

Persistent High Cardiovascular Health Related Burden In Michigan Five-County Cluster

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BACKGROUND

Cardiovascular disease is the number one cause of death in the United States and in the state of Michigan. Michigan has consistently had a higher cardiovascular disease mortality rate when compared to the national rate and the burden has been much higher in certain geographical regions. Age-adjusted hospitalization and mortality rates in Michigan were first mapped with 2002-2006 data for five major cardiovascular diseases (total cardiovascular disease, coronary heart disease, heart disease, heart failure, and stroke). These maps revealed a five-county contiguous cluster with a disparate geographical burden. The five counties identified were Arenac, Bay Clare, Gladwin, and Ogemaw.

OBJECTIVE

To measure cardiovascular health-related disease-specific hospitalization and mortality rates with more recent data in order to determine if geographical disparities continue to exist among the same Michigan five-county cluster and to compare the rate maps to other health behavior and population maps used to describe the population.

METHODS

- Five-year age-adjusted hospitalization and mortality rates were calculated using data from 2004-2008 for five major cardiovascular diseases: cardiovascular disease, coronary heart disease, heart disease, heart failure, and stroke. Rates were age-adjusted to the 2000 U.S. standard population. Analysis followed methods used in the 2002-2006 project.
- Disease-specific ICD-9 and ICD-10 codes shown below were used to calculate the rates. Rates were then mapped by county using Geographical Information Software, ArcGIS 9.2.

| Cardiovascular Disease ICD-10: I00-I25 ICD-9: 410-414, 430-438 | | |
|--|--|---|
| Diseases of the Heart ICD-10: I00-I25 ICD-9: 410-414, 430-438 | | |
| Coronary Heart Disease ICD-10: I20-I25 ICD-9: 410-414, 430-438.2 | Heart Failure ICD-10: I50 ICD-9: 431 | Stroke ICD-10: I60-I69 ICD-9: 430-434, 436-438, 431 |
| Ischemic ICD-10: I20-I25 ICD-9: 410-414, 436 | Hemorrhagic ICD-10: I60-I69 ICD-9: 430-431 | Transient Ischemic Attack ICD-9: 431 |

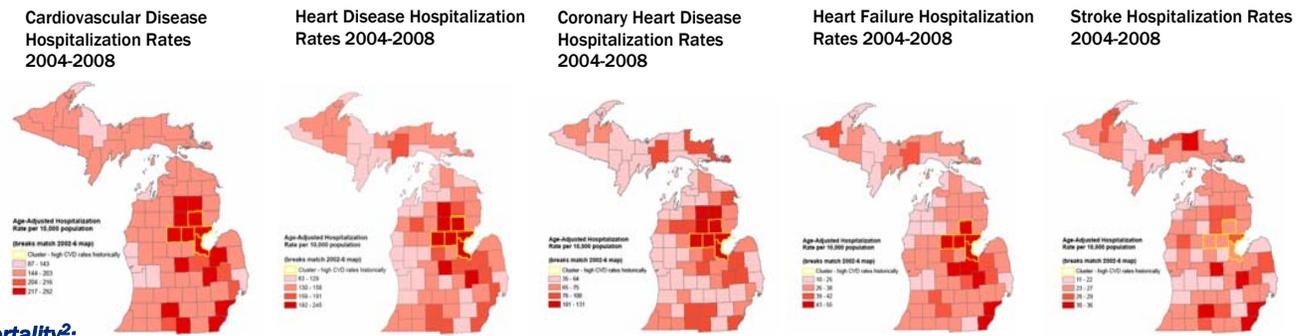
- County and Local Health Department data from sources such as Michigan Behavioral Risk Factor Survey, Michigan Health and Hospital Association, and Vital Statistics were used to understand the demographics, health behaviors, and resources of the five-county cluster.

Resources:
¹ Michigan Resident Death Files, Vital Records & Health Statistics Section, Michigan Department of Community Health, 2002-2008
² Michigan Resident Inpatient Files, Vital Records & Health Statistics Section, Michigan Department of Community Health 2002-2008
³ Michigan Behavioral Risk Factor Survey, 2007-2009
⁴ Michigan Health and Hospital Association, 2008
⁵ Michigan Center for Geographic Information, 2008
⁶ Area Resource File (ARF), 2005, U.S. Department of Health & Human Services, 2005

RESULTS

Hospitalization^{1:}

- The combined 2004-2008 age-adjusted rates still showed Arenac, Bay Clare, Gladwin, and Ogemaw among the top ten counties with the highest cardiovascular disease, coronary heart disease, heart disease, and heart failure hospitalization rates.
- The 2004-2008 age-adjusted cardiovascular disease hospitalization rates per 10,000 and rank by county were as follows: Arenac (291.5, 1st), Bay (257.7, 2nd), Clare (256.1, 4th), Gladwin (236.1, 10th), and Ogemaw (257.3, 3rd). County rank for hospitalizations was consistent with 2002-2006 data.
- The following five maps show the distribution of hospitalization rates with the five-county cluster highlighted and selected cardiovascular disease risk factors:

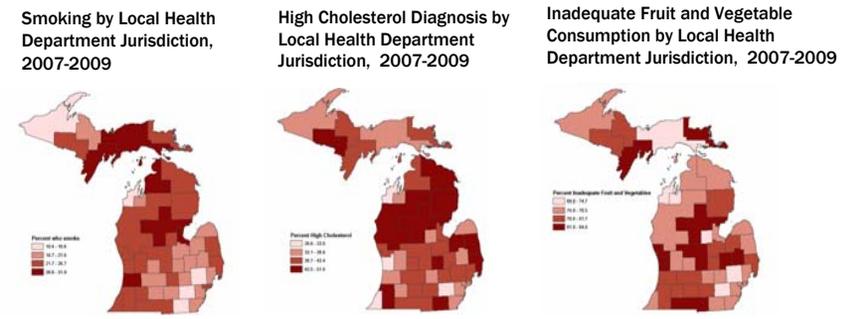


Mortality^{2:}

- The five-county cluster also had some of the highest mortality rates for the previously stated diseases. The 2004-2008 age-adjusted cardiovascular disease mortality rate per 100,000 and rank by county were as follows: Arenac (377.1, 2nd), Bay (297.1, 29th), Clare (358.1, 5th), Gladwin (313.0, 16th), and Ogemaw (360.1, 4th).
- Four out of the five counties experienced an increase in mortality rate rank when compared to 2002-2006 data.
- Maps of age-adjusted mortality rates of the five major cardiovascular diseases are not pictured here, but show a similar burden distribution.
- Stroke hospitalization and mortality rates were not consistent with the other four measured diseases; the burden was not as great in the five-county cluster.

Health Behaviors and Resources^{3,4,5,6:}

- Risk factor distribution maps show a high percent of residents in the five county cluster that smoked or were told by a doctor that they had high cholesterol.³
- The percent of people living in the local health department jurisdictions that encompass the five county cluster was high for reporting of inadequate fruit and vegetable consumption.³
- Five hospitals and three local health departments operate within the region.^{4,5}
- Population demographic distribution maps show a high unemployment rate and a low percent of residents with a high school or college education.⁶



CONCLUSIONS

The 2004-2008 analysis revealed that the five-county cluster of Arenac, Bay, Clare, Gladwin, and Ogemaw counties remain among the counties with the highest hospitalization and mortality rates in the state and their rates do not seem to be decreasing. It appears that the burden of some cardiovascular health-related risk factors in this region such as a high percent of residents that smoked, high cholesterol, and inadequate fruits and vegetable consumption could be contributing factors. These counties also appear to have socioeconomic disparities which also correlate with poorer health conditions. The residents in these five counties do have access to health care, however, further analyses and outreach to hospitals, public health, and other relevant entities in this region are needed to help understand why rates were much higher compared to other Michigan counties.

In an effort to gather more information, leaders from the Michigan Department of Community Health and other experts will work together to develop relevant topics for a discussion in the form of town hall meetings in this region. Local leaders and other interested parties from the five counties will be invited to attend the meetings in order to gain a better understanding and obtain suggestions for reducing some probable causes or contributors of the high burden.