

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^{1,2} 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.³ 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

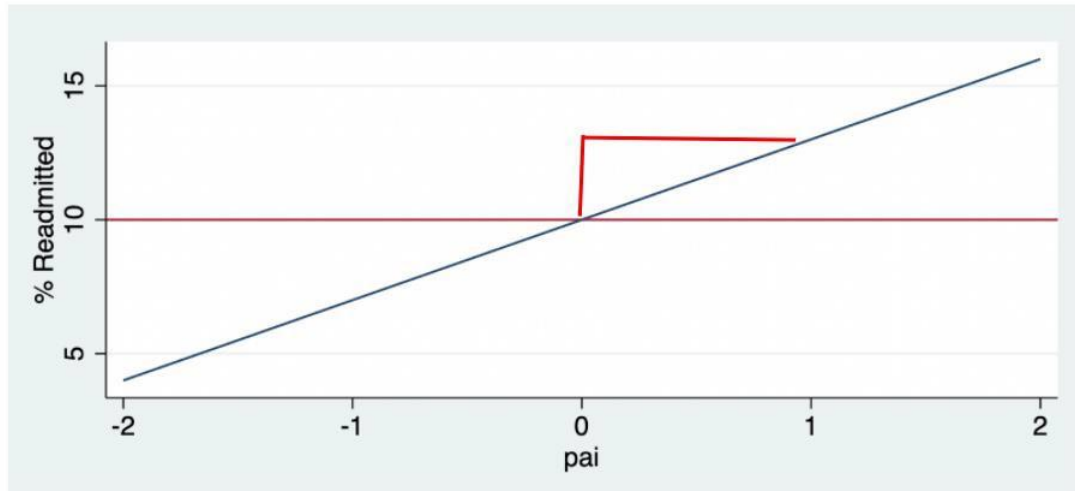
¹ Tsai TC, Orav EJ, Joynt KE. Disparities in surgical 30-day readmission rates for Medicare beneficiaries by race and site of care. *Ann Surg.* 2014;259(6):1086–1090. doi:10.1097/SLA.0000000000000326;

² 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.

³ 5 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

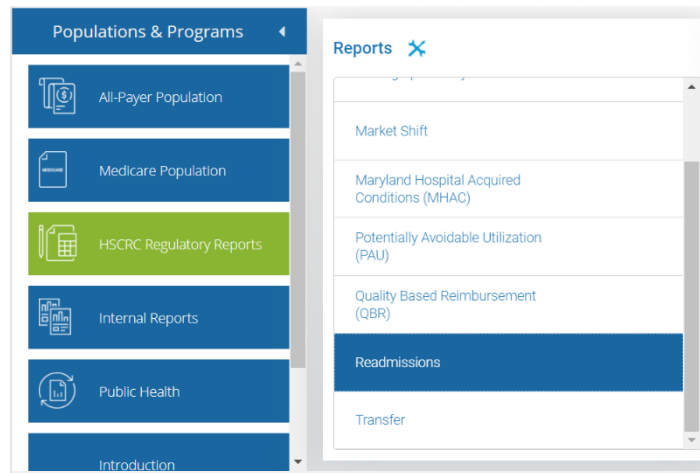
1. Inpatient Case-mix data run under APR-DRG grouper v39
2. Out-of-state readmission rates from Medicare data obtained from CMMI

Static Reports User Guide

Readmission Report Access/Card

The Patient Adversity Index and Disparity Gap report can be accessed by visiting reports.crisphealth.org 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. 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.

A screenshot of the login page for the CRISP Reporting Services (CRS) Portal. The page has a light blue background. At the top, it says 'Log in to CRISP Reporting Services (CRS) Portal' next to a circular logo featuring a blue crab. Below this is a text input field labeled 'Email'. To the right of the field is a blue button labeled 'Next'. Below the button is a link that says 'Reset your password?'. At the bottom of the login area, there is a warning message: 'Warning: CRISP policy prohibits username and password sharing. Violation could result in account termination.'

Questions or Concerns? Please contact the [CRISP Customer Care Team](mailto:support@crisphealth.org) at 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
Average PAI	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.
Disparity Gap (slope)	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
Risk-Adjusted Readmission Rate	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.
Eligible Discharges	Discharges eligible for a readmission
Case-Mix Adjusted Readmission Rate	A given hospital's expected number of readmissions based on the process of indirect standardization

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

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

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															
<p>Average PAI: Average of patient PAI values at each hospital (positive values indicate higher risk of readmission). Patient PAI measure is continuous score</p> <p>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 Rate). These are the readmission rates at PAI(s) (lower adversity) and PAI(s) (higher adversity) adjusting for APR-DRG-DSI</p>															
Hospitals		Performance Metric		CY2022 (Rolling 12 month Performance Period)				CY2021				CY2020			
HOSPITAL #	HOSPITAL NAME	Percent Change in Disparity Gap From 2018 to 2021 YTD	Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate (hospital centered PAI)	Risk-Adjusted Readmission Rate (state centered PAI)	Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate (hospital centered PAI)	Risk-Adjusted Readmission Rate (state centered PAI)	Average PAI	Disparity Gap (slope)	Risk-Adjusted Readmission Rate (hospital centered PAI)	Risk-Adjusted Readmission Rate (state centered PAI)	
		-0.20%	0.1879	3.80%	8.00%	11.80%	0.2029	3.52%	7.84%	11.50%	0.1862	3.62%	7.50%	10.97%	
		-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%	
		-18.43%	0.2580	2.17%	7.95%	8.48%	0.2660	2.17%	7.21%	9.39%	0.2477	3.50%	7.18%	10.68%	
		-4.57%	-0.1856	1.69%	7.87%	9.56%	-0.1842	4.71%	8.01%	9.72%	-0.1866	1.39%	8.08%	9.47%	
		-3.31%	-0.5524	2.69%	7.84%	10.53%	-0.5702	2.68%	7.96%	10.64%	-0.6094	2.88%	8.01%	10.89%	
		-8.35%	0.0130	3.89%	9.68%	12.53%	-0.0312	3.90%	8.64%	12.44%	-0.0438	2.44%	9.38%	11.73%	
		51.62%	0.5149	5.57%	7.57%	11.14%	0.4575	5.19%	7.74%	10.93%	0.4428	2.82%	8.28%	10.35%	
		-18.49%	0.1302	1.93%	9.35%	11.29%	0.1390	2.33%	9.22%	11.55%	0.1586	2.19%	9.46%	11.66%	
		-44.14%	0.4661	1.45%	8.71%	10.71%	0.4771	1.89%	8.74%	10.19%	0.4785	2.14%	9.40%	10.43%	
		-11.28%	0.6588	2.08%	9.93%	10.93%	0.6551	8.48%	9.07%	10.88%	0.5776	2.09%	9.52%	10.95%	
		-48.41%	0.2871	1.52%	8.94%	10.46%	0.2469	3.78%	9.07%	10.88%	0.2545	2.39%	8.58%	10.93%	
		-0.27%	-0.1665	2.27%	7.62%	10.20%	-0.1760	3.00%	7.86%	10.00%	-0.1095	1.12%	7.66%	8.86%	
		12.05%	0.4513	1.06%	9.53%	10.61%	0.4561	1.72%	9.24%	10.96%	0.4421	1.41%	9.59%	10.95%	
		-23.68%	-0.5147	3.05%	7.53%	10.58%	-0.5033	2.78%	7.60%	10.38%	-0.5183	3.43%	8.87%	10.30%	
		7.51%	0.4505	2.53%	7.23%	9.74%	0.4385	2.40%	7.07%	9.54%	0.4352	1.97%	8.77%	8.74%	
		-30.16%	-0.8703	2.88%	7.64%	10.52%	-0.8690	3.04%	7.87%	10.47%	-0.8996	4.07%	7.40%	11.47%	
		-8.12%	-0.6139	2.65%	8.77%	11.43%	-0.6184	2.76%	8.70%	11.44%	-0.6502	2.80%	8.77%	11.57%	
		-5.09%	0.6201	3.32%	7.96%	11.28%	0.6369	3.09%	8.39%	11.49%	0.6013	3.02%	7.82%	10.84%	
		20.50%	0.7516	3.09%	6.18%	9.27%	0.7494	8.63%	6.54%	8.96%	0.7391	2.53%	6.72%	9.23%	
		14.60%	-0.3320	4.57%	7.53%	12.10%	-0.3209	4.10%	8.16%	12.31%	-0.3453	3.42%	7.49%	10.81%	
		-24.86%	-0.3911	2.52%	8.43%	11.95%	-0.4036	2.75%	8.45%	12.21%	-0.4391	2.83%	9.03%	11.86%	
		-11.78%	-0.2639	1.95%	6.42%	8.37%	-0.2655	2.04%	6.34%	8.46%	-0.2495	2.21%	6.43%	8.49%	
		7.20%	-0.0742	3.16%	8.26%	11.43%	-0.0994	3.02%	7.85%	10.67%	-0.0105	2.39%	8.25%	10.64%	
		-6.03%	-0.3884	3.70%	7.70%	11.23%	-0.3863	3.25%	7.50%	10.76%	-0.3729	2.55%	7.49%	10.32%	
		-19.55%	0.5722	5.20%	9.78%	12.06%	0.5993	2.87%	9.67%	12.53%	0.6177	2.71%	10.21%	12.92%	
		-34.72%	-0.1879	7.89%	8.48%	10.95%	-0.2051	1.81%	8.89%	10.71%	-0.2442	1.12%	7.82%	11.31%	
		-1.47%	-0.0861	1.47%	7.05%	8.87%	-0.0672	1.40%	6.97%	8.85%	-0.0045	1.47%	7.05%	7.05%	
		-0.50%	1.0664	1.15%	9.13%	10.48%	1.0693	1.88%	9.52%	10.81%	1.0488	2.20%	9.88%	11.83%	
		-19.12%	0.1584	2.17%	10.21%	11.62%	0.1618	2.24%	10.09%	12.44%	0.1447	2.18%	10.69%	11.49%	
		-37.84%	0.4773	2.50%	8.25%	10.55%	0.4848	2.04%	8.48%	10.43%	0.4048	3.59%	7.59%	11.51%	
		-10.78%	-0.2256	2.52%	8.80%	11.52%	-0.2261	2.78%	8.65%	11.55%	-0.2527	2.74%	11.86%	11.72%	
		-13.52%	-0.1648	2.29%	6.68%	8.89%	-0.1643	2.32%	6.88%	8.84%	-0.2056	1.43%	7.14%	8.49%	
		12.55%	-0.5588	3.51%	7.81%	11.52%	-0.5650	3.18%	7.80%	10.99%	-0.5558	3.55%	8.17%	11.72%	
		24.81%	-0.3744	4.44%	7.82%	11.26%	-0.3807	3.18%	7.98%	11.17%	-0.3984	2.08%	8.91%	11.09%	
		-7.65%	-0.1155	1.18%	8.68%	11.46%	-0.1168	1.45%	8.58%	11.30%	-0.1136	1.45%	8.53%	11.30%	

3a. Medicaid

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

Readmissions by Medicaid Status											
Payer 1 or payer 2 equals Medicaid FFS/HMO (02, 14)											
Hospitals		Percent Difference in Readmission Rates between Medicaid and Non-Medicaid CY2022	CY2022 (Rolling 12 month Performance Period)				CY2021				Case-Mix Adjusted Readmission Rate
HOSPITAL	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	14.57%	8,628	10.56%	4,420	14.12%	8,038		
		1.9400%	8,615	11.91%	10,262	10.97%	8,746	12.96%	10,594		
		0.8300%	3,558	10.13%	4,798	9.30%	3,661	10.33%	4,665		
		1.0500%	6,856	12.50%	12,620	11.45%	6,785	12.42%	12,982		
		2.1600%	2,541	12.55%	10,236	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%	21,258		
		0.8700%	3,418	11.50%	5,305	11.43%	3,483	12.44%	5,349		
		2.0300%	6,062	11.88%	6,360	9.84%	5,954	12.48%	6,345		
		0.4900%	6,319	11.94%	8,882	11.45%	6,358	12.15%	9,132		
		-0.0600%	3,171	11.12%	4,436	11.18%	3,162	12.29%	4,520		
		3.2700%	377	8.35%	1,011	5.08%	388	9.25%	1,016		
		2.8400%	1,184	12.81%	3,818	9.87%	1,200	12.04%	3,824		
		1.2200%	4,372	11.51%	7,910	10.29%	4,196	11.67%	7,994		
		2.6600%	1,347	12.79%	8,117	10.13%	1,421	14.15%	8,225		
		2.1200%	4,162	14.32%	16,946	12.20%	4,053	14.21%	17,149		
		3.8100%	3,358	14.44%	4,855	10.63%	3,403	14.67%	4,872		
		3.4100%	2,441	11.79%	5,435	8.38%	2,436	11.03%	5,415		
		5.1200%	2,094	15.02%	4,448	9.90%	2,040	15.68%	4,397		
		3.3900%	4,650	15.05%	8,317	11.71%	4,688	15.35%	8,285		
		0.1500%	64	4.68%	205	4.53%	80	6.74%	262		
		3.3200%	1,559	13.75%	3,418	10.43%	1,559	12.75%	3,336		

3b. Race

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

Readmissions by Race													
Black	Case-mix variable Rblack=1												
Non-Black	Defaults to zero if rblack does not equal 1												
Hospitals		Percent Difference in Readmission Rates between Black and Non-Black CY2022	CY2022 (Rolling 12 month Performance Period)					CY2021					Case-Mix Adjusted Readmission Rate
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	11.88%	1,483	11.61%	10,995				
		7.60%	8,615	11.32%	10,262	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%	2,668	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%	4,658				
		-3.06%	7,598	10.78%	4,824	11.10%	7,544	11.59%	4,785				
		-8.00%	4,171	10.93%	11,630	11.88%	4,210	11.31%	11,280				
		24.13%	2,839	12.50%	4,768	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%	3,655				
		24.73%	327	11.65%	7,544	9.34%	312	10.90%	7,529				
		21.16%	1,537	13.34%	5,095	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%	3,621	13.51%	2,133	13.40%	3,568				
		-4.62%	2,372	10.02%	2,593	10.44%	2,359	10.27%	2,666				
		32.40%	973	11.85%	3,377	8.95%	957	11.58%	3,284				

3c. ADI

The ADI sheet provides case-mix adjusted readmission rates by low vs high Area Deprivation Index by year.

Readmissions by ADI

High ADI Greater than or equal to 85th ADI Percentile

Low ADI Less than 85th ADI Percentile

Hospitals		Percent Difference in Readmission Rates between High ADI and Low ADI CY2022	CY2022 (Rolling 12 month Performance Period)								
HOSPITAL ID	HOSPITAL NAME		Mean ADI	High ADI		Low ADI				Mean ADI	High ADI
				Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate				
		-22.26%	51.24	525	9.36%	11,839	12.04%		51.59	547	
		-2.78%	46.07	2,285	11.17%	16,612	10.87%		46.48	2355	
		24.12%	33.43	45	11.94%	8,219	9.82%		33.51	43	
		-42.64%	26.02	72	6.74%	19,404	11.75%		26.08	69	
		0.65%	29.51	18	10.88%	12,759	10.81%		29.64	21	
		28.54%	40.32	24	18.26%	3,361	12.65%		39.76	27	
		22.91%	55.37	1,334	15.29%	7,837	12.45%		55.40	1264	
		-4.88%	42.87	3,115	12.38%	26,994	11.89%		43.01	3137	
		-0.35%	51.40	1,149	11.42%	7,569	11.48%		51.79	1197	
		7.36%	52.18	1,894	11.52%	10,528	10.73%		52.15	1675	
		3.79%	47.78	667	12.06%	14,534	11.62%		47.73	653	
		-52.33%	26.61	23	5.33%	7,584	11.18%		26.51	26	
		39.35%	64.23	57	8.11%	1,331	5.82%		64.26	68	
		-10.31%	21.54	6	9.57%	4,196	10.67%		21.62	6	
		-4.41%	57.02	866	11.17%	11,414	10.66%		57.06	866	
		10.43%	15.97	10	11.65%	9,446	10.55%		15.98	10	
		54.55%	22.75	140	19.38%	20,828	12.54%		22.72	137	
		16.93%	55.24	1,200	14.09%	7,018	12.05%		55.56	1281	
		-2.95%	73.12	1,448	9.22%	6,423	9.50%		73.23	1486	
		70.52%	29.54	3	19.78%	6,539	11.60%		29.51	2	
		6.78%	53.90	1,409	13.71%	11,558	12.84%		53.74	1447	
		-188.08%	37.11			269			37.62	1	
		-188.08%	42.84	17	8.80%	4,919	11.41%		43.12	16	
		54.28%	28.37	6	17.11%	7,723	11.09%		28.50	7	