

Commentary

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Are international differences in breast cancer survival between Australia and the UK present amongst both screen-detected women and non-screen-detected women? Survival estimates for women diagnosed in West Midlands and New South Wales 1997–2006

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Patient, tumor, and healthcare system factors contribute to international differences in breast cancer survival and may contribute to increased breast cancer mortality observed in the United Kingdom (UK) when compared with Australia and several European countries. In this article, Woods and colleagues used flexible non-parametric regression models to estimate the excess hazard ratio of breast cancer death by screening status to assess (1) the risk of death from breast cancer for women diagnosed outside of screening in the West Midlands (UK) compared with women in New South Wales (Australia) and (2) differences in risk of death from breast cancer for women diagnosed by screening in the established UK and Australian national screening programs. The authors adjusted for relevant confounders, including stage of cancer and age, as well as for overdiagnosis and lead-time bias. After adjustment for potential bias and confounding, the risk of death from breast cancer was lowest in the populations of women in whom cancer was diagnosed by screening. Two further key findings were that for women diagnosed through screening, risk of death in the UK was significantly higher than in Australia (excess hazard ratio, 1.72) and that the disadvantage was greatest for women in the UK who were diagnosed outside of screening (excess hazard ratio, 2.00).

It is not surprising that the overall unadjusted survival rates for women diagnosed with breast cancer were lower in the UK than in Australia, as this has been previously reported.(1) This is consistent with comparisons of breast cancer survival between the UK and other European countries,(2) where the reduced survival has been at least partly attributed to a significantly higher proportion of patients in the UK being first diagnosed with more advanced late-stage cancer.(3) It is novel that the excess hazard of death from breast cancer for women diagnosed as part of the screening programs and outside of the programs was greater in the UK than in Australia (after adjustment for stage of cancer and age). While it is possible that residual confounding may explain a proportion of these observed differences, since the measure of stage adjusted for had only 3 categories (localized, regional, and distant), diagnostic interval and stage at diagnosis are unlikely to be the only causes of the significant excess hazard of breast cancer death in the UK population.

Woods and colleagues(4) published a secondary analysis in which the survival of these populations was estimated by deprivation status. Of particular note is that for affluent women diagnosed by screening, survival rates were similar for the Australian and UK populations. Critically, the deprived screen-detected population of the West Midlands had significantly

poorer survival than the affluent group and the deprived population of New South Wales, where (in contrast) survival was similar between the deprived and affluent groups.

As is typical for patients diagnosed outside of the screening programs, the study identified reduced survival in the deprived populations of New South Wales and the West Midlands. The “deprivation gap” was greater in the UK, and overall survival was also lower in the UK. These findings are consistent with previous studies that have identified a deprivation gap for cancer survival in other UK populations,(5) but the results of the study by Woods and colleagues are novel in that they show the effect of screening in leveling out socioeconomic differences in survival. This has been observed in other countries(6) but only partly applies in the UK. The survival differences persist after adjustment for stage (and therefore the effects of delays in diagnosis), lead-time bias, and overdiagnosis.

It is observed in almost all environments that poverty and poor health outcomes go together, and the differences in health outcomes according to deprivation are striking in the UK.(7) It is reassuring that the deprivation gap for breast cancer survival in the UK is at least somewhat reduced in those diagnosed as part of the National Health Service Breast Screening Programme, but why survival differences according to deprivation status exist for women with screen-detected cancers in the UK but not in Australia is an important question to be answered. As the authors noted, it would be particularly interesting to identify any differences according to deprivation status in patient factors (comorbidity and adherence to or compliance with treatment) or in healthcare system factors (timeliness of treatment, availability of treatment, and follow-up received) that exist for women with breast cancer in UK but not in Australia, as these may explain the observed survival differences. If the cause of the wider deprivation gap observed in the UK can be identified, this may help inform future policy interventions targeting improvements in breast cancer survival.

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References

1. Woods LM, Rachet B, O’Connell D, et al. Large differences in patterns of breast cancer survival between Australia and England: a comparative study using cancer registry data. *Int J Cancer*. 2009;124:2391-2399.
2. Abdel-Rahman M, Stockton D, Rachet B, Hakulinen T, Coleman MP. What if cancer survival in Britain were the same as in Europe: how many deaths are avoidable? *Br J Cancer*. 2009;101 Suppl 2:S115-S124.
3. McPhail S, Elliss-Brookes L, Shelton J, et al. Emergency presentation of cancer and short-term mortality. *Br J Cancer*. 2013;109:2027-2034.
4. Woods LM, Rachet B, O’Connell D, Lawrence G, Coleman MP. Impact of deprivation on breast cancer survival among women eligible for mammographic screening in the West Midlands (UK) and New South Wales (Australia): women diagnosed 1997-2006. *Int J Cancer*. 2016;138:2396-2403.

5. McKenzie F, Ives A, Jeffreys M. Socio-economic inequalities in survival from screen-detected breast cancer in South West England: population-based cohort study. *Eur J Public Health*. 2012;22:418-422.
6. Puliti D, Miccinesi G, Manneschi G, et al. Does an organised screening programme reduce the inequalities in breast cancer survival? *Ann Oncol*. 2012;23:319-323.
7. Newton JN, Briggs ADM, Murray, CJL, et al. Changes in health in England, with analysis by English regions and areas of deprivation, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015;386:2257-2274.