

# Neighborhood Associated Exposures and Socioeconomic Factors are Associated with Prostate Biopsy Outcomes

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## Background

- Neighborhood associated socioeconomic factors such as poverty, education, segregation, employment, crime, insurance status, and residential stability, are important predictors of prostate cancer (PCa) mortality
- Chicago neighborhoods with the highest PCa mortality also have the highest rates of crime and poverty, and lowest levels of educational attainment

## Research Objectives

- To determine if census tract level socioeconomic factors are independently associated with prostate biopsy outcomes

## Methods

- Evaluated a prospectively recruited cohort of 1485 men undergoing routine prostate specific antigen (PSA) screening (n=566) or initial biopsy (n=919) for elevated PSA or abnormal digital rectal exam (DRE)
- Exploratory factor analytic approach (EFA) tested 23 socioeconomic and environmental variables resulting in two highly reliable indices capturing > 70% of variance among neighborhood variables
- Multivariate analyses examined the associations between clinical risk factors, NATS and NAA with overall PCa diagnosis and Gleason grade >3+3

	Min	Max	M	SD
<b>Neighborhood Associated Toxic Stress (NATS) Index</b>	-6.86	8.90	.00	3.29
% Poverty				
% Female headed households				
% Public assistance				
% Black residents				
% Unemployed				
% Vacant housing				
% Housing burden				
% Violent crime				
% Total crime				
<b>Neighborhood Associated Advantage (NAA) Index</b>	-9.77	26.68	.0000	7.42
% \$75,000+ in past year				
% Owner-occupied				
% >Bachelor's degree				
Median Housing value (log)				

Table 1. Descriptive statistics for component variables included in creation of Neighborhood Associated Toxic Stress and Neighborhood Associated Advantage Indices

	Black (N =437)	Non-Black (N =482)	p value <sup>1</sup>
<b>Biopsy Outcomes</b>			
Cancer on Biopsy	321 (73.5%)	294 (61.0%)	<0.001
> Gleason 3+4	178 (40.7%)	146 (30.3%)	<0.001

<sup>1</sup>Using  $\chi^2$  test; bold type indicates p <0.05

Table 2. Biopsy outcomes stratified by race

## Limitations

- Zip code sourced socioeconomic and environmental data could only be obtained for two-thirds of our cohort (i.e. limited to Chicago metro area)
- Referred population

## Results

- Cohort included 647 (43.6%) Black men and 837 (56.4%) non-Black men. Of these, 437 (67.5%) Blacks and 482 (57.6%) non-Blacks underwent biopsy
- Model additionally adjusted for DRE and PSA, showed that NATS (OR 1.64; 1.22-2.18; p=0.001) and NAA (OR 0.71; 0.53-0.95; p=0.02) remain independently associated with PCa diagnosis
- In fully adjusted ordinal regression models for Gleason grade 6-10, the strength and direction of association persist for NATS (OR 1.68; p=0.004) and NAA (OR 0.50, p=0.001)

Covariate	Odds Ratio	95% CI	P value
NATS (highest quartile)	1.54	1.11 – 2.12	0.009
NAA (highest quartile)	0.70	0.52 – 0.95	0.02
Black race	1.52	1.14 – 1.51	0.004
Family history	2.45	1.81 – 3.33	<0.001
Age	1.31	1.14 – 1.51	<0.001

Table 3. Multivariable logistic regression for cancer on biopsy vs. negative biopsy

## Conclusions

- Census tract level neighborhood exposures are independently associated with biopsy outcomes.
- Utilization of neighborhood measures can inform public policy and should be validated in biopsy cohorts