consideration.

Adding HCAHPS Linear Scores

The JHHS, JHHS/UMMS, MedStar and MHA all support adding HCAHPS linear scores to the Person and Community Engagement domain. However, hospital and Commissioner stakeholders voiced concerns about including the “responsiveness of hospital staff” measure in the focused set of linear measures and suggested instead the use of the “overall rating of care” measure. Furthermore, in the exemption approval noted above, CMS stated concerns that this approach would only drive minor improvements.

Staff Response: As stated in this recommendation, staff continues to support the “responsiveness” measure in the linear score calculation as this measure is meaningful to patients while they are receiving care and potentially is not as linked to an institutional reputation as the “overall” rating may be. Furthermore, nationally there is high correlation between responsiveness and the overall hospital rating for both top-box and linear scores. Thus, staff maintains the recommendation to include responsiveness as a linear measure of performance. Furthermore, to address CMS concerns, the staff proposes that the addition of linear scores be thought of as a pilot that can be phased out in coming years if improvements are not realized.

ED Wait Time Measure Concerns

The Adventist Health, JHHS, JHHS/UMMS and MHA letters raise concerns about the recommendation to require hospitals to report the ED-2 eCQM measure. Adventist notes that the eCQM submission timeframes beginning in CY 2022 that were outlined in an HSCRC staff memo of 9/23/21 do not align with

the timeframes required for the CMS Inpatient Quality Reporting (IQR) program, and that the reporting requirement would be inefficient and cause additional, unnecessary expense for hospitals in third party vendor costs. The JHHS letter notes the importance of lowering ED wait times to improve patient experience, however, they along with UMMS cite concerns about the variation across hospitals of ED-2 measure definition of admission times, and the measure holding hospitals accountable for infrastructure outside the hospital (e.g., primary care and behavioral health services). The MHA letter asserts that the measure is not appropriate in a pay for performance program. On the other hand, the MedStar letter notes that they “see ED-2b as particularly valuable in that it is a ‘leading measure’ on which we can focus operational improvement work.”

Staff Response: Staff appreciates the comments and remains concerned that Maryland continues to be a significant outlier on every measure of ED wait times that is also correlated with sub-par HCAHPS performance in the state. Staff will work with hospitals, CRISP and their digital measure vendor subcontractor, Medisolv, to address the submission timeframe alignment concerns between HSCRC and CMS IQR digital measure reporting. Staff also asserts that the eCQM version of the ED-2 measure provides better standardization and definitions of data elements that comprise the measure such as time of admission. Staff also believes that stratifying hospitals in volume groups to establish the performance standards and measure performance provides for adequate comparison. Further, staff believes the digital measure infrastructure will increase our ability to be efficient and innovative as more digital measures become available. Finally, staff note in the CMS exemption letter that CMMI believes the state should continue to work to collect ED-2 from hospitals to address this area of performance and hopefully lead to commensurate improvements in HCAHPS.

Timely Follow-up after Acute Exacerbation of Chronic Conditions Measure

The JHHS/UMMS, JHHS, MHA letters agree that timely follow-up after acute exacerbations of chronic conditions improves patient outcomes; however, their letters voice concerns about the lack of available timely and accurate data reports to the hospitals over the last year. The MHA letter requests that the measure be suspended in the QBR program pending the production of timely and valid hospital-level reports. To the recommendation to expand the measure to behavior health and Medicaid populations, the comments support production of hospital monitoring reports in CY 2022 before considering expansion of the measure. The MedStar letter supports maintaining a Medicare-only measure to minimize confusion and promote alignment with the Statewide Integrated Health Improvement Strategy (SIHIS).

Staff Response: Staff does acknowledge that the production of timely and valid hospital reports on the Medicare measure has been challenging in the last year. Staff notes, however, that hospitals have had access to their own Medicare data used to calculate the measure in the last year and that the conditions

included in the measure were known to hospitals before the measurement period, allowing them to target their efforts to improve follow up for these patient populations. Staff continues to support the inclusion of behavioral health and Medicaid populations in the measure and believes this is an important next step in our all-payer system. Staff agrees that monitoring performance on behavioral health and Medicaid for the next year as they are included in the measure is appropriate and is working with CRISP to operationalize these monitoring reports.

Better Understanding of HCAHPS Performance and Strategies to Improve

The exemption letter from CMS encourages the State to prioritize strategies to investigate the root cause of poor HCAHPS performance, create a formalized platform for hospitals to share HCAHPS best practices, and invest in infrastructure to capture patient-level-data. Furthermore, they suggest that Maryland should consider developing statewide improvement goals for HCAHPS and request to see a framework for sharing of best practices and improvement goals as part of the FY 2023 exemption request.

Staff Response: The Maryland Healthcare Commission (MHCC) noted during the workgroup process that it was setting up infrastructure to collect patient level HCAHPS data, which the State has expressed in for several years. There was also interest from some of the subgroup members to develop a way to expand sharing of best practices. Staff hope to work with partners (MHA, MHCC) to collect and analyze patient level HCAHPS data so as to better understand any underlying factors that cause poor performance, e.g. ED wait times, out-of-pocket expenses. Staff will also work with partners to develop a plan for expanding sharing of best practices and discussing statewide improvement goals over the next few years while staff simultaneously assesses the efficacy of incentivizing improvements in linear performance. Based on this feedback an additional recommendation has been added to this final recommendatio

FINAL RECOMMENDATIONS FOR RY 2024 QBR PROGRAM

Final Recommendations for RY 2024 QBR Program:

1. Continue Domain Weighting to determine hospitals' overall performance scores as follows: Person and Community Engagement (PCE) - 50 percent, Safety (NHSN and AHRQ Patient Safety Index composite) - 35 percent, Clinical Care - 15 percent.
 - A. Within the PCE domain, pilot including four linear measures weighted at 10% of QBR score; remove associated revenue at risk from top box.

- B. Within the PCE domain, continue to include timely follow-up after acute exacerbation of a chronic condition weighted at 5% of QBR score; currently, Medicare only measure.
2. Collaborate with partners to implement statewide HCAHPS improvement initiative, which can focus on root causes of HCAHPS performance and the sharing of best practices for improvement.
3. Develop monitoring reports for measures that expand the scope of the policy and align with the goals of the TCOC Model that will be considered for adoption in RY 2025:
 - A. 30-day all-payer, all-cause mortality;
 - B. Follow-up for acute exacerbation of chronic conditions for Medicaid; and
 - C. Follow-up after hospitalization for mental illness.
4. Collaborate with CRISP to develop infrastructure for collection of hospital electronic clinical quality measures (e-CQMs) and core clinical data elements:
 - A. Require hospitals to submit the CY 2022 ED-2 eCQM and consider for re-adoption in future rate years; and
 - B. Explore development of hospital eCQM for inpatient/outpatient all-payer THA-TKA complications.
5. Maintain the pre-set scale (0-80 percent with cut-point at 41 percent), and continue to hold 2 percent of inpatient revenue at-risk (rewards and penalties) for the QBR program.
6. Adjust retrospectively the RY 2024 QBR pay-for-performance program methodology as needed due to COVID-19 Public Health Emergency and report any changes to Commissioners.

APPENDIX A QBR PROGRAM BACKGROUND AND SUBGROUP OVERVIEW

A. Detailed Overview of HSCRC QBR Program

Maryland's QBR Program, in place since July 2009, uses measures that are similar to those in the federal Medicare VBP Program, under which all other states have operated since October 2012. Similar to the VBP Program, the QBR Program currently measures performance in Clinical Care, Safety, and Person and Community Engagement domains, which comprise 15 percent, 35 percent, and 50 percent of a hospital's total QBR score, respectively. For the Safety and Person and Community Engagement domains, which constitute the largest share of a hospital's overall QBR score (85 percent), performance standards are the same as those established in the national VBP Program. The Clinical Care Domain, in contrast, uses a Maryland-specific mortality measure and benchmarks. In effect, Maryland's QBR Program, despite not having a prescribed national goal, reflects Maryland's rankings relative to the nation by using national VBP benchmarks for the majority of the overall QBR score.

In addition to structuring two of the three domains of the QBR Program to correspond to the federal VBP Program, the HSCRC has increasingly emphasized performance relative to the nation through benchmarking, domain weighting, and scaling decisions. For example, beginning in RY 2015, the QBR Program began using national benchmarks to assess performance for the Person and Community Engagement and Safety domains. Subsequently, the RY 2017 QBR policy increased the weighting of the Person and Community Engagement domain, which was measured by the national HCAHPS survey instrument to 50 percent. The weighting was increased to raise incentives for HCAHPS improvement, as Maryland has consistently lagged behind the nation on these measures. In RY 2020, ED-1b and ED-2b wait time measures for admitted patients were added to this domain, with the domain weight remaining at 50 percent. In RY 2021, the domain weight remained constant, but the ED-1b measure was removed from the program. For RY 2022, ED-2b was removed from QBR because CMS no longer required submission of the measure for the Inpatient Quality Reporting Program.

Although the QBR Program has many similarities to the federal Medicare VBP Program, it does differ because Maryland's unique model agreements and autonomous position allow the state to be innovative and progressive. Figure A.1 compares the RY 2023 and 2024 QBR measures and domain weights to those used in the CMS VBP Program.

Figure A.1. RY 2023 and 2024 QBR measures and domain weights compared with those used in the VBP Program

	Maryland QBR domain weights and measures	CMS VBP domain weights and measures
Clinical Care	15 percent Two measures: All-cause inpatient mortality; THA/TKA complications	25 percent Five measures: Four condition-specific mortality measures; THA/TKA complications
Person and Community Engagement	50 percent Nine measures: Eight HCAHPS categories; follow-up after chronic conditions exacerbation	25 percent Eight HCAHPS measures
Safety	35 percent Six measures: Five CDC NHSN hospital-acquired infection (HAI) measure categories; all-payer PSI 90	25 percent Five measures: CDC NHSN HAI measures
Efficiency	n.a.	25 percent One measure: Medicare spending per beneficiary

Note: Details of CMS VBP measures can be found at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html>.

The methodology for calculating hospital QBR scores and associated inpatient revenue adjustments has remained essentially unchanged since RY 2019. It involves (1) assessing performance on each measure in the domain; (2) standardizing measure scores relative to performance standards; (3) calculating the total points a hospital earned divided by the total possible points for each domain; (4) finalizing the total hospital QBR score (0–100 percent) by weighting the domains based on the overall percentage or importance the HSCRC has placed on each domain; and (5) converting the total hospital QBR scores into revenue adjustments, using a preset scale ranging from 0 to 80 percent.

1. Domain weights and revenue at risk

As already noted, the policy weights the Clinical Care domain at 15 percent of the final score, the Safety domain at 35 percent, and the Person and Community Engagement domain at 50 percent.

The HSCRC sets aside a percentage of hospital inpatient revenue to be held “at risk” based on each hospital’s QBR Program performance. Hospital performance scores are translated into rewards and penalties in a process called scaling.³⁵ Rewards (positive scaled amounts) or penalties (negative scaled amounts) are then applied to each hospital’s update factor for the rate year. The rewards or penalties are applied on a one-time basis and are not considered permanent revenue. The HSCRC previously

³⁵ Scaling refers to the differential allocation of a predetermined portion of base-regulated hospital inpatient revenue based on an assessment of hospital performance.

approved scaling a maximum reward of 2 percent and a penalty of 2 percent of the total approved base revenue for inpatients across all hospitals.

HSCRC staff has worked with stakeholders over the last several years to align the QBR measures, thresholds, benchmark values, time lag periods, and amount of revenue at risk with those used by the CMS VBP Program, where feasible,³⁶ enabling the HSCRC to use data submitted directly to CMS. Maryland implemented an efficiency measure outside of the QBR Program, based on potentially avoidable utilization (PAU). The PAU savings adjustment to hospital rates is based on the costs of potentially avoidable admissions, as measured by the Agency for Healthcare Research and Quality's Prevention Quality Indicators and avoidable readmissions. HSCRC staff will continue to work with key stakeholders to finish developing an efficiency measure that incorporates population-based cost outcomes.

2. QBR score calculation

QBR scores are evaluated by comparing a hospital's performance rate to its base period rate, as well as to the threshold (which is the median, or 50th percentile, of all hospitals' performance during the baseline period) and the benchmark (which is the mean of the top decile, or roughly the 95th percentile, during the baseline period).

Attainment points: During the performance period, attainment points are awarded by comparing a hospital's rates with the threshold and the benchmark. With the exception of the Maryland mortality measure and ED wait time measures, the benchmarks and thresholds are the same as those used by CMS for the VBP Program measures.³⁷ For each measure, a hospital that has a rate at or above the benchmark receives 10 attainment points. A hospital that has a rate below the attainment threshold receives 0 attainment points. A hospital that has a rate at or above the attainment threshold and below the benchmark receives 1–9 attainment points.

Improvement points: Improvement points are awarded by comparing a hospital's rates during the performance period to the hospital's rates from the baseline period. A hospital that has a rate at or above the attainment benchmark receives 9 improvement points. A hospital that has a rate at or below the baseline period rate receives 0 improvement points. A hospital that has a rate between the baseline period rate and the attainment benchmark receives 0–9 improvement points.

³⁶ VBP measure specifications can be found at www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html.

³⁷ One exception is the ED wait time measures. For these measures, attainment points are not calculated; instead, the full 10 points are awarded to hospitals at or below (more efficient) than the national medians for their respective volume categories in the performance period.

Consistency points: Consistency points are awarded only in the Experience of Care domain. The purpose of these points is to reward hospitals that have scores above the national 50th percentile in all eight HCAHPS dimensions. If they do, they receive the full 20 points. If they do not, the dimension for which the hospital received the lowest score is compared to the range between the national 0 percentile (floor) and the 50th percentile (threshold) and is awarded points proportionately.

Domain denominator adjustments: In certain instances, QBR measures will be excluded from the QBR Program for individual hospitals. Hospitals are exempt from measurement for any of the NHSN Safety measures for which there is less than one predicted case in the performance period. If a hospital is exempt from an NHSN measure, its Safety domain score denominator is reduced from 50 to 40 possible points. If it is exempt from two measures, the Safety domain score denominator would be 30 possible points. Hospitals must have at least two of five Safety measures to be included in the Safety domain.

Domain scores: The better of the attainment score and improvement score for each measure is used to determine the measure points for each measure. The measure points are then summed and divided by the total possible points in each domain and multiplied by 100.

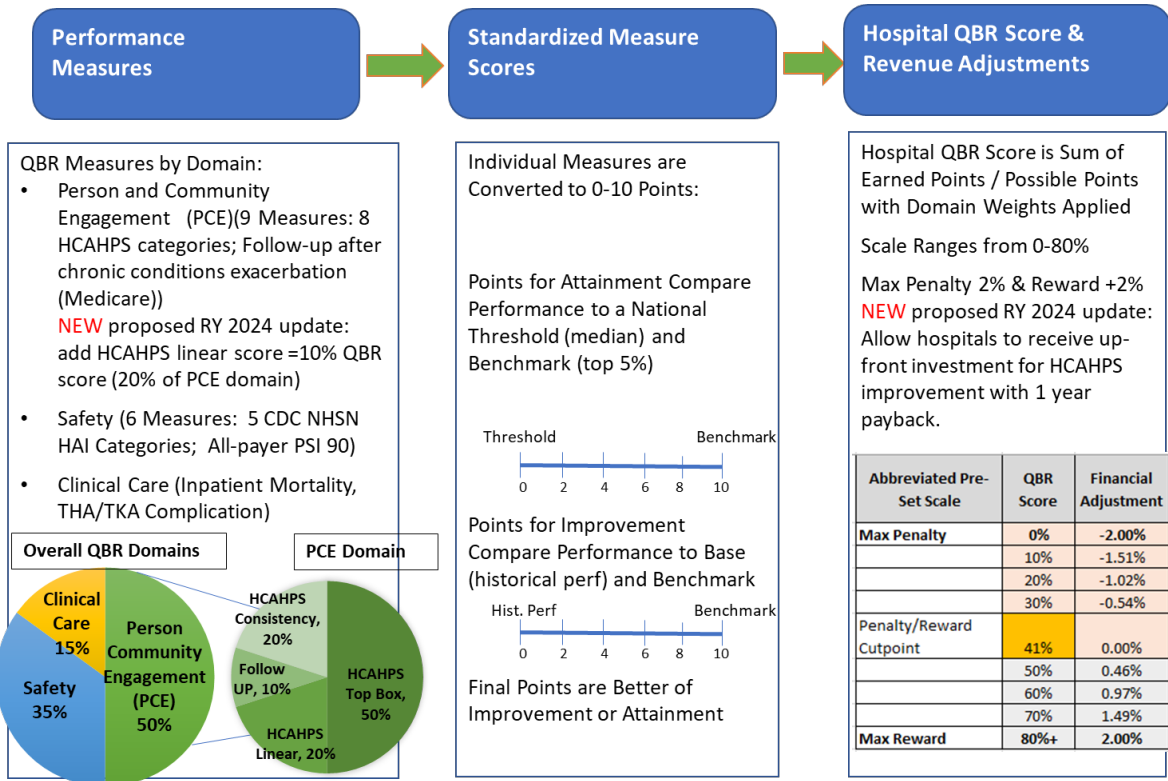
Total performance score: The total performance score is computed by multiplying the domain scores by their specified weights and then adding those totals together. The total performance score is then translated into a reward or penalty that is applied to hospital revenue.

3. RY 2023 and 2024 QBR Program

For RY 2023, the HSCRC did not make fundamental changes to the QBR Program's methodology but implemented the addition of the Follow-Up After Acute Exacerbation of Chronic Conditions measure and PSI-90 composite measures.

Figure A.2 shows the steps for converting measure scores to standardized scores for each measure, and then to rewards and penalties based on total scores earned, reflecting the updates for RY 2023 and proposed for RY 2024.

Figure A.2. Process for calculating RY 2023 QBR scores, and Proposed updates for RY 2024



There were no fundamental changes for the measures and domain weighting for RYs 2023 and 2024, as shown in Figure A.3.

Figure A.3. RY 2023-2024 QBR domains, measures, and data sources

	Clinical Care	Person and Community Engagement	Safety
QBR RY 23 Program	<p>15 percent 2 measures</p> <ul style="list-style-type: none"> Inpatient mortality (HSCRC case-mix data) THA TKA (CMS Hospital Compare, Medicare claims data) 	<p>50 percent 9 measures</p> <ul style="list-style-type: none"> 8 HCAHPS domains (CMS Hospital Compare patient survey) Follow-Up After Acute Exacerbation of Chronic Conditions (Medicare claims) 	<p>35 percent 7 measures</p> <ul style="list-style-type: none"> 6 CDC NHSN HAI measures (CMS Hospital Compare chart abstracted) PSI 90 all-payer (HSCRC case-mix data)

a. *PSI 90 measure (adopted for RY 2023)*

Newly adopted in RY 2023, the Patient Safety Indicator composite measure was developed by the Agency for Healthcare Research and Quality in 2003.³⁸ CMS first adopted the composite measure in the VBP program in FFY 2015 and removed the measure in FY 2019-FY 2022 due to operational constraints from the International Classification of Diseases, Tenth Revision (ICD-10) transition. The HSCRC had used the ICD-9 version of this measure in the QBR program but applied it to Maryland's all-payer population. CMS adopted the updated NQF endorsed ICD-10 version of the measure (Medicare only) that is used beginning with the FY 2023 Hospital VBP program³⁹, and also adopted by the QBR program (all-payer version) in RY 2023.

AHRQ's specified PSI uses include:

- Assess, monitor, track, and improve the safety of inpatient care
- Comparative public reporting, trending, and pay-for-performance initiatives
- Identify potentially avoidable complications that result from a patient's exposure to the health care system
- Detect potential safety problems that occur during a patient's hospital stay

The discharge weighted average of the observed-to-expected ratios for the following subset of AHRQ's PSIs comprise the PSI-90 composite measure:

- PSI 03 Pressure Ulcer Rate
- PSI 06 Iatrogenic Pneumothorax Rate
- PSI 08 In-Hospital Fall With Hip Fracture Rate
- PSII 09 Perioperative Hemorrhage or Hematoma Rate
- PSI 10 Postoperative Acute Kidney Injury Requiring Dialysis Rate
- PSI 11 Postoperative Respiratory Failure Rate
- PSI 12 Perioperative Pulmonary Embolism (PE) or Deep Vein Thrombosis (DVT) Rate
- PSI 13 Postoperative Sepsis Rate
- PSI 14 Postoperative Wound Dehiscence Rate
- PSI 15 Abdominopelvic Accidental Puncture or Laceration Rate

³⁸ Source: <https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2020/TechSpecs/PSI%2090%20Patient%20Safety%20and%20Adverse%20Events%20Composite.pdf>.

³⁹ For more information on the measure removal and adoption, reference the [FY 2018 IPPS/LTCH PPS final rule](#) (82 FR 38242-38244) and (82 FR 38251-38256).

PSI 90 combines the smoothed (empirical Bayes shrinkage) indirectly standardized morbidity ratios (observed/expected ratios) from selected Patient Safety Indicators. The weights of the individual component indicators are based on two concepts: the volume of the adverse event and the harm associated with the adverse event. The volume weights were calculated based on the number of safety-related events for the component indicators in the all-payer reference population. The harm weights were calculated by multiplying empirical estimates of the probability of excess harms associated with each patient safety event by the corresponding utility weights (1–disutility). Disutility is the measure of the severity of the adverse events associated with each harm (for example, the outcome severity or the least-preferred states from the patient perspective).

The PSI 90 measure scores are converted to program scores, as described in the QBR Score Calculation section of this appendix.

b. Follow-Up After Acute Exacerbation for Chronic Conditions (adopted for RY 2023)

Newly proposed for RY 2023, this measure was developed by IMPAQ on behalf of CMS.⁴⁰ Technical details for calculating measure scores are provided below.

Measure full title: Timely Follow-Up After Acute Exacerbations of Chronic Conditions

Measure steward: IMPAQ International

Description of measure: The percentage of issuer-product-level acute events requiring an ED visit or hospitalization for one of the following six chronic conditions: hypertension, asthma, heart failure, coronary artery disease, chronic obstructive pulmonary disease, or diabetes mellitus (Type I or Type II), where follow-up was received within the time frame recommended by clinical practice guidelines in a non-emergency outpatient setting.

Unit of analysis: Issuer-by-product

Numerator statement: The numerator is the sum of the issuer-product-level denominator events (ED visits, observation hospital stays, or inpatient hospital stays) for acute exacerbation of the following six conditions in which follow-up was received within the time frame recommended by clinical practice guidelines:

1. Hypertension: Within 7 days of the date of discharge

⁴⁰ Source: <https://impaqint.com/measure-information-timely-follow-after-acute-exacerbations-chronic-conditions>

2. Asthma: Within 14 days of the date of discharge
3. HF: Within 14 days of the date of discharge
4. Coronary artery disease: Within 14 days of the date of discharge
5. Chronic obstructive pulmonary disease: Within 30 days of the date of discharge
6. Diabetes: Within 30 days of the date of discharge

Numerator details: This measure is defined at the issuer-by-product level, meaning that results are aggregated for each qualified insurance issuer and for each product. A product is defined as a discrete package of health insurance coverage benefits that issuers offer in the context of a particular network type, such as health maintenance organization, preferred provider organization, exclusive provider organization, point of service, or indemnity. Issuers are broadly defined as health insurance providers who participate in the Federally Facilitated Marketplaces and health insurance contracts offered in the Medicare Advantage market.

Timely follow-up is defined as a claim for the same patient after the discharge date for the acute event that (1) is a non-emergency outpatient visit and (2) has a Current Procedural Terminology (CPT) or Healthcare Common Procedure Coding System (HCPCS) code indicating a visit that constitutes appropriate follow-up, as defined by clinical guidelines and clinical coding experts. The follow-up visit may be an office or telehealth visit and takes place in certain chronic care or transitional care management settings. The visit must occur within the condition-specific time frame to be considered timely and for the conditions specified in the numerator. For a list of individual codes, please see the data dictionary.⁴¹

The time frames for a follow-up visit for each of the six chronic conditions are based on evidence-based clinical practice guidelines, as laid out in the evidence form.

Denominator statement: The denominator is the sum of the acute events—that is, the issuer-product-level acute exacerbations that require an ED visit, observation stay, or inpatient stay—for any of the six conditions listed above (hypertension, asthma, heart failure, coronary artery disease, chronic obstructive pulmonary disease, or diabetes).

Denominator details: Acute events are defined as either an ED visit, observation stay, or inpatient stay. If a patient is discharged and another claim begins for the same condition on the same day or the following day, the claims are considered to be part of one continuous acute event. In this case, the discharge date of the last claim is the beginning of the follow-up interval. The final claim of the acute event must be a discharge to community.

⁴¹ Please see <https://impaqint.com/measure-information-timely-follow-after-acute-exacerbations-chronic-conditions>.

An acute event is assigned to [condition] if:

1. The primary diagnosis is a sufficient code for [condition].

OR

2. The primary diagnosis is a related code for [condition] AND at least one additional diagnosis is a sufficient code for [condition].
 - If the event has two or more conditions with a related code as the primary diagnosis and a sufficient code in additional diagnosis positions, **assign the event to the condition with a sufficient code appearing in the “highest” (closest to the primary) diagnosis position.**

If the visits that make up an acute event are assigned different conditions, the event is assigned the condition that occurs last in the sequence. Following this methodology, only one condition is recorded in the denominator per acute event.

Denominator exclusions: The measure excludes events with:

1. Subsequent acute events that occur two days after the prior discharge but still during the follow-up interval of the prior event for the same reason; to prevent double-counting, the denominator will include only the first acute event
2. Acute events after which the patient does not have continuous enrollment for 30 days in the same product
3. Acute events in which the discharge status of the last claim is not “to community” (“left against medical advice” is not a discharge to community)
4. Acute events for which the calendar year ends before the follow-up window ends (for example, acute asthma events ending less than 14 days before December 31)
5. Acute events in which the patient enters a skilled nursing facility, non-acute care, or hospice care during the follow-up interval

Measure scoring:

1. Denominator events are identified by hospitalization, observation, and ED events with appropriate codes (that is, codes identifying an acute exacerbation of one of the six included chronic conditions).
2. Exclusions are applied to the population from Step 1 to produce the eligible patient population (that is, the count of all qualifying events) for the measure.

3. For each qualifying event, the claims are examined to determine whether they include a subsequent code that satisfies the follow-up requirement for that event (for example, whether a diabetes event received follow-up within the appropriate time frame for diabetes, from an appropriate provider). Each event for which the follow-up requirement was satisfied is counted as one in the numerator. Each event for which the follow-up requirement was not satisfied is counted as zero in the numerator.
4. The percentage score is calculated as the numerator divided by the denominator.

Measure-scoring logic: Following the National Quality Forum's guideline, we use **opportunity-based weighting** to calculate the follow-up measure. This means each condition is weighted by the sum of acute exacerbations that require either an ED visit or an observation or inpatient stay for all of the six conditions that occur, as reflected in the logic below.

$$[\text{NUM}(\text{ASM}) + \text{NUM}(\text{CAD}) + \text{NUM}(\text{HF}) + \text{NUM}(\text{COPD}) + \text{NUM}(\text{DIAB}) + \text{NUM}(\text{HTN})] / [\text{DENOM}(\text{ASM}) + \text{DENOM}(\text{CAD}) + \text{DENOM}(\text{HF}) + \text{DENOM}(\text{COPD}) + \text{DENOM}(\text{DIAB}) + \text{DENOM}(\text{HTN})]$$

Although the development team designed the measure to aggregate each condition score in the manner described above into a single overall score, programs may choose to also calculate individual scores for each chronic condition when implementing the measure. Individual measure scores would be calculated by dividing the condition-specific numerator by the condition-specific denominator, as in the example for heart failure: $\text{NUM}(\text{HF}) / \text{DENOM}(\text{HF})$.

The follow-up measure scores are converted to QBR scores, as described in the QBR Score Calculation section above.

5. QBR RY 2024 base and performance periods by measure

Figure A.4 shows the proposed base and performance period timeline for the RY 2023 QBR Program.

Figure A.4. RY 2024 timeline (base and performance periods; financial impact)

Rate year (Maryland fiscal year)	Q3-19	Q4-19	Q1-20	Q2-20	Q3-20	Q4-20	Q1-21	Q2-21	Q3-21	Q4-21	Q1-22	Q2-22	Q3-22	Q4-22	Q1-23	Q2-23	Q3-23	Q4-23	Q1-24	Q2-24	Q3-24	Q4-24		
Calendar year	Q1-19	Q2-19	Q3-19	Q4-19	Q1-20	Q2-20	Q3-20	Q4-20	Q1-21	Q2-21	Q3-21	Q4-21	Q1-22	Q2-22	Q3-22	Q4-22	Q1-23	Q2-23	Q3-23	Q4-23	Q1-24	Q2-24		
QBR base and performance periods	BASE- CMS Hospital Compare base period (HCAHPS measures, all CDC NHSN measures)																							
													PERFORMANCE: CMS Hospital Compare performance period (HCAHPS measures, all CDC NHSN measures)											
	BASE- inpatient mortality, PSI-90, follow-up chronic conditions																							
														PERFORMANCE: inpatient mortality, PSI-90, follow-up chronic conditions)										
	PERFORMANCE: CMS Hospital Compare THA/TKA performance period*X																							

* Hospital Compare THA/TKA complications **base period** April 1, 2014–March 31, 2017.

X CMS announced it will not use data for CY Quarters 1 and 2 for the quality pay-for-performance programs due to the COVID-19 public health emergency; staff will consider options as CMS publishes to the updated measure performance period.

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APPENDIX B HCAHPS

Figure B.1. VBP thresholds, benchmarks and Maryland HCAHPS top box scores (2016–2019)

Figure B.1.a. Nurse communication

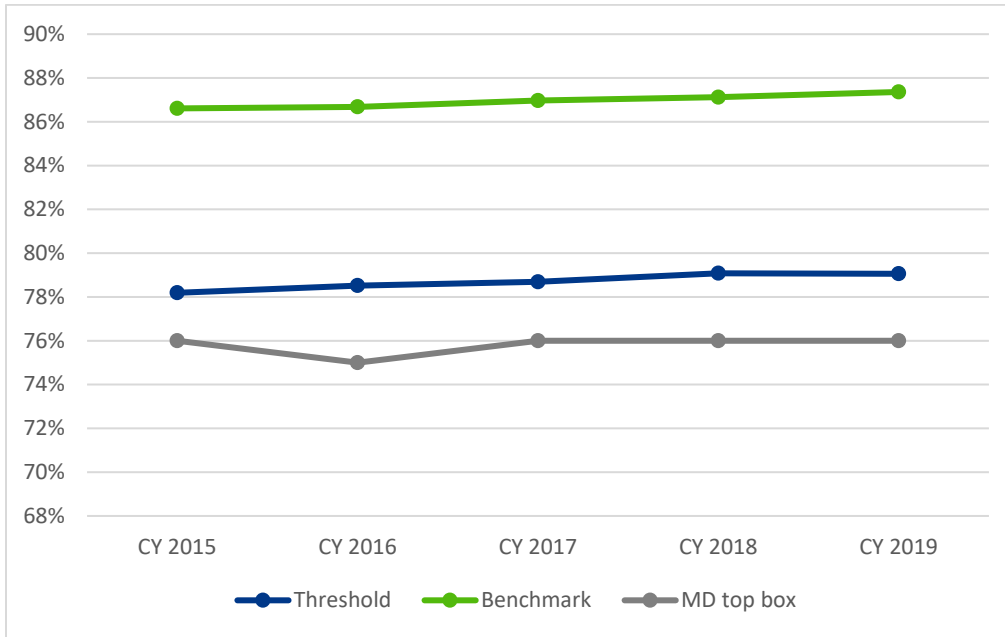


Figure B.1.b. Doctor communication

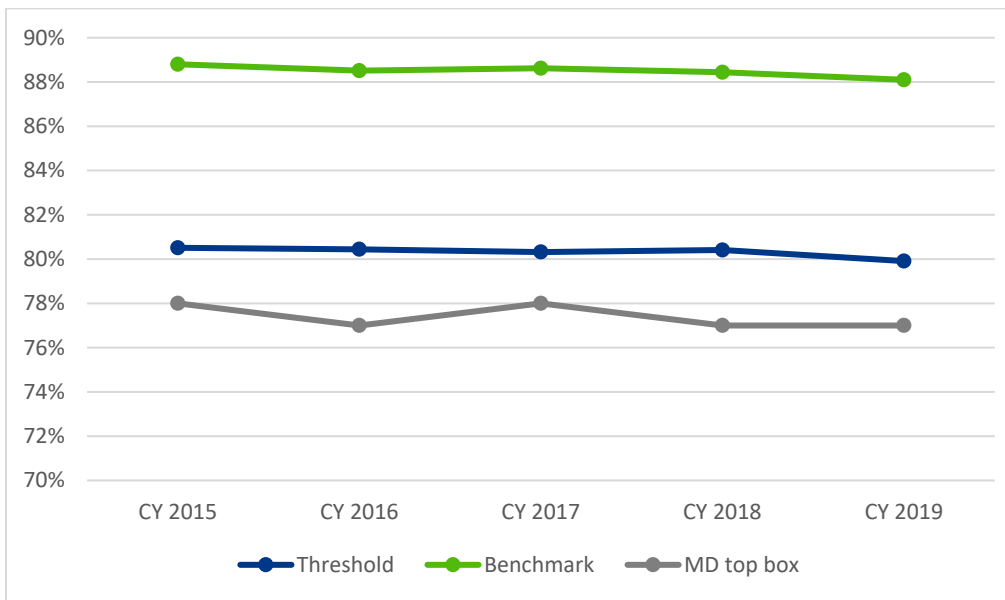


Figure B.1.c. Staff responsiveness

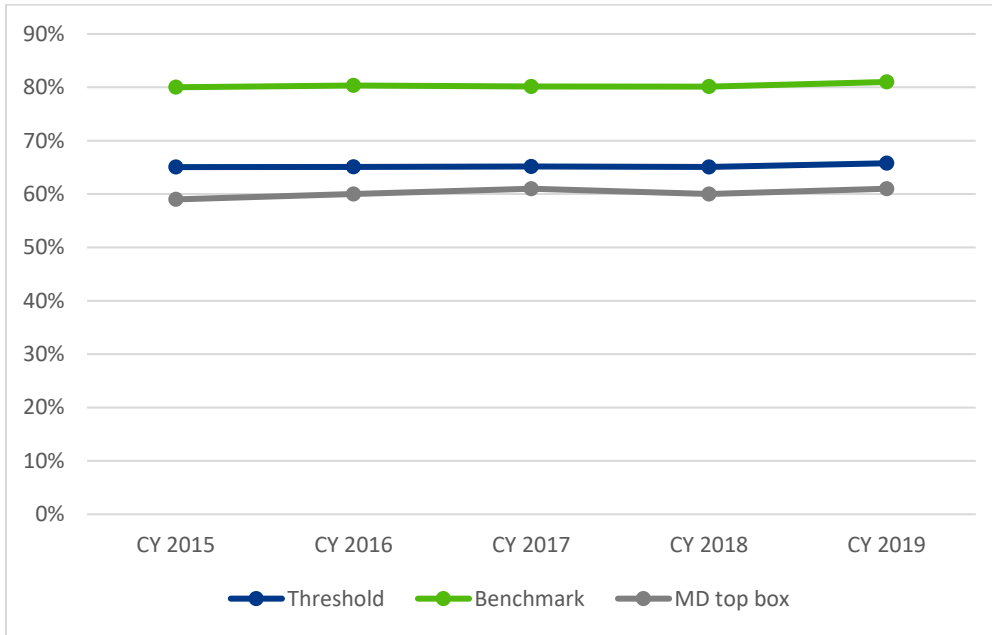


Figure B.1.d. Communication about medicines

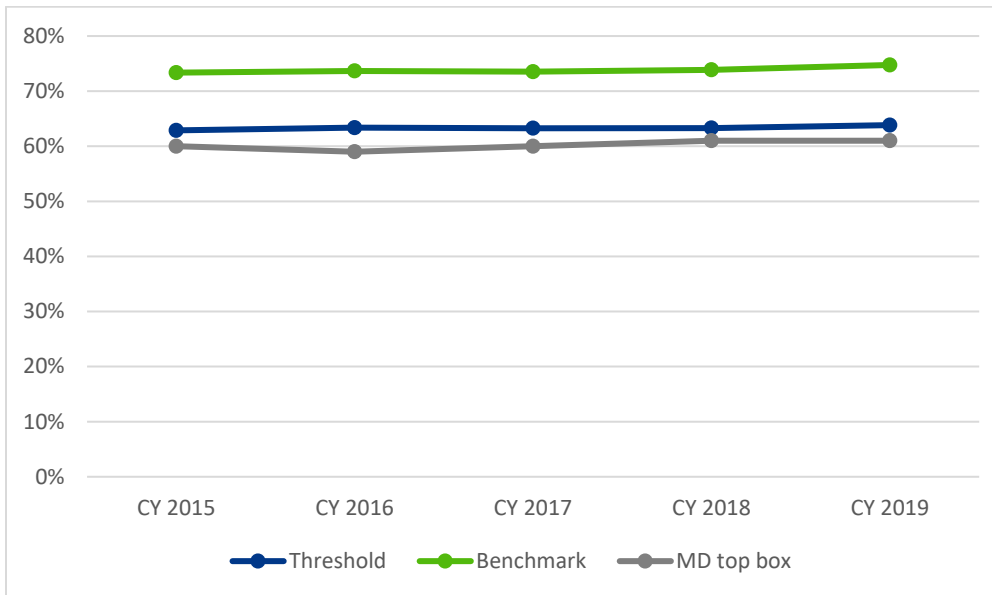


Figure B.1.e. Discharge information

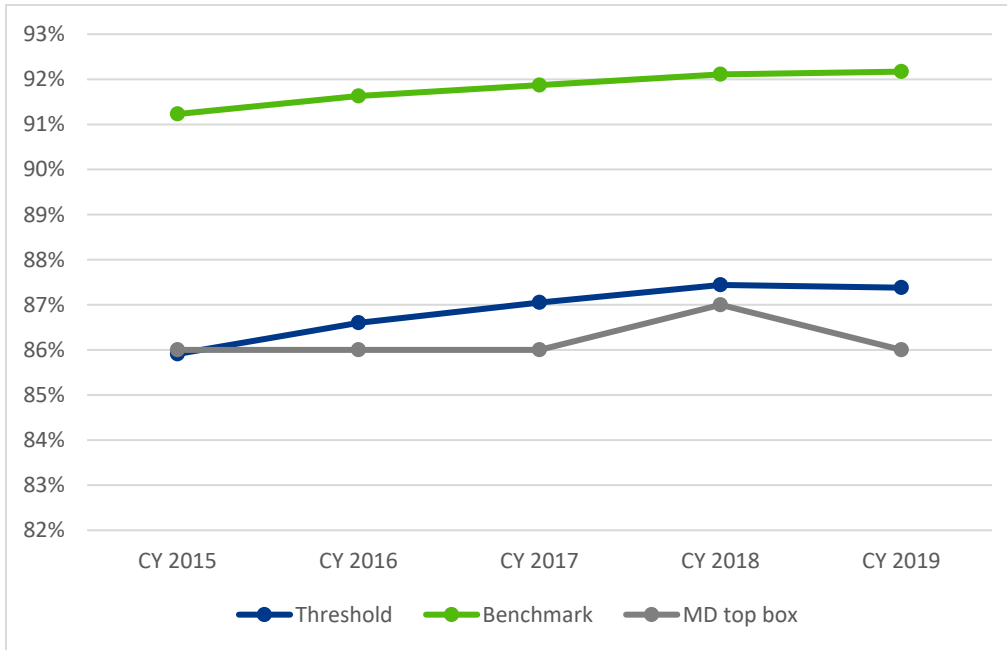


Figure B.1.f. Care transition

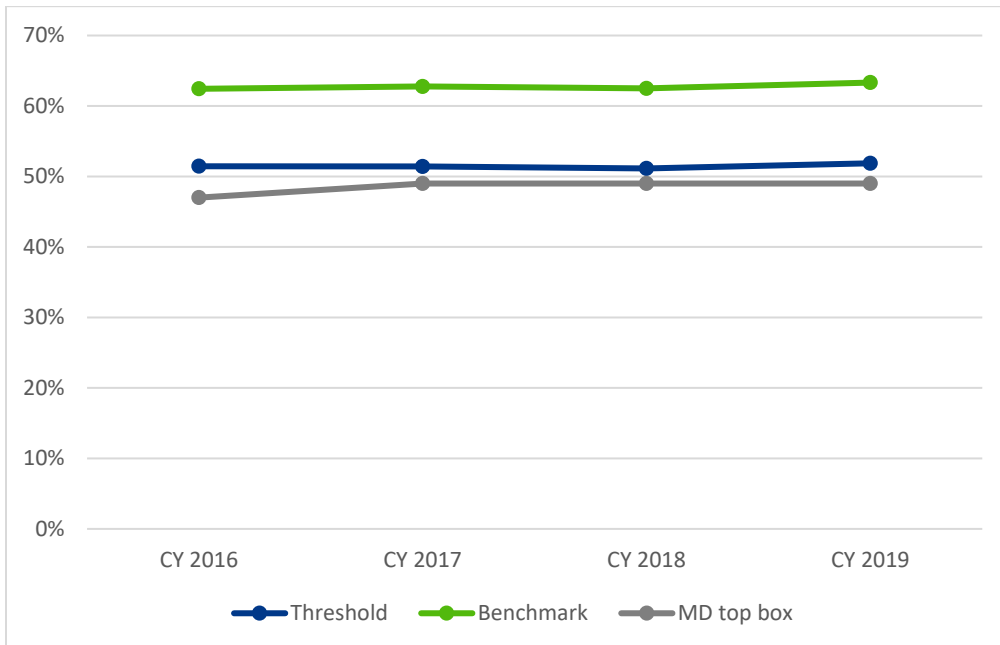


Figure B.1.g. Clean and quiet

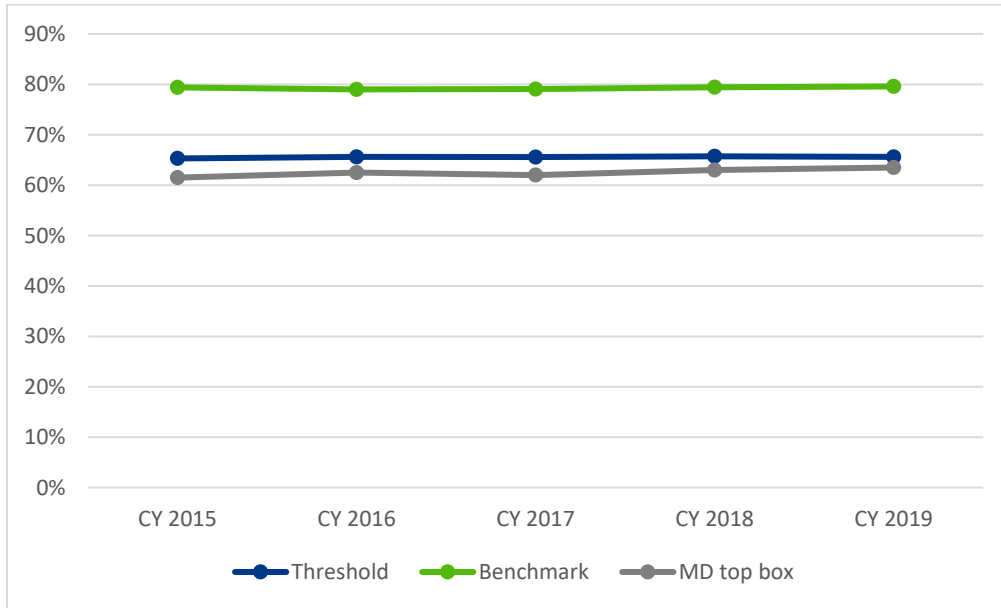


Figure B.1.h. Hospital rating

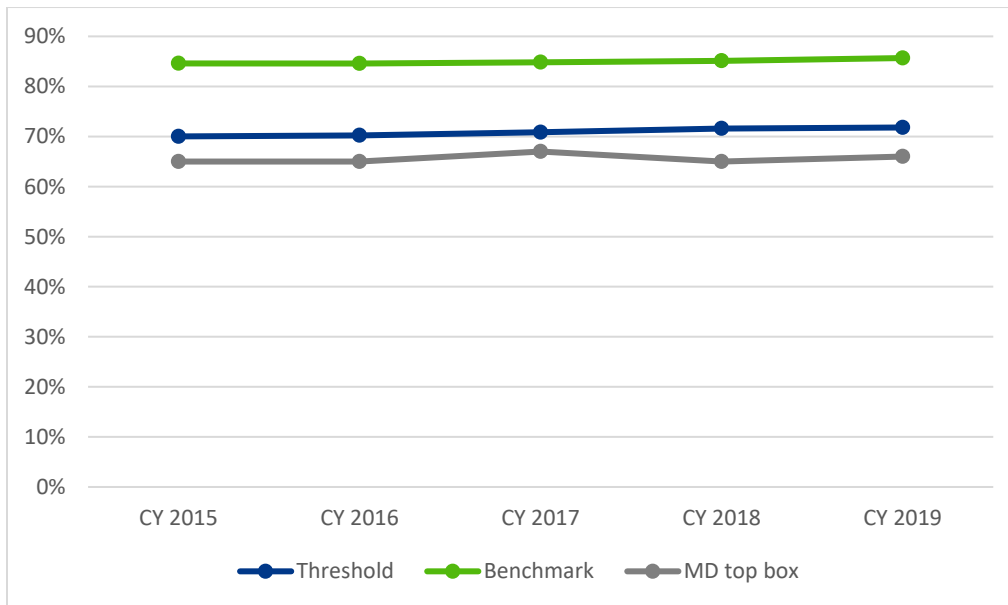


Figure B.2. Maryland hospital top box score changes over time (2013–2018, 2018–2019)

Figure B.2.a. Nurse communication

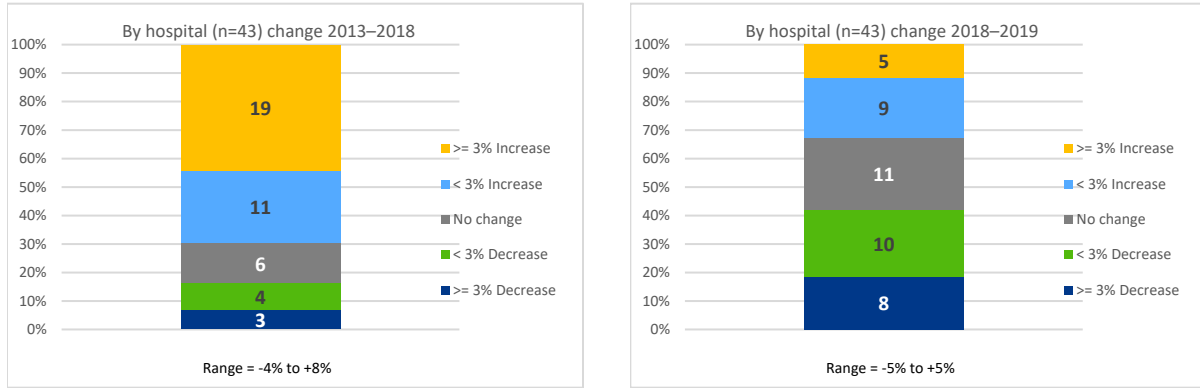


Figure B.2.b. Doctor communication

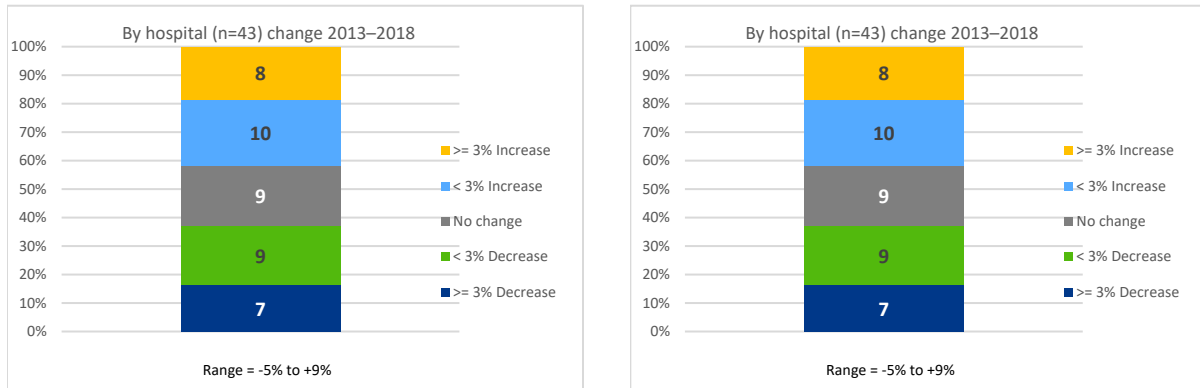


Figure B.2.c. Staff responsiveness

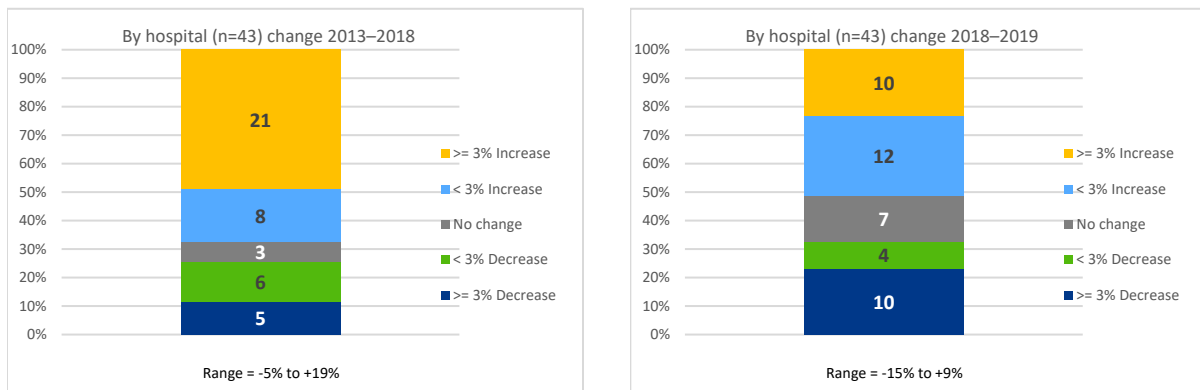


Figure B.2.d. Communication about medicines

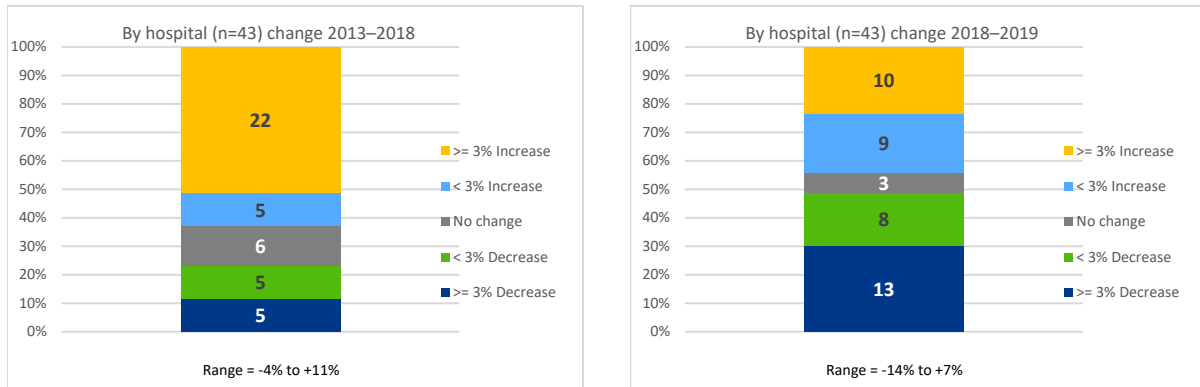


Figure B.2.e. Discharge information

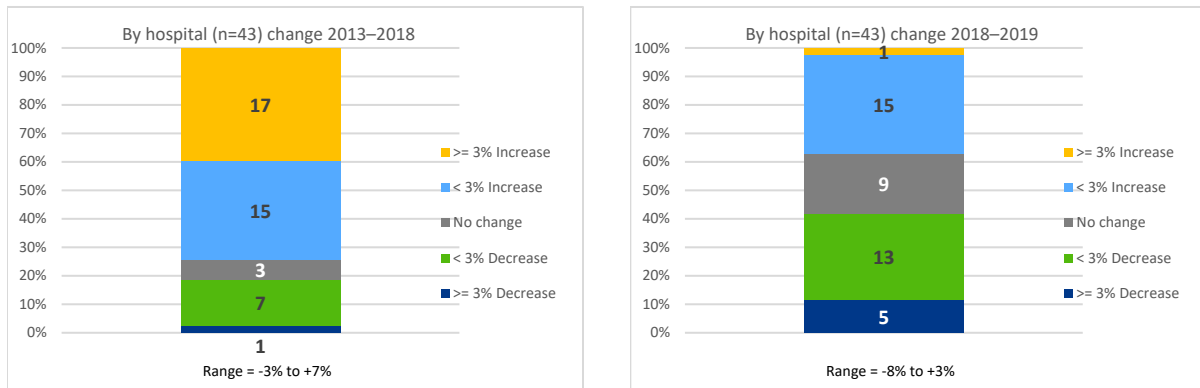


Figure B.2.f. Care transition

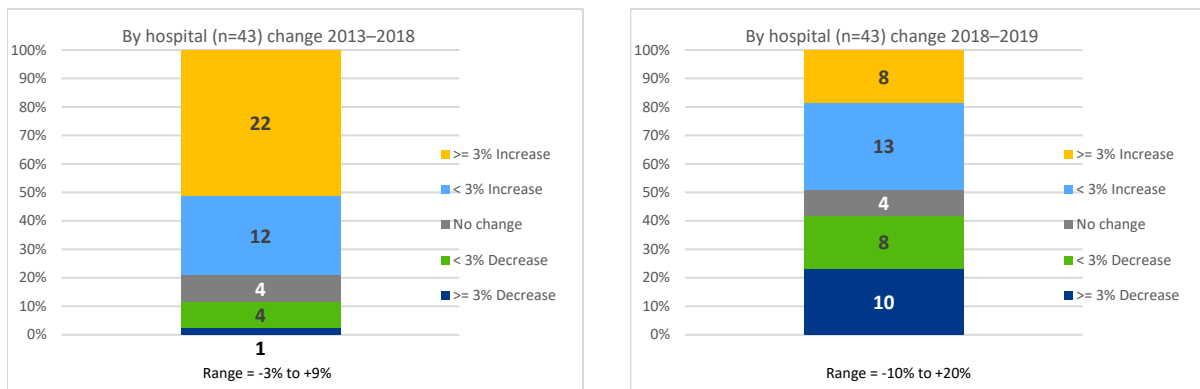


Figure B.2.g. Average clean and quiet

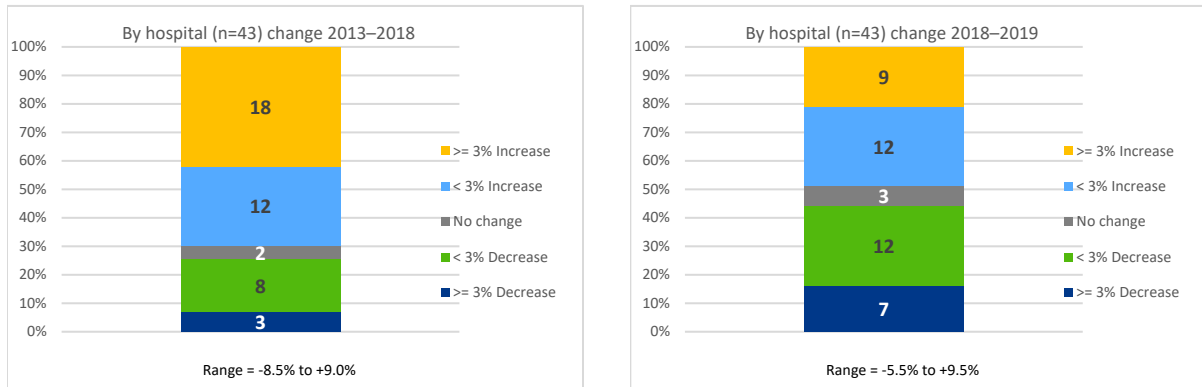


Figure B.2.h. Overall hospital rating

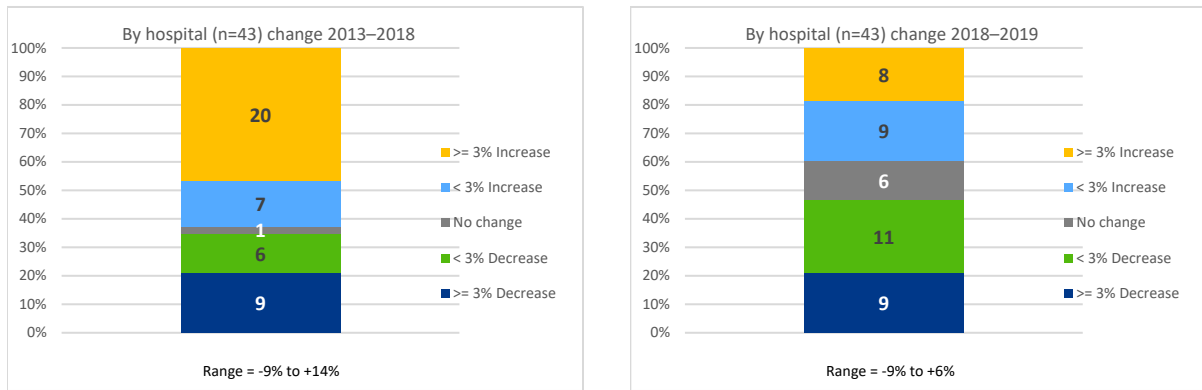


Figure B.3. Spearman rank-order correlation analysis looking at the relationship between domain scores and various quality measures and hospital characteristics

Figure B.3.a. 2017

Measure	Nurse communication	Doctor communication	Staff responsiveness	Communication about medicines	Discharge information	Care transition	Clean-liness	Quietness	Overall hospital rating	Recom-mend hospital	Average clean and quiet	Average 7 measures
PPC rate	0.1	0.2	-0.02	0.01	0.19	-0.01	0.13	0.02	0.18	0.06	0.11	0.12
Readmission rate	-0.47*	-0.08	-0.26	-0.03	-0.08	-0.25	-0.39*	0.16	-0.27	-0.16	-0.1	-0.28
Survival rate	0.50*	0.06	0.11	0.09	0.13	0.47*	0.28	-0.05	0.28	0.17	0.14	0.34*
Length of stay	-0.39*	-0.25	-0.54*	-0.17	-0.11	-0.24	-0.39*	-0.09	-0.2	-0.13	-0.27	-0.34*
Race/ethnicity, White	0.52*	0.15	0.32*	0.23	0.32*	0.37*	0.65*	-0.14	0.28	0.12	0.31*	0.41*
Race/ethnicity, Black	-0.45*	-0.13	-0.24	-0.16	-0.26	-0.35*	-0.64*	0.12	-0.3	-0.15	-0.32*	-0.36*
Race/ethnicity, Native American	-0.24	-0.35*	-0.47*	-0.16	-0.27	-0.02	-0.25	-0.1	-0.14	-0.08	-0.21	-0.24
Race/ethnicity, Asian	-0.17	-0.02	-0.35*	-0.37*	-0.3	0.1	-0.3	0.16	0.2	0.32*	-0.14	-0.19
Race/ethnicity, Hawaiian	0.2	-0.03	-0.04	-0.17	-0.15	0.14	0.22	-0.09	0.19	0.17	0.12	0.06
Race/ethnicity, other	-0.28	-0.11	-0.40*	-0.39*	-0.26	-0.01	-0.19	-0.06	0.04	0.16	-0.14	-0.21
ADI	-0.06	0.22	0.09	0.44*	0.42*	0.03	-0.11	0.15	0.07	-0.06	0.03	0.19
Dual status	-0.38*	-0.15	-0.06	-0.05	-0.05	-0.53*	-0.3	-0.08	-0.49*	-0.49*	-0.23	-0.32*
PAI distribution	-0.35*	-0.02	-0.11	0.23	0.12	-0.24	-0.39*	0.09	-0.22	-0.26	-0.18	-0.13
PSI 90 composite	-0.26	-0.13	-0.25	0.14	0.03	-0.28	-0.17	-0.16	-0.17	-0.23	-0.23	-0.17
Survey response rate	0.47*	0.43*	0.29	0.28	0.34*	0.49*	0.55*	-0.07	0.53*	0.43*	0.29	0.53*
Bad debt as % of total charges	-0.35*	-0.45*	-0.1	-0.49*	-0.52*	-0.41*	-0.26	-0.40*	-0.44*	-0.40*	-0.43*	-0.48*
Case mix index	0.15	0.04	-0.2	-0.04	0.11	0.33*	0.16	0.16	0.43*	0.42*	0.22	0.19

Note: Asterisk (*) indicates statistical significance at $p < 0.05$.

Figure B.3.b. 2018

Measure	Nurse communication	Doctor communication	Staff responsiveness	Communication about medicines	Discharge information	Care transition	Cleanliness	Quietness	Overall hospital rating	Recommend hospital	Average clean and quiet	Average 7 measures
Staffing ratio	0.30*	0.2	0.38*	0.25	0.38*	0.16	0.16	-0.18	-0.1	-0.17	0.05	0.23
PPC rate	0	0.05	0.01	0.08	0.04	-0.11	0.03	-0.03	-0.12	-0.19	-0.03	-0.04
Readmission rate	-0.46*	-0.01	-0.24	-0.01	-0.14	-0.22	-0.27	0.09	-0.27	-0.23	-0.05	-0.27
Survival rate	0.36*	0.09	0.2	0.22	0.14	0.26	0.31*	0.2	0.06	0.06	0.28	0.22
Length of stay	-0.38*	-0.05	-0.21	-0.07	-0.23	-0.23	-0.3	0.29	-0.21	-0.17	-0.02	-0.25
Race/ethnicity, White	0.66*	0.16	0.33*	0.25	0.51*	0.27	0.46*	-0.29	0.29	0.17	0.17	0.40*
Race/ethnicity, Black	-0.58*	-0.1	-0.28	-0.13	-0.47*	-0.21	-0.41*	0.3	-0.35*	-0.22	-0.12	-0.36*
Race/ethnicity, Native American	-0.08	-0.13	-0.35*	-0.15	-0.17	-0.12	-0.2	0.04	-0.12	-0.14	-0.15	-0.18
Race/ethnicity, Asian	-0.05	0.06	-0.31*	-0.19	-0.21	0.18	-0.34*	0.24	0.31*	0.44*	-0.12	0.05
Race/ethnicity, Hawaiian	0.17	-0.12	-0.01	-0.15	-0.1	0.2	-0.05	0.04	0.33*	0.22	-0.04	0.12
Race/ethnicity, Other	-0.18	-0.09	-0.23	-0.32*	0.01	-0.06	-0.19	0.03	0.16	0.2	-0.1	-0.02
ADI	-0.17	0.13	0.06	0.26	0.14	-0.1	-0.01	0.16	-0.04	-0.1	0.09	-0.01
Dual status	-0.44*	-0.14	-0.02	-0.02	-0.3	-0.49*	-0.12	0.09	-0.63*	-0.59*	-0.03	-0.43*
PAI distribution	-0.46*	-0.03	-0.14	0.06	-0.17	-0.28	-0.22	0.17	-0.29	-0.3	-0.06	-0.27
PSI 90 composite	-0.23	-0.28	-0.2	-0.14	-0.23	-0.39*	-0.22	-0.06	-0.31*	-0.35*	-0.19	-0.35*
Bed size	0.01	0.01	-0.25	-0.19	0.01	0.19	-0.33*	0.3	0.43*	0.39*	-0.07	0.13
DSH percentage	-0.48*	-0.09	-0.17	-0.08	-0.19	-0.39*	-0.19	0.18	-0.19	-0.2	0.02	-0.3
Survey response rate	0.42*	0.37*	0.24	0.22	0.34*	0.3	0.32*	-0.11	0.37*	0.34*	0.13	0.43*
Bad debt as % of total charges	-0.16	-0.29	0.02	-0.28	-0.17	-0.37*	0.01	-0.24	-0.26	-0.30*	-0.18	-0.24
Case mix index	-0.06	-0.32*	-0.07	-0.45*	-0.03	-0.22	0.12	-0.14	0.02	-0.1	0	-0.16

Note: Asterisk (*) indicates statistical significance at $p < 0.05$.

B. Subgroup discussion

Figure B.4. HCAHPS policy lever diagram



1. Linear scoring

Figure B.5. HCAHPS top-box and linear scores correlation analysis

Measure	Type	Perf 2014	Perf 2015	Perf 2016	Perf 2017	Perf 2018
Nurse communication	Corr. top-box & linear, Spearman	0.96*	0.96*	0.95*	0.96*	0.96*
	Corr. top 2 boxes & linear, Spearman	0.94*	0.92*	0.92*	0.92*	0.96*
Doctor communication	Corr. top-box & linear, Spearman	0.94*	0.95*	0.88*	0.94*	0.9*
	Corr. top 2 boxes & linear, Spearman	0.89*	0.89*	0.92*	0.75*	0.83*
Staff responsiveness	Corr. top-box & linear, Spearman	0.97*	0.98*	0.97*	0.87*	0.87*
	Corr. top 2 boxes & linear, Spearman	0.96*	0.93*	0.94*	0.86*	0.88*
Communication about medicines	Corr. top-box & linear, Spearman	0.95*	0.89*	0.94*	0.89*	0.91*
	Corr. top 2 boxes & linear, Spearman	0.97*	0.98*	0.97*	0.98*	0.97*
Discharge information	Corr. top-box & linear	1*	1*	1*	1*	1*
Care transition	Corr. top-box & linear, Spearman	0.97*	0.96*	0.96*	0.92*	0.92*
	Corr. top 2 boxes & linear, Spearman	0.82*	0.79*	0.89*	0.84*	0.8*
Cleanliness	Corr. top-box & linear, Spearman	0.94*	0.95*	0.95*	0.98*	0.95*
	Corr. top 2 boxes & linear, Spearman	0.96*	0.95*	0.95*	0.96*	0.89*
Quietness	Corr. top-box & linear, Spearman	0.88*	0.92*	0.95*	0.94*	0.89*
	Corr. top 2 boxes & linear, Spearman	0.87*	0.93*	0.92*	0.87*	0.85*
Overall hospital rating	Corr. top-box & linear, Spearman	0.97*	0.89*	0.92*	0.89*	0.95*
	Corr. top 2 boxes & linear, Spearman	0.92*	0.93*	0.94*	0.92*	0.92*
Recommend hospital	Corr. top-box & linear, Spearman	0.99*	0.98*	0.96*	0.95*	0.97*
	Corr. top 2 boxes & linear, Spearman	0.92*	0.89*	0.91*	0.82*	0.88*
Average clean and quiet	Corr. top-box & linear, Spearman	0.93*	0.93*	0.96*	0.95*	0.9*
	Corr. top 2 boxes & linear, Spearman	0.92*	0.96*	0.93*	0.93*	0.92*
Average 7 measures	Corr. top-box & linear, Spearman	0.98*	0.97*	0.96*	0.95*	0.97*
	Corr. top 2 boxes & linear, Spearman	0.98*	0.96*	0.97*	0.94*	0.94*

* Statistical significance at $p < 0.05$.

Figure B.6. Linear scoring thresholds, benchmarks versus the top box scores thresholds, benchmarks analysis

Measure	Linear			Top-box		
	Threshold	Benchmark	Gap	Threshold	Benchmark	Gap
Cleanliness and quietness	84.50%	90.30%	5.80%	65.61%	79.58%	13.97%
Nurse communication	91.00%	93.60%	2.60%	79.06%	87.36%	8.30%
Doctor communication	91.00%	94.60%	3.60%	79.91%	88.10%	8.19%
Staff responsiveness	85.00%	90.20%	5.20%	65.77%	81.00%	15.23%
Communication about medicines	78.00%	84.60%	6.60%	63.83%	74.75%	10.92%
Care transition	82.00%	84.70%	2.70%	51.87%	63.32%	11.45%
Overall hospital rating	88.00%	92.70%	4.70%	71.80%	85.67%	13.87%

Figure B.7. Modeled statewide QBR scores with linear measures

Statistic	Total QBR score			
	Model 1 RY23 measures, no linear	Model 2 RY23 measures + 8 linear (all)	Model 3 RY23 measures + 5 linear	Model 4 RY23 measures + 4 linear
Median	32.24%	33.11%	32.98%	33.01%
Average	32.96%	33.41%	33.42%	33.49%
25th percentile	27.68%	27.81%	27.81%	27.75%
75th percentile	38.94%	39.48%	39.60%	39.66%
Min	13.02%	13.02%	12.90%	12.90%
Max	51.23%	52.48%	52.55%	53.52%

APPENDIX C EMERGENCY DEPARTMENT WAIT TIME MEASURE

A. Analyses

Figure C.1. Emergency department utilization snapshot

Maryland	National
<ul style="list-style-type: none"> • ~2.38M annual ED visits (average CY16-19) <ul style="list-style-type: none"> – NOTE: CY 2020 experienced sustained volume decline to 1.78M visits 	<ul style="list-style-type: none"> • 130M annual ED visits
<ul style="list-style-type: none"> • 39.45 visits per 100 Marylanders per year 	<ul style="list-style-type: none"> • 42 visits per 100 Americans per year
<ul style="list-style-type: none"> • 17.9% arrive by ambulance (CY19) 	<ul style="list-style-type: none"> • ~15% of patients arrive by ambulance
<ul style="list-style-type: none"> • ~85.5% of patients are discharged without being admitted <ul style="list-style-type: none"> – NOTE: 2020 this figure dropped to 83.3% 	<ul style="list-style-type: none"> • Common complaints are: <ul style="list-style-type: none"> – Stomach/abdominal pain – Chest Pain – Fever/Headache
	<ul style="list-style-type: none"> • ~80% of patients are discharged without being admitted

Figure C.2. Preliminary regression results: Risk adjusting ED wait time measures to account for volume and occupancy

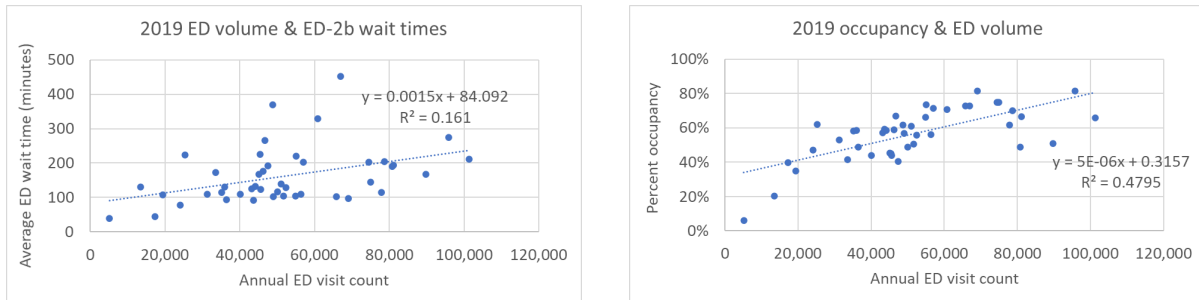
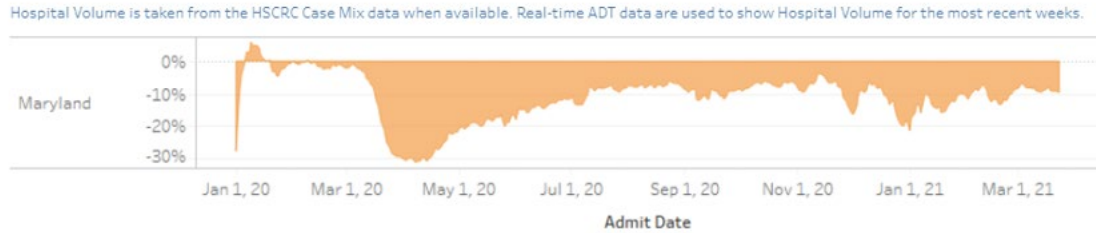
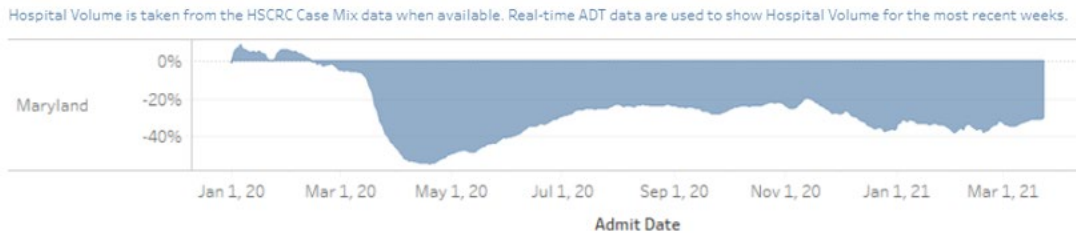


Figure C.3. COVID and ED volume reduction

While inpatient volumes have predominantly recovered following April–June 2020 declines (~10% current decline),



we see a persistent decline in year-over-year emergency department volume (~25% current decline).



APPENDIX D CDC NHSN HAI

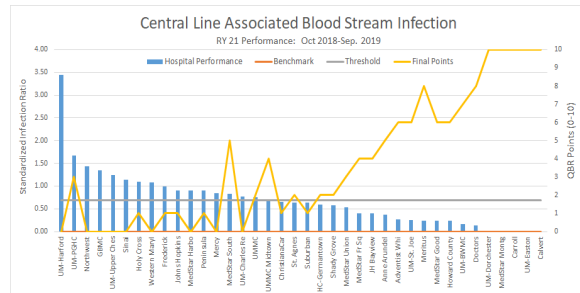
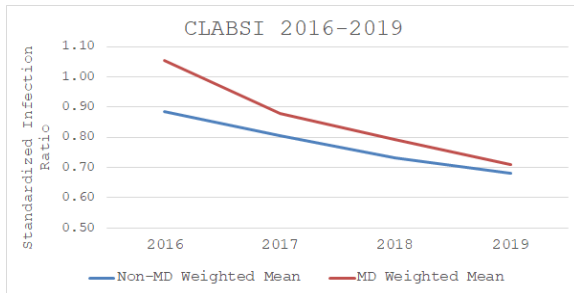
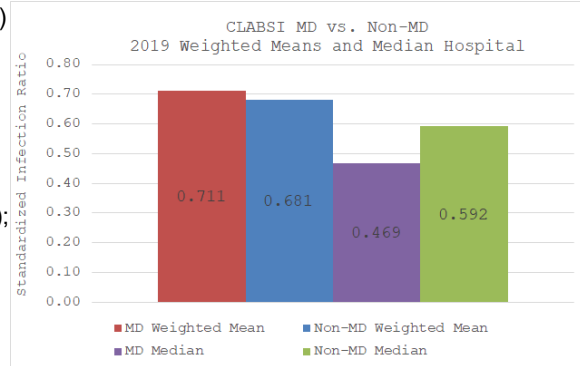
A. Analyses

Figure D1. Summary table: Data sources and analyses for NHSN SIRs

Data sources	Hospitals included	Descriptive statistics
CMMI VBP Analysis	MD + VBP hospitals	Unweighted mean
CMS Hospital Compare	All hospitals, approximation can be used to limit to VBP-only hospitals	Unweighted mean, weighted mean, median
CDC Progress Report	All hospitals with >1 predicted	Weighted means and hospital mean

Figure D2. CLABSI snapshot

Maryland performs worse than nation* (weighted mean)
 Median Maryland hospital performs better than median non-MD hospital
 By hospital graph shows distribution in performance; some hospitals are receiving improvement points despite poor performance
 2019: State rank 39 (weighted mean); 26 (unweighted);
 2019: 209 CLABSI events in Maryland (hosp=37)



* National data is all non-Maryland hospitals subject to VBP.

Figure D3. CAUTI snapshot

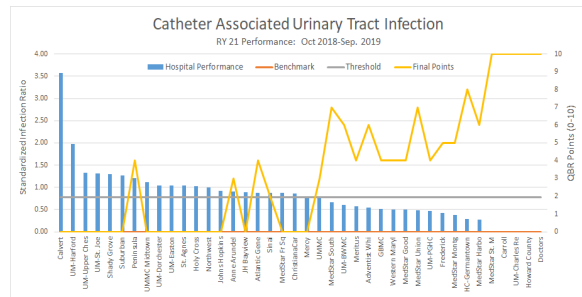
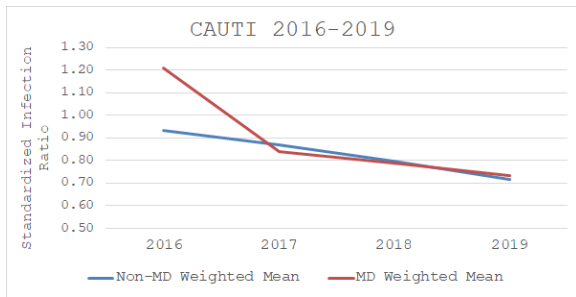
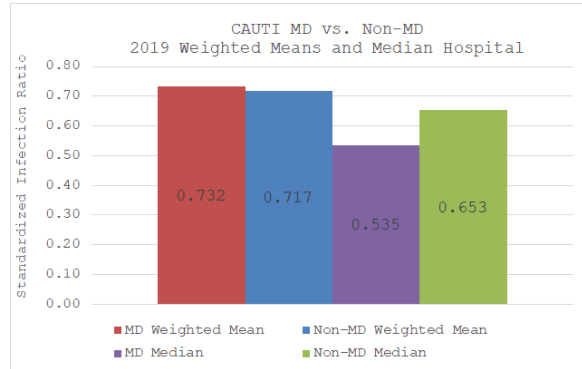
Maryland performs tad worse than nation* (weighted mean)

Median Maryland hospital performs better than median non-MD hospital

By hospital graph shows distribution in performance; some hospitals are receiving improvement points despite poor performance

2019: State rank #26 (weighted mean); 18 (unweighted)

2019: 225 CAUTI events in Maryland (N=38)



* National data is all non-Maryland hospitals subject to VBP.

Figure D4. SSI Colon snapshot

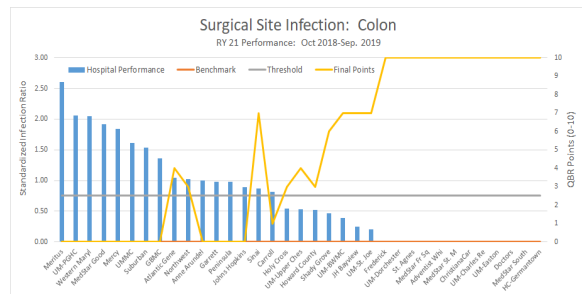
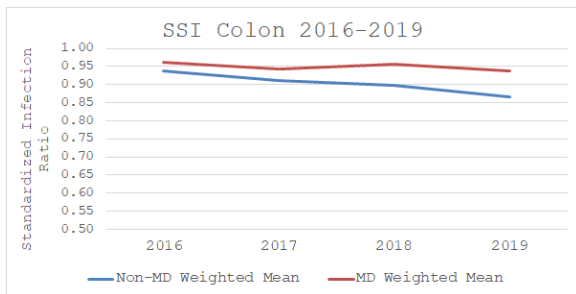
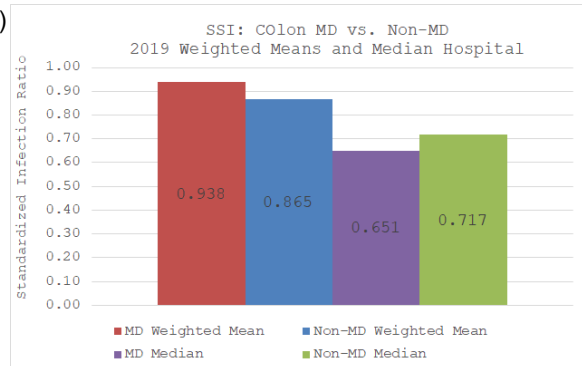
Maryland performs worse than nation* (weighted mean)

Median Maryland hospital performs better than median non-MD hospital

By hospital graph shows distribution in performance; some hospitals are receiving improvement points despite poor performance

2019: State rank #31 (weighted mean); 19 (unweighted)

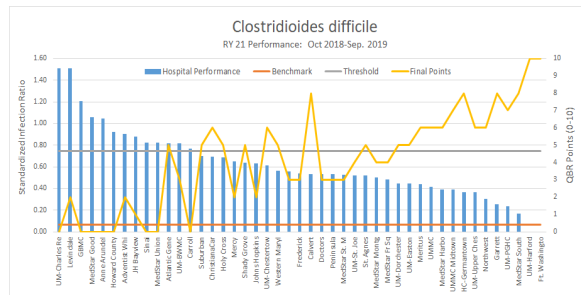
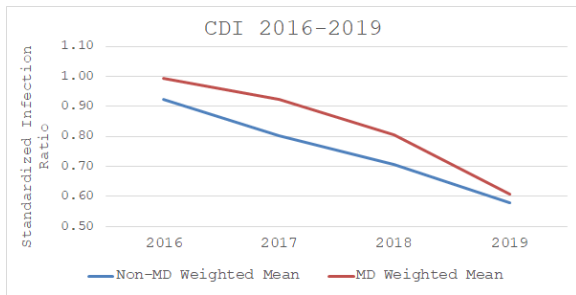
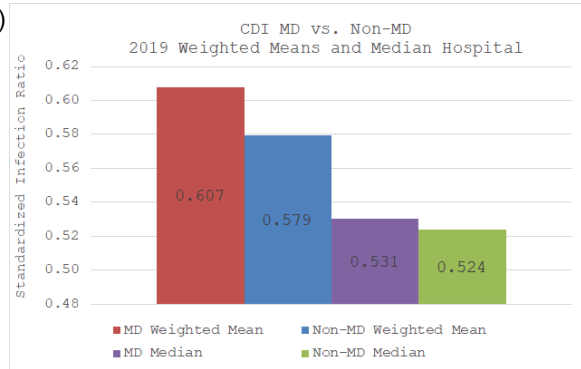
2019: 138 Colon SSI events in Maryland (N=33)



* National data is all non-Maryland hospitals subject to VBP.

Figure D7. C.Diff. snapshot

Maryland performs worse than nation* (weighted mean)
 Median Maryland hospital performs worse than median non-MD hospital
 By hospital graph shows distribution in performance; some hospitals are receiving improvement points despite poor performance
 2019: State rank #26 (weighted mean); 19 (unweighted)
 2019: 1,065 CDI events in Maryland (N=43)



* National data is all non-Maryland hospitals subject to VBP.

APPENDIX E

30-DAY MORTALITY MEASURE

30-Day All Cause, All Payer Mortality Measure Development

Recent legislative changes have allowed Maryland Vital Statistics to share death data directly with CRISP, the state-designated health information exchange, which can share data with the HSCRC. HSCRC staff and CRISP are working to finalize the monthly data process to match death data to our inpatient case-mix files. In the meantime, staff have been working with Mathematica to develop specifications for a 30-day all-cause, all-payer mortality measure to capture deaths within 30 days of hospital admission, regardless of where the deaths occur. Although it is estimated that two-thirds of deaths occur in hospitals, staff believe post-hospitalization deaths are an important indicator of quality and that moving to a 30-day measure better aligns with CMS's measures. Furthermore, staff believes the current inpatient measure might be topped out due to the shrinking distance between benchmark and threshold values and because most Maryland hospitals (34 of 44) are either earning equal improvement and attainment credit (n = 14) or are earning attainment credit (n = 20). Figure X shows the threshold and benchmark values for the current inpatient mortality measure.

Figure E1. Maryland's threshold and benchmark values for the inpatient mortality measure in the QBR Program

	Threshold	Benchmark	Distance
RY 2018	97.5400%	98.7700%	1.23%
RY 2019-Palliative care excluded	98.1949%	99.2436%	1.05%
RY 2019-Palliative care included	95.5074%	97.1680%	1.66%
RY 2020	95.6169%	97.0807%	1.46%
RY 2021	95.4754%	96.9606%	1.49%
RY 2022	96.1926%	97.2555%	1.06%

For its quality programs, CMS calculates a number of condition- and procedure-specific 30-day mortality measures. CMS does not calculate an all-cause claims-based mortality measure, but it has specified one in partnership with the Yale Center for Outcomes Research & Evaluation (CORE). The HSCRC is using this measure as a guide for designing the QBR 30-day measure. Although CMS did not implement the

claims-based version,⁴² the agency will require hospitals to submit core clinical data elements for a hybrid version of the measure.⁴³

Figure XX compares the draft specifications for the HSCRC's 30-day all-cause mortality measure to the specifications to the CMS claims based measure. The biggest difference is that the HSCRC's all-payer measure risk adjustment for this all-payer measure is based on the current inpatient measure because the HSCRC lacks complete inpatient and outpatient all-payer claims data. Otherwise in terms of specifications the Maryland 30-day measure is similar to the CMS measure for things such as exclusions, assignment to service lines, and calculation of the overall mortality rate.

Figure .E2 The HSCRC's proposed 30-day all-cause mortality measure versus CMS's draft all-cause claims-based mortality measure

	CMS	Maryland
Population	Medicare beneficiaries	All-payer
Service lines	Stays assigned to service lines in nonsurgical and surgical cohorts	Same as CMS except maternity service line will be identified but not used in final calculation of hospitals' rates
Risk-adjustment data	Inpatient Medicare administrative claims data extending 12 months before the index admission, and all claims data for the index admission itself	Same data used for the QBR Program inpatient measure based on All-Patient Refined Diagnosis-Related Groups (APR-DRGs) and risk of mortality, age, gender, and palliative care diagnosis
Selection of random hospitalizations	Selects one admission for inclusion in the sample for patients who have multiple admissions that qualify for measure inclusion	Same as CMS

As mentioned above, we are currently waiting for an updated case-mix data file with a flag for 30-day death following hospital admission and merged with our CCLF data to obtain additional hospice cases for Medicare that were not identified using the case-mix data. Then Mathematica will be able to run the 30-day mortality measure and assess the following statistical properties:

- **Convergent validity:** Compare the measure results with CMS's overall star ratings, CMS's condition-specific 30-day mortality results (July 2015–June 2018), and the HSCRC's inpatient mortality results from the QBR Program (CY 2018 and 2019).

⁴² CMS used a hybrid approach, relying on administrative and EHR data rather than claims-based data.

⁴³ The CMS IPPS FY 2022 proposed rule recommends adopting the measure in a stepwise fashion, starting with a voluntary reporting period from July 1, 2022, through June 30, 2023, and followed by mandatory reporting from July 1, 2023, through June 30, 2024. This would affect the FY 2026 payment determination and payment for subsequent years.

- **Predictive validity:** Compare all-payer, 30-day mortality results for CY 2018 and CY 2019 to assess correlation overtime. Assuming the underlying quality is stable from year to year, we would expect a high degree of correlation across the two years, which does occur.
- **Reliability analysis:** Conduct a signal-to-noise test to assess reliability of both the overall measure and by hospital measure.
- **C-statistic:** Calculate the C-statistic to assess how well a measure distinguishes between an event and a non-event. A C-statistic of 0.5 indicates that the model does no better than a coin flip in terms of accurately predicting an outcome, whereas values close to 1 indicate better prediction.

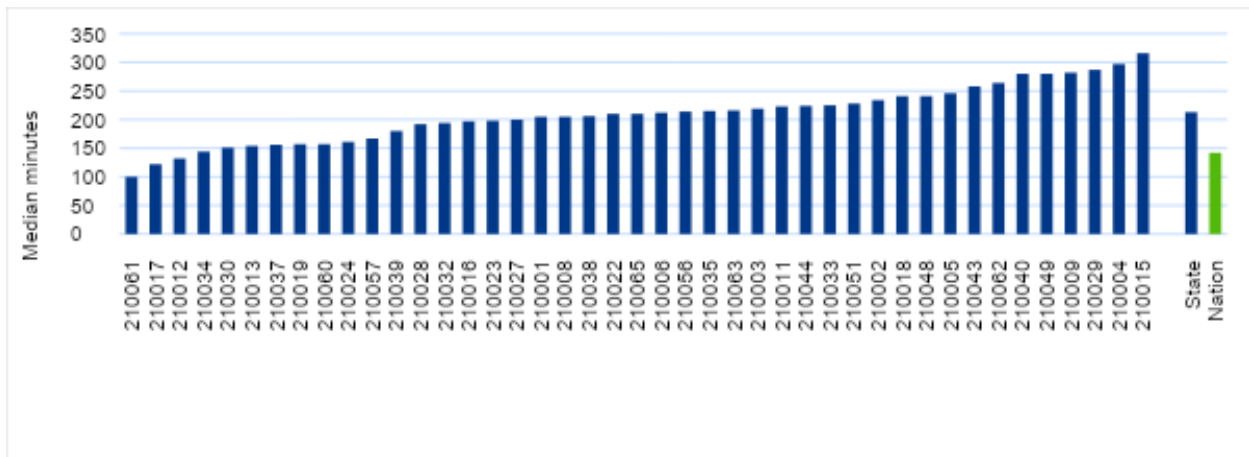
APPENDIX F

CMS HOSPITAL OUTPATIENT QUALITY MEASURE ANALYSIS

The graphs in this appendix show Maryland vs. the Nation CY2019 performance results based on data from CMS Care Compare on seven of the CMS Hospital Outpatient Quality Reporting Program.

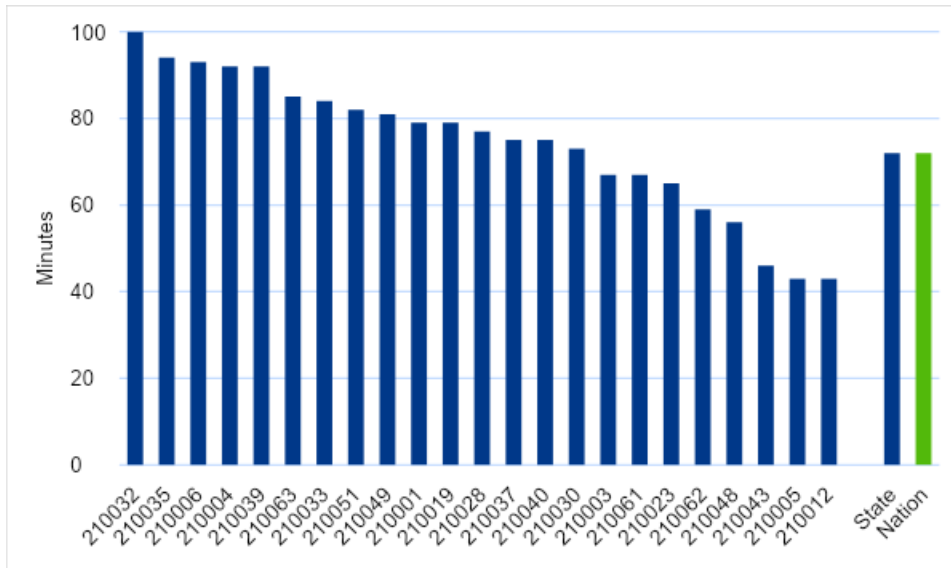
a. timely and effective care measures.

Figure F1. OP-18b: Median Time from ED Arrival to ED Departure for Discharged ED Patients (CY 2019)



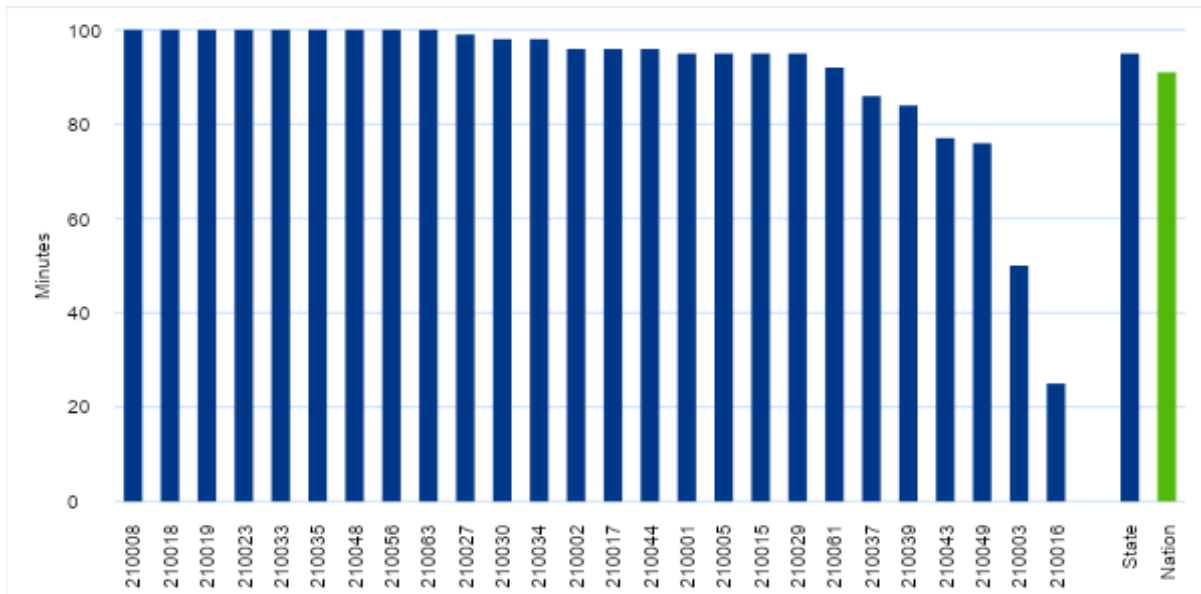
Note: Lower is better.

Figure F2. OP-23: Head Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) Scan Results for Acute Ischemic Stroke or Hemorrhagic Stroke Patients Who Received Head CT or MRI Scan Interpretation Within 45 Minutes of ED Arrival (CY 2019)



Note: Higher is better.

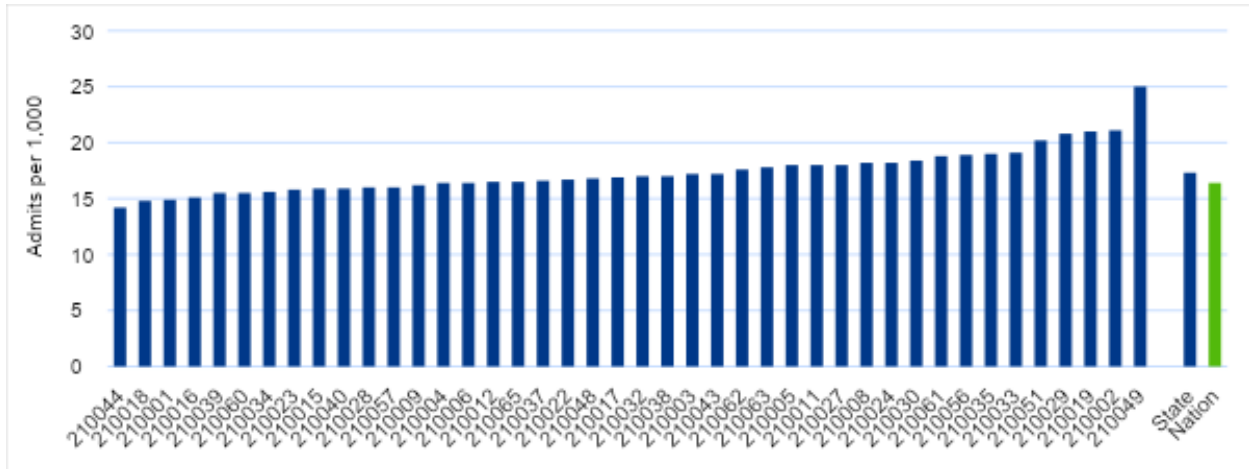
Figure F3. OP-29: Appropriate Follow-Up Interval for Normal Colonoscopy in Average-Risk Patients (CY 2019)



Note: Higher is better.

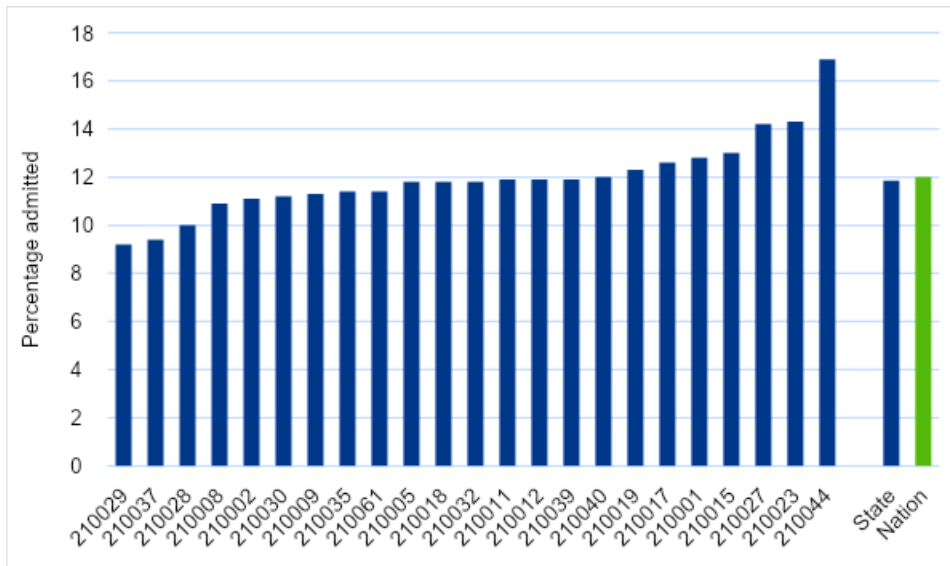
b. Unplanned hospital visit measures

Figure F4 . OP-32: Facility Seven-Day Risk Standardized Hospital Visit Rate After Outpatient Colonoscopy (time period: 2017–2019)



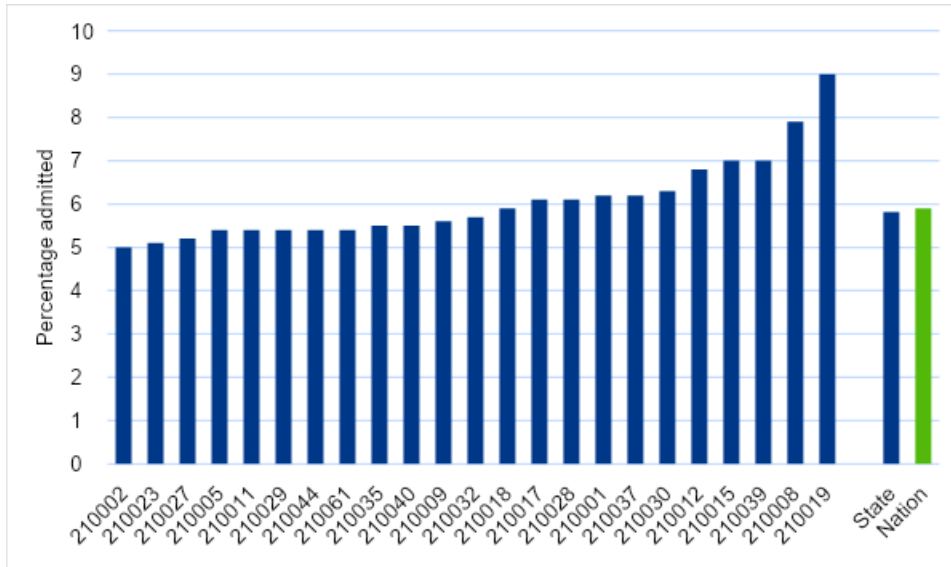
Note: Lower is better.

Figure F5. OP-35ADM: Admissions for Patients Receiving Outpatient Chemotherapy



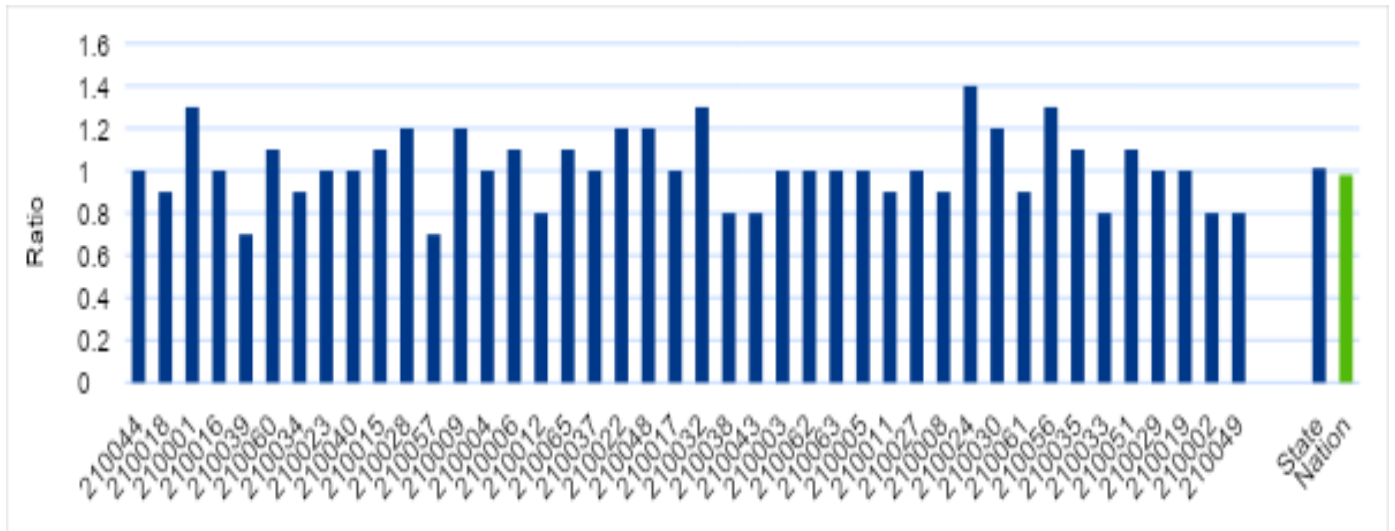
Note: Lower is better.

Figure 6. OP-35ED: Emergency Department (ED) Visits for Patients Receiving Outpatient Chemotherapy



Note: Lower is better.

Figure F7. OP-36: Ratio of Unplanned Hospital Visits After Outpatient Surgery (time period: 2019)



Note: Lower is better.