Neighborhood Socioeconomic Status and Breast Cancer Subtypes Among Black Women

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NCI Comprehensive Cancer Center — A Cancer Center Designated by the National Cancer Institute

BACKGROUND

- Compared to White women, African American/Black women are more likely to develop triple-negative breast cancer, an aggressive breast cancer subtype.

- While many studies have examined individual-level socioeconomic status (SES) as a major social determinant of more aggressive breast tumor phenotypes, the impact of neighborhood-level SES on breast cancer is not well understood, particularly among Blacks.

OBJECTIVE

- **To evaluate the impact of neighborhood SES on breast cancer subtypes among Black women with breast cancer.**

METHODS

- **Study population**: 1,220 Black women with invasive breast cancer enrolled from 10 counties of New Jersey from 2006 to 2018 in the Women's Circle of Health Study (WCHS).

- **Data collection:** Participants completed an interviewer-administered questionnaire, which included detailed questions on socio-demographic, lifestyle, and reproductive factors, comorbidities, and family history of cancer.

- Hormone receptors and HER2 status from patients' pathology reports, tissue microarrays, and New Jersey State Cancer Registry files.

- Residential address at diagnosis was geocoded to the census tract-level.

- Neighborhood SES was measured at the census tract-level by the Yost index, a year-specific score constructed by NCI via a factor analysis of seven variables (Table 1).

- **Statistical analysis**: In a case-only analysis, we used multilevel multinomial logistic regressions to estimate neighborhood SES in relation to breast cancer subtype (triple-negative, HER2-enriched, luminal B vs. luminal A).

- Models were adjusted for individual-level SES variables, body mass index and reproductive factors, and census tract-level percentage of Black residents.

- We tested whether the associations were modified by percentage of Black residents and participant's education.

Study Area

Table 1. Neighborhood SES index components

Education index
Percent unemployed
Percent working class
Median household income
Percent below 150% of poverty line
Median house value
Median rent

Table 2. Selected characteristics of Black women with invasive breast cancer in the WCHS (*n* = 1,220)

	n	(%)
ER status		
ER+	837	(68.6)
ER-	383	(31.4)
Molecular subtype		
Luminal A	710	(58.2)
Luminal B	143	(11.7)
HER2+ enriched	88	(7.2)
Triple negative	279	(22.9)
Age (Mean±SD)	53.8	±10.8
Foreign born	200	(16.4)
Education		
≤High school graduate	494	(40.5)
Some college	368	(30.2)
≥College	358	(29.3)
Household income		
<$50,000	652	(53.4)
≥$50,000	500	(40.9)
Unknown	68	(5.6)
Health insurance at diagnosis		
Private	672	(55.1)
Medicaid	166	(13.6)
Medicare	171	(14.0)
Uninsured	144	(11.8)
Other/unknown	67	(5.5)
Marital status		
Married/living as married	434	(35.6)
Single/other	786	(64.4)
BMI 1 year before diagnosis (kg/m², mean±SD)	31.5	±7.0
Post-menopausal	738	(60.5)
Age at menarche, y		
<12	330	(27.1)
12-13	594	(48.7)
>13	296	(24.3)
Age at first birth		
Nulliparous	198	(16.2)
<25 y	704	(57.7)
≥25 y	318	(26.1)
Parity ≥3	396	(32.5)
Ever breastfed among parous women	415	(40.6)
Ever oral contraceptive use	854	(70.0)
Smoking status		
Never	719	(58.9)
Former	278	(22.8)
Current	223	(18.3)
Census tract %Black residents	46.7	±30.6

RESULTS

Figure 1. Neighborhood SES and breast cancer subtypes among Black women in a case-only analysis
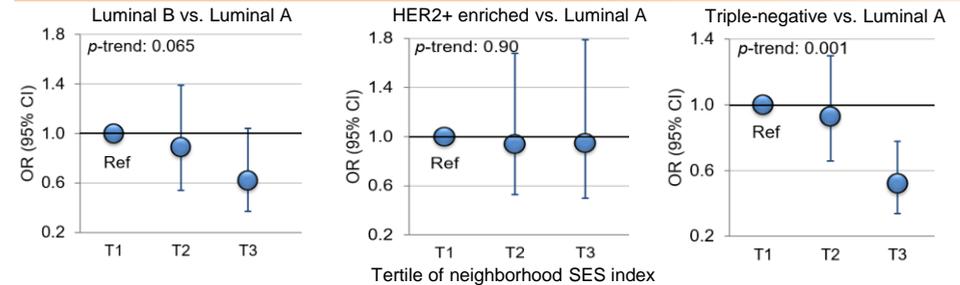

Model adjusted for age, education, insurance status, menopausal status, age at first birth, BMI 1 year prior to diagnosis, and census tract-level percentage of Black residents.

Figure 2. Neighborhood SES and breast cancer subtypes among Black women stratified **by percentage of Black residents**

Among Black patients living in census tracts with lower proportion of Black residents

in census tracts with higher proportion of Black residents
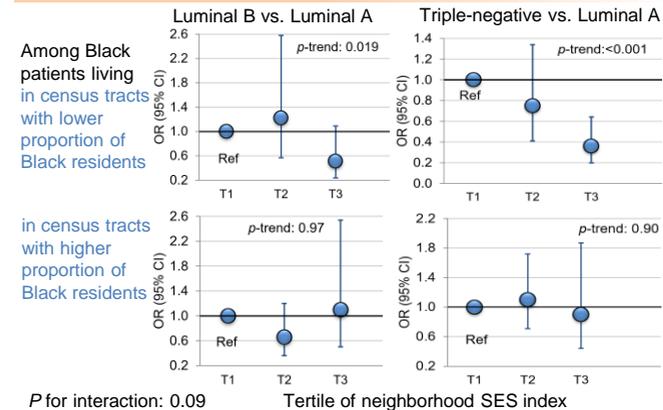
P for interaction: 0.09

Figure 3. Neighborhood SES and breast cancer subtypes among Black women stratified **by education**

Among Black patients with college education or higher

with high school, some college or lower
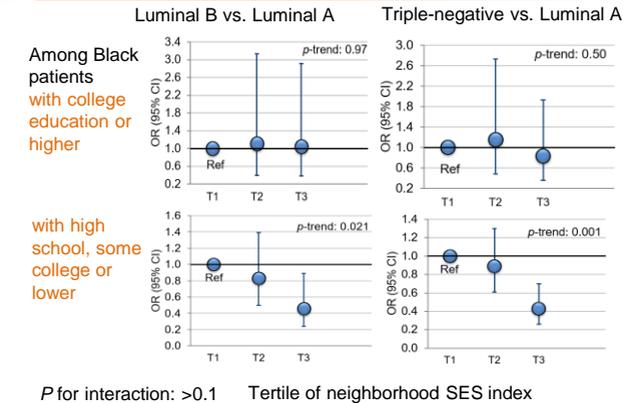
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CONCLUSION

- Neighborhood socioeconomic environment may influence the development of triple-negative breast cancer among Black women.

- Such impact might be buffered by some contextual factors in areas with more Black residents. Further investigation to elucidate these factors is needed.

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