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Introduction

- **Our previous results**: a significant difference in five-year breast cancer survival between Australia and England of 6% in the screening age group for women diagnosed during the period 1996-19991
- **One possible explanation**: relatively low intensity of breast screening in England compared to Australia

Material

- Women aged 50 years or younger on 1st January 1996
- Diagnosed with a primary invasive breast cancer during the period 1 January 1996 to 31 December 2006
- 5,717 women from West Midlands region of England
- 6,396 women New South Wales, Australia
- All women were followed up to 31 December 2006

**Figure 1** – Cohort included in analyses

- Cancer registry data
- Individual registry records linked to individual screening records
- Categories for screening status at diagnosis: screen-detected, interval cancer, lapsed attender, non-attender

Methods

- Non-parametric net survival estimates using the Pohar-Perme estimator, using stns (software available for Stata 12)
- Comparison of the Pohar-Perme estimates with widely used Estève approach
- Excess hazard and hazard ratios derived from survival
- Expected survival from regional life tables (single years of age for each year of follow-up)
- Adjustment for the potential effect of lead time bias:
  - calculation of adjusted survival time \( E(s) \)
  - mean sojourn time of 4 years
  - 10 simulated data sets: \( E(s_1), E(s_2), ... E(s_{10}) \) assuming survival exponentially distributed with a mean of \( E(s) \)
  - survival estimates derived from these 10 separate data sets recomputed using rules from the multiple-imputation setting

Results

- A significant difference in net survival between women diagnosed in New South Wales and the West Midlands (Figure 2)
- Survival for screen-detected women similar (Figure 3)
- Differences smaller for women who had attended screening (Figure 4)
- Lead time adjusted estimates lower (Figure 5)
- Non-significant survival difference between New South Wales and West Midlands in adjusted estimates (Figure 6)
- Excess hazard ratios: regional differences in survival were greatest during the first three years following diagnosis (Figure 7)

**Figure 2**: Net survival estimates: West Midlands and New South Wales

**Figure 3**: Net survival estimates: Screen-detected vs. non-detected

**Figure 4**: Net survival estimates by screening category

**Figure 5**: Estimates adjusted for lead time bias: West Midlands

**Figure 6**: Adjusted net survival estimates: screen-detected cancers

**Figure 7**: Excess hazard ratios comparing lead-time adjusted hazard in screened group with the non-screened group

Conclusions

- Survival remains higher in New South Wales compared to the West Midlands for women aged 50-64
- Survival differences less marked for women who had attended screening
- Non-significant difference in survival amongst screen-detected women after adjustment for lead time
- Differential survival in the non-screen detected groups may be due to women obtaining mammography privately in New South Wales
- Poorer treatment of non-screen detected women after their diagnosis remains one explanation for poorer survival in West Midlands

References

5. Cancer Research UK Cancer Survival Group, steel computer program version 5.8 and life tables for cancer survival analysis. Non-communicable Disease Epidemiology Unit, London School of Hygiene & Tropical Medicine, UK, Last update 19 November 2006.