ESOPHAGEAL CANCER IN CANADA, 1986-2006:
TRENDS BY MORPHOLOGY AND
ANATOMICAL LOCATION

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The first Canadian cancer registries established in 1930s (Saskatchewan and British Columbia) – these are among the oldest in the world.

By late 1960s, most provinces had cancer registries. The addition of Quebec in 1970 brought the percentage of the population covered to 100%.

Adapted from ‘The Making of the Canadian Cancer Registry’ 1993
Cancer surveillance data: forms and functions

Incidence and mortality rates

Histology and stage

Survival and recurrence rates

Utility
- Descriptive/analytic
- Survival
- Prevalence
- Projections

Functions
- Research
- Planning and evaluation

Patterns of care

Adapted from discussion between M. Parkin and L. Mery
Canadian Cancer Statistics report

- annual series that began in 1987
- each edition developed by representatives from various organizations, including
  - Canadian Cancer Society
  - Public Health Agency of Canada
  - Statistics Canada
  - Provincial/territorial cancer registries
- report aims to provide health professionals, researchers, and policy makers with detailed information on cancer
  - incidence & mortality
  - survival & prevalence
  - special topics (e.g., end-of-life care)
  - analyses in-depth (e.g., esophageal cancer)

Pick up a copy at the PHAC booth, or see www.cancer.ca/statistics
DATA SOURCES

Provincial/territorial registries collect clinical and demographic data on new cancer cases/deaths. These are reported annually to Statistics Canada:

- Canadian Cancer Registry (CCR), 1992-onward: “person-based” registry
- Canadian Vital Statistics Death database (1951-onward)

REVIEW AND ANALYSIS

Chronic Disease Surveillance Division (Public Health Agency of Canada), and Health Statistics Division (Statistics Canada) conduct analyses

Pick up a copy at the PHAC booth, or see www.cancer.ca/statistics
Most esophageal cancers develop in epithelial tissue as either

- **adenocarcinomas** (more common in lower esophagus)
- **squamous cell carcinomas** (more common in upper esophagus)
Percentage of new cases of esophageal cancer by subsite, Canada, 2002-2006

*27% of esophageal cancers were not specified with respect to location or overlapped across subsites
Esophageal cancer in Canada: summary statistics

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Number of cases:</td>
<td>5,231</td>
<td>1,903</td>
</tr>
<tr>
<td>Rate (per 100,000):</td>
<td>6.1</td>
<td>1.7</td>
</tr>
<tr>
<td>% of all cancers:</td>
<td>1.4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Number of deaths:</td>
<td>5,419</td>
<td>1,834</td>
</tr>
<tr>
<td>Rate (per 100,000):</td>
<td>6.6</td>
<td>1.7</td>
</tr>
<tr>
<td>% of all cancer deaths:</td>
<td>3.1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

- still relatively rare: 15th (males) and 19th (females) most common cancer type
- occurs three times more often in males than females
- >90% of cases occur among those 50 years of age and older
- accounts for over 7000 deaths annually
Age-standardized* incidence rates for esophageal cancer by province, Canada, 2002-2006

*Rates standardized to the 1991 Canadian population
Overall incidence rates have changed little since mid-1980s
- males: increase 0.3% per year*
- females: decrease 0.5% per year

Mortality rates have increased slightly among males (0.7% per yr) but remained stable in females

Prevention and control of esophageal cancer in Canada have not improved in the last 20 years

*Statistically significant time trends reported as annual percent change, calculated using a log-linear model
## Esophageal cancers by morphology and anatomical location

<table>
<thead>
<tr>
<th>Cancer</th>
<th>ICD0-3 Site</th>
<th>ICD0-3 Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophagus, All Types*</td>
<td>C15.0–C15.9</td>
<td>Type 8000–9049, 9060–9139, 9141–9589, 9990–9999</td>
</tr>
<tr>
<td>Upper Esophagus</td>
<td>C15.3</td>
<td>Type 8000–9049, 9060–9139, 9141–9589, 9990–9999</td>
</tr>
<tr>
<td>Middle Esophagus</td>
<td>C15.4</td>
<td>Type 8000–9049, 9060–9139, 9141–9589, 9990–9999</td>
</tr>
<tr>
<td>Lower Esophagus</td>
<td>C15.5</td>
<td>Type 8000–9049, 9060–9139, 9141–9589, 9990–9999</td>
</tr>
<tr>
<td>Not Specified as Upper, Middle or Lower</td>
<td>C15.0, C15.1–C15.2, C15.8–C15.9</td>
<td>Type 8000–9049, 9060–9139, 9141–9589, 9990–9999</td>
</tr>
<tr>
<td>Adenocarcinoma, All</td>
<td>C15.0–C15.9</td>
<td>Type 8140–8141, 8143–8145, 8190–8231, 8260–8263, 8310, 8401, 8480–8490, 8550–8551, 8570–8574, 8576</td>
</tr>
<tr>
<td>Adenocarcinoma, Lower Esophagus</td>
<td>C15.2, C15.5</td>
<td>Type 8140–8141, 8143–8145, 8190–8231, 8260–8263, 8310, 8401, 8480–8490, 8550–8551, 8570–8574, 8576</td>
</tr>
<tr>
<td>Adenocarcinoma, All Other</td>
<td>C15.0–C15.1, C15.3–C15.4, C15.6–C15.9</td>
<td>Type 8140–8141, 8143–8145, 8190–8231, 8260–8263, 8310, 8401, 8480–8490, 8550–8551, 8570–8574, 8576</td>
</tr>
<tr>
<td>Squamous Cell Carcinoma</td>
<td>C15.0–C15.9</td>
<td>Type 8050–8078, 8083–8084</td>
</tr>
</tbody>
</table>

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**U.S. data from Devesa et al. 1998**
Age-standardized incidence of esophageal cancer, by morphology and anatomical location, Canada, 1986-2006

- Adenocarcinomas increasing rapidly and now dominate in males
- Squamous cell carcinomas declining, but still dominate in females
- Lower esophageal cancers are rising, all others are falling
Location and morphology together show only adenocarcinomas of the lower esophagus are increasing rapidly (4.9% per yr, but up to 6.1% per yr for under 50 yrs of age).

Over the last 20 years, incidence of esophageal adenocarcinoma has 
doubled in Canada.
Predicted 5-year survival for individuals diagnosed with esophageal cancer is poor: 14% compared to similar individuals in the general population.

Since 1992-94, 5-year survival has increased by 3.3%
New cases of esophageal cancers by stage* and morphology, Manitoba, 2005-2007

<table>
<thead>
<tr>
<th>Stage</th>
<th>New Cases</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Esophageal Cancers</td>
<td>128</td>
<td>100.0</td>
</tr>
<tr>
<td>(unknown stage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>19</td>
<td>14.8</td>
</tr>
<tr>
<td>II</td>
<td>20</td>
<td>15.6</td>
</tr>
<tr>
<td>III</td>
<td>25</td>
<td>19.5</td>
</tr>
<tr>
<td>IV</td>
<td>64</td>
<td>50.0</td>
</tr>
<tr>
<td>Unknown stage</td>
<td>31</td>
<td>—</td>
</tr>
<tr>
<td>Adenocarcinomas (known stage)</td>
<td>74</td>
<td>100.0</td>
</tr>
<tr>
<td>I</td>
<td>11</td>
<td>14.9</td>
</tr>
<tr>
<td>II</td>
<td>12</td>
<td>16.2</td>
</tr>
<tr>
<td>III</td>
<td>16</td>
<td>21.6</td>
</tr>
<tr>
<td>IV</td>
<td>35</td>
<td>47.3</td>
</tr>
<tr>
<td>Unknown stage</td>
<td>7</td>
<td>—</td>
</tr>
<tr>
<td>Squamous Cell Carcinomas</td>
<td>39</td>
<td>100.0</td>
</tr>
<tr>
<td>(known stage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>7</td>
<td>17.9</td>
</tr>
<tr>
<td>II</td>
<td>7</td>
<td>17.9</td>
</tr>
<tr>
<td>III</td>
<td>6</td>
<td>15.4</td>
</tr>
<tr>
<td>IV</td>
<td>19</td>
<td>48.7</td>
</tr>
<tr>
<td>Unknown stage</td>
<td>14</td>
<td>—</td>
</tr>
</tbody>
</table>

* Stage derived using Collaborative Stage (CS)

Data source: Manitoba Cancer Registry

At diagnosis, half of all new cases of a known stage were in the most advanced category (IV-metastatic disease).

Data on stage helps to explain the low survival rates observed for esophageal cancer.
Summary

- Cancer of the esophagus occurs more often in males than in females, and the majority are adenocarcinomas (more common in males) and squamous cell carcinomas (more common in females).

- Although the overall incidence of esophageal cancer has remained stable, rates of adenocarcinomas (particularly in the lower esophagus) have doubled since the mid-1980s; rates of squamous cell carcinoma have declined.

- The prognosis is generally poor for individuals with esophageal cancer; however, five-year relative survival has improved slightly since the early 1990s.
Discussion

• Changing rates of esophageal adenocarcinoma and squamous cell carcinoma may relate to changes in risk factor prevalence, notably obesity, gastroesophageal reflux disease, and smoking

• Differences in cancer rates across time and provinces inevitably reflect a mix of true differences and variation in registry practices

• Analysis of cancer trends must reflect the complexity of the disease; overall rates may hide important trends in histology/topography

• The Canadian Cancer Registry is a valuable tool, allowing examination of cancer patterns across the entire Canadian population; such analyses can inform public health research, planning, and decision making
Contributors

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