PMWG Readmissions Sub-group

08/27/2019

HSCRC
Health Services Cost Review Commission

Agenda

1. In-depth Issue Exploration:
   a. Considering Improvement Target Range
   b. Benchmarking Update - Medicare, Commercial
   c. Brief Update on Attainment Considerations
   d. Decision points on Readmission Measure: include oncology, exclude AMA?
   e. Update on tracking Social Determinants of Health

2. Status Update on Priority Areas:
   a. Non-traditional Measure(s) - EDAC Modeling

Generating an Improvement Target

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General Improvement Target Considerations

1. Lack of demonstrated, sustained asymptote suggests that hospitals can still improve
   a. As does lack of shrinking denominator
2. Case-mix adjustment and statewide normative values acknowledge increase in case-mix index over time
3. Sub-group believes improvement target preferable than attainment-only readmission program
   a. Uncertainty in acceptable readmission rate is cushioned with opportunity to earn credit for improvement
4. An acceptable readmission rate will always be non-zero, some readmissions are unavoidable and hospitals should not be unduly pressured to reach zero readmission rate

Potential Improvement Target Calculation Methods

1. Quantify:
   a. Improvement over All-Payer Model; predict similar improvement over subsequent 5 years
   b. Number of readmissions that are also considered avoidable admissions (PQIs)
   c. Improvement needed to bring all hospitals to current statewide median
   d. Impact of reducing disparities on overall readmission rate
2. Understand:
   a. Impact (if any) of medical versus surgical cases
   b. Impact (if any) of TPR hospitals
   c. Research for (open-source) clinical logic was not fruitful

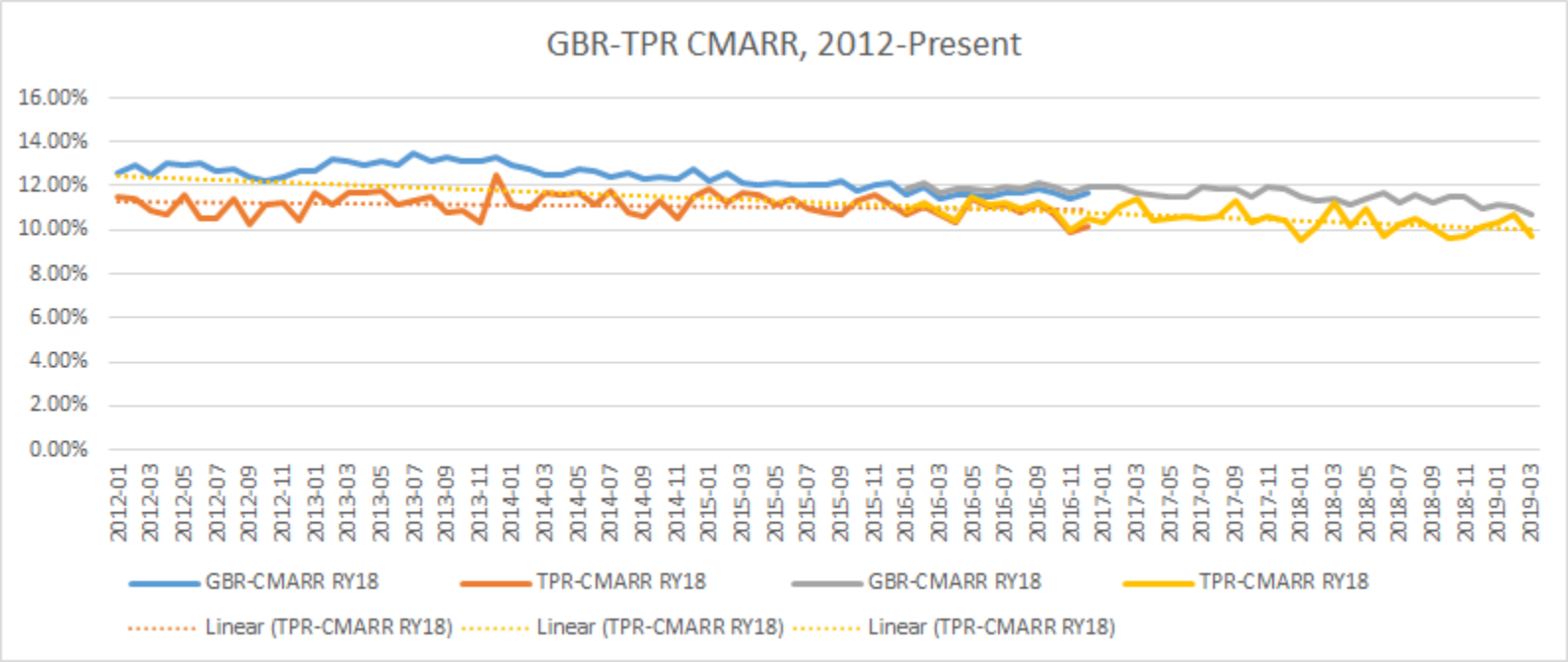
All-Payer Improvement Estimates

Estimating Method*	Percent Improvement	Resulting Readm Rate (2023)**
1. Annual 2013-2018 Improvement	-14.94%	9.73%
2. Annual 2016-2018 Improvement	-11.48%	10.13%
3. Readmission-PQI Reduction (50%)	-9.36%	10.19%
4. All hospitals to 2018 Median	-6.5%	10.70%
5. Reduction in Disparities	-4.2%	10.96%

Other considerations: Medical/surgical, TPR experience, clinical expertise

*The PQI and disparity reduction analysis use RY2020 data without specialty hospitals; all others use RY 2021 for CY16-CY18.

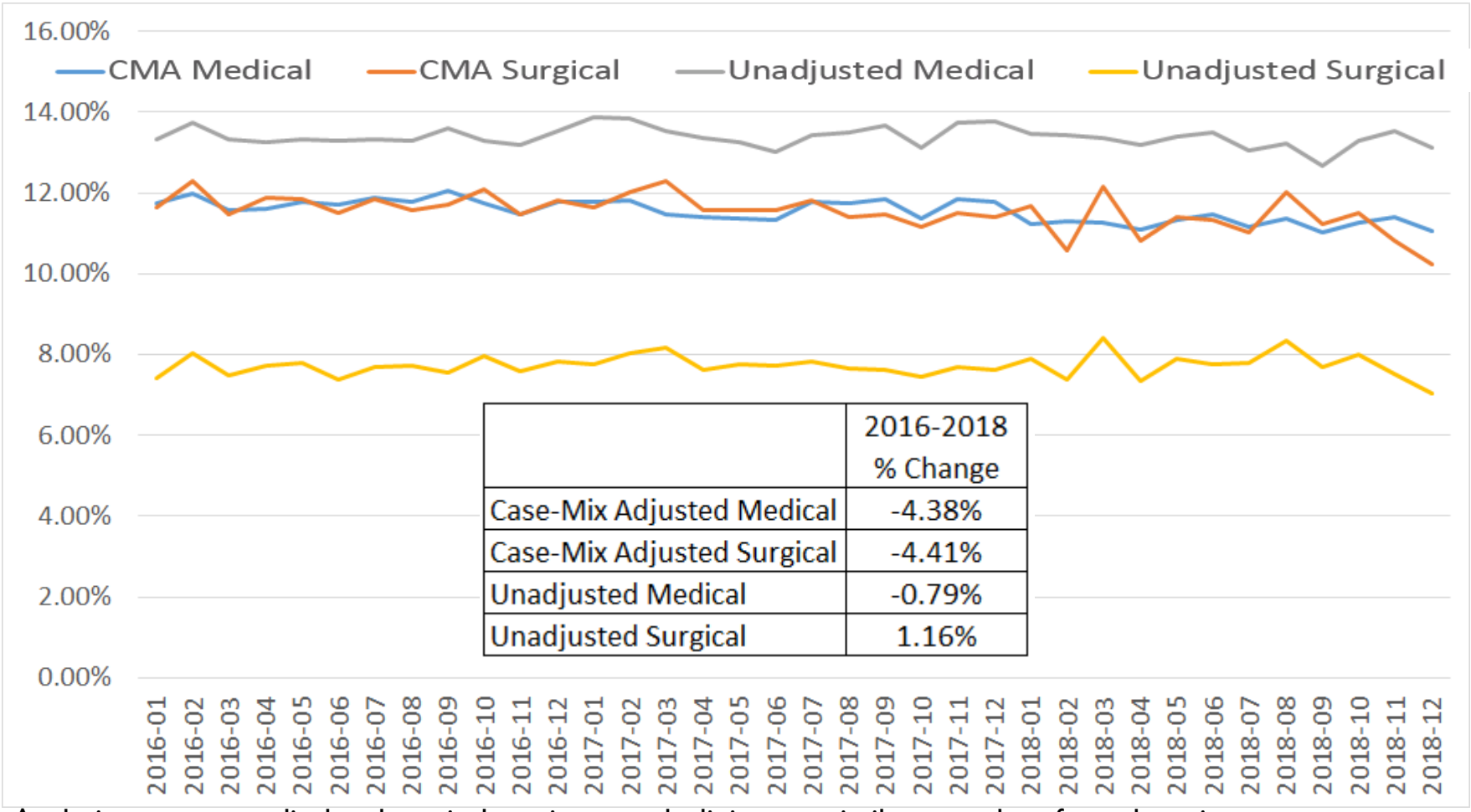
GBR-TPR Hospital Comparison



- Analysis suggests uneven but ongoing improvement in readmission rate for TPR hospitals
- Most recent two-year improvement (2016-2018):

	GBR Hospitals	TPR Hospitals
2016-2018 Improvement	-4.15%	-6.57%

Medical-Surgical Graph



	2016-2018 % Change
Case-Mix Adjusted Medical	-4.38%
Case-Mix Adjusted Surgical	-4.41%
Unadjusted Medical	-0.79%
Unadjusted Surgical	1.16%

Analysis suggests medical and surgical services are declining at a similar rate; therefore, there is not strong evidence to suggest developing separate improvement targets for medical and surgical services.

Surgical cases make up 28% of eligible discharges

Concluding Conversation

1. Additional clinical considerations?
    a. HSCRC does not have clinical expertise to do this; needs to rely on input from this sub-group
2. Timeframe
    a. 2018-2023 improvement target with annual increments
    b. Can be reassessed at end of three years
3. Range of improvement target suggestions to date
    a. 4.2% to 14.9% with current modeling
    b. Staff believe 7.5% (or 1.5% annually) is reasonably within this modeling range
        i. CY 2020 improvement goal would be 3% from 2018

Benchmarking Goals

Overall Goals for Readmission Analysis

- Provide information on readmission trends in comparable geographic areas, to inform establishment of new statewide readmission goals
  - Focus today on methodology and preliminary state level results
  - Discuss next steps on the commercial and Medicare benchmarking

Multi-Payer Benchmarking

Initial focus where data is most available:

- **Medicare Fee-for-service (MC FFS)-**
  - Includes patients covered by the traditional Medicare program, not including those covered under a Medicare Advantage program
  - No adjustments, consistent with CMMI scorekeeping. National peer county benchmarks based on annual data received from CMS in CCW with 100% of national hospital experience.

- **Commercial Payer-**
  - Private payer includes commercial group and individual markets but not Medicare Advantage or Medicaid MCOs.
  - Current data present unadjusted Readmission Rates using Milliman Consolidated Health Cost Guidelines Score Database (CHSD) national data set, which is a combination of claims submitted by carriers and employers.
    - Milliman CHSD has approximately 1/5 of Maryland's estimated Commercial Beneficiaries in its dataset
  - Also have data from MHCC Medical Claims Database (MCDB) for Maryland, which reflects approximately 2/3rds of Maryland commercial claims.
  - All data exclude members ages 65 and over
- No adjustments applied in the data in this presentation

Peer Selection Approach

Medicare FFS Evaluation Unit: County

- **Focus for this effort is member/beneficiary geography:**
  - Geographies align best with per capita measures.
  - Selection of comparison group relies on measures that are available on a geographic basis.
  - Since most HSCRC methodologies are hospital based will need to determine a weighting approach to blend per capita results into each methodology.
- **During this phase we generated peer groups at the county level**.

Characteristics Used to Select Peer Counties

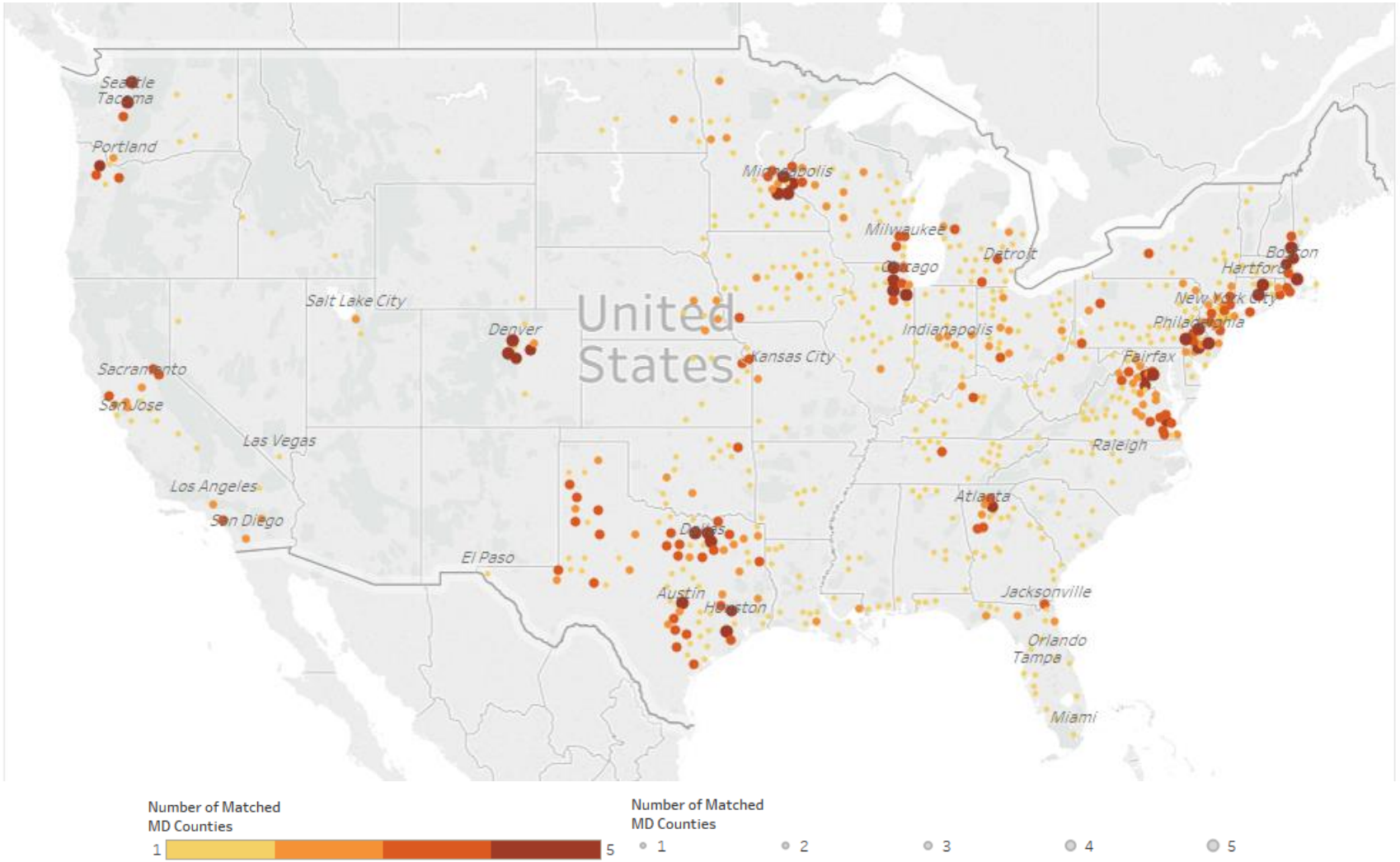
- *Step 1*: Narrow potential peer counties to counties with a similar level of **urbanization**
- *Step 2*: Calculate potential peer county "similarity" to Maryland counties across **4 demographic characteristics**
  - **Median Income; Deep Poverty; Regional Price Parity; Hierarchical Condition Category**
- *Step 3*: **Identify Peer Counties** for each Maryland county
  - Urban counties matched to 20 similar peer counties
  - Non-urban (rural) counties matched to 50 similar peer counties

Differences in Commercial Approach

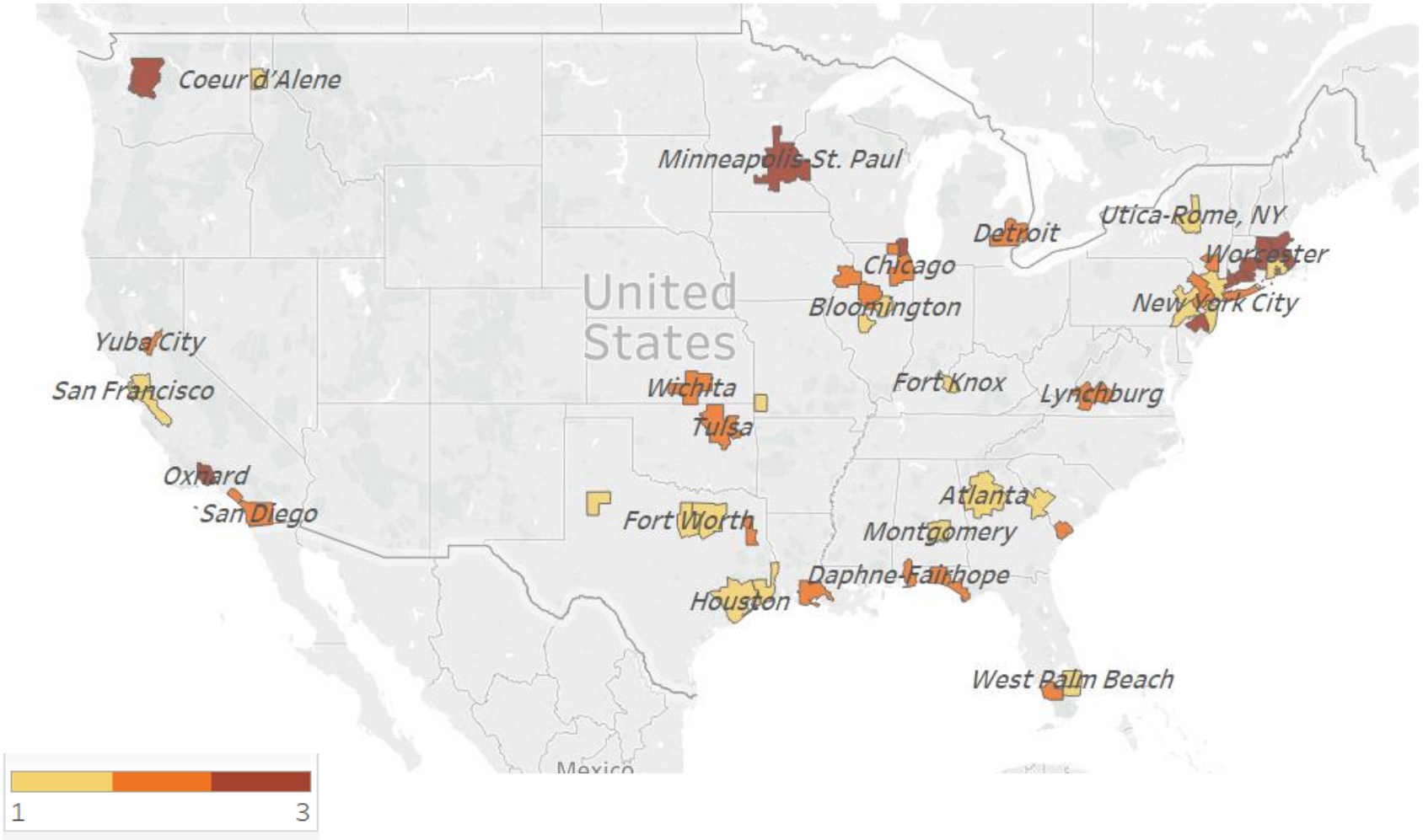
- Overall the approach was similar however, data limitations and the different nature of the population required some adjustment. Key changes were:

Element	Change
Level of geographic aggregation	Outside Maryland data is only available at an MSA level. Using MCDB finer slices are possible in Maryland. To create the best match modified Maryland MSAs were created to eliminate Maryland non-MSA areas and areas shared with other states and these "Modified MSAs" were matched to national MSAs
Narrowing on Urbanization	A combination of population size and density was used to narrow eligible MSAs for the match, rather than the rural-urban continuum element
Matching characteristics	Population, Population Density, RPP, Median Income and Deep Poverty were used as in the Medicare model. In addition: • The HHS Platinum Risk score was substituted for HCC (this is a commercial risk scoring approach used for exchange plans) • % Medicare and Medicaid patients was added to reflect payor mix
Number of matches	20 matches were identified for all Modified MSAs, the lower amount was used due to the much smaller number of MSAs total.

Medicare - Distribution of Peer Counties for All Maryland Counties



Commercial - Distribution of Peer MSAs



Benchmark Comparisons

Medicare Benchmarking (Preliminary)

	Unadjusted Rates	2018 Readmissions Rate			2018 Readmissions per 1000	
		Maryland	Nation	Peer County BM[1]	Maryland	Peer County BM[1]
Performance	Overall (Per CMMI)	**15.40%**	**15.45%**			
	MD % Above (Below) National	*(0.32%)*				
	HSCRC Calculated (CCW)	**14.50%**		**14.28%**	**35.3**	**34.9**
	MD % Above (Below) Benchmark	*1.53%*			*1.09%*	
	Benchmark 25th Percentile (CCW)	**14.50%**		**13.32%**	**35.3**	**30.4**
	MD % Above (Below) Benchmark	*8.9%*			*16.16%*	
Opportunity	Benchmark if all MD counties were at or below **benchmark average**	**14.50%**		**14.00%**	**35.3**	**33.1**
	MD improvement opportunity	*3.47%*			*6.14%*	
	Benchmark if all MD counties were at or below **benchmark 25th percentile**	**14.50%**		**13.32%**	**35.3**	**30.4**
	MD improvement opportunity	*8.15%*			*13.91%*	

1. Benchmark reflects the straight average of each county's peer counties blended to a state average based on MD admits or beneficiaries

Commercial Benchmarking

	Unadjusted Rates	2018 Readmissions Rate				2018 Readmissions per 1000			
		MD APCD	MD CSHD	Nation[1]	Peer MSA BM[2]	MD APCD	MD CSHD	Nation[1]	Peer MSA BM[2]
Performance	Overall (Casemix = 6.40%)	**6.84%**	**7.39%**	**6.82%**	**6.98%**	**2.48**	**2.64**	**2.91**	**3.17**
	MD % Above (Below) Nation	*0.23%*	*8.29%*			*(14.82%)*	*(9.34%)*		
	MD % Above (Below) Benchmark	*(2.06%)*	*5.82%*			*(21.71%)*	*(16.68%)*		
	Benchmark 25th Percentile (CHSD)	**6.84%**	**7.39%**	**5.63%**	**6.53%**	**2.48**	**2.64**	**2.02**	**2.14**
	MD % Above (Below) Benchmark	*4.63%*	*13.20%*			*15.93%*	*23.38%*		
Opportunity	Benchmark if all MD counties were at or below benchmark average	**6.84%**	**7.39%**		**6.72%/ 6.97%**	**2.48**	**2.64**		**2.49/ 2.58**
	MD improvement opportunity	*(1.76%)*	*6.02%*			*(0.47%)*	*(2.40%)*		
	Benchmark if all MD counties were at or below benchmark 25th percentile	**6.84%**	**7.39%**		**6.44%/ 6.53%**	**2.48**	**2.64**		**2.14/ 2.11**
	MD improvement opportunity	*6.20%*	*13.20%*			*16.93%*	*25.34%*		

1. Nation reflects the total of the data in the CSHD and may not reflect an accurate balance of national experience
2. Benchmark reflects the straight average of each Modified MSA's peers blended using APCD admissions or beneficiaries by modified MSA

Summary and Next Steps

- Resolve differences between CMMI and HSCRC calculation of readmission rates

- Discuss how to best utilize this information in calculation of readmission targets
  - Data suggests Maryland performance is around average versus national results
  - 25% benchmarks highlight potential range for improvement

Generating an Attainment Target

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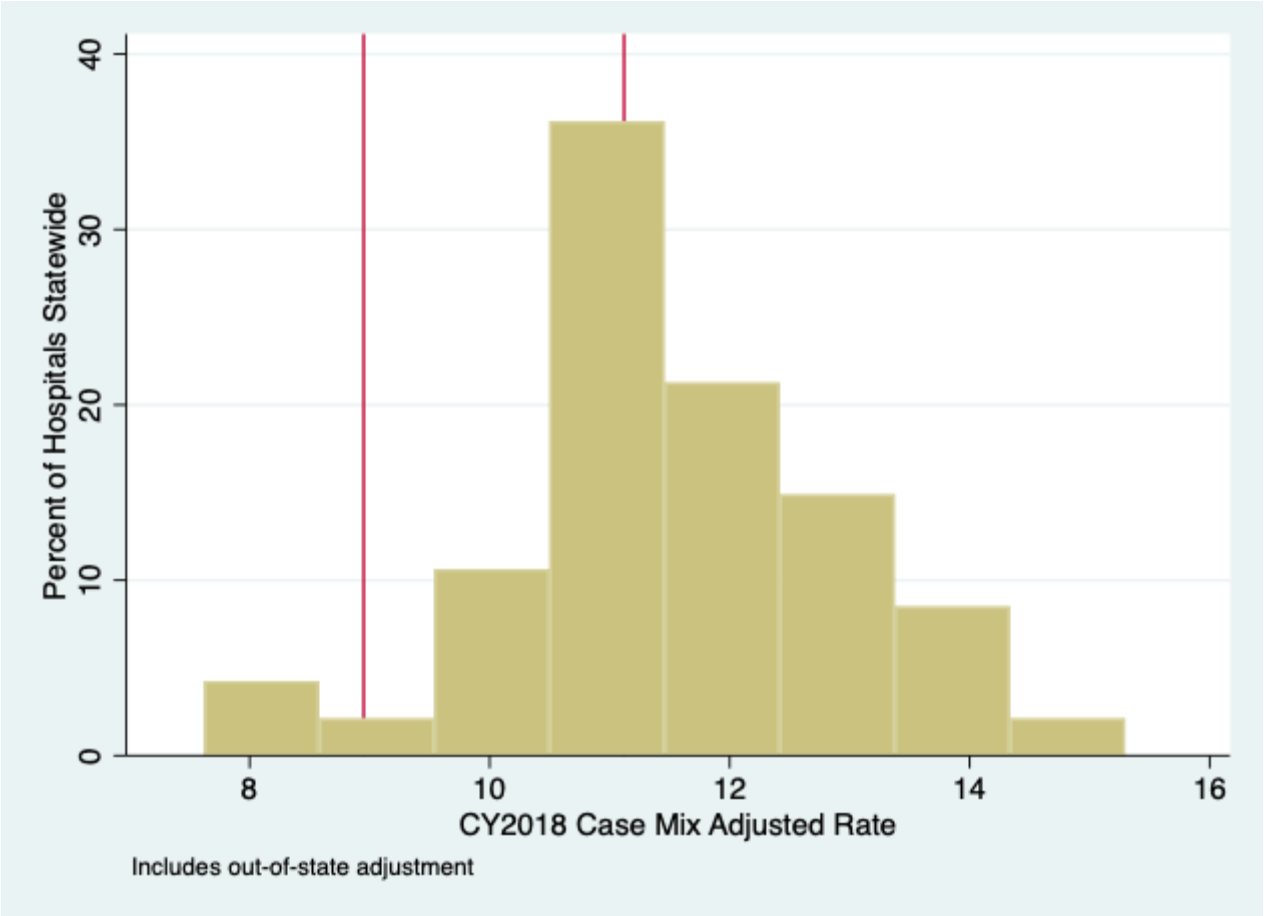
General Attainment Target Considerations

- Current attainment threshold set at the 35th percentile of historical performance plus improvement target
  - If ongoing Medicare and Commercial benchmarking analyses indicate that Maryland is performing about average, then is the 35th percentile of statewide performance reasonable?
  - Should we continue to add in improvement target?

Distribution of CY18 Readmission Rate



Red vertical lines indicate RY21 Attainment Benchmark (8.94%) and Threshold (11.12%)

Decision Points: Readmission measure inclusion and exclusion criteria

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Inclusion of Oncology Patients

Oncology Readmission Measure:

- For many cancer patients, readmission following hospitalization may be preventable; if addressed, would lower costs/improve patient outcomes.
- The Alliance of Dedicated Cancer Centers (ADCC) recognizes the need for oncology-specific efficiency measures, including unplanned readmissions
  - NQF endorsed quality measure: **NQF 3188** 30-day unplanned readmissions for cancer patients
    - The NQF measure should enable hospitals to identify "pockets" where care improvement is possible, enable hospitals to strengthen capacity to match demand
  - Planned readmissions are often used in clinical pathways for cancer patients; this reality is addressed in inclusion/exclusion criteria of the measure
  - Good care does not mean a zero percent readmission rate
- Initial measure in use by oncology-specific hospitals; adapted measure may be used for general acute care hospitals

Oncology Discussions

HSCRC intention to incorporate oncology patients back into readmission measure

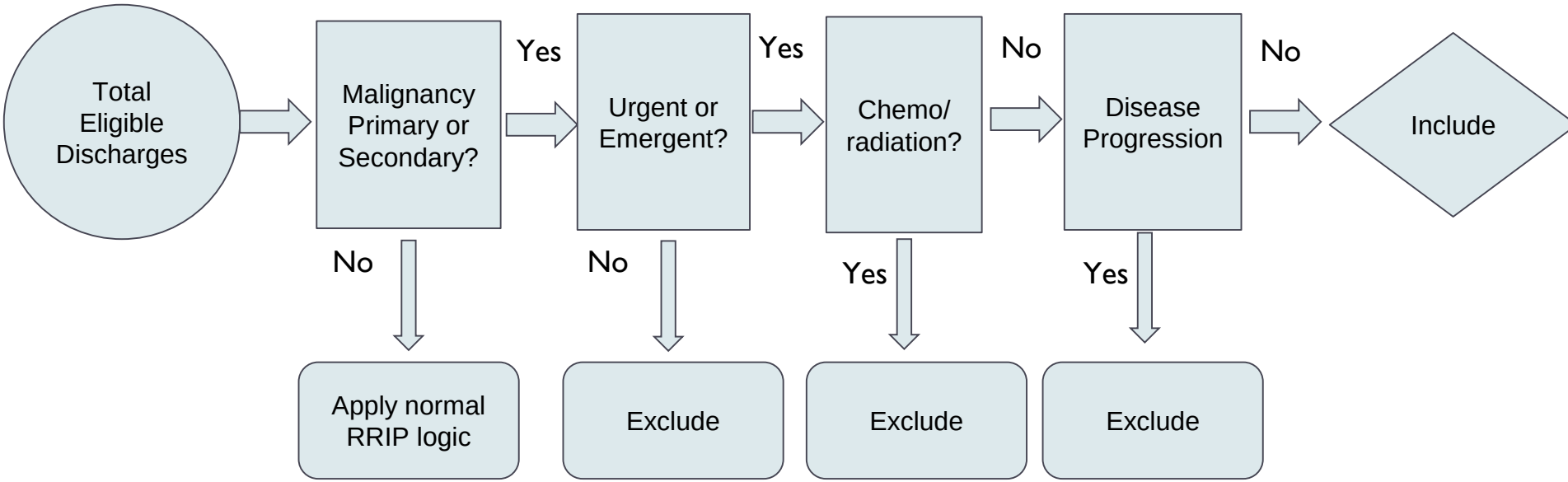
- Spoke with cancer measure developers and Maryland oncologists in July
- Stated concerns from MD oncologists:
  - Definition of oncology in acute-care hospital RE: active cancer treatment?: Developers note the measure ICD-10 CM codes are widely accepted as active treatment (one option is analyze decrease in counts with various diagnosis codes cut-offs)
  - Cases of liquid tumors, lymphoma, leukemia may require additional risk adjustment or be excluded?: HSCRC will analyze case numbers and impact on hospitals of excluding liquid tumors
  - Bone marrow transplants may also require additional risk adjustment or exclusion?: HSCRC notes BMT is on the planned procedure list under the CMS planned exclusion logic - cases are excluded if the discharge condition category is not acute or a complication of care
  - Concern about tracking measure across hospitals given that majority of complex oncology patients go to AMCs (this concern is linked to the BMT and liquid tumors)

Adapted Oncology Measure

- **Denominator:** Comprehensive list of commonly used cancer diagnosis codes from for cancer readmission measure: ICD-10-CM range: C00 – C96.9, J91.0, R18.0, primary or secondary malignant diagnosis
  - Consider exclusion of liquid tumors (leukemias and lymphomas): ICD-10-CM C81.00-C96.0. (bone marrow transplant procedure codes may more effectively identify this patient population than diagnosis codes).

- **Numerator:**
  - Admission was within 30 days of previous hospitalization and had nature of admission coded as emergency (3) or urgent (4)
  - Excludes any admission with primary diagnosis of metastatic cancer, chemotherapy, or radiotherapy
  - CMS planned admission logic also excludes bone marrow transplants (CCS 64) and maintenance chemotherapy and radiotherapy (not included in cancer measure, may be duplicative)

Numerator Flowchart



Preliminary Analysis: ~7000 Cancer Patients would be included in the measure (liquid tumors not yet excluded)

Exclude AMA from Readmission Measure

- Based on Commissioner concerns, staff explored and presented data and literature indicating:
  - AMA patients have high readmission rate
  - Percent of discharges with AMA ranged from 0.5% to 6% on by-hospital basis
  - Reasons cited in the literature for leaving AMA include both patient factors and provider factors
  - Descriptive statistics showing that high proportion of AMA discharges have primary or secondary behavioral health diagnosis and more than half have Medicaid
  - CMS removes AMA patients from readmission measures (although included in our Waiver Test metric)
- Staff recommendation:
  - Remove AMA discharges using Patient Disposition Code to align with CMS
  - Patient disposition = 07 for SFY19 and beyond (Left against medical advice or discontinued care (includes administrative discharge, escape, absent without official leave); 71, 72, 73 for prior to SFY 19)
  - Monitor AMA readmissions and percent of patients discharged AMA

Social Determinants of Health (SDOH) - Update

Introduction

- HSCRC is interested in establishing formal goals around reducing disparities and promoting health equity under TCOC model

- Recent article (Jencks, et al) using Maryland hospital data shows that patient area deprivation index (ADI) and hospital safety-net status (average ADI) are both associated with increased risk for readmission

- Staff are considering potential methods to:
  - Assess patient level adversity, i.e. risk adjust based on sociodemographic factors
  - Measure within-hospital disparity for monitoring or payment program inclusion, in line with NQF recommendations
- Staff will also respond to concerns raised about:
  - Selection of covariates to determine patient level adversity
  - Sufficiency of distribution of hospital patient level adversity to evaluate disparities in outcomes
  - Reporting templates for hospital monitoring

NQF Panel Recommendation

Recommendations Related to NQF Criteria and Processes Related to SDS Adjustment

Recommendation 1: When there is a conceptual relationship (i.e., logical rationale or theory) between sociodemographic factors and outcomes or processes of care and empirical evidence (e.g., statistical analysis) that sociodemographic factors affect an outcome or process of care reflected in a performance measure:

- those sociodemographic factors should be included in risk adjustment of the performance score (using accepted guidelines for selecting risk factors) unless there are conceptual reasons or empirical evidence indicating that adjustment is unnecessary or inappropriate;

AND

- the performance measure specifications must also include specifications for stratification of a clinically-adjusted version of the measure based on the sociodemographic factors used in risk adjustment.

The Patient Adversity Index (PAI) Methodology: Description

1. Regress each adversity metric against readmission (**using separate models**)
    - ADI
    - Medicaid
    - Race/ethnicity
    - Regression coefficient from each model indicates strength of association with readmission
2. "Weight" each discharge's adversity values by their coefficients
3. Sum weights across discharge
    - Estimate joint effect of ADI/Medicaid/race
    - Larger value = higher adversity (i.e. above 1)

The Patient Adversity Index (PAI) Methodology: Modeling Approximate Weights

- Medicaid (dual or only): 4
- ADI (change of 1 SD): 2
- Race/Ethnicity:
  - Black non-Hispanic: 2
  - Native American: 1
  - Asian/Pacific Islander: -4
  - Hispanic: -4
  - White non-Hispanic: 0
- Interpretation: Patients with Medicaid status have a readmission rate ~ 4% higher than others.

The Patient Adversity Index (PAI) Methodology: The Math

Baking a PAI

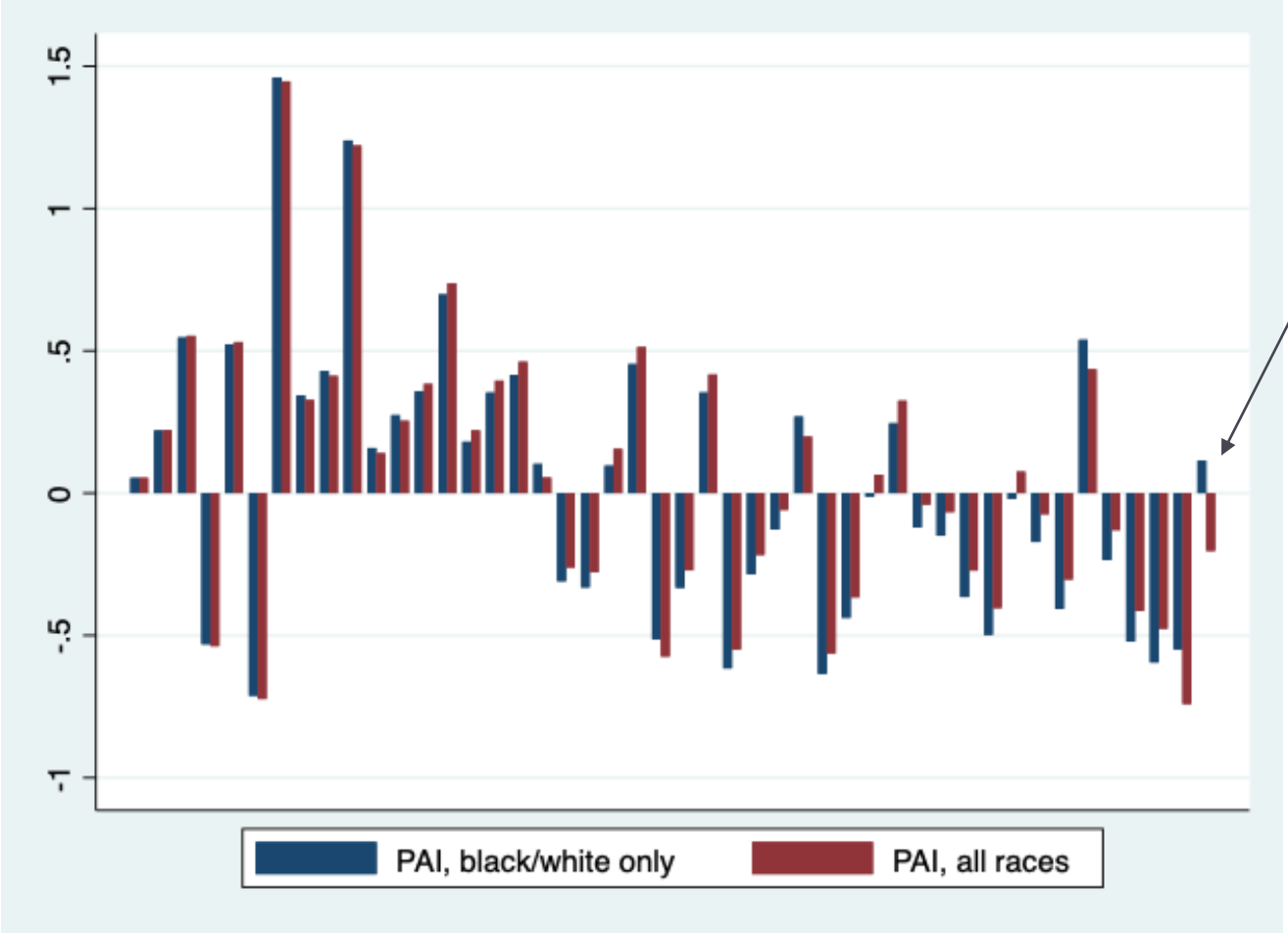
Hospid	EID	Black	Black Weight	Medicaid	Medicaid Weight	ADI	ADI Weight	PAI
210001	2	1	2	1	4	0.8	2	7.6
210003	4	0	2	0	4	0.2	2	0.4

(1*2) + (1*4) +(.8*2)=7.6

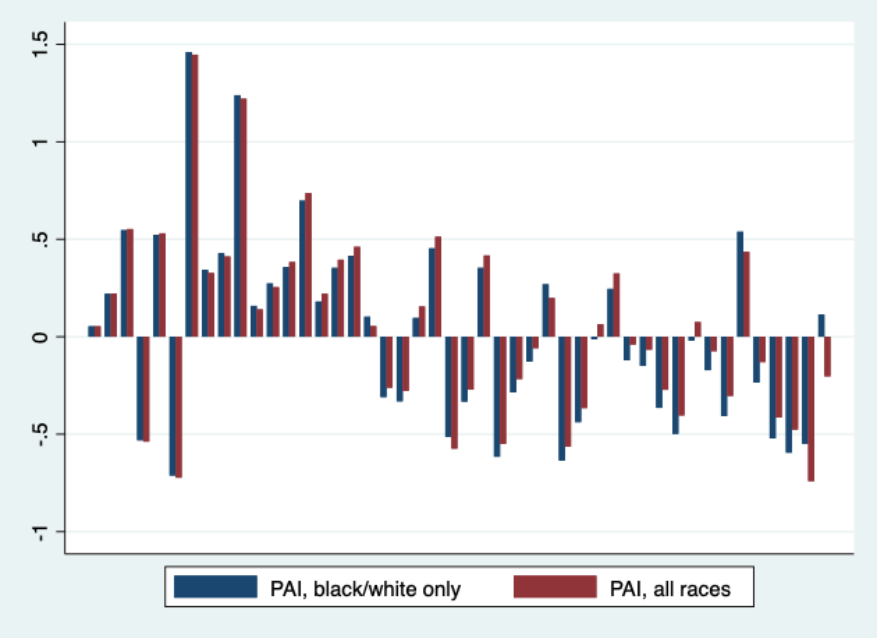
PAI Score is then normalized so that statewide mean is 0. Each one point change in the scale represents a change of one standard deviation.

Concern: Selection of Covariates for PAI Multi-race vs Black/White

Disparity by Hospital Using Two Different PAI's



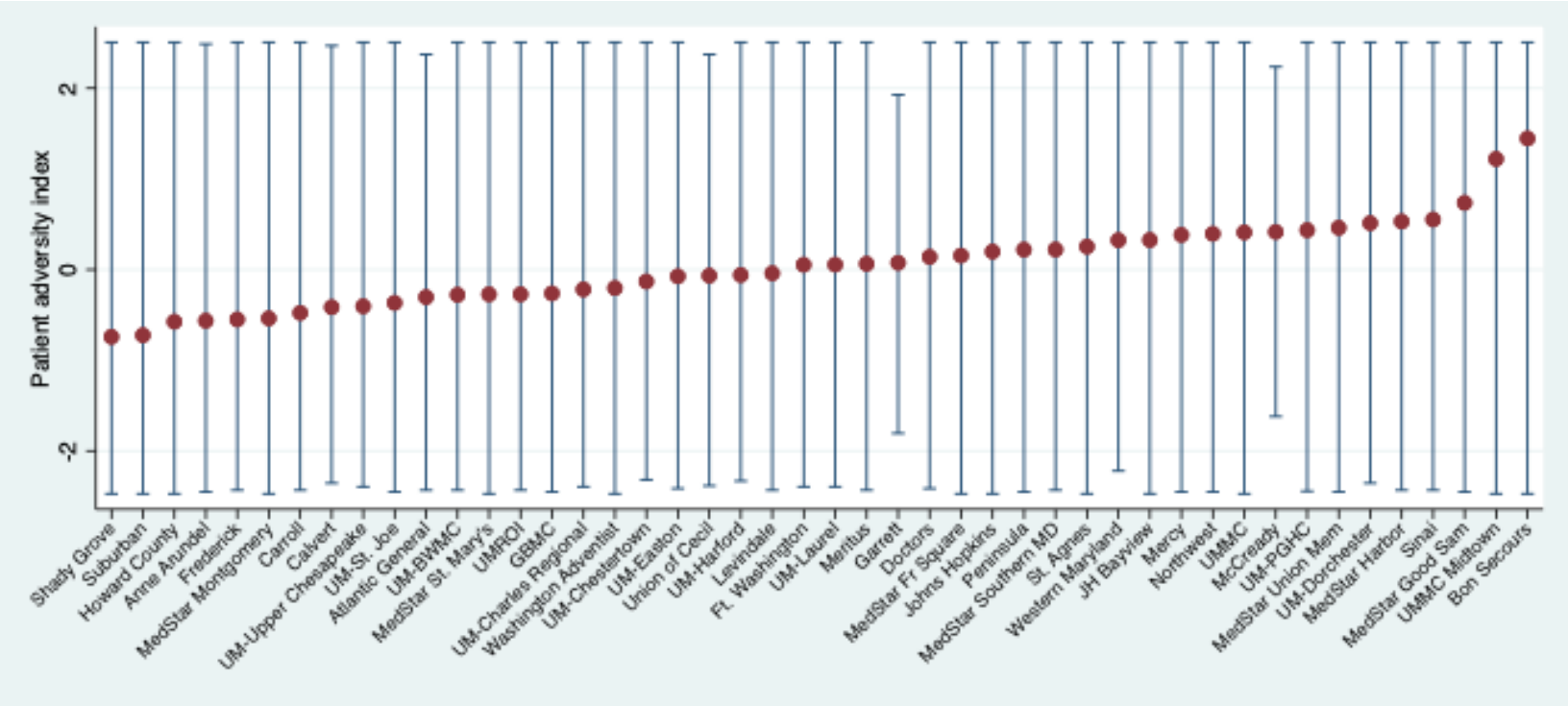
Concern: Selection of Covariates for PAI Multi-race vs Black/White



- Prior iterations of PAI only assessed black vs white variables.
- Formulating PAI with black-vs-white or all races does not change the disparity metric much. The all-races version is more inclusive and enhances statistical power.
- Therefore, staff recommends adopting the all-races version of PAI

Concern: Unique Distribution of PAI

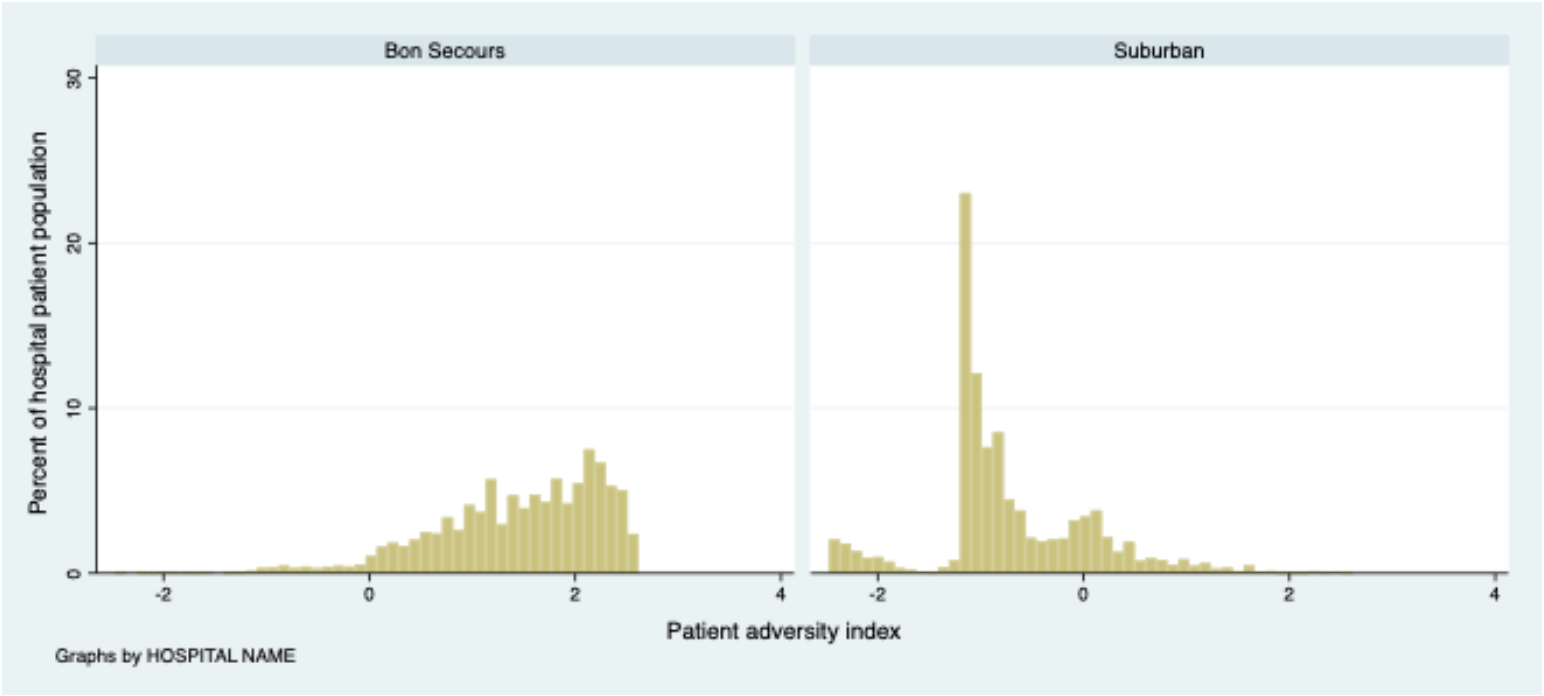
Patient adversity index (PAI): Mean, min, max



- There is substantial overlap across hospitals in the distribution of PAI values, i.e. individual hospitals do not exclusively serve disadvantaged or advantaged populations.
- Analysis suggests it is appropriate to compare disparity by PAI between hospitals.

Concern: Unique Distribution of PAI

PAI: Comparing the extremes

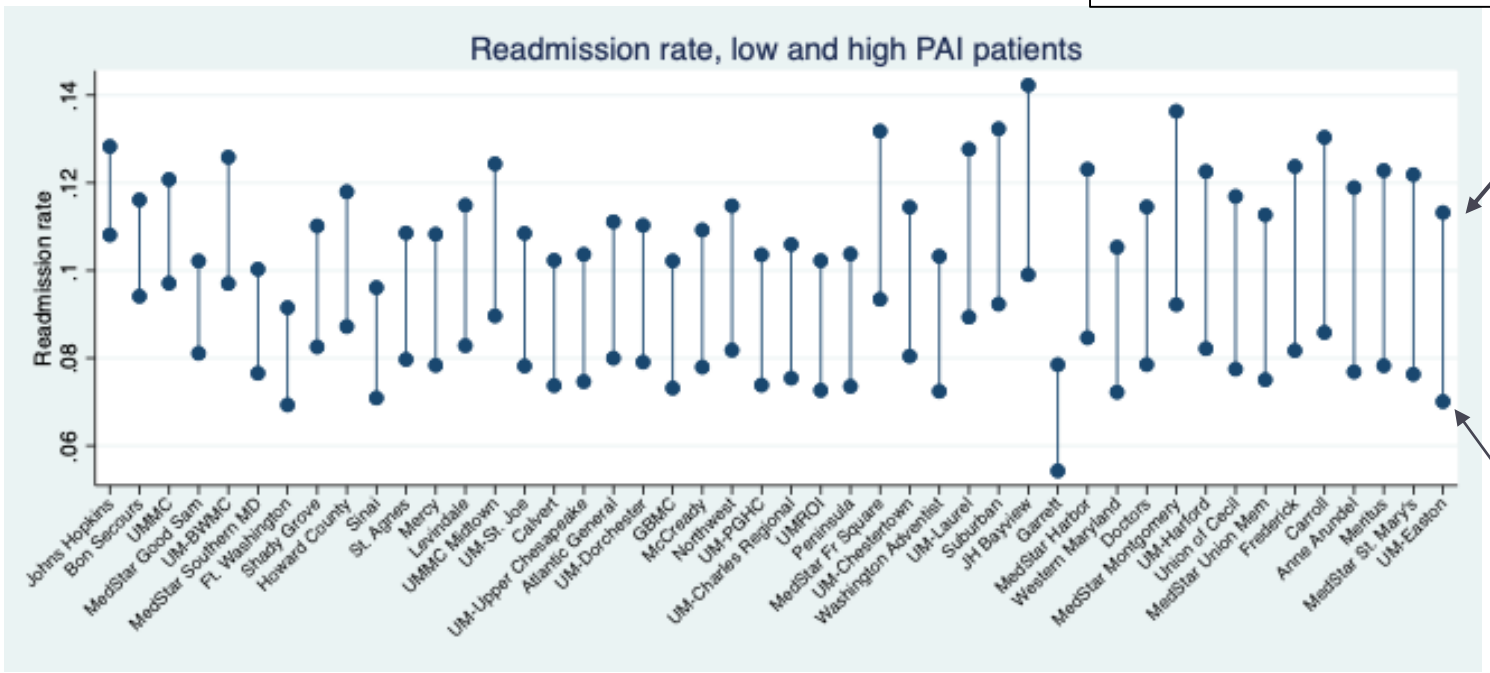


Hospitals with mean PAI values at opposite ends of the range overlap in the types of patients they treat

Measuring Within Hospital Disparity: Risk Difference Approach

- Reflects absolute difference in readmission rate for low and high-PAI patients
  - Adjusted for APR-DRG/SOI risk, age, gender, hospital mean PAI value
- Relatively easy to understand, provides actual rates for each patient group
- Does not reflect whether hospital's performance is better/worse than others
- Year-over-year decrease in risk difference represents improvement on disparities

Measuring Within Hospital Disparity: Risk Difference Approach



% readmitted, high PAI

% readmitted, low PAI

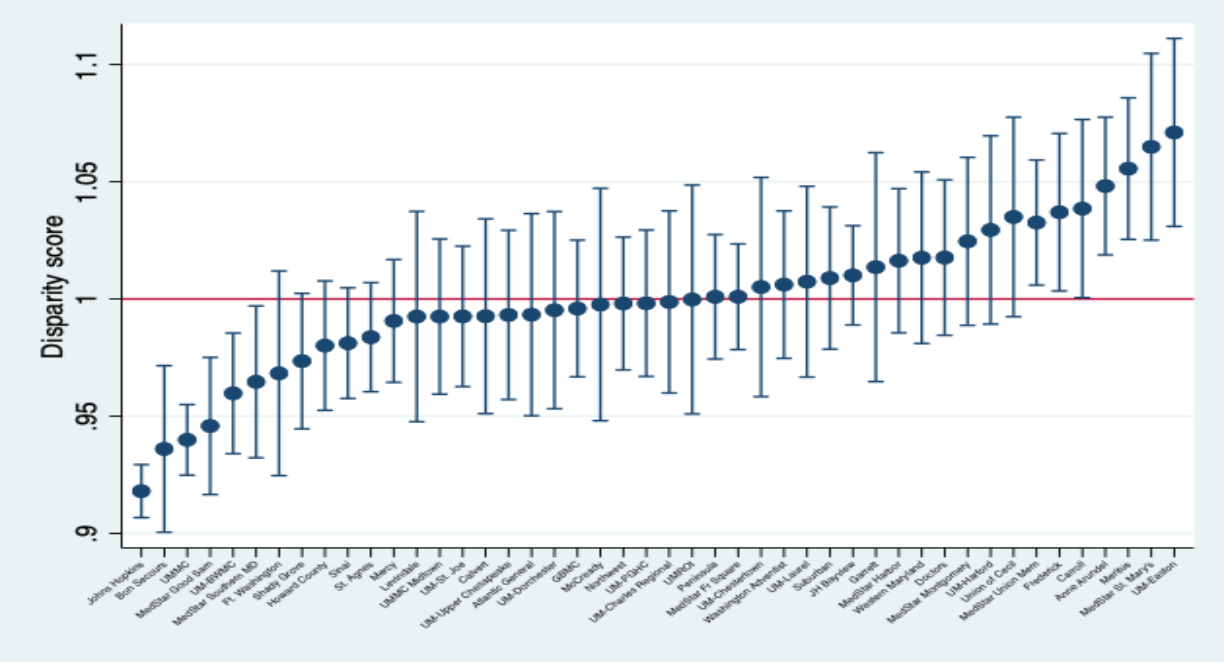
Risk difference disparity score reflects the difference in readmission rates for low- and high-PAI patients

Measuring Within Hospital Disparity: Risk Ratio Approach

- Reflects relative risk of readmission for patients treated at the hospital who have a 1-SD difference in PAI
  - Adjusted for APR-DRG/SOI risk, age, gender, hospital mean PAI value
- Similar to O:E Ratio— the hospital's observed disparity is divided by the average or "expected" level of disparity.
- Does not provide actual readmission rates
- Provides a ready comparison to performance of other hospitals
- Improvement?

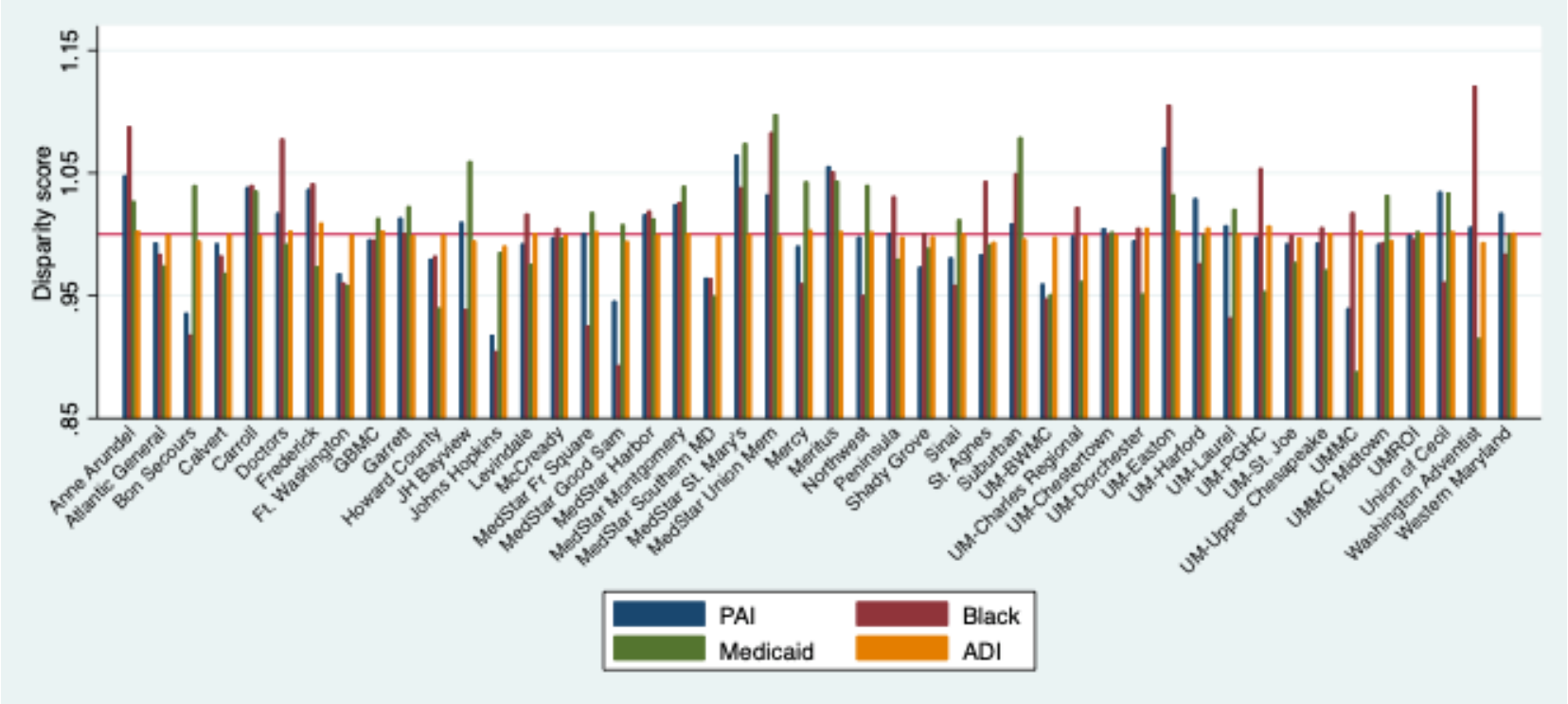
Measuring Within Hospital Disparity: Risk Ratio Approach

PAI Adjusted Within Hospital Disparity Scores with 75% Confidence Intervals



Disparity score reflects risk of readmission for a patient with a PAI of 1, compared to a patient with PAI of 0 (average). >1 indicates high disparity.

Comparing disparity estimates



A hospital with a large race disparity in readmission may be average or better on Medicaid disparity or ADI disparity. Removing one of the three ingredients of the PAI will leave important aspects of disparities unaddressed.

Concluding Thoughts

- PAI captures meaningful variation in patient exposure to social/environmental factors across three dimensions
- There is wide variation in mean PAI scores by hospital, but all hospitals treat a full range of patients, so cross-hospital differences in outcomes by level of PAI may be informative
- The within-hospital disparity score varies substantially across hospitals, and some differences are not explained by chance alone

Recommendation & Next Steps

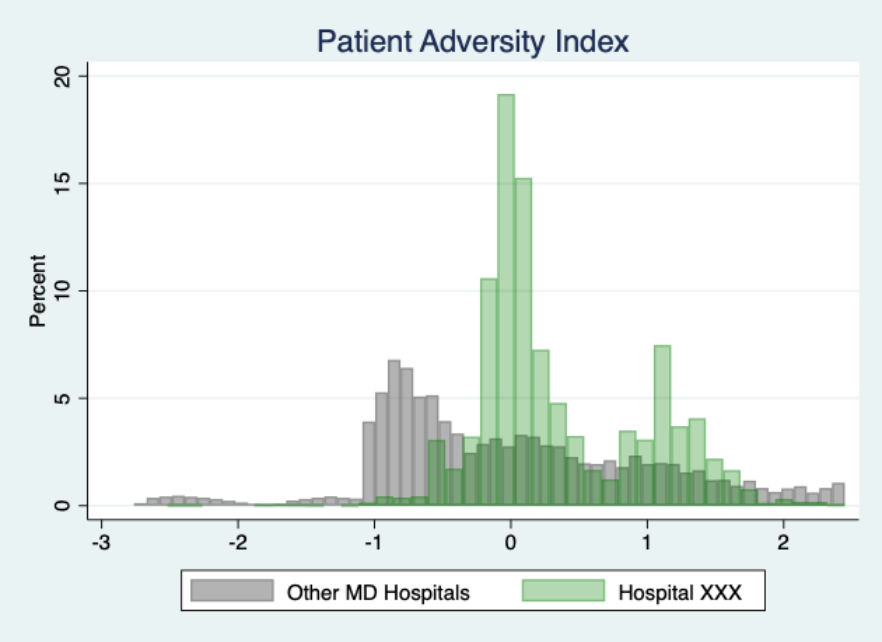
- Implement risk difference disparity scoring methodology using all-race PAI with upside risk only.
- Additional work will need to be done to integrate disparity performance into RRIP revenue adjustment methodologies

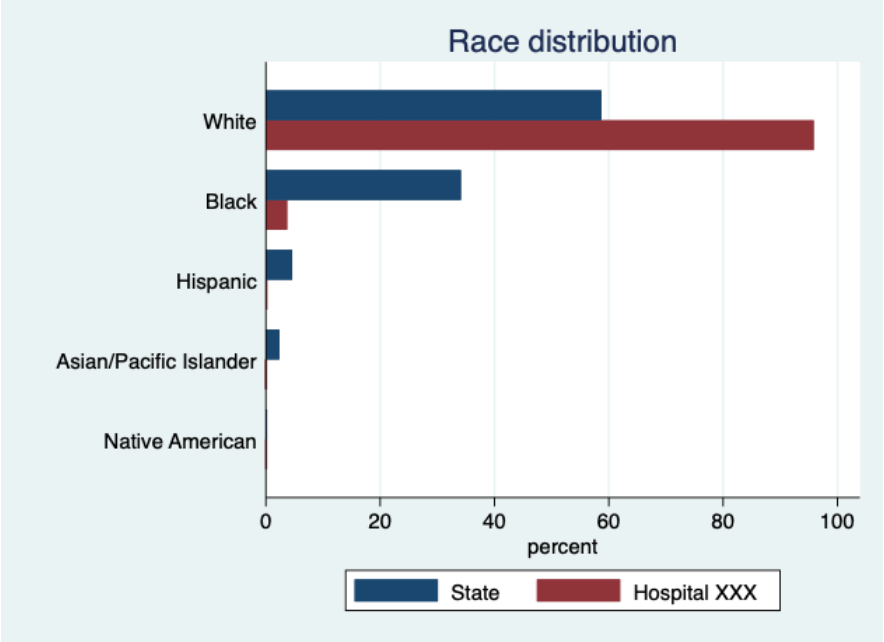
Timeline

	Plan A	Plan B
CY 2019	Finalize within-hospital disparity measure	Finalize within-hospital disparity measure
CY 2020	Include measure in RRIP program at small domain weight for improvement (reward only)	Measure reporting, consider goal for disparity reduction
CY 2021	Consider refinements to measure, attainment/penalty options	Include measure in RRIP program at small domain weight for improvement (reward only)

Concern: Reporting Template and Hospital Monitoring

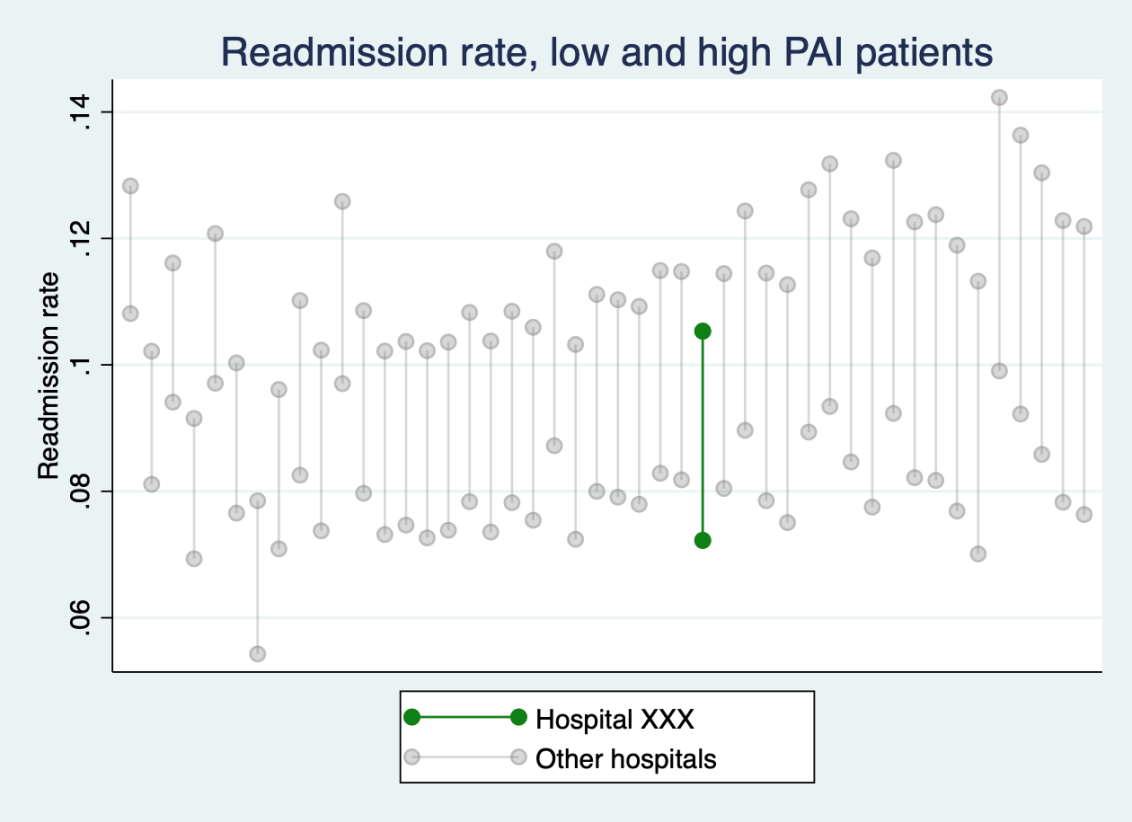
Descriptive Statistics of Patient Population





Concern: Reporting Template and Hospital Monitoring

Disparity Performance



EDAC Modeling

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EDAC Measure and Modeling Considerations

- Plan to ask new methodology contractor to model an all-payer all-cause EDAC measure in coming quarters
- Currently HSCRC staff reviewing CMS EDAC methodology and SAS code to develop flow chart for adapted measure
- In the absence of data, does subgroup still believe that HSCRC staff should propose monitoring this measure during 2020/2021?

Next meeting and conclusion

Next meeting is **Tuesday, Sep 24**