Disparities in Cancer Incidence Among Residents of Appalachia Ohio

Ohio Cancer Incidence Surveillance System

The Ohio Department of Health
Arthur G. James Cancer Hospital and Richard J. Solove Research Institute
The Ohio State University

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Appalachian Region of the United States
Characteristics of Appalachia

- 410 counties in 13 states, stretching from southern New York to northeast Mississippi
- Counties range from metropolitan (58%) to rural (42%), compared to 20% rural in the nation
- Employment has diversified over the past 15 years:
  - Prior to 1990: Industry, agriculture, mining
  - Today: Service industry, retail, government
Characteristics of Appalachia, cont.

- Appalachia has been characterized as a region of health disparities:

Health disparities are differences in the incidence, prevalence, mortality and burden of disease among specific populations
Characteristics of Appalachia, cont.

- Greater proportion of counties with high rates of unemployment
- Lower per-capita income (81.9% of U.S. average)
- 121 (30%) counties designated as economically distressed (Fiscal year 2004; Appalachian Regional Commission 2003)
- Lower percentage of persons (age 25+) with a high school diploma or college degree
- Limited access to care: greater distance to medical facilities and lack of transportation
- High prevalence of cancer-related health behaviors:
  - High rates of obesity, smoking and physical inactivity
  - Low rates of mammography and Pap tests
Appalachia Ohio Demographics*

- 29 counties along the eastern and southern border
- 2000 Census of Population: 1,455,313 persons; 13% of Ohio’s population
  - 49.1% Male, 50.9% Female
  - 96.1% White, 2.1% African American
- Land Use: 37.4% Agricultural, 1.2% Urban
- Unemployment Rate: 5.7% (versus 4.0% for Ohio)
- Registered Hospitals: 33

Objectives

- Illustrate disparities in cancer incidence and mortality in Appalachia versus non-Appalachia Ohio, focusing on leading and screenable sites/types of cancer
- Explore factors that may contribute to these disparities, including: health behaviors, stage at diagnosis, income, education, insurance status and access to medical care
Sources of Data

  - Primary cancers diagnosed among Ohio residents
  - Coded to the ICD-O-3; SEER site/type groupings

  - Ohio residents with an underlying cause of death of cancer

- **Health Behaviors**: Ohio Behavioral Risk Factor Surveillance System, 1999-2003
### Appalachia and Non-Appalachia Ohio
Age-adjusted Cancer Incidence Rates* by Site/Type, 1998-2002

<table>
<thead>
<tr>
<th>Cancer Site/Type</th>
<th>Appalachia</th>
<th>Non-Appalachia</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Sites/Types</td>
<td>480.7</td>
<td>470.2</td>
<td>+ 2.2%</td>
</tr>
<tr>
<td>Breast (Female)</td>
<td>121.8</td>
<td>130.8</td>
<td>- 6.9%</td>
</tr>
<tr>
<td>Cervix</td>
<td>11.5</td>
<td>8.1</td>
<td>+ 42.0%</td>
</tr>
<tr>
<td>Colon and Rectum</td>
<td>63.6</td>
<td>55.7</td>
<td>+ 14.2%</td>
</tr>
<tr>
<td>Lung and Bronchus</td>
<td>82.9</td>
<td>75.2</td>
<td>+ 10.2%</td>
</tr>
<tr>
<td>Melanoma of Skin</td>
<td>14.3</td>
<td>14.6</td>
<td>- 2.1%</td>
</tr>
<tr>
<td>Oral Cavity/Pharynx</td>
<td>9.3</td>
<td>9.2</td>
<td>+ 1.1%</td>
</tr>
<tr>
<td>Prostate</td>
<td>142.0</td>
<td>154.8</td>
<td>- 8.3%</td>
</tr>
</tbody>
</table>

*Average annual rates per 100,000, age adjusted to the U.S. 2000 standard population.

• Note: A number of additional sites/types had a high percent difference in Appalachia versus non-Appalachia Ohio: brain and other CNS (7.7%); corpus uterus (6.4%); Hodgkin’s lymphoma (6.9%); leukemias (8.4%); non-Hodgkin’s lymphoma (7.4%); and thyroid (13.6%).
### Appalachia and Non-Appalachia Ohio

**Age-adjusted Cancer Mortality Rates* by Site/Type, 1998-2002**

<table>
<thead>
<tr>
<th>Cancer Site/Type</th>
<th>Appalachia</th>
<th>Non-Appalachia</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Sites/Types</td>
<td>218.1</td>
<td>210.1</td>
<td>+ 3.8%</td>
</tr>
<tr>
<td>Breast (Female)</td>
<td>27.8</td>
<td>29.0</td>
<td>- 4.1%</td>
</tr>
<tr>
<td>Cervix</td>
<td>3.7</td>
<td>2.7</td>
<td>+ 37.0%</td>
</tr>
<tr>
<td>Colon and Rectum</td>
<td>25.7</td>
<td>22.3</td>
<td>+ 15.2%</td>
</tr>
<tr>
<td>Lung and Bronchus</td>
<td>66.9</td>
<td>61.2</td>
<td>+ 9.3%</td>
</tr>
<tr>
<td>Melanoma of Skin</td>
<td>3.4</td>
<td>2.5</td>
<td>+ 36.0%</td>
</tr>
<tr>
<td>Oral Cavity/Pharynx</td>
<td>2.4</td>
<td>2.7</td>
<td>- 11.1%</td>
</tr>
<tr>
<td>Prostate</td>
<td>27.5</td>
<td>31.7</td>
<td>- 13.2%</td>
</tr>
</tbody>
</table>

*Average annual rates per 100,000, age adjusted to the U.S. 2000 standard population.

- Note: A number of additional sites/types had a high percent difference in Appalachia versus non-Appalachia Ohio: brain and other CNS (12.5%); Hodgkin’s lymphoma (40.0%); larynx (7.1%); non-Hodgkin’s lymphoma (7.9%); and testis (150.0%).
The prevalence of screening for breast, cervical and colorectal cancer is lower in Appalachia versus non-Appalachia Ohio.
The prevalence of current cigarette smoking, obesity, no leisure time physical activity and inadequate fruit and vegetable consumption is higher in Appalachia versus non-Appalachia Ohio.
Melanoma of Skin is the only cancer site/type with a greater percent late stage at diagnosis in Appalachia versus non-Appalachia Ohio.
Cervical Cancer in Appalachia Ohio
Age-adjusted Incidence Rates by Quartile of Median Household Income*, 1998-2002

- Cervical cancer incidence decreases with increasing quartile of income.
- Cervical cancer incidence is 42.0 % greater in Appalachia vs. non-Appalachia Ohio.

* Census 2000 Summary File 3 (SF 3) – Sample Data. Quartiles of median household income were determined for the state of Ohio and then assigned to each census tract. Persons with a residence of diagnosis within a particular census tract were assigned to the quartile of income for that census tract.
Colorectal cancer incidence decreases with increasing quartile of income.
Colorectal cancer incidence is 14.2% greater in Appalachia vs. non-Appalachia Ohio.

* Census 2000 Summary File 3 (SF 3) – Sample Data. Quartiles of median household income were determined for the state of Ohio and then assigned to each census tract. Persons with a residence of diagnosis within a particular census tract were assigned to the quartile of income for that census tract.
Prostate cancer incidence is highest in the highest quartile of income.
Prostate cancer incidence is 8.3% less in Appalachia vs. non-Appalachia Ohio.

* Census 2000 Summary File 3 (SF 3) – Sample Data. Quartiles of median household income were determined for the state of Ohio and then assigned to each census tract. Persons with a residence of diagnosis within a particular census tract were assigned to the quartile of income for that census tract.
Residents of Appalachia compared to non-Appalachia Ohio are more likely to have an educational attainment less than high school and less likely to have a college degree.

* Census 2000 Summary File 3 (SF 3) – Sample Data.
Persons with cancer in Appalachia versus non-Appalachia Ohio are less likely to have managed care, HMO, PPO plans and Medicare but are equally likely to have no health insurance.
There is little difference in type of reporting source between Appalachia and non-Appalachia Ohio.
Hospital Locations in Ohio

- Only 33 hospitals are located in the 29-county Appalachia Ohio region.
- Six counties in Appalachia Ohio do not have a hospital facility.

Source: ESRI GIS and mapping software, 2000
Conclusions

- Disparities in cancer incidence are found in Appalachia Ohio for all cancer sites/types combined and cancers of the cervix; colon and rectum; lung and bronchus; and oral cavity and pharynx.

- Disparities in cancer mortality are found in Appalachia Ohio for all cancer sites/types combined and cancers of the cervix; colon and rectum; lung and bronchus; and melanoma of the skin.

- The high rates of cervical and colorectal cancer mortality in Appalachia Ohio may be associated with the lower prevalence of screening for these cancers.
Conclusions, cont.

- The high rates of lung and bronchus cancer incidence and mortality in Appalachia Ohio may be due to the high prevalence of cigarette smoking in the region.

- Appalachia Ohio has a lower per capita income compared to non-Appalachia, and a direct relationship is found between low income and high rates of cervical and colorectal cancer in the region.

- Persons diagnosed with cancer in Appalachia and non-Appalachia Ohio are equally likely to be uninsured and reported from hospital facilities. Differences in access to appropriate care, however, may be associated with cancer disparities.
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