

# **RRIP- Patient Adversity Index and Disparity Gap for Rate Year 2024**

By HSCRC, last updated 6/27/2022

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## Patient Adversity Index and Disparity Gap

This is a user guide specifically for the Patient Adversity Index and Disparity Gap report, used to track within-hospital disparities in readmission rates. For more information about the PAI policy, please visit the [RRIP Final Policy](#).

### Background

Racial and socioeconomic differences in readmission rates are well documented<sup>1,2</sup> and are a source of significant concern. Many Maryland hospitals, as well as the Maryland Hospital Association, identify reduction in readmission disparities as a key priority over the near term. Thus, staff developed the Patient Adversity Index (PAI), a composite social risk index incorporating information on patient race, Medicaid status, and the Area Deprivation Index (ADI) for the area surrounding the patient's address (as recorded in claims). Staff chose, and vetted with stakeholders, these three variables because they are among the few available in claims that capture social determinants of health. Medicaid status is often used as a proxy for income. Race is included, not to reflect biological differences across races, but rather as a proxy for exposure to structural racism.<sup>3</sup> The ADI reflects exposure to diminished access to neighborhood resources, such as health care providers, pharmacies, transportation, and gainful employment, which may impact health outcomes.

### Methodology

The PAI for each patient discharge is calculated by regressing readmission status (yes or no) against Medicaid status, race (black vs. other), and ADI percentile, along with terms for interactions between each of these three variables. The result is a continuous value reflecting the patient's social exposures, weighted by the degree to which each of them is associated with readmissions. The PAI value is then converted to a standardized score which sets the statewide mean at zero and the scale so that a one-unit change is equal to a change of one standard deviation.

To measure the effect of PAI, staff developed a regression model that estimates the slope of PAI at each hospital, after controlling for patient age, gender, and APR-DRG readmission risk. Additionally, staff controlled for the average PAI value for patients at the hospital, as hospitals serving higher proportions of disadvantaged patients may face heightened challenges in reducing readmission rates. The PAI slope, or disparity gap measure, is interpreted as the difference in readmission rates at a given hospital between patients at a base (lower) level of PAI, and patients with PAI one unit higher than the base. The

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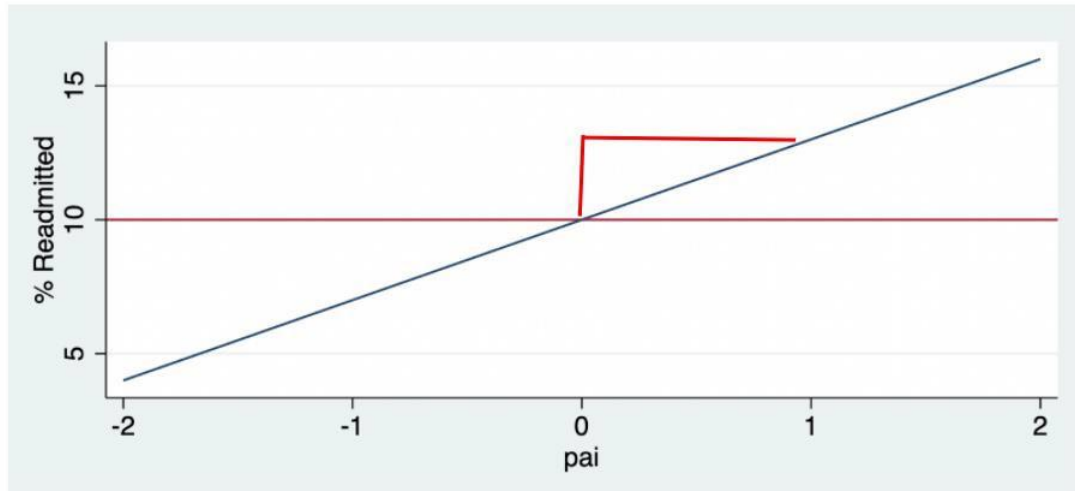
<sup>1</sup> Tsai TC, Orav EJ, Joynt KE. Disparities in surgical 30-day readmission rates for Medicare beneficiaries by race and site of care. *Ann Surg.* 2014;259(6):1086–1090. doi:10.1097/SLA.0000000000000326;

<sup>2</sup> Calvillo–King, Linda, et al. "Impact of social factors on risk of readmission or mortality in pneumonia and heart failure: systematic review." *Journal of general internal medicine* 28.2 (2013): 269-282.

<sup>3</sup> Structural racism is defined as the macro-level systems, social forces, institutions, ideologies, and processes that interact with one another to generate and reinforce inequities among racial and ethnic groups (Powell JA. *Structural Racism: Building upon the Insights of John Calmore.* North Carolina Law Review. 2008;86:791–816.)

change in disparity gap measure from the base year (CY2018) to a given performance year (CY2020) is the performance metric.

## Understanding the Disparity Measure



We use a statistical model to estimate the slope of the line connecting readmission rates at various levels of PAI within a hospital. A flat slope means there is no disparity.

### Data Sources

1. Inpatient Case-mix data run under APR-DRG grouper v39
2. Out-of-state readmission rates from Medicare data obtained from CMMI

# Static Reports User Guide

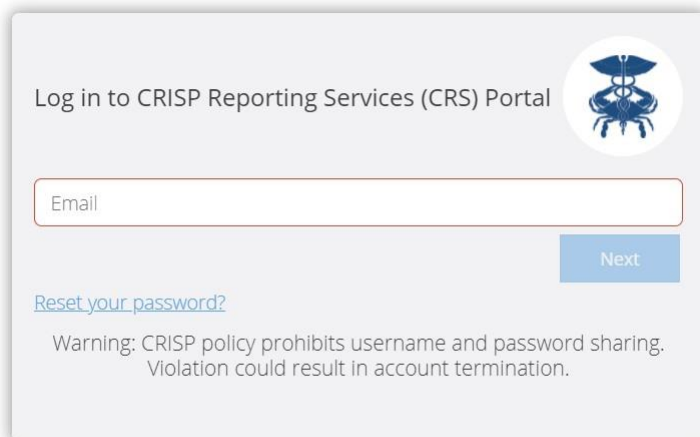
## Readmission Report Access/Card

The Patient Adversity Index and Disparity Gap report can be accessed by visiting [reports.crisphealth.org](https://reports.crisphealth.org) and logging-in with a CRS username and password.

**Step 1.** To access the PAI Report a user must first login to the CRISP Reporting Services Portal by visiting [reports.crisphealth.org](https://reports.crisphealth.org). The following screenshots represent the user's workflow.



**Step 2.** Once in the CRS Portal, a dashboard of different blue report “cards” will appear based on the access permissions of the user. Clicking the card named “Readmissions” will bring up the available reports for this category.



Questions or Concerns? Please contact the [CRISP Customer Care Team](mailto:support@crisphealth.org) at [support@crisphealth.org](mailto:support@crisphealth.org) or 877-952-7477.

**Step 3.** By clicking the excel icon as shown below, you will access the most recent static summary file. An excel workbook will open with all available tabs.



## PAI and Disparity Gap Reports

Sheets included in workbook:

1. Cover Sheet
2. Disparity Gap
- 3a. Medicaid
- 3b. Race
- 3c. ADI

**The following metrics can be found in the PAI and Disparity Gap Report:**

Metric	Description
<b>Average PAI</b>	Average of patient PAI values at each hospital (positive values indicate higher risk of readmission). Patient PAI measure is continuous score of readmission risk based on Medicaid status, race, and Area Deprivation Index.
<b>Disparity Gap (slope)</b>	The disparity gap is the percent difference between the readmission rates at PAI=0 and PAI=1, which also is equivalent to the slope of the line for readmissions across all values of PAI
<b>Risk-Adjusted Readmission Rate</b>	The readmission rate at PAI=0 (lower adversity) and PAI=1 (higher adversity) adjusting for APR-DRG-SOI readmission risk, age, gender and hospital mean PAI.
<b>Eligible Discharges</b>	Discharges eligible for a readmission
<b>Case-Mix Adjusted Readmission Rate</b>	A given hospital's expected number of readmissions based on the process of indirect standardization

<b>Medicaid FFS &amp; MCO</b>	Payer 1 or 2 equals Medicaid FFS/HMO (02,14)
<b>Non- Medicaid</b>	Payer 1 or 2 does not equal Medicaid FFS/HMO
<b>Black</b>	Case-mix variable "rblack" equals 1
<b>Non-Black</b>	Case-mix variable "rblack" does not equal 1
<b>High ADI</b>	Greater than or equal to 85 <sup>th</sup> ADI percentile
<b>Low ADI</b>	Less than 85 <sup>th</sup> ADI percentile
<b>Percent Difference in Readmission Rates</b>	The percent difference between the readmission rates at PAI factor=0 and PAI factor=1

# 1. Cover Sheet

The cover sheet provides an overview of each sheet available in the PAI and Disparity Gap Report.

<b>RY2024 Readmissions Reduction Incentive Program (RRIP)</b>	<b>RY 24 Readmissions Reduction Incentive Program (RRIP)</b>
<b>Disparity Gap Workbook</b>	<b>Disparity Gap Workbook</b>
<b>BASE YEAR</b>	CY2018
<b>PERFORMANCE YEAR</b>	CY2022 YTD Through March (Apr 2021- Mar 2022)
<b>VERSION</b>	APR-DRG Grouper version 39 base & performance period; ADI v. 2019 National Percentiles
<b>INCLUDED IN THIS EXCEL WORKBOOK:-</b>	<b>Description</b>
2. PAI and Disparity Gap by Hospital	Provides average PAI and the current disparity gap metric compared to the 2018 disparity gap metric
3. Patient Sociodemographics by Hospital	<b>Descriptive statistics for PAI components of patients seen at each hospital by year</b>
3a. Medicaid	Readmission rates for Medicaid and non-Medicaid
3b. Race	Readmission rates for Blacks and non-Blacks
3c. ADI	Readmission rates by Area Deprivation Index

# 2. Disparity Gap

The Disparity Gap sheet provides average PAI and the current disparity gap metric compared to the 2018 disparity gap metric by hospital by year.

## Disparity Gap by Hospital

**Average PAI:** Average of patient PAI values at each hospital (positive values indicate higher risk of readmission). Patient PAI measure is continuous score  
**Disparity Gap (slope):** This is the performance metric that will be used to determine disparity rewards (requires improvement in disparity gap and Risk-Adjusted Readmission Rates: These are the readmission rates at PAI=0 (lower adversity) and PAI=1 (higher adversity) adjusting for APR-DRG-SOI)

HOSPITAL #	HOSPITAL NAME	Performance Metric Percent Change in Disparity Gap from 2018 2021 YTD	CY2022 (Rolling 12 month Performance Period)				CY2021				CY2020			
			Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate at hospital centered PAI = 0	Risk-Adjusted Readmission Rate at hospital centered PAI = 1	Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate at hospital centered PAI = 0	Risk-Adjusted Readmission Rate at hospital centered PAI = 1	Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate at hospital centered PAI = 0	Risk-Adjusted Readmission Rate at hospital centered PAI = 1
1		-0.20%	0.1873	1.85%	8.00%	11.89%	0.2022	1.52%	7.84%	11.90%	0.1802	1.62%	7.90%	10.57%
2		-19.40%	0.3690	1.89%	8.20%	10.09%	0.3802	1.82%	8.37%	10.19%	0.4110	2.04%	8.50%	10.54%
3		-18.43%	0.2380	2.13%	7.36%	9.49%	0.2660	2.17%	7.21%	9.39%	0.2477	3.50%	7.18%	10.68%
4		-4.57%	-0.1856	1.69%	7.87%	9.56%	-0.1942	1.71%	8.01%	9.72%	-0.1866	1.39%	8.09%	9.47%
5		-3.31%	-0.5524	2.69%	7.84%	10.53%	-0.5702	2.88%	7.96%	10.64%	-0.6094	2.88%	8.01%	10.89%
6		-8.35%	-0.0150	2.89%	9.68%	11.57%	-0.0132	2.90%	9.54%	12.44%	-0.0450	2.44%	9.28%	11.73%
7		51.62%	0.6469	3.57%	7.57%	11.14%	0.4575	3.19%	7.54%	10.95%	0.4428	2.82%	7.53%	10.53%
8		-18.49%	0.1302	1.93%	9.33%	11.29%	0.1150	2.33%	9.22%	11.55%	0.1586	2.19%	9.46%	11.66%
9		-44.14%	0.4663	1.48%	8.77%	9.74%	0.4771	2.19%	7.86%	10.17%	0.5076	2.14%	7.40%	10.14%
10		11.28%	0.6588	2.08%	7.85%	9.93%	0.6551	2.85%	8.48%	10.53%	0.5776	2.09%	9.52%	9.52%
11		-48.41%	0.2873	1.52%	8.94%	10.46%	0.2569	3.78%	9.07%	10.86%	0.2543	2.39%	8.56%	10.95%
12		-0.27%	-0.1605	2.29%	7.52%	10.20%	-0.1750	3.00%	7.65%	10.54%	-0.1095	1.12%	7.86%	8.88%
13		12.05%	0.4513	1.69%	5.53%	7.04%	0.4561	3.72%	5.24%	6.96%	0.4422	1.41%	4.54%	5.85%
14		-23.66%	-0.5147	3.05%	7.53%	10.58%	-0.5033	2.78%	7.60%	10.38%	-0.5163	3.43%	8.87%	10.50%
15		7.61%	0.4925	2.51%	7.23%	9.74%	0.4385	2.46%	7.07%	9.54%	0.4332	1.97%	6.77%	8.53%
16		-30.16%	-0.8703	2.88%	7.64%	10.52%	-0.8690	3.04%	7.87%	10.91%	-0.8396	4.07%	7.40%	11.47%
17		-8.12%	-0.6119	2.65%	8.77%	11.43%	-0.6184	2.76%	8.70%	11.48%	-0.6502	2.80%	8.77%	11.57%
18		-5.09%	0.6201	3.32%	7.96%	11.28%	0.6369	3.99%	8.39%	11.69%	0.6613	3.02%	7.82%	10.84%
19		20.50%	0.7516	3.09%	6.18%	9.27%	0.7494	2.62%	6.34%	8.96%	0.7391	2.53%	6.72%	9.23%
20		14.60%	-0.3310	4.57%	7.55%	11.10%	-0.3198	4.15%	8.16%	12.31%	-0.3453	3.42%	7.49%	10.91%
21		-24.86%	0.3911	2.52%	9.43%	11.95%	0.4016	2.75%	8.40%	12.21%	0.4391	2.83%	9.05%	11.66%
22		-11.78%	-0.2839	1.95%	6.42%	8.37%	-0.2605	2.04%	6.42%	8.46%	-0.1436	2.21%	6.43%	8.64%
23		8.72%	-0.0742	3.16%	8.16%	11.43%	-0.0194	1.02%	7.81%	10.87%	-0.0191	2.39%	8.25%	10.64%
24		-26.05%	-0.5858	3.55%	7.00%	11.23%	-0.5865	3.25%	7.52%	10.79%	-0.5729	2.83%	7.49%	10.52%
25		-19.55%	0.5272	2.30%	9.78%	12.06%	0.5393	2.87%	9.67%	12.53%	0.6477	2.71%	10.21%	12.92%
26		-34.27%	-0.1878	1.51%	7.89%	9.40%	-0.2051	1.91%	7.57%	9.48%	-0.2462	1.37%	7.92%	9.31%
27		-6.80%	0.0981	1.67%	7.05%	8.72%	0.0672	1.89%	6.67%	8.56%	0.0045	1.17%	5.87%	7.03%
28		-0.50%	1.0664	1.35%	9.13%	10.48%	1.0693	1.88%	8.92%	10.61%	1.1688	2.20%	9.68%	11.89%
29		19.24%	-0.1584	2.45%	8.17%	10.62%	-0.1426	2.74%	8.26%	10.99%	-0.1442	3.10%	7.49%	10.59%
30		-37.84%	0.4773	2.30%	8.25%	10.55%	0.4848	2.04%	8.48%	10.51%	0.4948	3.93%	7.59%	11.51%
31		-10.78%	-0.2256	2.52%	8.80%	11.32%	-0.2261	2.78%	8.65%	11.49%	-0.2527	2.74%	8.62%	11.38%
32		-13.52%	-0.1618	2.29%	6.68%	8.97%	-0.1643	2.35%	6.50%	8.83%	-0.2050	1.61%	7.46%	8.93%
33		12.58%	-0.5588	3.51%	7.81%	11.52%	-0.5650	3.18%	7.80%	10.99%	-0.5538	3.05%	8.17%	11.72%
34		24.81%	-0.1144	3.44%	7.62%	11.28%	-0.3607	3.18%	7.98%	11.17%	-0.3984	2.08%	8.91%	11.00%
35		1.64%	0.4441	1.44%	7.44%	8.44%	0.4424	1.94%	7.14%	8.44%	0.4444	1.44%	7.44%	8.44%



### 3a. Medicaid

The Medicaid sheet provides case-mix adjusted readmission rates for Medicaid and non-Medicaid beneficiaries by year.

Hospitals		Percent Difference in Readmission Rates between Medicaid and Non-Medicaid CY2022	CY2022 (Rolling 12 month Performance Period)				CY2021			
HOSPITAL ID	HOSPITAL NAME		Medicaid FFS & MCO		Non-Medicaid		Medicaid FFS & MCO		Non-Medicaid	
			Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate
		4.0100%	4,336	14.87%	8,628	10.56%	4,420	14.12%	8,038	
		1.9400%	8,615	11.91%	10,362	10.37%	8,748	12.96%	10,524	
		0.8300%	3,568	10.13%	4,798	9.32%	3,661	10.33%	4,965	
		1.0500%	8,896	12.50%	12,620	11.45%	8,785	12.42%	12,902	
		2.1600%	2,541	12.55%	10,238	10.39%	2,289	12.84%	10,570	
		0.8700%	1,245	13.21%	2,140	12.34%	1,253	12.96%	2,158	
		6.4600%	3,590	16.90%	5,581	10.44%	3,756	16.86%	5,748	
		2.5000%	10,567	13.37%	21,542	10.87%	10,591	13.48%	21,208	
		0.3700%	3,410	11.50%	5,300	11.43%	3,462	12.44%	5,349	
		2.0200%	6,062	11.88%	8,360	9.84%	5,984	12.48%	8,345	
		0.4900%	6,319	11.94%	8,882	11.45%	6,558	12.15%	9,132	
		-0.9600%	3,171	11.12%	4,438	11.18%	3,162	12.29%	4,520	
		3.2700%	377	8.35%	1,011	5.08%	388	9.25%	1,018	
		2.8400%	1,184	12.81%	3,918	9.87%	1,200	12.04%	3,024	
		1.2200%	4,372	11.51%	7,910	10.29%	4,196	11.67%	7,994	
		2.8600%	1,347	12.79%	8,117	10.13%	1,421	14.15%	8,225	
		2.1200%	4,102	14.32%	16,968	12.20%	4,053	14.21%	17,149	
		3.8100%	3,358	14.44%	4,858	10.63%	3,493	14.67%	4,872	
		3.4100%	2,441	11.79%	5,430	8.38%	2,428	11.03%	5,415	
		5.1200%	2,094	15.02%	4,448	9.90%	2,040	15.68%	4,397	
		3.3600%	4,650	15.10%	8,317	11.71%	4,986	15.35%	8,285	
		0.1500%	64	4.68%	205	4.53%	80	6.74%	262	
		3.3200%	1,509	13.75%	3,418	10.43%	1,509	12.75%	3,036	

### 3b. Race

The Race sheet provides case-mix adjusted readmission rates for Blacks and Non-Blacks by year.

Hospitals		Percent Difference in Readmission Rates between Black and Non-Black CY2022	CY2022 (Rolling 12 month Performance Period)				CY2021			
HOSPITAL ID	HOSPITAL NAME		Black		Non-Black		Black		Non-Black	
			Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharge	Case-Mix Adjusted Readmission Rate
		-3.92%	1,344	11.51%	11,020	11.98%	1,463	11.61%	10,995	
		7.60%	8,615	11.32%	10,282	10.52%	8,751	11.53%	10,301	
		-3.73%	5,950	9.55%	2,314	9.92%	5,687	9.35%	2,359	
		13.26%	9,131	12.47%	10,345	11.01%	9,373	12.67%	10,314	
		3.16%	1,431	11.11%	11,346	10.77%	1,480	11.77%	11,379	
		-0.16%	717	12.66%	2,669	12.68%	706	12.41%	2,703	
		50.00%	4,803	15.27%	4,368	10.18%	5,002	15.02%	4,500	
		7.47%	12,633	12.23%	19,476	11.38%	12,580	12.68%	19,269	
		9.62%	4,069	11.96%	4,829	10.91%	4,174	12.30%	4,858	
		-3.06%	7,568	10.78%	4,824	11.10%	7,544	11.59%	4,725	
		-9.00%	4,171	10.93%	11,830	11.88%	4,210	11.31%	11,320	
		24.13%	2,839	12.59%	4,769	10.07%	2,832	13.18%	4,850	
		-100.00%	6	0.00%	1,382	5.94%	9	0.00%	1,395	
		34.99%	1,224	13.04%	2,978	9.66%	1,241	13.05%	2,983	
		14.73%	3,378	11.76%	8,904	10.25%	3,362	11.12%	8,828	
		6.35%	2,057	11.06%	7,407	10.40%	2,057	11.02%	7,589	
		7.78%	5,462	13.30%	15,606	12.34%	5,472	13.38%	15,730	
		7.26%	4,588	12.71%	3,628	11.85%	4,715	13.45%	3,650	
		24.73%	207	11.65%	7,544	9.34%	312	10.92%	7,529	
		21.16%	1,537	13.34%	5,005	11.01%	1,494	13.13%	4,943	
		-0.54%	3,704	12.89%	9,263	12.96%	3,873	13.34%	9,198	
		163.71%	45	9.23%	224	3.50%	56	6.44%	294	
		13.19%	544	12.70%	4,383	11.22%	524	13.01%	4,021	
		39.85%	497	15.09%	7,232	10.79%	485	13.09%	7,174	
		-5.55%	2,094	12.76%	3,821	13.51%	2,133	13.40%	3,568	
		-4.02%	2,372	10.02%	2,593	10.44%	2,359	10.27%	2,666	
		32.40%	973	11.85%	3,377	8.95%	967	11.58%	3,284	

