



The Social Determinants of Electronic Health Record Quality in US Hospitals

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Introduction

Since the 2009 HITECH Act, federal healthcare legislation and incentives have encouraged widespread EHR adoption¹.

While other groups have investigated EHR quality by hospital characteristics² and linking demographics to the EHR³, to our knowledge, **no studies have examined how EHR quality varies by community demographics.**

Considering that factors such as income and race are social determinants of health⁴, and the prospect of medical AI based on the EHR⁵, **we explored the influence of 4 distinct social factors on hospital EHR quality.**

Methods

2019 AHA IT Supplement Survey

EHR status of 3,237 US hospitals

2020 American Community Survey

ZCTA and county level demographics

The data was normalized and **multinomial logistic regressions** were implemented for ZCTA and county level factors using the **statsmodels** package in Python.

Odds ratios were calculated to quantify the strength and direction of associations. **95% confidence intervals** and **p-values** provide measures of significance.

Results

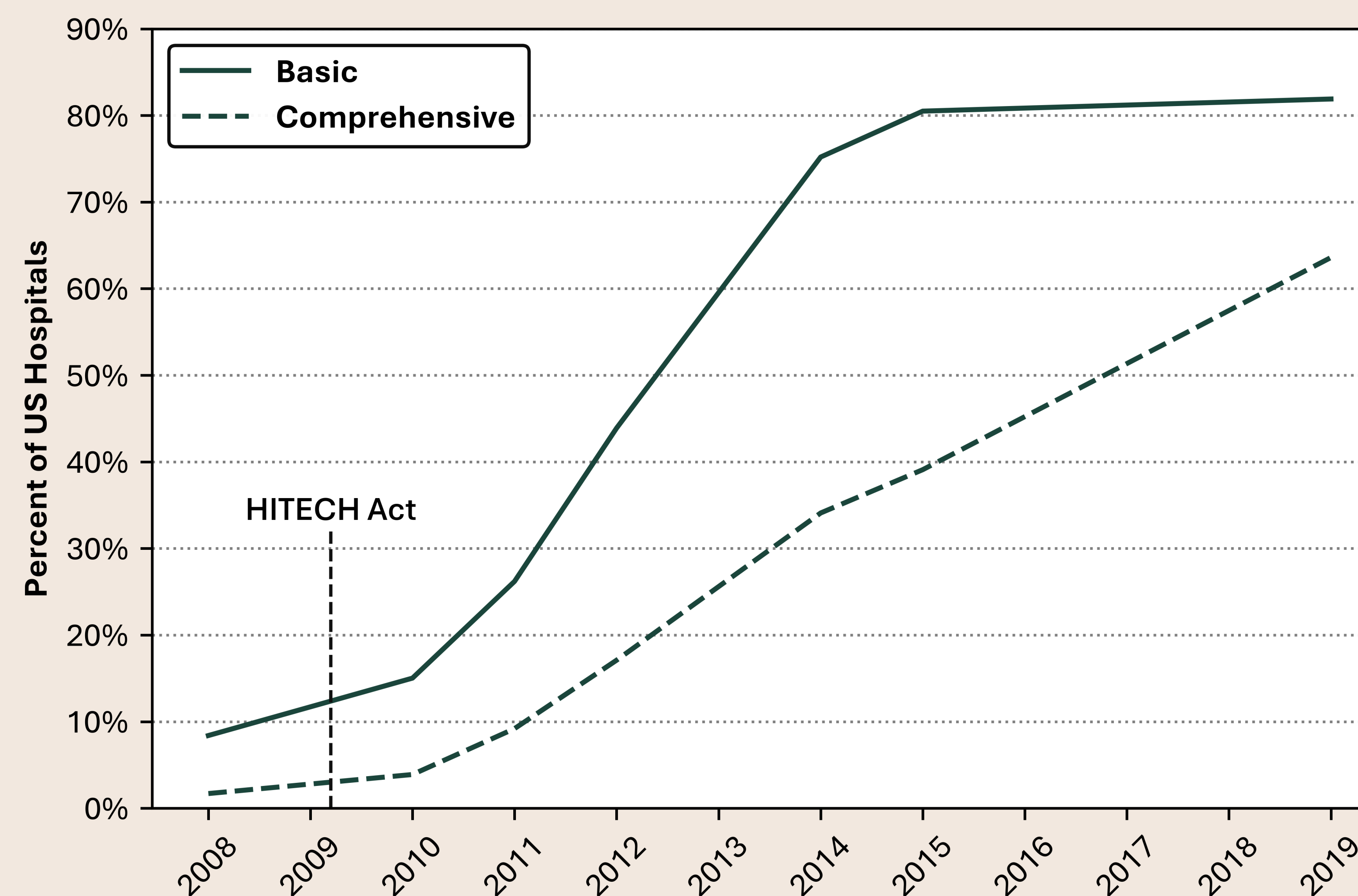


Figure 1. EHR adoption in US hospitals from 2008-2019.

Pre-2019 data taken from Adler-Milstein, J. *et al.*²

Table 1. Association of social factors with the adoption of EHRs.

Values in parentheses represent 95% confidence intervals.

Factor	Basic EHR		Comprehensive EHR	
	Odds ratio	p	Odds ratio	p
ZCTA Level				
Median Income	0.936 (0.777, 1.129)	0.4910	1.101 (0.955, 1.269)	0.1857
% White	1.321 (1.155, 1.511)	< 0.0001	1.172 (1.059, 1.296)	0.0020
% Poverty Rate	1.059 (0.880, 1.275)	0.5422	1.105 (0.955, 1.280)	0.1800
% Insured	0.988 (0.874, 1.117)	0.8456	1.113 (1.007, 1.230)	0.0359
County Level				
Median Income	0.821 (0.667, 1.011)	0.0639	1.007 (0.861, 1.179)	0.9110
% White	1.194 (1.031, 1.382)	0.0180	1.069 (0.955, 1.196)	0.2480
% Poverty Rate	0.850 (0.692, 1.043)	0.1190	0.929 (0.792, 1.088)	0.3588
% Insured	0.925 (0.820, 1.043)	0.2016	1.084 (0.982, 1.197)	0.1099

Discussion

Literature suggests that **Black and Hispanic populations tend to have less healthcare access** than the White population.

Higher proportion of White residents is associated with EHR adoption, even when adjusting for income, suggesting that the White population has greater access.

Relationships are more significant at the ZCTA level, likely because ZCTA demographics capture more nuanced information.

This indicates that **race-specific factors independent of income**, possibly including historical inequalities and systemic barriers, **play a role in EHR uptake** in US hospitals.

More research is needed to fully understand and potentially reduce this disparity.

Conclusion

There seems to be racial bias in EHR quality. Thus, policy surrounding EHR/AI technology should prioritize the most disadvantaged groups. However, further research is needed to fully understand this relationship.

References

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