

Clinical Acumen or Biased Clinicians? Locating Racial Disparity in a Comprehensive Primary Care Plus Two-step Risk Stratification Program

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Background

- The Centers for Medicare & Medicaid Innovation (CMMI) mandated that patients be risk-scored to guide enrollment in longitudinal care management, as part of the Comprehensive Primary Care Plus (CPC+) program.
- CPC+ required that risk scoring algorithms be adjustable by clinicians, to incorporate their assessment of patient risk
- Subjective decisions by humans – potentially including risk score adjustments – may be influenced by conscious or subconscious racial bias

Objective

- Determine the extent of racial discrepancy in:
 - Clinician propensity to review for adjustment
 - Adjustment magnitude
 - Enrollment in longitudinal care management

Methods

- We conducted a retrospective cohort study of medicare fee-for-service patients with Penn PCPs, who had a mandated EHR-derived risk score (range 0 to 15) used to guide enrollment in a LCMP at primary care clinics participating in CPC+.
- We used fixed effects regression models to estimate the conditional expectations of the following:
 - The probability that a patient is reviewed for adjustment
 - The probability that an adjustment is made (up or down)
 - The magnitude of the adjustment
 - The probability that a patient is enrolled in longitudinal care management
- Controls included algorithmic score (to proxy health status), date, and clinician fixed effects
- Standard errors were clustered at the patient level

Results

Table 1: summary statistics (right) by Black/White, with differences.

Column1	All	Black	White	Difference
N patients	106,024	21,620	74,584	-52,964
Age	70.9 (12.1)	66.6 (14)	72.8 (10.6)	-6.19 (p<.001)
Female %	58.4	65.7	55.6	0.101 (p<.001)
Medicaid %	15.4	37.9	4.73	0.332 (p<.001)
N Scores/Patient	11.2	0.0776 (0.268)	0.114 (0.318)	-3.67 (p<.001)
Avg Risk Score	238	2.92 (1.7)	2.25 (1.29)	0.671 (p<.001)
Avg Score Adjustment	4.71	0.0445 (0.212)	0.0481 (0.202)	-0.00365 (p = 0.0257)
LCM enrollment	2.66	0.0345	0.0256	0.00885 (p<.001)

Table 2: Regression results (below) All models control for clinician fixed effects, algorithmic risk score, and date. Observations are weighted by the inverse of the number of times an individual appears in the dataset. Standard errors are clustered at the level of the adjusting clinician.

	Dependent variable:		
	Probability of review (1)	Adjustment Magnitude (2)	LCM enrollment (3)
Asian	-0.009* (0.005)	-0.039* (0.023)	0.001 (0.001)
Black	1 -0.014*** (0.004)	2 0.065*** (0.017)	3 0.005*** (0.001)
Hispanic	-0.004 (0.005)	0.0001 (0.019)	-0.0002 (0.002)
Other	-0.006* (0.004)	0.042** (0.019)	-0.0003 (0.001)
Adjustment Size			5 0.001 (0.002)
Ever Adjusted			4 0.016*** (0.002)
Observations	122,060	78,815	501,430
R ²	0.598	0.453	0.066
Adjusted R ²	0.588	0.450	0.060
Residual Std. Error	0.222 (df = 118905)	0.233 (df = 78485)	0.039 (df = 498317)

Note: *p<0.1; **p<0.05; ***p<0.01

Limitations

- The study is limited to the Medicare Fee-for-Service population while the two-step risk prediction was applied to all patients at participating practices
- While we control for several key confounders – including heterogeneous patient mixes via clinician fixed effects, and algorithmic score as a proxy for health status – unmeasured confounding may still bias these estimates.

Key Findings

- Black patients were 1.4 percentage points less likely to be reviewed for risk score adjustment by their primary care provider.
 - If reviewed for adjustment, Black patients were adjusted upwards slightly more than were white patients.
 - Black patients are 0.5 percentage points more likely to be enrolled in longitudinal care management.
 - Enrollment in longitudinal care management is associated with ever having been reviewed for adjustment.
 - Enrollment in longitudinal care management is not associated with the magnitude of the adjustment
- Results for Asian patients were marginally significant.

Conclusions

- We detect small but statistically significant racial disparities in clinician behavior with respect to risk adjustment.
- On average, clinicians are slightly less likely to review the risk scores of their Black patients
- When reviewed, a Black patient is more likely to be adjusted upwards (toward more risk) than a White patient with the same risk score
- While the act of risk adjustment is associated with enrollment in longitudinal care management, the magnitude of the adjustment is not.
- Black patients are more likely than white patients to be enrolled in longitudinal care management, both unconditionally AND after controlling for a suite of confounders.