Association between public health partnership and telehealth infrastructure and Medicare cost and disparities among patients with depression

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BACKGROUND

- Research has shown the effective role of public health system (PHS) integration in mental health care: reduced health disparities, reduced costs, reduced preventable hospitalization and avoidable emergency department visits.
- Health information technology has been widely adopted since the pandemic, especially in mental health care.
- Digital divide is also a public health crisis.
- The COVID-19 pandemic has underscored the importance of PHS partnership and telehealth.

OBJECTIVE

- To examine the association between PHS partnership and telehealth-post discharge and racial disparities in health care expenditures among patients with depression and coexisting multiple chronic conditions.

DATA AND MEASURES

- The analysis used a merged dataset of 2020 CMS Medicare inpatient claims data, the Medicare Beneficiary Summary File, and the American Hospital Annual Survey.
- Our study focuses on community-dwelling Medicare fee-for-service beneficiaries aged 65 years and up who had depression and multiple chronic conditions (MCC).
- PHS partnership was defined as one if the hospital reported a partnership with local or state public health organizations or local or state human/social service organizations and zero as otherwise.
- Telehealth-post-discharge was defined as one if the hospital adopted telehealth remote patient monitoring post-discharge or telehealth remote patient monitoring for ongoing chronic care management, and zero as otherwise.
- The total cost of Medicare payments per person per year was the sum of Medicare payments on major services. We used the generalized linear model with log link and gamma variance distribution to estimate the total Medicare payments.

RESULTS

Figure 1: Probability of Being Treated in Hospitals with LHD and HIT

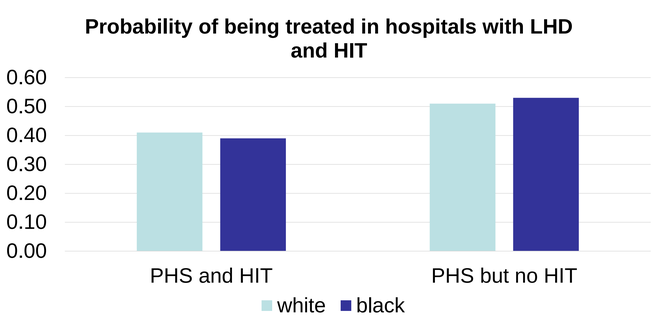

Figure 2: Average Annul Total Medicare Payment, FFS

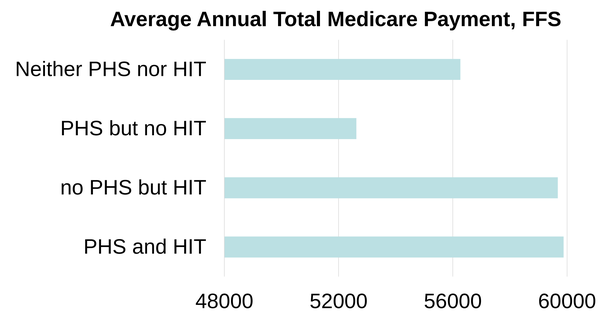

Table 1: Sample Characteristics, n=563,126

	mean	std dev
white	0.95	0.22
black	0.05	0.22
age6574	0.48	0.50
age7584	0.36	0.48
age85up	0.15	0.36
female	0.61	0.49
heart	0.57	0.50
diabetes	0.47	0.50
hyperl	0.88	0.32
hypert	0.96	0.19
asthma	0.15	0.36
Teaching hosp	0.77	0.42
Bed size small	0.05	0.22
Bed size medium	0.23	0.42
Bed size large	0.71	0.45

Table 1: Sample Characteristics, *cont*

	mean	std dev
Gov hospital	0.10	0.30
Non for-profit hospital	0.80	0.40
For profit hosp	0.10	0.29
metro	0.92	0.28
micro	0.07	0.25
rural	0.02	0.13
SVI Q1	0.23	0.42
SVI Q2	0.23	0.42
SVI Q3	0.21	0.41
SVI Q4 (the most vulnerable)	0.32	0.47

Table 2: GLM regressions with log link and gamma variance distribution, state fixed effects

	coef	95% CI		p-val
Black	0.04	0.02	0.05	0.00
Neither PHS nor HIT	ref			
PHS and HIT	0.05	0.04	0.06	0.00
no PHS but HIT	-0.01	-0.04	0.01	0.27
PHS but no HIT	-0.02	-0.03	-0.01	0.00
age7584	-0.05	-0.06	-0.05	0.00
age85up	-0.21	-0.22	-0.21	0.00
female	-0.12	-0.13	-0.12	0.00
heart	0.29	0.28	0.29	0.00
diabetes	0.09	0.08	0.09	0.00
hyperl	0.02	0.01	0.03	0.00
hypert	0.10	0.09	0.12	0.00
asthma	0.09	0.08	0.10	0.00
Teaching	-0.22	-0.23	-0.22	0.00
Bedsize medium	-0.05	-0.07	-0.04	0.00
Bedsize large	-0.12	-0.13	-0.11	0.00
for profit hospital	ref			
Gov hospital	0.03	0.02	0.04	0.00
Non for profit hospital	-0.06	-0.07	-0.05	0.00
rural	ref			
metro area	0.23	0.21	0.25	0.00
micro area	0.09	0.07	0.11	0.00
SVI Q1	ref			
SVI Q2	-0.01	-0.02	-0.01	0.00
SVI Q3	0.03	0.02	0.04	0.00
SVI Q4 (the most vulnerable)	0.05	0.04	0.06	0.00

Table 3: GLM regression with interaction terms

	coef	95% CI		p-val
PHS and HIT *black	-0.06	-0.11	-0.02	0.01
no PHS but HIT *black	0.02	-0.09	0.12	0.74
PHS but no HIT *black	-0.03	-0.07	0.02	0.21

RESULTS

- Compared to White, Black patients with depression and MCC encountered significantly higher total medical costs ($67,340 vs. $55,285).
- Results showed that compared to patients treated in hospitals with neither a PHS partnership nor telehealth-post discharge, beneficiaries treated in hospitals with a PHS partnership and telehealth-post discharge encountered significantly lower Medicare payments (coef=-0.04, p<0.001).
- The interaction term showed that the Black patients treated in hospitals with telehealth post-discharge and PHS faced significantly lower Medicare costs than their counterparts (coef=-0.06, p=0.01).

LIMITATIONS

- First, the study used a cross-sectional analysis, and the results cannot infer a causal relationship.
- Second, the measures of hospital-based telehealth services were based on an intent-to-treat approach, meaning we examined the availability rather than the actual utilization of telehealth services.
- Third, while the claims dataset provides comprehensive information, it may lack details on disease progression/severity.
- Fourth, our data were limited to the Medicare FFS population and individuals living in the community.

IMPLICATIONS

- Results demonstrated the importance of combining PHS partnership + telehealth-post discharge to improve the efficiency of the healthcare delivery system and health equity, particularly for Black patients with depression and MCC.

CONTACT INFORMATION

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