Final Recommendation for the Readmissions Reduction Incentive Program for Rate Year 2020

March 14, 2018

Health Services Cost Review Commission

4160 Patterson Avenue
Baltimore, Maryland 21215
(410) 764-2605
FAX: (410) 358-6217

This document contains the final staff recommendations for updating the Readmission Reduction Incentive Program for Rate Year 2020, ready for Commission discussion and vote.

Table of Contents

List of Abbreviations 2
Key Methodology Concepts and Definitions....3
Recommendations....4
Introduction....5
Background....6
Medicare Hospital Readmissions Reduction Program 6
Overview of the Maryland RRIP Policy....7
Assessment....13
Maryland's Performance to Date....13
Improvement Target Calculation Methodology RY 2020....16
Attainment Target Calculation Methodology 20
Prospective Scaling for RY 2020 Policy 21
Future of Model 22
Stakeholder Comments and Responses 23
Recommendations....27
Appendix I. HSCRC Current Readmissions measure specifications 28
Performance Metric 28
Inclusions and Exclusions in Readmission Measurement 28
Details on the Calculation of Case-Mix Adjusted Readmission Rate 29
A Brief Note on Compounding Improvement 32
Appendix II. CMS Medicare Readmission Test modifications - Versions 5 and 6....33
Appendix III. By-Hospital Readmission Changes....34
Appendix IV. RY 2020 Improvement and Attainment Scaling – Modeled Results....37
Appendix V. Out-Of-State Medicare Readmission Ratios....40

LIST OF ABBREVIATIONS

ACA	Affordable Care Act
APR-DRG	All-patient refined diagnosis-related group
ARR	Admission-Readmission Revenue Program
CMS	Centers for Medicare & Medicaid Services
CMMI	Center for Medicare and Medicaid Innovation
CRISP	Chesapeake Regional Information System for Our Patients
CY	Calendar year
FFS	Fee-for-service
FFY	Federal fiscal year
HRRP	Hospital Readmissions Reduction Program
HSCRC	Health Services Cost Review Commission
ICD-10	International Classification of Disease, 10th Edition
RRIP	Readmissions Reduction Incentive Program
RY	Rate year
SOI	Severity of illness
YTD	Year-to-date

KEY METHODOLOGY CONCEPTS AND DEFINITIONS

Diagnosis-Related Group (DRG): A system to classify hospital cases into categories that are similar in clinical characteristics and in expected resource use. DRGs are based on a patient's primary diagnosis and the presence of other conditions.

All Patients Refined Diagnosis Related Groups (APR-DRG): Specific type of DRG assigned using 3M software that groups all diagnosis and procedure codes into one of 328 All-Patient Refined-Diagnosis Related Groups.

Severity of Illness (SOI): 4-level classification of minor, moderate, major, and extreme that can be used with APR-DRGs to assess the acuity of a discharge.

APR-DRG SOI: Combination of diagnosis-related groups with severity of illness levels, such that each admission can be classified into an APR-DRG SOI "cell" along with other admissions that have the same diagnosis-related group and severity of illness level.

Observed/Expected Ratio: Readmission rates are calculated by dividing the observed number of readmissions by the expected number of readmissions. Expected readmissions are determined through case-mix adjustment.

Case-Mix Adjustment: Statewide rate for readmissions (i.e., normative value or "norm") is calculated for each diagnosis and severity level. These **statewide norms** are applied to each hospital's case-mix to determine the expected number of readmissions, a process known as **indirect standardization**.

RECOMMENDATIONS

This is a final recommendation for the Maryland Rate Year (RY) 2020 Readmission Reduction Incentive Program (RRIP) policy. It provides an updated improvement target, based on restated historical data and an additional month of CMS data through September 2018. At this time, the staff requests that Commissioners vote on the following final recommendations:

1. The RRIP policy provides incentives to reduce readmissions on an all-payer basis.
2. Hospital performance is measured as the better of attainment or improvement.
3. Due to ICD-10 transition, a compounded improvement target is used that combines Calendar Year (CY) 2013 to Calendar Year (CY) 2016 improvement (under ICD-9) and CY2016 to CY 2018 improvement (under ICD-10); the combined improvement target will be set at 14.30% percent for CY 2013 to CY 2018.
4. The attainment threshold is set at the 25th percentile of hospital performance in CY 2017, with an improvement factor (currently 2% from previous calendar year); the preliminary attainment target is 10.70 percent for CY 2018.
5. Hospitals are eligible for a maximum reward of 1 percent, or a maximum penalty of 2 percent, based on the better of their attainment or improvement scores.

Staff will review the improvement target and attainment benchmark in April/May against finalized CY 2017 data in order to bring back to the Commission revised performance targets if data trends warrant the revision. This may necessitate an additional vote from Commissioners.

INTRODUCTION

The Maryland Health Services Cost Review Commission's (HSCRC's or Commission's) quality-based measurement and payment initiatives are important policy tools for providing strong incentives for hospitals to improve their quality performance over time. Under the current All-Payer Model Agreement (the Agreement) between Maryland and the Centers for Medicare & Medicaid Services (CMS), which began in January 2014, there are overarching quality performance requirements for reductions in readmissions and hospital acquired conditions as well as other ongoing program and performance requirements across HSCRC's quality and value-based programs.

As long as Maryland makes incremental progress towards the Agreement goals, the State receives automatic exemptions from the CMS Hospital Readmission Reduction program as well as the Hospital Acquired Conditions Reduction Program, while the exemption from the CMS Medicare Value-Based Purchasing program is requested annually. These exemptions from national quality programs are important, because the State of Maryland's all-payer global budget system benefits from having autonomous, quality-based measurement and payment initiatives that set consistent quality incentives across all-payers.

This report provides staff's final recommendations for updates to Maryland's Readmission Reduction Incentive Program (RRIP) for Rate Year 2020 (RY 2020), which is one of three core quality programs that the HSCRC administers for all payers. The RRIP program holds 2% of hospital revenue at-risk by assessing performance on 30-day all-cause all-payer readmission rates across all acute care hospitals in Maryland. The current all-payer model Agreement necessitates that Maryland hospitals reduce Medicare readmissions to at or below the national Medicare readmission rate by the end of Calendar Year (CY) 2018. Based on a 12-month rolling rate as of September 2017, Maryland's Medicare readmission rate of 15.29% is slightly below the national Medicare rate of 15.38%. However, it should be noted that this progress must continue to keep up with Medicare reductions through the end of CY 2018 in order to satisfy the State's contractual obligation.

For RY 2020, which reflects the performance results from the final year of the Agreement (CY 2018), staff is recommending minimal changes to the RRIP policy and the other existing quality programs in order to focus on future policy development. Future policy development includes establishing quality strategies and performance goals that are "aggressive and progressive" under the Total Cost of Care Model ("TCOC Model"). Staff will work with key stakeholders to develop all-payer readmission targets for RY 2021 and beyond that support the specific requirements and overall goals of the TCOC Model. Specifically, new targets will evaluate Maryland hospital performance relative to external benchmarks for Medicaid and commercial payer readmission rates to the extent they are available, in addition to Medicare. Staff will also consider options for modifying the readmission measure, such as the addition of specialty hospitals or observation stays. Furthermore, staff will work to develop and assess the feasibility of integrating social risk factors into the assessment of readmission rates under a modified RRIP policy based only on attainment.

BACKGROUND

Medicare Hospital Readmissions Reduction Program

The United States healthcare system currently has an unacceptably high rate of preventable hospital readmissions, which are defined as an admission to a hospital within a specified time period after a discharge from the same or another hospital.[1] Excessive readmissions generate considerable unnecessary costs and represent substandard quality of care for patients. A number of studies show that hospitals can engage in several activities to lower their rate of readmissions, such as clarifying patient discharge instructions, coordinating with post-acute care providers and patients' primary care physicians, and reducing medical complications during patients' initial hospital stays.[2] Efforts have been underway nationally to address excessive readmissions and their deleterious effects.

Under authority of the Affordable Care Act, the Centers for Medicare & Medicaid Services (CMS) established its Medicare Hospital Readmissions Reduction Program in federal fiscal year 2013. Under this program, CMS uses three years of data to calculate the average risk-adjusted, 30-day hospital readmission rates for patients with certain conditions. For federal fiscal year 2018, this includes patients with heart attack, heart failure, pneumonia, chronic obstructive pulmonary disease, elective hip or knee replacement, and coronary artery bypass graft surgery. If a hospital's risk-adjusted readmission rate for such patients exceeds that average, CMS penalizes it in the following year by using an adjustment factor that is applied to Medicare reimbursements for care for patients admitted for any reason; the penalty is in proportion to the hospital's excess rate of readmissions. Penalties under the Medicare Hospital Readmissions Reduction Program were first imposed in federal fiscal year 2013, during which the maximum penalty was 1 percent of the hospital's base inpatient claims, and the maximum penalty has increased to 3 percent for federal fiscal year 2015 and beyond.

As required by the 21st Century Cures Act, CMS has modified the Medicare Hospital Readmissions Reduction Program starting in federal fiscal year 2019 to assess penalties based on a hospital's performance relative to other hospitals with a similar proportion of dually-eligible (Medicare and Medicaid) patients. Hospitals will be stratified into five peer groups based on their dual-eligible proportion, which is defined as the proportion of hospital stays for patients

---

[1] Jencks, S. F. et al., "Hospitalizations among Patients in the Medicare Fee-for-Service Program," *New England Journal of Medicine* Vol. 360, No. 14: 1418-1428, 2009.; Epstein, A. M. et al., "The Relationship between Hospital Admission Rates and Rehospitalizations," *New England Journal of Medicine* Vol. 365, No. 24: 2287-2295, 2011.

[2] Ahmad, F. S. et al., "Identifying Hospital Organizational Strategies to Reduce Readmissions," *American Journal of Medical Quality* Vol. 28, No. 4: 278-285, 2013.; Silow-Carroll, S. et al., "Reducing Hospital Readmissions: Lessons from Top-Performing Hospitals," *Commonwealth Fund Synthesis Report*, New York: Commonwealth Fund, 2011.; Jack, B. W. et al., "A Reengineered Hospital Discharge Program to Decrease Hospitalization: A Randomized Trial," *Annals of Internal Medicine* Vol. 50, No. 3: 178-187, 2009.; and Kanaan, S. B., "Homeward Bound: Nine Patient-Centered Programs Cut Readmissions," Oakland, CA: California HealthCare Foundation, 2009.

with dual eligibility for Medicare and full-benefit Medicaid. Hospital performance will be compared to the median of the hospital's peer group. The Cures Act also requires that estimated total penalties under the new methodology must equal estimated total penalties under the original methodology.

Beginning in CY 2018, CMS has also begun voluntary reporting of the Hybrid Hospital-Wide Readmission measure for hospitals in order to test collection of core clinical data elements and laboratory test results that stakeholders believe would enhance the administrative coding data that is utilized currently in the risk model variables.[3]

Overview of the Maryland RRIP Policy

The All-Payer Model Agreement with CMS replaced the requirements of the Affordable Care Act by establishing two sets of requirements. One set of requirements established performance targets for readmissions and complications in order to maintain Maryland exemptions from these programs, while the second set of requirements ensured that the amount of potential and actual revenue adjustments in Maryland's quality-based programs was at or above the CMS levels in aggregate but on an all-payer basis. Maryland has historically performed poorly compared to the nation on readmissions, ranked 50th among all states in a study examining Medicare data from 2003-2004.[4] Under the Agreement, Maryland's Medicare fee-for-service statewide hospital readmission rate must be equal to or below the national Medicare readmission rate by the end of Calendar Year (CY) 2018, and demonstrate annual progress toward this goal (also known as the "Waiver Test").

In order to meet the new Model requirements, the Commission approved a new readmissions program in April 2014—the RRIP—to further bolster the incentives to reduce unnecessary readmissions. The RRIP replaced a previous Commission policy, the Admission Readmission Revenue policy, which had been in place since RY 2012.[5] As recommended by the Performance Measurement Work Group, the RRIP is more comprehensive than the Medicare Hospital Readmission Program, as it includes all patients and payers, but it otherwise aligns – albeit with some minor differences – with the CMS readmission measure, and reasonably supports the goal of meeting or out-performing the national Medicare readmission rate.

The most notable difference between the Maryland model and the Federal model is that Maryland does not stratify hospitals into peer groups, which CMS does based on the proportion of stays for patients who are fully dually-eligible for Medicare and Medicaid. Staff does not plan on stratifying by Maryland-specific peer groups at this time. In addition, adopting the national

---

[3] For more information on Medicare Hospital Readmissions Reduction Program, see https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html.

[4] Jencks, S. F. et al., "Hospitalizations among Patients in the Medicare Fee-for-Service Program," *New England Journal of Medicine* Vol. 360, No. 14: 1418-1428, 2009.

[5] http://hscrc.maryland.gov/Pages/archived-quality-initiatives.aspx

stratification determination for Maryland hospitals is not currently possible as this data is calculated retrospectively and will not be available until the start of federal fiscal year 2019. Staff will evaluate the CMS stratification approach and its applicability to Maryland as the data becomes available.

RRIP Methodology

Under the RRIP, the methodology evaluates all-payer, all-cause inpatient readmissions using the CRISP unique patient identifier to track patients across Maryland hospitals. The readmission measure excludes certain types of discharges from consideration, due to data issues and clinical concerns, in order to increase the fairness of this all-payer measure, e.g. planned readmissions. Readmission rates are adjusted for case-mix using all-patient refined diagnosis-related group (APR-DRG) severity of illness (SOI), and the policy determines a hospital's score and revenue adjustment by the better of improvement or attainment, with scaled rewards of up to 1% of inpatient revenue and scaled penalties of up to 2%.[6] Figure 1 illustrates the readmission performance metric specifications.

Figure 1. Rate Year 2020 RRIP Measure

RRIP Performance Metric

Measure: All-Payer, 30-day, all-cause readmissions using CRISP unique identifier to track patients across acute hospitals in Maryland

Case-Mix Adjustment: Indirect standardization by diagnosis and severity of illness levels to calculate hospital expected readmissions given the patient mix and acuity

Discharges Ineligible for Readmission: transfers, deaths, oncology, rehab, newborns, APR-DRG SOI cells <2 discharges statewide, missing or ungroupable data

Unplanned Readmissions Only: Planned admissions (based on CMS logic) are not counted as readmissions (but are eligible for an unplanned readmission)

Improvement: Change in readmission rate CY13-CY16 compounded with CY16-CY18 (due to ICD-10 transition)

Attainment: All-payer readmission rate is adjusted to account for out of state readmissions using Medicare ratio of in-state vs. out-of-state readmissions

The improvement target compares the performance year to CY 2013, as opposed to a new updated base period; this ensures that hospitals that made early investments to reduce readmissions receive credit for these early improvements. The attainment target is calculated by taking hospitals' all-payer case-mix adjusted readmission rates and adjusting them for out of

[6] See Appendix I for details of the indirect standardization method used to calculate a hospital's expected readmission rate.

state readmissions using Medicare data, with the attainment target then defined as the 25th percentile of hospital performance plus an additional reduction (currently 2% from previous CY) in order to set a more aggressive attainment target over time. Figure 2 shows the improvement and attainment targets for each rate year.

Figure 2. RRIP Program Improvement Target, Attainment Threshold, and Revenue at-Risk, Rate Years 2016-2020

Rate Year	Base Period	Performance Period	Improvement Target (cumulative from CY 2013)	Attainment Threshold	Revenue at Risk: Reward	Revenue at Risk: Penalty
RY 2016	CY 2013	CY 2014	6.76%	N/A	0.50%	N/A
RY 2017	CY 2013	CY 2015	9.30%	12.09%	1.0%	2.0%
RY 2018	CY 2013	CY 2016	9.50%	11.85%	1.0%	2.0%
RY 2019*	CY 2013	CY 2017	14.50%[7]	10.83%	1.0%	2.0%
RY 2020 (proposed)	CY 2013	CY 2018	14.30%	10.70%	1.0%	2.0%

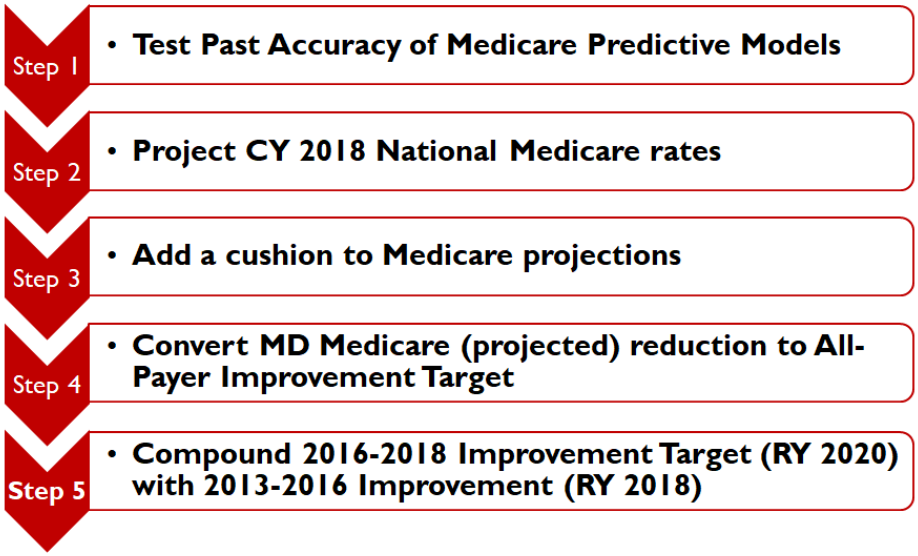
*Due to the ICD-10 transition and changes to the APR-DRG grouper, the cumulative improvement rate was calculated by adding the RY 2018 improvement (CY 2013 to CY 2016 improvement under APR-DRG grouper versions 32 and 33) to the RY 2019 one-year CY 2016 to CY 2017 improvement (both under APR-DRG grouper version 34).

[7] The compounded RY 2019 Improvement Target is 14.10%. The RY 2020 (proposed) Improvement Target of 14.30% represents a small increase on the Improvement Target.

Methodology for Determining Improvement Target

Developing an appropriate improvement target is a multi-step process to ensure that the State responsibly incorporates projections of the national Medicare readmissions rate with the latest federal data to determine the Maryland All-Payer Case-mix Adjusted Readmissions Rate. A simple flowchart of the necessary steps is included below in Figure 3.

Figure 3. Steps to Determine Improvement Target



In Step 1, staff worked with contractor, Mathematica Policy Research, to review past accuracy of seven forecasting models. Additional information on this analysis may be found in the assessment section below.

In Step 2, Mathematica Policy Research and staff projected the CY 2018 national Medicare readmission rate using trends based on data through September 2017. Given that the RY 2020 improvement target must yield the improvement to enable Maryland to achieve the Waiver Test by the end of CY 2018, or else trigger a corrective action from CMS, staff will closely monitor updated data through end of CY 2017, and **may revise the improvement target mid-year.** This would require Commissioners approving an amendment to the proposed policy, as the data will become available following the March Commission meeting, when presumably the RRIP policy will be formally approved.

In Step 3, given that predictions are fundamentally uncertain, staff has included a cushion to make the improvement target more aggressive in case the predictions are inaccurate, and to ensure that Maryland continues to improve beyond the initial goal of the national median.

In Step 4, staff compared improvement trends in unadjusted, Medicare readmission rates to case-mix adjusted, All-Payer readmission rates. Case-mix adjusted rates are required as the performance metric for the payment program in order to take into account the different types of patients seen at different hospitals and their varying acuity levels. This step is fundamentally

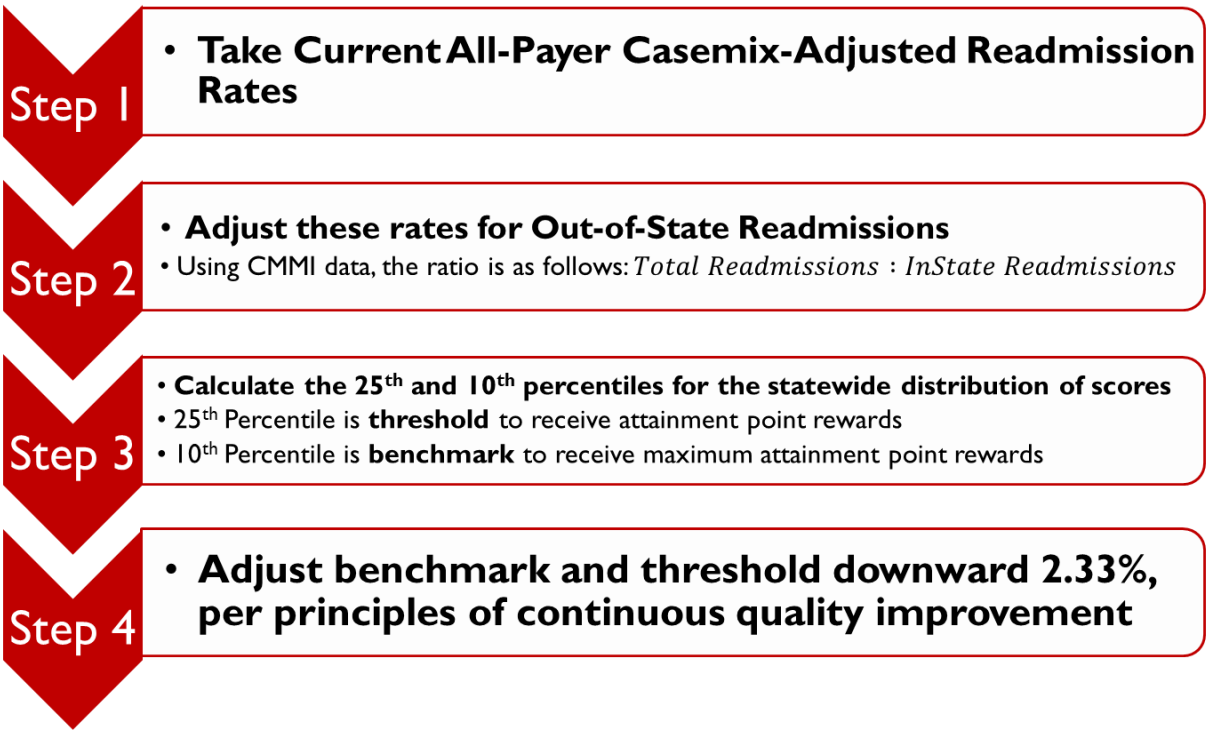
necessary, and would be even if the program was only assessing Medicare readmissions, as Medicare-only readmission rates would still need to be case-mix adjusted. Further discussion of this step is provided in the Assessment section.

Finally, in Step 5, staff has to compound the improvement target for CY 2016 to CY 2018 with the previously experienced RY 2018 improvement (CY 2013 to CY 2016). Step 5 is necessary because the RY 2018 and RY 2020 measures are based on fundamentally different datasets expressed in terms of percentages due to the conversion to ICD-10 in FFY 2016. The HSCRC has made it a policy to not penalize hospitals that made early investments to improve their readmission rates from CY 2013 to CY 2016, so the earlier data must be included.

Methodology for Determining Attainment Target

Beginning in RY 2017, HSCRC began including an attainment target, whereby hospitals with low case-mix adjusted readmission rates are rewarded for maintaining low readmission rates. A simple flowchart of the necessary steps to determine the attainment target is included below in Figure 4.

Figure 4. Steps to Determine Attainment Target



In Step 1, staff examine the current All-Payer, Case-mix Adjusted Readmission Rates (these data are current through October with preliminary data). These rates are then further adjusted to account for readmissions to out-of-state hospitals (Step 2), which is done by adjusting case-mix

adjusted rates by the ratio of Medicare readmissions that were outside-of-Maryland in the most recent four full quarters of data (currently September 2016-August 2017). From these adjusted trends, a threshold (25th percentile) and benchmark (10th percentile) are calculated, providing a range by which hospitals with low readmission rates can be assessed, should their attainment score be higher than their calculated improvement score. Finally, both the benchmark and threshold are adjusted downward by 2% from those prior CY numbers, reflecting the State's desire that all Maryland hospitals continue to improve over the next year. However, the modeling is currently using an adjustment of 2.33%,[8] given that this year's policy is projecting 14 months of performance as opposed to 12 months and hospitals may have improvements in the final two months of calendar year 2017 that are not reflected in the current data.

Scoring and Scaling Methodology

HSCRC will calculate a by-hospital revenue adjustment based on the difference between a hospital's score and the improvement and the attainment targets and benchmarks. Hospitals will receive the more favorable revenue adjustment (the better of their improvement or attainment adjustments). These rewards and penalties are linearly scaled between -2% and 1% using the improvement target and attainment threshold as the cut point. An illustration of the abbreviated scales is provided below in the tables in Figure 5.

Figure 5. RRIP Improvement and Attainment Revenue Adjustment Scales

Improvement Scale

All Payer Readmission Rate Change CY13-CY18	RRIP % Inpatient Revenue Payment Adjustment
A	B
Improving Readmission Rate	1.0%
-24.80%	1.0%
-19.55%	0.5%
-14.30% (Target)	0.0%
-9.05%	-0.5%
-3.80%	-1.0%
1.45%	-1.5%
6.70%	-2.0%
Worsening Readmission Rate	-2.0%

Attainment Scale

All Payer Readmission Rate CY18	RRIP % Inpatient Revenue Payment Adjustment
A	B
Lower Absolute Readmission Rate	**1.0%**
10.20% (Benchmark)	1.0%
10.45%	0.5%
10.70% (Threshold)	**0.0%**
10.95%	-0.5%
11.20%	-1.0%
11.45%	-1.5%
11.70%	-2.0%
Higher Absolute Readmission Rate	**-2.0%**

[8] (2% divided by 12) will yield one-month incremental increase in annual downward adjustment, which is multiplied by two, and then added to the 2%.

ASSESSMENT

Under the Maryland All-Payer Model Agreement, the State is required to reduce the Maryland Medicare Fee-For-Service readmission rate to at or below the national average by the end of CY 2018. Reducing readmissions is a difficult task that requires significant effort, investment, and coordination. To track progress on this Waiver Test, HSCRC staff prepares updates to the latest readmission data for each Commission. Based on the latest 12 months of data through September 2017, the Maryland Readmission Rate is 15.29%, while the National Readmission Rate is 15.38%. These numbers have been refreshed with the latest data, which reflects re-stated Medicare numbers under an updated definition of Medicare beneficiaries. This is very welcome news; however, it does not mean that Maryland has "met" the Waiver Test, given that Maryland must continue to discern where the national readmission rate will be in December 2018 and must match any additional national improvement.

To refine the improvement target and attainment benchmark for RY 2020, the HSCRC has solicited input from the Performance Measurement Work Group, and staff has worked with contractors to model the readmission rate improvement needed to achieve the All-Payer Model Waiver Test. This final recommendation is based on the most recent Center for Medicare and Medicaid Innovation readmission data (through September 2017) and HSCRC case-mix data (preliminary through October 2017); the improvement target has been updated since the draft policy.

Maryland's Performance to Date

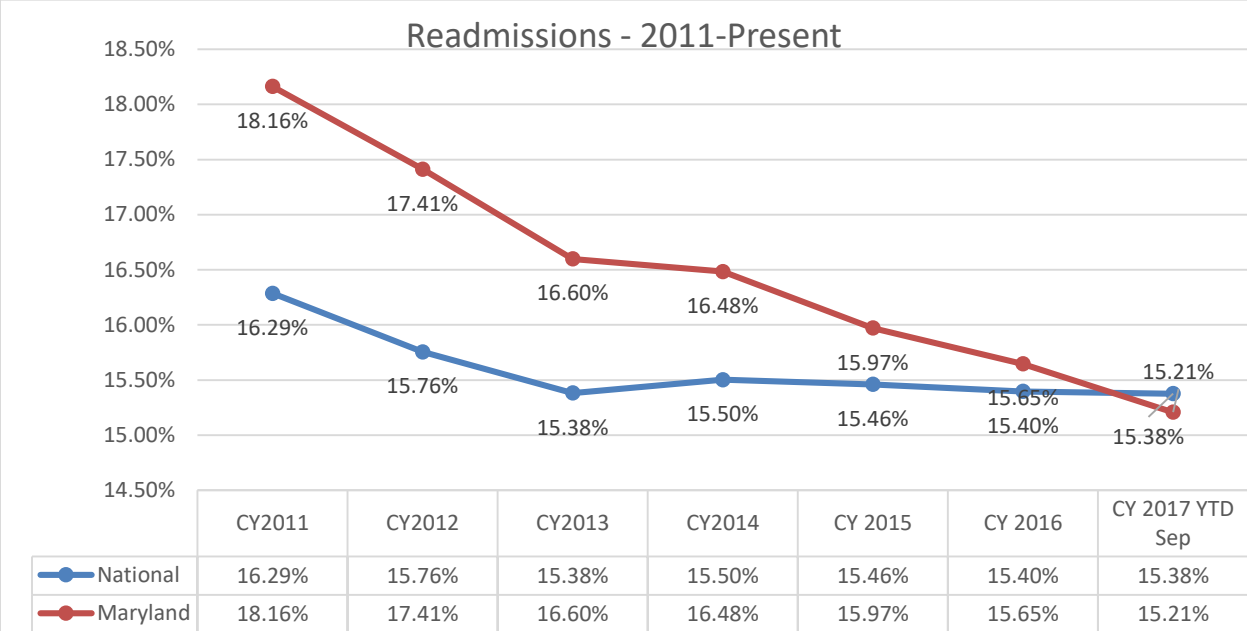
Maryland Waiver Test Performance

In the RY 2019 RRIP policy, calculations indicated that the gap between the national and the Maryland Medicare readmission rates for fee-for-service enrollees should be at or below 0.15 percentage points by the end of CY 2017 so that Maryland could close the remaining gap in the final year of the Waiver Test (CY 2018). The preliminary data for CY 2017, either year-to-date or with a rolling 12 month rate through September, indicate that Maryland's Medicare readmission rate is currently below the National rate. As shown in Figure 6, the 2017 year-to-date Maryland readmission rate of 15.21% is significantly lower than the national rate of 15.38%; while on a 12 month rolling basis the gap is less as the Maryland readmission rate is higher than YTD at 15.29% and the national rate is that same at 15.38%. On a rolling 12 month period basis, Maryland has improved more than the nation for CY 2017 compared to CY2016 (Maryland: 0.46 percentage point reduction, National: 0.02 percentage point reduction). Again this is refreshed data that includes re-stated beneficiaries. This re-stated data had minimal impact on the trends, but does make Maryland's improvement more favorable.

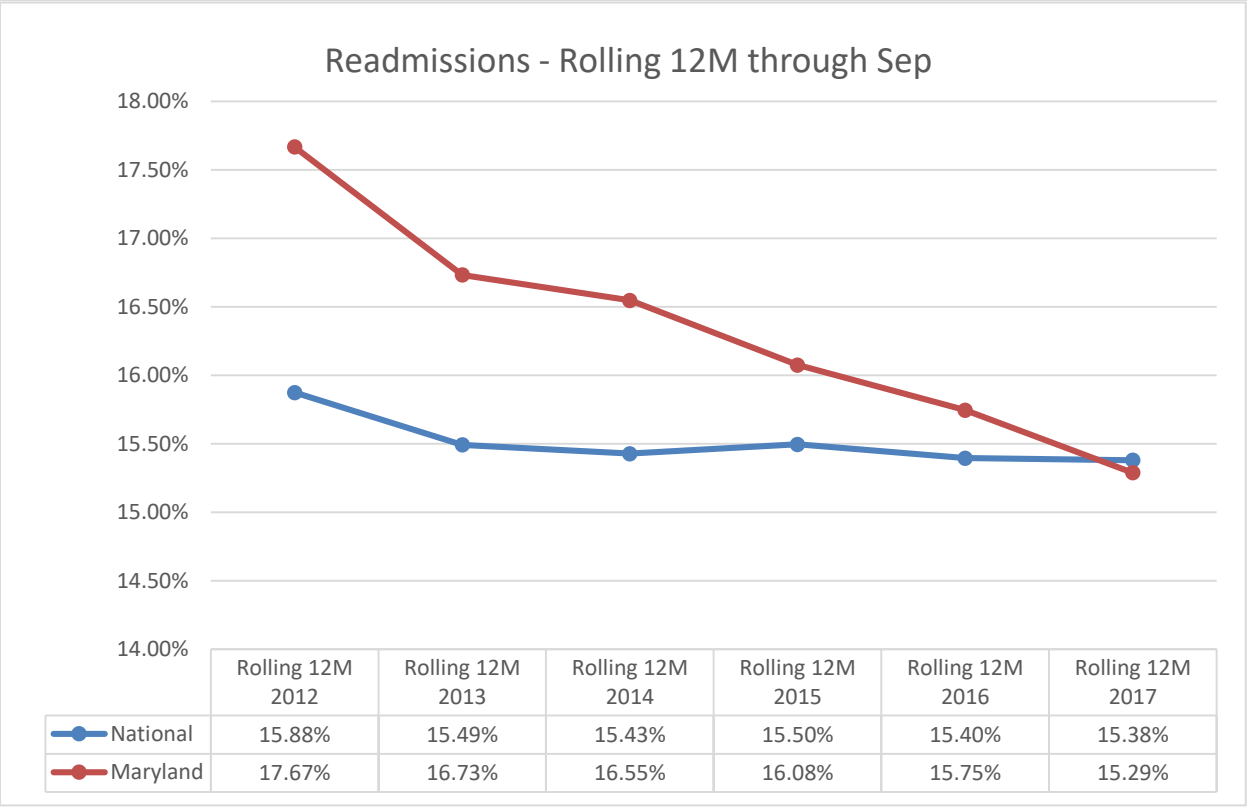
The progress Maryland has made in reducing readmissions in CY 2017 is very promising in terms of meeting the 2018 Waiver Test; however, the RY 2020 policy must set a higher improvement target to: a) account for any national readmission reductions during CY 2018, and

b) to ensure the Maryland program incentivizes continuous quality improvement beyond the initial Waiver Test goal. This principle of continuous quality improvement is similarly included in the MHAC program, where the state continued to set additional improvement goals even after the 30% reduction was achieved.

Figure 6. Medicare FFS Readmissions, National and Maryland, 2011 – Present



	CY2011	CY2012	CY2013	CY2014	CY 2015	CY 2016	CY 2017 YTD Sep
National	16.29%	15.76%	15.38%	15.50%	15.46%	15.40%	15.38%
Maryland	18.16%	17.41%	16.60%	16.48%	15.97%	15.65%	15.21%



	Rolling 12M 2012	Rolling 12M 2013	Rolling 12M 2014	Rolling 12M 2015	Rolling 12M 2016	Rolling 12M 2017
National	15.88%	15.49%	15.43%	15.50%	15.40%	15.38%
Maryland	17.67%	16.73%	16.55%	16.08%	15.75%	15.29%

All-Payer Performance

While the CMS readmission Waiver Test is based on the unadjusted readmission rate for Medicare patients, the RRIP incentivizes performance improvement on the All-Payer, case-mix adjusted readmission rate. Based on CY 2017 year-to-date data through October, the State has achieved a compounded reduction in the All-Payer, case-mix adjusted readmission rate of 12.55% since CY 2013, and 22 hospitals are on track to achieve the RY 2019 modified cumulative improvement target of 14.5 percent. Since the incentive program also includes an attainment target, an additional four hospitals are on track to achieve the attainment goal of a readmission rate lower than 10.83 percent. Appendix III provides current hospital-level year-to-date improvement and attainment rates for CY 2017.

Improvement Target Calculation Methodology RY 2020

In order to calculate the RY 2020 improvement target for Maryland, the Commission must forecast the national readmission rate for CY 2018. HSCRC staff and its contractor Mathematica Policy Research modeled seven different projections (Figure 7) for the CY 2018 national readmission rate. Mathematica Policy Research and staff also conducted an analysis of the accuracy of these predictive models, comparing their predictive output for various calendar years for which actual experienced data is available (Step 1). Analysis of the accuracy of the various predictive models did not clearly suggest any individual predictive method as being superior to the others; therefore, staff has averaged the forecasts derived from the seven different methods to determine the CY 2018 national Medicare readmission rate of 15.28% - see figure below (Step 2).

Figure 7. Improvement Target Model Projections

Model Abbreviation	Model Name	Model Description	CY 2018 Projection
AAC	Average Annual Change	Averages the annual change of 2016 over 2015, 2015 over 2014, 2014 over 2013	**15.38%**
MRAC	Most Recent Annual Change	2017 YTD over 2016 YTD	**15.37%**
12MMA	12 Month Moving Average	Moving average predictive method, using most recent 12M of data and moving trend forward	**15.31%**
24MMA	24 Month Moving Average	Moving average predictive method, using most recent 24M of data and moving trend forward	**15.39%**
PROC	PROC Forecast	Combination of deterministic time trend model (long-term) and autoregressive model (short-term)	**15.07%**
ARIMA	Auto-Regressive Integrated Moving Average	Parametric statistical model characterizing the time series data, which better incorporates seasonality and multiple evaluation criteria	**15.17%**
STL	Seasonal and Trend decomposition using Loess	Divides time series data into three components - seasonal, trend cycle, and remainder, to yield projection value	**15.28%**
	Average	**Average of Seven Models**	**15.28%**

Next, staff modeled the relationship between the Maryland Medicare Readmission Rate for CY 2016 (15.65%) and the projected national Medicare readmission rate for CY 2018 (15.28%). In order to reduce the Maryland Medicare rate from 15.65% to 15.28%, the Maryland Medicare FFS rate must be reduced 2.34% in CY 2018 compared to CY 2016.[9]

Given that this is the last year of a moving Waiver Test, staff has included a cushion to this improvement target, in case the projection is inaccurate and too lenient. The cushions under the

[9] Calculations may be vary due to rounding; components in the calculation of the improvement target are not rounded until the final step.

draft policy were set at 0.1% and 0.2%, but for the final policy a cushion of 0.3% was added to ensure the target was higher than RY 2019 target (Step 3), as shown in figure 8 below.

Figure 8. Improvement Target Calculation with Cushions

	National Actual Trend	National Actual Trend with -0.1% Cushion	National Actual Trend with -0.2% Cushion	National Actual Trend with -0.3% Cushion
CY 2016 MD Medicare Readmission Rate (A)	15.65%	15.65%	15.65%	15.65%
CY 2018 Projected National Readmission Rate (B)	15.28%	15.18%	15.08%	14.98%
Required Reduction (C) = Projected National Rate (B) / CY 2016 MD Medicare Readmission Rate (A) - 1				
CY 2018 Reduction Required in MD Medicare FFS Rate from CY 2016 (C)	-2.34%	-2.98%	-3.61%	-4.25%

Staff then converted the unadjusted, Medicare FFS improvement target to a Case-mix Adjusted, All-Payer improvement target (Step 4) to ensure fairness across Maryland hospitals with differing case-mix acuity. To convert to an all-payer improvement target, staff and Mathematica Policy Research have evaluated the ratio relationship between the unadjusted Medicare FFS readmission rates and the Case-Mix Adjusted All-Payer readmission rates. As shown in Figure 9 below, this ratio relationship appears to be stable over time. The Case-mix Adjusted All-Payer Readmission Rate has been approximately 75% of the unadjusted Medicare FFS readmission rate over the past several years. Therefore, staff has removed the multiple "conversion factors" used in the RY 2019 policy, and has instead converted the improvement target to an All-Payer target using the average of these ratios, which is 75.1%.

Figure 9. Unadjusted Medicare FFS to Case-mix Adjusted All-Payer Improvement Target Conversion

	CMMI (Unadjusted) MD Medicare FFS Readmissions Rate	HSCRC Case mix Adjusted All Payer Readmissions Rate	All Payer to Medicare Ratio of Readmissions Rates
CY 12	17.41%	12.49%	71.7%
CY 13 Rolling 12M thru Aug	16.73%	12.74%	76.1%
CY 14 Rolling 12M thru Aug	16.55%	12.58%	76.0%
CY 15 Rolling 12M thru Aug	16.08%	12.13%	75.4%
CY 16 Rolling 12M thru Aug	15.75%	11.90%	75.6%
CY 17 Rolling 12M thru Aug	15.29%	11.59%	75.8%
		Average of Ratios	**75.1%**

When converting the necessary Medicare Readmission Rate Improvement to the necessary Case-mix Adjusted All-Payer Readmission Rate Improvement, the improvement from figure 8 above will then be modified to reflect the 75.1% ratio, per figure 10 below.

Figure 10. Translating Converted Improvement Target to Improvement Percent

	National Actual Trend	National Actual Trend with -0.1% Cushion	National Actual Trend with -0.2% Cushion	National Actual Trend with -0.3% Cushion
CY 2018 (Projected) National Readmission Rate (A)	15.28%	15.18%	15.08%	14.98%
Conversion Ratio (B)	75.1%	75.1%	75.1%	75.1%
CY 2016 Maryland Case-mix Adjusted All-Payer Rate (C)	11.72%	11.72%	11.72%	11.72%
Maryland Case-Mix Adjusted, All-Payer Readmission Rate Improvement (D = (A*B)/C-1)	**-2.03%**	**-2.68%**	**-3.32%**	**-3.96%**
Required CY 2018 Statewide Maryland Case-Mix Adjusted, All-Payer Readmission Rate (E=C*(1+D))	**11.48%**	**11.35%**	**11.33%**	**11.26%**

Staff is recommending to use the orange-highlighted target, a -3.96% improvement for CY 2018 over CY 2016. For context, the final RY 2019 RRIP policy required a -3.75% improvement target over CY 2016. The incremental increase in the improvement target reflects the success

that Maryland has achieved in CY 2017. Expansion of the cushion in step 3 will further align the RRIP policy with the policy of continuous quality improvement and aggressive program targets.

Finally, RY 2018 improvement must be compounded with RY 2020 (CY 2016 to CY 2018) improvement. Under the RY 2019 policy, these two improvement rates were simply added together; however, given that these are fundamentally discrete data that are expressed as percentage changes, compounding would yield a more accurate indication of the change over time (Step 5). For a detailed explanation of compounding, please see Appendix I.

Compounding the rates of improvement over time yields a RY 2020 improvement target of 14.30%, which is only slightly higher than the RY 2019 compounded target (14.10%). This modest improvement goal is attributed to: a) the fact that the State has reduced its Medicare readmission rate to below the nation, and b) the national improvement in readmissions slowed down in CY 2017, according to the most recent rolling 12 months of data. It should be noted that 24 hospitals already have achieved a compounded improvement greater than the RY 2020 proposed target of 14.30%.

Attainment Target Calculation Methodology

Beginning in RY 2017, HSCRC has also included an attainment target, whereby hospitals with low case mix adjusted readmission rates are rewarded for maintaining low readmission rates. To update the attainment target, staff examines the current All-Payer, Case-mix Adjusted Readmission Rates (these data are current through October with preliminary data). These rates are then further adjusted to account for readmissions to out-of-state hospitals (Step 2; additional information provided in Appendix V). From these adjusted trends, a threshold (25th percentile) and benchmark (10th percentile) are calculated, providing potential rewards to hospitals with low readmission rates (Step 3), as illustrated in Figure 11.

Finally, both the benchmark and threshold are adjusted downward by 2% from those prior CY numbers, reflecting the State's desire that all Maryland hospitals continue to improve over the next year. However, the modeling uses an adjustment of 2.33%,[10] given that hospitals should continue to improve throughout the final month of CY 2017, as well as throughout 2018.

[10] (2% divided by 12) will yield one-month incremental increase in annual downward adjustment, which is multiplied by two, and then added to the 2%.

Figure 11. Attainment Target Threshold and Benchmark with Cushion

	CY17 Jan-Oct	With Cushion%*
CYTD17 Top 10%	10.40%	**10.20%**
CYTD17 Top 25%	10.96%	**10.70%**

*2.33% cushion based on 2% cushion adjusted for 14 months

Prospective Scaling for RY 2020 Policy

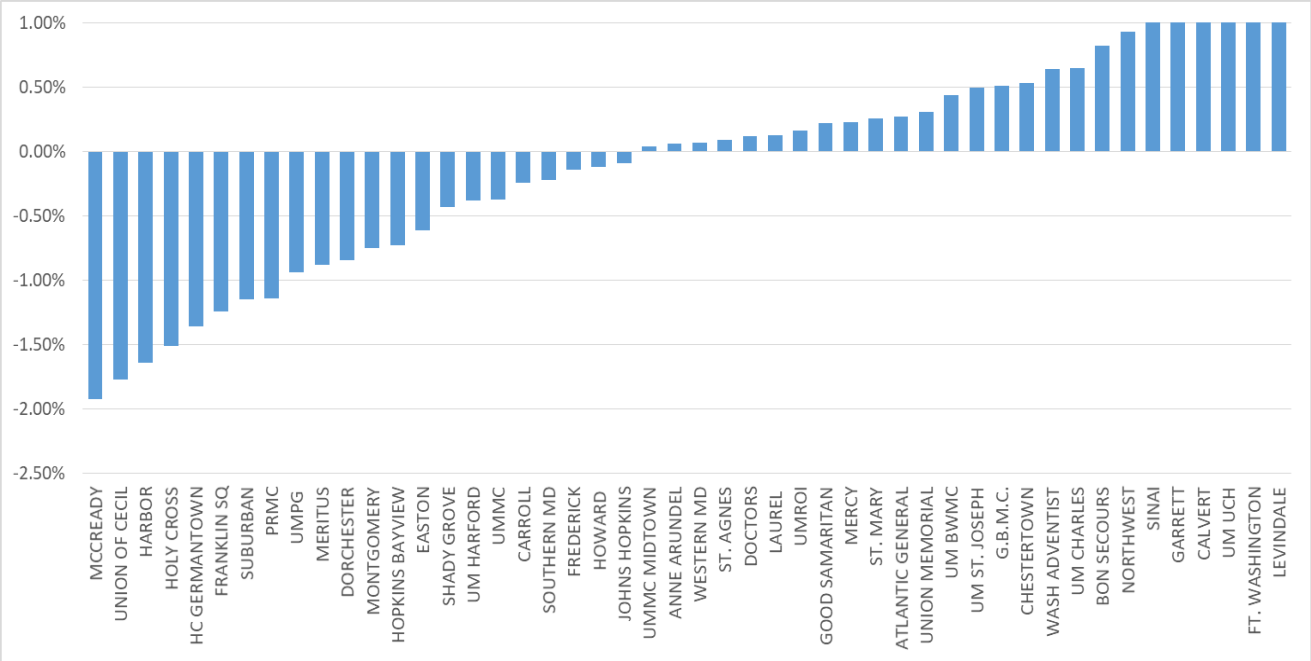
To determine by-hospital revenue adjustments, HSCRC creates a scoring scale based on prospectively determined targets (and attendant maximum and minimum rewards and penalties). This in keeping with three core principles of Maryland Quality programs: 1) Hospitals should know in advance of the performance period what they need to do to garner a positive revenue adjustment; 2) hospitals should not be evaluated relative to other hospitals because that potentially diminishes the incentive for improvement for various hospitals that may have inherent advantages, e.g., a patient population with higher socioeconomic status; and 3) hospitals should not be evaluated relative to other hospitals because the HSCRC wants to foster collaboration and shared best practices among hospitals that a relative ranking system would discourage.

Using assessed points and a linear scale, HSCRC assigns which scores are associated with the maximum reward and maximum penalties for improvement and attainment separately. Hospitals with a score at or above the maximum reward receive the maximum reward (1.0%), hospitals with a score at the target score receive no adjustment, and hospitals with a score at or below the maximum penalty score receive the maximum penalty (-2.0%). Hospitals with scores in the ranges between those points receive a scaled adjustment that is determined by the distance between a hospital's score and the targets and benchmarks. Hospitals will receive the more favorable revenue adjustment (the better of their improvement or attainment adjustments).

Staff has modeled revenue adjustments using RY 2019 year-to-date data through October 2017 and the proposed RY 2020 improvement and attainment scales (see Appendix IV). For this analysis, RY 2019 data was compounded to calculate the hospital improvement rate. Based on these analyses, 22 hospitals would be penalized for a total of $31.7 million, and 26 hospitals would be rewarded for a total of $16.1 million. Because the attainment thresholds and benchmarks are based on current performance plus a cushion, the majority of hospitals (37 out of

48) would receive their positive or negative revenue adjustment based on improvement and not attainment. This result highlights the need for greater scrutiny of risk-adjustment methods, as well as attainment threshold and benchmark calculation methodology, prior to migrating to an attainment only score. The revenue modeling for RY 2020 in Appendix IV, which uses RY 2019 year-to-date results, will result in higher penalties than what would be expected if hospitals continue to improve throughout CY 2018. Figure 12 presents the revenue adjustment percentages by hospital based on this modeling.

Figure 12. Modeled Revenue Adjustments by Hospital



FUTURE OF MODEL

For the Total Cost of Care (TCOC) Model, which will begin in January 2019, proposed contract terms do not define specific quality performance targets. The HSCRC, in consultation with staff and industry, has begun laying the framework for establishing specific quality performance targets under the TCOC Model. Specifically, performance targets must be aggressive and progressive, must align with other HSCRC programs, must be comparable to federal programs, and must consider rankings relative to the nation. Beyond guiding principles, nothing definitive has yet been established.

For the RY 2020 quality recommendations, staff considered recent Commission discussions as well as the white paper of November 15, 2017 co-authored by Commissioners John Colmers and Jack Keane regarding the overall strategy for the quality programs under the new TCOC Model. Staff notes the need to meet contractually obligated quality goals while making as few changes as possible to the final year of the current model in light of the additional work required to develop new targets and to better align measures with total cost of care. As highlighted in the

white paper, in addition to reducing Medicare readmissions compared to the nation, future considerations for updating the RRIP program for RY 2021 and beyond must include evaluating Maryland's performance compared to external benchmarks for non-Medicare patients. Analyses of modifying the denominator of included patients must also be considered, such as including patients receiving observation services, or those readmitted within longer timeframes than 30 days, or those receiving care in psychiatric and specialty facilities. Staff must also consider methodologies for adjusting readmission rates and the resulting payment adjustments for patient socioeconomic status and other social risk factors, critical to implementing "attainment only" measurement. As readmissions and overall admissions continue to decline, staff must also work with stakeholders to consider options for better population- and community-focused measurement, such as per capita admissions.

STAKEHOLDER COMMENTS AND RESPONSES

HSCRC Commissioners, as well as the hospital industry and payers, have given written and verbal comments to HSCRC staff regarding the RRIP program, applicable both in the short term, and as it evolves under the new TCOC model. Staff summarizes the comments and responses below.

All-Payer versus Medicare Readmission Program

There are opposing views on whether the RRIP program should include patients covered by all payers or only Medicare patients. Some Commissioners and other stakeholders have suggested that the RRIP shift to a Medicare-only program, because there are not definitive national benchmarks for non-Medicare readmission rates, and because the Global Budget Revenue hospital model already has incentives to reduce readmissions.

Additional public comments at the February Commission meeting from Robert Murray, representing Carefirst, echoed this position. In her letter on behalf of Medicaid, Tricia Roddy voiced support for the RRIP's inclusion of patients covered by all payers, noting that Medicaid would consider developing a separate readmission program if the HSCRC program were to include only Medicare patients. In Traci LaValle's comment letter on behalf of MHA, she supported an all-payer RRIP program, but notes that it will be important in the next demonstration to identify readmissions attainment benchmarks for a comparable set of hospitals outside Maryland.

Staff Response:

HSCRC staff has expressed concerns that the intention of the Maryland model is to improve care on an all-payer basis, and that having a Medicare-only readmission program would run contrary to the model's overarching goals. Staff maintains that the all-payer nature of the pay-for-performance programs is one of the Model's defining features, and believes that maintaining an all-payer RRIP is an important benefit from the perspective of consumers and other stakeholders.

Based on initial Performance Measurement Work Group input, staff believes that hospitals continue to support that the RRIP be maintained on an all-payer basis, and notes that other payers (notably Medicaid) are very interested in the continuation of an all-payer RRIP policy.

HSCRC staff will continue to work to obtain non-Medicare data and benchmarks in the coming years to address concerns that data limitations preclude the Commission from establishing reasonable non-Medicare readmission targets. Moreover, staff believes it is important to reinforce and align the incentives of the Global Budget Revenue hospital model by continuing to have a readmissions policy, especially when there is not a conclusive analysis that the statewide readmissions rate has reached an optimal level at this time.

Measure Readmissions Only on an Attainment Basis

During the February Commission meeting, CareFirst pointed out that the attainment threshold, where hospitals begin to earn credit, and the benchmark, where hospitals receive full credit, represent a narrow distribution (25th to 10th percentiles, respectively). CareFirst recommends widening the gap between the threshold and benchmark, as is done in other HSCRC quality programs (typically, the threshold is set at the 50th percentile and the benchmark is set at the 5th percentile). This expanded threshold-to-benchmark range would be more reflective of the distribution of hospital performance, and would better reflect Maryland hospital attainment levels, and (perhaps) render measurement of improvement unnecessary.

Regarding an attainment-only readmission program, MHA indicated in their comment letter that including both attainment and improvement targets helps address inherent differences in hospitals' populations that are difficult to measure and for which there are not clearly defined data at this time.

Staff Response:

Staff agrees that widening the range between threshold and benchmark would be more reflective of the distribution of Maryland hospital performance on attainment, but also notes that this change would not fully address the inherent differences in hospitals' populations, for which there are not standardized approaches for measurement at this time.

Staff believes it may be possible to shift to a program that measures attainment only under a future readmission program, when population differences are adequately understood and measured. Moreover, if future evaluation of all-payer benchmarks conclude that optimal readmission rates are reached, the Commission may be required to remove improvement performance targets and consider shifting its focus to admissions per capita.

However, given the complexity of this endeavor and given that this is the last year of the current hospital model, staff does not recommend altering the RY 2020 policy to evaluate attainment only. In the coming years, staff will work with contractors and stakeholders to evaluate the availability of data and a sufficient risk adjustment to potentially develop an attainment only readmissions policy as well as a per capita admissions policy.

Social Risk Factor Adjustments

When the draft recommendation was presented in the February Commission meeting, Mr. Murray supported Medicare's approach of using the proportion of dually eligible beneficiaries to stratify hospitals and make adjustments on readmission performance.

In their letter, MHA references the National Quality Forum (NQF)'s July 2017 report, *Evaluation of the NQF Trial Period for Risk Adjustment for Social Risk Factors.* Regarding the readmission measures evaluated, NQF did not recommend adjusting for social risk factors because, although there was a relationship with certain risk factors, the effect had limited impact on hospital performance scores, or the performance of the risk adjustment model. The MHA letter points out that this finding is consistent with HSCRC staff's finding in the spring of 2016, based on analysis done by Mathematica Policy Research. The MHA letter adds that the addition of social risk factors can add complexity with little additional explanatory value.

Staff Response:

Staff concurs that at this time there is limited explanatory value beyond what is already provided using the existing DRG-SOI adjustment. As noted above in the 'Overview of the Maryland RRIP Policy', staff does not plan on adopting the national stratification determination for Maryland hospitals, as it is not currently possible (this data is calculated retrospectively and will not be available until the start of federal fiscal year 2019). Again, staff will evaluate the CMS stratification approach and its applicability to Maryland as the data becomes available.

Consider Impact of Observation Stays and Emergency Department Visits

In the February Commission meeting, Mr. Murray pointed out that it is important to also look at observation stays and ED visits following hospital admissions, as care may be shifted to these settings.

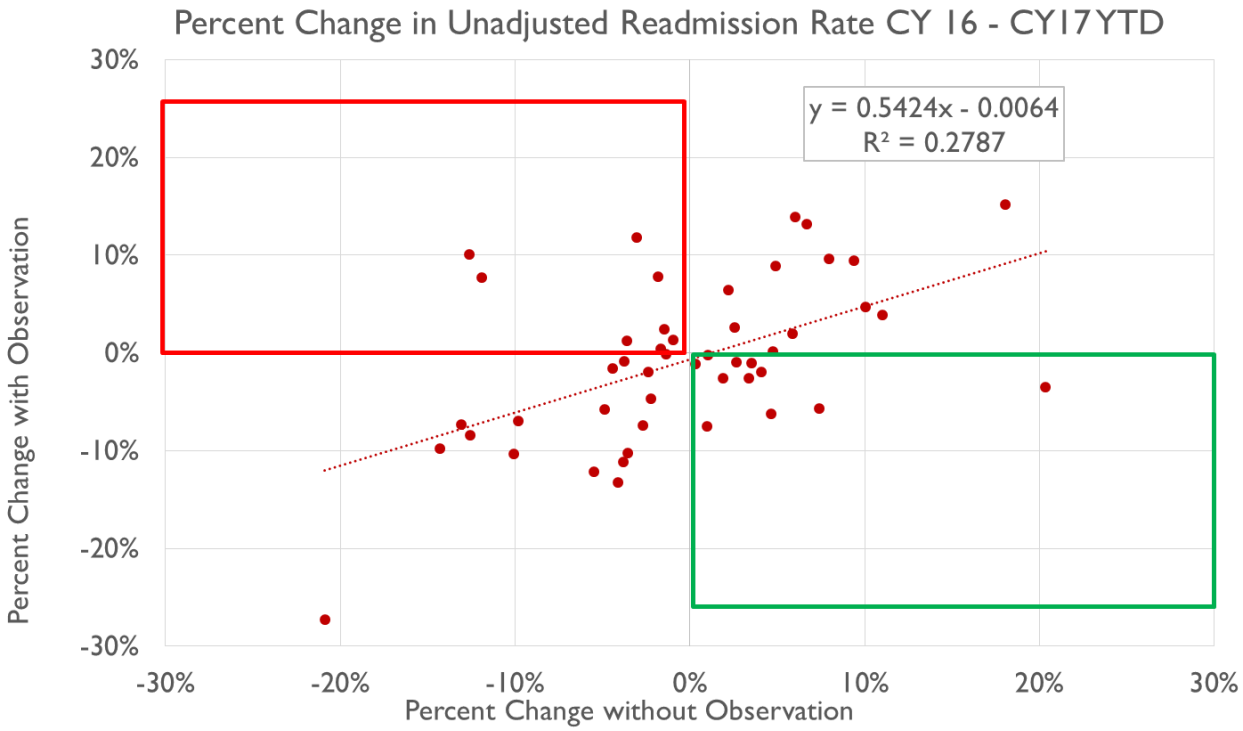
Staff Response:

Staff analyzed the potential impact of the use of observation services on readmission rates. Overall the statewide readmission rate for CY 2017 (January to November) increased by 2.80% (simple difference); however, improvement in readmission rates

from CY 2016 (January-November) to CY 2017 (January to November) decreased by 1.02% (simple difference)when observation stays are counted as readmissions.

Figure 13 is a scatterplot showing the unadjusted change in readmission rates CY16 YTD- CY17 YTD by hospital under current RRIP readmission measure and with observation stays added as readmissions (not counted in denominator). This analysis was designed to see whether the improvement in readmissions post-inpatient admission differed when observation stays were included. While additional analysis is warranted, especially for a handful of hospitals with significantly different trends (red box on top-left), statewide trends were inconsistent, and some hospitals have much higher improvement when observation stays are counted (green box on bottom-right). As the RRIP program is modified over the next couple of years, similar analysis should also include ED visits, and policy decisions will need to be made on whether and how to include observations stays and emergency department visits when measuring readmissions. It should also be noted that observation stays >23 hours are currently in the PAU measure, which theoretically will balance out potential incentives in the RRIP program to increase Observation Stays.

Figure 13. Observation Analysis



RECOMMENDATIONS

This is a final recommendation for the Maryland Rate Year (RY) 2020 Readmission Reduction Incentive Program (RRIP) policy. At this time, the staff requests that Commissioners consider the following draft recommendations:

1. The RRIP policy provides incentives to reduce readmissions on an all-payer basis.
2. Hospital performance is measured as the better of attainment or improvement.
3. Due to ICD-10 transition, a compounded improvement target is used that combines Calendar Year (CY) 2013 to Calendar Year (CY) 2016 improvement (under ICD-9) and CY2016 to CY 2018 improvement (under ICD-10); the combined improvement target will be set at 14.30% percent for RY 2020.
4. The attainment threshold is set at the 25th percentile of hospital performance in CY 2017, with an improvement factor (currently 2% from previous calendar year); the preliminary attainment target is 10.70 percent for CY 2018.
5. Hospitals are eligible for a maximum reward of 1 percent, or a maximum penalty of 2 percent, based on the better of their attainment or improvement scores.

Staff will review the improvement target and attainment benchmark in April/May against finalized CY 2017 data in order to bring back to the Commission revised performance targets if data trends warrant the revision. This may necessitate an additional vote from Commissioners.

APPENDIX I. HSCRC CURRENT READMISSIONS MEASURE SPECIFICATIONS

Performance Metric

The methodology for the Readmissions Reduction Incentive Program (RRIP) measures performance using the 30-day all-payer all hospital (both intra- and inter-hospital) readmission rate with adjustments for patient severity (based upon discharge all-patient refined diagnosis-related group severity of illness [APR-DRG SOI]) and with the exclusion of planned admissions.[11]

This measure is similar to the readmission rate that will be calculated under the All-Payer Model, with some exceptions. The most notable exceptions are that the HSCRC measure includes psychiatric patients and excludes oncology admissions. In comparing Maryland's Medicare readmission rate to the national readmission rate, the Centers for Medicare & Medicaid Services (CMS) will calculate an unadjusted readmission rate for Medicare beneficiaries. Since the Health Services Cost Review Commission (HSCRC) measure is for hospital-specific payment purposes, adjustments had to be made to the metric that accounted for planned admissions and severity of illness. See below for details on the readmission calculation for the RRIP program.

Inclusions and Exclusions in Readmission Measurement

- Planned readmissions are excluded from the numerator based upon the CMS Planned Readmission Algorithm V. 4.0. The HSCRC has also counts all vaginal and C-section deliveries and rehabilitation as planned using the APR-DRGs, rather than principal diagnosis (APR-DRGs 540, 541, 542, 560, 860). Planned admissions are counted in the denominator because they could have an unplanned readmission.
- Discharges for the newborn APR-DRG are removed.
- Oncology cases are removed prior to running the readmission logic (APR-DRGs 41, 110, 136, 240, 281, 343, 382, 442, 461, 500, 511, 512, 530, 680, 681, 690, 691, 692, 693, 694, 695, and 696).
- Rehabilitation cases as identified by APR-DRG 860 (which are coded under ICD-10 based on type of daily service) are marked as planned admissions and made ineligible for readmission after the readmission logic is run.
- Admissions with ungroupable APR-DRGs (955, 956) are not eligible for a readmission, but can be a readmission for a previous admission.
- Hospitalizations within 30 days of a hospital discharge for a patient who dies during the second admission are counted as readmissions, however, the readmission is removed from the denominator because there cannot be a subsequent readmission.
- Admissions that result in transfers, defined as cases where the discharge date of the admission is on the same as or the next day after the admission date of the subsequent admission, are removed from the denominator counts. Thus, only one admission is

[11] Defined under [CMS Planned Admission Logic version 4 – updated October 2017.]

counted in the denominator, and that is the admission to the receiving transfer hospital. It is this discharge date that is used to calculate the 30-day readmission window.

- Discharges from rehabilitation hospitals (provider IDs Chesapeake Rehab 213028, Adventist Rehab 213029, and Bowie Health 210333) are not included when assessing readmissions.
- Holy Cross Germantown 210065 and Levindale 210064 are included in the program.
- Starting in January 2016, HSCRC is receiving information about discharges from chronic beds within acute care hospitals in the same data submissions as acute care discharges. These discharges were excluded from RRIP for RY 2018.
- In addition, the following data cleaning edits are applied:
    - Cases with null or missing Chesapeake Regional Information System for our Patients (CRISP) unique patient identifiers (EIDs) are removed.
    - Duplicates are removed.
    - Negative interval days are removed.
    - HSCRC staff is revising case-mix data edits to prevent submission of duplicates and negative intervals, which are very rare. In addition, CRISP EID matching benchmarks are closely monitored. Currently, hospitals are required to make sure 99.5 percent of inpatient discharges have a CRISP EID.

Details on the Calculation of Case-Mix Adjusted Readmission Rate

Data Source:

To calculate readmission rates for RRIP, inpatient abstract/case-mix data with CRISP EIDs (so that patients can be tracked across hospitals) are used for the measurement period, plus an additional 30 days. To calculate the case-mix adjusted readmission rate for CY 2016 base period and CY 2018 performance period, data from January 1 through December 31, plus 30 days in January of the next year are used.

***SOFTWARE*:** APR-DRG Version 35 (ICD-10) for CY 2016-CY 2018.

Calculation:

$$\text{Risk-Adjusted Readmission Rate} = \frac{\text{(Observed Readmissions)}}{\text{(Expected Readmissions)}} * \text{Statewide Readmission Rate}$$

***Numerator*:** Number of observed hospital-specific unplanned readmissions.

***Denominator*:** Number of expected hospital-specific unplanned readmissions based upon discharge APR-DRG and severity of illness. See below for how to calculate expected readmissions adjusted for APR-DRG SOI.

Risk Adjustment Calculation:

- Calculate the Statewide Readmission Rate without Planned Readmissions.
    - Statewide Readmission Rate = Total number of readmissions with exclusions removed / Total number of hospital discharges with exclusions removed.
- For each hospital, calculate the number of observed, unplanned readmissions.
- For each hospital, calculate the number of expected unplanned readmissions based upon discharge APR-DRG SOI (see below for description). For each hospital, cases are removed if the discharge APR-DRG and SOI cells have less than two total cases in the base period data (CY 2016).
- Calculate the ratio of observed (O) readmissions over expected (E) readmissions. A ratio >1 means that there were more observed readmissions than expected, based upon a hospital's case-mix. A ratio <1 means that there were fewer observed readmissions than expected based upon a hospital's case-mix.
- Multiply the O/E ratio by the statewide rate to get risk-adjusted readmission rate by hospital.

Expected Values*:*

The expected value of readmissions is the number of readmissions a hospital would have experienced had its rate of readmissions been identical to that experienced by a reference or normative set of hospitals, given its mix of patients as defined by discharge APR-DRG category and SOI level. Currently, HSCRC is using state average rates as the benchmark.

The technique by which the expected number of readmissions is calculated is called indirect standardization. For illustrative purposes, assume that every discharge can meet the criteria for having a readmission, a condition called being "at-risk" for a readmission. All discharges will either have zero readmissions or will have one readmission. The readmission rate is the proportion or percentage of admissions that have a readmission.

The rates of readmissions in the normative database are calculated for each APR-DRG category and its SOI levels by dividing the observed number of readmissions by the total number of discharges. The readmission norm for a single APR-DRG SOI level is calculated as follows:

Let:

N = norm
P = Number of discharges with a readmission

D = Number of discharges that can potentially have a readmission
i = An APR DRG category and a single SOI level

$$N_i = \frac{P_i}{D_i}$$

For this example, the expected rate is displayed as readmissions per discharge to facilitate the calculations in the example. Most reports will display the expected rate as a rate per one thousand.

Once a set of norms has been calculated, the norms can be applied to each hospital. In this example, the computation presents expected readmission rates for an individual APR-DRG category and its SOI levels. This computation could be expanded to include multiple APR-DRG categories or any other subset of data, by simply expanding the summations.

Consider the following example for an individual APR DRG category.

Expected Value Computation Example

1 Severity of Illness Level	2 Discharges at Risk for Readmission	3 Discharges with Readmission	4 Readmissions per Discharge	5 Normative Readmissions per Discharge	6 Expected # of Readmissions
1	200	10	.05	.07	14.0
2	150	15	.10	.10	15.0
3	100	10	.10	.15	15.0
4	50	10	.20	.25	12.5
Total	**500**	**45**	**.09**		**56.5**

For the APR-DRG category, the number of discharges with a readmission is 45, which is the sum of discharges with readmissions (column 3). The overall rate of readmissions per discharge, 0.09, is calculated by dividing the total number of discharges with a readmission (sum of column 3) by the total number of discharges at risk for readmission (sum of column 2), i.e., 45/500 = 0.09. From the normative population, the proportion of discharges with readmissions for each SOI level for that APR-DRG category is displayed in column 5. The expected number of readmissions for each SOI level (column 6) is calculated by multiplying the number of discharges at risk for a readmission (column 2) by the normative readmissions per discharge rate (column 5) The total number of readmissions expected for this APR-DRG category is the sum of the expected numbers of readmissions for the 4 SOI levels.

In this example, the expected number of readmissions for this APR-DRG category is 56.5, compared to the actual number of discharges with readmissions of 45. Thus, the hospital had

11.5 fewer actual discharges with readmissions than were expected for this APR-DRG category. This difference can also be expressed as a percentage (79.65% of expected readmissions).

APR-DRGs by SOI categories are excluded from the computation of the actual and expected rates when there are only zero or one at risk admission statewide for the associated APR-DRG by SOI category.

A Brief Note on Compounding Improvement

For RY 2020, the rate of improvement used in RY 2018 (CY 2013-CY2016) will be **compounded** with the rate of improvement from CY 2016 to CY2018, as the datasets are fundamentally discrete and are expressed in terms of percentages.

- Formula for Compounded Improvement:

$$(\mathbf{1} + \boldsymbol{a}) * (\mathbf{1} + \boldsymbol{b}) - \mathbf{1}$$

Where a = the percentage improvement during period 1 and b = the percentage improvement during period 2.

For example, suppose Hospital A improves its readmission rate by 50% (written as -.5) under RY 2018 logic (the change between CY 2013 and CY 2016), and improves an additional 50% under between CY 2016 and CY 2018:

$$(1 + -.5) * (1 + -.5) - 1$$

$$(-.5) * (-.5) - 1$$

$$.25 - 1$$

$$-.75$$

In this example, Hospital A has achieved a 75% reduction in Readmissions, rather than a 100% reduction, as a 50% improvement upon the original 50% improvement is a compounded 75% improvement.

The **RY 2019** improvement target (-3.75%) compounded with statewide RY 2018 improvement (-10.75%) would be ~ -14.10%

$$(\mathbf{1} - \mathbf{.1075}) * (\mathbf{1} - \mathbf{.0375}) - \mathbf{1}$$

$$\mathbf{\sim 14.10\%}$$

The **RY 2020 Modeled Improvement Target** (-3.96%) compounded with experienced RY 2018 Improvement (-10.75%) yields a compounded **RY 2020 Improvement Target** of 14.30%.

$$(\mathbf{1-.1075}) * (\mathbf{1-.0396}) - \mathbf{1}$$

$$\sim \mathbf{14.28}\%$$

The 14.28% is rounded to 14.30%.

APPENDIX II. CMS MEDICARE READMISSION TEST MODIFICATIONS - VERSIONS 5 AND 6

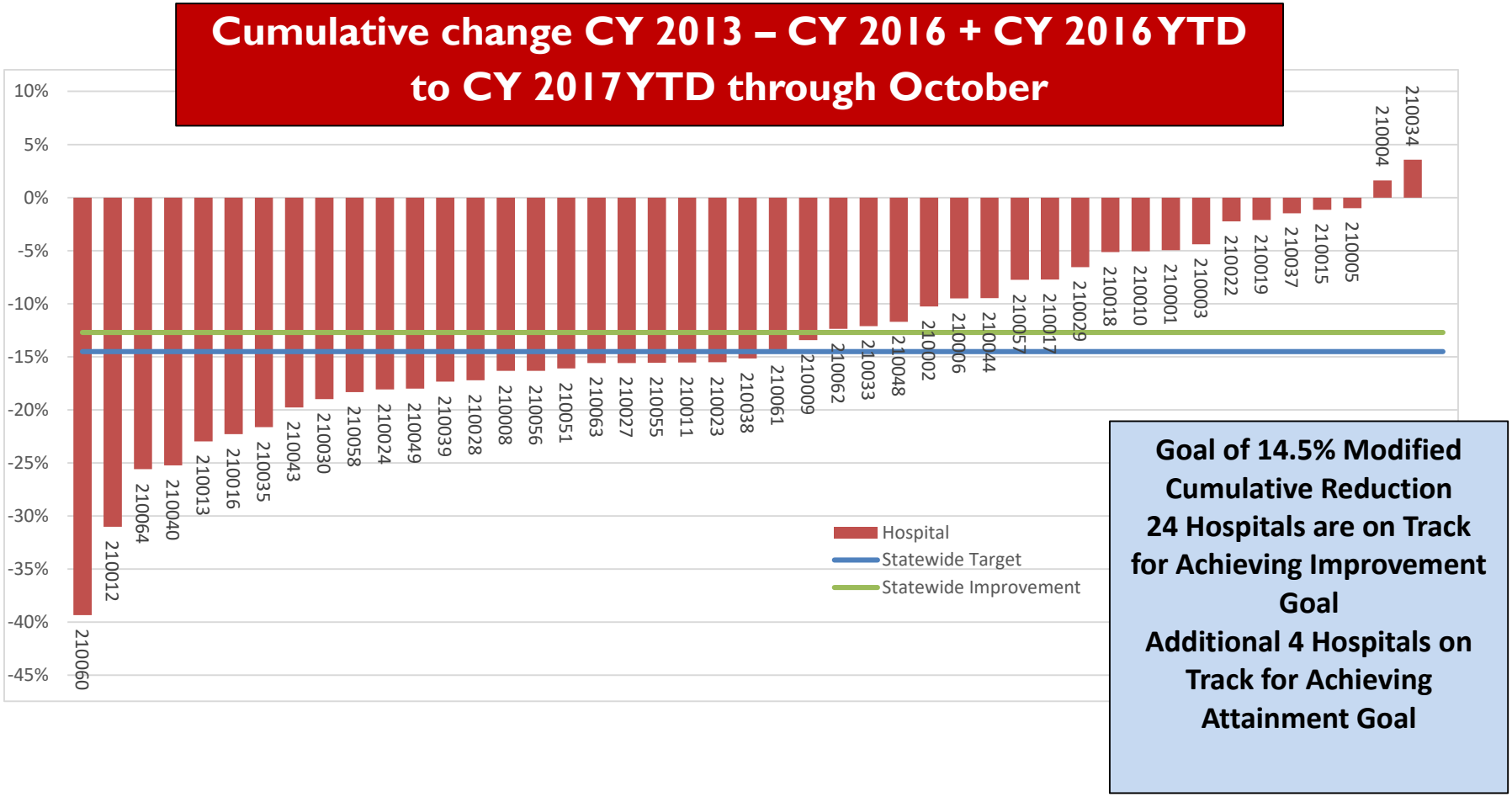
As presented last year, currently the HSCRC and CMS are evaluating the Waiver Test performance under the current Readmission definition (version 6).

In the RY 2018 policy, HSCRC included an itemized list of changes in version 5 of the CMS Medicare Readmission Test. These changes are listed below as a reminder. Beginning in CY 2016, the rehabilitation discharges are identified using Universal Billing (UB) codes to account for definition changes under ICD-10.

Below are the specification changes made to allow an accurate comparison of Maryland's Medicare readmission rates with those of the nation.

- Requiring a 30-day enrollment period in fee-for-service (FFS) Medicare after hospitalization to fully capture all readmissions.
- Removing planned readmissions using the CMS planned admission logic for consistency with the CMS readmission measures.
- Excluding specially-licensed rehabilitation and psychiatric beds from Maryland rates due to inability to include these beds in national estimates because of data limitations. In contrast, the HSCRC includes psychiatric and rehabilitation readmissions in the all-payer readmission measure used for payment policy.
    - Version 6 of the CMS measure changed to using UB codes to identify rehabilitation discharges due to ICD-10.
- Refining the transfer logic to be consistent with other CMS readmission measures.
- Changing the underlying data source to ensure clean data and inclusion of all appropriate Medicare FFS claims (e.g., adjusting the method for calculating claims dates and including claims for patients with negative payment amounts).

APPENDIX III. BY-HOSPITAL READMISSION CHANGES



Case-mix Adjusted, All-Payer Readmission Rates – RY 2019 YTD through October by-Hospital

Hospitals		CY2016 Base Period (YTD, Jan-Oct 2016)	CY2017 Performance Period (YTD, Jan-Oct 2017)								
A	B	C = Obs/Exp * 11.78%	D	E	F = E/D	G	H = E/G	I = E/G * 11.78%	J = I/C - 1	K	L = J + K
HOSP ID	HOSPITAL NAME	Case-Mix Adjusted Readmission Rate	Total # of IP Disch.	Total # of Readmits	Percent Readmits	Total # of Expected Readmits	Readmit Ratio	Case-Mix Adjusted Readmit Rate	Change in Case-mix Adjusted Rate from CY2016	RY 2018 % Change	CY17 Modified Cumulative Improvement Readmission Rate
210001	Meritus	11.41%	11,599	1,418	12.23%	1,443	0.983	11.58%	1.49%	- 6.44%	- 4.95%
210002	UMMC*	12.91%	19,166	2,918	15.22%	2,619	1.114	13.13%	1.70%	- 11.95%	- 10.25%
210003	UM-PGHC	10.92%	8,606	1,014	11.78%	1,140	0.889	10.47%	- 4.12%	- 0.28%	- 4.40%
210004	Holy Cross	11.71%	20,466	1,714	8.37%	1,736	0.987	11.63%	- 0.68%	2.30%	1.62%
210005	Frederick	9.53%	12,533	1,322	10.55%	1,502	0.880	10.37%	8.81%	- 9.81%	- 1.00%
210006	UM-Harford	12.49%	3,321	445	13.40%	493	0.902	10.63%	- 14.89%	5.38%	- 9.51%
210008	Mercy	12.49%	10,459	922	8.82%	851	1.083	12.76%	2.16%	- 18.48%	- 16.32%
210009	Johns Hopkins	13.21%	33,321	4,932	14.80%	4,431	1.113	13.11%	- 0.76%	- 12.66%	- 13.42%
210010	UM-Dorchester	12.60%	1,798	249	13.85%	257	0.970	11.42%	- 9.37%	4.31%	- 5.06%
210011	St. Agnes	11.98%	11,694	1,417	12.12%	1,424	0.995	11.72%	- 2.17%	- 13.36%	- 15.53%
210012	Sinai	12.34%	11,399	1,298	11.39%	1,447	0.897	10.57%	- 14.34%	- 16.68%	- 31.02%
210013	Bon Secours	15.41%	2,911	621	21.33%	476	1.305	15.38%	- 0.19%	- 22.77%	- 22.96%
210015	MedStar Fr Square	12.59%	16,548	2,278	13.77%	2,066	1.103	12.99%	3.18%	- 4.33%	- 1.15%
210016	Washington Adventist	10.60%	8,016	757	9.44%	950	0.797	9.38%	- 11.51%	- 10.77%	- 22.28%
210017	Garrett	5.92%	1,610	96	5.96%	174	0.550	6.48%	9.46%	- 17.19%	- 7.73%
210018	MedStar Montgomery	10.78%	5,633	719	12.76%	720	0.999	11.76%	9.09%	- 14.22%	- 5.13%
210019	Peninsula	10.51%	13,437	1,497	11.14%	1,627	0.920	10.84%	3.14%	- 5.26%	- 2.12%
210022	Suburban	11.20%	10,824	1,226	11.33%	1,293	0.948	11.17%	- 0.27%	- 1.97%	- 2.24%
210023	Anne Arundel	11.29%	20,543	1,701	8.28%	1,889	0.901	10.61%	- 6.02%	- 9.50%	- 15.52%
210024	MedStar Union Mem	12.79%	8,525	1,090	12.79%	1,041	1.047	12.34%	- 3.52%	- 14.56%	- 18.08%
210027	Western Maryland	11.49%	8,322	1,013	12.17%	1,103	0.918	10.82%	- 5.83%	- 9.75%	- 15.58%
210028	MedStar St. Mary's	10.99%	5,669	589	10.39%	637	0.925	10.90%	- 0.82%	- 16.39%	- 17.21%
210029	JH Bayview	14.29%	15,113	2,371	15.69%	1,941	1.222	14.39%	0.70%	- 7.25%	- 6.55%
210030	UM-Chestertown	14.14%	1,224	154	12.58%	166	0.928	10.93%	- 22.70%	3.71%	- 18.99%
210032	Union of Cecil	10.51%	4,197	480	11.44%	538	0.892	10.51%	0.00%	4.29%	4.29%

Hospitals		CY2016 Base Period (YTD, Jan-Oct 2016)	CY2017 Performance Period (YTD, Jan-Oct 2017)								
A	B	C = Obs/Exp * 11.78%	D	E	F = E/D	G	H = E/G	I = E/G * 11.78%	J = I/C - 1	K	L = J + K
HOSP ID	HOSPITAL NAME	Case-Mix Adjusted Readmission Rate	Total # of IP Disch.	Total # of Readmits	Percent Readmits	Total # of Expected Readmits	Readmit Ratio	Case-Mix Adjusted Readmit Rate	Change in Case-mix Adjusted Rate from CY2016	RY 2018 % Change	CY17 Modified Cumulative Improvement Readmission Rate
210033	Carroll	11.51%	7,578	893	11.78%	947	0.943	11.11%	- 3.48%	- 8.62%	- 12.10%
210034	MedStar Harbor	11.91%	5,694	789	13.86%	707	1.116	13.14%	10.33%	- 6.76%	3.57%
210035	UM-Charles Regional	9.88%	5,257	546	10.39%	668	0.817	9.62%	- 2.63%	- 19.00%	- 21.63%
210037	UM-Easton	10.95%	5,233	507	9.69%	567	0.894	10.53%	- 3.84%	2.37%	- 1.47%
210038	UMMC Midtown	15.42%	3,618	708	19.57%	563	1.257	14.81%	- 3.96%	- 11.20%	- 15.16%
210039	Calvert	9.21%	4,260	387	9.08%	534	0.725	8.54%	- 7.27%	- 10.08%	- 17.35%
210040	Northwest	12.55%	7,907	1,150	14.54%	1,149	1.001	11.79%	- 6.06%	- 19.18%	- 25.24%
210043	UM-BWMC	12.77%	12,330	1,704	13.82%	1,680	1.014	11.95%	- 6.42%	- 13.35%	- 19.77%
210044	GBMC	10.59%	13,014	1,038	7.98%	1,192	0.870	10.25%	- 3.21%	- 6.26%	- 9.47%
210045	McCready	11.70%	181	23	12.71%	23	0.990	11.66%	- 0.34%	7.04%	6.70%
210048	Howard County	11.36%	12,654	1,262	9.97%	1,404	0.899	10.59%	- 6.78%	- 4.92%	- 11.70%
210049	UM-Upper Chesapeake	11.06%	8,064	797	9.88%	966	0.825	9.72%	- 12.12%	- 5.87%	- 17.99%
210051	Doctors	11.78%	7,138	989	13.86%	1,048	0.943	11.11%	- 5.69%	- 10.41%	- 16.10%
210055	UM-Laurel	11.82%	2,272	348	15.32%	344	1.012	11.93%	0.93%	- 16.49%	- 15.56%
210056	MedStar Good Sam	12.14%	5,906	970	16.42%	925	1.048	12.35%	1.73%	- 18.05%	- 16.32%
210057	Shady Grove	10.11%	12,946	1,083	8.37%	1,238	0.875	10.31%	1.98%	- 9.73%	- 7.75%
210058	UMROI	10.66%	480	30	6.25%	36	0.835	9.84%	- 7.69%	- 10.65%	- 18.34%
210060	Ft. Washington	9.81%	1,699	181	10.65%	247	0.734	8.64%	- 11.93%	- 27.41%	- 39.34%
210061	Atlantic General	8.90%	2,464	282	11.44%	337	0.836	9.84%	10.56%	- 25.02%	- 14.46%
210062	MedStar Southern MD	11.20%	7,999	949	11.86%	1,048	0.906	10.67%	- 4.73%	- 7.63%	- 12.36%
210063	UM-St. Joe	10.95%	11,750	1,041	8.86%	1,183	0.880	10.37%	- 5.30%	- 10.29%	- 15.59%
210064	Levindale	11.40%	869	125	14.38%	125	0.999	11.77%	3.25%	- 28.84%	- 25.59%
210065	HC-Germantown	10.67%	3,711	437	11.78%	426	1.027	12.09%	13.31%		13.31%
	STATEWIDE	**11.81%**	**409,958**	**48,480**	**11.83%**	**49,321**	**0.983**	**11.58%**	**- 1.95%**	**- 10.75%**	**- 12.70%**

*Currently the UMMS numbers do not include Shock Trauma due to an issue with the CRISP unique identifier; UMMS readmission rate does not impact attainment target.

APPENDIX IV. RY 2020 IMPROVEMENT AND ATTAINMENT SCALING – MODELED RESULTS

The following figure presents the proposed RY 2020 model scaling, using preliminary CYTD 2017 readmission rate results. Column A shows the hospital's RY 2017 permanent inpatient revenue. Column B shows the percent change in in-state actual case-mix adjusted readmission rates between CY 2016 and CY 2013 (RY 2018 % Change). Columns C and D show the actual case-mix adjusted readmission rates for in-state readmission for CYTD 2016 and CYTD 2017 respectively. Column E shows the actual case-mix adjusted rate with out-of-state adjustment for CYTD 2017. Column F presents the percent change in case-mix adjusted in-state readmission rate for CYTD 2017. Column G compounds the improvement readmission rates for RY2018 and RY19 to calculate the hospital's CYTD17 modified cumulative improvement readmission rate. Columns H through I present the scaling results using the proposed RY 2020 cumulative improvement methodology, and columns J through K present the scaling results using the proposed RY 2020 attainment methodology. Columns L and M shows the revenue adjustment that is the better of attainment or improvement. (RY 2017 Permanent Global Budgets and Readmission Rates, used to calculate the revenue adjustments, may be updated in the final recommendation). The modeled results for RY 2020 using CYTD 2017 actual data show an overall negative adjustment. This result is expected, since the proposed policy requires an improvement beyond the actual CY 2017 results.

RY 2020 Readmission Reduction Incentive Program									Improvement		Attainment		Final Adjustment	
HOSP ID	HOSPITAL NAME	RY 17 Permanent Inpatient Revenue	RY2018 % Change	RY19 (CYTD16) BASE Case Mix Adj. Readmit Rate	CYTD17 Case Mix Adj. Readmit rate	CYTD17 Case mix Adj. rate Adj for out of state	CYTD17 % Change in instate Case mix adj. Rate	CYTD17 Modified Cumulative Improve Readmit Rate (compounded)	Target	RY20 Scaling %	Target	RY20 Scaling %	RY20 Better of Attain/ Improve	RY20 Scaling %
		A	B	C	D	E	F = D/C-1	G = (1+F)*(1+B)-1	H	I	J	K	L	M = L/A
210001	MERITUS	$185,173,878	-6.44%	11.41%	11.58%	12.11%	1.49%	-5.05%	-14.3%	-0.88%	10.7%	-2.00%	-$1,629,530	-0.88%
210002	UMMC	$874,727,573	-11.95%	12.91%	13.13%	13.63%	1.70%	-10.45%	-14.3%	-0.37%	10.7%	-2.00%	-$3,236,492	-0.37%
210003	UM - PG	$215,010,869	-0.28%	10.92%	10.47%	13.24%	-4.12%	-4.39%	-14.3%	-0.94%	10.7%	-2.00%	-$2,021,102	-0.94%
210004	HOLY CROSS	$339,593,506	2.30%	11.71%	11.63%	12.90%	-0.68%	1.60%	-14.3%	-1.51%	10.7%	-2.00%	-$5,127,862	-1.51%
210005	FREDERICK	$178,853,951	-9.81%	9.53%	10.37%	10.77%	8.81%	-1.86%	-14.3%	-1.18%	10.7%	-0.14%	-$250,396	-0.14%
210006	HARFORD	$46,975,749	5.38%	12.49%	10.63%	11.16%	-14.89%	-10.31%	-14.3%	-0.38%	10.7%	-0.92%	-$178,508	-0.38%
210008	MERCY	$216,281,427	-18.48%	12.49%	12.76%	12.98%	2.16%	-16.72%	-14.3%	0.23%	10.7%	-2.00%	$497,447	0.23%
210009	JOHNS HOPKINS	$1,357,164,899	-12.66%	13.21%	13.11%	14.19%	-0.76%	-13.32%	-14.3%	-0.09%	10.7%	-2.00%	-$1,221,448	-0.09%
210010	DORCHESTER	$24,256,573	4.31%	12.60%	11.42%	11.94%	-9.37%	-5.46%	-14.3%	-0.84%	10.7%	-2.00%	-$203,755	-0.84%
210011	ST. AGNES	$233,151,492	-13.36%	11.98%	11.72%	11.89%	-2.17%	-15.24%	-14.3%	0.09%	10.7%	-2.00%	$209,836	0.09%
210012	SINAI	$397,073,246	-16.68%	12.34%	10.57%	10.72%	-14.34%	-28.63%	-14.3%	1.00%	10.7%	-0.03%	$3,970,732	1.00%

RY 2020 Readmission Reduction Incentive Program									Improvement		Attainment		Final Adjustment	
HOSP ID	HOSPITAL NAME	RY 17 Permanent Inpatient Revenue	RY2018 % Change	RY19 (CYTD16) BASE Case Mix Adj. Readmit Rate	CYTD17 Case Mix Adj. Readmit rate	CYTD17 Case mix Adj. rate Adj for out of state	CYTD17 % Change in instate Case mix adj. Rate	CYTD17 Modified Cumulative Improve Readmit Rate (compounded)	Target	RY20 Scaling %	Target	RY20 Scaling %	RY20 Better of Attain/ Improve	RY20 Scaling %
		A	B	C	D	E	F = D/C-1	G = (1+F)*(1+B)-1	H	I	J	K	L	M = L/A
210013	BON SECOURS	$62,008,295	-22.77%	15.41%	15.38%	15.51%	-0.19%	-22.92%	-14.3%	0.82%	10.7%	-2.00%	$508,468	0.82%
210015	MEDSTAR FRANKLIN	$287,510,180	-4.33%	12.59%	12.99%	13.09%	3.18%	-1.29%	-14.3%	-1.24%	10.7%	-2.00%	-$3,565,126	-1.24%
210016	WASH ADVENTIST	$150,097,509	-10.77%	10.60%	9.38%	10.65%	-11.51%	-21.04%	-14.3%	0.64%	10.7%	0.11%	$960,624	0.64%
210017	GARRETT	$21,836,267	-17.19%	5.92%	6.48%	9.44%	9.46%	-9.36%	-14.3%	-0.47%	10.7%	1.00%	$218,363	1.00%
210018	MONTGOMERY	$79,298,762	-14.22%	10.78%	11.76%	12.56%	9.09%	-6.42%	-14.3%	-0.75%	10.7%	-2.00%	-$594,741	-0.75%
210019	PRMC	$235,729,906	-5.26%	10.51%	10.84%	11.61%	3.14%	-2.29%	-14.3%	-1.14%	10.7%	-1.82%	-$2,687,321	-1.14%
210022	SUBURBAN	$189,851,798	-1.97%	11.20%	11.17%	12.60%	-0.27%	-2.23%	-14.3%	-1.15%	10.7%	-2.00%	-$2,183,296	-1.15%
210023	AAMC	$296,168,973	-9.50%	11.29%	10.61%	10.98%	-6.02%	-14.95%	-14.3%	0.06%	10.7%	-0.57%	$177,701	0.06%
210024	UNION MEMORIAL	$231,121,787	-14.56%	12.79%	12.34%	12.49%	-3.52%	-17.57%	-14.3%	0.31%	10.7%	-2.00%	$716,478	0.31%
210027	WESTERN MD	$171,858,929	-9.75%	11.49%	10.82%	11.89%	-5.83%	-15.01%	-14.3%	0.07%	10.7%	-2.00%	$120,301	0.07%
210028	ST. MARY	$77,346,008	-16.39%	10.99%	10.90%	13.54%	-0.82%	-17.08%	-14.3%	0.26%	10.7%	-2.00%	$201,100	0.26%
210029	HOPKINS BAYVIEW	$348,529,477	-7.25%	14.29%	14.39%	14.78%	0.70%	-6.60%	-14.3%	-0.73%	10.7%	-2.00%	-$2,544,265	-0.73%
210030	CHESTERTOWN	$18,989,104	3.71%	14.14%	10.93%	11.88%	-22.70%	-19.83%	-14.3%	0.53%	10.7%	-2.00%	$100,642	0.53%
210032	UNION OF CECIL	$68,179,037	4.29%	10.51%	10.51%	12.69%	0.00%	4.29%	-14.3%	-1.77%	10.7%	-2.00%	-$1,206,769	-1.77%
210033	CARROLL	$116,510,378	-8.62%	11.51%	11.11%	11.40%	-3.48%	-11.80%	-14.3%	-0.24%	10.7%	-1.39%	-$279,625	-0.24%
210034	HARBOR	$107,761,881	-6.76%	11.91%	13.14%	13.26%	10.33%	2.87%	-14.3%	-1.64%	10.7%	-2.00%	-$1,767,295	-1.64%
210035	UM CHARLES	$68,387,041	-19.00%	9.88%	9.62%	11.30%	-2.63%	-21.13%	-14.3%	0.65%	10.7%	-1.20%	$444,516	0.65%
210037	EASTON	$100,000,562	2.37%	10.95%	10.53%	11.00%	-3.84%	-1.56%	-14.3%	-1.21%	10.7%	-0.61%	-$610,003	-0.61%
210038	UMMC MIDTOWN	$114,950,934	-11.20%	15.42%	14.81%	14.96%	-3.96%	-14.72%	-14.3%	0.04%	10.7%	-2.00%	$45,980	0.04%
210039	CALVERT	$63,319,998	-10.08%	9.21%	8.54%	9.97%	-7.27%	-16.62%	-14.3%	0.22%	10.7%	1.00%	$633,200	1.00%
210040	NORTHWEST	$125,696,184	-19.18%	12.55%	11.79%	12.00%	-6.06%	-24.08%	-14.3%	0.93%	10.7%	-2.00%	$1,168,975	0.93%
210043	UM BWMC	$227,399,457	-13.35%	12.77%	11.95%	12.15%	-6.42%	-18.91%	-14.3%	0.44%	10.7%	-2.00%	$1,000,558	0.44%
210044	G.B.M.C.	$216,554,825	-6.26%	10.59%	10.25%	10.44%	-3.21%	-9.27%	-14.3%	-0.48%	10.7%	0.51%	$1,104,430	0.51%
210045	MCCREADY	$2,930,574	7.04%	11.70%	11.66%	11.66%	-0.34%	6.68%	-14.3%	-2.00%	10.7%	-1.92%	-$56,267	-1.92%
210048	HOWARD COUNTY	$176,085,796	-4.92%	11.36%	10.59%	10.76%	-6.78%	-11.37%	-14.3%	-0.28%	10.7%	-0.12%	-$211,303	-0.12%
210049	UMUCH	$133,152,736	-5.87%	11.06%	9.72%	9.85%	-12.12%	-17.28%	-14.3%	0.28%	10.7%	1.00%	$1,331,527	1.00%

RY 2020 Readmission Reduction Incentive Program									Improvement		Attainment		Final Adjustment	
HOSP ID	HOSPITAL NAME	RY 17 Permanent Inpatient Revenue	RY2018 % Change	RY19 (CYTD16) BASE Case Mix Adj. Readmit Rate	CYTD17 Case Mix Adj. Readmit rate	CYTD17 Case mix Adj. rate Adj for out of state	CYTD17 % Change in instate Case mix adj. Rate	CYTD17 Modified Cumulative Improve Readmit Rate (compounded)	Target	RY20 Scaling %	Target	RY20 Scaling %	RY20 Better of Attain/ Improve	RY20 Scaling %
		A	B	C	D	E	F = D/C-1	G = (1+F)*(1+B)-1	H	I	J	K	L	M = L/A
210051	DOCTORS	$132,931,890	-10.41%	11.78%	11.11%	12.26%	-5.69%	-15.51%	-14.3%	0.12%	10.7%	-2.00%	$159,518	0.12%
210055	LAUREL	$59,724,224	-16.49%	11.82%	11.93%	12.36%	0.93%	-15.71%	-14.3%	0.13%	10.7%	-2.00%	$77,641	0.13%
210056	GOOD SAMARITAN	$158,579,215	-18.05%	12.14%	12.35%	12.43%	1.73%	-16.63%	-14.3%	0.22%	10.7%	-2.00%	$348,874	0.22%
210057	SHADY GROVE	$219,319,153	-9.73%	10.11%	10.31%	10.92%	1.98%	-7.94%	-14.3%	-0.61%	10.7%	-0.43%	-$943,072	-0.43%
210058	UMROI	$67,555,816	-10.65%	10.66%	9.84%	9.84%	-7.69%	-17.52%	-14.3%	0.31%	10.7%	1.00%	$108,089	0.16%
210060	FT. WASH	$19,371,986	-27.41%	9.81%	8.64%	11.41%	-11.93%	-36.07%	-14.3%	1.00%	10.7%	-1.42%	$193,720	1.00%
210061	ATLANTIC GENERAL	$38,966,012	-25.02%	8.90%	9.84%	10.95%	10.56%	-17.10%	-14.3%	0.27%	10.7%	-0.50%	$105,208	0.27%
210062	SOUTHERN MD	$163,339,853	-7.63%	11.20%	10.67%	13.26%	-4.73%	-12.00%	-14.3%	-0.22%	10.7%	-2.00%	-$359,348	-0.22%
210063	ST. JOSEPH	$234,995,507	-10.29%	10.95%	10.37%	10.45%	-5.30%	-15.04%	-14.3%	0.07%	10.7%	0.50%	$1,174,978	0.50%
210064	LEVINDALE	$54,805,171	-28.84%	11.40%	11.77%	12.28%	3.25%	-26.53%	-14.3%	1.00%	10.7%	-2.00%	$548,052	1.00%
210065	HC GERMAN	$62,086,212		10.67%	12.09%	12.88%	13.31%		-3.55%	-1.36%	10.7%	-2.00%	-$844,372	-1.36%
STATEWIDE		**$8,971,214,597**	-10.75%	11.81%	11.58%		-1.95%						**-$15,594,938**	

UMROI is adjusted to 16% of total RY 17 Permanent Inpatient Revenue
Some percentages have been rounded for display. Final scaling values are rounded to two decimal places.
Holy Cross Germantown has an adjusted improvement target

State Total	-$15,594,938
Penalty	**-$31,721,897**
% Inpatient	**-0.35%**
Reward	**$16,126,959**
% Inpatient	**0.18%**

APPENDIX V. OUT-OF-STATE MEDICARE READMISSION RATIOS

Out-of-state readmission ratios displayed below are for September 2016 - August 2017.

Out-of-State Readmission Ratios for RRIP Attainment

Based on CMMI Data September 2016 – August 2017

Hospital Name	Medicare FFS Readmission Rate	In-State Medicare FFS Readmission Rate	Out-of-State (OOS) Ratio	Case-Mix Adjusted Readmission Rate	Case-Mix Adjusted Rate with OOS Adjustment
210001 - MERITUS	18.15%	17.28%	1.05	11.58%	12.16%
210002 - UNIVERSITY OF MARYLAND	18.70%	18.04%	1.04	13.13%	13.61%
210003 - PRINCE GEORGE	18.17%	14.50%	1.25	10.47%	13.11%
210004 - HOLY CROSS	15.59%	14.11%	1.11	11.63%	12.85%
210005 - FREDERICK MEMORIAL	13.00%	12.46%	1.04	10.37%	10.82%
210006 - HARFORD	17.65%	16.88%	1.05	10.63%	11.12%
210008 - MERCY	12.21%	11.98%	1.02	12.76%	13.01%
210009 - JOHNS HOPKINS	18.87%	17.49%	1.08	13.11%	14.14%
210010 - DORCHESTER			1.04	11.42%	11.86%
210011 - ST. AGNES	15.41%	15.22%	1.01	11.72%	11.87%
210012 - SINAI	14.40%	14.23%	1.01	10.57%	10.69%
210013 - BON SECOURS	20.30%	20.30%	1.00	15.38%	15.38%
210015 - FRANKLIN SQUARE	18.46%	18.30%	1.01	12.99%	13.10%
210016 - WASHINGTON ADVENTIST	14.29%	12.67%	1.13	9.38%	10.57%
210017 - GARRETT COUNTY	9.94%	6.86%	1.45	6.48%	9.38%
210018 - MONTGOMERY GENERAL	14.56%	13.80%	1.06	11.76%	12.41%
210019 - PENINSULA REGIONAL	14.98%	14.09%	1.06	10.84%	11.52%
210022 - SUBURBAN	12.60%	11.35%	1.11	11.17%	12.41%
210023 - ANNE ARUNDEL	12.28%	11.84%	1.04	10.61%	11.01%
210024 - UNION MEMORIAL	12.50%	12.32%	1.01	12.34%	12.51%
210027 - WESTERN MARYLAND	14.40%	13.13%	1.10	10.82%	11.87%
210028 - ST. MARY	14.27%	11.69%	1.22	10.90%	13.31%

Hospital Name	Medicare FFS Readmission Rate	In-State Medicare FFS Readmission Rate	Out-of-State (OOS) Ratio	Case-Mix Adjusted Readmission Rate	Case-Mix Adjusted Rate with OOS Adjustment
210029 - HOPKINS BAYVIEW MED CTR	21.25%	20.67%	1.03	14.39%	14.79%
210030 - CHESTERTOWN	15.33%	14.05%	1.09	10.93%	11.93%
210032 - UNION HOSPITAL OF CECIL	16.51%	13.70%	1.21	10.51%	12.67%
210033 - CARROLL COUNTY	14.36%	13.96%	1.03	11.11%	11.43%
210034 - HARBOR	16.43%	16.28%	1.01	13.14%	13.26%
210035 - CHARLES REGIONAL	15.02%	12.97%	1.16	9.62%	11.14%
210037 - EASTON	13.84%	13.32%	1.04	10.53%	10.94%
210038 - UMMC MIDTOWN	23.75%	23.58%	1.01	14.81%	14.92%
210039 - CALVERT	12.57%	10.92%	1.15	8.54%	9.83%
210040 - NORTHWEST	15.00%	14.73%	1.02	11.79%	12.01%
210043 - UMBWMC	15.69%	15.40%	1.02	11.95%	12.17%
210044 - G.B.M.C.	12.44%	12.22%	1.02	10.25%	10.43%
210045 - MCCREADY	14.72%	14.72%	1.00	11.66%	11.66%
210048 - HOWARD COUNTY	15.44%	15.12%	1.02	10.59%	10.81%
210049 - UPPER CHESAPEAKE HEALTH	12.90%	12.70%	1.02	9.72%	9.87%
210051 - DOCTORS COMMUNITY	16.61%	14.95%	1.11	11.11%	12.35%
210055 - LAUREL REGIONAL	21.56%	20.53%	1.05	11.93%	12.53%
210056 - GOOD SAMARITAN	16.81%	16.73%	1.00	12.35%	12.41%
210057 - SHADY GROVE	13.20%	12.46%	1.06	10.31%	10.92%
210058 - REHAB & ORTHO	3.66%	3.66%	1.00	9.84%	9.84%
210060 - FT. WASHINGTON	15.17%	11.61%	1.31	8.64%	11.29%
210061 - ATLANTIC GENERAL	11.54%	10.24%	1.13	9.84%	11.09%
210062 - SOUTHERN MARYLAND	19.26%	15.27%	1.26	10.67%	13.46%
210063 - UM ST. JOSEPH	10.54%	10.44%	1.01	10.37%	10.47%
210064 - LEVINDALE	16.56%	15.95%	1.04	11.77%	12.22%
210065 - HOLY CROSS GERMANTOWN	14.66%	13.60%	1.08	12.09%	13.03%