The impact of screen-detection upon international differences in survival from breast cancer: a comparison of the West Midlands, England, and New South Wales, Australia

Laura M Woods1 Bernard Rachet1 Dianne O’Connell2 Gill Lawrence1 Michel P Coleman1

1London School of Hygiene and Tropical Medicine, London, UK
2Cancer Epidemiology Research Unit, Cancer Council NSW, Sydney, Australia
3West Midlands Cancer Intelligence Unit, University of Birmingham, Birmingham, UK

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

Introduction

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 estimator2, using stns (software available for Stata)23
Comparison of the Pohar-Perme estimates with widely used Estève approach45
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)4
• mean sojourn time of 4 years
• 10 simulated data sets: E(s), E(s2) ... E(s10) assuming survival exponentially distributed with a mean of E(s)
• survival estimates derived from these 10 separate data sets recombined using rules from the multiple-imputation setting7

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)

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. stcinetool software 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.

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