

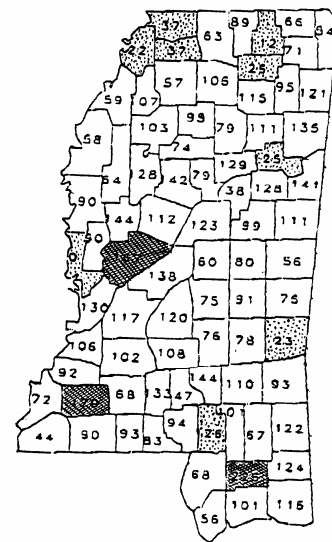
Breast Cancer Mapping in Mississippi: A Pilot Study

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Objectives and Significance. The *overall goal* of this research project is to assess risk for breast cancer in Mississippi by analyzing the interaction of known environmental hazards and clusters of breast cancer. More specifically, we will map patterns of breast cancer incidence and mortality in relation to geographic variables including socio-economic data, ethnicity, environmental factor such as large-scale historical pesticide use, and access to health care facilities by using a geographic information system (GIS). GIS is a unique tool, which presents risk factors or exposure factors in various layers (such as water source, land use, location of pollution sources and cancer screening facilities), and it allows to establish spatial and temporal relationship of the risk factors. In this pilot phase of the study, our *specific aims* are two-fold: 1) map all breast cancer cases (morbidity) and deaths (mortality) by county and by population to identify “high risk” and “low risk” areas; and 2) select two counties randomly, one at “high risk” and the other at “low risk” of breast cancer; identify selected geographic risk factors and correlate them with the morbidity and mortality of breast cancer in the two counties. This pilot study will generate preliminary data for a larger study to fill up the gap in our understanding: why breast cancer incidence and mortality are higher in certain counties of Mississippi, and how to bring them down.

Relation to the Present State of Knowledge. Breast cancer is by far the most common cancer among women. It accounts for almost one out of every three cancer diagnoses in women. In 2001, an estimated 192,200 new cases of invasive breast cancer occurred in women (an increase of 5% over last year). Breast cancer is also the leading cause of death for women between the ages of 35 and 54.¹ Overall, white women are most likely to be diagnosed with breast cancer, while black women are more likely to die from it. In Mississippi, about 2000 new cases and 400 deaths from invasive breast cancer are projected in 2001. The distribution of age-adjusted incidence rate of breast cancer in 1996 (Figure), as reported by the Mississippi State Department of Health² was found to be high in certain counties (for example, Stone, Franklin, and Yazoo counties) and low in some other counties (for example, Issaquena on the East; Lamar on the South; Clarke on the South-East; Clay on the North-East; and Benton, Union, De Soto, Tate, and Tunica on the North). However, we don't know why some counties have higher rates of breast cancer than others.



Relation to the Investigator's Long-Term Goal. Current knowledge regarding the risk factors for breast cancer in Mississippi is scanty. There are some data regarding socioeconomic and

ethnic difference of breast cancer incidence and death in Mississippi, however, detailed socio-economic, behavioral, and environmental data are needed to show the association of risks and rates of breast cancer. This pilot study will help the PI generate some preliminary data for a full research proposal for further improving our knowledge of the risk factors for breast cancer in the State. In the long term, mapping of cancer clusters is needed to objectively evaluate apparent "hot spots" so as to better focus etiologic and intervention studies. This knowledge base on GIS will be used by the PI to develop further GIS-based research in other fields of epidemiology.

Methods and Procedures. The PI will obtain data for the selected counties using the following sources: 1) Mississippi State Department of Health Cancer Registry for morbidity and mortality data on breast cancer; 2) Mississippi Automated Resource Information System (MARIS) for geographic data;³ 3) University of Southern Mississippi Department of Geology and Mississippi State University Department of Agriculture for geological and pesticide use data; and 4) The National Cancer Institute for GIS support information. USM has got a site license for GIS (contact person, Dr. Clifton Dixon, Chair of the Department of Geography). A software, called ArcView will be used to create plots and analyze spatial data. The PI obtained necessary training on using this software (attached CV). Dr. Faruque, Director of GIS, Office of Research at the University of Mississippi Medical Center will provide technical expertise for GIS database development and analysis.

Expected Date of Completion. June 1-July 31, 2002: Gathering data; August 1-31, 2002: Data analysis and manuscript. These preliminary data will be used to develop a research proposal for extramural grants. Projected time for submission of a full research proposal for extramural grants: January 2003.

Dissemination of the Results. Data obtained from this study will be presented at the State and national conferences, such as Mississippi Public Health Association meeting and American Public Health Association meeting. Data will also be published in a peer-reviewed journal.

Reference

1. Breast Cancer Action. The facts and nothing but the facts. <http://www.bcaction.org/Pages/GetInformed/Facts.html>.
2. Mississippi State Department of Health. Cancer in Mississippi. Annual Report 1996.
3. Mississippi Automated Resource Information System. <http://www.maris.state.ms.us>