# Optimising follow-up for women after primary treatment for early breast cancer

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……

If we knew what it was we were doing,

it would not be called research, would it?

*Albert Einstein*

## TABLE OF CONTENTS


| | | Page |
|---|---|---|
| Acknowledgements | | 4 |
| Abstract | | 5 |
| Thesis Declaration | | 8 |
| Glossary of Acronyms | | 9 |
| List of Tables | | 10 |
| Chapter 1 | Introduction | 12 |
| Chapter 2 | Systematic Review | 41 |
| Chapter 2 Extension | Cross validation of our systematic review | 77 |
| Chapter 3 | A patient-level calibration framework for evaluation surveillance strategies: a case study of mammographic follow-up after early breast cancer | 84 |
| Chapter 4 | One size does not fit all? Cost utility analyses of alternative mammographic schedules, by risk of recurrence | 116 |
| Chapter 4 Extension | Cross validation of our economic evaluation | 141 |
| Chapter 5 | Issues with data access and quality | 154 |
| Chapter 6 | Discrete Choice Experiment | 194 |
| Chapter 7 | Conclusions | 222 |
| Appendices | Example of DCE (block 1 of 3) | 237 |
| References<br>*References for Chapters 1, 2 Extension, 4 Extension, 5 and 7 only*<br>*All other references included in publication chapters* | | 255 |

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## ABSTRACT

### Title

Optimising follow-up for women after primary treatment for early breast cancer

### Overview

Due to early diagnosis and improved treatment outcomes, there is a growing pool of breast cancer survivors who will require follow-up during their lifetime. International guidelines currently recommend routine annual mammography, but there is no randomised controlled trial evidence to support this frequency over any other. In addition, there are economic and workforce imperatives around the provision of cancer follow-up care. The current workload growth is unsustainable for breast cancer specialists who also provide care for women newly diagnosed or with a recurrence. If new models of care are to be developed, it is important that these are appropriate and acceptable, yet currently we know little about patient preferences for possible alternative modes of delivery of follow-up services.

### Research Questions

1. What is the impact on survival of the method and timing of detection of a second breast cancer event within the breast?
2. Using a model based economic analysis, is it efficient to tailor mammographic follow-up according to risk of recurrence?
3. What do Australian breast cancer survivors prefer with respect to the provider, location, frequency, and method of delivery of routine follow-up care in years 3, 4 and 5 following diagnosis if existing specialist services were not available; and what is the perceived value of offering “drop-in” clinics providing additional support?

## Structure of Thesis

*Chapter 2: Systematic Review*

The aim of this paper was to review the evidence around the effectiveness of mammographic follow-up. The review identified a complete absence of randomised clinical trials (RCTs) in this area. I conclude that we should embrace alternative research techniques, such as decision analytic modelling, to guide our practice in the likely continued absence of randomised controlled studies in this field.

*Chapter 3: A patient-level calibration framework for evaluating surveillance strategies: a case-study of mammographic follow-up after early breast cancer*

This paper describes the development, calibration, and cost-effectiveness analyses of an early breast cancer surveillance discrete event simulation (DES) model. The DES model was used to analyse three alternative mammographic follow-up schedules for postmenopausal women who were disease free following primary treatment for moderate prognosis early breast cancer; taking into account age and adherence to mammography. This study demonstrates the potential value of combining linked, retrospective data and decision analytic modelling to provide estimates of costs and health outcomes that are sufficiently robust to inform cancer clinical guidelines and individual patient decisions regarding appropriate follow-up schedules.

*Chapter 4: One size does not fit all? Cost utility analyses of alternative mammographic follow-up schedules, by risk of recurrence*

The aim of this paper is to report the full set of cost-effectiveness results from the model described in chapter 3, comparing alternative mammographic follow-up schedules for postmenopausal women with excellent, good, moderate and poor prognosis early breast cancer. Our results suggest that annual mammographic follow-up is not cost effective for most postmenopausal women, and that mammographic follow-up can be tailored based on the Nottingham Prognostic Index score of the primary breast cancer and age at diagnosis.

*Chapter 5: Issues with data access and quality*

This chapter describes the large gulf between the ideal dataset to inform the cost-effectiveness model and what is currently available in South Australia (and beyond).

*Chapter 6: Discrete Choice Experiment (DCE)*

The aim of this study was to explore the preferences of Australian breast cancer survivors for alternative modes of delivery of follow-up services if we could no longer offer long term specialist-led hospital based follow-up. This study provides important insights into what attributes of a breast cancer follow-up service women value most.

*Chapter 7: Conclusion*

This chapter summarises and synthesises the research findings, discusses the limitations of this research, describes the advances in the field during the period of this work, and suggests directions for future research and recommendations for policy.

## THESIS DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Dr Taryn Bessen

31st October 2013

## GLOSSARY OF ACRONYMS

| | |
|---|---|
| AT | Adjuvant therapy |
| BCD | Breast cancer death |
| BCS | Breast-conserving surgery |
| BDM | Registry of Births, Deaths and Marriages |
| CE | Clinical examination |
| CI | Confidence Interval |
| CLBC | Contralateral breast cancer |
| CT | Chemotherapy |
| CXR | Chest x-ray |
| DCE | Discrete choice experiment |
| DCIS | Ductal carcinoma in-situ |
| DES | Discrete event simulation |
| DF | Disease-free |
| DM | Distant metastases |
| ER+ | Estrogen receptor positive |
| ER- | Estrogen receptor negative |
| HER2+ | HER2 receptor positive |
| HER2- | HER2 receptor negative |
| HR | Hazard rate, hazard ratio |
| IBTR | Ipsilateral breast tumor recurrence |
| ICER | Incremental cost effectiveness ratio |
| ILR | Impalpable local recurrence |
| ISAAC | Integrated South Australian Activity Collection |
| LABC | Locally advanced breast cancer |
| LCIS | Lobular carcinoma in-situ |
| LN | Lymph nodes |
| LR | Local recurrence |
| M | Metastases |
| MMG | Mammogram |
| MRI | Magnetic resonance imaging |
| MRN | Medical record number |
| Mx | Mastectomy |
| NPI | Nottingham Prognostic Index |
| OACIS | Open Architecture Clinical Information System |
| OCD | Other cause death |
| OR | Odds ratio |
| PBC | Primary breast cancer |
| PLR | Palpable local recurrence |
| PR+ | Progesterone receptor positive |
| PR- | Progesterone receptor negative |
| QALY | Quality adjusted life year |
| RCT | Randomised controlled trial |
| RILR | Removed impalpable local recurrence |
| RT | Radiotherapy |
| SA | South Australia |
| SACR | South Australian Cancer Registry |
| T | Tumor (size) |
| URN | Unit record number |
| US | Ultrasound |

## LIST OF TABLES


| **Chapter 1** | | **Page** |
|---|---|---|
| Table 1 | TNM classification of breast cancer | 17 |
| Table 2 | Anatomic stage/prognostic groups | 20 |
| Table 3 | Rates (per 1,000 woman years) of breast cancer recurrences and second primaries by characteristics at initial diagnosis, adapted from Buist et al. | 24 |
| **Chapter 2** | | |
| Table 1 | Nested case-control studies | 47 |
| Table 2 | Cohort studies | 50 |
| Table 3 | Quality rating of included studies | 60 |
| Table 4 | Quality of included papers and survival benefit | 61 |
| Table 5 | Improving the design of observational studies | 63 |
| **Chapter 3** | | |
| Table 1 | Model scenarios for moderate subgroup | 93 |
| Table 2 | Observed outcomes of postmenopausal women with moderate prognosis breast cancer in South Australia (n=407) | 95 |
| Table 3 | Baseline costs in $A2011 and utilities, for health states in the model | 97 |
| Table 4 | Mean incremental cost-effectiveness results for postmenopausal women with moderate prognosis early breast cancer. | 102 |
| Table 5 | Best and worse case cost and utility parameter scenario analyses | 104 |
| Table 6 | Probabilistic sensitivity analysis | 105 |
| **Chapter 4** | | |
| Table 1 | Model scenarios for all risk subgroups | 123 |
| Table 2 | Baseline costs in $A2011 and utilities, for health states in the model | 125 |
| Table 3 | ICER for increasing frequency of mammographic surveillance, by age cohort and prognostic subgroup of primary tumour, assuming 90% adherence and 0.01 quality of life decrement with surveillance mammography | 128 |
| Table 4 | ICER for increasing frequency of mammographic surveillance, by age cohort and prognostic subgroup of primary tumour, assuming 75% adherence and 0.01 quality of life decrement with surveillance mammography | 130 |
| Table 5 | Probabilistic sensitivity analysis-probability that given mammographic surveillance schedule is cost-effective | 132 |

**Chapter 4 extension**


| | | |
|---|---|---|
| Table 1 | Our health state utility values | 150 |
| Table 2 | HTA health state utility values | 150 |


**Chapter 5**


| | | |
|---|---|---|
| Table 1 | Identifying variables provided by SACR for matching in OACIS | 162 |
| Table 2 | Data points extracted from OACIS reports | 166 |
| Table 3 | OACIS Inclusion Criteria | 166 |
| Table 4 | OACIS Exclusion Criteria | 167 |
| Table 5 | SACR Exclusion Criteria | 168 |
| Table 6 | ERPR status of the primary breast cancer of women in the OACIS study cohort | 170 |
| Table 7 | Comparison of prognostic subgroups between SACR and the final OACIS study cohort s | 175 |
| Table 8 | Breast cancer related ICD 10-AM V6 codes | 178 |
| Table 9 | Decision process for recurrence status | 181 |
| Table 10 | Prognostic subgroups and mortality in premenopausal women with invasive breast cancer: SACR vs final study cohort | 187 |
| Table 11 | Prognostic subgroups and mortality in postmenopausal women with invasive breast cancer: SACR vs final study cohort | 189 |
| Table 12 | Proportion of breast and distant recurrence in pre and postmenopausal women in the final study cohort | 190 |
| Table 13 | Major data issues within the South Australian Health system | 192 |


**Chapter 6**


| | | |
|---|---|---|
| Table 1 | Attributes and levels | 201 |
| Table 2 | Mixed logit estimates for total sample | 208 |
| Table 3 | Preference scores and predicted probabilities within the top 10 breast cancer follow-up scenarios | 210 |