Unequal Access to PrEP in Rural U.S. Counties: Focus on Health Infrastructure and Population Characteristics

Authors, C, DAVIS[1] and C, PERCHESKI [1]
1 Northwestern University, Department of Sociology

Northwestern University

INTRODUCTION

As the HIV epidemic in the US shifts to rural communities, a better understanding of biomedical HIV prevention (PrEP) uptake in these areas is needed. The existing measure of PnR cannot account for the year-to-year fluctuations in new HIV diagnoses that characterize sparsely populated regions.

METHOD

- We aggregated rural counties into county sets and ranked them by quintile of PnR.
- PnR is a measure of the number of PrEP prescriptions per new HIV diagnoses.
  - Our modified measure uses the average new HIV diagnoses from 2019-2021 as the denominator to better represent rural counties with low HIV incidence.
- We mapped these rural county sets (Figure 1) to identify geographic trends in rural PrEP uptake.
- We modeled the variation in county-set PnR quintile with an ordinal logit regression (Table 1). The coefficients represent the odds of a 1 quintile increase in PnR associated with a one unit change in the independent variable, all else being equal.
- Standard errors are clustered by state.
- Several variables—votes for Trump, level of education, and religiosity—are removed from Table 1 for clarity.

AIM

- To introduce a new measure of PnR that better represents the most rural counties.
- To compare rural county sets' PnR on a range of demographic characteristics, health indicators, and HIV-specific risk factors and resources.
- To represent geographic variation in PrEP uptake in a way that accounts for rurality.
- To explain why rural counties in the South have more unmet need than their counterparts in other regions and why the Middle Atlantic performs better.

CONTACT INFORMATION

Clay Davis
cdavis@u.northwestern.edu

Christine Percheski
c-percheski@northwestern.edu

RESULTS

### Figure 1: Map of variation in PnR quintile among rural county sets in the United States

PnR quintile[1]

- Lowest quintile
- Second quintile
- Third quintile
- Fourth quintile
- Fourth quintile
- Highest quintile
- NA
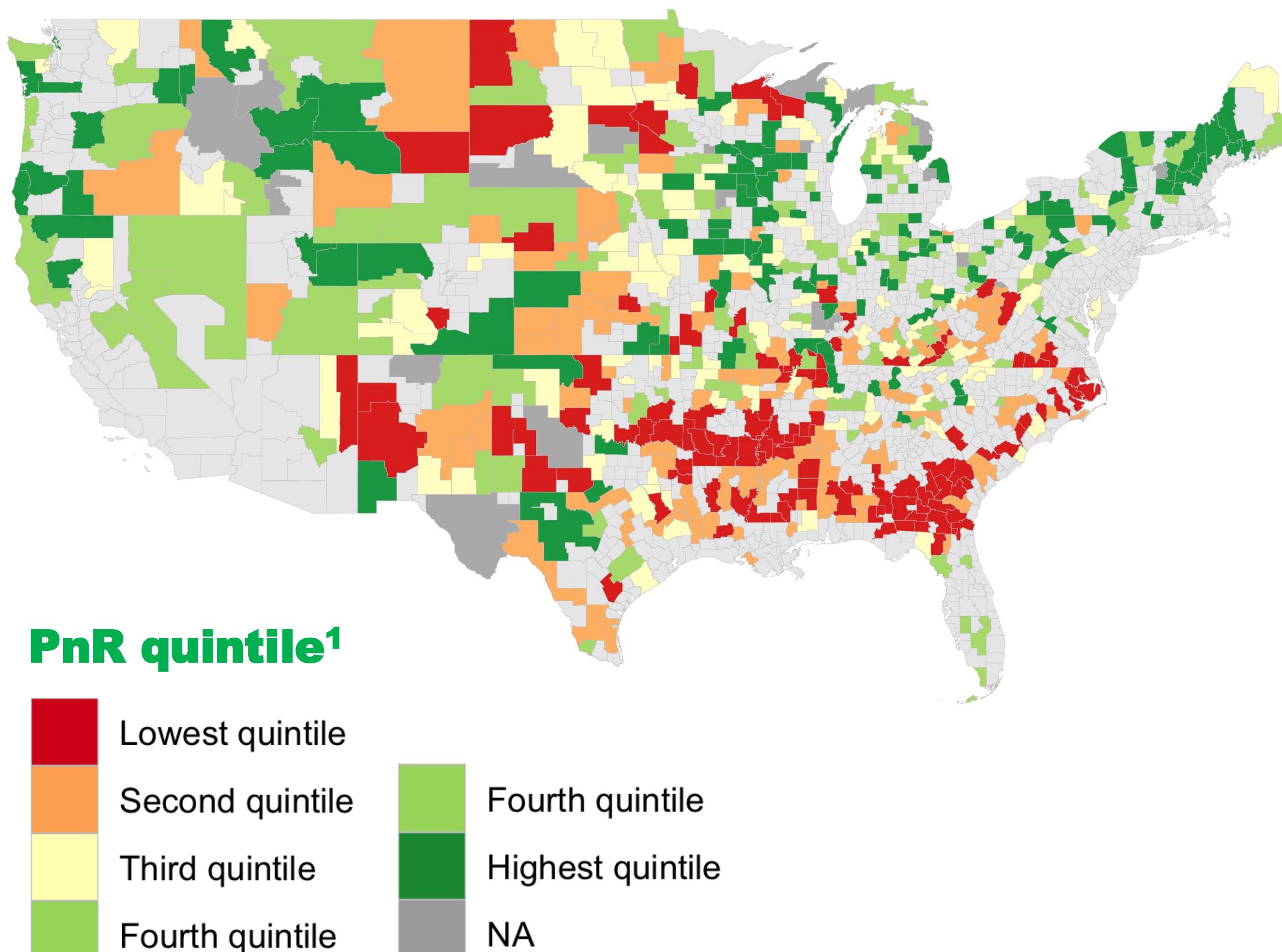
Figure 2: Regional variation in PnR quintile among rural county sets in the United States

New England | Middle Atlantic | East North Central | West North Central | South Atlantic Region | East South Central | West South Central | Mountain | Pacific
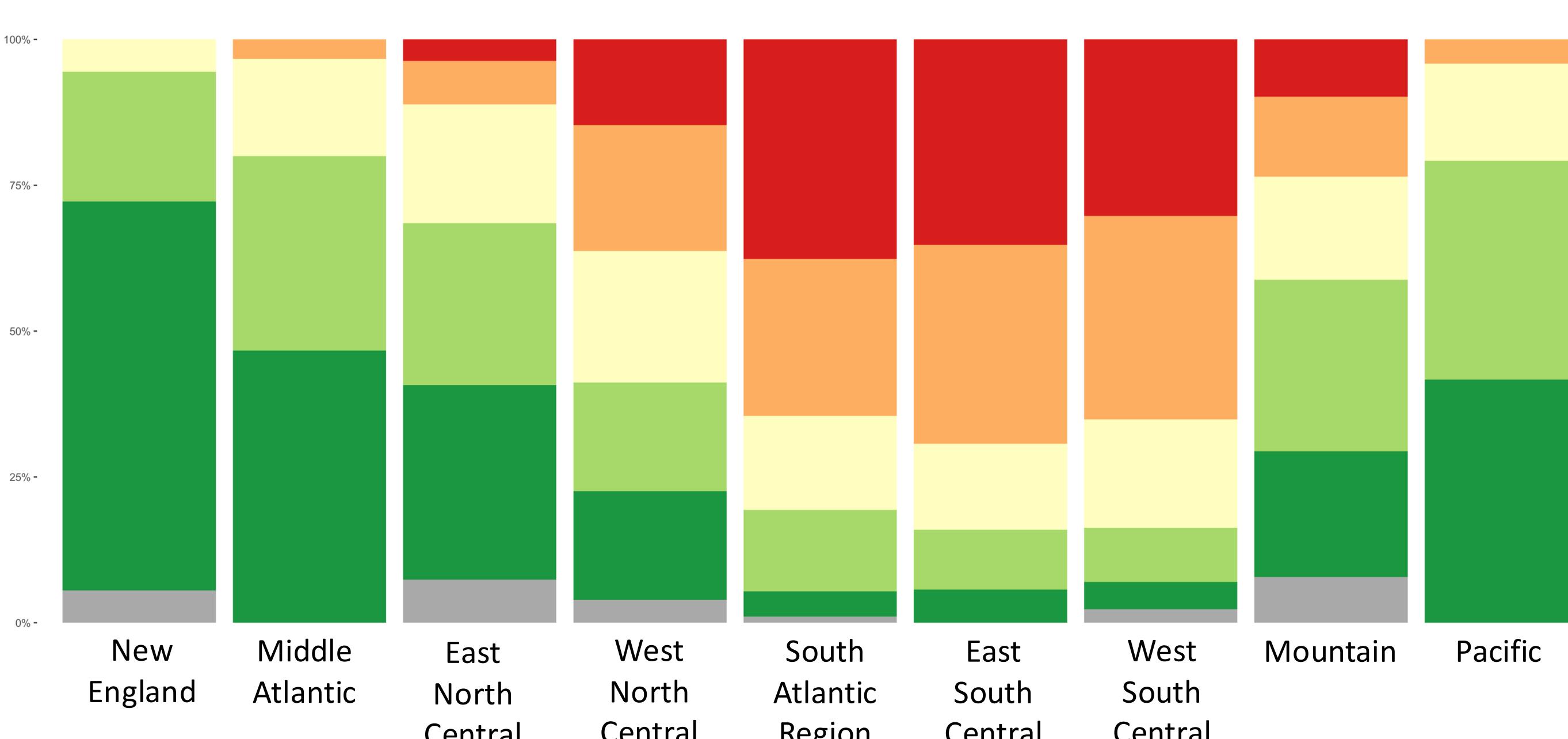
Table 1: Results from ordered logit of quintile of PnR among U.S. rural county sets, (n=589)

	Odds ratio	95% CI	
Population (squared)*	1.103	1.024	1.188
Percent adult (19-65)	0.973	0.887	1.068
Gini coefficient	0.969	0.872	1.078
Median household income	1.000	1.000	1.000
% Hispanic	0.971	0.942	1.001
% Black*	0.939	0.906	0.974
% Medicaid enrolled	1.001	0.954	1.051
% Uninsured	1.004	0.922	1.094
Correctional facility (binary)	1.008	0.689	1.474
American Indian reservation (binary)	0.776	0.512	1.175
% MSM	1.382	0.974	1.96
Overdose death rate*	1.026	1.005	1.046
STI diagnosis rate	0.999	0.997	1.001
Local PrEP clinic (binary)	0.998	0.682	1.462
Federal HIV grant recipient (binary)	1.156	0.615	2.172
Premature death rate*	0.993	0.989	0.997
PCP ratio*	0.992	0.988	0.995
Medicare spending per beneficiary	1.000	1.000	1.000
Local teaching hospital (binary)*	0.592	0.393	0.89
Most rural (NCHS 6)	0.761	0.483	1.198
New England	2.759	0.783	9.722
Middle Atlantic*	1.793	1.004	3.201
East North Central		Reference category	
West North Central	0.414	0.142	1.203
South Atlantic	0.397	0.146	1.075
East South Central	0.69	0.268	1.774
West South Central	0.516	0.168	1.581
Mountain	0.901	0.343	2.366
Pacific	1.372	0.471	3.998

[1] Highest quintile indicates most PrEP prescriptions per 3-yr average new HIV diagnoses (2019-2021)

CONCLUSIONS

- PnR varies widely across rural counties. Lower PnR is associated with sicker, more disadvantaged county sets with a greater share of Black residents.
- Geographically, counties in southern regional divisions ranked in the lowest absolute PnR quintiles. When relevant variables were held constant, counties in the Middle Atlantic performed better than their counterparts in other regions.
- Altogether, premature death rate, overdose death rate, percentage of Black residents, PCP ratio, and the presence of a teaching hospital were significantly associated with PnR quintile in our ordered logit regression model.
- There was no association between PnR quintile and MSM population, STI diagnosis rate, PrEP clinics, HIV-related federal grant receipt, Medicare spending, Medicaid utilization, and uninsurance rate, all other variables being equal.