

Background

- Roughly 90-95% of cancer can be attributed to social, behavioral, and environmental factors, while only 5-10% is directly attributable to genetics.
- Where individuals live, work, and play is vitally important across the cancer control continuum, including the risk of developing cancer, timely early detection, appropriate treatment, and mortality.
- Demographics have been shown to predict cancer trial enrollment, but there is less research on how geographic and neighborhood factors affect trial participation.

Purpose: This study identified demographic, clinical, geographic, and neighborhood predictors of consenting to trial participation among cancer patients at the Sydney Kimmel Cancer Center (SKCC).

Methods

Sample

- SKCC patient encounters representing new cases of cancer during the time period of 2015-2017, were selected from the SKCC Cancer Registry. This database provided information about demographics (age at diagnosis, sex, race, ethnicity, marital status) risk factors (tobacco use, alcohol use), cancer characteristics (primary site, grade, stage), and mortality.
- We linked patient demographics and clinical data to information on trials participation. Using ArcGIS 10.3, we geocoded patient addresses by residence. We then limited the dataset to Philadelphia residents (N=3254).
- We joined an index describing patients' neighborhood-level social capital to the individual-level dataset. Social Capital Index was the average of three self-reported variables; % residents that trust people in neighborhood, % residents feel that they belong in their neighborhood, and % residents that think people in their neighbors are willing to help.
- Using ArcGIS 10.3, we calculated driving distance between each patients' residence and SKCC, along the network of streets in Philadelphia.

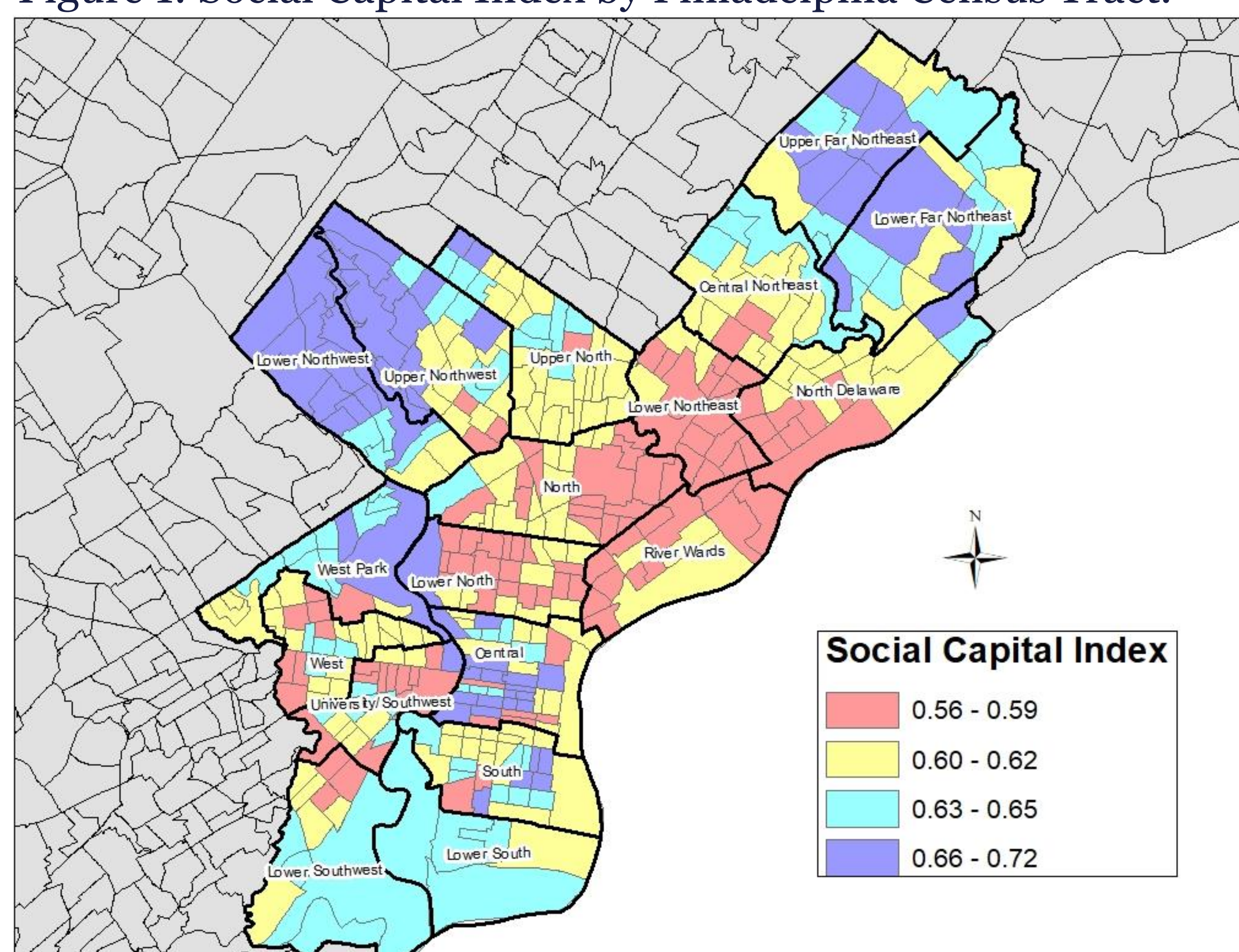
Statistical Analysis

- We used generalized linear mixed effects conditional logistic regression models to identify the individual and neighborhood correlates of consenting to participate in a clinical trial.

Results

- Of the 3254 patients included in our multilevel modeling, 399 (12%) consented to be in a SKCC clinical trial and only 42 (11%) of them did not enroll in a trial.
- 363 among 384 CTs in Philadelphia had at least one cancer patient in the SKCC database.
- The mean Social Capital Index was 0.61 and the mean residential distance from SKCC was 7.3 KM, or ~4.5 miles.

Figure 1: Social Capital Index by Philadelphia Census Tract.



- Compared to patients under age 50, those 50-69 had higher odds of consenting to a clinical trial (AOR=1.42) while patients age 80+ had lower odds of consenting (AOR=0.36).
- Compared to patients with other solid tumor cancer types, those with breast cancer had nearly a 4-fold higher odds of consenting (AOR=3.87) and those with hematologic cancer had 2-fold higher odds of consenting (AOR=2.12).
- Compared to patients with local stage cancer, those with regional stage had higher odds of consenting (AOR=1.79).
- Compared to patients who live in neighborhoods in the lowest quartile of our sample's social capital index, those in the 2nd quartile had a 35% higher odds of consenting (AOR=1.35) and those in the highest quartile had a 50% higher odds of consenting (AOR=1.50).
- Interestingly, each kilometer of driving distance from a patient's residence to SKCC was associated with a 4% increase in odds of consenting (AOR=1.04).

Results

Table 1. GEE modeling results on the likelihood of consenting to SKCC clinical trials associated with individual-level variables and neighborhood social capital.

Predictors	Fixed Effects for Patient-Level Factors Model*	Fixed Effects for Patient- and Neighborhood-Level Factors Model*
Fixed Effects Odds Ratios		
Age at Diagnosis		
50-69y (vs. under 50y)	1.41 (1.02, 1.93)	1.42 (1.03, 1.96)
70-79y (vs. under 50y)	0.75 (0.48, 1.16)	0.75 (0.48, 1.18)
≥80y (vs. under 50y)	0.36 (0.21, 0.64)	0.36 (0.20, 0.66)
Cancer Type		
Breast (vs. Solid Tum)	3.79 (2.53, 5.69)	3.87 (2.54, 5.89)
GI (vs. Solid Tum)	1.27 (0.88, 1.84)	1.26 (0.86, 1.86)
GU (vs. Solid Tum)	1.06 (0.68, 1.64)	1.04 (0.66, 1.63)
Head/Neck (Solid Tum)	1.29 (0.82, 2.04)	1.29 (0.81, 2.07)
Heme (vs. Solid Tum)	2.08 (1.31, 3.29)	2.12 (1.32, 3.40)
Melan/Other (Solid Tum)	1.13 (0.62, 2.06)	1.12 (0.60, 2.11)
Cancer Stage		
In-situ (vs. Local)	0.73 (0.47, 1.14)	0.76 (0.48, 1.20)
Regional (vs. Local)	1.77 (1.36, 2.31)	1.79 (1.36, 2.35)
Distant (vs. Local)	1.31 (0.95, 1.79)	1.30 (0.94, 1.80)
Driving Distance to SKCC (per km)		
	1.04 (1.02, 1.05)	1.04 (1.02, 1.06)
Neighborhood Social Capital		
0.59-0.62 (vs. <0.59)		1.35 (1.02, 1.78)
0.63-0.65 (vs. <0.59)		1.00 (0.71, 1.41)
≥0.65 (vs. <0.59)		1.50 (1.15, 1.96)
Random Effects Variance (SE)		
	N/A	N/A

Models additionally controlled for Sex, Race/Ethnicity, Marital Status, Tobacco and Alcohol Use, and Neighborhood Cancer Prevalence.

Discussion

- SKCC Patients living in neighborhoods with higher social capital had higher odds of consenting to clinical trials. This relationship may reflect social support among neighborhood residents in areas with high social capital.
- Residential distance from the SKCC was inversely related to consenting to trials. This relationship may be the result of transportation or parking issues, or may reflect the neighborhood income and resource inequities in Philadelphia.
- We could not control for income, education level or other important demographics that were not in the SKCC registry.
- More research is necessary to identify the extent to which distance from screening facilities serves as a barrier for receipt of LDCT services in order to reduce this barrier and improve screening adherence.

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