

Temporal, Geographic and Demographic Trends of Early Onset Breast Cancer (EOBC) in Hampden County, MA



Holly S. Mason MD FACS
Jane Garb MS



Baystate
Medical Center

Early Onset Breast Cancer

- ✓ Breast CA is leading cause of cancer in women
- ✓ Second cause of cancer-related deaths
- ✓ Leading cause of death in women under 40
- ✓ Stage at presentation is more advanced
- ✓ Racial and ethnic disparities in screening
- ✓ Observed increase in breast CA in young women

Objectives

- ✓ Validate an increase in EOBC in women < 40 over time in Hampden County, MA
- ✓ Determine if stage at presentation is higher in patients with EOBC than in older cohorts
- ✓ Identify geographic areas and demographic subgroups at higher risk of EOBC

Data Sources

- ✓ All Breast Cancer Cases diagnosed January 1, 1982 – December 31 2008
- ✓ Massachusetts Cancer Registry
- ✓ BMC Tumor Registry
- ✓ Mercy Medical Center Tumor Registry
- ✓ Census Decennial population data for 1990, 2000, 2010

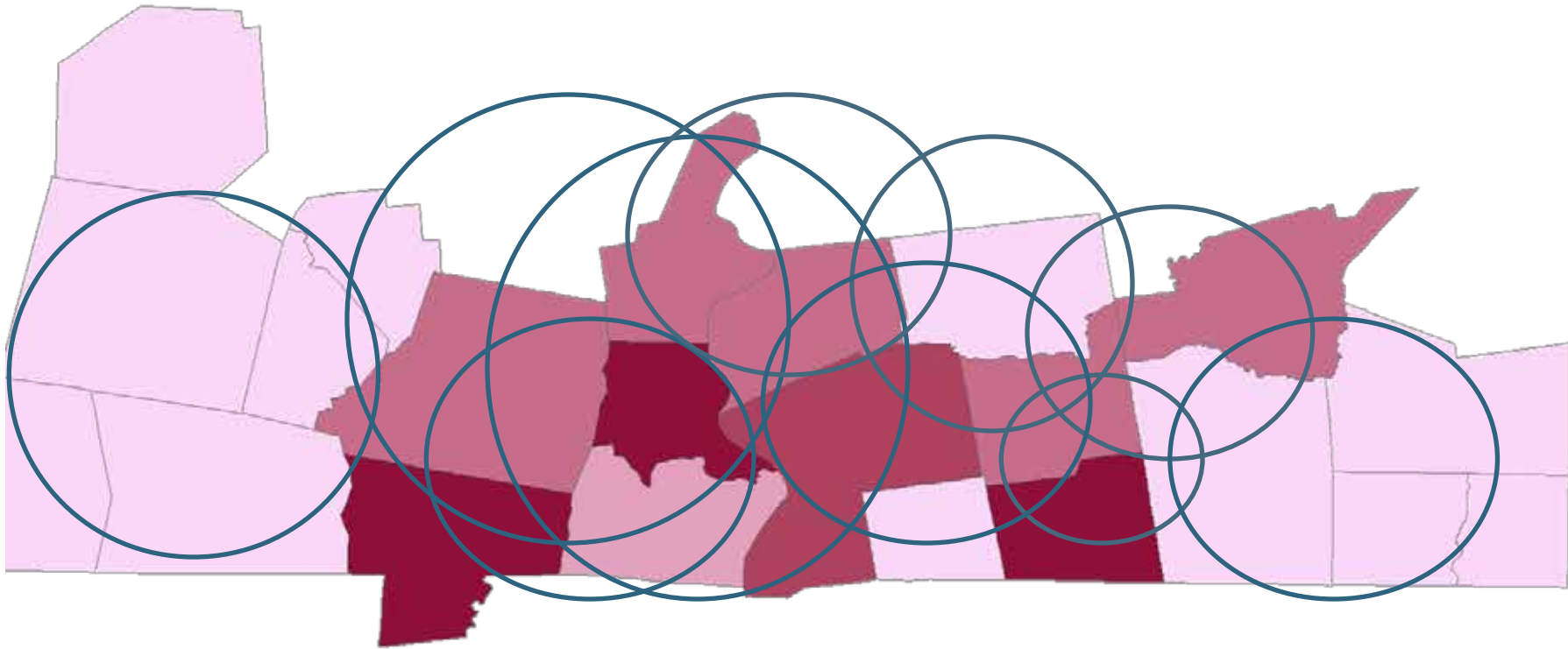
EOBC Incidence Rate

- ✓ Numerator: 5-yearly average of EOBC cases
- ✓ Denominator: All females 18-39
- ✓ Incidence: $\frac{EOBC \text{ Cases}}{Females \text{ } 18-39}$ per 100,000 per year
- ✓ Calculated rates by town to stabilize estimates

GIS Methods

- ✓ Choropleth mapping to visual trends in rates over time
- ✓ Spatial Analysis to test for geographic and temporal clustering of rates
 - ✗ Moran's I
 - ✗ Spatial Scan statistic

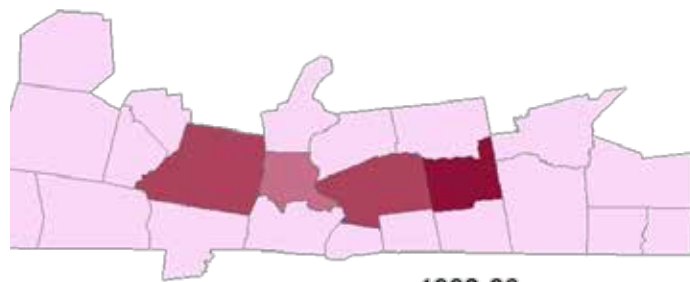
Spatial Scan Statistic



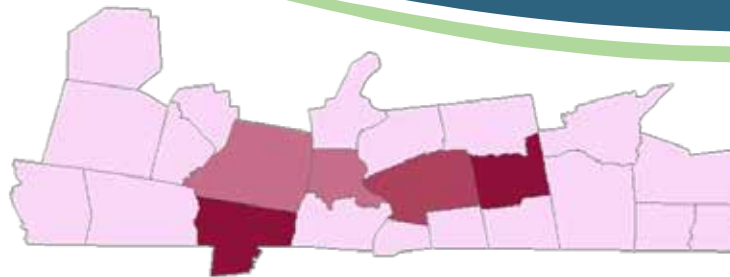
Statistical Modeling

- ✓ Linear regression to test for increase in EOBC town rates over time
- ✓ Multiple logistic regression to identify patient- and tumor-level risk factors for EOBC

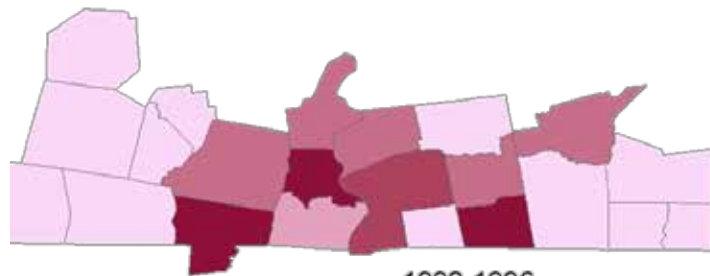
Results



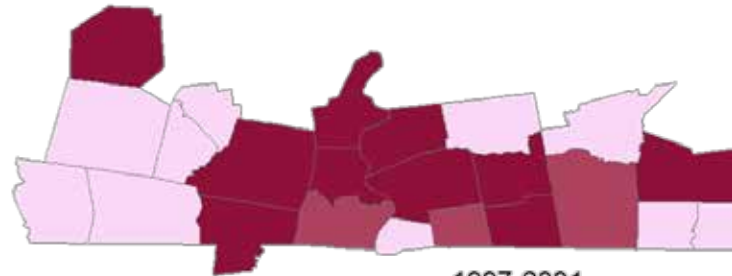
1982-86



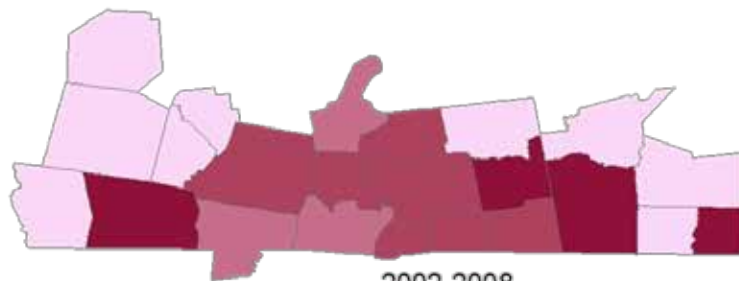
1987-1991



1992-1996

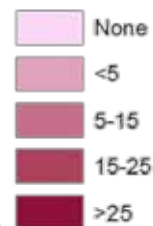


1997-2001



2002-2008

Yearly Rates per
100,000 Females 18-39



Results

- ✓ No spatial or temporal clustering
- ✓ Increase in 1 per 100,000 cases every 5 years
- ✓ Risk Factors in EOBC
 - ✗ **Grade:** 89% increase in risk for every increase in grade
 - ✗ **Ethnicity:** Hispanics 2.5 times as likely to be EOBC
 - ✗ **Race:** Asian women almost 7 times as likely to be EOBC
 - ✗ **Marital Status:** Single women 2.1 times as likely to be EOBC

Conclusions

- ✓ There has been an increase in EOBC in our region in the last 20 years.
- ✓ No increase in stage
- ✓ Hispanic and Asian women are at increased risk of EOBC.
- ✓ Focused efforts at screening may help to lower the stage at initial diagnosis and thereby increase overall survival.

Why this study took 5 years

- ✓ Getting data from Mass Cancer Registry
- ✓ Reconciling data from two hospital registries
- ✓ Compiling census data from 3 time periods
- ✓ Deciding how to aggregate the data
 - time units
 - Spatial units

Thank you!

Jane Garb

jane.garb@baystatehealth.org

Baystate Health
Springfield, MA