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GIS Mapping as a Tool to Visualize Breast Cancer Risk and Mammography Services and to Guide Prevention Efforts in Shelby County

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GIS Mapping as a Tool to Visualize Breast Cancer Risk and Mammography Services and to Guide Prevention Efforts in Shelby County

Background: Shelby has one of the highest breast cancer mortality rates among Tennessee counties and more breast cancer deaths than any other county in the state.

Objectives: To compare breast cancer risk and provision of mammograms within Shelby County and inform local prevention efforts.

Methods: Four measures of breast cancer risk were mapped by zip code: breast cancer incidence and mortality rates and percentages of women in poverty and without health insurance. These measures were also combined into a single, weighted risk score for each zip code. Three aspects of mammography service delivery were examined: location of mammography facilities, location and volume of mobile mammography services and location and volume of Tennessee Breast and Cervical Screening Program (TBCSP) services. Service data were superimposed on risk score maps in order to identify underserved, high risk areas.

Results: All TBCSP enrollment sites are located in high and medium risk zip codes. However, none of the vendors providing mammograms to TBCSP participants are located in high risk zip codes and the majority of mammography facilities are located outside of high risk areas. Only 30% of mammograms provided by mobile units occurred in high risk zip codes. Study findings were used to target mobile units to underserved high risk areas, support the recruitment of mobile units as TBCSP enrollment sites and identify the need for additional TBCSP vendors, especially in high risk areas.

Conclusion: GIS mapping is an effective tool for visualizing disease risk and service provision in order to guide prevention efforts.