Association between Neighborhood-Level Indices of Socioeconomic Status and Breast, Cervical, and Colorectal Cancer Screenings in Rhode Island

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Overview

Utilizing data from the RI-APCD, we analyzed whether neighborhood-level indices like the Social Vulnerability Index and Area Deprivation Index were significantly related with screening rates for breast, cervical, and colorectal cancers by ZIP code in Rhode Island.

Background

- Access to effective, routine cancer screening for breast, cervical, and colorectal cancer is critical in reducing the burden of disease.[1]

- The disparities in breast, cervical, and colorectal cancer mortality between communities can be partly explained by lack of access to screening.[2,3,4]

- Significant disparities in cancer screening exist due to individual socioeconomic factors, but we must also consider them at the interpersonal, community, and societal levels.[5]

- The Area Deprivation Index (ADI) and Social Vulnerability Index (SVI) are effective tools that rank socioeconomic disadvantage at the neighborhood-level.[6,7]

Methods

- The Rhode Island All-Payer Claims Database was used to calculate screening rates for breast, cervical, and colorectal cancers from 2016 to 2019 for each ZIP-code tabulation area in Rhode Island.[8]

- The ADI and SVI percentile scores were calculated at the ZIP code level using 2020 American Community Survey data through R-studio.

- ArcGIS was used to map the screening rates for breast, cervical, and colorectal cancer as well as the ADI and SVI percentile scores for each year.

- A tobit regression was used to study the association between SVI and ADI and cancer screening rates.
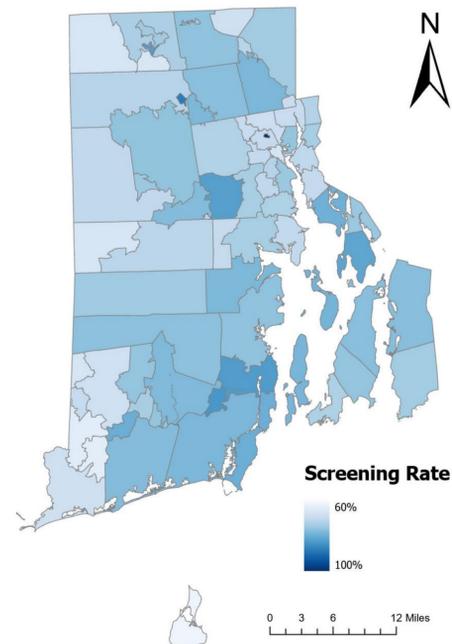
2019 Cancer Screening Rate Maps

Colorectal Cancer Screening Rate by ZIP Code, 2019
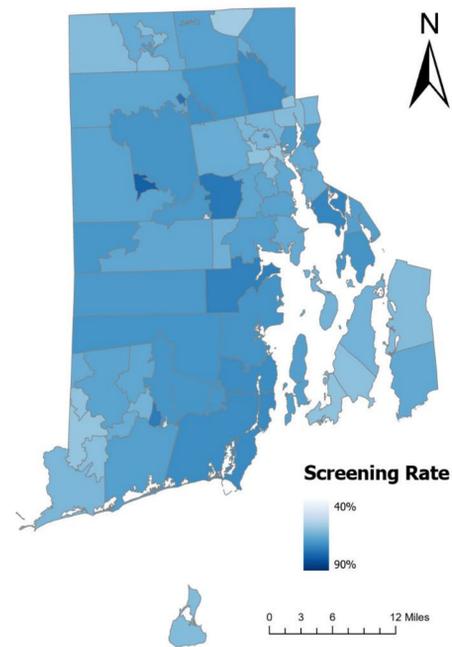
Cervical Cancer Screening Rate by ZIP Code, 2019
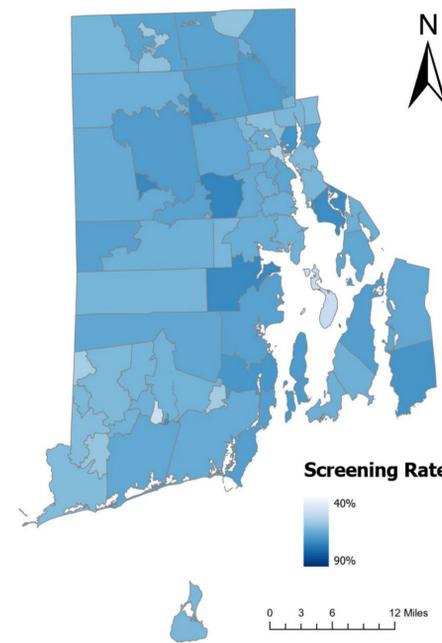
Breast Cancer Screening Rate by ZIP Code, 2019

Results

	Breast Cancer Screening Rate 2019	Cervical Cancer Screening Rate 2019	Colorectal Cancer Screening Rate 2019
Overall ADI	-0.000714 (95% CI [-0.001085, -0.000342])	-0.000541 (95% CI [-0.000953, -0.000129])	-0.000807 (95% CI [-0.00117, -0.000443])
Overall SVI	-0.0615 (95% CI [-0.109744, -0.013311])	-0.00182 (95% CI [-0.055245, 0.051605])	-0.0615 (95% CI [-0.110, -0.0133])
Per $100,000 Increase in Capita Income	0.127 (95% CI [0.0397, 0.214])	0.219 (95% CI [0.141 0.297])	0.179 (95% CI [0.0966, 0.262])
% No High School Diploma	-0.212 (95% CI [-0.381, -0.0433])	-0.101 (95% CI [-0.285, 0.0827])	-0.272 (95% CI [-0.436, -0.108])

- Breast and colorectal cancer screening rates were significantly associated with both ADI and SVI as well as most variables of the SVI.

- Cervical cancer screening rates were only significantly associated with the ADI, so further studies are needed to identify effective predictors of screening rates at the neighborhood level.

Conclusion

- Screening rates for breast, cervical, and colorectal cancers are influenced by various sociodemographic factors that affect individuals' ability to seek care.

- Significant negative associations between screening rates and ADI and SVI suggest the importance of utilizing neighborhood-level indices to effectively target interventions for the most disadvantaged communities.

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