

Social Determinants of Health Factors Associated with Breast Cancer Screening in Underserved Communities of Northwest Indiana

Seth Allen Bower¹, Basem Altarshan², Pooja Patel², Amy Han³

Indiana University School of Medicine-Northwest^{1,2}; Indiana University School of Medicine-Department of Psychiatry³

Background: Despite breast cancer being the second most common type of cancer found in female patients, a large number of female patients have not received a mammogram in the past two years. This disparity is partly due to factors related to social determinants of health. The effects of social determinants of health on positive breast cancer screenings are clearly present in Northwest Indiana, a region containing vastly differing communities with a wide range of income levels and diversity. Nearly two decades of patient data from this area can inform us which social determinants of health are associated with increased risk for breast cancer.

Methods: “Hospital System A”, located in Lake County, Indiana, provided data from 111,564 mammograms from the year 2006 to the end of 2023. These 18 years of data provide patient zip code, age, race, insurance category, and screening results. A proportion of positive screenings was calculated for each group and compared using Chi-Square tests. Census information such as mean household income, race, and age was gathered for each zip code in Northwest Indiana and was tested on proportion of positive screenings by regression analysis.

Results: When comparing zip codes of Northwest Indiana, lower mean household income was associated with higher rates of breast cancer (p -value = 0.0049). Medicare and Medicaid patient groups both had significantly higher rates of breast cancer than private and self-pay groups (p -value = 1.35×10^{-10} , p -value = 0.0032). Race had almost no impact on breast cancer rates.

Potential Impact: Income level has the greatest impact on breast cancer rates. We hypothesize that this relationship may be related to decreased access to care and unhealthy lifestyles because of economic restraints. Additionally, race has little influence on breast cancer rates, which may explain that society may have a greater role in health than individual characteristics.