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International differences in breast cancer survival and ‘cure’: impact of social deprivation

A comparative study of England and Australia

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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

Canada and USA (SEER)
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
Cancer survival in developing countries (IARC)

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

Five-year relative survival (%)

Australia

England and Wales

1992-1997

1987-1991

1982-1986
Survival contrasts

Australia

England and Wales

Five-year relative survival (%) vs Age at diagnosis
Survival contrasts

Increasing deprivation vs Increasing survival

- Australia vs England
- Red and yellow lines indicating trends
Survival contrasts

Australia

Unequal five-year survival rates

Cured' proportion

Cured' proportion

Time since diagnosis (years)

Relative survival (%)
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

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<th>Variables required</th>
<th>National Data</th>
<th>Registry Data</th>
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<tr>
<td>Screening history</td>
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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

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