
Downloaded from: http://researchonline.lshtm.ac.uk/2121452/

DOI:

Usage Guidelines:

Please refer to usage guidelines at https://researchonline.lshtm.ac.uk/policies.html or alternatively contact researchonline@lshtm.ac.uk.

Available under license: Copyright the author(s)
International differences in breast cancer survival and ‘cure’: impact of social deprivation

A comparative study of England and Australia

Laura M Woods, PhD student
London School of Hygiene and Tropical Medicine
Supervisor: Professor Michel P Coleman
Breast cancer - overview

- Worldwide, the most common malignancy in women
- 20% of all cancers
- 36,000 cases diagnosed in England and Wales during year 2000
- 10% of the female population of Leeds
Breast cancer overview

INCIDENCE
- Increasing age at first birth and nulliparity
- Increasing obesity
- Screening

SURVIVAL

MORTALITY
- Improvement in hormonal treatment and surgery
- Screening
Measuring cancer survival

• Preferable measure for patient and clinician

• Separate studies are difficult to compare:
  ► Reliant on accurate recording of dates (birth, diagnosis, death)
  ► Different statistical methods
  ► Inclusion (and exclusion) criteria
Comparative studies

- Survival highest in Sweden, Finland, France and Switzerland
- Survival lowest in UK and Eastern Europe
- Variation by age where survival is low
Comparative studies

- Focus on the comparison between deprivation groups
- Deprived in USA had lower survival than the deprived in Canada
- Conflicting findings: USA>Canada, USA<Canada
Comparative studies

- Trans-Atlantic comparisons
- Europe and USA

- Survival in USA higher than all 17 European countries included
- Pooled European five-year survival rate 10% lower than for USA
Comparative studies

- Survival lower than USA or Europe
- Highest in urban China
Comparative studies

- International collaboration of cancer registries
- In progress (results expected 2005)
Implications from literature review

- Comparable data
- Comparable statistical methods
- National and sub-national analyses
- Adequate adjustment for age at diagnosis
- Multi-variate analyses
- Inclusion of diagnostic delay and treatment
- Adjustment for deprivation
Comparison of breast cancer survival in Australia and England

• Extend comparative studies to Australasia

• Important similarities
  ► Nationalised health care
  ► Caucasian population
  ► National cancer registration

• Important differences
  ► Survival rates
  ► Deprivation gap in survival
Survival contrasts

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Australia</th>
<th>England and Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992-1997</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>1987-1991</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>1982-1986</td>
<td>75</td>
<td>75</td>
</tr>
</tbody>
</table>
Survival contrasts

Five-year relative survival (%)

Age at diagnosis

Australia
England and Wales
Survival contrasts

- Australia
- England

Increasing deprivation

Increasing survival
Survival contrasts

Australia

Unequal five-year survival rates

Relative survival (%)

Cured’ proportion

Time since diagnosis (years)

Cured’ proportion
Aims

• Describe epidemiology of breast cancer
• Quantify the Australian advantage
• Compare the proportion ‘cured’
• Investigate reasons for differences
  ► Between Australia and England
  ► Within Australia and England
• Investigate the role of within-country variability in international differences
Planned analysis

• National data (‘big picture’) and registry data (detailed analyses)

• Incidence, relative survival and ‘cure’

• Several covariates:
  ▶ deprivation category
  ▶ age at diagnosis
  ▶ stage of disease at diagnosis
  ▶ screening history
  ▶ time period of diagnosis
West Midlands Cancer Intelligence Unit
New South Wales Central Cancer Registry

- Population 5.3 million (West Midlands)
  6.4 million (New South Wales)
- Register c.3000 breast cancer cases per year
- Consistent geographic boundaries 1980-2004
- Screening history available for all women through national screening programme
## Data: Breast cancers 1980-2004

<table>
<thead>
<tr>
<th>Variables required</th>
<th>National Data</th>
<th>Registry Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient and tumour identifiers</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Dates of birth, diagnosis and death or censoring</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Data quality indicators</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Region/ State at diagnosis</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Area-based deprivation category</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tumour characteristics</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Screening history</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Measuring deprivation

• No individual measure in cancer registry data

• Area-based scores (census data)

• Several indices available
  ► Carstairs, Townsend, IMD (England)
  ► Townsend, SEIFA (Australia)

• Several possible geographies
  ► English EDs (’91), OAs, Super-OAs (‘01), wards
  ► Australian Collection districts (CDs)
Methods

• Relative survival analysis
  ► Adjusts for background mortality
  ► Permits valid comparisons between different groups of cancer patients
  ► Country- and deprivation-specific life tables

• Age standardisation of survival

• Cure analysis
  ► Testing of currently available models
  ► Development of a more robust cure model
Research conducted in collaboration with the West Midlands Cancer Intelligence Unit and the New South Wales Central Cancer Registry

Laura Woods is funded by a Medical Research Council PhD Studentship 2003-2006