MEMO

To: Kate Sapra, Center for Medicare and Medicaid Innovation

From: Katie Wunderlich, Executive Director

Re: Maryland TCOC Model: QBR Program Report, QBR/MHAC Quality Programs Update, and Request for Continued VBP/HACRP Exemption in Federal Fiscal Year 2022

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On behalf of the State of Maryland, the Health Services Cost Review Commission (HSCRC) respectfully submits this annual report on Maryland's hospital quality and value-based payment programs to the Centers for Medicare & Medicaid Services (CMS). This report serves as a request for continued exemption from the Value-Based Purchasing (VBP) Program and Hospital-Acquired Conditions Reduction Program (HACRP) for federal fiscal year (FFY) 2022.[1]

Maryland maintains long-standing Medicare waivers for its all-payer hospital rate-setting system, and because of this system, CMS has historically granted special considerations to Maryland, including exemption from federal quality-based payment programs. In their place, the HSCRC implements Maryland-specific, all-payer quality-based payment programs, which provide incentives for hospitals to improve their quality performance.

This report is intended to fulfill the requirements of the Total Cost of Care (TCOC) Model agreement, which began January 1, 2019, and includes model reporting requirements for calendar year (CY) 2021 based on model year 2020 results.[2] CMS requires Maryland to implement hospital quality and value-based payment programs that achieve or surpass the measured results of the national programs in terms of patient outcomes and cost savings.

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[1] For Maryland's formal exemption request from the FY 2022 Hospital Readmission Reduction Program, please see file entitled "HSCRC FY 2022 Quality Exemption 2021-07-09.pdf" submitted to the Center for Medicare & Medicaid Innovation on July 9, 2021.

[2] Due to the ongoing COVID-19 public health emergency, the report mostly relies on CY 2019 data, except where noted.

This memo is accompanied by two attachments:

1. **A report from the Quality-Based Reimbursement (QBR) Subgroup**, describing a multiyear proposed redesign of the program. This report serves as a formal exemption request for the QBR Program to serve as a substitute for Maryland's participation in the federal VBP Program. The report includes:

   – An assessment of Maryland's performance on QBR/VBP measures and other areas of opportunity to strengthen the QBR Program and associated analytics

   – Stakeholder feedback

   – Recommendations and next steps for the Performance Measurement Work Group and the HSCRC.

2. Hospital QBR Stakeholder Letters: Submissions to HSCRC

3. A formal exemption request for the Maryland Hospital-Acquired Conditions (MHAC) Program to serve as a substitute for Maryland's participation in the federal HACRP.

It is important to recognize the robust stakeholder process that contributed to the QBR Redesign Subgroup report (the first attachment). The redesign of the QBR Program was multifaceted, fast-paced, and comprehensive. HSCRC staff appreciates the work of a diverse set of stakeholders comprising quality measurement, clinical, public policy, consumer, and payer experts and representatives, among others. The staff also thanks its contractor Mathematica for its extensive statistical and measurement expertise, used iteratively throughout the QBR report.

The MHAC report (the second attachment) consists of three sections:

- Section I: Describes the MHAC Program

- Section II: Summarizes the most recent program results

- Section III: Describes efforts to improve the program going forward

Of note, for the Potentially preventable complications (PPCs) used in the MHAC program, Maryland achieved a greater than 50 percent reduction in case-mix-adjusted PPCs via the All-Payer Model, exceeding the model requirement of a 30 percent reduction in PPCs. In the first year of the TCOC Model, CY 2019 (state fiscal year [SFY] 2021 performance period), the observed-to-expected ratio for the 14 PPCs in the MHAC Program was further reduced by 20 percent.

Maryland's hospital quality-based payment programs apply to all payers wherever possible and are crucial to the success of the TCOC Model. Each of Maryland's current quality-based payment programs holds hospitals accountable for improved quality by tying performance directly to revenue adjustments under the hospital rate-setting system.

To ensure the continued success of Maryland's reform efforts, it is critical that Maryland hospitals concentrate on areas with the greatest opportunity for quality improvement. Exemptions from the CMS national hospital programs for FFY 2022 give Maryland the continued flexibility to focus its quality-based payment programs on areas specific to Maryland hospitals. Exemption from the VBP and HACRP Medicare Programs also enables Maryland to maintain its all-payer approach to hospitals' quality-based payment adjustments and to align the all-payer programs with the operational needs of the all-payer hospital rate-setting system.

Finally, this exemption is not only of value to Maryland but to the entire nation. With it, Maryland can continue to serve as an unparalleled, large-scale pilot of all-payer quality improvement, cost containment, and delivery reform. These efforts validate the HSCRC's belief that quality improvement should benefit all patients and remain a central tenet of any patient-centered health care reform. By supporting the all-payer attributes of the Maryland hospital payment system, CMS preserves health care delivery innovations that may generate successful, scalable models for the rest of the nation.

We appreciate your careful consideration and are happy to provide additional context or data upon request.

Attachments:

Quality-Based Reimbursement Program Redesign: Workgroup Summary and Future Considerations, August 16, 2021

Hospital QBR Stakeholder Letters: Submissions to HSCRC

Maryland Hospital-Acquired Conditions Program: Formal Exemption Request, August 16, 2021

Quality-Based Reimbursement Program Redesign:

Workgroup Summary and Future Considerations

August 16, 2021

Contents

Figures

Executive Summary

Maryland systematically revises its quality and value-based payment programs, with the aim of better achieving 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). Also included are more recent large-scale overhauls to better align program policies with the expanded and evolving goals of the Total Cost of Care (TCOC) Model agreement with the Centers for Medicare & Medicaid Services (CMS), which took effect in 2019.

The HSCRC intended to convene a subgroup to redesign the Quality-Based Reimbursement (QBR) Program in calendar year (CY) 2020 for the rate year (RY) 2023 QBR policy; however, the HSCRC postponed this for one year due to the COVID-19 public health emergency. The QBR Program, broadly analogous to the national Hospital Value-Based Purchasing (VBP) Program, remained similar to prior iterations of the policy in RY 2023, with the understanding that the program would be redesigned in CY 2021.

Under the TCOC Model, Maryland must request exemptions each year from CMS pay-for-performance programs. 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 VBP 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. Furthermore, as part of exemption approval, CMS stipulated that Maryland develop a high-level work plan and a report summarizing the QBR redesign.

This report summarizes the state's efforts to redesign the QBR Program. Specifically, it describes the work done by the HSCRC and a stakeholder workgroup—the QBR Redesign Subgroup— to examine and consider revisions to the QBR Program. In fall 2021, the Performance Measurement Workgroup (PMWG) will review the subgroup's feedback, and the HSCRC will include recommended changes to the program in the RY 2024 Draft and Final QBR Policies, to be presented to HSCRC commissioners in late 2021 for their approval.

To guide the discussion with the subgroup, HSCRC staff and its contractor, Mathematica, conducted a wide range of analyses (including literature reviews, descriptive statistics, trends analyses, correlation analyses, and validity and reliability testing) for the existing and new measures. The analyses mainly compared Maryland performance to national performance, and Maryland hospital-level analyses were conducted when appropriate or helpful for the discussion.

As a result of the subgroup discussions and guidance, the HSCRC will bring the following action items and topics before the PMWG this fall (Figure ES.1). The PMWG will further assess and provide guidance on these items to inform the development of the RY 2024 QBR policy and future QBR policies.

Figure ES.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	• Create criteria for and determine which HCAHPS measures' linear scores to include in the Person and Community Engagement (PCE) domain • Include an option for a voluntary upfront investment that hospitals can use to improve HCAHPS performance	• 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	• 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	• 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	• 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	• 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	• Maintain alignment with national VBP Program; focus on improvement on current measures	• Explore working with CDC to add more innovative and less burdensome "digital" measures (such as the hospital-onset bacterium measure)

Measure	RY 2024	Future program years
Clinical Care domain		
30-day mortality	• 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	• Continue to evaluate 30-day measure • Consider developing a hybrid measure using eCQM infrastructure
Total hip arthroplasty/total knee arthroplasty	• Consider expansion of the current inpatient total hip arthroplasty/total knee arthroplasty measure to all-payers	• 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 have acknowledged this time of disruption and uncertainty to the extent possible in conveying the QBR Redesign Subgroup's suggestions to the PMWG. However, further analysis of data or unforeseen complications related to COVID-19 could affect Maryland's ability to take the steps suggested in this report. The state is particularly concerned about resources and data availability as it continues to grapple with COVID-19. Given the expected persistence of COVID-19, Maryland might decide that more adjustments are needed to further account for the effects of the pandemic.

I.   Introduction

Maryland's hospital quality-based payment programs have evolved along with the method for setting Maryland's hospital payment rates, with the aim of better achieving the state's overarching goals: more efficient, higher quality care, and improved population health. Since 2014, when the All-Payer Model agreement with the Centers for Medicare & Medicaid Services (CMS) took effect, Maryland hospitals have been funded under a population-based revenue system with a fixed annual revenue cap that is adjusted for inflation, quality performance, reductions in potentially avoidable utilization, market shifts, and demographic growth. Under the global budget system, hospitals have an incentive to shift services to the most appropriate care setting, and they may keep any savings they earn via better patient experiences, reduced hospital-acquired infections, or other improvements in care.

The Health Services Cost Review Commission (HSCRC) must ensure that any incentives to constrain hospital expenditures do not lower the quality of care. Thus, the HSCRC hospital quality programs reward quality improvements and achievements while guarding against unintended consequences and penalizing poor performance. Maryland's Quality-Based Reimbursement (QBR) program was the first hospital pay-for-performance program implemented by the HSCRC, and it is now one of several such initiatives that provide incentives for hospitals to enhance and maintain high quality care and value over time.

Maryland has systematically revised its quality and value-based payment programs. The revisions include annual updates to each program policy, which must be approved by the HSCRC, and more recent large-scale overhauls to better align program policies with the expanded and evolving goals of the Total Cost of Care (TCOC) Model agreement with CMS, which took effect in 2019.[3] The HSCRC worked with stakeholders over the last two years to revise the Maryland Hospital-Acquired Conditions program, the Potentially Avoidable Utilization program,[4] and the Readmissions Reduction Incentive Program for rate year (RY) 2022 (the calendar year [CY] 2020 performance period). Although staff intended to convene a subgroup to redesign the QBR Program in CY 2020 for the RY 2023 QBR policy, the HSCRC postponed this for one year due to the COVID-19 public health emergency. The QBR Program, broadly analogous to the national Hospital Value-Based Purchasing (VBP) Program, remained similar to prior iterations of the policy in RY 2023, with the understanding that the program would be redesigned in CY 2021.

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[3] In Fall 2017, HSCRC commissioners and staff held several strategic planning sessions to develop priorities and guiding principles for the upcoming TCOC Model. Based on these sessions, the HSCRC created a critical action plan that delineates timelines for review and the possible reform of financial and quality methods, along with other staff operations.

[4] Maryland implemented an efficiency measure in the population-based revenue system based on a calculation of potentially avoidable utilization. But the state has not made efficiency part of its core quality programs as a domain because the revenue system itself provides incentives for improved efficiency. Potentially avoidable utilization is defined as the costs of readmissions and avoidable admissions, as outlined by the Agency for Healthcare Research and Quality's Prevention Quality Indicators.

Under the TCOC Model, Maryland must request exemptions each year from the CMS pay-for-performance programs, which are the Hospital-Acquired Conditions Program, Hospital Readmissions Reduction Program, and VBP Program. CMS assesses and grants these exemptions based on a report for each program showing that Maryland's results continue to meet or exceed 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 VBP Program domains:

1. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) measures in the Person and Community Engagement domain
2. The Centers for Disease Control and Prevention's (CDC's) National Health Safety Network (NHSN) infection measures in the Safety domain

Furthermore, as part of exemption approval, CMS stipulated that Maryland develop a high-level work plan (submitted January 2021) and a report summarizing the QBR redesign. This report summarizes the state's redesign efforts.

Maintaining Maryland's exemption from the national VBP Program is critical to the HSCRC because the exemption enables the state (via the HSCRC) to generate autonomous, quality-based measurement and payment initiatives that set consistent all-payer quality incentives. Furthermore, the exemption affords Maryland the flexibility to select performance measures and focal points in areas where statewide improvement is needed, and it enables the state to develop programs with greater potential for system transformation. For example, unlike the national VBP Program, QBR does not rank hospitals but instead gives all hospitals the opportunity to receive penalties or earn rewards, which are determined using a prospective revenue-adjustment scale.

The current TCOC Model agreement between Maryland and CMS does not have explicit performance requirements for Maryland's QBR Program, but the HSCRC has prioritized aligning the QBR Program with the VBP Program. Where feasible, QBR policy incorporates more comprehensive measurement than does the VBP Program to encourage improvement in areas where Maryland has underperformed. Notably, the HSCRC puts more weight on the Person and Community Engagement and Safety domains than the VBP Program to encourage improvement on measures of patient experience.

This report describes the work done by the HSCRC and a stakeholder workgroup to examine and consider revisions to the QBR Program. The HSCRC's Performance Measurement Workgroup (PMWG) will review the considerations in this report, and staff will include recommended changes to the program in the RY 2024 Draft QBR Policy, to be presented to HSCRC commissioners for approval in fall 2021.

II. QBR Program Background

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 II.1 compares RY 2023 QBR measures and domain weights to those used in the VBP Program.

Figure II.1. 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** 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

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
5. 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 II.2.

Figure II.2. Process for calculating RY 2023 QBR scores

	Performance measures		Standardized measure scores		Hospital QBR score and revenue adjustments

QBR measures by domain:

Person and Community Engagement (9 measures: 8 HCAHPS categories; NEW follow-up after chronic conditions exacerbation measure)

Safety (6 measures: 5 CDC NHSN HAI categories; NEW all-payer PSI 90 measure)

Clinical Care (inpatient mortality, THA/TKA complications)

Pie chart:
- Clinical Care 15%
- Safety 35%
- Person & Community Engagement 50%

Individual measures are converted to 0–10 points:

Points for attainment are based on performance versus a national threshold (median) and benchmark (top 5%)

Threshold benchmark
0 2 4 6 8 10

Points for improvement are based on performance versus base (historical perf.) and benchmark

Hist. perf. benchmark
0 2 4 6 8 10

Final score is the better of the two scores (improvement or attainment)

Hospital QBR score is the sum of earned points/possible points with domain weights applied

Scale of 0–80%

Max penalty -2% & reward +2%

Abbreviated Pre-Set Scale	QBR Score	Financial Adjustment
Max Penalty	0%	-2.00%
	10%	-1.51%
	20%	-1.02%
	30%	-0.54%
Penalty/Reward Cutpoint	41%	0.00%
	50%	0.46%
	60%	0.97%
	70%	1.49%
Max Reward	80%+	2.00%

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

III. 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.

A. Goals

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, as described in the next section. The goals are as follows:

1. 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

B. Objectives[5]

Objective 1. Consider options for improving HCAHPS performance

Objective 2. Consider options for improving performance on CDC NHSN HAI measures

Objective 3. Consider issues related to measurement of emergency department (ED) wait times

Objective 4. Explore complementary measures and data sources that align with the State Integrated Health Improvement Strategy (SIHIS)—for example:

- Follow-up after discharge measure expansion to Medicaid; other chronic conditions measures
- Other care coordination elements that can draw on data captured by the Chesapeake Regional Information System for Our Patients (CRISP)

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[5] The following objectives are a condensed version from those stated in the March 2021 QBR Redesign Subgroup Work Plan. For a complete objectives list, please see:
https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/RY2023/2020%20QBR%20Sub-group%20Workplan%20-%20for%20website.pdf.

Objective 5. Refine existing measures or domains —for example:

- Mortality: Shift from current all-payer, all-condition inpatient measure to all-payer, all-condition 30-day mortality

- Total Hip/Total Knee Complications (THA-TKA): Consider feasibility of implementing all-payer measure using the HSCRC case-mix data or other payers' data

Objective 6. Evaluate the feasibility of expanding quality measurement in QBR to include outpatient hospital/ambulatory surgery metrics—for example:

- New measures such as return to hospital after colonoscopy or surgery at an ambulatory surgery center

- Measures of THA-TKA complications after outpatient hospital surgery

Objective 7. Consider alternative measurement topics or domain options in areas that need improvement in Maryland, such as:

- Maternal health care

- Sepsis bundles

- Incentives for improving disparities

- Palliative care

IV. Assessment

A. Hospital Consumer Assessment of Healthcare Providers and Systems

1. Background

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 consistency[6]; 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 have also increased slightly over time for all measures except doctor communication. Figure IV.1 provides the Maryland HCAHPS top-box performance results for the 2015 to 2019 performance periods compared to the nation's VBP thresholds and benchmarks.[7]

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

[7] 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.

Figure IV.1. VBP thresholds, benchmarks and Maryland HCAHPS top-box scores (2015–2019)

		CY 2015	CY 2016	CY 2017	CY 2018	CY 2019
Nurse communication	Threshold	78.19%	78.52%	78.69%	79.08%	79.06%
	Benchmark	86.61%	86.68%	86.97%	87.12%	87.36%
	MD top box	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%
	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%

As a further illustrative example, Figure IV.2 shows that Maryland performs worse than the nation for the average of the seven HCAHPS measures. Maryland performance has improved by 1 percent between the years 2016 and 2019, but national performance standards have increased at roughly the same rate. Consequently, while Maryland has improved, the performance gap between Maryland and the nation remains largely unchanged.

Figure IV.2. VBP thresholds, benchmarks and Maryland HCAHPS top-box scores for average of the seven HCAHPS measures (2016–2019)
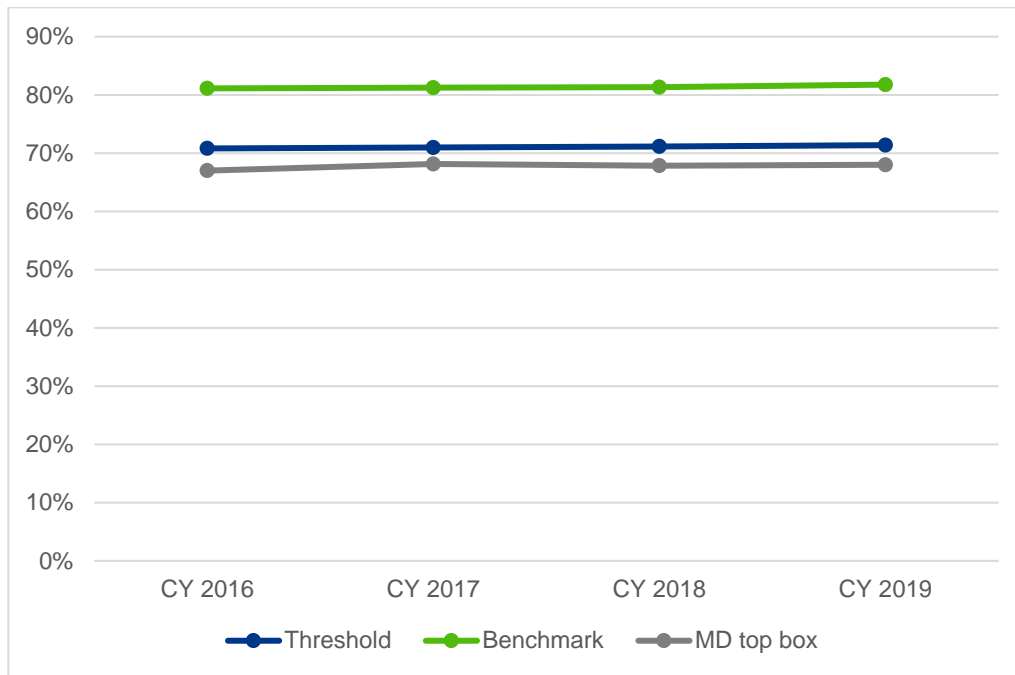
Note: For analysis of the remaining HCAHPS measures, please see Appendix B.

Across Maryland hospitals, change has fluctuated over time. 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). Figure IV.3 illustrates these trends for the average of the seven HCAHPS measures.

Figure IV.3. Maryland hospital top-box score changes over time (2013–2018, 2018–2019) for average of the seven HCAHPS measures
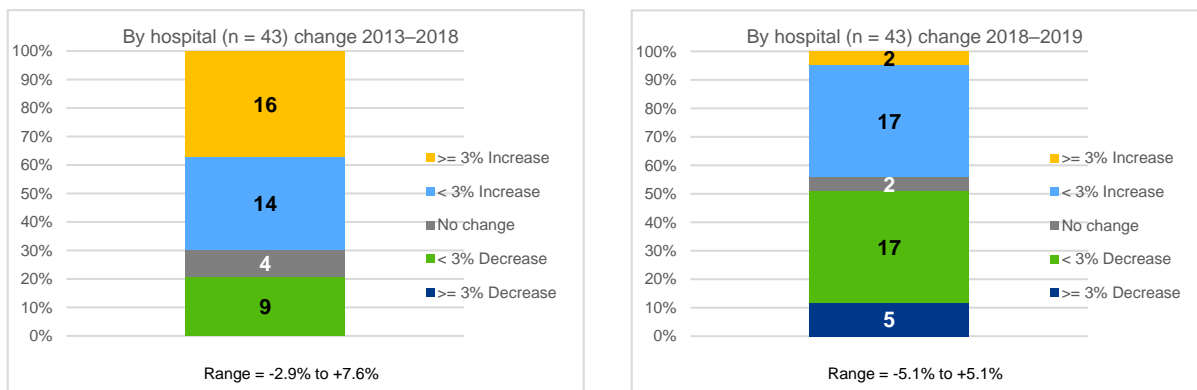
Note: For analysis of the remaining HCAHPS measures, please see Appendix B.

The HSCRC further researched whether HCAHPS improvement was different for low- versus high-performing hospitals by grouping hospitals into quartiles of performance using 2013 top-box scores and examining the average improvement in each quartile from 2013 for top-box scores, or 2014 for linear scores, through 2018. Figure IV.4 illustrates this analysis. 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. However, divergence across hospital improvement suggests that performance improvement and achievement sufficient to earn attainment points is possible.

Figure IV.4. Maryland HCAHPS improvement by quartile (2013/2014–2018)

Average annual improvement (base year-2018)	Nurse communication		Doctor communication		Staff responsiveness		Communication about medicines		Discharge information		Care transition		Hospital rating		Cleanliness/quietness	
	Top-box	Linear	Top-box	Linear	Top-box	Linear	Top-box	Linear	Top-box	Linear	Top-box	Linear	Top-box	Linear	Top-box	Linear
4th quartile	0.7	0.3	0.3	0.1	1.5	0.4	1.3	0.3	0.9	0.4	0.9	0.3	0.8	-0.1	1.1	0.3
3rd quartile	0.7	0.2	0.1	0.0	0.8	0.2	0.7	0.3	0.4	0.3	0.7	0.3	0.4	-0.2	0.4	0.3
2nd quartile	0.4	0.0	-0.1	-0.1	0.1	0.1	0.3	0.1	0.2	0.1	0.4	-0.1	0.3	-0.1	0.4	0.6
1st quartile	-0.1	0.0	-0.2	-0.3	-0.1	0.1	-0.1	-0.1	-0.2	-0.5	0.3	0.2	-0.4	-0.2	-0.3	0.2

The HSCRC also presented the following analyses:

- A **literature review** conducted by Mathematica summarizing successful HCAHPS improvement strategies implemented by other states or individual hospitals (for example, organizational factors associated with a culture of "patient focus," best practices for patient-physician communication, hospital interventions, and so on.[8]

- 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).

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[8] For the HCAHPS literature review, please see
https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/RY2023/Literature%20Review%20Summary%20for%20HCAHPS%20Improvement.pdf.

- 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.

- 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 performance goals.

- 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:[9]

  - 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:

    o There is a positive, moderate, and statistically significant correlation between survival rate and several HCAHPS categories.

    o 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.

2.   Subgroup discussion

Maryland is finding 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.[10] Across subgroup meetings, the HSCRC detailed redesign options, including the following:

- Adding an HCAHPS linear scoring component[11]

- Changing the timing of incentives by providing up-front rewards with the same at-risk dollars for anticipated improvements

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[9] 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.

[10] For an HCAHPS policy lever diagram, please see Figure B.4 in Appendix B.

[11] 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.

- Further increasing the domain weight

- Adding complimentary measures

- Requiring hospitals to expand on sharing best practices[12]

- The subgroup had the most in-depth discussions about the first two policy levers. These discussions are further detailed below.

a.   *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,[13] there may be a cliff effect occurring that does not recognize more granular gradations in HCAHPS performance. Linear scoring, however, gives partial credit for intermediate response options ("sometimes" and "usually") and could benefit hospitals that earn low points on top-box scoring. Figure IV.5 shows the linear scoring methodology.

Figure IV.5. CMS star rating linear scoring methodology

| Never 0 points | Sometimes 33 points | Usually 66 points | Always 100 points |

Given the high correlation between top-box and linear scores,[14] incentivizing improvements in linear scores could have the potential to raise top-box scores, 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. Figures IV.6 and IV.7 detail the results of the Spearman correlation analysis.[15] There is some evidence that while patients prefer top-box scores, providers feel that the linear scores better reflect the quality of care being provided. Also, as discussed below, Dr. Dale Schumacher presented analyses on regional bias in top-box scores and the addition of linear scores may ameliorate this bias.

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[12] 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%20 2021%20QBR%20Redesign%20Subgroup.pdf.

[13] Top-box scoring: never = 0 points; sometimes = 0 points; usually = 0 points; always = 100 points.

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

[15] 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).

Figure IV.6. Spearman rank-order correlation analysis looking at the relationship between HCAHPS linear scores and various quality measures and hospital characteristics, 2017

Measure	Nurse communi-cation	Doctor communi-cation	Staff responsive-ness	Communi-cation about medicines	Discharge informa-tion	Care transition	Clean-liness	Quietness	Overall hospital rating	Recom-mend hospital	Average clean and quiet	Average 7 measures
PPC rate	0.05	0.14	0.04	0.1	0.19	0.12	0.13	0.08	0.09	0.13	0.15	0.12
Readmission rate	-0.52*	-0.19	-0.49*	-0.14	-0.08	-0.3	-0.42*	0.01	-0.38*	-0.27	-0.21	-0.35*
Survival rate	0.51*	0.18	0.34*	0.15	0.13	0.46*	0.35*	0.1	0.42*	0.28	0.25	0.36*
Length of stay	-0.46*	-0.3	-0.61*	-0.23	-0.11	-0.25	-0.37*	-0.2	-0.33*	-0.21	-0.35*	-0.37*

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

Figure IV.7. Spearman rank-order correlation analysis looking at the relationship between HCAHPS linear scores and various quality measures and hospital characteristics, 2018

Measure	Nurse communi-cation	Doctor communi-cation	Staff responsive-ness	Communi-cation about medicines	Discharge information	Care transition	Clean-liness	Quietness	Overall hospital rating	Recom-mend hospital	Average clean and quiet	Average 7 measures
PPC rate	-0.05	0.07	-0.04	-0.02	0.04	-0.11	-0.02	-0.08	-0.14	-0.19	-0.12	-0.05
Readmission rate	-0.52*	-0.16	-0.42*	-0.1	-0.14	-0.34*	-0.31*	-0.16	-0.32*	-0.28	-0.24	-0.31*
Survival rate	0.37*	0.09	0.34*	0.24	0.14	0.23	0.38*	0.34*	0.1	0.1	0.38*	0.25
Length of stay	-0.38*	-0.1	-0.37*	-0.17	-0.23	-0.43*	-0.28	0.08	-0.29	-0.24	-0.16	-0.32*

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

Staff supports inclusion of a linear measure in the HCAHPS domain because linear scores do the following:

- Make additional sense to providers
- Are more highly correlated with other quality outcomes than top-box scores
- May encourage iterative improvement on HCAHPS under the QBR Redesign

For the QBR Redesign, staff is proposing a reweighting of the Person and Community Engagement domain to include a portion on linear scoring. Figure IV.8 illustrates an example of what would happen if the domain was reweighted with linear scores given 10 percent of the weight. 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).

Figure IV.8. 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

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. While some members stated that it could be worth weighting linear scoring 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 there is no understanding of how linear scoring incentives will drive behavior change. Furthermore, staff is concerned about diluting or lowering the standards on HCAHPS too much with the addition linear scores. Subgroup members also favored a more focused approach using a subset of HCAHPS measures and including measures that are correlated to clinically meaningful outcomes. They believed that focusing on a few measures for linear scoring would increase movement and subsequently raise top-box scores. However, a concern raised about linear scoring was how to adjudicate payment differentially, given that there would be less scoring variation.

Per the request of subgroup members, the HSCRC modeled three approaches that included the addition of linear scores to the HCAHPS domain. Figure IV.9 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.

Figure IV.9. Linear scoring measures modeled at 10 percent of total QBR score

Model 1	Model 2	Model 3	Model 4
No linear	8 measures	5 measures	4 measures
	Nurse communication	Nurse communication	Nurse communication
	Doctor communication	Doctor communication	Doctor communication
	Responsiveness	Responsiveness	Responsiveness
	Care transition	Care transition	Care transition
	Med communication	Med communication	
	Discharge information		
	Overall rating		
	Clean and quiet		

Subgroup members had conflicting views on which linear score model to implement. In discussing Model 2 results, one member believed they resulted in fewer hospitals with worse performance. This member also wanted the group to consider that having more measures could allow for greater flexibility for hospitals that do better in some measures than others. Using Model 3, the HSCRC staff presented that linear scoring decreases the gap between the threshold and benchmark across all HCAHPS measures compared to top-box scores[16] and also produces higher QBR scores (higher average, median, 25th percentile, 75th percentile, lowest, and highest scores).[17] 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. Other members voiced support for Model 4 as well because of this rationale. However, some subgroup members cautioned that on CMS Hospital Compare, Maryland would still be compared to other hospitals on all eight HCAHPS measures, even if the linear scoring used a focused approach.

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[16] For the linear scoring thresholds, benchmarks versus the top-box score thresholds, benchmarks analysis, please see Figure B.6 in Appendix B.
[17] For the modeled statewide QBR scores with linear measures, please see Figure B.7 in Appendix B.

Generally, subgroup members were concerned about which specific measures to include in the linear scoring model. Members wanted "comparison to the nation", where Maryland is lacking relative to the nation on linear scores, to be a criterion for selecting measures on which to focus. Several subgroup members had comments about the inclusion of 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. However, another member shared that responsiveness is linked to patient safety— HSCRC correlations also show a link to patient safety.[18] Subgroup members also stated that responsiveness related closely to sufficient staffing, a concern across many Maryland hospitals. One member favored the responsiveness measures, stating that measures should be looked at from the patient perspective.

Regarding other linear scores in the model, subgroup members did not want medication or discharges to be "doubled up" because they are both components of the care transitions measure.

The HSCRC will look further into correlation analyses between a potential measure and desired outcomes to determine which linear scores are most appropriate for inclusion in the QBR Program.

b.   *Voluntary up-front investment*

Staff also suggested exploring 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. The HSCRC believes loss aversion is a salient negative consequence and, thus, the incentive for improvement should be greater if hospitals have upfront financial support (without raising the percentage of revenue at risk) that will be taken back fully if improvements are 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, an up-front investment may also finance changes in hospital operations to fund frontline staff incentives that lead to permanent improvements in patient experience.

Considerations that the HSCRC asked the subgroup to discuss included whether there should be a link to improvement in linear scoring, top-box scoring, or both; whether there should be a requirement that financial incentives be used only for HCAHPS interventions; how to calculate potential improvements and associated financial support; how the calculation of the QBR revenue adjustment should take into account the up-front support; and the timeline for paying back the up-front investment if a hospital's HCAHPS score does not improve.

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[18] For a correlation analysis looking at the relationship between Maryland hospitals' linear scores and various quality measures and hospital characteristics, please see Figures IV.6 and IV.7.

Subgroup members expressed hesitancy about the up-front investment. Some members did not believe that it would help hospitals improve on HCAHPS. Others were uncertain how to estimate anticipated improvements. The HSCRC staff had proposed anticipated improvements where all measures below the threshold would increase to the threshold and those above threshold would improve by one percentage point. While this was quite aggressive for some poor performing hospitals, staff acknowledged that hospitals could take less upfront financial support or propose their own less aggressive improvement target for which the support is calculated. However, 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. Subgroup members also asked whether the HSCRC had considered a longer pay-back period, rather than a one-year period, to give hospitals more time to see a return on the investment. The HSCRC shared that CMMI wanted to see expeditious HCAHPS improvements, and therefore would be hesitant to provide up-front dollars that did not have immediate results. Subgroup members were curious about how this payment structure would work year over year and its effect on payers. The HSCRC stated that because there has not been much interest for up-front investments that it could be a one-year pilot and that payers would be paying out rewards a year earlier but would get the money back the following year. A few subgroup members stated that the benefit of an up-front investment would be earmarking it for HCAHPS and that this could make conversations with the hospital Chief Financial Officer surrounding an initial investment easier. Figure IV.10 shows the calculation of the upfront investment for three hypothetical hospital examples and the subsequent payback.

Figure IV.10. Up-front investment calculation using hospital base years from RY 2021

		Hospital A	Hospital B	Hospital C
Attainment score using base period data	A	20.48%	41.73%	26.75%
Attainment score with anticipated improvement*	B	25.80%	44.23%	31.75%
Attainment revenue adjustment $	C = A scaled	-$2,000,000	$80,000	-$1,380,000
Anticipated improvement* $	D = B scaled	-$1,480,000	$340,000	-$900,000
Upfront investment opportunity $	E = C – D	$520,000	$260,000	$480,000
Final QBR score	F	36.39%	53.58%	29.00%
Final QBR revenue adjustment $	H = F scaled	-$440,000	$1,280,000	-$1,180,000
Final QBR revenue adjustment + payback	I = H + -E	-$960,000	$1,020,000	-$1,660,000

c. 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 had not resulted in HCAHPS score improvements. 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.

d. 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. The Subgroup discussed adding back into the Person and Community Engagement domain an ED wait time measure when the data are available (See Section B). 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 Section C).

e. 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 has facilitated some opportunities for such sharing; however, 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 due to the prospective scale and lack of ranking. The subgroup however did not offer specific suggestions on ways to increase sharing of best practices; this could be further explored by the PMWG.

f. Other discussion topics

Other topics discussed by the subgroup included the following:

- **Understanding the core reasons why Maryland is underperforming on HCAHPS compared to the nation.** Subgroup members noted the importance of understanding the core issues in Maryland that are causing the state to have worse scores compared to the rest of the nation. The HSCRC noted that it is looking for help from experts and hospitals to uncover these issues. Furthermore, obtaining patient level detail would allow analyses on disparities in patient experience that might shed light on Maryland's performance.

- Regional bias in HCAHPS. Related to the previous point, subgroup members also noted that in the past, the mid-Atlantic region has not performed as well as the rest of the nation on the HCAHPS. Dr. Dale Schumacher from the Rockburn Institute supported this assertion with data in his presentation on regional bias on the HCAHPS that showed that hospitals in mid-Atlantic states (DC, DE, NY, NJ, PA) performed worse compared with all other hospitals nationally on HCAHPS for RY 2021;[19] performance on clinical care outcomes in VBP, however, was better.

- **Focusing on modifiable versus non-modifiable factors.** Subgroup members suggested focusing on modifiable factors, such as communication, rather than non-modifiable ones, such as plant age and number of beds in rooms, when identifying areas for improvement and additional analytics.

- **Consider other variables identified by the HCAHPS literature review,[20] such as private room status, age of plant, and service lines, for correlation analyses.** This could help stratify results, even beyond the QBR Program, to show improvement based on characteristics that are certain to vary. However, as discussed above, the HSCRC currently does not have the capabilities to collect certain patient-level data (for example, service line data) and would need to develop the infrastructure to do so.

- **Understanding the difference between service excellence work and service delivery.** For example, patients can have overwhelmingly positive reviews about care but still be upset that they have to wait in the ED for a long time. The HSCRC is open to discussing new measures that help present a clearer picture of patient experience and referenced the ED wait time measure that staff is currently working on as a potential option (See Section B).

- **Determining how many hospital employees and teams are dedicated to patient experience as their sole jobs,** because there may be a reverse incentive: if hospitals lose money, they can't employ staff and teams to focus on patient experience.

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[19] 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.
[20] For the HCAHPS literature review, please see
https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/RY2023/Literature%20Review%20Summary%20for%20HCAHPS%20Improvement.pdf.

3. Considerations and next steps

The subgroup discussion emphasized the shared goal of improving HCAHPS performance in Maryland and discussed methods for encouraging that improvement. The subgroup was supportive of adding linear scores to the QBR Person and Community Engagement domain with the idea that this will over time lead to improvements in top box scores. In the fall, the PMWG should recommend which linear measures to include based on the criteria proposed by the subgroup.

In addition, to continue to improve HCAHPS performance, the HSCRC should do the following:

- Implement an option for hospitals to participate in an up-front HCAHPS investment, for implementation in RY 2024.

- Develop state infrastructure to collect patient-level data and more timely hospital HCAHPS scores to provide further opportunity for analytics and hospital improvement.

- Consider inclusion of measures correlated with HCAHPS (for example, ED wait time measures) when the data are available (see Section B), as well as expand the follow-up measure to include Medicaid data and behavioral health (See Section C).

- Work with stakeholders to facilitate additional sharing of best practices.

B. Emergency Department Wait Time Measure

1. Background

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 IV.11—IV.13 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.[21] As CMS considers the expansion of alternative payment models—such as hospital global budgets and capitated models— in other states, ED throughput should be monitored for unintended consequences in a capitated model.

Figure IV.11. Maryland performance compared to national performance on ED-1b: Arrival to Admission for Admitted Patients

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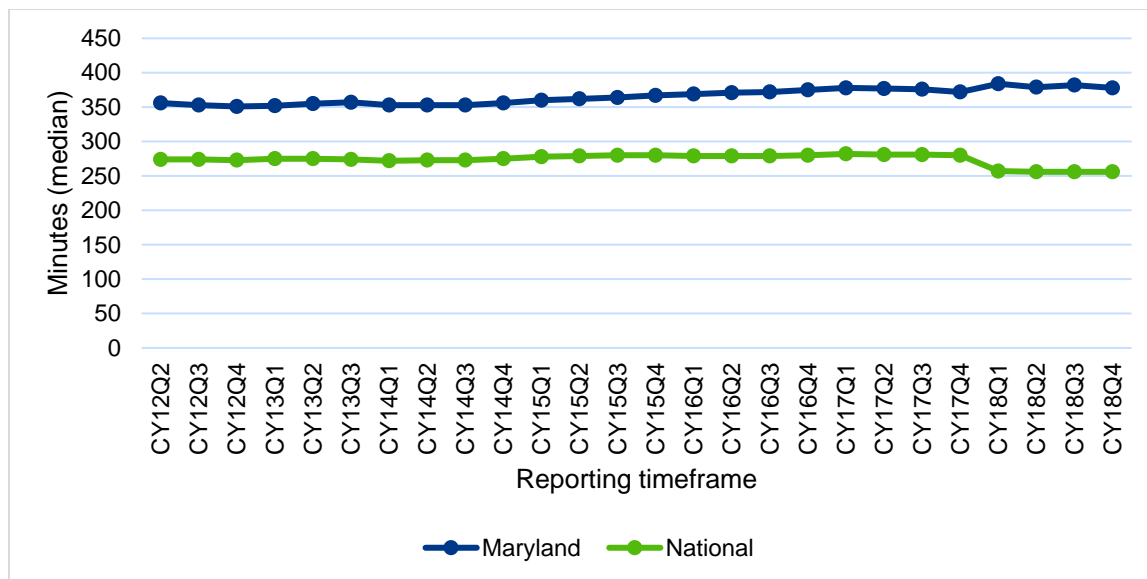
[21] For the "Emergency Department Overcrowding Update" November 2019 Joint Chairman Report, please see
http://www.miemss.org/home/Portals/0/Docs/LegislativeReports/miemss-ed-overcrowding-update-10-31-19.pdf?ver=2019-11-19-174743-763.

Figure IV.12. Maryland performance compared to national performance on ED-2b: Decision to Admit to Admission for Admitted Patients
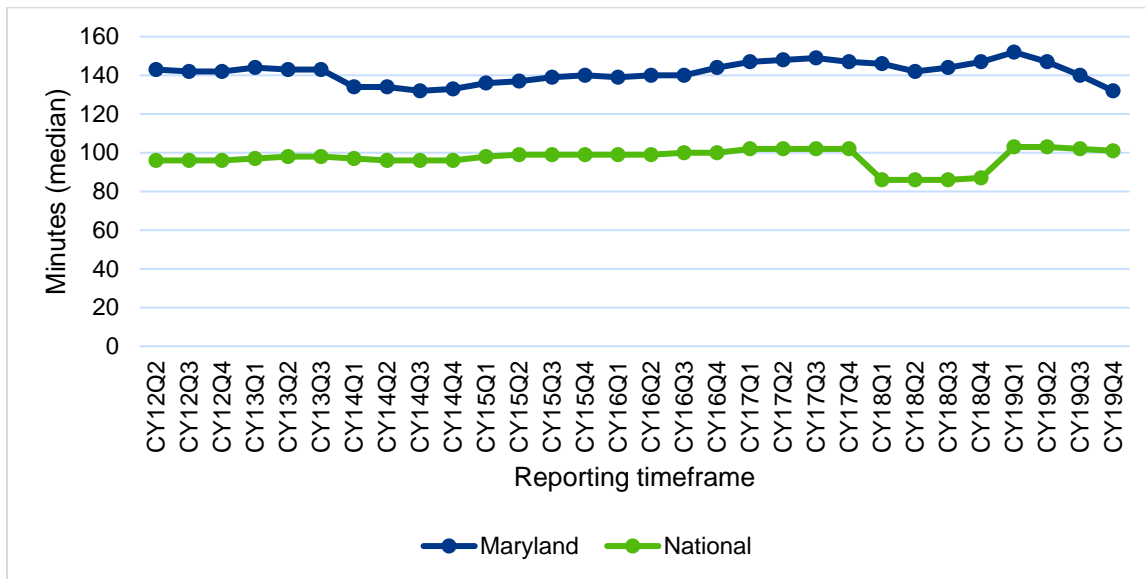
Figure IV.13. Maryland performance compared to national performance on OP-18b: Arrival to Departure for Discharged ED Patients
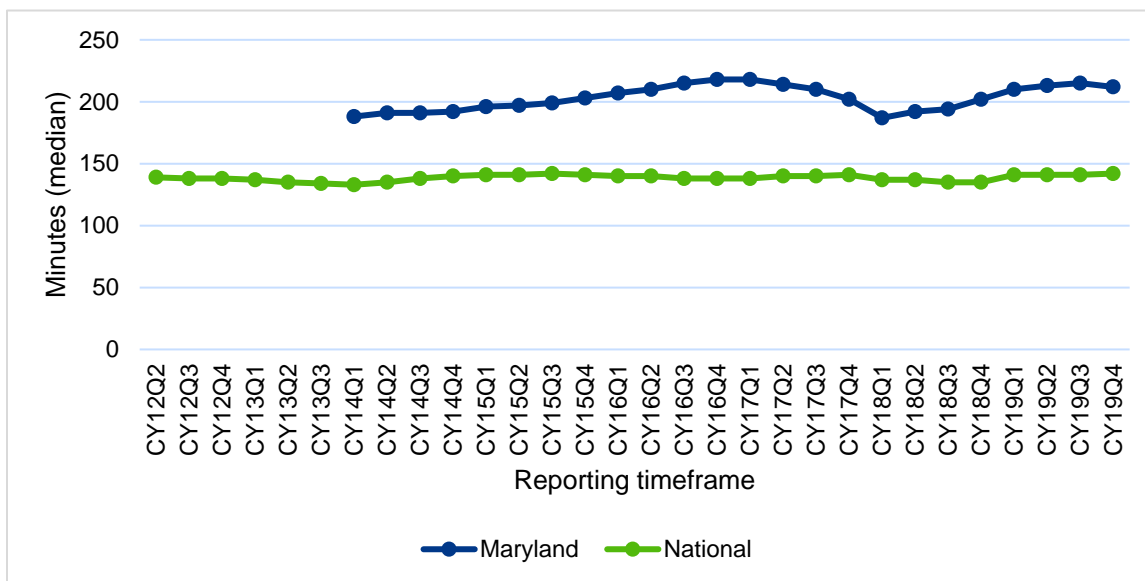
In RY 2020 (CY 2018 measurement period), the QBR Program introduced the use of the ED-1b and ED-2b measures. Although there is also a sustained trend of longer wait times than the national average for OP-18b, stakeholders did not support including this outpatient measure in the QBR Program. Some stakeholders, including HSCRC staff, had previously voiced support for including an ED wait time measure for patients not admitted to the hospital. However, HSCRC commissioners did not vote to adopt OP-18b because concerns were raised that OP ED visits may include patients whose admissions could

be avoidable with care management in the ED. Consequently, because hospitals would treat and provide care management services as appropriate in the ED instead of admitting this subset of patients, wait times would increase. In general, ED staff supported including the inpatient wait time measures because the issue of ED boarding is largely an overall hospital throughput issue.

The HSCRC included the measures as part of the QBR Person and Community Engagement domain and scored Maryland hospitals compared to peer groups based on ED volume; the HSCRC provided protections to hospitals when an improvement in ED wait times would lower the hospital's QBR score. The measures were adopted as part of the QBR Program in response to concerns about patient safety and because of ED throughput's correlation with HCAHPS performance, an area in which Maryland also lags behind the nation.

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 no longer had the data available to use in the QBR Program. This necessitated the removal of ED-1b and ED-2b from the RY 2021 and RY 2022 QBR Programs, respectively. 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-2b measure, which is optional for hospitals to submit; however, in the 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.

2.   Subgroup discussion

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, commissioners and staff are interested in including an ED wait time measure for inpatient admissions again, because it could help improve HCAHPS scores. For RY 2024 and beyond, staff proposes investing in infrastructure for Maryland to collect eCQMs, specifically the ED-2b eCQM equivalent. The eCQM ED-2b measure has several advantages:

- Nationally specified measure

- National historical data available with stables values over time for establishing performance standards

- Aligns with CMS requirements for submitting eCQMs through CY 2023, and is still used voluntarily by the Joint Commission

- Infrastructure investment will allow for potential use of eCQMs and hybrid data from the electronic health record (EHR) for other purposes

The subgroup was supportive of the eCQM ED-2b 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-2b, including the lack of comparable historical or national data to allow for creating a benchmark. Also, it is now a voluntary metric that hospitals may choose not to report, especially if they perform poorly on it. Commissioners and stakeholders had also voiced concern about whether the measures should be risk adjusted for volume and occupancy. When the measures were in the QBR Program, hospitals were compared with peer groups based on ED volume to address this concern. For the subgroup, staff used 2019 data to conduct correlation and regression analyses.[22] Both ED visit volume and occupancy are statistically significantly associated with ED-2b in univariate regression analysis ($p < .05$), but 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. Staff noted that it will take time to develop an eCQM infrastructure, with implementation potentially taking place in CY 2022 or CY 2023. Staff will continue to work to acquire eCQM ED-2b data reporting capabilities to keep examining ED throughput and the potential impacts of COVID-19 (including a >25 percent reduction in ED visits through CY 2020); urgent care utilization; and telehealth utilization.

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

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[22] 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.

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.

3. Considerations and next steps

The subgroup was supportive of including an inpatient ED wait time measure in the QBR Program. In the fall, the PMWG should review analysis of ED median wait times during COVID (when occupancy and volumes were lower) if the data are publicly released by CMS.[23] For RY 2024 and RY 2025, the HSCRC will work on development of eCQM infrastructure to collect and use ED-2b eCQM in the QBR Program. This will include:

- Once CRISP procures an eCQM vendor, review project plan on implementation of eCQMs and hybrid data element collection to develop HSCRC timelines;

- Communicate with hospitals on requirements for eCQMs and hybrid data elements, with assistance from the Maryland Health Care Commission as needed for mandating measures;

- Determine whether to include an ED-2 strata with or without the psychiatric diagnoses; and

- Determine the methodology to allow inclusion of the measure in the QBR Program (such as performance standards)

Finally, the HSCRC will continue the avoidable ED utilization work in parallel—for example, through the convening the "Avoidable ED" subgroup and the HSCRC Center for Payment Reform and Provider Alignment initiative on ED utilization.

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[23] For preliminary COVID and ED volume reduction analysis, please Figure C.3 in Appendix C.

C.   SIHIS-Aligned Measure: Follow-Up After Discharge

1.   Background

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 into the RY 2023 QBR Program within the Person and Community Engagement domain.

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:

1. Hypertension (follow-up within seven days)

2. Asthma (follow-up within 14 days)

3. Heart failure (follow-up within 14 days)

4. Coronary artery disease (follow-up within 14 days)

5. Chronic obstructive pulmonary disease (follow-up within 30 days)

6. Diabetes (follow-up within 30 days)

Figure IV.14 shows Maryland's performance versus the nation's performance for each chronic condition in CY 2019.[24] For most of these conditions, Maryland performed slightly worse than or on par with the nation. But given that the TCOC Model has both hospital and primary care components, CMMI has suggested that Maryland should perform better than the nation. As a result, Maryland set the following SIHIS goals for the Medicare follow-up after discharge measure: 72.26 percent across all measures by the end of Year 3 (2021) and 73.16 percent for Year 5 (2023), with the ultimate goal of 75.00 percent for Year 8 (2026) or 1 percentage point better than the national average, whichever is greater.

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[24] For reports on follow-up after discharge monitoring by hospital and by condition for 2019, please see Figure D.1 in Appendix D.

Figure IV.14. Medicare-only: Maryland versus national performance by chronic condition (CY 2019)

	ASTHMA	CAD	CHF	COPD	DIABETES	HTN	TOTAL
■ MD CCLF	66.9%	71.5%	70.1%	81.5%	65.0%	68.5%	71.5%
■ US CCW	67.8%	70.9%	70.3%	81.5%	65.8%	69.3%	71.6%
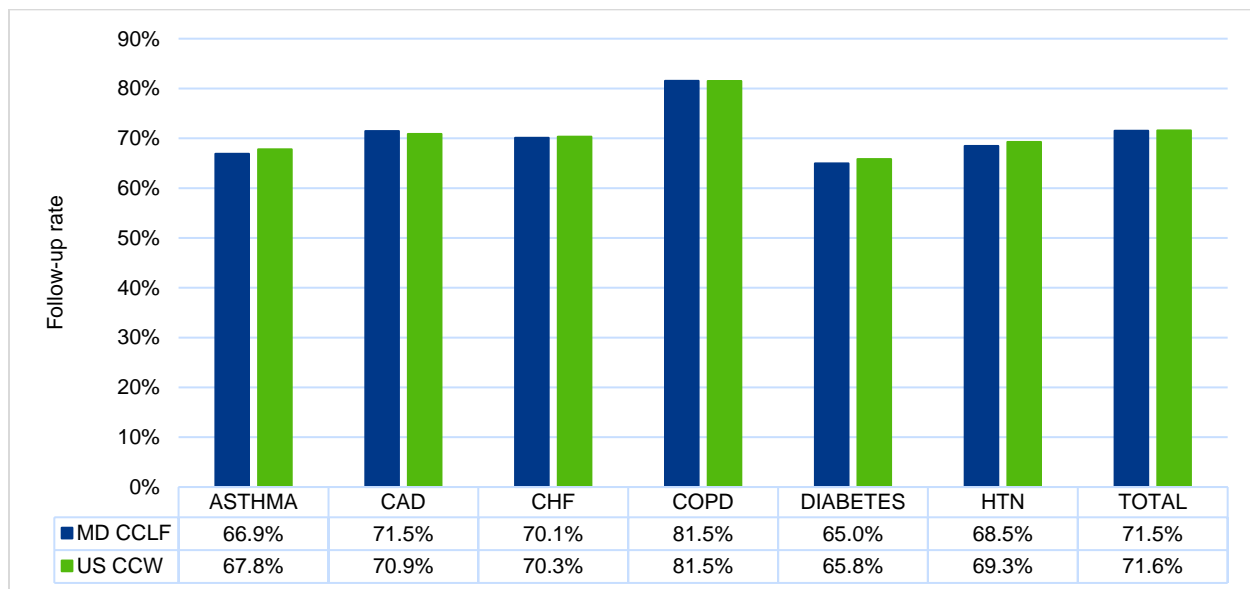
Note: Maryland numbers are claims-based and built on the Claim and Claim Line Feed with a four-month runout. National numbers are based on the national 5 percent sample in the Chronic Conditions Data Warehouse.

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

The HSCRC described several additional monitoring tools they are using to track rates of follow-up after discharge. For example, they are identifying patients using real-time ADT feeds from the CRISP infrastructure system;[25] tracking outreach in the EHR and scheduling visits within the specified time frames for each condition; and measuring success using Medicare Claim and Claim Line Feed data to create summary and detailed reports on timely follow-up.

However, staff sees room for improvement in data reporting and recognize that this could increase follow-up rates. CRISP analyzed the ADT data to understand which hospitals are sending discharge diagnoses reliably (the percentage of ADT messages that contain discharge diagnoses at discharge or within 24 hours of discharge). Only 14 of 49 hospitals (28.6 percent) are sending 90 percent or more of their discharges with diagnosis codes at the time of discharge, and most hospitals (51.0 percent) are sending 32 percent or less of their discharges with diagnosis codes at the time of discharge. Figure IV.15 shows these results.

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[25] Support staff for primary care providers are using CRISP ADT data to identify patients who have discharges associated with inpatient, ED, or observation visits for the six chronic conditions, with the goal of prioritizing outreach and scheduling within suggested time periods. CRISP is piloting a PROMPT filter as an initial sort for outreach and scheduling; this filter is designed for use by hospitals that are reliably and accurately charting discharge diagnoses (within chronic-condition subgroups) and sending them to CRISP when patients are discharged that same day.

Figure IV.15. Number of Maryland hospitals sending any diagnosis to CRISP at time of discharge, by percentage of discharges with diagnosis codes sent

Hospitals sending any discharge diagnosis to CRISP in ADT
Message at time of discharge

■ >= 90% ■ 80–89% ■ 67–79% ■ 33–66% ■ 32% or lower
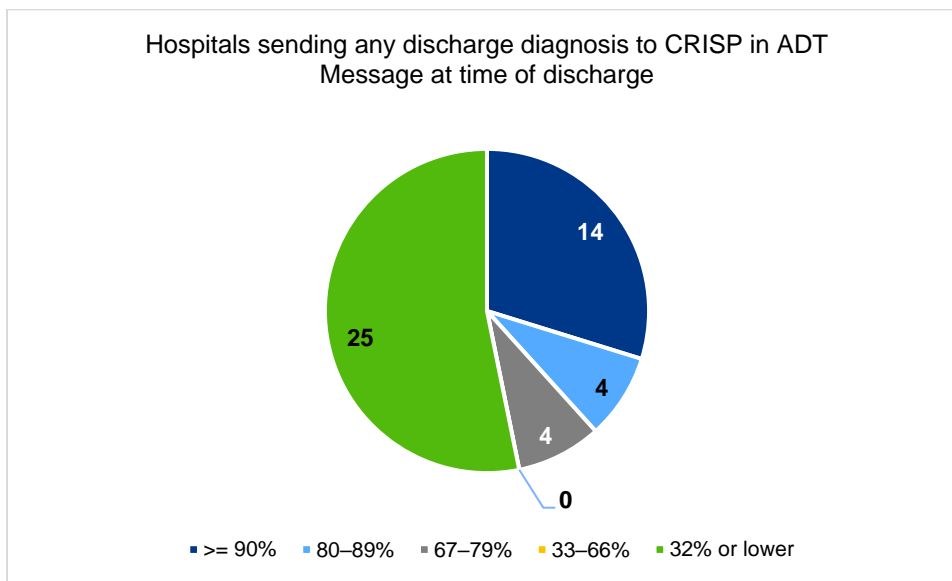
Note: Legend represents the percentage of discharges with diagnosis codes at the time of discharge. No hospitals were in the 33-66% range.

With the QBR redesign, the HSCRC sees the potential to expand the follow-up measure to additional payers. This goal is in keeping with the guiding principle of using all-payer measures whenever possible. Currently, the HSCRC and Medicaid seek to expand the follow-up measure to include Medicaid beneficiaries. The HSCRC has access to historical Medicaid claims data from Maryland's All-payer claims database for modeling the measure, with the most recent data available which was CY 2018. Furthermore, Medicaid now provides CRISP with monthly Medicaid data and these data could be used to implement the follow-up measure in the QBR Program and provide hospitals with patient-level data with an updated data use agreement between CRISP and Medicaid.

Although Medicare enrollees make up the majority of discharges (74 percent) across the six chronic conditions,[26] a CY 2018 analysis shows a disparity between Medicare and Medicaid follow-up rates. Figure IV.16 compares the rates of Medicare fee-for-service, Medicaid managed care organization, and Medicare and Medicaid follow-up and shows the disparity, with more follow-up among Medicare fee-for-service beneficiaries than among Medicaid Managed Care Organization beneficiaries. Although Maryland's SIHIS goal is limited to Medicare fee-for-service, the HSCRC stated in the SIHIS proposal that the state would expand to additional payers where possible and believes that CMMI wants the state to use all-payer measures whenever feasible.

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[26] For the percentage of Maryland Medicare beneficiaries per chronic-condition discharge, please see Figure D.2 in Appendix D.

Figure IV.16. Follow-up rates by condition and payer in Maryland (CY 2018)
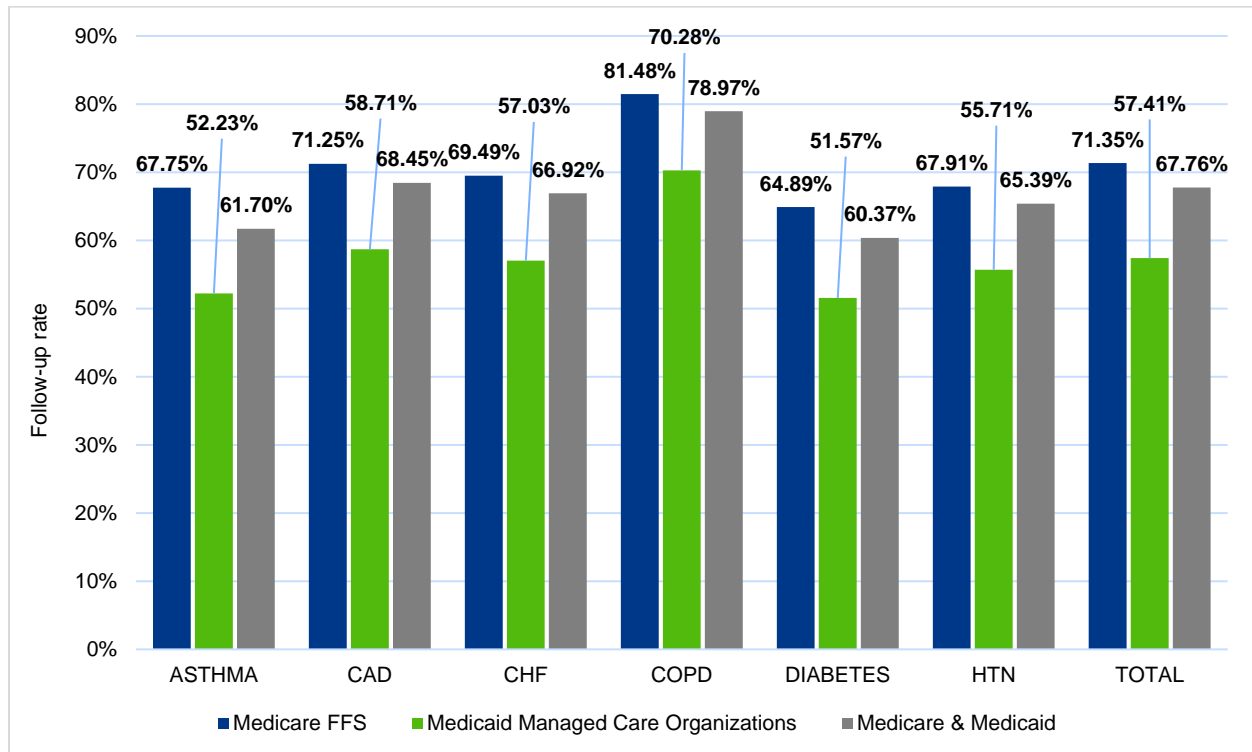
CAD = coronary artery disease, CHF = coronary heart failure; COPD = chronic obstructive pulmonary disease; HTN = hypertension.

The HSCRC would also like to include commercial payers in the multipayer follow-up measure. But without regular access to nonhospital claims data at the patient level, the HSCRC recognizes the measure could only be used for monitoring at this time. In terms of monitoring options, staff is considering using the Maryland Health Care Commission's medical claims database (although there would be significant lag time) or giving payers the follow-up SAS code and aggregate table shells to populate.

Lastly, per PMWG's request in fall 2020, the HSCRC is exploring the timeliness of follow-up care after behavioral health-related hospitalizations, and using HEDIS measure specifications. The proposed HEDIS measures (1) identify the percentage of patients who received follow-up within 7 days and 30 days of discharge and (2) assess adults and children 6 years of age and older who were hospitalized for treatment of selected mental illnesses or intentional self-harm and had an outpatient visit, an intensive outpatient encounter, or a partial hospitalization with a mental health practitioner.

Figures IV.17 and IV.18 show 7-day and 30-day follow-up rates by Maryland hospital in 2018 and 2019, based on Medicare fee-for-service data. Although Maryland performs better than the nation for both 7- and 30-day rates, the state is still looking to improve in this important area. Potential challenges with the HEDIS measure include the suppression of 42 CFR data (substance use disorder data that have special

protection)[27] and a lack of ability to share case-level Medicare data with hospitals because the data source is the Chronic Conditions Data Warehouse. In addition, initial modeling suggests a sizeable gap between Maryland Medicare performance (roughly 65 percent) versus national Medicare performance (roughly 50 percent); this appears to be partially due to acute care hospitals performing better than inpatient psychiatric hospitals, which corresponds with a high percentage of non-Maryland psychiatric visits occurring in inpatient psychiatric hospitals. While not discussed with the subgroup, HSCRC and Medicaid staff have discussed together and are both supportive of the use of this measure for Medicaid Managed Care Organization beneficiaries.

Figure IV.17. Timely follow-up for behavioral health-related hospitalizations by Maryland hospital, seven-day rates (Medicare fee-for-service) for 2018 and 2019
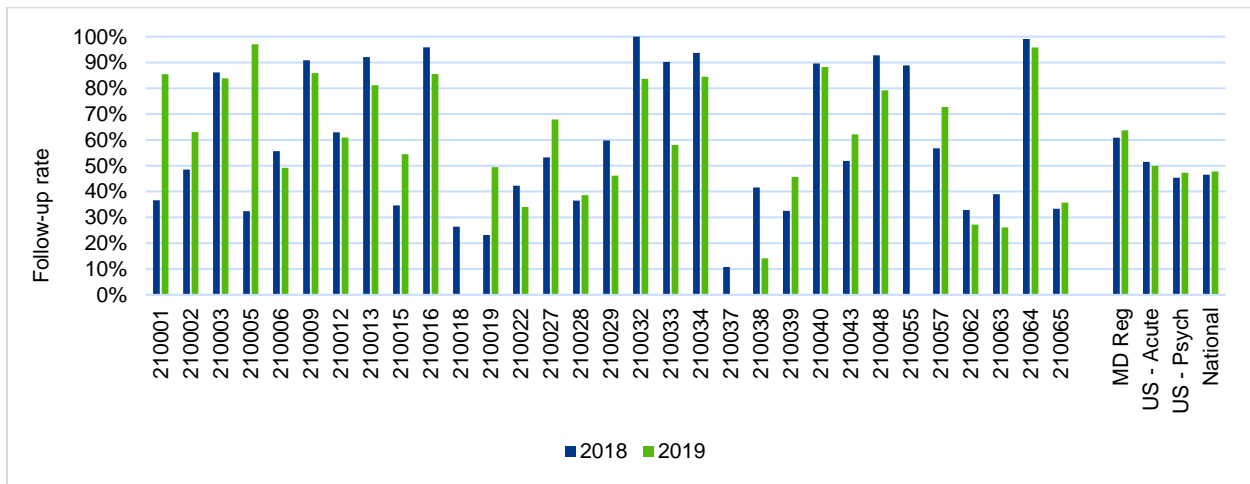
Figure IV.18. Timely follow-up for behavioral health-related hospitalizations by Maryland hospital, 30-day rates (Medicare fee-for-service) for 2018 and 2019

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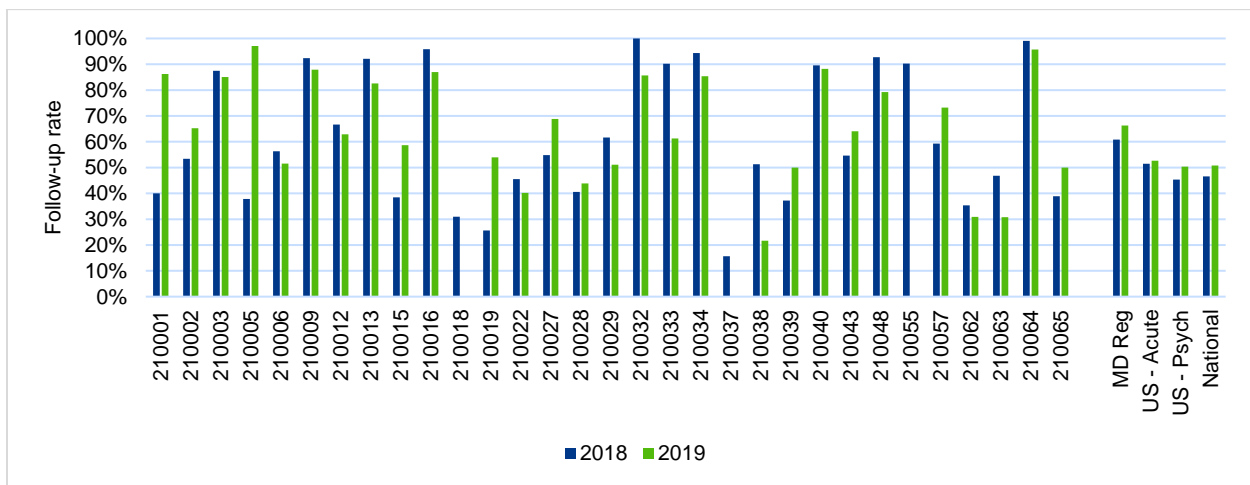
[27] For more information on 42 CFR data suppression, please see https://www.samhsa.gov/about-us/who-we-are/laws-regulations/confidentiality-regulations-faqs.

2.   Subgroup discussion

Subgroup members were open to expanding the follow-up pay-for-performance measure to Medicaid, especially because of CMMI's all-payer focus. But they expressed concern that the SIHIS goal is Medicare only and said the measure in QBR should be focused on the SIHIS goal. Furthermore, if a Medicaid measure is adopted, members wanted it to be harmonized with and have a similar timeline to the SIHIS measure. They cautioned that following up with patients who are being enrolled in Medicaid or who come in for an initial behavioral health stay might be difficult, as many are indigent or experiencing homelessness. Although the Medicaid population might have lower follow-up rates than other populations due to socioeconomic factors, the subgroup also noted that commercial follow-up rates could be higher because of socioeconomic factors.

Overall, subgroup members would like to develop a monitoring report for a Medicaid follow-up measure for CY 2022 and evaluate the reports to determine future payment policy. As their main reasons for this recommendation, they said that (1) Maryland hospitals are still working through the monitoring and analysis of the current follow-up measure, which was recently implemented, and (2) the National Quality Forum measure is not risk-adjusted. Subgroup members would like to see several confounding variables related to equity and disparities (such as socioeconomic inequities) tested before the measure is implemented in the QBR Program.

Some subgroup members supported a measure of follow-up after behavioral health admissions, specifically an all-payer measure. They said if such a measure were to succeed, it would need to include mental health disorders, which are associated with much higher spending in both Medicare and Medicaid. Subgroup members cited major differences in access to community follow-up between Medicare and Medicaid, with Medicaid offering much more robust benefits for behavioral health care and greater access to services. As a result, members suggested further defining the structural resources that might differ for Medicare versus Medicaid beneficiaries, for equity and other purposes. Also, because Maryland is already performing better than the nation on rates of behavioral health follow-up for Medicare, the subgroup said satisfactory performance on this measure might have to be defined differently than with other follow-up comparisons.

The subgroup also wanted to discuss the Medicare-only measure of follow-up after discharge that is currently assessed in the RY 2023 QBR Program. This discussion covered the following:

- Subgroup members received clarification that telehealth visits do count as follow-up and that both hospital and outpatient Medicare claims are used to monitor follow-up; however, the HSCRC is checking on whether any new telehealth codes were introduced during the COVID-19 public health emergency that need to be added to the measure.

- The subgroup asked if the HSCRC has national data by hospital to calculate the top 20th percentile of performance on follow-up rates, given that Maryland is trying to exceed the national average. Staff explained that because they have only the 5 percent data sample from the Chronic Conditions Data Warehouse, they have not calculated hospital-level rates at a national level.

- Subgroup members were concerned about physicians' frustration with the lack of timely data on follow-up and suggested that more follow-up metrics and payers could add to this lag.

- The subgroup asked if the HSCRC is tracking the completeness of discharge diagnoses for hospitals sending in ICD-10 diagnoses at discharge or within 24 hours. Members said that unless there is concurrent coding, a lag generally occurs and that the data take longer to code for some hospitals (such as academic or quaternary hospitals) than for others.

- Subgroup members also expressed concern about data completeness: most hospitals have only 32 percent or less of their discharges with diagnosis codes at the time of discharge in the ADT data. Members expressed interest in working with CRISP over the coming months to improve data completeness and timeliness, with the ultimate goal of enhancing coordinated follow-up care after discharge.

3. Considerations and next steps

The HSCRC will discuss with the PMWG development of a monitoring report for a Medicaid and/or behavioral health follow-up measure for CY 2022. These reports will then be evaluated and monitored for future payment policy. The HSCRC will also work with the PMWG on potential approaches to raising all hospitals in Maryland above the national average for the current Medicare-only follow-up measure.

Also, in response to the subgroup's concern about most Maryland hospitals having 32 percent or less of their discharges with diagnosis codes at the time of discharge in the ADT data, the HSCRC will ask CRISP to look into why this is occurring.

# D.	CDC NHSN HAI

## 1.	Background

The QBR Safety domain is weighted at 35 percent in the QBR Program and contains five measures from six CDC NHSN HAI categories.[28] In the latest exemption approval, CMMI raised concerns about NHSN performance based upon previous analysis of state-level results compared to national weighted mean results submitted by the HSCRC. However, based on additional analysis of available data, Maryland's performance on NHSN measures has trended roughly on par with the national average over time.

Figure.IV.19 shows that performance varies by NHSN measure and statistic using CY 2019 data.[29] Of note, for four of six NHSN measures, the median hospital in Maryland performed better (had lower standardized infection ratios [SIRs]) than the national median hospital; SSI hysterectomy and C. Diff. are the exceptions.[30]

Figure IV.19. 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

Other studies included a trend analysis[31] and a peer-group analysis and reviewing data from the CDC 2019 National and State HAI Progress Report.[32] The HSCRC conducted a trend analysis from CY 2016–2019 that shows most NHSN measures improved over time (except for the SSI measures). Mathematica also conducted a peer-group analysis, using the K-nearest neighbor approach to assign a peer group of

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[28] For use in the QBR Program, as well as the VBP program, the SSI Hysterectomy and SSI Colon measures are pooled.

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

[30] 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.

[31] 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 E.

[32] 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.

15 national hospitals most similar to a particular Maryland hospital on a number of key hospital characteristics. This analysis shows that although Maryland performed worse than its peers 50 to 60 percent of the time in CY 2016–2018, the state improved and performed better than its peers slightly over 50 percent of the time in CY 2019. Figure IV.20 shows the findings from the peer-group analysis.

Figure IV.20. Percentage of Maryland hospitals with SIRs above and below peer-group median

Measure	Maryland SIR vs. peer group	2016	2017	2018	2019
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.

Of note, CDC statistical analysis of the data indicate that (1) most Maryland hospitals (64 to 94 percent) have SIRs that are not statistically different from the national rate and (2) there was no statistically significant change on any NHSN measure between 2018 and 2019 for Maryland. Figure IV.21 shows the CDC findings from the review of CDC data.

Figure IV.21. CDC assessment of the statistical significance of Maryland versus national hospital SIRs[33]

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.

Despite various analyses indicating Maryland is performing on par with the national average, staff is committed to continued improvement across NHSN measures to improve the safety of Maryland hospitals. Staff explored potential ways to expand the Safety domain to other measures, including some that are NHSN measures not currently in the VBP program.

a.   Other NHSN measures not included in the VBP program

- Additional SSI categories on the Maryland Health Care Commission's Quality Report Website (coronary artery bypass graft, hip replacement, and knee replacement)
- Other NHSH HAI SSI procedure categories[34] (there are 39 procedure categories)
- Ventilator-associated events[35]

b.   Other safety measures

While staff is tracking NHSN measures, they are also at exploring other quality measures from CMS Care Compare to see where CMS is moving and whether Maryland has an opportunity to improve in those areas.

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[33] Ibid.

[34] 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.

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

- 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 septic shock three-hour bundle [SEP_SH_3HR]) were added in CY 2019.
- Severe maternal morbidity (CDC-defined measures)[36]
  - This 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.
  - In October 2015, with the transition to ICD-10, CDC updated the list of 21 indicators and corresponding ICD codes used to identify delivery hospitalizations with severe maternal morbidity
  - 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.
- Hospital-onset bacteremia (HOB) (CDC developing pilot for measure)
  - 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.[37]
  - 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.
- Antibiotic stewardship (CDC structural survey measure)[38]
  - Core elements of Hospital Antibiotic Stewardship Programs include hospital leadership commitment, accountability, pharmacy expertise, action, tracking, reporting, and education.
- Other claims-based measures

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[36] For more information on CDC's severe maternity morbidity indicators, please see https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html#icd.

[37] For more information on the HOB pilot, please see https://pubmed.ncbi.nlm.nih.gov/30932802/.

[38] For more information on the CDC antibiotic stewardship program core elements, please see https://www.cdc.gov/antibiotic-use/core-elements/hospital.html.

2.   Subgroup discussion

Staff asked the subgroup to discuss other proposed safety measures and whether the Safety domain should remain weighted at 35 percent. The subgroup said 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 risk adjusted for properly. For instance, subgroup members said they expect HOB to replace CLABSI soon, given that HOB is a more comprehensive and valid way to measure quality in hospitals. One subgroup member's work showed that NHSN measures are inversely correlated with mortality and length of stay.

Some members expressed support for an SMM measure but recommended monitoring since the measure is not risk adjusted. Stakeholders in general did not support a measure of ventilator-associated events, saying it has validity issues and a high reporting burden. Although all members agreed that investments should be made in valid measures, many members stressed the need to focus on improving existing NHSN measures rather than adding more measures to QBR's Safety domain. 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.

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.[39] 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. Subgroup members also said reporting burden, such as manual chart data abstraction, could explain the variability in over- or under-reporting for some metrics and that electronic data could enhance consistency. The HSCRC has begun discussions with the CDC on opportunities for collaboration and the feasibility of adopting innovative and less burdensome digital measures, such as the HOB measure, that can replace current chart-abstracted measures. One subgroup member also shared that CMS is developing non-infection, patient safety digital measures, including measures for severe hyperglycemia and severe hypoglycemia in the Hospital Inpatient Quality Reporting Program.

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[39] 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.

3. Considerations and next steps

Overall, the Subgroup supported maintaining the course for the NHSN measures and continuing to incentivize improvement and align with the national VBP program. Additionally, the HSCRC will:

- 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 other hospital infections
- Complete development of reports by hospital on SMM for monitoring and to support SIHIS-related goals

E.   30-Day Mortality Measure

1.   Background

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. This measure differs from the CMS mortality measures that assess Medicare condition-specific 30-day mortality, although HSCRC staff is seeking to expand the all-payer mortality measure to assess 30-day mortality similar to the CMS's measures.

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 has therefore been working with Mathematica and various stakeholders to develop 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 two-thirds of deaths occur in hospitals, staff believes posthospitalization 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 IV.22 shows the threshold and benchmark values for the current inpatient mortality measure.

Figure IV.22. 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,[40] the agency included a hybrid version in the IPPS proposed rule.[41]

With Mathematica's help, the HSCRC updated CMS's draft claims-based measure to estimate a version of the model on Maryland all-payer data, using death data from Maryland Vital Statistics merged with Maryland's inpatient records from CY 2018 and CY 2019. The 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. Figure IV.23 compares the current version of the HSCRC's all-cause mortality measure to CMS's.

Figure IV.23. 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; maternity service line is 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

The following section describes the analysis completed and decision points discussed during the specification of Maryland's all-cause mortality measure:

a.   Exclusion criteria

Figure IV.24 summarizes the exclusions CMS applied to its measure and the specific exclusions tested for the HSCRC's all-cause mortality measure. Previous feedback from PMWG members suggested that more analyses be conducted on out-of-state residents and hospice patients.

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

[41] 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.

Figure IV.24. Cases excluded from Maryland's 30-day mortality measure sample

Transferred in from another acute care facility	Inconsistent vital status (e.g., death date precedes admission date)
Enrolled in hospice during index admission	Left against medical advice
Metastatic cancer	Crush, spinal, brain, or burn injury
Limited ability for survival (based on ICD-10 codes)	Non-Maryland resident (vital statistics data not reliable for non-Maryland residents)

The QBR Redesign Subgroup raised concerns about whether lack of data on out-of-state residents could skew hospital mortality rates especially for hospitals near the borders, given that Vital Statistics data for the most part do not capture deaths for out-of-state patients. However, analyses show that removing out-of-state patients does not introduce bias into the model. [42] Subgroup members also wanted to understand how the measure treats patients in hospice. The 30-day measure currently excludes patients based on in-hospital use of hospice services and if the inpatient record indicates discharge from the hospital to a hospice setting.[43] In ongoing analyses, Mathematica is working to understand hospice utilization outside the inpatient setting using Medicare claims data;[44] inpatient all-payer data does not capture post discharge enrollment in hospice care, and some patients discharged from the hospital could then enroll in hospice within the 30-day time frame. Based on stakeholder concerns, the HSCRC will incorporate this additional hospice data for Medicare beneficiaries, if feasible.

Finally, analyses examined whether the "80 percent" rule currently used for the inpatient measure should be included in the 30-day measure. This rule limits the inpatient measure to APR-DRGs that contribute to the top 80 percent of inpatient deaths. Applying a similar logic to the 30-day measure generated low case counts for some service lines and also does not align with CMS's measure, so Mathematica did not include it in the 30-day measure.

b. *Assignment of stays to a service line*

Similar to the CMS hospital-wide mortality measure, the 30-day mortality measure being developed by Mathematica on behalf of the HSCRC assigns each discharge to a service line and then calculates service-line-specific mortality rates that are then aggregated to the hospital level. Because Maryland's population is all-payer and CMS's measure only includes Medicare beneficiaries who are over 65, Mathematica conducted analyses to assess whether it was appropriate to include a maternity service line for the HSCRC's 30-day measure.

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[42] For additional analyses on out-of-state exclusions, see Figures F.1.a.–F.1.c. in Appendix F.

[43] For additional analyses on hospice, see Figure F.2 in Appendix F.

[44] Once data on Medicare hospice utilization are merged with Maryland case-mix data, the model will also exclude any Medicare patient who had evidence of hospice utilization within the 30-day window.

The analyses showed that including the maternity service line yielded unstable measure results and outlier hospital performance. Mathematica recommended continuing to implement the maternity service line and tracking mortality numbers descriptively for maternity cases but excluding the maternity service line from the calculation of a hospital's risk-standardized mortality rate (RSMR). Therefore, the measure does the following when assigning stays to a service line:

1. Assigns all maternity cases to a service line for monitoring.

2. For nonmaternity stays, determines if a major surgical procedure was performed. If so, assigns to the surgical cohort; if not, assigns to the nonsurgical cohort.

3. Assigns stays to a service line within nonsurgical and surgical cohorts, with nonsurgical cohort assignments based on the principal diagnosis and surgical cohort assignments based on the principal procedures.

Figure IV.25. Assigning stays to a service line
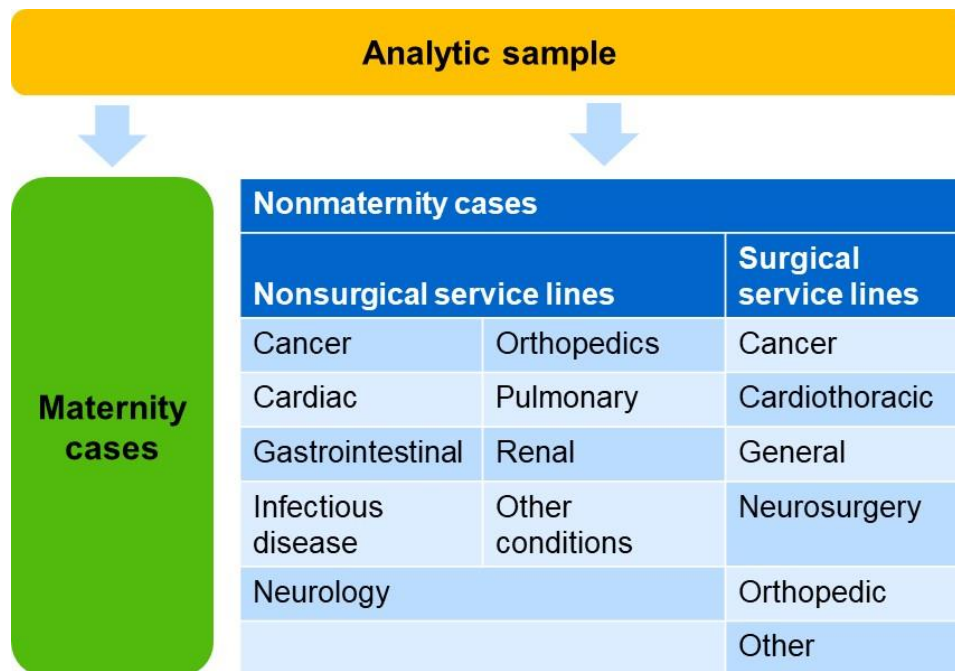
c.   Model results

The final sample for the 30-day model was 282,308, with the exclusion criteria applied (this included a random multiple-admission exclusion[45] and the dropping of certain additional cases, such as those with no service line assigned, an APR-DRG cell size of less than 20, and missing data on mortality risk).

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[45] The random multiple-admission exclusion is part of CMS's model. It randomly selects one admission for inclusion in the sample for patients who have multiple admissions that qualify for measure inclusion.

Figure IV.26 shows the distribution of stays by exclusion criteria (CY 2019), and Figure IV.27 shows the distribution of stays by service line (CY 2019).

Figure IV.26. Distribution of stays by exclusion criteria (CY 2019)

	Dropped cases	Resulting sample
Initial sample		**635,918**
Exclusion criteria	**109,589**	**526,329**
Transferred in from another facility	11,550	
Age > 95	4,419	
Hospice enrollment at time of admission or discharge to hospice setting	14,082	
Metastatic cancer	34,741	
Limited ability to affect survival	413	
Inconsistent vital status	4	
Discharge against medical advice	9,851	
Crush, spinal, brain, or burn injury	4,435	
Non-Maryland resident	42,442	
Random exclusion	**215,793**	**310,536**
Additional dropped cases	**28,228**	**282,308**
No service line assigned	24,969	
APR-DRG cell size < 20	3,248	
Missing risk of mortality	11	
Final sample for model		**282,308**

Figure IV.27. Distribution of stays by service line (CY 2019)

Nonsurgical	# of stays	# of deaths	Unadjusted mortality rate
Cancer	1,349	72	5.34%
Cardiac	17,246	497	2.88%
Gastrointestinal	18,164	254	1.40%
Infectious disease	29,275	1,835	6.27%
Neurology	12,639	480	3.80%
Orthopedics	5,711	104	1.82%
Pulmonary	22,781	790	3.47%
Renal	17,277	515	2.98%
Other conditions	32,745	641	1.96%
Subtotal	**157,187**	**5,188**	**3.30%**

Surgical	# of stays	# of deaths	Unadjusted mortality rate
Cancer	3,408	24	0.70%
Cardiothoracic	4,154	152	3.66%
General	15,397	212	1.38%
Neurosurgery	1,542	90	5.84%
Orthopedic	30,572	192	0.63%
Other	11,242	161	1.43%
Subtotal	**66,315**	**831**	**1.25%**
Surgical and nonsurgical total	**223,502**	**6,019**	**2.69%**
Maternity	# of stays	# of deaths	Unadjusted mortality rate
	58,806	5	0.01%

RSMRs for the 30-day all-cause mortality measure are then calculated based on the following methodology:

- Risk-adjustment variables and models
  - Adjust for age, gender, palliative care diagnosis, APR-DRG category, and risk of mortality
  - Estimate models in each service line, except for the maternity service line, using logistic regression
- Production of hospital-level RSMRs
  1. For each hospital, calculate the expected number of 30-day deaths in each service line
  2. Calculate observed-to-expected mortality ratios that are specific to the service lines
  3. Create aggregate observed-to-expected mortality ratios for each hospital
  4. Multiply each hospital's aggregate observed-to-expected ratio by the state's average 30-day mortality

Calculating Maryland hospitals' 2018 RSMRs and 2019 RSMRs based on the 30-day model yields the results shown in Figures IV.28 and IV.29.[46]

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[46] For preliminary 30-day mortality rates per Maryland hospital, see
https://hscrc.maryland.gov/Documents/Preliminary%2030%20day%20mortality%20rates%2006152021.xlsx.

Figure IV.28. 2018 distribution of Maryland hospital 30-day RSMRs

Legend: ■ 2018 RSMR ── 2018 state average = 3.4%
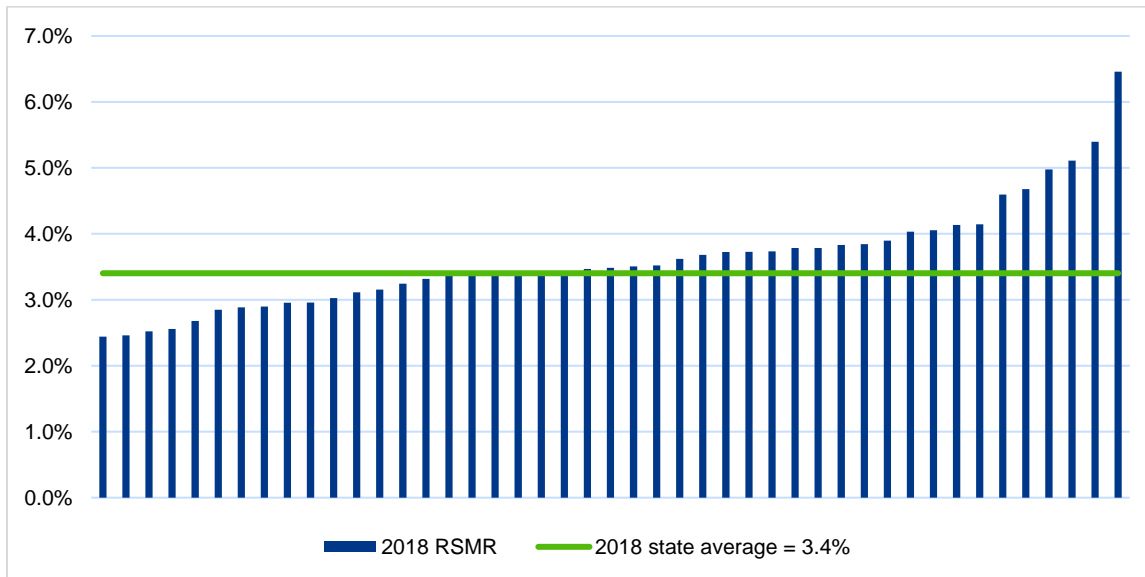
Figure IV.29. 2019 distribution of Maryland hospital 30-day RSMRs

Legend: ■ 2019 RSMR ── 2019 state average = 2.94%
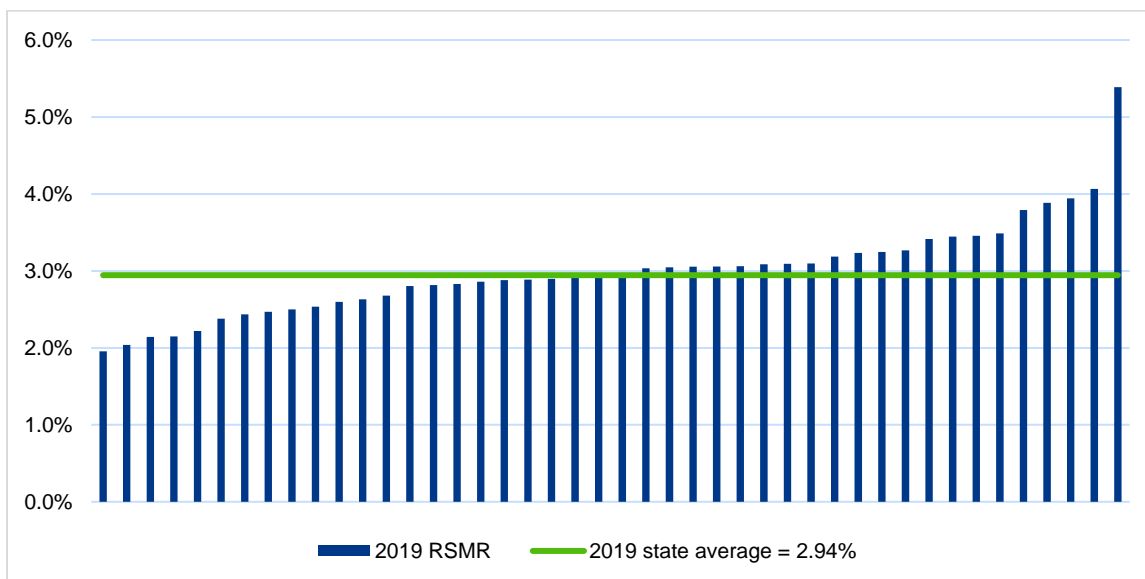
When assessing the statistical properties of the 30-day mortality measure, Mathematica conducted the following tests:

- **Convergent validity:** Mathematica compared the measure's 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). Figure IV.30 shows the correlation between the 30-day mortality results and CMS star ratings. The findings revealed a downward gradient from one to five stars, indicating a correlation between the quality of the 30-day measure and the quality reflected in the star ratings.

- Figure IV.31, compares the 30-day measure to CMS's condition-specific 30-day mortality rates for acute myocardial infarction, coronary artery bypass graft, chronic obstructive pulmonary disease, heart failure, pneumonia, and stroke to the all-cause, all-payer 30 da measure. (The CMS/Yale CORE mortality measure also performs this correlation analysis with CMS's condition-specific mortality rates to assess validity.) Results for this analysis were mixed, and statistically significant correlations ($p < 0.01$) occurred only with acute myocardial infarction and heart failure. Lack of further correlation is likely due to underlying differences in patient populations across measures and the comparison of a hospital-wide measure to condition-specific measures.

- Figures IV.32 and IV.33 compare the 30-day mortality measure to Maryland's inpatient mortality measure for CY 2018 and CY 2019 data. The findings revealed low rank-order correlation between the all-payer 30-day mortality results and the QBR inpatient mortality results (2018: r = .24; 2019: r = .39).

Figure IV.30. Comparison of 30-day mortality measure results and CMS star ratings
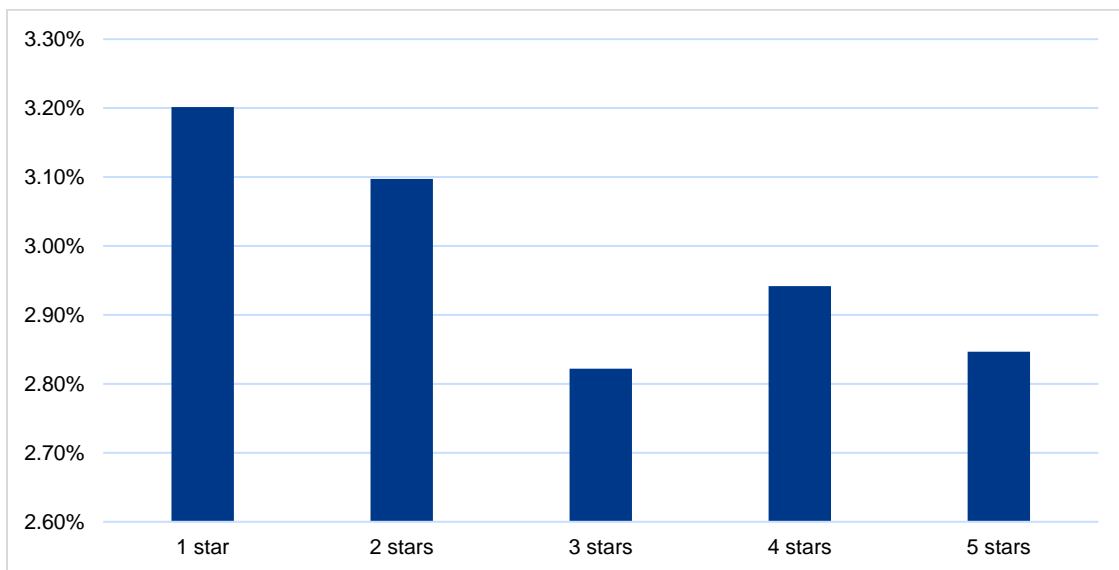
Figure IV.31. Comparison of 30-day mortality measure results and CMS's condition-specific 30-day mortality rates (June 2015–June 2018)

CMS 30-day mortality rate for…	Correlation statistic	*p*-value
AMI	0.49	<0.01
CABG	-0.36	0.31
COPD	0.13	0.39
Heart failure	0.42	<0.01
Pneumonia	0.29	0.06
Stroke	0.13	0.40

AMI = acute myocardial infarction; CABG = coronary artery bypass graft; COPD = chronic obstructive pulmonary disease.

Figure IV.32. Comparison of 30-day mortality measure results and Maryland's current inpatient mortality measure (CY 2018)
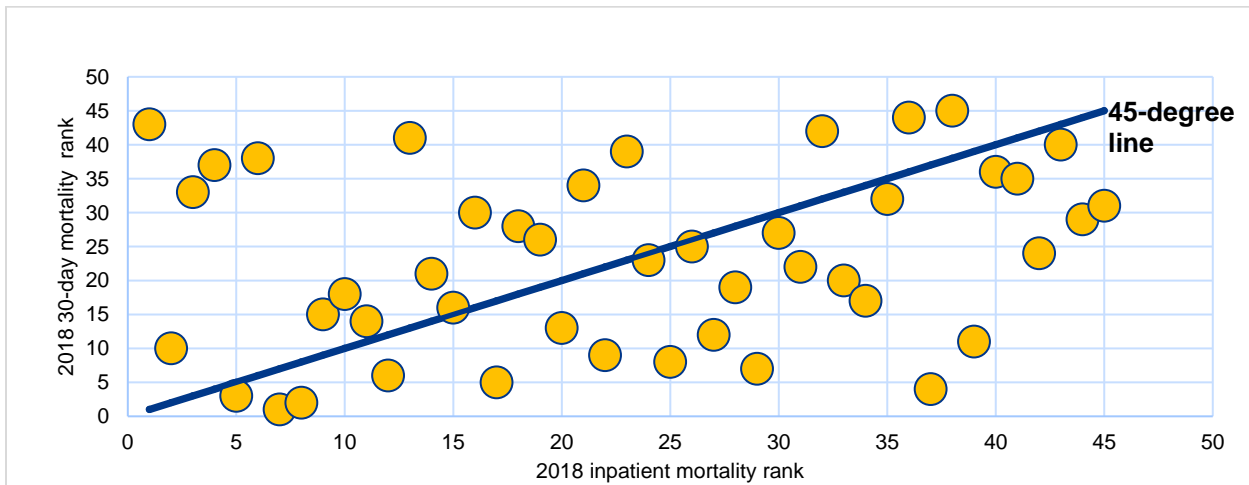
Figure IV.33. Comparison of 30-day mortality measure results and Maryland's current inpatient mortality measure (CY 2019)
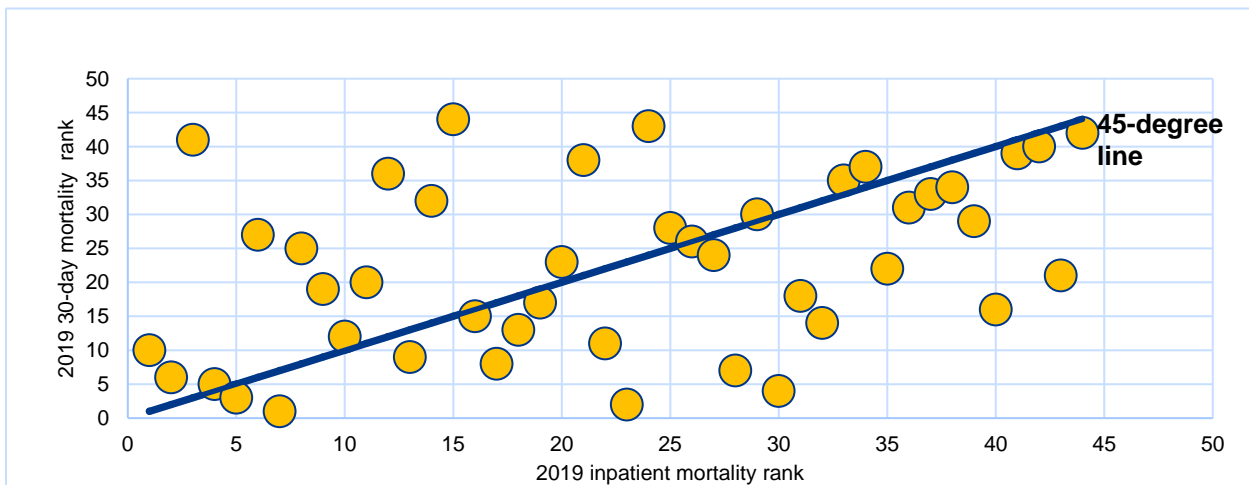
- **Predictive validity:** All-payer, 30-day mortality results for CY 2018 and CY 2019 were positively correlated (r = 0.84, $p < 0.01$). Assuming the underlying quality is stable from year to year, we would expect a high degree of correlation across the two years, which does occur.

- **Reliability analysis:** In a signal-to-noise test for both the overall measure and by hospital, the measure showed an overall reliability of 0.86, and 82 percent of hospitals had a reliability of at least 0.70 (0.70 is typically the benchmark in measure development).
    - Variation in hospital-level reliability estimates ranged from 0.26 to 0.96.
    - Hospitals with lower reliability estimates had smaller cases sizes.

- **C-statistic:** The C-statistic indicates 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. For each of the service-line-specific models, the C-statistic was greater than 0.9, indicating high accuracy in mortality prediction.

2. Subgroup discussion

The HSCRC provided four options for the subgroup to consider regarding how to proceed with the 30-day mortality measure for RY 2024:

- Continue using the inpatient mortality measure for RY 2024
6. Use the inpatient mortality measure in QBR and monitor the 30-day measure for RY 2025
7. Adopt the 30-day measure for RY 2024
8. Use the current inpatient mortality measure for attainment and the 30-day mortality measure for improvement in RY 2024[47]
    - Similar to integrating palliative care into the inpatient mortality measure, this option would be a one-year transition in which the 30-day measure would be exclusively used in RY 2025

The subgroup had several comments about the 30-day mortality measure:

- Some subgroup members expressed concern that the random multiple-admission exclusion would prohibit hospitals from running their own data for monitoring. But other members said alignment with CMS whenever possible is preferable to deviating from CMS's methods and that using CMS's approach would prevent bias from multiple admissions.
    - To address these concerns, the HSCRC conducted more analyses of random multiple-admission exclusions. Figure IV.34 shows that reliability was high, whether the random

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[47] For QBR Program methodology surrounding attainment and improvement, please see Figure II.2.

exclusion was applied (0.86) or not (0.90). Furthermore, the rank correlation (comparing rank performance with the random exclusion applied versus not applied) between both versions of the measure was 0.89.[48] Because the analyses show little difference for hospitals' RSMRs from one model to the other, staff believes the benefits of alignment with CMS outweigh the challenges of hospital monitoring and the analytic sample not being fully representative of Maryland discharges.

Figure IV.34. 30-day mortality measure with and without random exclusion

	With random exclusion applied	With random exclusion NOT applied
Total number of stays	168,987	322,004
Total number of 30-day deaths	4,976	8,252
State average unadjusted 30-day mortality rate	2.94%	2.56%
Average number of cases per hospital	3,754	7,153
Reliability	0.86	0.90
Rank correlation between both versions of 30-day mortality measure (comparing rank performance when random exclusion is applied vs. when it is not)	0.89	

- Subgroup members also expressed concern that Maryland's all-payer data do not adequately show which patients enroll in hospice after a hospitalization. The HSCRC is working to use Medicare data to assess which patients ages 65 and older enroll in hospice. This information is not available in the all-payer data.

- The subgroup asked how the current model is risk adjusting and deriving the expected number of deaths per service line. Members suggested using a risk-adjustment approach more similar to CMS's approach than the method used by the current inpatient measure.

  – The HSCRC staff said the use of service lines and the selection of random hospitalizations are based on the method used by the CMS/Yale CORE draft measure. However, the draft measure uses different risk adjustors and a different approach to categorize utilization, owing to the availability of all-payer data. CMS can also use historical Part B (physician data) from the previous 12 months, a capability that the HSCRC does not have on an all-payer basis. Furthermore, the HSCRC does not have CMS's EHR-based clinical data capabilities, which is why staff is suggesting a claims-based mortality measure rather than a measure similar to CMS's recently proposed hybrid one.

  – Staff also conducted a literature review on lookback periods to help ease concerns. Few studies addressed the value of the lookback period for 30-day all-cause mortality in all-payer

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[48] For the rank correlation between both versions of the 30-day mortality measure (with the random exclusion applied versus not applied), please see Figure F.3 in Appendix F.

populations, but for the studies that looked more broadly at the lookback period for 30-day mortality measures, the results were mixed. Although some papers showed some improvement in modeling when there was a 30-day lookback, other papers showed no benefit, which staff found reassuring.[49]

- Subgroup members expressed concern about the low correlation between the inpatient and 30-day measures. They asked if differences between the existing inpatient measure and the new 30-day measure were due to the 30-day shift or to other methodological differences.

  – The HSCRC is also interested in this question and are exploring this issue with Mathematica. Staff did not complete their investigation in time to review with the subgroup but will bring their findings to PMWG in the fall.

- The subgroup also expressed interest in CMS's hybrid 30-day mortality measure. Members said this measure uses clinical data elements to risk adjust, which helps with the lack of data on comorbid conditions in the absence of a lookback period. As Maryland develops eCQM and hybrid data capabilities, the HSCRC will consider the adoption of the hybrid mortality measure.

- Given that the model was derived from pre-COVID-19 data, subgroup members expressed interest in knowing the impact of COVID-19 on the measure and possibly accounting for COVID-19 and its variants in the model.

- Overall, subgroup members voiced concerns about hospitals' lack of experience with this measure, but they supported the continued development of the measure and said the PMWG should determine whether to include it in QBR and when to implement it. One member said monitoring would provide the opportunity to see more claims-based data and determine whether the risk of mortality looks different if it is reviewed after admission. This member said both this measure and the CMS measure examine risk factors only before admission, not during the 30-day window.

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[49] For the full literature review conducted by the HSCRC on 30-day lookback periods, see Figure F.4 in Appendix F.

3.   Considerations and next steps

- Subgroup members encouraged additional analysis and continued review of the 30-day measure and suggested that the PMWG determine next steps. The HSCRC will work to incorporate hospice data from Claim and Claim Line Feed files into the hospice flag to expand it by matching case-mix data with data from the feed (Medicare fee-for-service). However, due to a four-month data runout, the flag for hospice determined from Claim and Claim Line Feed data will be delayed. Additionally, the HSCRC will work to better understand the lack of correlation with the current inpatient measure. If the 30-day measure is adopted for RY 2024, PMWG should consider how performance standards will be developed.

F.   Outpatient Measure Expansion

1.   Background

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.[50]

- 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,[51] 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.

Staff acknowledged 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.[52] 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 (such as observation stays longer than 24 hours and THA/TKA surgeries), and trying to understand overlapping regulatory authorities for care across the system.

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[50] 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.

[51] 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.

[52] 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.

In particular, the HSCRC has spent time analyzing seven CMS Hospital Outpatient Quality Reporting Program measures using CY 2019 data. The following figures show the analyses conducted on these measures.

a. **Timely and effective care measures**

Figure IV.35. OP-18b: Median Time from ED Arrival to ED Departure for Discharged ED Patients (CY 2019)
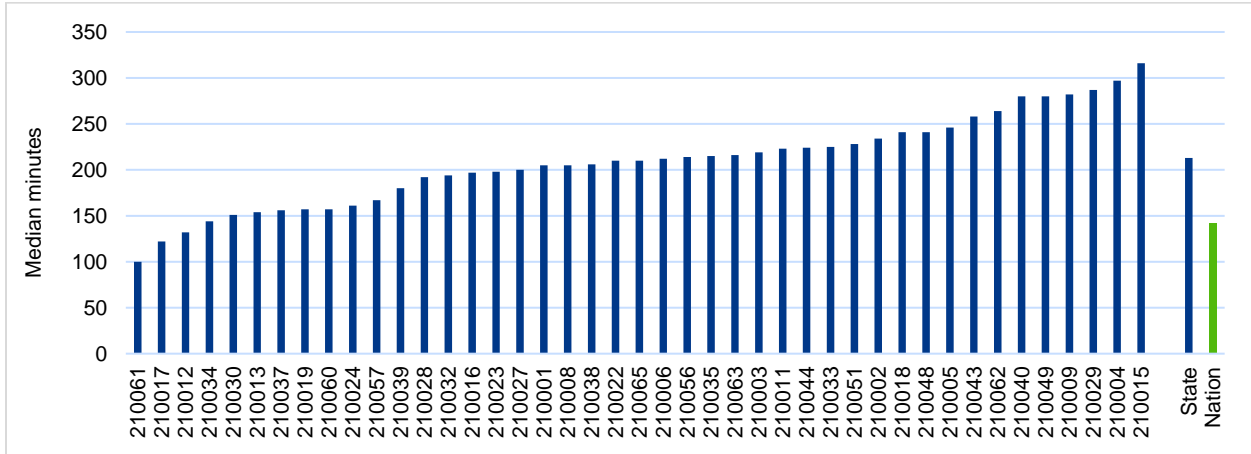
Note: Lower is better.

Figure IV.36. 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)
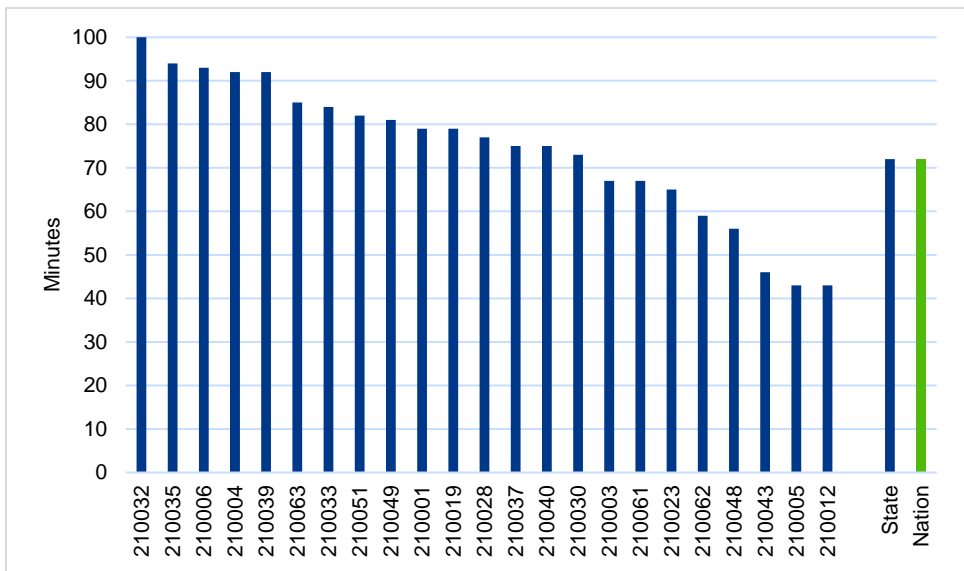
Note: Higher is better.

Figure IV.37. OP-29: Appropriate Follow-Up Interval for Normal Colonoscopy in Average-Risk Patients (CY 2019)
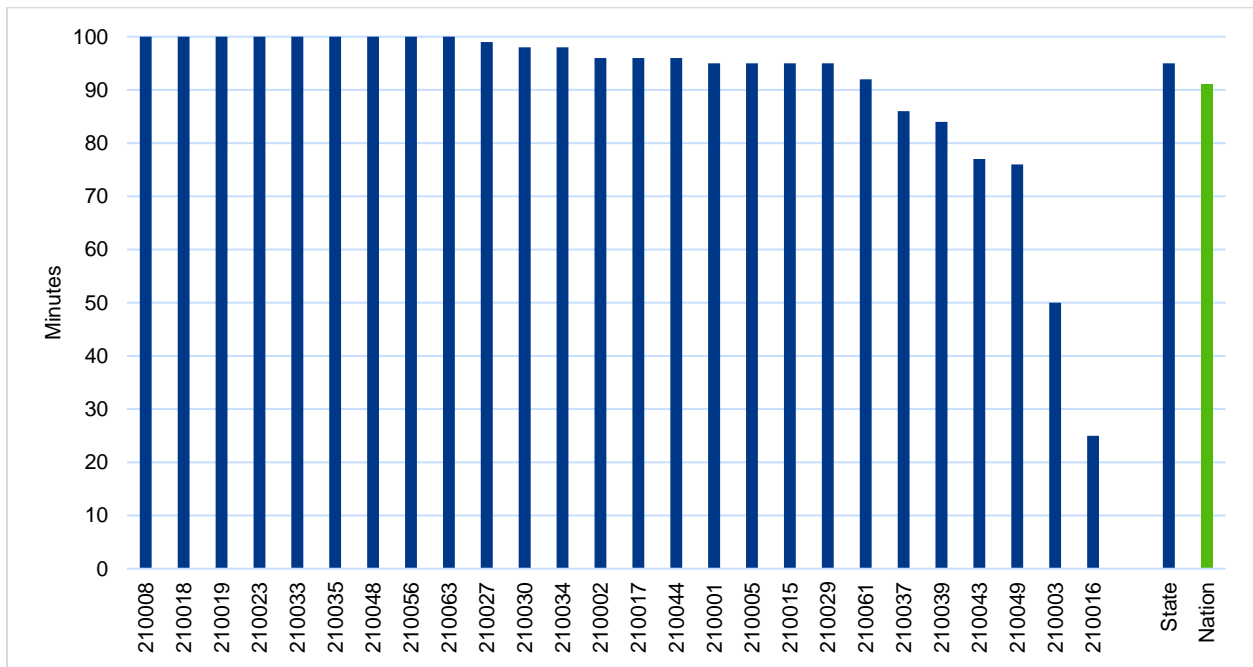
Note: Higher is better.

b.   Unplanned hospital visit measures

Figure IV.38. OP-32: Facility Seven-Day Risk Standardized Hospital Visit Rate After Outpatient Colonoscopy (time period: 2017–2019)
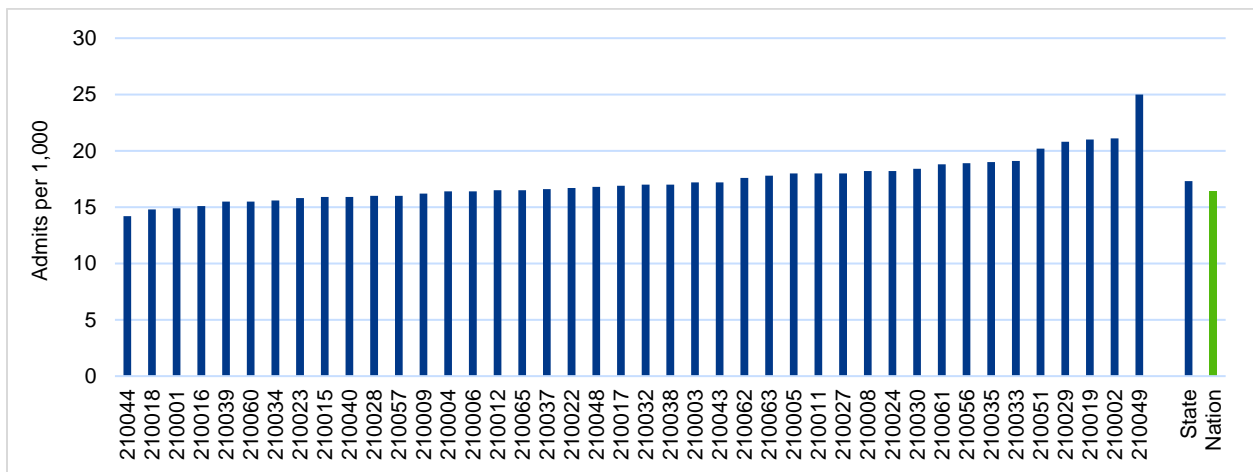
Note: Lower is better.

Figure IV.39. OP-35ADM: Admissions for Patients Receiving Outpatient Chemotherapy
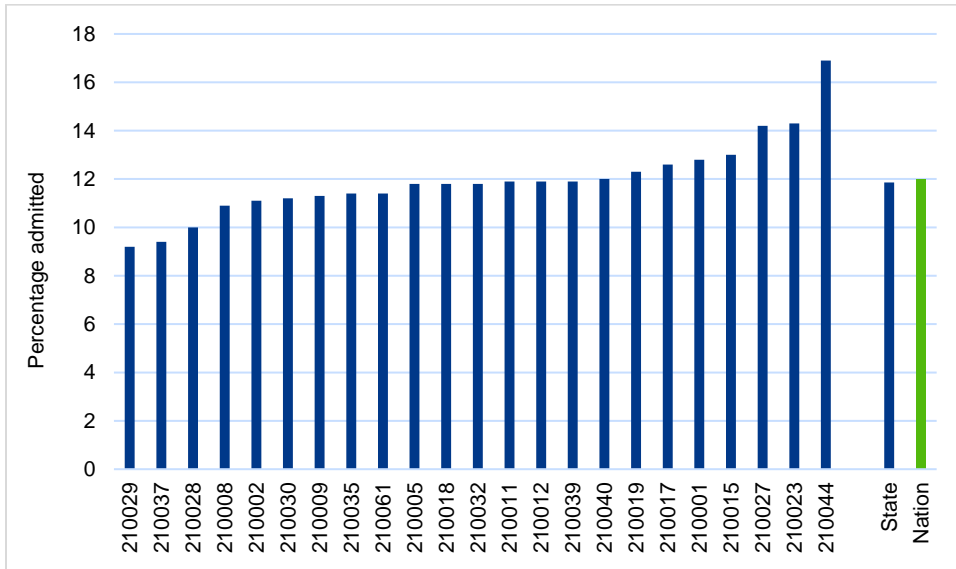
Note: Lower is better.

Figure IV.40. OP-35ED: Emergency Department (ED) Visits for Patients Receiving Outpatient Chemotherapy
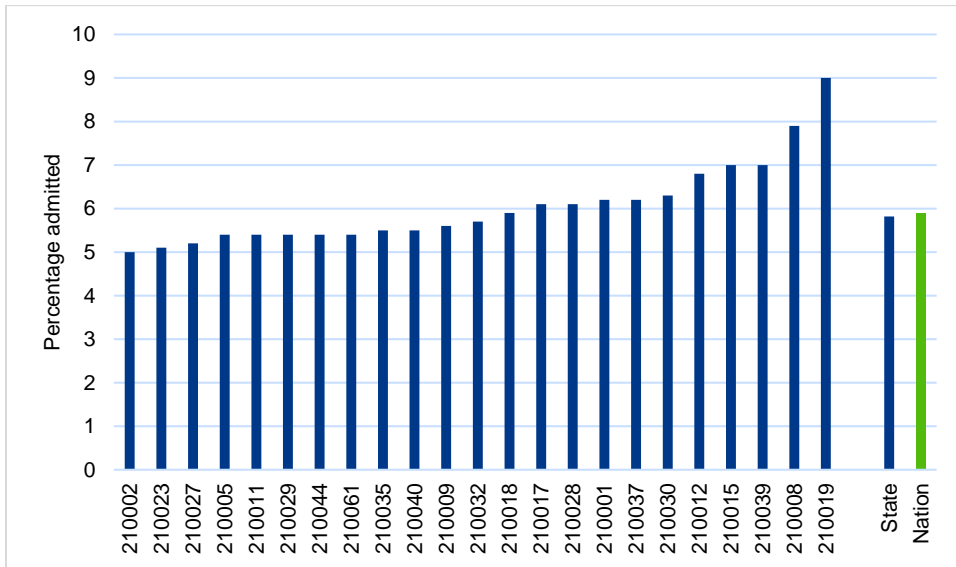
Note: Lower is better.

Figure IV.41. OP-36: Ratio of Unplanned Hospital Visits After Outpatient Surgery (time period: 2019)
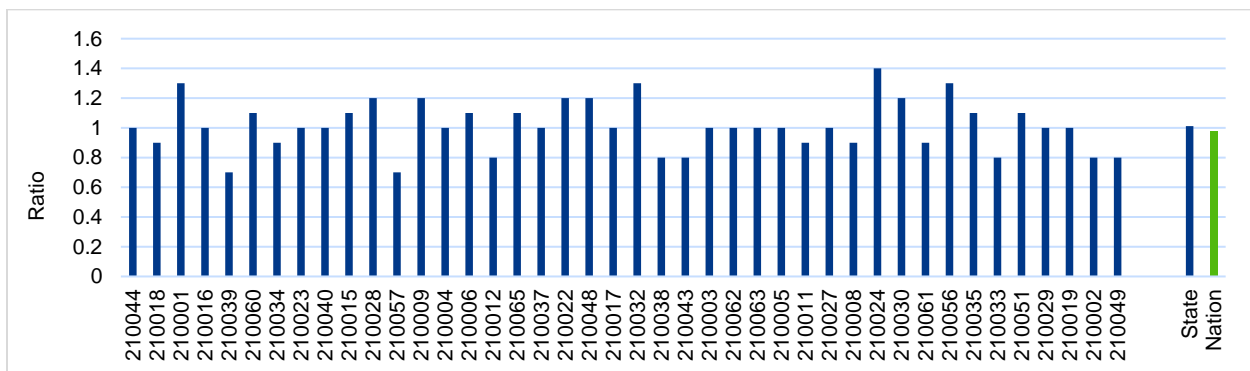
Note: Lower is better.

Figure IV.42 summarizes the findings from various analyses of Maryland's performance versus the nation's performance on Hospital Outpatient Quality Reporting Program measures. Overall, the HSCRC's analyses show that Maryland is performing worse than the nation on OP ED wait times (see discussion in Section B on Rationale to not include OP-18b in QBR) and on the post-colonoscopy hospital visit rate (see discussion below); on all other measures, Maryland performed similarly to the nation.

Figure IV.42. Maryland's versus the nation's performance on Hospital Outpatient Quality Reporting Program measures

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 IV.43 shows a sample of the study results.[53] Although 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

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

improve quality in the hospital outpatient space. However, staff also wants to acknowledge Maryland'
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. 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. But 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).

Figure IV.43. Volume of elective services by place of service among Maryland hospitals (CY 2019)

Surgeries by POS CY2019	Claims				Percentage		
Current Procedural Terminology category	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%

c.   THA/TKA measure

The QBR Program currently includes an inpatient THA/TKA complications measure for Medicare
beneficiaries. The current measure falls 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 the following:

- **Acute myocardial infarction** during the index or subsequent admission that occurs within seven
  days

- **Pneumonia** or other acute respiratory complication during the index or subsequent admission
  that occurs within seven days

- **Sepsis**, septicemia, or shock during an index or subsequent admission that occurs within seven
  days

- Surgical-site **bleeding** or other surgical-site complication during the index admission or a
  subsequent inpatient admission within 30 days from the start of the index admission

- **Pulmonary embolism** during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission

- **Death** during the index admission or within 30 days from the start of the index admission

- **Mechanical complication** during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission

- Periprosthetic joint infection/wound **infection** or other wound complication during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission

Staff presented three items for the subgroup to consider related to updating the THA/TKA measure. First, as previously discussed, staff mentioned **the movement of THA/TKA procedures from the inpatient setting to the outpatient hospital setting**, nationally and statewide. For instance, in Maryland, 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 IV.44 shows the movement of THA/TKA procedures per Maryland hospital from 2018 to 2019.

Figure IV.44. Total number of hip and knee replacements and inpatient share across Maryland hospitals
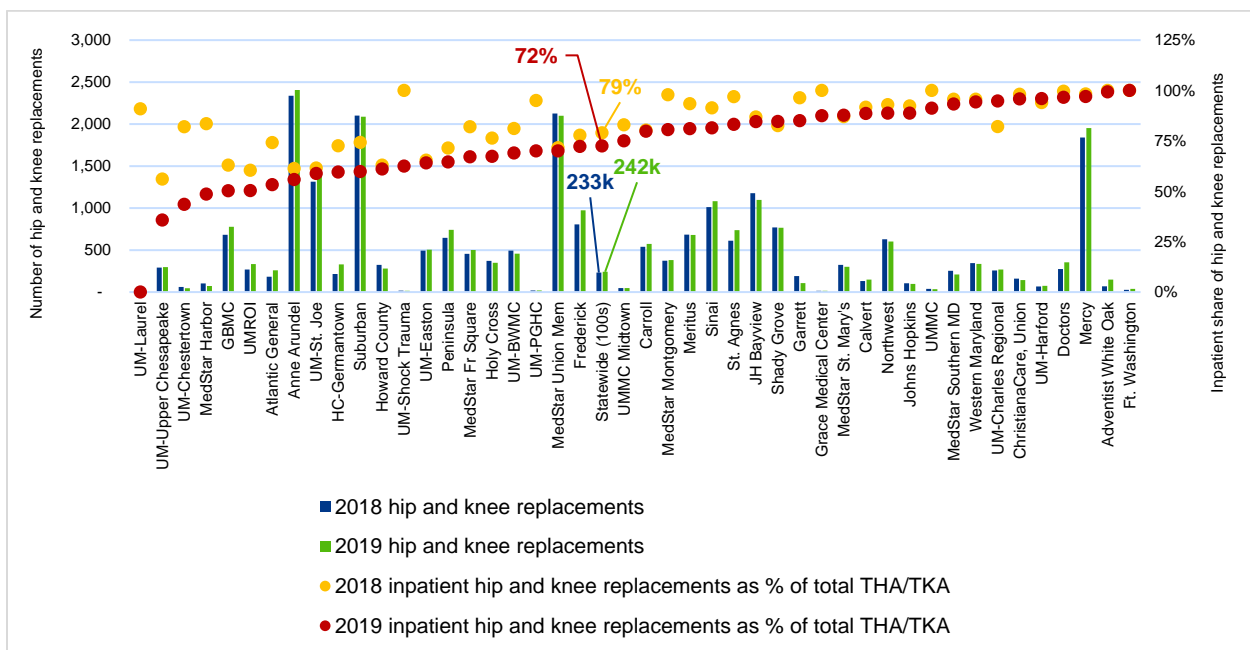
The second consideration was accounting for **non-Medicare THA/TKA procedures**. Despite Maryland's programs being all-payer, the current THA/TKA measure is a Medicare-only measure, which means quality of care is not assessed for many patients undergoing these procedures. Staff suggested respecifying the measure from Medicare-only to reflect the nature of Maryland's all-payer model. For

instance, 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. If the subgroup were to move forward with this consideration, the 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. 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. Post discharge mortality for other payers may be identified from vital statistics or inpatient discharge dispositions.

The third consideration was **other potential THA/TKA measures**, such as an eCQM for THA/TKA complications or a hospital-level patient-reported outcome performance measure (PRO-PM) following an elective primary THA/TKA procedure. If the subgroup decided to pursue an eCQM, the CMS-funded eCQM created in 2020 by Brigham and Women's Hospital could be considered but would need to be converted from a provider- to a hospital-level measure. CMS developed this measure for the Merit-Based Incentive Payment System, and it uses the same complications as the current claims-based measure. Creating an all-payer measure that includes both inpatient and outpatient procedures (ages 18+) would align with the HSCRC's current strategy and investment to begin collecting eCQMs.

If pursuing a patient-reported outcome measure (PROM), staff could use the hospital-level PRO-PM suggested in the FY 2022 IPPS proposed rule.[54] This PRO measure, 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.

Figure IV.45 shows the measures considered and the programs that currently use the measures. Figure IV.46 shows the measures 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.[55]

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[54] 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).

[55] For a more thorough list describing hip/knee hospital measure options, please see https://hscrc.maryland.gov/Documents/Quality_Documents/QBR/RY2023/THA-TKA%20Measure%20Expansion%20Options%20for%20Discussion.pdf.

Figure IV.45. THA/TKA quality measures and programs

Measure	Program
7. **Inpatient risk-standardized complications measure based on Medicare claims data**	CMS Hospital Inpatient Quality Reporting Program, VBP, CMS CJR program
8. **Inpatient PROM based on claims and surveys**	CJR program
9. **Inpatient and outpatient complications measure based on EHRs**	CMS Measuring Outcomes in Orthopedics Routinely (MOOR) project[a]
10. **Inpatient and outpatient PROM based on EHRs and a survey (MOOR project)**	CMS MOOR project
11. **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 postdischarge drug measures.

Figure IV.46. THA/TKA quality measures and adoption options summary

	Inpatient	Inpatient and outpatient
Medicare	• CMS THA/TKA complications claims measure (Hospital Inpatient Quality Reporting Program, VBP, CJR) • CMS inpatient PROM (CJR)	Measures 1 and 2 **(adapted for outpatient)**
All-payer	Measures 1 and 2 **(adapted for all-payer)** 5. Joint Commission outpatient/ ambulatory PROM, a process measure based on chart abstraction and a survey; the outcome is administration of the PROM survey, not the results	3. CMS inpatient and outpatient complications measure based on EHRs **(adapt for hospital)** 4. CMS's inpatient and outpatient PROM based on EHRs and a survey **(adapt for hospital)**

2. Subgroup discussion

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. The subgroup shared staff's aforementioned concern that the QBR Program regulates hospitals, and many surgery centers where THA/TKA procedures might be performed are not hospital owned or regulated. However, hospitals are seeing complications from ambulatory surgical centers, despite these procedures not being performed at hospitals. Subgroup members want to better understand how a new THA/TKA measure would specifically affect the QBR Program and how best to structure financial incentives to achieve better outcomes when other parties that may not be affiliated with the hospital are performing these procedures and are responsible for the patient outcomes.

The subgroup expressed enthusiasm for exploring a PRO measure and believe PROs are critical to driving value for patients. If Maryland adopts a PRO measure under the QBR Program, subgroup members noted a potential challenge for community-based hospitals: working with provider groups affiliated with multiple hospitals. Community hospitals should do their best to help these provider groups meet multiple standards, especially if there is a shift toward outpatient measures. Some subgroup members said 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.

Regarding the implementation of an eCQM measure, subgroup members shared the need to establish a new baseline as a result of the increase in the inpatient complications rate (with a shift to the outpatient setting, the more complex patients have procedures in inpatient settings, leading to an increase in the complications rate). 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.

3.   Considerations and next steps

The PMWG should continue building a multiyear, multipronged, broad strategy for inclusion of outpatient measures in the HSCRC's quality programs. Specifically, for a THA/TKA measure, the PMWG should explore approaches to adapting CMS's current claims-based inpatient THA/TKA measure to the all-payer population and the feasibility of developing an infrastructure to collect and use a hospital-level PRO-PM for elective primary THA/TKA procedures.

The HSCRC should consider the following for THA/TKA:

- Further assess how a PRO measure would affect hospitals under the QBR Program, in light of the procedure volumes handled at outpatient surgery centers
- Consider adapting the current inpatient measure to the all-payer population.
- Consider adapting the provider eCQM measure to hospital inpatient and outpatient settings

G.   Other Measure Areas

1.   Background

The QBR Program is unique in that it brings together many dimensions of quality across its three delineated domains. This structure provides an opportunity to add new measures, given that the program is broader in scope than Maryland's complications and readmissions programs. But Maryland's ability to add new measures must be weighed against the need to ensure comparable performance on measures in the VBP program.

The initial work plan for the QBR Redesign Subgroup included exploring other measure areas, such as maternal health, sepsis, and palliative care or other end-of-life care—three areas that staff and stakeholders have considered over the years. Figure IV.47 lists these areas and the HSCRC's reasons for further exploring them.

Figure IV.47. Other measure areas to potentially explore in the QBR Program

Measure area	Rationale for further evaluation
Maternal health	• Focusing on this area aligns with SIHIS goals (such as reducing the number of SSM events).[56] • At the May 2021 HSCRC meeting, the HSCRC commissioners approved the provision of $8 million annually to support Medicaid and Managed Care Organization initiatives on maternal and child health. The HSCRC now intends to provide SMM data reports (calculated using the case mix data hospitals submit to the HSCRC) to Maryland birthing hospitals beginning in CY 2022 for monitoring purposes, but these data will not be included in QBR pay-for-performance. • Focusing on this area aligns with state- and grant-based initiatives, such as Medicaid funding for the Maryland Maternal Health Innovation Program (MDMOM),[57] Agency for Healthcare Research and Quality grants for maternal child health, the Maryland Patient Safety Center, and Perinatal Quality Collaborative initiatives. • Maternal health is an area of persistent health disparity.
Sepsis	• Septicemia and sepsis are areas of growing scrutiny and concern for hospitals both nationally and in Maryland. • Sepsis bundles are now on CMS Hospital Compare, and are required measures in the Hospital Inpatient Quality Reporting Program.[58] • Septicemia and related complications have increased, including during the COVID-19 Public Health Emergency. • In 2018, the Maryland legislature mandated the completion of a sepsis public awareness campaign report.[59]
Palliative care or other end-of-life care	• Historically, palliative care was excluded from measures of potentially preventable complications, but it has recently been incorporated in limited cases. • Palliative care is included in the QBR Program's inpatient mortality measure, but inpatient hospice is excluded. The HSCRC is exploring ways to further link palliative care/hospice to the 30-day all-cause mortality measure.[60] • There are expanding measure sets and an evolving understanding of other end-of-life care throughout Maryland quality programs.

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[56] In October 2015, with the transition to ICD-10, CDC updated the list of 21 indicators and corresponding ICD codes used to identify delivery hospitalizations with severe maternal morbidity. For more information on CDC's indicators for severe maternal morbidity, see https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html#icd.

[57] MDMOM is a five-year program to improve maternal health across Maryland by coordinating innovation in the areas of maternal health data, hospital and U.S. home visiting, training, and resource availability. Funded by the Health Resources and Services Administration, MDMOM is a collaboration between the Maryland Department of Health; Maryland Patient Safety Center; Johns Hopkins University; and University of Maryland, Baltimore County. For more information, see https://mdmom.org/.

[58] Sepsis bundle (SEP_1) came online in CY 2017, and additional process measures (such as the septic shock three-hour bundle [SEP_SH_3HR]) were added in CY 2019.

[59] To view the 2018 Report on Sepsis Public Awareness Campaign, see https://health.maryland.gov/phpa/documents/HB-1467-2018-Report-on-the-Sepsis-Public-Awareness-Campaign-Workgroup.pdf.

[60] For more details on the existing inpatient mortality measure and the creation of a 30-day mortality measure, please see the 30-Day Mortality Measure section of this report.

2.   Subgroup discussion

Other than expanding to the outpatient space where feasible,[61] subgroup members want the QBR Program to focus on reforming and refining existing quality measurement areas more broadly. Of the three areas discussed, members are most interested in maternal health. At present, the HSCRC is adding monitoring reports to the CRISP Reporting Services (CRS) Portal as topical data become available and suggests creating a monitoring report for hospitals and industry for notable maternal health measures, such as measures of severe maternal morbidity.

3.   Considerations and next steps

Due to the in depth analysis and discussion of the other topics, the subgroup had limited time to discuss other measures. The HSCRC does not intend to expand the QBR Program in these measure areas at this time. Moving forward, the HSCRC along with the PMWG should consider:

- Researching options for sepsis measures and protocols to improve performance and reduce sepsis
- Consider developing a monitoring report for notable maternal health measures (such as severe maternal morbidity), also see Section D
- Continue to track palliative care and other end-of-life care throughout Maryland's quality programs

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[61] For more details on the QBR Program's outpatient expansion, please see the Outpatient Measure Expansion section of this report.

V. Conclusion

The evidence-based considerations in this report represent substantial improvements to QBR policy. In particular, the considerations related to adopting HCAHPS linear scoring, building eCQM infrastructure for ED wait times and other measures (such as the THA/TKA outpatient measure), developing the 30-day mortality measure, and converting the THA/TKA inpatient measure to an all-payer measure will improve quality outcomes for Maryland residents and enable Maryland to continue serving as a health care innovator through the QBR Program.

The HSCRC staff will work with the PMWG in fall 2021 to finalize the QBR policy for RY 2024. For future years, it will be important for Maryland and its stakeholders to focus on specific outcome improvements and work toward achieving health outcomes that are equal to or better than national outcomes. Doing so will allow for the state's continued exemption from the national programs and further improvements in the health of its residents.

The HSCRC staff would like to thank the stakeholders who participated in the subgroup to redesign the QBR Program.

APPENDIX A
Introduction, 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 QBR measures and domain weights to those used in the CMS VBP Program.

Figure A.1. 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** 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 illustrated in the body of this report, for the RY 2023 QBR Program, 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.[62] 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

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[62] 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,[63] 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.[64] 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.

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

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

[64] 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.

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 QBR Program updates

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.

Figure A.2. Process for calculating RY 2023 QBR scores

Performance measures → **Standardized measure scores** → **Hospital QBR score and revenue adjustments**

QBR measures by domain:

Person and Community Engagement (9 measures: 8 HCAHPS categories; NEW follow-up after chronic conditions exacerbation measure)

Safety (6 measures: 5 CDC NHSN HAI categories; NEW all-payer PSI 90 measure)

Clinical Care (inpatient mortality, THA/TKA complications)

Clinical Care 15%
Safety 35%
Person & Community Engagement 50%

Individual measures are converted to 0–10 points:

Points for attainment are based on performance versus a national threshold (median) and benchmark (top 5%)

Threshold benchmark
0 2 4 6 8 10

Points for improvement are based on performance versus base (historical perf.) and benchmark

Hist. perf. benchmark
0 2 4 6 8 10

Final score is the better of the two scores (improvement or attainment)

Hospital QBR score is the sum of earned points/possible points with domain weights applied

Scale of 0–80%

Max penalty -2% & reward +2%

Abbreviated Pre-Set Scale	QBR Score	Financial Adjustment
Max Penalty	0%	-2.00%
	10%	-1.51%
	20%	-1.02%
	30%	-0.54%
Penalty/Reward Cutpoint	41%	0.00%
	50%	0.46%
	60%	0.97%
	70%	1.49%
Max Reward	80%+	2.00%

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

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

	Clinical Care	Person and Community Engagement	Safety
QBR RY 23 Program	**15 percent** 2 measures • Inpatient mortality (HSCRC case-mix data) • THA TKA (CMS Hospital Compare, Medicare claims data)	**50 percent** 9 measures • 8 HCAHPS domains (CMS Hospital Compare patient survey) • **Adopted**: Follow-Up After Acute Exacerbation of Chronic Conditions (Medicare claims)	**35 percent** 7 measures • 6 CDC NHSN HAI measures (CMS Hospital Compare chart abstracted) • **Adopted**: 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.[65] The PSI 90 measure comprises the weighted average of the observed-to-expected ratios for the following component indicators:

- PSI 03 Pressure Ulcer Rate
- PSI 06 Iatrogenic Pneumothorax Rate
- PSI 08 In-Hospital Fall with Hip-Fracture Rate
- PSI 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 or Deep-Vein Thrombosis Rate
- PSI 13 Postoperative Sepsis Rate
- PSI 14 Postoperative Wound Dehiscence Rate
- PSI 15 Abdominopelvic Accidental Puncture or Laceration Rate

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.

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

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.[66] 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
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

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[66] Source: https://impaqint.com/measure-information-timely-follow-after-acute-exacerbations-chronic-conditions.

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.[67]

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.

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**.

[67] Please see https://impaqint.com/measure-information-timely-follow-after-acute-exacerbations-chronic-conditions.

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.

[NUM(ASM) + NUM(CAD) + NUM(HF) + NUM (COPD) + NUM(DIAB) + NUM(HTN)] / [DENOM(ASM) + DENOM(CAD) + DENOM(HF) + DENOM (COPD) + DENOM(DIAB) + DENOM(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: NUM(HF) / DENOM(HF).

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

4.   QBR RY 2023 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 2023 timeline (base and performance periods; financial impact)

Rate year (Maryland fiscal year)	Q3-18	Q4-18	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
Calendar year	Q1-18	Q2-18	Q3-18	Q4-18	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

QBR base and performance periods:

- CMS Hospital Compare base period (HCAHPS measures, all CDC NHSN measures) — spans Q1-19 through Q4-19 (calendar year)
- CMS Hospital Compare performance period (HCAHPS measures, all CDC NHSN measures) — spans Q1-21 through Q4-21 (calendar year)
- Base period (inpatient mortality, PSI-90, follow-up chronic conditions) — spans Q1-19 through Q4-19 (calendar year)
- Performance period (inpatient mortality, PSI-90, follow-up chronic conditions) — spans Q1-21 through Q4-21 (calendar year)
- CMS Hospital Compare THA/TKA performance period*X — spans Q3-18 through Q2-20 (calendar year, with X-marked quarters for CY Q1-20 and Q2-20)
- Rate year impacted by QBR results — spans Q3-22 through Q2-23 (calendar year)

* Hospital Compare THA/TKA complications base period April 1, 2013–March 31, 2016.

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

A.   Background

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

Figure B.1.a. Nurse communication
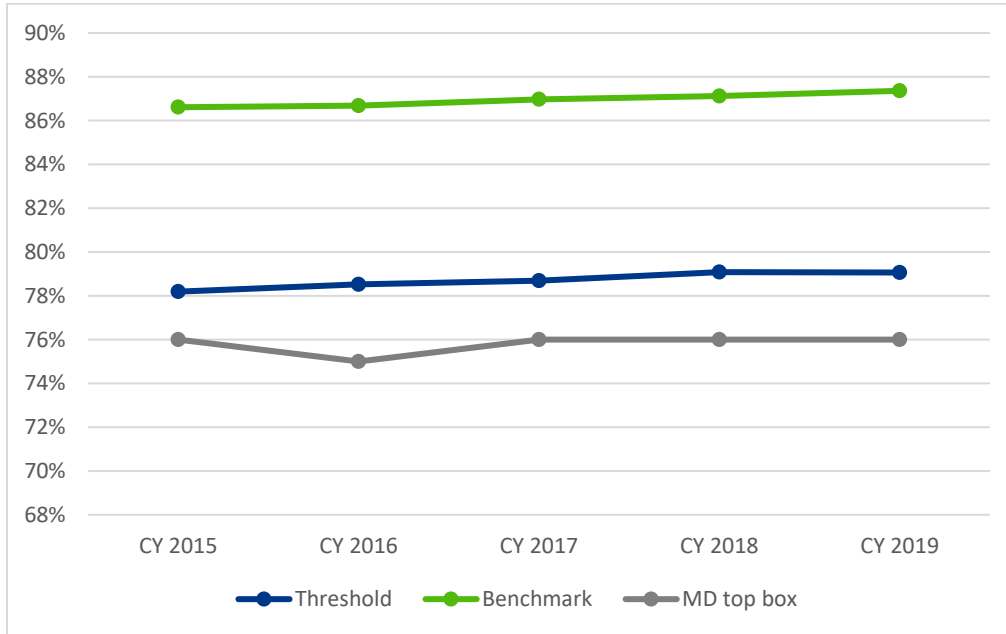
Figure B.1.b. Doctor communication

Figure B.1.c. Staff responsiveness
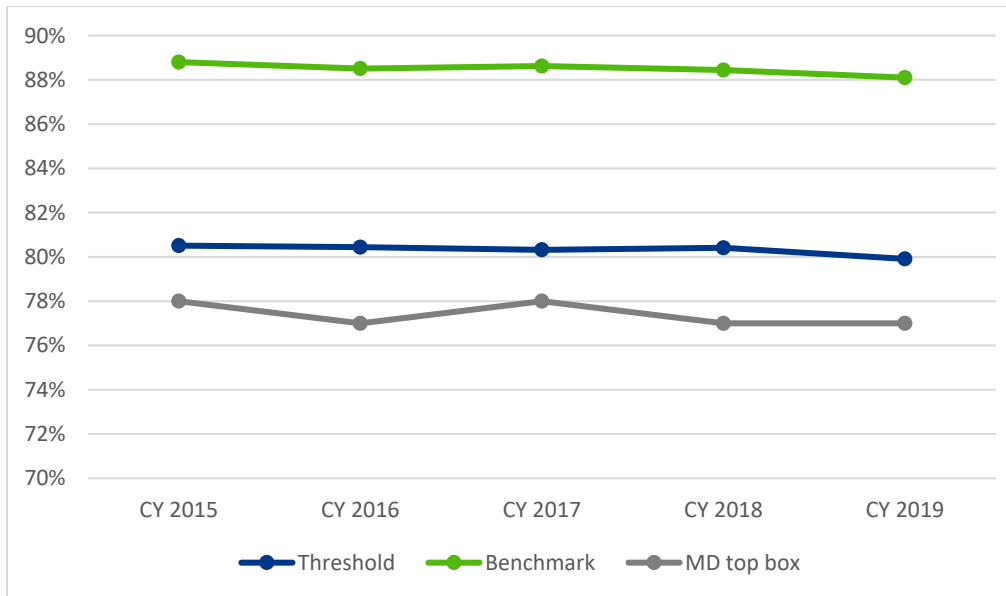
Figure B.1.c. Staff responsiveness

Figure B.1.d. Communication about medicines
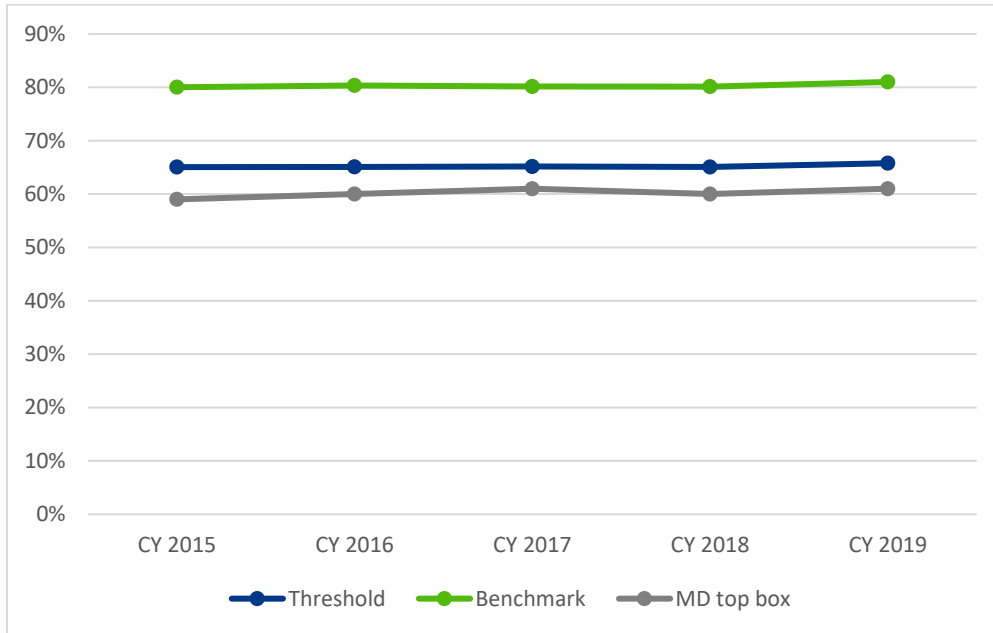
Figure B.1.d. Communication about medicines
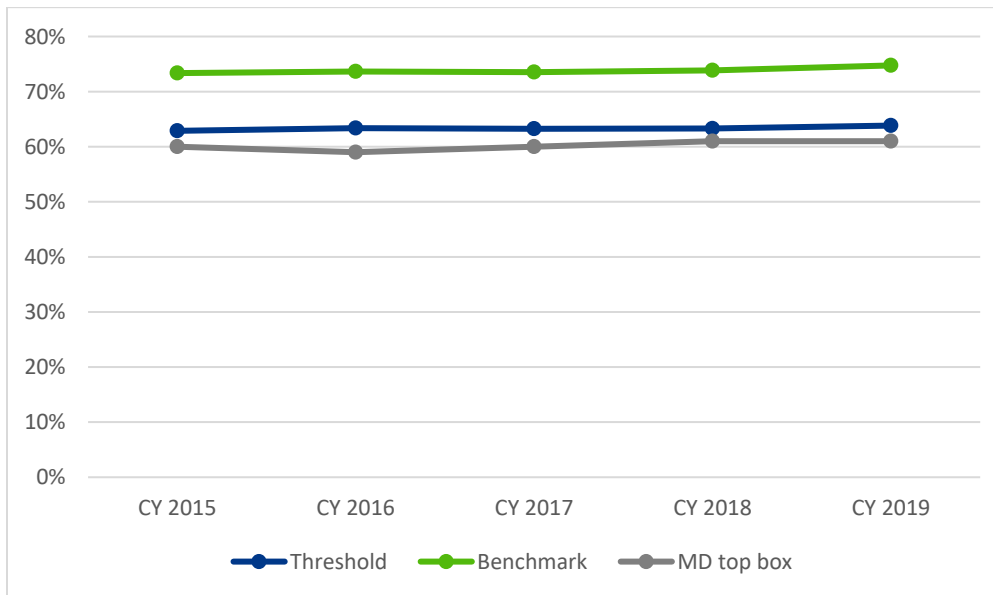
Figure B.1.e. Discharge information
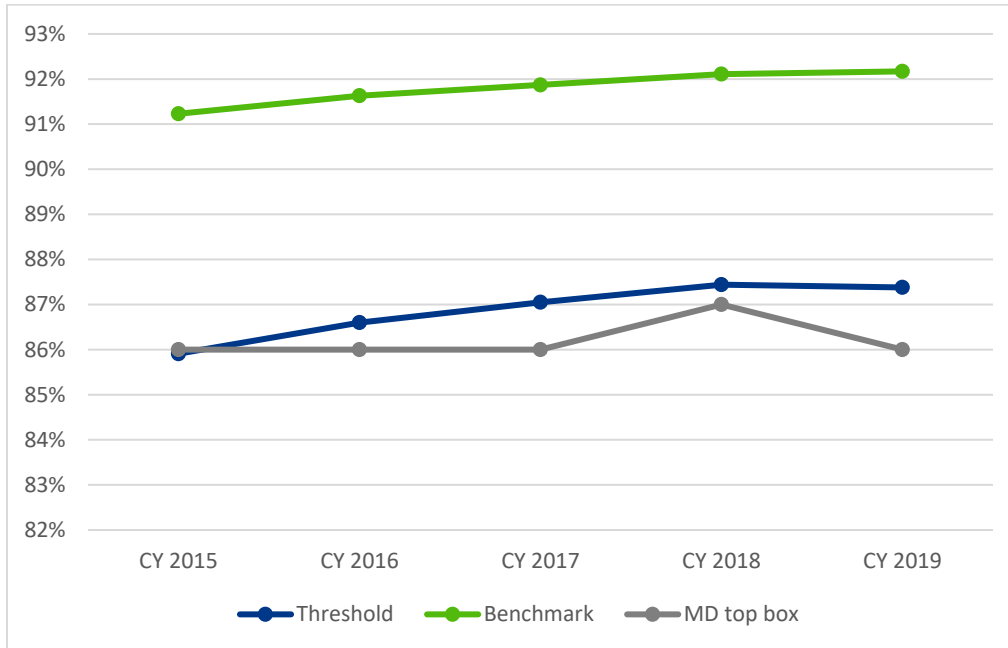
Figure B.1.f. Care transition
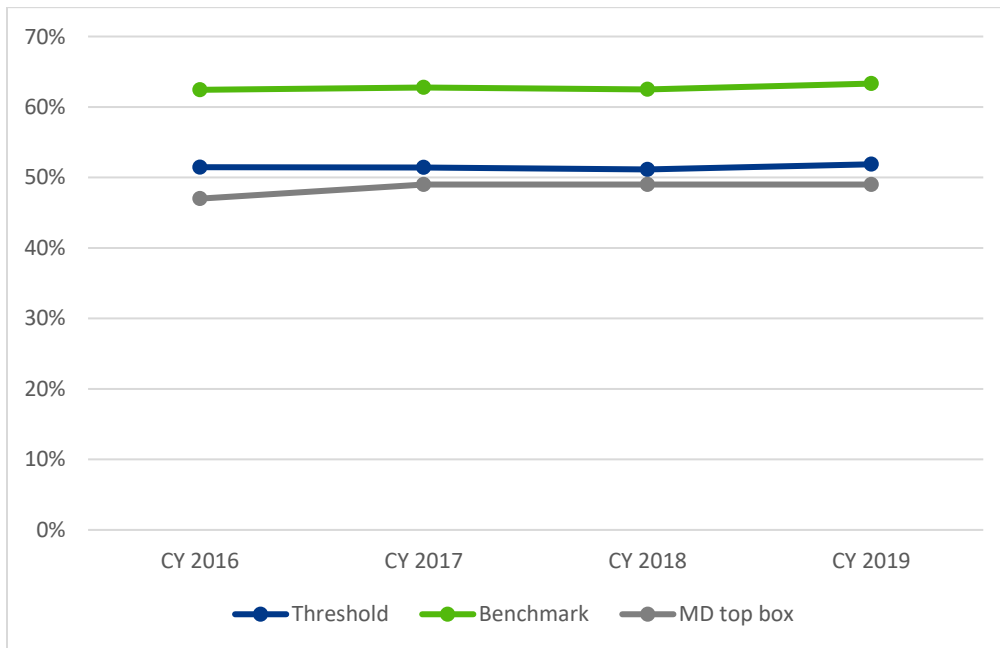
Figure B.1.g. Clean and quiet
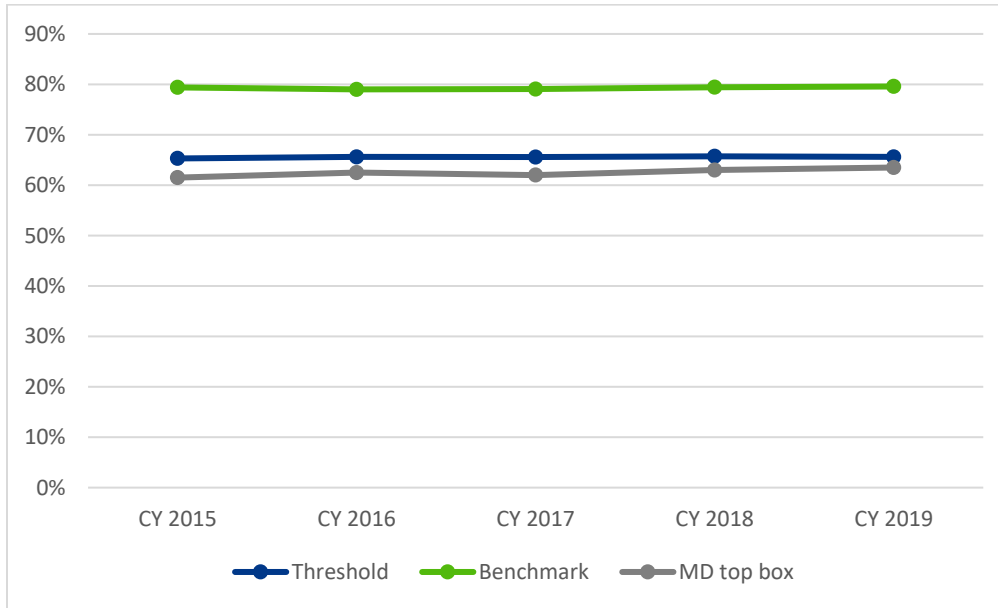
Figure B.1.h. Hospital rating
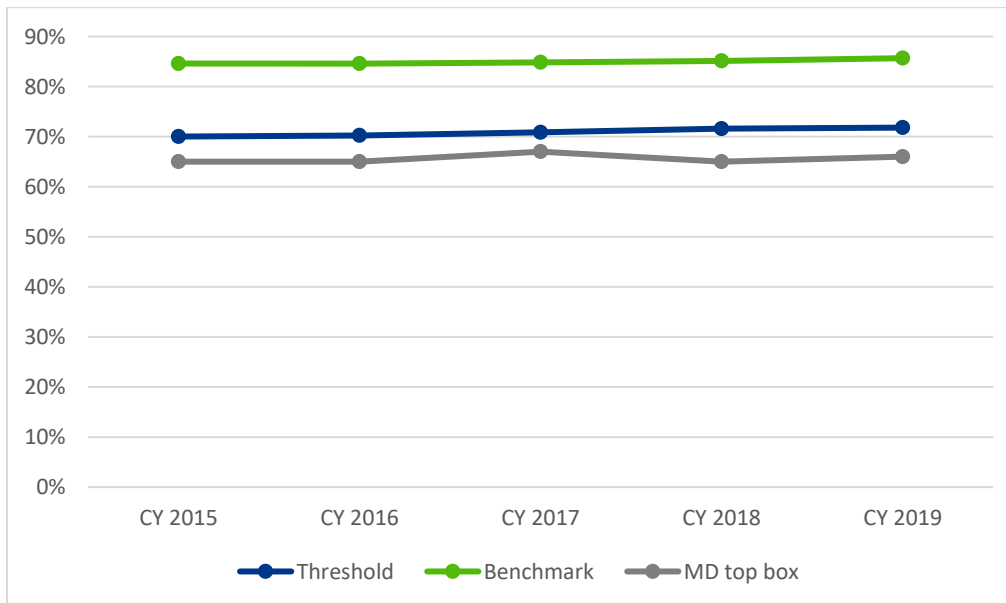
Figure B.2. Maryland hospital top box score changes over time (2013–2018, 2018–2019)

Figure B.2.a. Nurse communication

By hospital (n=43) change 2013–2018

- 19 — >= 3% Increase
- 11 — < 3% Increase
- 6 — No change
- 4 — < 3% Decrease
- 3 — >= 3% Decrease

Range = -4% to +8%

By hospital (n=43) change 2018–2019

- 5 — >= 3% Increase
- 9 — < 3% Increase
- 11 — No change
- 10 — < 3% Decrease
- 8 — >= 3% Decrease

Range = -5% to +5%
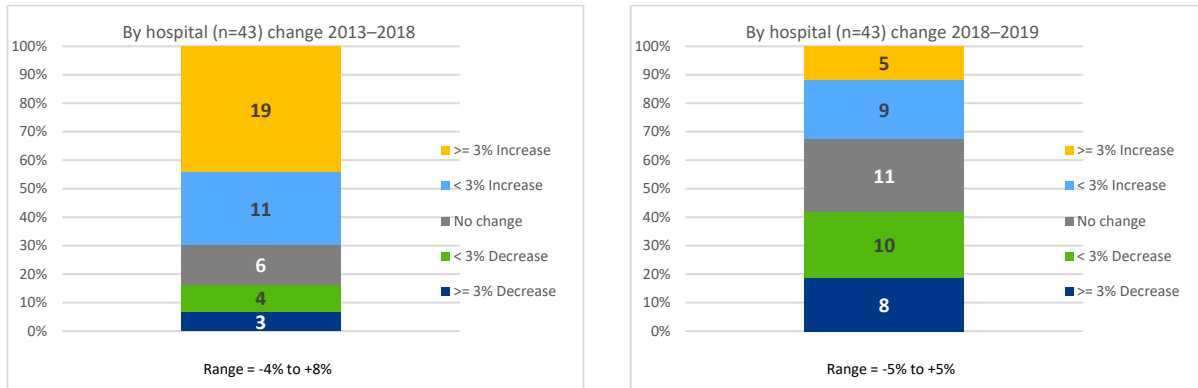
Figure B.2.b. Doctor communication

By hospital (n=43) change 2013–2018

- 8 — >= 3% Increase
- 10 — < 3% Increase
- 9 — No change
- 9 — < 3% Decrease
- 7 — >= 3% Decrease

Range = -5% to +9%

By hospital (n=43) change 2013–2018

- 8 — >= 3% Increase
- 10 — < 3% Increase
- 9 — No change
- 9 — < 3% Decrease
- 7 — >= 3% Decrease

Range = -5% to +9%
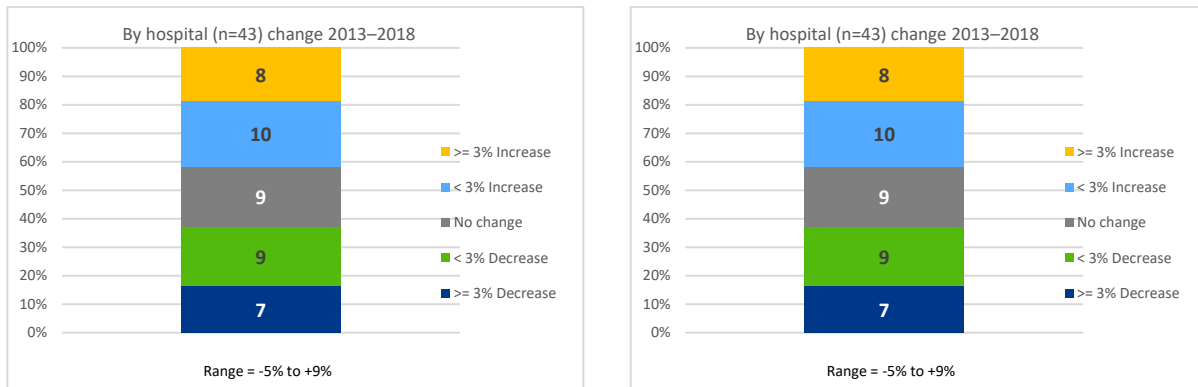
Figure B.2.c. Staff responsiveness

By hospital (n=43) change 2013–2018

- 21 — >= 3% Increase
- 8 — < 3% Increase
- 3 — No change
- 6 — < 3% Decrease
- 5 — >= 3% Decrease

Range = -5% to +19%

By hospital (n=43) change 2018–2019

- 10 — >= 3% Increase
- 12 — < 3% Increase
- 7 — No change
- 4 — < 3% Decrease
- 10 — >= 3% Decrease

Range = -15% to +9%
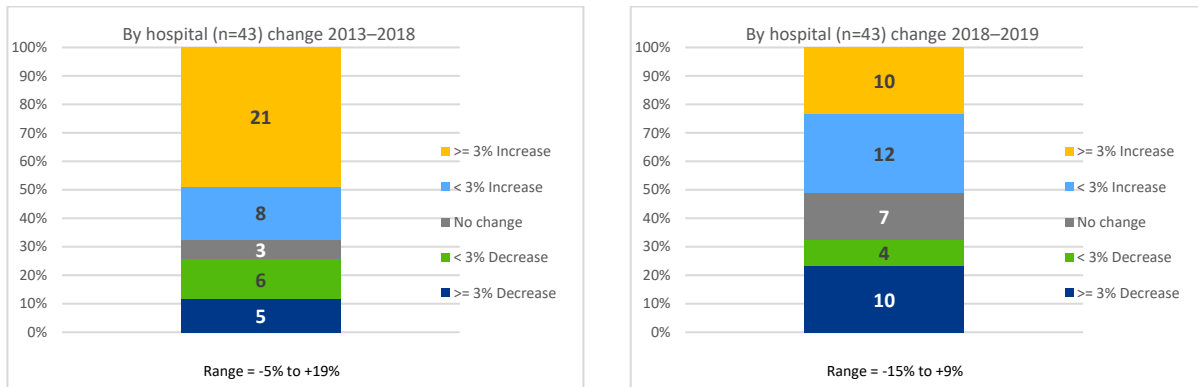
Figure B.2.d. Communication about medicines

By hospital (n=43) change 2013–2018

Range = -4% to +11%

By hospital (n=43) change 2018–2019

Range = -14% to +7%
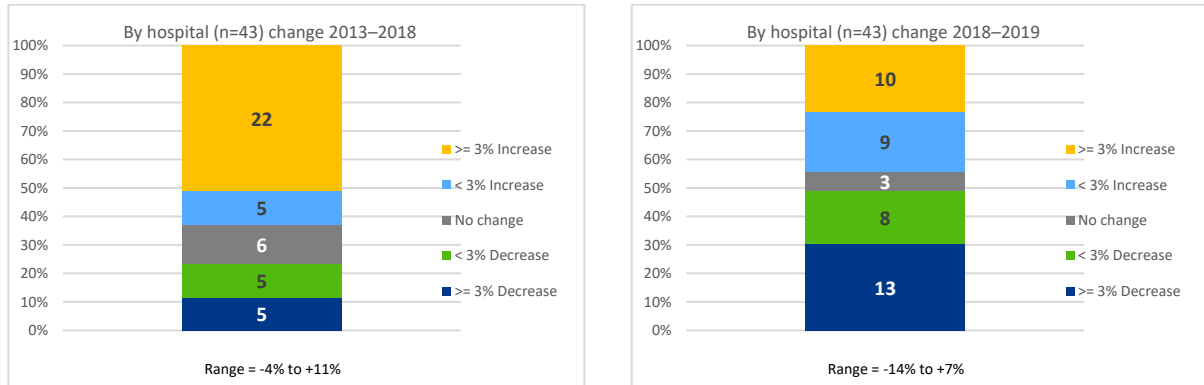
Figure B.2.e. Discharge information

By hospital (n=43) change 2013–2018

Range = -3% to +7%

By hospital (n=43) change 2018–2019

Range = -8% to +3%
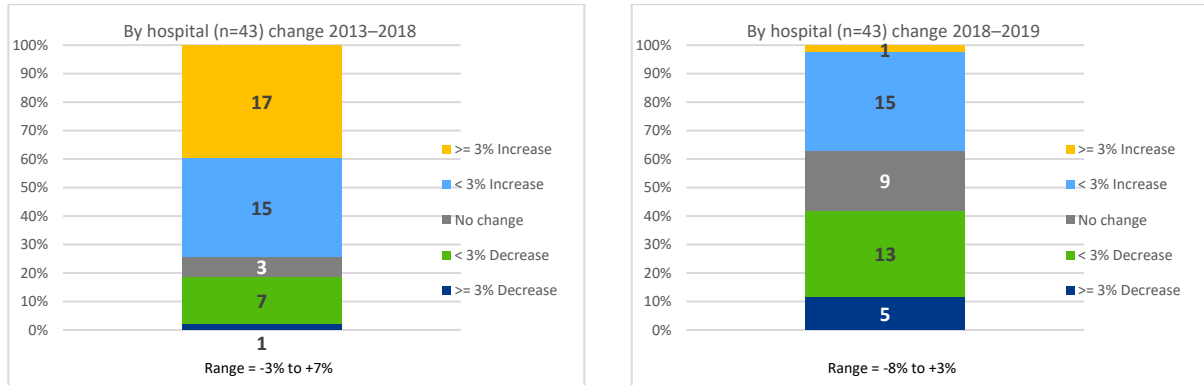
Figure B.2.f. Care transition

By hospital (n=43) change 2013–2018

Range = -3% to +9%

By hospital (n=43) change 2018–2019

Range = -10% to +20%
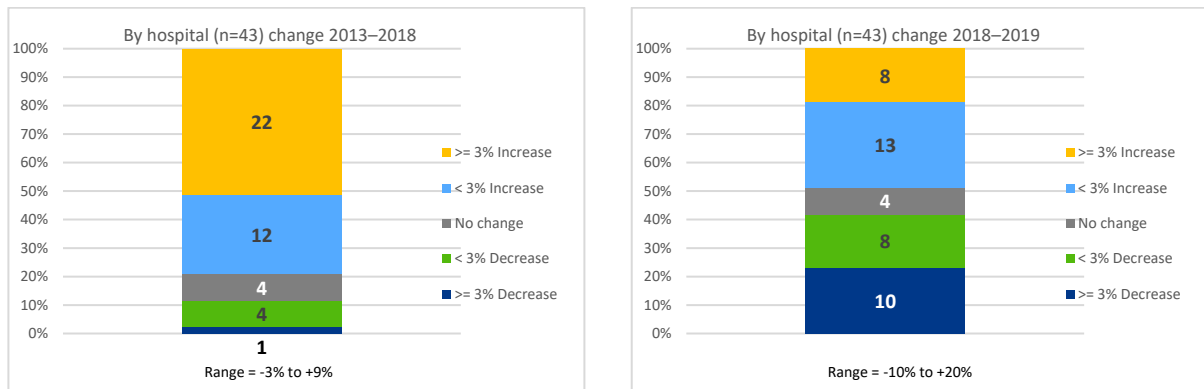
Figure B.2.g. Average clean and quiet

By hospital (n=43) change 2013–2018

	Count
>= 3% Increase	18
< 3% Increase	12
No change	2
< 3% Decrease	8
>= 3% Decrease	3

Range = -8.5% to +9.0%

By hospital (n=43) change 2018–2019

	Count
>= 3% Increase	9
< 3% Increase	12
No change	3
< 3% Decrease	12
>= 3% Decrease	7

Range = -5.5% to +9.5%
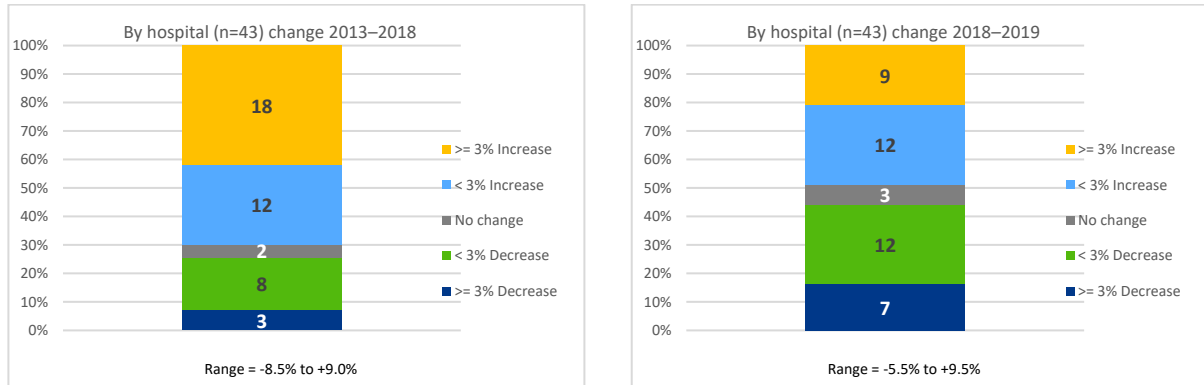
Figure B.2.h. Overall hospital rating

By hospital (n=43) change 2013–2018

	Count
>= 3% Increase	20
< 3% Increase	7
No change	1
< 3% Decrease	6
>= 3% Decrease	9

Range = -9% to +14%

By hospital (n=43) change 2018–2019

	Count
>= 3% Increase	8
< 3% Increase	9
No change	6
< 3% Decrease	11
>= 3% Decrease	9

Range = -9% to +6%
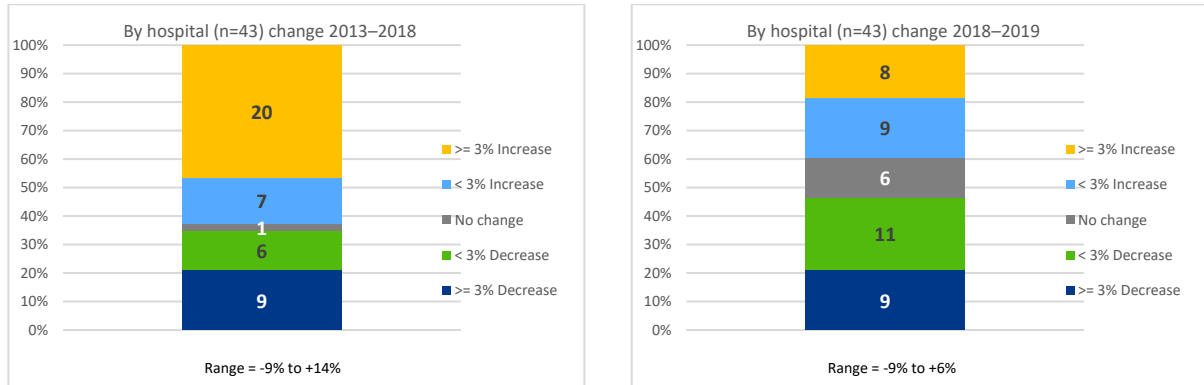
Figure B.3. Spearman rank-order correlation analysis looking at the relationship between domain scores and various quality measures and hospital characteristics

Figure B.3.a. 2017

Measure	Nurse communication	Doctor communication	Staff responsiveness	Communication about medicines	Discharge information	Care transition	Cleanliness	Quietness	Overall hospital rating	Recommend 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 communi-cation	Doctor communi-cation	Staff responsive-ness	Communi-cation about medicines	Discharge informa-tion	Care transition	Clean-liness	Quietness	Overall hospital rating	Recom-mend 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
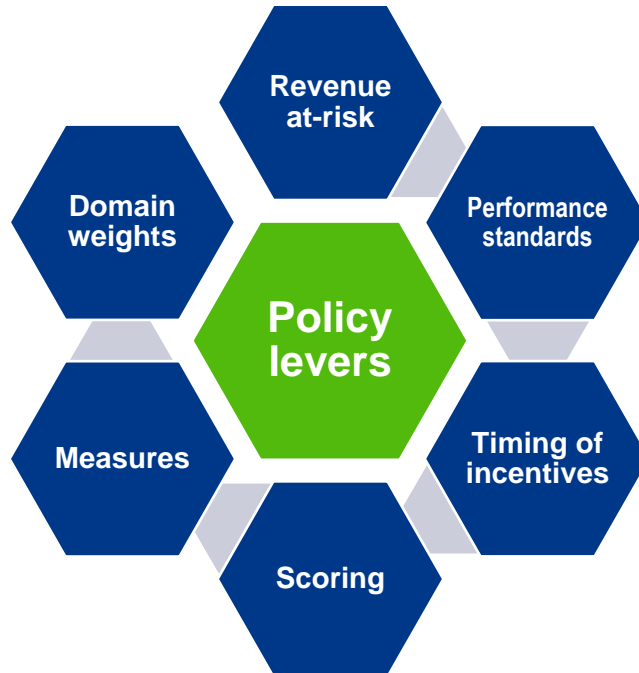
1. Linear scoring

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%

2. Voluntary up-front rewards

Figure B.8. Potential up-front investment money by Maryland hospital
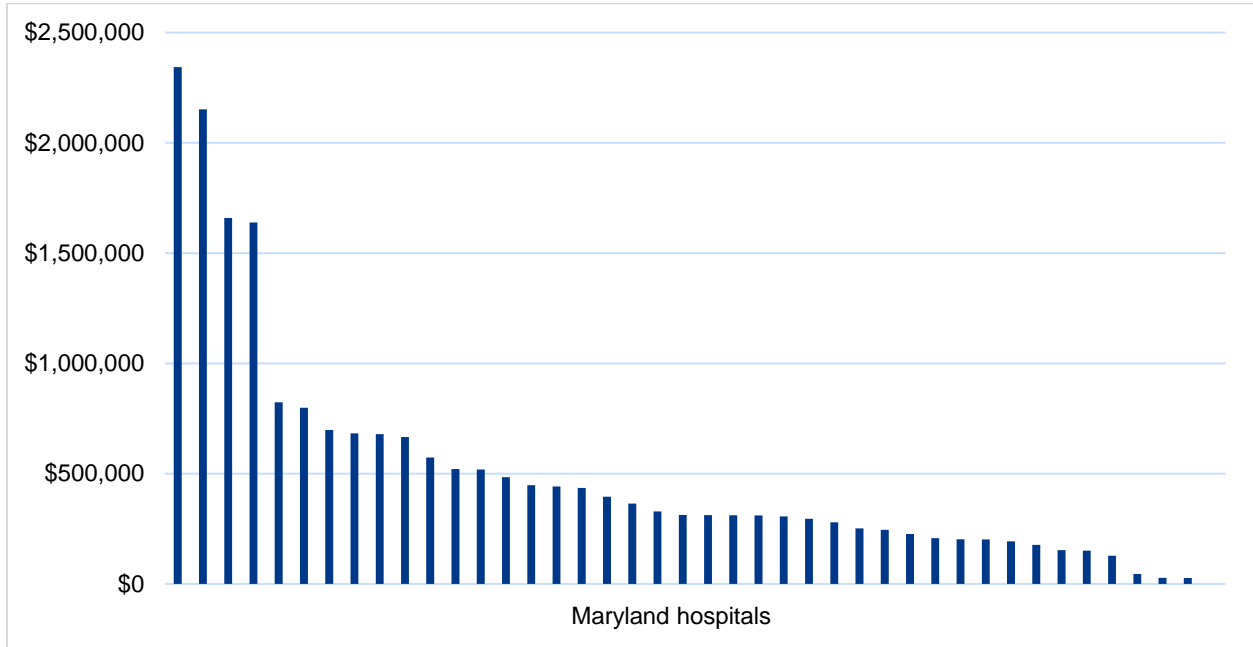
APPENDIX C
Emergency Department Wait Time Measure

A. Analyses

Figure C.1. Emergency department utilization snapshot

Maryland	National
• ~2.38M annual ED visits (average CY16-19) − NOTE: CY 2020 experienced sustained volume decline to 1.78M visits	• 130M annual ED visits
• 39.45 visits per 100 Marylanders per year	• 42 visits per 100 Americans per year
• 17.9% arrive by ambulance (CY19)	• ~15% of patients arrive by ambulance

• ~85.5% of patients are discharged **without** being admitted
  − NOTE: 2020 this figure dropped to 83.3%
	• Common complaints are:
	  − Stomach/abdominal pain
	  − Chest Pain
	  − Fever/Headache

	• ~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
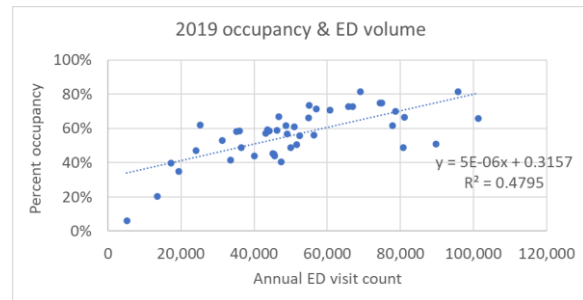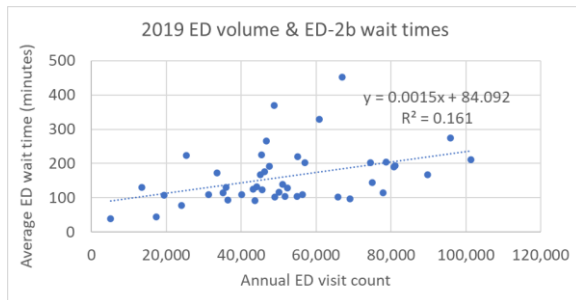
Figure C.3. COVID and ED volume reduction

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

Hospital Volume is taken from the HSCRC Case Mix data when available. Real-time ADT data are used to show Hospital Volume for the most recent weeks.
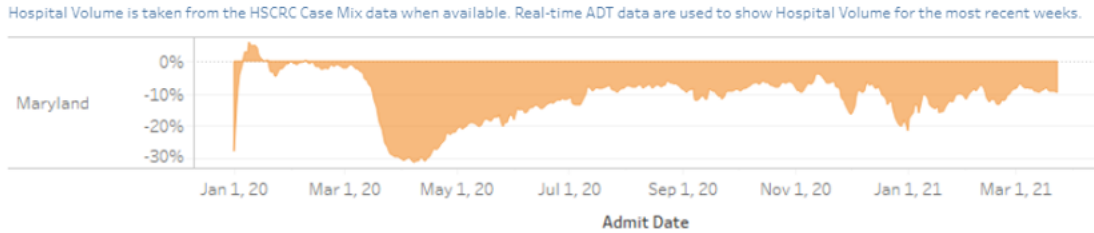
we see a persistent decline in year-over-year emergency department volume (~25% current decline).

Hospital Volume is taken from the HSCRC Case Mix data when available. Real-time ADT data are used to show Hospital Volume for the most recent weeks.
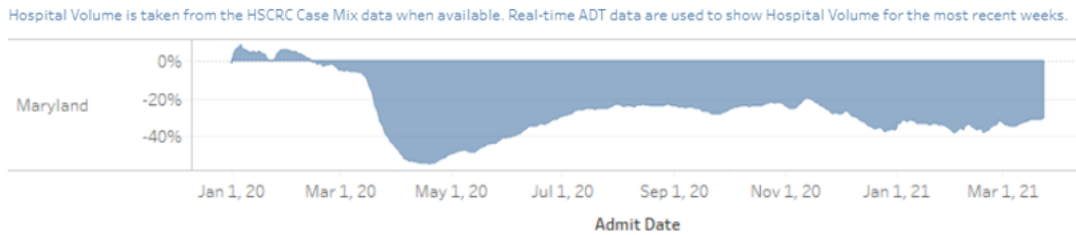
APPENDIX D
SIHIS-Aligned Measure: Follow-Up After Discharge

A. Analyses

Figure D.1. Follow-up after discharge monitoring reports by hospital and by condition (CY 2019)

Hosp ID	Hospital name	Asthma			CAD			CHF			COPD			Diabetes			HTN			Total		
		Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate
210001	Meritus	268	208	77.61%	380	316	83.16%	668	544	81.44%	572	502	87.76%	259	184	71.04%	120	89	74.17%	2,267	1,843	81.30%
210002	UMMC	128	74	57.81%	367	256	69.75%	463	321	69.33%	201	155	77.11%	193	139	72.02%	122	82	67.21%	1,474	1,027	69.67%
210003	UM-PGHC	130	73	56.15%	273	193	70.70%	466	279	59.87%	245	179	73.06%	157	88	56.05%	138	77	55.80%	1,409	889	63.09%
210004	Holy Cross	158	102	64.56%	299	224	74.92%	515	379	73.59%	272	220	80.88%	201	131	65.17%	171	127	74.27%	1,616	1,183	73.21%
210005	Frederick	347	251	72.33%	448	366	81.70%	784	618	78.83%	571	484	84.76%	327	234	71.56%	188	148	78.72%	2,665	2,101	78.84%
210006	UM-Harford	92	57	61.96%	101	72	71.29%	256	179	69.92%	236	195	82.63%	95	62	65.26%	66	54	81.82%	846	619	73.17%
210008	Mercy	71	37	52.11%	151	82	54.30%	234	135	57.69%	143	102	71.33%	103	55	53.40%	42	22	52.38%	744	433	58.20%
210009	Johns Hopkins	179	104	58.10%	305	186	60.98%	605	388	64.13%	246	188	76.42%	302	187	61.92%	83	59	71.08%	1,720	1,112	64.65%
210011	St. Agnes	211	126	59.72%	260	163	62.69%	569	338	59.40%	450	339	75.33%	322	175	54.35%	161	105	65.22%	1,973	1,246	63.15.
210012	Sinai	170	105	61.76%	433	317	73.21%	671	462	68.85%	326	240	73.62%	290	167	57.59%	187	111	59.36%	2,077	1,402	67.50%
210015	MedStar Fr Square	395	249	63.04%	566	371	65.55%	1,102	734	66.61%	879	710	80.77%	499	320	64.13%	329	213	64.74%	3,770	2,597	68.89%
210016	Adventist White Oak	129	86	66.67%	337	240	71.22%	436	300	68.81%	180	154	85.56%	153	100	65.36%	111	78	70.27%	1,346	958	71.17%
210017	Garrett	35	26	74.29%	44	30	68.18%	76	57	75.00%	70	63	90.00%	36	28	77.78%	20	14	70.00%	281	218	77.58%
210018	MedStar Montgomery	112	83	74.11%	122	96	78.69%	276	216	78.26%	195	165	84.62%	120	90	75.00%	92	69	75.00%	917	719	78.41%
210019	Peninsula	381	287	75.33%	411	321	78.10%	712	558	78.37%	520	453	87.12%	352	256	72.73%	142	102	71.83%	2,518	1,977	78.51%
210022	Suburban	164	123	75.00%	269	223	82.90%	471	365	77.49%	245	210	85.71%	180	134	74.44%	112	89	79.46%	1,441	1,144	79.39%
210023	Anne Arundel	343	252	73.47%	455	314	69.01%	1,073	768	71.58%	713	615	86.26%	450	306	68.00%	259	180	69.50%	3,293	2,435	73.94%
210024	MedStar Union Mem	121	73	60.33%	429	296	69.00%	594	410	69.02%	265	191	72.08%	153	80	52.29%	142	83	58.45%	1,704	1,133	66.49%
210027	Western Maryland	187	146	78.07%	232	189	81.47%	446	342	76.68%	395	351	88.86%	205	145	70.73%	90	63	70.00%	1,555	1,236	79.49%
210028	MedStar St. Mary's	151	106	70.20%	171	128	74.85%	421	323	76.72%	317	272	85.80%	169	105	62.13%	84	65	77.38%	1,313	999	76.09%
210029	JH Bayview	180	126	70.00%	279	197	70.61%	590	432	73.22%	390	325	83.33%	235	142	60.43%	127	87	68.50%	1,801	1,309	72.68%

Hosp ID	Hospital name	Asthma			CAD			CHF			COPD			Diabetes			HTN			Total		
		Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate	Eligible discharges	Follow-up received	Follow-up rate
210030	UM-Chestertown	55	32	58.18%	31	20	64.52%	87	48	55.17%	97	73	75.26%	42	13	30.95%	21	16	76.19%	333	202	60.66%
210032	ChristianaCare, Union	165	100	60.61%	118	88	74.58%	258	174	67.44%	301	234	77.74%	149	104	69.80%	42	32	76.19%	1,033	732	70.86%
210033	Carroll	206	151	73.30%	334	231	69.16%	472	328	69.49%	420	357	85.00%	200	140	70.00%	178	122	68.54%	1,810	1,329	73.43%
210034	MedStar Harbor	114	65	57.02%	107	70	65.42%	265	165	62.26%	281	203	72.24%	115	62	53.91%	70	46	65.71%	952	611	64.18%
210035	UM-Charles Regional	150	98	65.33%	139	91	65.47%	320	216	67.50%	246	196	79.67%	174	130	74.71%	122	85	69.67%	1,151	816	70.89%
210037	UM-Easton	296	208	70.27%	205	142	69.27%	446	317	71.08%	427	365	85.48%	260	183	70.38%	99	67	67.68%	1,733	1,282	73.98%
210038	UMMC Midtown	44	27	61.36%	42	22	52.38%	130	68	52.31%	72	58	80.56%	86	50	58.14%	40	19	47.50%	414	244	58.94%
210039	Calvert	103	75	72.82%	259	204	78.76%	407	307	75.43%	253	210	83.00%	174	101	58.05%	106	71	66.98%	1,302	968	74.35%
210040	Northwest	247	130	52.63%	334	191	57.19%	769	456	59.30%	481	368	76.51%	353	193	54.67%	320	184	57.50%	2,504	1,522	60.78%
210043	UM-BWMC	413	285	69.01%	467	354	75.80%	964	702	72.82%	754	630	83.55%	491	329	67.01%	264	191	72.35%	3,353	2,491	74.29%
210044	GBMC	120	87	72.50%	123	83	67.48%	353	250	70.82%	248	207	83.47%	169	120	71.01%	118	84	71.19%	1,131	831	73.47%
210048	Howard County	301	203	67.44%	357	271	75.91%	736	545	74.05%	477	406	85.12%	300	221	73.67%	175	139	79.43%	2,346	1,785	76.09%
210049	UM-Upper Chesapeake	258	179	69.38%	410	308	75.12%	727	536	73.73%	538	470	87.36%	271	187	69.00%	189	139	73.54%	2,393	1,819	76.01%
210051	Doctors	258	163	63.18%	259	181	69.88%	686	458	66.76%	420	339	80.71%	328	211	64.33%	160	106	66.25%	2,111	1,458	69.07%
210056	MedStar Good Sam	171	94	54.97%	218	158	72.48%	533	357	66.98%	333	241	72.37%	241	145	60.17%	156	103	66.03%	1,652	1,098	66.46%
210057	Shady Grove	207	149	71.98%	286	228	79.72%	510	387	75.88%	321	274	85.36%	222	161	72.52%	202	152	75.25%	1,748	1,351	77.29%
210060	Ft. Washington	72	38	52.78%	71	42	59.15%	202	125	61.88%	143	106	74.13%	82	42	51.22%	59	32	54.24%	629	385	61.21%
210061	Atlantic General	90	55	61.11%	40	30	75.00%	173	130	75.14%	164	131	79.88%	84	63	75.00%	45	29	64.44%	596	438	73.49%
210062	MedStar Southern MD	150	92	61.33%	303	197	65.02%	579	346	59.76%	278	202	72.66%	210	114	54.29%	148	88	59.46%	1,668	1,039	62.29%
210063	UM-St. Joe	199	150	75.38%	413	281	68.04%	545	412	75.60%	329	275	83.59%	217	147	67.74%	176	137	77.84%	1,879	1,402	74.61%
210065	HC-Germantown	38	23	60.53%	77	53	68.83%	132	89	67.42%	75	51	68.00%	58	40	68.97%	59	36	61.02%	439	292	66.51%
	STATEWIDE	7,609	5,098	67.00%	10,925	7,825	71.62%	20,722	14,564	70.28%	14,089	11,509	81.69%	9,027	5,884	65.18%	5,535	3,795	68.56%	67,907	48,675	71.68%

CAD = coronary artery disease; CHF = coronary heart failure; COPD = chronic obstructive pulmonary disease; HTN = hypertension.

Figure D.2. Percentage of Maryland Medicare beneficiaries per chronic-condition discharge

Chronic condition	Eligible discharge	Percent Medicare
Asthma	12,595	61%
CAD	14,063	78%
CHF	25,635	79%
COPD	18,222	78%
Diabetes	13,557	66%
HTN	6,749	79%
TOTAL	90,821	74%

CAD = coronary artery disease; CHF = coronary heart failure; COPD = chronic obstructive pulmonary disease; HTN = hypertension.

APPENDIX E
CDC NHSN HAI

A.   Analyses

Figure E.1. 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 E.2. 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)
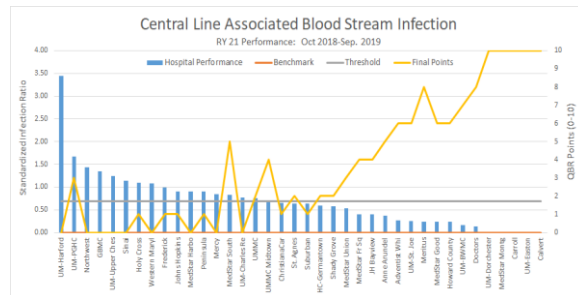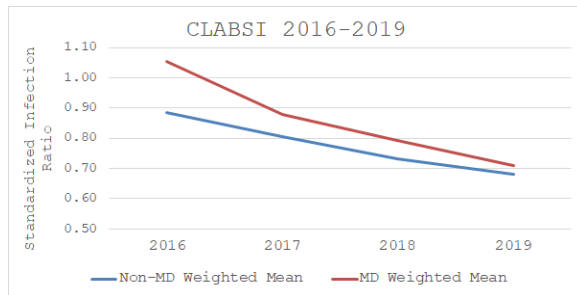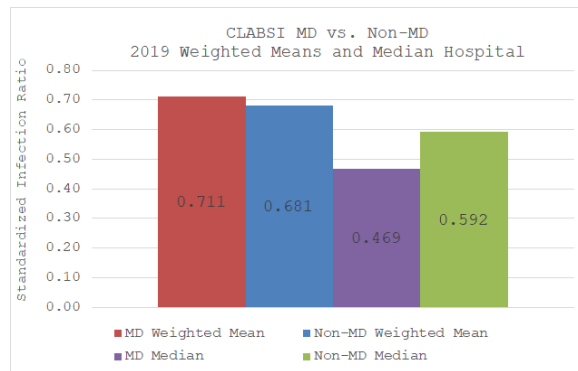
* National data is all non-Maryland hospitals subject to VBP.

Figure E.3. 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 E.4. 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.
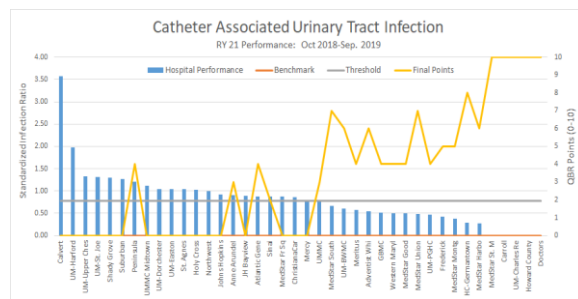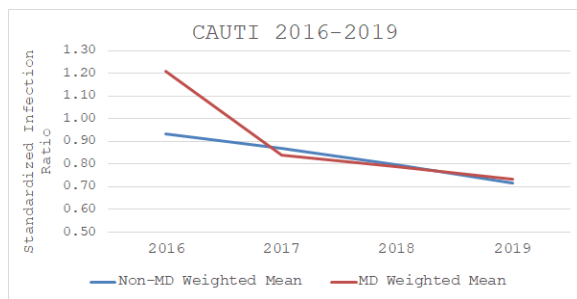
Figure E.5. SSI Hysterectomy snapshot

- 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 #47 (weighted mean); 49 (unweighted)
- 2019: 42 Hyst SSI events in Maryland (N=11)

SSI: Hyst MD vs. Non-MD
2019 Weighted Means and Median Hospital

- MD Weighted Mean: 1.372
- Non-MD Weighted Mean: 0.918
- MD Median: 1.371
- Non-MD Median: 0.735

SSI Hyst 2016-2019

Surgical Site Infection: Hyst
RY 21 Performance: Oct 2018-Sep. 2019

* National data is all non-Maryland hospitals subject to VBP.
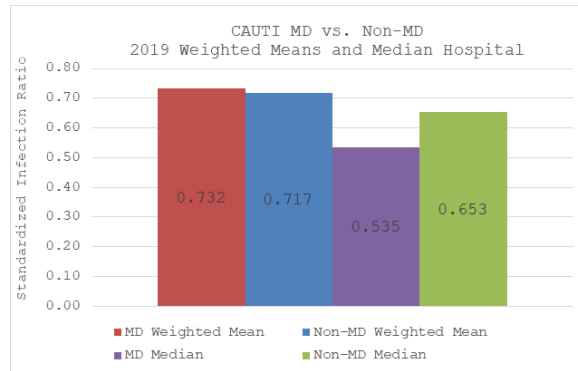
Figure E.6. MRSA snapshot

- Maryland performs better 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 #32 (weighted mean); 24 (unweighted)
- 2019: 133 MRSA events in Maryland (N=34)

MRSA MD vs. Non-MD
2019 Weighted Means and Median Hospital

- MD Weighted Mean: 0.752
- Non-MD Weighted Mean: 0.821
- MD Median: 0.696
- Non-MD Median: 0.726

MRSA 2016-2019

Methicillin-resistant Staphylococcus aureus
RY 21 Performance: Oct 2018-Sep. 2019

* National data is all non-Maryland hospitals subject to VBP.
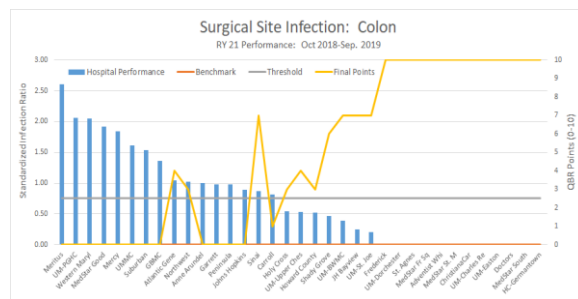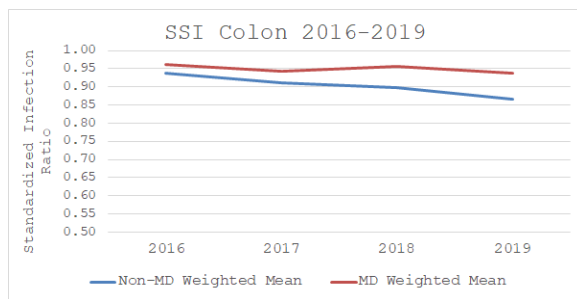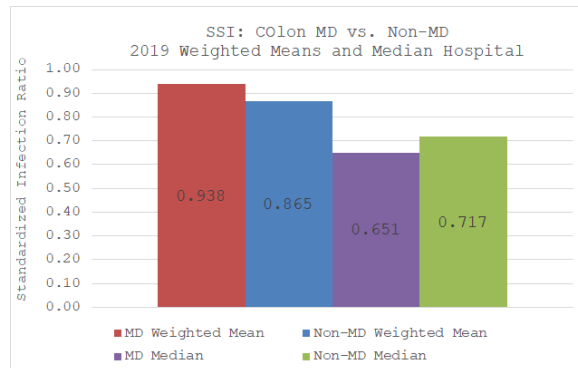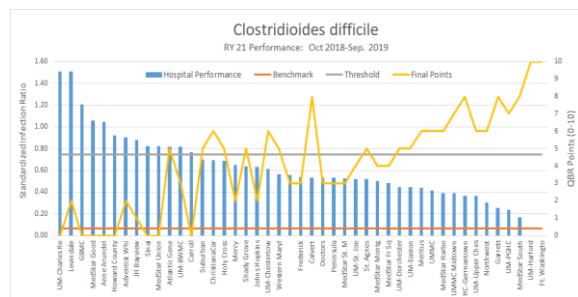
Figure E.7. C.Diff. snapshot

- 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)

CDI MD vs. Non-MD
2019 Weighted Means and Median Hospital

0.607 MD Weighted Mean
0.579 Non-MD Weighted Mean
0.531 MD Median
0.524 Non-MD Median

CDI 2016-2019

Clostridioides difficile
RY 21 Performance: Oct 2018-Sep. 2019
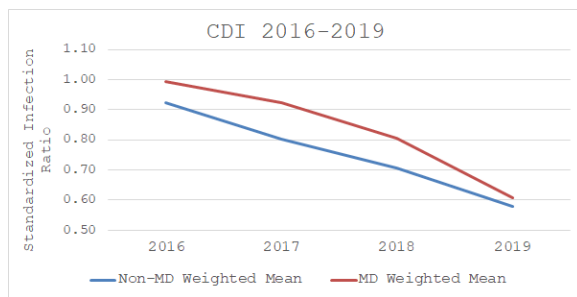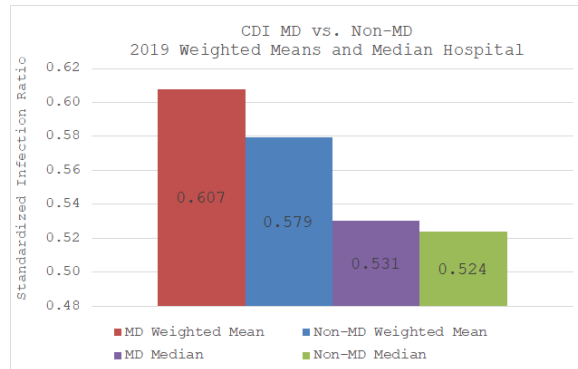
* National data is all non-Maryland hospitals subject to VBP.

APPENDIX F
30-Day Mortality Measure

A.   Analyses

Figure F.1. Additional analyses of the out-of-state exclusion

Figure F.1.a. Hospital RSMRs by out-of-state patients

- **HSCRC evaluated whether IP mortality is similar for in/out-of-state patients using random effects model that adjusted for SOI, ADI, age, sex, race**
  - If similar rates then restricting measure to in-state residents will not produce bias
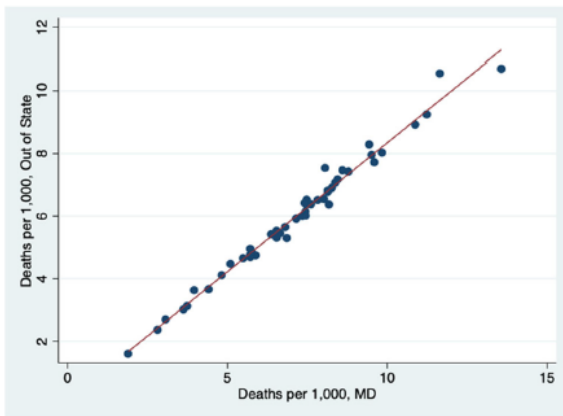
- Correlation at hospital level is 0.99
- In-state mortality rate is an acceptable proxy for out-of-state rate
- Limiting 30-day mortality measure to in-state patients is appropriate

Figure F.1.b. Out-of-state exclusion: Impact on RSMR

Change in risk-adjusted 30-day mortality rate

Removing out-of-state patients increases rates

Removing out-of-state patients decreases rates

Increasing proportion of out-of-state patients at hospital
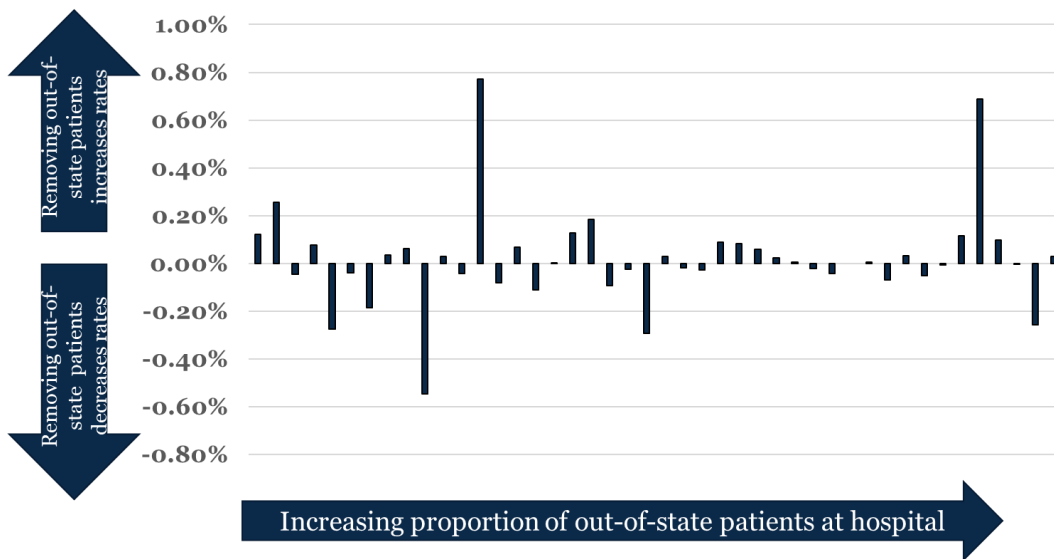
Figure F.1.c. Out-of-state exclusion: Assessment of risk

Figure F.2. Additional analyses on hospice

Patient disposition*	Percent enrolled in hospice within 30 days of discharge	
	Maryland	U.S.
Home	1.6	1.3
SNF	5.4	6.7
Home health	3.2	3.2
Rehab	2.2	2.4
Hospice-facility	90.3	88.1
Other short-term hospital	5.1	6.6
Hospice-home	86.3	80.8

* Dispositions listed account for 98% of all stays.

Figure F.3. Rank correlation between both versions of the 30-day mortality measure (with random exclusion versus without random exclusion)
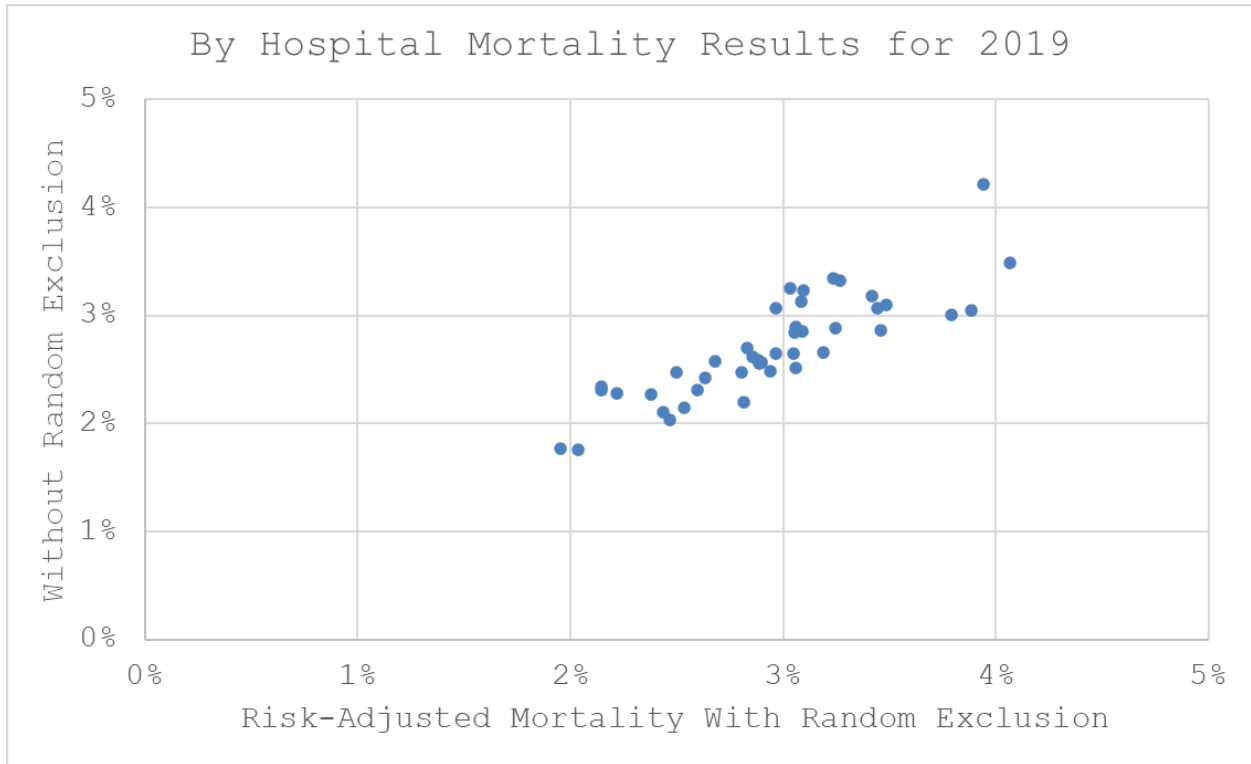
Figure F.4. Literature review on 30-day lookback periods

First author	Journal	Population	Lookback period	Results
Dobbins	J. Clin. Epid.	Cancer surgery patients	0, 1, 2, 3 years	No benefit of lookback period
Lee	Medical Care	Heart failure patients	1 year	Marginally improved prediction
Pritchard	J. Clin. Epid.	UK all payer, all cause	1 year	Improved model fit, uncertain clinical significance

Hospital QBR Stakeholder Letters:

Submissions to HSCRC

August 16, 2021

Rollin J (Terry) Fairbanks, MD, MS, FACEP
Vice President and Chief Quality & Safety Officer, MedStar Health
Founding Director, National Center for Human Factors in Healthcare
Professor of Emergency Medicine, Georgetown University

June 25, 2021

Dear HSCRC:

As the QBR redesign continues to mature, MedStar Health would like to share our input on a few of the proposed changes to the program. These issues are clearly complex, and we want to recognize and to thank you for the expertise, the collaborative spirit, and the leadership that you all have brought to the process.

Safety Domain
We want to emphasize the importance of keeping this section limited to the current NHSN HAIs and PSI-90 (all-payor). The NHSN HAIs are well established all-payor measures that CMMI uses to compare our state's performance with the country. In fact, these were cited in the March 2021 QBR workgroup meeting slides as a key area where CMMI is looking for us to improve. Moreover, these measures are used in CMS Star Rating and Leapfrog evaluations of our hospitals. We feel it is very important for Maryland hospitals to keep laser focused on these current HAIs and the recently added PSI-90, as opposed to diverting resources/focus to other potential measures under consideration (eg hospital onset bacteremia, severe maternal morbidity, sepsis eCQMs, etc). This approach will drive safety for our patients and will help Maryland perform well compared to the nation from the CMMI, CMS Stars, and Leapfrog perspectives.

QBR Mortality Measure
We feel the evolution of the QBR mortality measure to a 30-day measure is overall an excellent decision – it will push our hospitals to provide even better inpatient care and will align Maryland's mortality measure more closely with the CMS 30-day measures. As previously communicated, we want the policy to strongly support robust hospice services for our patients (a conspicuous weakness in the current CMS measures). This is critical for providing the best care for our patients and their families and for helping to support our TCOC efforts. We agree with the approach of excluding patients discharged to facility hospice or home hospice from the measure, we want to reiterate that excluding patients *enrolled in hospice at any time throughout the 30 days* would further strengthen the policy by incentivizing investments in much needed hospice services in outpatient settings.

Person and Community Engagement Domain
It is clear that overall improvement of HCAPHS performance is a significant focus of CMMI.   From the data shared in the QBR workgroup, it appears the prior tactic of increasing the weighting of top-box HCAHPS scores has not proven to be broadly effective. We agree with your staff's recommendation to assign 10% of this domain to consistency scores and 10% to linear scores (with commensurate decreases in "top-box" score weights). We also agree with the plan to assign substantial portions of this domain to process measures known to correlate with and/or drive improvements in HCAHPS. We see ED-2b as particularly valuable in that it is a "leading measure" on which we can focus operational improvement work. We also think the SIHIS follow up measure is an excellent addition here. We would *recommend keeping the follow up measure in QBR the same as the SIHIS measure* to avoid confusions and to align improvement work. Specifically, we would recommend the QBR follow up measure is Medicare only (like in SIHIS). Regarding proposed voluntary upfront investments for HCAHPS improvements, it is unlikely we would pursue such funding.

THK Complications

Given the increasing proportion of elective hip and knee arthroplasties being performed in hospital-based outpatient settings and ambulatory surgical centers (ASCs), we view the THK complication measure as very dynamic. Overall, we think the best option is to continue using the current QBR inpatient-only measure. That said, we encourage your staff to look at complication rates in this increasingly small and complex inpatient population – as it may be important to re-establish baseline performance and benchmarks after COVID. If we pursue an eCQM THK measure in the future, we recommend limiting this to inpatient and hospital-based outpatient cases (not ASCs) to avoid confusion on case attribution to a given hospital.

Thank you for your consideration of our ideas and perspective. We are excited for this new version of QBR and optimistic it can be another lever to drive better care for Marylanders and better quality performance at our hospitals compared to the nation.

Sincerely,

Rollin J (Terry) Fairbanks MD MS FACEP
Vice President and Chief Quality & Safety Officer, MedStar Health

July 30, 2021

Dr. Alyson Schuster
Deputy Director, Quality Methodologies
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Dr. Schuster:

On behalf of the Maryland Hospital Association's 60 member hospitals and health systems, we appreciate the opportunity to comment on the Health Services Cost Review Commission's (HSCRC) Quality-Based Reimbursement (QBR) Redesign Subgroup's (subgroup) proposals.

HSCRC convened the subgroup in the spring to help ensure success under the Total Cost of Care Model. The subgroup discussed the domains of Maryland's QBR program, where Maryland underperforms relative to the nation, and where there are opportunities to improve hospital measurement and innovation. We support the subgroup's proposal to add linear measures to encourage top-box HCAHPS improvement. We do not support the proposed reintroduction of an emergency department (ED) wait time measure in payment policy.

Since HCAHPS was included in QBR's Person and Community Engagement (PCE) domain, Maryland hospitals have on average underperformed compared to hospitals in the National Value-Based Purchasing (VBP) program. Additionally, in rate year 2021, roughly two-thirds of hospitals were penalized under QBR. Considering PCE is weighted at 50% of QBR, HCAHPS performance drives the penalties or rewards earned by hospitals. We continue to urge HSCRC to reduce this weight to align with the national VBP program more closely and rebalance the emphasis on metrics that reflect improved quality and safety. HCAHPS improvement is best supported by sustainable and stable investment in resources and infrastructure. We appreciate the subgroup's recommendation to offer hospitals upfront funding to support HCAHPS improvement. However, funding for meaningful improvement must be sustainable, and the return on this funding needs to be evaluated for longer than one year. It is appropriate to offer this advance funding as a voluntary program.

We support the subgroup's proposal to offer hospitals the opportunity for reward for linear HCAHPS score improvement. This proposal reduces emphasis on top box HCAHPS scores and allows hospitals to gain credit for the full spectrum of HCAHPS improvement. We also support a focused approach to including linear scores—a subset of all eight HCAHPS measures. We look forward to working with staff to decide what measures should be included.
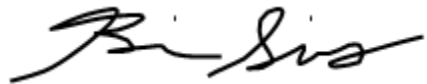
In Maryland, overall ED visits decreased, particularly among low and medium complexity patients. For all payers, ED visits for behavioral health conditions continue to rise, while non-

behavioral health ED visits and admissions decline. We recognize ED wait times are an important operational measure, yet there are too many external factors to control for in a payment policy.

Recognizing the importance to patient safety and shared responsibility for the Marylanders they care for, hospitals in recent years addressed wait times with hospital clinical leaders and ED physician leaders. Maryland hospitals aggressively reduced avoidable utilization and ensured patients receive the appropriate level of care in the right setting. EDs are at the center of this transformation. Increased screening and use of evidence-based practices to lower readmissions and unnecessary inpatient stays require hospitals to consider the needs of all units and overall operations. For these reasons, we do not support an ED wait time measure in payment policy.

We welcome the opportunity to participate in this collaborative and engaging process. We also appreciate staff's willingness to work with the field to modernize the QBR program to benefit of Marylanders and the patients we serve. Please reach out to me with any questions.

Sincerely,

Brian Sims
Director, Quality & Health Improvement

August 4, 2021

Alyson Schuster, PhD
Deputy Director, Quality Methodologies
Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, Maryland 21215

Dear Dr. Schuster:

On behalf of both the Johns Hopkins Health System (JHHS) and the University of Maryland Medical System, (UMMS), we welcome the opportunity to provide feedback on HSCRC's redesign of its Quality Based Reimbursement (QBR) program. We thank HSCRC commissioners and staff for the collaborative approach and we share your commitment to advancing healthcare quality and equity for all Maryland residents.

JHHS and UMMS generally support the QBR redesign proposal and request consideration for the following comments and recommendations on specific components listed below:

Domain 1: Person and Community Engagement

HCAHPS

1. JHHS and UMMS support adding linear mean scores to "top box" scores for HCAHPS domains. We agree that reflecting the additional gradation in performance will help recognize improvements that may not yet be reflected in improved "top box" scores. The linear mean score is proposed to be weighted at 10% of the total domain and we would recommend increasing the weight to 20%.

2. We appreciate the analysis completed by the staff to look at the relationship between a hospital's HCAHPS scores with other safety outcomes. We support including those domains into the QBR redesign that are most highly correlated with safety outcomes and are most clinically meaningful. In addition, we support HSCRC's proposal to narrow to a small number of HCAHPS domains, which will allow hospitals to focus their efforts in specific key areas to drive performance. We support HSCRC using model 4 (nurse communication, doctor communication, responsiveness of hospital staff, and care transitions) with one caveat, which we note below.

3. We recommend HSCRC add the "overall rating of care" score to model 4 and remove the "responsiveness of hospital staff" domain. We recommended including "overall rating of care" as it directly asks patients their experience of the overall quality of care they received, rather than one component. Although important from a patient-

facing perspective, we recommend removing the "responsiveness of hospital staff" domain as there have been limitations to in-person care partner visits during the Covid-19 pandemic (for safety concerns) and severe staffing shortages, which has been a national challenge during the pandemic. These limitations are likely not experienced equally across all Maryland hospitals, as several Maryland hospitals have disproportionally cared for more Covid-19 patients.

Follow up after discharge

1. Overall, JHHS and UMMS support efforts to improve patient follow-up after discharge from the hospital, as research shows timely follow-up with outpatient providers improves outcomes for patients with many conditions. One concern we have with this proposed measure, as it is currently defined, is that it does not capture all the factors that can influence successful follow-up appointments within a strict, defined timeframe. Examples of factors that are not captured include: access to transportation, competing economic and home priorities, mental illness, and substance use. These factors are likely not evenly distributed across the patient populations for every hospital in the state. While we agree that it is important to understand and mitigate these factors to best serve our patient population, if this measure is going to be included in a quality-based payment program, the confounding factors need to be assessed and appropriately attributed. This could be done through stratification, risk-adjustment, or more heavily weighting improvement over attainment. One recommendation for risk adjustment is to consider including the area deprivation index (ADI).

2. We acknowledge that the 'follow-up after discharge' measure for Medicare patients is currently included in QBR for CY21 performance / FY23 payment determination. We would like to express our concern with the accuracy of the data we are finding with the current measure, and we would like to request to work collaboratively with HSCRC to address this.

   As a result of our experience with the 'follow-up after discharge' measure with Medicare patients, JHHS and UMMS recommends at a minimum one year of monitoring and evaluation (CY2022) to ensure data accuracy and validity before adding Medicaid patients. This recommendation would allow hospitals the opportunity to assess their gaps and opportunities before holding them financially accountable for improvement. If we agree, we will monitor the addition of Medicaid patients in CY2022 with potential inclusion in QBR in CY2023 and potential financial determination in FY2025.

Emergency Room Wait Time

1. We have concerns about including *Emergency Department (ED) 2 - Admit Decision Time to ED Departure for Admitted Patients* measure in QBR redesign. CMS Inpatient Prospective Payment System (IPPS) FY2022 Final Rule removes this eCQM measure based on a literature review that shows inconclusive association

between a hospital's ED boarding times and negative outcomes, such as patient mortality. We agree with CMS's decision to remove this measure for the reasons mentioned in the FY2022 final rule and would recommend HSCRC align with CMS decision on this measure.

2. One concern with an ED wait time measure is the heterogeneity in how different hospitals choose to define different time points. Time zero for "decision to admit" can be measured in multiple ways, making inter-hospital comparisons both difficult and inaccurate.

3. ED wait times can also be influenced by systemic factors that are likely not directly controllable by a hospital. For example, patient access to urgent care centers or robust community outpatient practices, access to community resources for behavioral health, and patients that are willing and able to engage with outpatient care (a variable known to be associated with socio-economic factors) all influence emergency room and hospital patient volumes. If HSCRC continues to move forward with this measure, we recommend HSCRC analyze the availability of these community resources to better understand current performance, gaps, attribution, and opportunities for improvement.

Domain 2: Clinical Care

30 Day Mortality

1. JHHS and UMMS support HSCRC migrating from the existing in-hospital mortality measure to an all-cause all payer 30-day mortality measure.

2. We recommend monitoring the all-cause all payer 30-day mortality measure for a minimum of one year (CY22) before it is used in a quality-based payment program (CY23 performance / FY25 financial determination). This will allow for the time needed to refine the measure specifications, such as defining "hospice care" and formalizing the inclusion and exclusion criteria that will better reflect the new data sources being sourced for this metric.

Hip/Knee Arthroplasty Complications
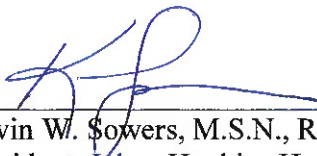
1. We support expanding the Total Hip Replacement and Total Knee Replacement complications metric to include all-payers and outpatient procedures. We agree that there should be a minimum volume threshold of procedures performed for a hospital to be measured, as to improve the reliability of this performance metric.

Domain 3: Safety

1. We support HSCRC testing and piloting new safety metrics, related to infection prevention, working with organizations, such as, the Centers for Disease Control and Prevention (CDC), to identify measures that are less focused on low-volume events in high-risk populations.

On behalf of both health systems (JHHS and UMMS), we appreciate the opportunity to comment on the redesign of the QBR program. We commend the HSCRC staff's thoughtful analysis, collaborative engagement in this work, and willingness to explore new opportunities and solicit stakeholder feedback. If you have questions or would like further information on our feedback, please contact Renee Demski, Vice President of Quality, Johns Hopkins Health System, via email: rdemski@jhmi.edu and Michael Sokolow, Sr. Director Quality Business Intelligence, University of Maryland Medical System via email: msokolow@umm.edu.

Sincerely,

Kevin W. Sowers, M.S.N., R.N., F.A.A.N.
President, Johns Hopkins Health System
EVP, Johns Hopkins Medicine

Mohan Suntha, MD, MBA
President & Chief Executive Officer
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Maryland Hospital-Acquired Conditions (MHAC) Program:

Formal Exemption Request

August 16, 2021

Contents

Figures

Maryland Hospital-Acquired Conditions (MHAC) Program Formal Exemption Request

A.   MHAC program

Although the methodology of the Maryland Hospital-Acquired Conditions (MHAC) Program differs from that of CMS's Hospital-Acquired Condition Reduction Program (HACRP), the two programs work to achieve the same objective: reducing in-hospital acquired complications. CMS's HACRP uses the CDC NHSN measures and the PSI-90 composite measure, whereas the MHAC Program adjusts payments based on rates of potentially preventable complications (PPCs), which are claims-based measures developed by 3M Health Information Systems. PPCs are harmful events that occur after a patient is admitted to the hospital and result from care and treatment processes, rather than from the natural progression of the underlying illness; they are therefore considered potentially preventable.

The MHAC Program was first implemented in 2011, with hospital payment adjustments first applied in SFY (state fiscal year)/RY 2013. By the end of CY 2015, hospitals exceeded the five-year statewide aggregate goal of a 30 percent reduction in PPCs, as established in the All-Payer Model agreement—with a 35 percent reduction compared with CY 2013 performance. Hospitals continued to reduce their complications through CY 2018, culminating in a greater than 50 percent reduction in PPCs over the course of the All-Payer Model (2014–2018).

In CY 2018, staff overhauled the MHAC Program (with changes to be applied beginning with SFY 2021 hospital payments), per directives from HSCRC commissioners. For the redesign of the complications program, the HSCRC staff worked to address industry concerns about the large number of complication measures, focusing on the most meaningful and clinically significant measures of patient safety. The Clinical Adverse Event Measures (CAME) Subgroup met from February through September 2018, and its suggestions were then presented to the Performance Measurement Work Group for further discussion. The final MHAC policy for SFY 2021 reflected consensus recommendations from both the subgroup and PMWG, including:

- Maintain the use of the 3M PPCs but reduce the number of complication measures, focusing on a narrowed list of 14 PPCs

- Adopt an attainment-only program, given Maryland's sustained improvement over the past several years (that is, no longer award credit for reductions in PPC rates)

- Weight complications by their associated cost weights

Stakeholders and staff agreed that the PPCs are valid patient safety measures that address important clinical areas and should be retained in the MHAC Program. Regarding the Agency for Healthcare Research and Quality PSIs, the subgroup discussed that the all-payer risk adjustment was not yet available for the measures, and thus they could not be included in a pay-for-performance program at that time. HSCRC also evaluated an analysis of the overlap between the PSI measures and the payment program PPCs which showed there was very little to modest overlap in both the numerators and denominators across the PPCs and conceptually similar-sounding PSIs. The CAEM Subgroup suggested that the PMWG evaluate the PSIs for adoption into a payment program once the all-payer risk adjustment was available; an updated, all-payer PSI 90 composite measure was adopted into the QBR Program for RY 2023.

In summary, as shown in Figure 1, the final SFY 2021 policy established an attainment-only evaluation with a prospective linear scale and a hold-harmless zone, used a narrowed-down PPC list, established normative values using two years of data, and increased the potential reward from 1 to 2 percent of inpatient revenue. The SFY 2022 policy retained these updates from SFY 2021 and also lengthened the performance period for small hospitals from one to two years to strengthen the reliability of the case numbers. Due to the ongoing COVID-19 public health emergency and in consultation with CMMI, Maryland reused CY 2019 performance as a proxy for CY 2020 performance.

Figure 1. Overview of the SFY 2021 MHAC Program

Potentially Preventable Complication Measures

New! Narrowed PPC list of 14 clinically significant PPCs.

Acute Pulmonary Edema & Respiratory Failure w/o Ventilation	Post-Operative Infection & Deep Wound Disruption Without Procedure
Acute Pulmonary Edema & Respiratory Failure w/ Ventilation	Post-Operative Hemorrhage & Hematoma w/ Hemorrhage Control Procedure or I&D Proc
Pulmonary Embolism	Accidental Puncture/Laceration During Invasive Procedure
Shock	Iatrogenic Pneumothorax
Venous Thrombosis	Major Puerperal Infection & Other Major Obstetric Complications
In-Hospital Trauma & Fractures	Other Complications of Obstetrical Surgical & Perineal Wounds
Septicemia & Severe Infections	Pneumonia Combo

Global Exclusions:
- Palliative care
- Discharges >6 PPCs
- APR-DRG SOI cells with less than 31 at-risk discharges

Hospital PPC Exclusions:
- <20 at-risk discharges
- <2 expected PPC

Case-Mix Adjustment and Standardized Scores

Performance Measure: CY 2019 Observed to Expected PPC Ratio.

Expected calculated by applying statewide average PPC rates by diagnosis and severity of illness level to hospitals' patient mix (i.e., indirect standardization).

New! Attainment only score (0-100 points) calculated by comparing hospital performance to a statewide threshold and benchmark.

Attainment Points

Threshold — 10th Percentile
Benchmark — 90th Percentile

0   20   40   60   80   100

New! FY2017 & FY2018 (2 years) data used to calculate statewide averages and performance standards.

Hospital MHAC Score & Revenue Adjustments

Hospital MHAC Score is Sum of Earned Points / Possible Points with PPC Cost Weights Applied

Scores Range from 0-100%
New! Revenue neutral zone 60-70%

Max Penalty -2% & Reward +2%

MHAC Score	Revenue Adjustment
0%	-2.00%
10%	-1.67%
20%	-1.33%
30%	-1.00%
40%	-0.67%
50%	-0.33%
60% to 70% Hold Harmless	0.00%
80%	0.67%
90%	1.33%
100%	2.00%

New! Increased Potential Reward

This program creates a clear incentive structure for hospitals to reduce avoidable complications, as statewide benchmarks are established before the performance period, and hospitals have access to case-level data detailing their performance throughout the year.
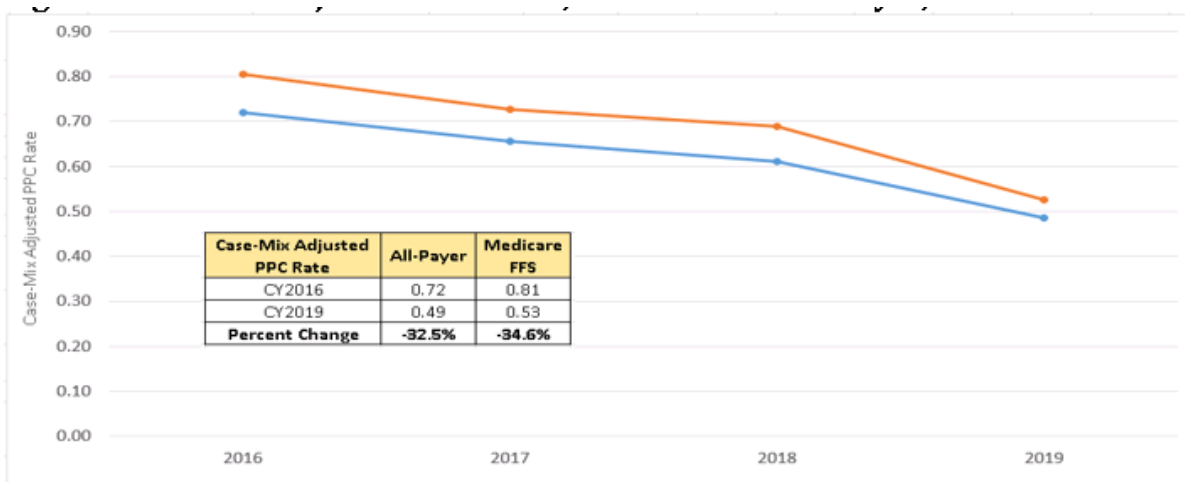
More information on the most current MHAC policy can be found on the HSCRC website (https://hscrc.maryland.gov/Pages/init_qi_MHAC.aspx).

B. Performance results and comparison with national programs

1. MHAC Program

In the SFY 2021 MHAC Program, Maryland sustained significant improvement on the Medicare and all-payer PPC rates adjusted for case mix, achieving more than a 30 percent reduction on both payer categories in 2016–2019 (Figure 2).

Figure 2. PPC rates adjusted for case mix, Medicare and all-payer, 2016–2019

Case-Mix Adjusted PPC Rate	All-Payer	Medicare FFS
CY2016	0.72	0.81
CY2019	0.49	0.53
Percent Change	**-32.5%**	**-34.6%**

Maryland continues to make substantial progress in reducing complications, both in the actual number of PPCs and the case-mix-adjusted PPC rates. Figure 3 presents the PPC reduction trends in Maryland for CY 2016 through CY 2019 for the RY 2021 payment PPCs. The figure shows the number of PPCs occurring each year as well as the yearly case-mix-adjusted rate of PPCs (number of case-mix-adjusted PPCs per 1,000 at-risk discharges). The final column in the figure shows the percent change in both the number and rate of complications from 2016 to CY 2019.

Because the TCOC goal is to avoid any deterioration in performance since 2018, the figure also shows the changes from CY 2018 to CY 2019. Performance improved during that period, with no backsliding. Although data from CY 2020 are not shown here, the HSCRC did provide CMMI with performance results for CY 2018 versus CY 2020, showing no decline in performance.

Figure 3. PPC reduction trends in Maryland, CY 2016–2019

	RY 2021 PPC rates					
	CY2016	CY2017	CY2018	CY2019	CY18–CY19 change	CY16–CY19 change
Total number of complications	3,706	3,460	3,192	2,491	-21.96%	-32.78%
Case-mix adjusted complication rate	0.72	0.66	0.61	0.49	-20.46%	-32.54%

2.   CMS HACRP: FY 2021 results

As noted previously, Maryland does not use the HACRP measures or methodology to identify and reduce hospital complications in its MHAC Program. Based on results provided by CMMI/CMS for FY 2021 HACRP, Figure 4 shows that the state is performing better than the 75th percentile. The by-hospital results indicate that 16 of 45 Maryland hospitals would have been penalized under HACRP; this is an improvement over FY 2020, in which 22 of 46 Maryland hospitals would have been penalized. These results are consistent with the assessment of Maryland's comparative performance on the QBR Safety domain, given that much of the HACRP score is made up of NHSN measures (see the CDC NHSN HAI section in the QBR Redesign Subgroup report for details on NHSN performance).

Figure 4. HACRP scores, Maryland compared with the nation, FY 2021

National 75th percentile total HAC score	Maryland total HAC score
0.3383	0.2635

The HSCRC appreciates the opportunity to continue to track hospital safety using a variety of measures and methods, but it reiterates its commitment to using the 3M PPC measure set to evaluate in-hospital complications under the TCOC Model.

3.   Future policy considerations

As mentioned previously, the HSCRC worked throughout 2018 with a diverse group of key stakeholders to update the MHAC Program for the SFY 2021 policy. The updates included narrowing the complication measures to a more focused measure set, which demonstrated sufficient evidence of reliability and validity and significant opportunity for improvement. The work group generally maintained the established methodology for converting performance on each measure to a performance score, but it enhanced the methodology by moving to measuring attainment only (rather than using the better of the attainment and improvement scores) and weighting the PPCs in the MHAC Program by the 3M cost weights as a proxy for harm. The HSCRC will identify strategic updates to the MHAC Program, such as those related to (1) measuring complications outside the inpatient hospital setting and (2) bundling complications versus including them in a measure index applicable to specific medical conditions or service lines.

In addition, the immense disruption of the COVID-19 pandemic led to an increase in several PPCs, which appears to also impact PSIs and other safety measures. The HSCRC continues to monitor trends over time for all payment and monitoring PPCs, including for last year.