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Is there evidence of a ‘cured’ sub-population amongst women with screen-detected breast cancer?

Results from New South Wales, Australia, and the West Midlands region of England

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Concept

Population ‘cure’ occurs when excess hazard reaches zero and the relative survival curve plateaus.

Median survival time of ‘fatal’ cases

Proportion of patients considered ‘cured’
Background

- Long-term excess mortality from breast cancer
- Our previous work:
  - Women with apparently localised disease
  - 'Cure' seldom attained
  - Inflexible approach?
- Statistical developments: flexible models
- ‘Cure’ and breast cancer screening
Hypothesis

That a sub-population of women diagnosed with asymptomatic disease via screening have no excess mortality, in comparison to their counterparts, and that the presence of this ‘cured’ population could be detected using a flexible modelling approach.
Materials and Methods

- 6,396 women in New South Wales,
- 5,717 women in West Midlands
- Non-parametric flexible (spline-based) relative survival model, adjusted for age:
  - ‘cure’ option assumes zero excess mortality after the last knot
- Reduction of 3 AIC to indicate better fitting model
## Results

<table>
<thead>
<tr>
<th>Region</th>
<th>Screening category</th>
<th>AIC non-'cure' model</th>
<th>AIC 'cure' model</th>
<th>Difference</th>
<th>Evidence of cure?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>Not screen-detected</td>
<td>3054.63</td>
<td>3067.33</td>
<td>12.70</td>
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<tr>
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<td>663.57</td>
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<tr>
<td>WM</td>
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<td>2490.48</td>
<td>2510.85</td>
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<td>*</td>
<td>-</td>
<td>-</td>
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<td>1555.11</td>
<td>1556.55</td>
<td>1.44</td>
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</tr>
</tbody>
</table>
Conclusions

• Evidence of ‘cure’ for screen-detected women

Next steps

• Examination by stage of diagnosis for the non-screened (missing values)