



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

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;

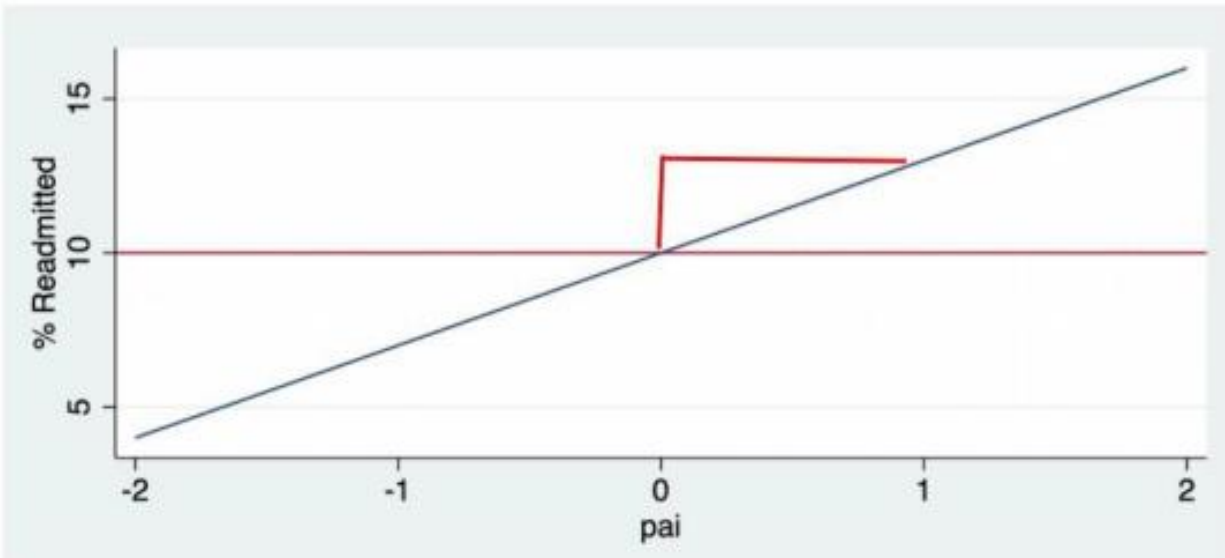
² Calvillo-King, Linda, et al. "Impact of social factors on risk of readmission or mortality in pneumonia and heart failure: systematic review." *Journal of general internal medicine* 28.2 (2013): 269-282

³ 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.)



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 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

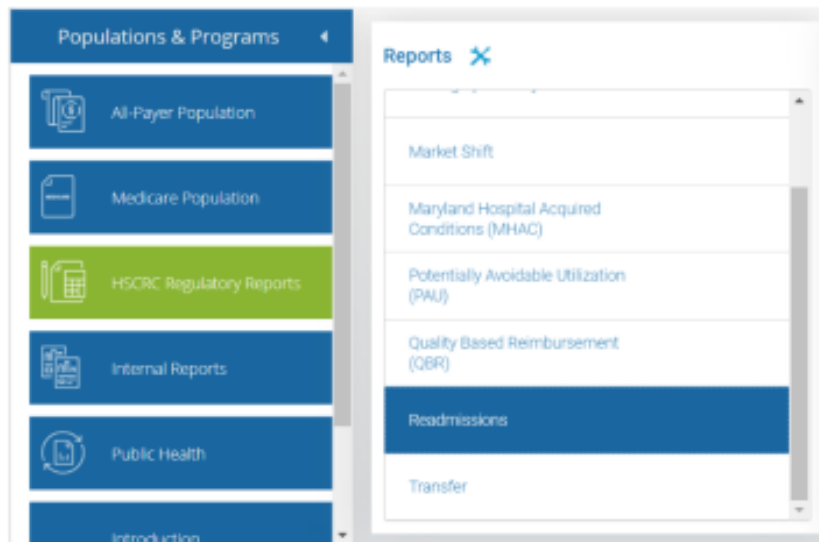
Readmission Report Access/Card

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.



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 APRDRG-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 85th ADI percentile
Low ADI	Less than 85th ADI percentile
Percent Difference in Readmission Rates	The percent difference between the readmission rates at PAI factor=0 and PAI factor=1



Cover Sheet (1)

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

RY2024 Readmissions Reduction Incentive Program (RRIP)	RY 24 Readmissions Reduction Incentive Program (RRIP)
Disparity Gap Workbook	Disparity Gap Workbook
BASE YEAR	CY2018
PERFORMANCE YEAR	CY2022 YTD Through March (Apr 2021- Mar 2022)
VERSION	APR-DRG Grouper version 39 base & performance period; ADI v. 2019 National percentiles
INCLUDED IN THIS EXCEL WORKBOOK:	Description
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	Descriptive statistics for PAI components of patients seen at each hospital by year
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

Disparity Gap (2)

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 patients PAI values at each hospital (positive values indicate higher risk of readmission). Patient PAI measure is continuous score. Disparity Gap (DGap): This is the performance metric that will be used to determine disparity rewards (requires improvement in DGap by year and Non-Adjusted Readmission Rate). (Since we use readmission rates at PAID (lower adjacency) and PAID (higher adjacency) adjusting for APR-DRG-DCI)													
HOSPITAL ID	HOSPITAL NAME	Performance Metric				CY2022 (Rolling 12 month Performance Period)				CY2018			
		Percent Change in Disparity Gap from 2018	Average PAI	Disparity Gap (DGap)	Non-Adjusted Readmission Rate	Non-Adjusted Readmission Rate	Average PAI	Disparity Gap (DGap)	Non-Adjusted Readmission Rate	Non-Adjusted Readmission Rate	Average PAI	Disparity Gap (DGap)	Non-Adjusted Readmission Rate
1		-3.2%	0.187%	0.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
2		-14.2%	0.368%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
3		-18.5%	0.228%	2.2%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
4		-1.8%	0.183%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
5		-3.1%	0.152%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
6		-1.3%	0.153%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
7		16.2%	0.494%	0.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
8		-18.2%	0.132%	1.9%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
9		-4.2%	0.468%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
10		12.2%	0.488%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
11		-18.1%	0.201%	1.3%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
12		-3.7%	0.185%	2.2%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
13		12.0%	0.492%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
14		-29.8%	0.154%	1.9%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
15		7.8%	0.455%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
16		49.2%	0.478%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
17		6.5%	0.411%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
18		-5.0%	0.525%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
19		20.0%	0.752%	0.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
20		14.8%	0.182%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
21		-29.8%	0.281%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
22		-11.7%	0.289%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
23		8.7%	0.172%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
24		-25.8%	0.265%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
25		-19.0%	0.172%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
26		36.2%	0.187%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
27		-4.8%	0.186%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
28		18.5%	0.188%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
29		20.8%	0.171%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
30		-10.7%	0.223%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
31		-11.5%	0.162%	2.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
32		12.5%	0.158%	1.5%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%
33		29.8%	0.174%	1.8%	0.2%	10.3%	0.182%	0.2%	0.2%	11.8%	0.182%	0.2%	0.2%

Medicaid (3a)

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

Readmissions by Medicaid Status										
Page 1 of page 2 equals Medicaid FFS/HMO (EL, 14)										
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 & HMO		Non-Medicaid		Medicaid FFS & HMO		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
1		4.110%	4,730	14.37%	6,020	10.94%	4,610	14.17%	6,020	
2		1.840%	3,810	11.91%	16,202	10.67%	6,740	12.96%	10,564	
3		0.830%	3,558	10.10%	4,790	9.30%	3,900	10.10%	4,665	
4		1.660%	8,896	12.09%	12,620	11.49%	6,700	12.42%	12,662	
5		2.180%	2,841	12.88%	16,238	10.39%	2,098	12.89%	10,971	
6		0.870%	1,248	13.21%	2,140	12.34%	1,260	12.96%	2,198	
7		0.400%	1,988	7.67%	16,804	6.68%	16,448	10.98%	17,052	
8		2.660%	10,987	13.17%	21,142	10.67%	10,911	13.48%	21,750	
9		0.670%	3,418	11.59%	5,500	11.43%	3,480	12.44%	5,549	
10		2.630%	6,862	11.88%	6,300	9.64%	5,664	12.48%	6,341	
11		0.490%	6,718	11.94%	8,882	11.49%	6,038	12.19%	8,121	
12		-0.860%	3,171	11.12%	4,136	11.16%	3,162	12.29%	4,620	
13		2.750%	3,071	8.24%	11,111	8.83%	3,068	11.23%	10,188	
14		2.840%	1,184	12.91%	3,193	9.67%	1,030	12.94%	3,024	
15		1.220%	4,372	11.91%	7,913	10.29%	4,196	11.67%	7,994	
16		2.860%	1,347	12.79%	8,117	10.19%	1,421	14.19%	8,201	
17		2.120%	4,162	14.32%	16,968	12.26%	4,013	14.21%	17,148	
18		3.910%	3,398	14.44%	4,056	10.61%	3,493	14.61%	4,013	
19		3.410%	1,441	11.79%	6,450	9.38%	2,400	11.09%	5,410	
20		5.120%	2,884	13.02%	4,448	9.90%	2,840	13.08%	4,361	
21		3.390%	4,888	13.19%	8,117	11.71%	4,888	13.18%	8,288	
22		0.190%	84	6.68%	288	6.74%	88	6.74%	282	
23		3.320%	1,388	13.76%	3,418	10.47%	1,808	12.73%	3,638	



Race (3b)

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
		-3.02%	1,244	11.81%	11,822	11.86%	5,602	11.81%	10,990	11.81%
		7.60%	6,615	11.32%	10,262	10.52%	8,751	11.52%	10,531	11.52%
		-3.72%	3,868	9.88%	2,214	9.82%	9,887	9.88%	2,238	9.88%
		13.25%	9,131	12.47%	10,345	11.81%	8,715	12.67%	10,514	12.67%
		2.19%	1,451	11.17%	11,246	10.37%	5,465	11.17%	11,278	11.17%
		-4.15%	717	12.95%	2,855	12.65%	705	12.41%	2,732	12.41%
		10.00%	4,882	13.27%	4,388	12.10%	5,022	10.62%	4,505	10.62%
		7.47%	12,031	12.22%	19,470	11.36%	12,950	12.62%	10,200	12.62%
		9.62%	4,388	11.86%	4,629	10.81%	4,174	12.38%	4,638	12.38%
		-3.06%	7,588	10.76%	4,824	11.16%	7,544	11.59%	4,735	11.59%
		-8.09%	4,771	10.90%	11,836	11.88%	4,218	11.21%	11,280	11.21%
		24.17%	2,828	12.55%	4,765	10.87%	2,822	13.18%	4,632	13.18%
		-188.00%	4	0.00%	1,382	5.94%	9	8.00%	1,390	8.00%
		34.00%	1,224	13.94%	2,370	9.95%	1,241	13.02%	2,902	13.02%
		14.72%	3,078	11.76%	8,864	10.20%	3,362	11.12%	8,828	11.12%
		6.35%	2,957	11.88%	7,487	10.45%	2,927	11.62%	7,530	11.62%
		7.19%	5,462	13.26%	19,898	12.34%	5,412	13.38%	19,720	13.38%
		7.25%	4,588	12.71%	5,825	11.87%	4,715	12.42%	3,920	12.42%
		24.72%	327	17.88%	7,544	9.34%	312	18.82%	7,528	18.82%
		21.16%	1,537	13.34%	5,085	11.81%	1,494	13.17%	4,942	13.17%
		-6.84%	3,174	12.88%	9,262	12.86%	3,812	13.34%	8,980	13.34%
		183.71%	48	9.27%	224	3.50%	55	6.44%	234	6.44%
		13.19%	844	12.76%	4,382	11.22%	824	13.61%	4,921	13.61%
		38.05%	487	15.36%	7,212	10.20%	485	17.05%	7,174	17.05%
		-4.38%	2,394	12.76%	3,821	13.17%	2,122	13.69%	3,638	13.69%
		-4.92%	2,372	10.32%	2,187	19.44%	2,339	18.27%	2,690	18.27%
		32.49%	871	11.89%	3,271	8.89%	897	11.98%	3,284	11.98%

ADI (3c)

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

Hospitals		Percent Difference in Readmission Rates between High ADI and Low ADI CY2022	CY2022 (Rolling 12 month Performance Period)				Mean ADI		High ADI	
HOSPITAL ID	HOSPITAL NAME		Mean ADI	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Eligible Discharges	Case-Mix Adjusted Readmission Rate	Mean ADI	Eligible Discharge	Case-Mix Adjusted Readmission Rate
		-22.26%	11,244	625	9.36%	11,828	12.04%	51,185	147	147
		2.76%	46,877	2,285	11.17%	16,612	10.67%	46,485	2,515	2,515
		24.12%	15,463	45	11.94%	6,219	8.62%	15,511	42	42
		-62.64%	28,822	72	8.34%	19,404	11.73%	28,180	88	88
		9.89%	29,511	18	18.88%	12,718	18.81%	29,644	21	21
		28.54%	42,321	24	18.28%	1,361	12.87%	39,718	27	27
		22.81%	52,327	1,226	10.28%	7,237	12.42%	53,465	1,364	1,364
		4.88%	42,837	3,113	12.28%	28,284	11.68%	43,371	3,127	3,127
		-8.31%	11,460	1,149	11.42%	7,888	11.46%	11,778	1,187	1,187
		7.36%	52,186	1,884	11.62%	16,528	18.73%	52,185	1,878	1,878
		3.79%	47,761	887	12.88%	14,534	11.62%	47,779	882	882
		-62.13%	28,871	221	8.33%	7,584	11.18%	28,311	28	28
		28.38%	44,228	837	8.11%	1,323	8.82%	44,348	86	86
		-10.37%	21,544	6	9.57%	4,195	10.67%	21,622	6	6
		4.41%	57,832	868	11.15%	11,414	10.66%	57,881	868	868
		18.42%	15,897	18	11.65%	9,448	10.99%	15,881	18	18
		54.93%	22,776	142	18.38%	20,828	12.84%	22,772	137	137
		18.83%	16,224	1,288	14.89%	7,518	12.89%	16,188	1,281	1,281
		-2.97%	71,132	1,448	9.22%	6,422	9.87%	70,223	1,448	1,448
		79.52%	29,544	3	18.16%	6,538	11.02%	29,511	3	3
		9.78%	13,881	1,408	13.71%	11,388	12.84%	13,749	1,407	1,407
		-188.00%	17,111	1	0.00%	288	4.87%	17,021	1	1
		-188.00%	42,844	17	8.66%	4,318	11.41%	42,132	16	16
		64.39%	16,101	42	17.11%	7,714	11.66%	16,141	21	21