Neighborhood Disinvestment Predicts Shorter Cancer Survival Time among Black Women Diagnosed with Invasive Breast Cancer

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ABSTRACT

Background: Observed neighborhood disinvestment is a chronic social determinant that is understudied in relation to cancer outcomes. This study investigated associations between neighborhood disinvestment, stage at diagnosis, and breast cancer–specific survival (BCSS) time.

Methods: Individual-level data included 844 women, diagnosed 2013 to 2019, from the Women's Circle of Health Follow-up Study, a population-based cohort of breast cancer survivors self-identifying as Black or African American. Neighborhood disinvestment was from a virtual audit of six indicators—garbage, graffiti, dumpsters, building conditions, yard conditions, and abandoned buildings—within 14,671 Google Street View streetscapes estimated at residential addresses using Universal Kriging. We fit accelerated failure time models of BCSS time as functions of neighborhood disinvestment by stage, adjusted for covariates (sociodemographic, lifestyle, and tumor- and treatment-related factors). Participants not experiencing an event at the end of follow-up (August 13, 2023) were right-censored.

Results: With a median follow-up time of 89 months, there were 91 breast cancer–specific deaths. Disinvestment and stage statistically interacted ($P < 0.01$). For stage III and stage II diagnoses, BCSS time decreased by 27% (95% confidence interval, 1%, 48%) and 37% (95% confidence interval, 5%, 58%), respectively, with each SD increase in disinvestment after adjustment for covariates. There was little evidence of associations between disinvestment and survival time among stages I and IV.

Conclusions: The tumor stage–dependent association between greater neighborhood disinvestment and shorter survival time could reflect chronic stress exposures suspected to adversely accumulate over time.

Impact: Neighborhood disinvestment might be an important, independent marker of social disadvantage impacting breast cancer survival.

Introduction

Non-Hispanic Black women have worse breast cancer survival outcomes compared with non-Hispanic White women, even after statistical control for prognostic indicators such as tumor stage, grade, receptor status, and treatment (1–4). Hypothesized but understudied explanations for this breast cancer outcome disparity involve the possibility that additional biologic and social factors—genetic ancestry, racial–ethnic discrimination, access to health care, and environmental exposures—vary across minoritized racial–ethnic populations and influence survival (5–8).

Several studies have previously reported on associations between breast cancer survival and various social environmental measures of neighborhood socioeconomic composition and structural racism (e.g., racial–ethnic segregation, redlining, and racialized economic polarization; refs. 3, 9–12). A study of clinical trial participants receiving standardized breast cancer treatment reported that residence in neighborhoods with the highest socioeconomic deprivation was associated with 34% higher hazard of all-cause death compared with residence in neighborhoods with the lowest deprivation (3). In a study of Medicaid recipients diagnosed with breast cancer, residence in areas experiencing contemporary redlining—a place-based measure of mortgage-lending disparity—was associated with a greater hazard of breast cancer–specific death (9).

Mortgage-lending discrimination, socioeconomic factors, and racial–ethnic segregation may be linked to the amount of investments within an area (13–16), which in turn could influence psychosocial stress pathways and health behaviors associated with breast cancer outcomes, including physical inactivity, dietary factors, tobacco use, and alcohol consumption (6, 17–20). Neighborhood disinvestment is a marker of social disadvantage that is routinely modified as part of community and government

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revitalization and reinvestment efforts and, therefore, can be targeted through place-based practice and policy (15, 21, 22). Despite its relevance as a potentially important social environmental factor, few studies have investigated whether neighborhood disinvestment is associated with breast cancer outcomes. One large population-based cancer registry study of more than 40,000 breast cancer cases reported a 10% decrease in breast cancer–specific survival (BCSS) time with each SD increase in neighborhood disinvestment, but this finding was observed only among those diagnosed in earlier stages (local or regional; ref. 2). This stage-dependent association can be better understood when considering that neighborhood disinvestment is conceptualized as a chronic stressor (2, 6, 19). Those diagnosed with metastatic disease may experience too short survival times to detect an adverse health effect of long-term residence within a disinvested neighborhood. Oppositely, relative 5-year survival is 99% among those with localized breast tumors at diagnosis, suggesting long survival times and low power to detect variation in survival by neighborhood disinvestment (23). A major limitation of this previous study is the potential for confounding, especially from socioeconomic factors (19).

Additional studies of breast cancer survival with data collection across multiple geographic levels and conceptual domains are needed to fully understand relationships and to motivate translational actions. Moreover, such comprehensive studies that are also large enough to investigate associations among minoritized racial–ethnic groups are lacking. This is a critical gap because the results of studies from populations that are sociodemographically heterogenous may obscure within-group racial–ethnic variation, especially if statistically underpowered from too few minoritized participants. To address these gaps, we investigated associations among neighborhood disinvestment, stage at diagnosis, and breast cancer survival among a cohort of breast cancer survivors self-identifying as Black or African American.

Materials and Methods

Data

All data except for social environmental variables were from the Women's Circle of Health Follow-up Study (ref. 24), a population-based cohort of breast cancer survivors, enrolling women self-identifying as Black or African American, followed for mortality outcomes annually since 2013. Full study procedures are described elsewhere (24). Briefly, potential participants with a newly diagnosed breast cancer in New Jersey were identified through the New Jersey State Cancer Registry (NJSCR) and contacted if diagnosed with breast cancer within the previous nine months. Additional Women's Circle of Health Follow-up Study eligibility criteria were residence in one of 10 counties in New Jersey, no previous history of cancer, and ages 20 to 75 years. Informed written consent was obtained, and participants completed a baseline questionnaire during an in-person home visit, during which body measurements were also collected. Variables for this study were from the baseline visit except for tumor- and treatment-related factors which were from medical record review, complemented with NJSCR data. We *a priori* restricted the study population to those diagnosed with invasive cancer due to differences in *in situ* breast cancer risk profiles ($n = 896$).

Date of diagnosis and last contact, vital status, and cause of death were obtained through data linkage with the NJSCR. International Classification of Diseases–10 code "C509" identified a breast cancer–specific death. Follow-up began at the date of diagnosis and continued through August 13, 2023, with death from other causes right-censored as such events ($n = 74$) were fewer than breast cancer deaths and comprised <10% of the sample (25). The American Joint Committee on Cancer stage at diagnosis (version 7), tumor subtype, and receipt of surgery (mastectomy, lumpectomy, or none), chemotherapy, radiation, or hormone therapy (all yes/no) were from medical record review complemented with information from the NJSCR or self-reported data (26).

Information on age at diagnosis, marital status, birthplace, educational attainment, household income, household size, health insurance at diagnosis, cigarette smoking at diagnosis, alcohol consumption in the year before diagnosis, and physical activity were collected during the computer-assisted in-person interview. The waist-to-hip ratio (WHR) was calculated from waist and hip circumferences measurements taken by trained study personnel. The income-to-poverty ratio was calculated from household income, household size, and year of enrollment (27). Weekly metabolic equivalent hours was calculated from self-reported physical activity. We calculated and included in models the time between the diagnosis date and baseline survey completion to control for this source of variation.

Geocoded residence at diagnosis was obtained from data linkage with the NJSCR data files. We limited analyses to patients from whom data on full residential street addresses and ZIP codes were available to ensure high-quality geocoding to longitude and latitude coordinates ($n = 851$, 95.0%) and those residing in the most urban census tracts (rural urban commuting code = "metropolitan area core", $n = 844$. 94.2%) as disinvestment was validated and intended for use in urban areas (19, 28). Neighborhood disinvestment was from a virtual neighborhood audit of six visual indicators—presence of garbage, presence of graffiti, presence of abandoned buildings, presence of large dumpsters, building conditions, and yard conditions–across 14,671 Google Street View streetscapes (29), as previously described and validated (2, 30, 31). Briefly, four trained auditors assessed the 360° view of streetscapes which were selected at random across the study area. Item response theory was used to investigate item correlation, for internal consistency reliability ($\alpha = 0.965$), and to produce an overall disinvestment score at each audited location (32). Universal Kriging spatial models were built to estimate disinvestment at each participant's geocoded address, thus generating household-specific values (**Fig. 1**; ref. 33). Higher disinvestment values were indicative of poorer streetscape conditions—presence of each of garbage, graffiti, abandoned buildings, large dumpsters, poor building conditions, and poor yard conditions. Ratings occurred January 2018 to June 2019, and 80% of streetscape images were captured between August 2012 and September 2017 (median October 2013).

Census tract–level Black racial residential segregation was measured by the Gini and isolation indices [both 0 (low)–100 (high)] calculated from 2010 decennial census data (34). Socioeconomic composition was measured by the Yost index, calculated annually and ranked nationally – 1 (lowest socioeconomic composition) to 100 (highest socioeconomic composition) – using American Community Survey (ACS) 5-year estimates [https://data.census.gov, U.S. Census Bureau (RRID: SCR_011587); ref. 35]. Yost indices were linked by the year of diagnosis and the midpoint of the 5-year ACS data, 1 year lagged; 2019 diagnoses were linked to Yost values calculated from the ACS 2016 to 2020 data.

Statistical analyses

We summarized covariate data distributions overall and by neighborhood disinvestment by categorizing the continuous values

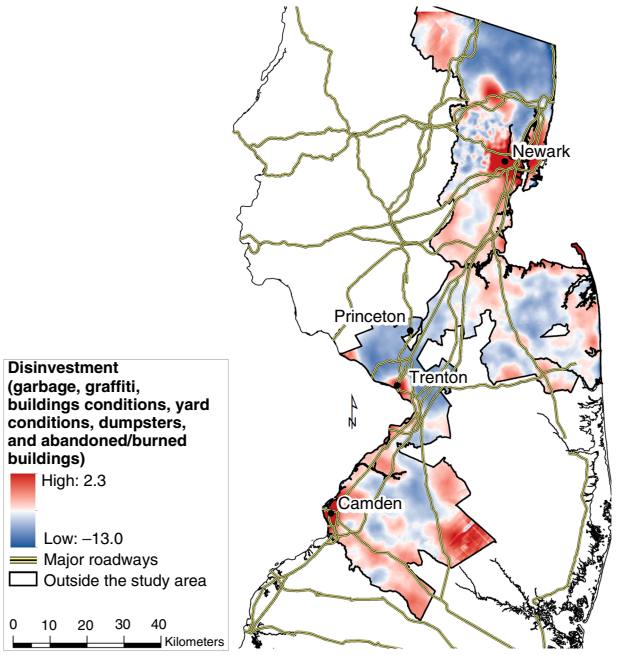

Figure 1.
Neighborhood disinvestment throughout Women's Circle of Health Follow-up Study region. Higher disinvestment was estimated in metropolitan areas of Newark, Trenton, and Camden, New Jersey.

into higher (≥median) or lower (<median). Covariate missingness was as follows: income $n = 71$ (8.4%), WHR $n = 28$ (3.3%), household size $n = 22$ (2.6%), Yost index $n = 20$ (2.4%), stage at diagnosis $n = 16$ (1.9%), health insurance $n = 16$ (1.9%), triple-negative receptor status $n = 10$ (1.2%), alcohol consumption $n = 8$ (1.0%), marital status $n = 5$ (0.6%), physical activity metabolic equivalents $n = 5$ (0.6%), education $n = 2$ (0.2%), and cigarette smoking $n = 1$ (0.2%). We imputed missing values of these variables under fully conditional specification producing 25 datasets. We described overall BCSS by calculating 5-year survival and the median follow-up time. We built several accelerated failure time models of BCSS time to investigate associations with disinvestment and control for covariates. Based on previous findings (2), we *a priori* hypothesized a stage-dependent association between disinvestment and survival time. Thus, we tested stage-specific associations between disinvestment and survival in five models: (i) unadjusted for additional covariates, (ii) adjusted for demographics factors and time between diagnosis and baseline survey completion, (iii) model 2 + socioeconomic factors, (iv) model 3 + health behaviors and WHR, and (v) model 4 + triple-negative breast tumor and treatment factors. Covariates of each model are conceptually grouped. Models 2 and 3 can be considered adjusted for varying degrees of potential confounders (primary results), and models 4 and 5 additionally adjusted for potential mediators. Using Rubin's rules, we combined the results of imputed datasets into single survival time ratios (TR) and 95% confidence intervals (CI; ref. 36). We report survival time ratios per SD changes in disinvestment. Failure times were fit according to a Weibull distribution. Analyses were conducted September 2020 (audit processing) through October 2024 (statistical analyses) using ArcGIS v10.8 and SAS v9.4. This study was conducted in accordance with the Declaration of Helsinki ethical guidelines and approved by the Ohio State University Institutional Review Board (2021C0034).

Data availability

Data needed to replicate the results will be made available for research purposes only upon request in compliance with university and Institutional Review Board regulations. Data will only be shared in anonymized format potentially using aggregation and variable categorization to prevent reidentification.

Results

Disinvestment seems concentrated in larger cities (e.g., Newark, Trenton, and Camden) compared with mid-sized cities (e.g., Princeton; **Fig. 1**). Participants' median disinvestment value was 0.40, which was higher than that of the general study area from which participants resided (median = −0.05). Several covariates varied by median neighborhood disinvestment: participants characterized as U.S.-born, high school–educated or less, with lower income-to-poverty ratio, insured with Medicaid, residing in lower socioeconomic composition and higher Black racial isolation segregation areas, with greater WHR, and currently smoking cigarettes disproportionately reside in areas in which disinvestment is at the median value or higher (**Table 1**).

There were 91 breast cancer–specific deaths: 14 stage I, 31 stage II, 24 stage III, and 22 stage IV. The median follow-up time was 89.3 months (95% CI, 86.5, 92.0), and the 5-year BCSS value was 91.6% (95% CI, 89.7%, 93.5%). Associations between disinvestment and BCSS time vary by cancer stage (**Table 2**; Supplementary Fig. S1; χ^2 test for improved model fit, $P < 0.01$). Among those diagnosed with stage III cancer, BCSS time decreased by 29% (95% CI, 3%, 48%) for each SD increase in disinvestment after adjustment for demographic and socioeconomic factors which are potential confounders (**Table 2**, model 3). The association from model 3 among those diagnosed with stage II cancer was similar to that of those diagnosed with stage III cancer (TR: 0.71, 95% CI, 0.49, 1.05), albeit with a 95% CI that includes null. In a model that additionally adjusts for health behavior, anthropometric and tumor- and treatment-related factors, conceptually considered mediators, stage-specific associations between disinvestment and BCSS time were nearly identical to those of model 3. Associations between disinvestment and survival among stages I and IV had wide CIs in models adjusted for potential confounders or mediators but trended toward longer survival with increasing disinvestment.

Discussion

In this cohort of Black or African American women diagnosed with breast cancer, we investigated associations between neighborhood disinvestment, stage at diagnosis, and BCSS with adjustment for numerous potential confounding factors. Each 1 SD increase in neighborhood disinvestment was associated with approximately 25% shorter survival time but only among those diagnosed at American Joint Committee on Cancer stage II or III. These associations were robust to covariate adjustments, including receipt of surgery, chemotherapy, radiotherapy, or hormone therapy. In contrast, associations between neighborhood disinvestment and BCSS among those diagnosed at stage I or IV were inconclusive due to wide CIs but trended toward longer survival with increases in disinvestment.

Table 1. Demographic, socioeconomic, health behavior, and tumor- and treatment-related factors overall and by median neighborhood disinvestment, Women's Circle of Health Follow-up Study, 2013 to 2019, $n = 844$.

	Total	Disinvestment	
		Low (<median)	High (≥median)
Variable	***n* (%)**	***n* (%)**	***n* (%)**
Age, years (mean and SD)	54.9 (10.8)	54.7 (10.6)	55.0 (10.9)
Marital status			
Married/living as married	291 (34.7)	170 (40.3)	121 (28.7)
Widow/divorced/separated	284 (33.8)	139 (32.9)	145 (34.4)
Single/never married	264 (31.5)	111 (26.3)	153 (36.3)
Birthplace			
Born in the United States	701 (83.1)	338 (80.1)	363 (86.0)
Born outside the United States	143 (16.9)	84 (19.9)	59 (14.0)
Educational attainment			
High school graduation or below	304 (36.1)	119 (28.2)	185 (43.8)
Some college education	278 (33.0)	145 (34.4)	133 (31.5)
College and postgraduate education	260 (30.9)	158 (37.4)	102 (24.2)
Income to poverty percentage ratio mean (SD)	305 (198)	341 (203)	268 (186)
Health insurance			
Private	458 (55.3)	258 (61.1)	200 (47.4)
Medicare	141 (17.0)	66 (15.6)	75 (17.8)
Medicaid	115 (13.9)	43 (10.2)	72 (17.1)
Uninsured	86 (10.4)	37 (8.8)	49 (11.6)
Other	28 (3.4)	11 (2.6)	17 (4.0)
Socioeconomic composition, Yost national rank mean (SD)	47.6 (28.4)	65.7 (23.1)	29.8 (20.7)
African American segregation, Gini mean (SD)	57.4 (14.1)	57.6 (14.1)	57.1 (14.1)
African American segregation, isolation mean (SD)	51.2 (27.1)	36.7 (21.9)	65.7 (23.8)
WHR			
≤0.85	158 (18.7)	126 (29.9)	102 (24.2)
>0.85	658 (78.0)	281 (66.6)	307 (72.7)
Physical activity, weekly metabolic equivalent hours mean (SD)	50.8 (52.1)	50.0 (51.8)	51.6 (52.4)
Cigarette smoking			
Never	513 (60.8)	275 (65.2)	238 (56.4)
Former	183 (21.7)	89 (21.1)	94 (22.3)
Current	147 (17.4)	57 (13.5)	90 (21.3)
Alcohol consumption, weekly drinks consumed			
Never-drinker	470 (55.7)	230 (54.5)	240 (56.9)
≤3	269 (31.9)	142 (33.6)	127 (30.1)
>3	97 (11.5)	45 (10.7)	52 (12.3)
Tumor stage at diagnosis			
I	385 (45.6)	207 (49.1)	178 (42.2)
II	320 (37.9)	147 (34.8)	173 (41.0)
III	89 (10.6)	47 (11.1)	42 (10.0)
IV	34 (4.0)	14 (3.3)	20 (4.7)
Triple-negative tumor receptor status			
Yes	172 (20.6)	80 (19.0)	92 (21.8)
No	662 (79.4)	337 (79.9)	325 (77.0)
Surgery receipt			
Mastectomy	392 (46.5)	185 (43.8)	207 (49.1)
Lumpectomy	406 (48.1)	215 (50.9)	191 (45.3)
No	46 (5.4)	22 (5.2)	24 (5.7)
Chemotherapy receipt			
Yes	546 (64.7)	267 (63.3)	279 (66.1)
No	298 (35.3)	155 (36.7)	143 (33.9)
Radiotherapy receipt			
Yes	609 (72.2)	320 (75.8)	289 (68.5)
No	235 (27.8)	102 (24.2)	133 (31.5)
Hormone therapy receipt			
Yes	578 (68.5)	291 (69.0)	287 (68.0)
No	266 (31.5)	131 (31.0)	135 (32.0)
Time from diagnosis to baseline survey, days (mean and SD)	347 (142)	350 (146)	345 (138)

Table 2. Associations between neighborhood disinvestment factors and BCSS time by tumor stage, Women's Circle of Health Follow-up Study, 2013 to 2019, $n = 844$.

	Time ratio (95% CI)[a]				
Variable, events/person-years	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Neighborhood disinvestment by tumor stage[b]					
1 SD increase at stage I, 14/2,922	1.34 (0.89–2.02)	1.45 (1.05–1.99)	1.33 (0.90–1.98)	1.31 (0.87–1.98)	1.24 (0.82–1.84)
1 SD increase at stage II, 31/2,403	0.70 (0.54–0.92)	0.77 (0.55–1.07)	0.71 (0.49–1.05)	0.67 (0.45–1.02)	0.63 (0.42–0.95)
1 SD increase at stage III, 24/668	0.76 (0.54–1.06)	0.72 (0.55–0.95)	0.71 (0.52–0.97)	0.72 (0.52–0.98)	0.72 (0.52–0.99)
1 SD increase at stage IV, 22/267	1.42 (1.03–1.96)	1.39 (0.92–2.10)	1.28 (0.83–1.98)	1.27 (0.82–1.97)	1.27 (0.83–1.94)

[a]Model 1: neighborhood disinvestment, stage, and their interaction. Model 2: model 1 + age, marital status, nativity, and time between diagnosis and baseline survey completion. Model 3: model 2 + educational attainment, income-to-poverty ratio, health insurance, socioeconomic composition, and African American residential segregation (Gini and isolation indices). Model 4: model 3 + WHR, physical activity, cigarette smoking, and alcohol consumption. Model 5: model 4 + triple-negative tumor receptor status, surgery receipt, chemotherapy receipt, radiotherapy receipt, and hormone therapy receipt.
[b]1 SD of neighborhood disinvestment was equal to 0.6.

A previous study of all breast cancer cases diagnosed between 2008 and 2017 within the NJSCR reported a similar interaction such that increases in disinvestment were associated with shorter survival time only among those diagnosed with early-stage breast cancer (2). No evidence of an association was observed among those diagnosed with late-stage cancer. That study included nearly 5,000 Black women, but individual socioeconomic, health behavior, or treatment factors were unmeasured. Direct comparison with other studies is difficult given that is the second study to measure disinvestment—also called observed neighborhood physical disorder—and any cancer outcome (19). However, conceptually similar studies of self-reported quality of life or stress and neighborhood perceptions among breast cancer cases have reported mixed findings. A study of negative psychologic consequences of breast cancer among a racial–ethnically diverse sample found that worse outcomes correlated with greater neighborhood social disorder (37). A study limited to Black/African American or Latina breast cancer survivors similarly described worse self-reported psychologic health outcomes with increases in perceived neighborhood stress (38). However, a study comprised of mostly non-Hispanic White breast cancer survivors found no association between self-reported neighborhood conditions and quality of life (39). These investigations are potentially subject to same-source bias for relying on neighborhood and health outcomes that were both self-reported (40), which notably differ from the current study which uses independently observed neighborhood disinvestment.

Increased tobacco and alcohol use, poorer dietary consumption, reduced physical activity, and psychosocial stress pathways leading to molecular processes (e.g., allostatic load and DNA methylation) impacting survival have been suggested as mechanisms through which social environmental factors might drive disparities in breast cancer outcomes by minoritized racial–ethnic group and geographic factors (5, 6, 18, 41). For example, an epigenetic study among 96 non-Hispanic Black and non-Hispanic White breast cancer cases reported differential DNA methylation by census-based neighborhood socioeconomic measures among 26 cytosine-phosphate-guanine sites, one of which was also associated with greater hazard of all-cause death (42). Stage-specific associations did not appreciably change with adjustment for health behaviors, WHR, treatments received, or triple-negative breast cancer, seemingly suggesting that these factors were not acting as mediators. However, statistical power was limited, and larger follow-up studies are needed to more accurately test for mediation. Accurately identifying mechanisms through which neighborhood disinvestment in particular could impact breast cancer survival is important for understanding how such exposures might impact survival and for developing interventions (43). Moreover, evidence from randomized trials exists—rarely available for many other commonly studied social environmental measures—supporting a psychosocial pathway between neighborhood disinvestment and health (44). Future research is needed to better understand temporal dynamics (e.g., timing and duration of exposure) and associations between neighborhood disinvestment and survival-related health behaviors (e.g., physical activity, tobacco use, and dietary patterns), treatment factors (e.g., guideline-concordant care and treatment resistance), tumor biology, and outcomes.

Cancer stage–dependent associations between disinvestment and breast cancer survival could arise from a mix of causal factors and biases (see limitations). As indicated above, potential direct or indirect causal effects on survival could exist via neuroendocrine stress pathways or health behaviors such as tobacco use, diet, and physical activity, which in turn impact survival-related processes such as treatment effectiveness, tumor growth, or metastases. These mechanisms to survival could be stage-dependent. A study of physical activity and breast cancer survival reported stage-dependent associations in line with the findings of the current study; greater physical activity was associated with 0.36 (95% CI, 0.19, 0.71) hazard of death among those with stage III cancer, whereas the hazard of death was 0.67 (95% CI, 0.41, 1.09) among those with stage I cancer (stage IV was omitted from the study; ref. 45).

Strengths of this study include the sample of women self-identifying as African American or Black, consideration of many potential confounders, use of validated and modifiable neighborhood measures, and active follow-up of study events, minimizing bias from follow-up loss. Individual socioeconomic factors are known confounders of associations between neighborhood factors such as disinvestment and health outcomes (19, 46, 47). Interestingly, we found little evidence of confounding by educational attainment, income-to-poverty level, or area-level socioeconomic composition as associations did not change with adjustment for these factors. Adjusting for sociodemographic factors, WHR, prediagnosis health behaviors, and indicators of treatment receipt also did not appreciably change associations observed between neighborhood disinvestment and survival time. This suggests that

stage-dependent associations are independent of these factors. Another strength was our use of validated measures of neighborhood disinvestment and socioeconomic composition (2, 29, 48), improving the accuracy and translational utility of the results.

Limitations include potential exposure misclassification, unmeasured confounding, and the small-to-moderate sample size resulting in wide CIs. Misclassification of neighborhood disinvestment could have occurred from a lack of residential history and spatio–temporal variation in exposure or other nonresidential disinvestment exposures. Google streetscapes virtually audited to create the disinvestment score could theoretically have been dated up to 10 years before or 6 years following diagnosis, because cancer diagnosis dates were from 2013 to 2019 and possible streetscape image dates were from 2009 to 2019. The latter represents reverse causality and is problematic if health outcomes impact neighborhood socioeconomic factors (49). Potentially leading to disinvestment misclassification by stage, one study of Surveillance, Epidemiology, and End Results–Medicare breast cancer survivors found that those diagnosed with stage II or III cancer had more residential moves compared with those diagnosed with stage I or IV cancer (50). If greater residential mobility is associated with disinvestment, stage, and survival, it represents an unmeasured confounder that could impact the stage-dependent associations of this study, including trends toward longer survival with increasing disinvestment among those diagnosed at stages I and IV. Future studies should more fully investigate these potential sources of measurement error and bias among those diagnosed with breast cancer.

Neighborhood disinvestment is a social environmental stressor unique for its modifiability, validated measurement properties, mounting evidence for associations with breast cancer risks and outcomes, and potential for involvement in breast cancer disparities by racial–ethnic minoritized group. Evidence for associations between greater disinvestment and shorter survival time among those diagnosed at earlier stages and who, on average, are expected to survive for several years suggests that cumulative, adverse health factors might result from long-term residence in areas of high disinvestment among this cohort of Black and African American breast cancer cases.

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Disclaimer

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Authors' Contributions

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Note

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