

The Australian BreastScreen workforce: a snapshot

Abstract *Purpose:* BreastScreen Australia programmes employ qualified, skilled radiographers who provide radiologists with high quality mammographic images for interpretation. Workforce issues are a key factor in productivity and capacity, particularly in light of the aging of the population and the possible expansion of the target age group. The purpose of this paper is to provide a snapshot of the demographics and current working practices of radiographers currently employed by BreastScreen Australia. *Methods:* A questionnaire was distributed to radiographers employed in BreastScreen Australia Services. This paper reports on responses to questions relating to demographics and current working practices. *Results:* Two hundred and fifty three questionnaires were returned. Of radiographers within Australian BreastScreen programmes 53% are over 50 years old, 69% were trained in Australia and have been undertaking mammography for 10 years or more. Radiographers under 35 years old make up 12% of the current workforce. Of the BreastScreen workforce, 63% are employed part time. *Conclusion:* An estimated 78% response rate implies that the data obtained from Australian radiographers currently working in BreastScreen is representative. Within the next five to ten years it is estimated that 30% of BreastScreen radiographers may retire. Strategies are needed to increase workforce numbers, in order to cope with increased participation rates due to population growth and an increased target age range.

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Introduction

Australia's first national programme for the early detection of breast cancer commenced in 1991 and is now known as BreastScreen Australia (BSA).¹ This programme has set a target age of 50–69 years because the incidence of breast cancer is highest in this age group and the reduction in mortality is most effective,^{2–4} however all women over the age of 40 are eligible to be screened. In 2007–2008, there were in excess of 1.6 million women screened nationally through the eight BSA services.²

BreastScreen programmes are always mindful of the number of false negative results and excessive recall rates⁵ and attempt to maximise the true positive and true negative results. In order to achieve this, it is essential that the programmes employ qualified, skilled radiographers who provide the radiologists with high quality mammographic images for interpretation. BreastScreen radiographers routinely undertake an average of 93 mammograms each per week;⁶ this is highly repetitious, skilled work. The focus of this paper is to report the demographics and working practices of these radiographers.

The typical management structure in a BSA service includes a designated radiologist, who is responsible for the overall issues of quality assurance, and a designated radiographer who, as chief radiographer, is responsible for overseeing all issues relating to breast imaging.⁵ All radiographers must be accredited by the Australian Institute of Radiography (AIR) and undertake the AIR Certificate of Clinical Proficiency in Mammography (CCPM) within 12 months of commencing employment in the service.⁵

A national online survey indicated that the major

workforce shortage in BSA was a lack of radiographers.⁷ In the two years prior to June 2008, there was a shortage of 54 FTE radiographers, and it took an average of 26 weeks to fill a radiographer position. These shortages will continue to increase due to demographic changes creating higher numbers of women participating in screening.

A report from the Evaluation of the BreastScreen Australia Programme in 2007–2009 showed an increase of 4% of women in the target age attending for breast screening between 2008 and 2010; and estimated a further 20% increase over the next 10 years to 2020.⁷ This estimate is based on the current participation rate of 56% and the growing ageing population. The report also recommended that BSA continues as a biennial population-based screening programme and that the participation rate in the current target age group be increased to provide a greater mortality benefit. Thereafter, preference should be given first to expanding the target age range to women 70–74 years old, and then to those women in the 45–49 year age group.⁷ A base case model in the Evaluation Report demonstrates that demand for screening will outweigh the capacity of the programme by 2014, and the recommended changes will add to the challenge of providing ongoing services.

The report identified a workforce preference for fewer hours per week and suggested that employment of part-time radiographers could be useful in overcoming stressful workloads and minimising the injury toll caused by repetitive duties, provided extra part-time workers can be recruited. Also noted in the report was the results from a national workforce survey of all radiographers, sonographers, radiologist and non-radiologist readers

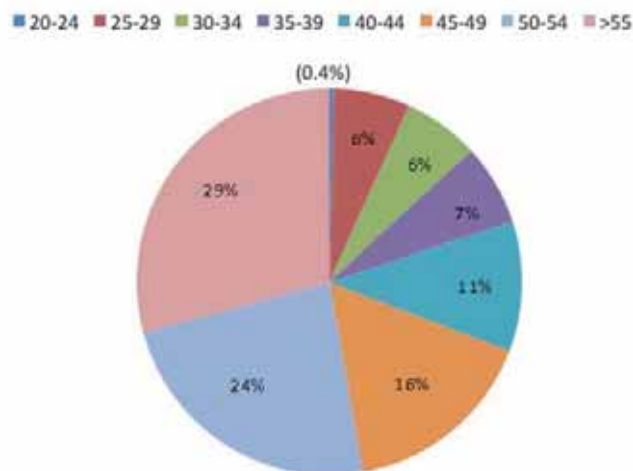


Figure 1: Age (in years) distribution of Australian radiographers working in BreastScreen.

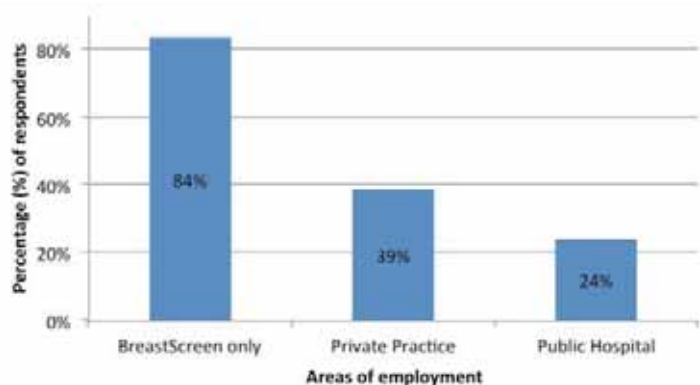


Figure 3: Areas of employment.

which showed a decline in the workforce due to pending retirement, and a perception that BreastScreen offers limited career opportunities.⁷ These findings were duplicated in the questionnaire on which this paper is based. The responses to the possibility of expanding the role of radiographers in order to enhance their career paths are discussed in another article by Moran and Warren-Forward.⁶ This paper focuses on responses relating to radiographer workforce demographics and current working practices.

Method

Ethics

Ethics approval (H-352-1206) for this study was given by the University of Newcastle and the Hunter New England Area Health.

Recruitment of sample

In June 2009, a questionnaire was distributed by the AIR on behalf of the researchers to all radiographers who had completed or were in the process of completing their CCPM. The participants were asked to return the completed questionnaire by 24th July 2009.

A total of 1100 questionnaires were distributed by post, however this number is believed to be a gross over-estimation of the actual number of radiographers currently working in BSA. The database held by the AIR

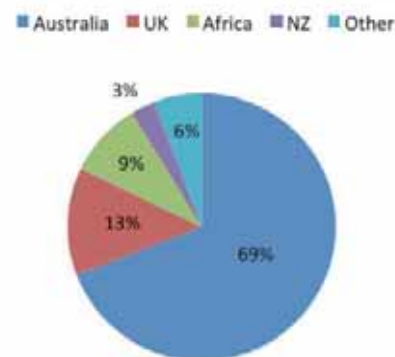


Figure 2: Country of radiographic qualification.

contained information for all those radiographers who had ever held a CCPM, many of whom have now retired or changed employment. Based on the number of BreastScreen centres and the numbers of radiographer and sonographers estimated to work in BSA in 2009⁷ a more realistic approximation of 300–350 radiographers are currently employed in BSA. This number will be used to provide an approximate response rate to the questionnaire.

A questionnaire was employed for this study as a way of collecting data from a large sample. The questionnaire asked information relating to demographics including: age, experience, education, and employment. Respondents were also asked to report their workload, whether they were frustrated by the repetitive nature of screening and whether they were involved in a diversity of tasks.

Results

A total of 253 returned questionnaires were used for the purpose of this paper; the estimated response rate from radiographers currently working in BSA was approximately 72% to 84%. This response rate has been calculated on the estimated number of 300–350 radiographers currently employed in BSA.⁷

Age demographics

Age demographics are presented in Figure 1. Of the BSA workforce replying to the questionnaire 80% were over 40 years old, with those over 50 years accounting for 53% of the workforce. Only 12% were less than 35 years while the largest single age cohort was the over 55 year olds (29%).

Country of qualification

The majority of respondents (69%) had been trained in radiography in Australia (Figure 2), with others having been trained in the UK, Africa, New Zealand as well as Canada, Ireland, USA, Singapore and Fiji. Specific mammography training for most radiographers within BSA has been completed or refreshed within Australia, as the CCPM is required to be updated every 5 years.⁵

Mammography experience and employment demographics

Only 13% of radiographers who responded to the questionnaire had less than 5 years experience in mammography (Table 1). The majority of radiographers had been employed in mammography for over 10 years, 22% of those having over 20 years experience.

The majority (84%) of the radiographer respondents work in BSA

Table 1: Experience in mammography.

Mammography experience	Number of respondents	%
0–2 yrs	7	3
2–5 yrs	25	10
5–10 yrs	46	18
10–15 yrs	61	24
15–20 yrs	51	20
> 20 yrs	56	22
Not answered	7	3
Total	246	100

Table 2: Other modalities

Modality	Hours/week	Number of radiographers
CT	10 and 35	2
General X-ray	6 to 28	15
Diagnostic mammography	2 to 23	14
Ultrasound	13 to 20	7
MRI	4	1

Table 3: Amount of time spent undertaking diverse duties within screening services

Time spent	None%	0%–24%	25%–49%	50%–74%	75%–100%	100%
Screening	11	19	16	21	44	26
Assessment	48	78	14	5	3	1
Procedures	58	92	3	3	2	1
Administration	70	92	4	3	1	0
Other	79	86	5	5	4	2

Table 4: Other duties within BreastScreen Australia programmes

Other duties	%	Number of respondents
Quality assurance	61%	33
Training of staff	15%	8
Ultrasound	13%	7
Review meetings	6%	3
Image interpretation	2%	1
Administration	2%	1
Research	2%	1
TOTAL	100%	54

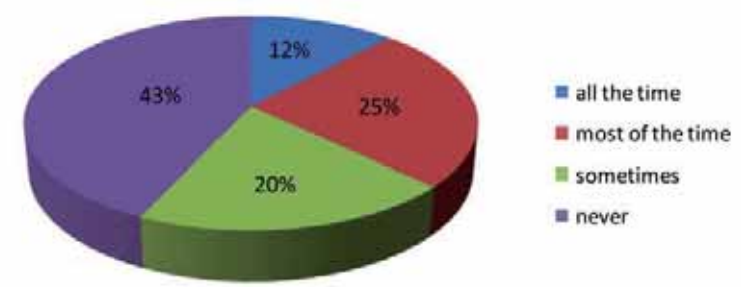


Figure 4: “Do you feel frustrated with the repetitiveness of screening?”

services (Figure 3) with a large overlap of radiographers who work in private x-ray practices (39%) and public diagnostic services (24%).

In addition to screening mammography, some (39) radiographers reported working with other modalities (Table 2); the majority (29) of these radiographers work in general x-ray or diagnostic mammography, seven respondents worked in ultrasound, two radiographers worked in computed tomography (CT) and one radiographer worked four hours in magnetic resonance imaging (MRI).

Working practices

A total of 153 participants from the 243 responded to the question about whether they worked part-time or full-time. Of these, 63% indicated that they worked part-time. Of radiographers who are employed solely in BSA, 44% spend more than three-quarters (75%) of their working time performing screening mammograms, while 26% spend 100% in screening

only roles (Table 3). From other duties performed within their BSA programme, the majority of radiographers undertook quality assurance duties (33) with relatively few radiographers undertaking training of staff (8) and breast ultrasound (7) (Table 4).

When asked if they were frustrated with the repetitiveness of patient screening, 57% of those responding indicated “yes” with varying degrees of frustration (Figure 4), ranging from “sometimes” (20%) to “all the time” (12%).

Of the 91 radiographers who did not feel frustrated with the repetitive nature of mammography screening, 22 (61%) were part time workers and 64 (69%) were those who undertook other duties besides screening (Table 5).

Discussion

This snapshot has revealed potential problems with the radiography workforce due to population ageing and expansion of the target age group.

Table 5: Radiographers not frustrated with repetitiveness of screening.

Not frustrated	Number	%	Full time (39%)	Part-time (61%)
Screen only	29	31	7	22
Screen with other duties	64	69	29	35

Statistics from the AIR show that the average age of radiographers in CT and MRI are 38 and 37 years old respectively (*personal communication with AIR; P. Gloster, 2011*). In comparison, the results of this questionnaire demonstrate that the average age of mammography radiographers is 48 years. There is a very real possibility that nearly 30% of the current workforce (over 55 year olds) could retire within the next five to 10 years.

The BreastScreen Australia Monitoring Report 2007–2008 figures demonstrate an average of 19 mammograms are produced by each full-time radiographer per day.² The large numbers of part-time workers (65%) may support the premise that many radiographers feel the effects of the repetitive nature of mammography and physically are reluctant to engage in full time work.⁷

The retention figures in BSA may be largely due to the working conditions of regular hours and part-time work, with little overtime or weekend shifts. Mammography appears to be a modality that not only attracts older radiographers, but retains them.

There has recently been wide discussion of expanding career pathways in order to attract more radiographers to BSA.^{6,8–12} Other options to increase radiographer numbers may include making provisions for Assistant Practitioners, following the UK four tier model¹³ or allowing male radiographers to perform mammograms in the currently female dominated BreastScreen setting. The Newcastle BreastScreen Service recruited radiographers from overseas (mainly the UK and Canada) between 1991 and 2004 due to a lack of available mammography trained workers in this country. Importing staff was an expensive exercise, but these radiographers provided the expertise necessary to maintain the required services. In the event of this again being part of a strategy to increase radiographer numbers, it may be difficult to attract radiographers from countries where they have been undertaking advanced practice; we need to be able to offer them the same opportunities in Australia.

It is recommended that radiographers themselves should become proactive in suggesting future employment strategies. The increases in population growth and thus increased numbers of women requiring screening will stretch the capacity of BSA even further if strategies are not put in place to increase the number of radiographers employed within BSA over the next 5–10 years. Screening mammography in its present form does not attract many radiographers; if BSA can offer diverse and interesting career pathways this is likely to encourage more interest in this modality.

According to the Evaluation Report, participation in BSA will increase, due to the increasing ageing population as well as suggested changes to the current target age group. Even assuming that the workforce numbers and current participation rates remain stable, the demand for screening will outweigh capacity by 2014.⁷ It is suggested that digital mammography has improved the resource infrastructure and the greatest constraint in the near future is the capacity of the workforce to yield significant increases. In order to increase capacity, there will need to be smarter use

of resources, as there is a physical limit for repetitive duties.

The introduction of flexible opening hours (increase participation) and co-locating diagnostic services with screening and assessment centres (full utilisation of equipment and varied duties) may help to provide increased capacity. Co-location of services and longer opening hours could have another advantage for BSA; it would offer radiographers more diverse duties and the possibility of more part-time hours. Both these reasons were shown to be important in the reduction of frustration levels in working radiographers.

One limitation of this study was that the questionnaire was limited to radiographers who had completed or were in the process of completing their CCPM. Since the policy of mandatory completion of this certificate is within 12 months the researchers are confident that the majority of BSA employees would have been reached.

Conclusion

The advent of digital equipment allowing tele-mammography throughout BSA programmes has enabled the image interpretation to be undertaken remotely, and therefore each service may be able to manage radiology workforce issues, but as the evaluation report states, “radiographers are the only health professionals who necessarily must see every woman attending the screening programme”.¹⁴ BSA needs to be proactive in implementing strategic changes within the programme to increase the number of radiographers entering mammography to ensure the future continued success of the BreastScreen Australia programme. Studies investigating Australian radiographers’ perceptions of working in BreastScreen and the perceptions of women to being screened by male radiographers are currently being conducted.

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References

- 1 AIHW. Breast Cancer in Australia: An overview, 2009. Cancer Series no 50 Cat no CAN 46 Canberra: Institute of health and welfare and the national breast and ovarian cancer centre 2009.
- 2 AIHW. BreastScreen Australia monitoring report 2006-2007 and 2007–2008. Canberra, 2010.
- 3 Duffy SW. Reduction in breast cancer mortality from organized service screening with mammography: 1. Further confirmation with extended data. *Cancer Epidemiol Biomarkers Prev* 2006; 15: 45–51..
- 4 Tabáar L, Vitak B, Chen H, Yen M, Duffy SW, Smith RA. Beyond randomized controlled trials: Organized mammographic screening substantially reduces breast carcinoma mortality. *Cancer* 2001; 91: 1724–31.
- 5 BreastScreen Australia. National accreditation standards (NAS). National quality management committee, Canberra, 2008; BSA Quality improvement program.
- 6 Moran S, Warren-Forward H. Assessment of the willingness of radiographers in mammography to accept new responsibilities in role extension: Part one - Quantitative analysis. *Radiography* 2011; (17): 270–74.
- 7 Commonwealth of Australia. Evaluation of the BreastScreen Australia program - Evaluation final report – June 2009. Barton, ACT, 2009.
- 8 Holt JJ, Pollard K. Radiographers’ ability to perceive and classify abnormalities on mammographic images – results of a pilot project. *The Radiographer* 2010; 57: 8–14.
- 9 Thompson W, Pollard K. The current status of radiographers as screen readers in breast screening units: applications for Australia. *The Radiographer* 2007; 54: 16–20.

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- 10 Moran S, Warren-Forward H. A retrospective pilot study of the performance of mammographers in interpreting screening mammograms. *The Radiographer* 2010; 57: 7–14.
 - 11 Moran S, Warren-Forward H. A retrospective study of the performance of radiographers in interpreting screening mammograms. *Radiography* 2011; 17: 126–31.
 - 12 Poulos A. Radiographers as screen readers - are we there yet? *The Radiographer* 2011; 58: 3–4.
 - 13 Nickerson C, Cush S. New ways of working in the NHS Breast Screening Programme: Second report on implementation NHSBSP, 2004.
 - 14 Commonwealth of Australia. BreastScreen Australia evaluation - review of infrastructure and capacity - April 2009. Barton ACT, 2009.
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