Evaluation of Completeness of Lymph Node Count in the North American Association of Central Cancer Registries for Selected Cancers

Data Assessment Work Group

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Background

Examining adequate number of regional lymph nodes is considered as a measure of quality of care for some cancers.

- colon cancer
- female breast cancer
- non-small cell lung cancer (NSCLC)

“Regional Nodes Examined” became a component of the Collaborative Staging System for cases diagnosed on or after January 1, 2004.
Background

- The completeness of this information in population-based cancer registries is unknown.
Objective

- To evaluate quality of “regional nodes examined” information for colon cancer, female breast cancer, and NSCLC in the North American Association of Central Cancer Registries (NAACCR) database.
Methods

- We used NAACCR Incidence-CiNA Analytic File, 1995-2011.
- Inclusion criteria
  - First primary invasive stage I-III colon cancer, female breast cancer, and NSCLC diagnosed between 2007 and 2011 in the US cancer registries
  - Aged 20 years and older
  - Received modified radical/radical/extended radical mastectomy for female breast cancer
  - Received site-specific surgery for NSCLC and colon cancer
Methods

- Exclusion criteria
  - Registries with 100% unknown/blank information for “regional nodes examined”
  - Those who received pre-operative radiation therapy
Methods

- Unknown/blank information for “regional nodes examined” was determined if cases had blank or 95-99 values for “regional nodes examined”.

- A total of 22 registries for female breast cancer and NSCLC, and 43 registries for colon cancer fulfilled our selection criteria.
Methods

- We analyzed percentages of unknown/blank information for “regional nodes examined” by race, diagnosis year, registry, census tract-level poverty, stage, and county-level metro/non-metro status.
Results

- A total of 149,601 colon cancer, 73,911 female breast cancer, and 5,522 NSCLC cases were included.

- For all races combined
  - 1.8% of female breast cancer
  - 8.3% of NSCLC
  - 0.8% of colon cancer cases had unknown/blank information for “regional nodes examined”
<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Breast cancer</th>
<th>NSCLC</th>
<th>Colon cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% unknown</td>
<td>% unknown</td>
<td>% unknown</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td>White</td>
<td>1.72%</td>
<td>8.41%</td>
<td>0.79%</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>2.32%</td>
<td>7.37%</td>
<td>0.77%</td>
</tr>
<tr>
<td></td>
<td>American Indian/Alaska Native</td>
<td>1.47%</td>
<td>20.00%</td>
<td>0.92%</td>
</tr>
<tr>
<td></td>
<td>Asian/Pacific Islander Unknown</td>
<td>1.02%</td>
<td>8.19%</td>
<td>0.66%</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>2.68%</td>
<td>3.57%</td>
<td>0.85%</td>
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<tr>
<td><strong>Diagnosis year</strong></td>
<td>2007</td>
<td>1.56%</td>
<td>8.82%</td>
<td>1.08%</td>
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<tr>
<td></td>
<td>2008</td>
<td>1.91%</td>
<td>7.90%</td>
<td>0.81%</td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>2.00%</td>
<td>7.35%</td>
<td>0.82%</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>1.66%</td>
<td>8.45%</td>
<td>0.69%</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>1.70%</td>
<td>9.26%</td>
<td>0.48%</td>
</tr>
<tr>
<td><strong>% below poverty</strong></td>
<td>&lt; 5.0%</td>
<td>1.59%</td>
<td>3.51%</td>
<td>0.28%</td>
</tr>
<tr>
<td></td>
<td>5.0% - 9.99%</td>
<td>1.68%</td>
<td>8.60%</td>
<td>0.48%</td>
</tr>
<tr>
<td></td>
<td>10.0% - 19.99%</td>
<td>1.73%</td>
<td>7.68%</td>
<td>0.81%</td>
</tr>
<tr>
<td></td>
<td>20.0% +</td>
<td>2.10%</td>
<td>11.74%</td>
<td>1.12%</td>
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<tr>
<td></td>
<td>Unknown</td>
<td>0.00%</td>
<td>25.00%</td>
<td>4.62%</td>
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<tr>
<td><strong>Metro/non-metro</strong></td>
<td>Metropolitan Counties</td>
<td>1.65%</td>
<td>8.14%</td>
<td>0.64%</td>
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<tr>
<td></td>
<td>Nonmetropolitan Counties</td>
<td>2.34%</td>
<td>9.03%</td>
<td>1.39%</td>
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</tbody>
</table>

**Abbreviations:** NSCLC, non-small cell lung cancer
Results

- No substantial variation in percentage of unknown/blank information for “regional nodes examined” between 2007 and 2011, and stage at diagnosis for each of the three cancer types.
  - Colon cancer: 0.9% (stage I), 0.6% (stage II), < 1.0% (stage III)
No substantial variation in percentage of unknown/blank information for “regional nodes examined” between racial groups.

Registries generally had similar percentages of unknown/blank information for “regional nodes examined” for each of the three cancer types. Examples with higher percentage:

- North Carolina 4.17%(BC), 9.07%(NSCC), 3.62% (CC)
- South Carolina 3.48%(BC), 9.09%(NSCLC), 2.00%(CC)
Results

Cases residing in poor neighborhoods had higher percentages of unknown/blank information than cases residing in affluent neighborhoods (>20% below poverty line vs. < 5% below poverty line)

✓ 2.1% vs. 1.6% for breast cancer
✓ 11.7% vs. 3.5% for NSCLC
✓ 1.1% vs. 0.3% for colon cancer
Results

- Cases reported from non-metropolitan areas had higher percentages of unknown/blank information compared with those reported from metropolitan areas (county with population > 1 million)
  - 2.3% vs. 1.7% for breast cancer
  - 9.0% vs. 8.1% for NSCLC
  - 1.4% vs. 0.6% for colon cancer
Conclusions

- Information on ‘regional nodes examined’ for colon cancer cases was remarkably complete and better than for NSCLC and female breast cancer cases in NAACCR database, but varied by census tract-level poverty and county-level metro/non-metro status.
Conclusions

- The percentage of unknown/blank information for “regional nodes examined” varied by census tract level-poverty, especially for NSCLC from 3.5% in the most affluent area to 11.7% in the poorest area.
Thank you