

# The Relationship between Geographical Access to Mammography and the Early Detection of Breast Cancer in Virginia | Megan Lohr

The purpose of this study was to investigate the nature of the relationship between geographical access to mammography, measured in terms of driving distance, and early detection of breast cancer, measured in terms of a small tumor size at diagnosis. This study also attempted to determine the influence of women's socioeconomic status on the geographical access – early detection relationship.

The early diagnosis of breast cancer is crucial to the successful treatment of the disease. When women are diagnosed with in situ and stage I breast cancers, they can be effectively treated with a five-year survival rate that is nearly 100%. The five-year survival rate declines rapidly for tumors diagnosed in stages II and III and is only 16% for tumors diagnosed at stage IV. Mammography is the recommended screening tool for breast cancer and is especially useful for detecting in situ cancers which are too small to be felt during clinical breast exams.

In the state of Virginia, only 75% of women over the age of 40 report having had a mammogram performed in the past two years. Accordingly, Virginia ranks 31<sup>st</sup> in the nation for mammography usage by women over the age of 40, the age group for which annual mammography is recommended. Possibly as a result of the poor level of mammography usage in the state, the breast cancer mortality rate in Virginia is the 10<sup>th</sup> highest in the country. Many factors are thought to influence the likelihood that women have mammograms as recommended, including age, race, and socioeconomic status. Geographical access could be another barrier to mammography usage, and therefore to early detection, particularly in the rural areas of Virginia. A negative relationship between geographical access and early detection may be intensified by women's socioeconomic status.

Information on incident, primary breast cancer cases that occurred in women in Virginia in 2000 and 2001 was obtained from the Virginia Cancer Registry. The patients' home locations were used to determine the driving distance between each patient and the nearest approved Virginia mammography facility as well as to assign an average, location-based socioeconomic status to each woman. Associations between patient characteristics and distance from a mammography facility and tumor size at diagnosis were analyzed separately. The association between distance and tumor size was analyzed for all the cases together and separately for each socioeconomic status group. Factors associated with tumor size and diagnoses of in situ breast cancer were also analyzed separately.

Among the 11,437 women included in the study, 81% had tumors that were in situ, stage I, or stage II. The average tumor size was 20.22 mm, which corresponds to a stage I or stage II tumor. Eighty-three percent of the women lived within 10 miles of a mammography facility. Non-white women and women with high socioeconomic status were the most likely to live within five miles of a facility. There was not a clinically significant relationship between the

distance that women lived from the nearest mammography facility and tumor size at diagnosis. When socioeconomic status was taken into account, there was still not a clinically significant association. There were mixed results when the association between distance and tumor size was analyzed within each of the socioeconomic categories. Some categories showed a positive relationship while others showed a negative relationship. The factors that were significantly associated with tumor size were age, race, and high versus low socioeconomic status. Additionally, the factors significantly associated with diagnosis of in situ breast cancer were age and high versus low socioeconomic status.

Geographical access was not a significant independent barrier preventing women from receiving screening mammograms or having breast cancer tumors diagnosed at an early stage in Virginia during the years 2000 and 2001. An implication of this study is that merely altering geographic access, possibly by bringing mobile mammography facilities to rural areas, would not be sufficient to increase mammography usage if other barriers to access, such as financial, cultural, attitudinal, and educational barriers, were not addressed simultaneously.