Evaluation of the organised mammographic screening programme in Australia

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An organised approach to mammographic screening in Australia commenced in 1992 as a free service for asymptomatic women in the target age range 50–69 years and accessible to all women aged ≥40 years. Screening is performed by two-view mammography, women aged 50–69 years being sent reminders every 2 years for repeat screens. National Accreditation Standards have been agreed and BreastScreen Australia has developed mechanisms to monitor and report performance including systems and standards for data collection. The national report includes participation rates, small cancer detection rates and programme sensitivities. These indicate that BreastScreen Australia is meeting its accreditation standards with respect to most measures. Routinely collected outcome data reflect an increasing trend in the proportion of women receiving breast conserving surgery; a decline in the proportion of women diagnosed with ductal carcinoma in situ undergoing axillary dissection and an increasing use of combination therapies with a corresponding decrease in the use of hormonal therapy alone. There have been increases in breast cancer incidence and falls in mortality with the largest changes in women aged 50–69 years. As the BreastScreen Australia database is routinely linked in future to population cancer registries, the mortality reduction due to mammographic screening may be estimated more precisely.

Key words: Australia, mammographic screening

The BreastScreen Australia programme

An organised approach to mammographic screening in Australia followed from the publication of the Forrest Report [1]. It was also preceded by state and territory pilot programmes and an evaluation by the Commonwealth of Australia [2]. The national programme BreastScreen Australia commenced in 1992 funded by the Commonwealth, co-funded and administered by states and territories. It is a free service for asymptomatic women in the target age range 50–69 years of age and is accessible to all women aged ≥40 years. No doctor’s referral is required to attend for screening, which is performed by two-view mammography. Women aged 50–69 years are sent reminders every 2 years for repeat screens. Organisationally, one or more screening centres are associated with an accredited breast cancer assessment centre where women are referred for multidisciplinary assessment and appropriate referral for treatment.

BreastScreen Australia is overseen by a National Advisory Committee to which several working groups report in the areas of monitoring and evaluation, quality management, workforce and training, communication and education, and policy review. BreastScreen Australia aims to ensure that the programme is implemented in such a way that significant reductions can be achieved in morbidity and mortality attributed to breast cancer, to maximise early detection of breast cancer in the target population, to ensure equitable access to women in the target age range, to ensure that services are acceptable and appropriate, to ensure that screening is provided in dedicated accredited screening and assessment services and to achieve high standards of programme management, service delivery, monitoring and evaluation, and accountability [3].

The specific aims of the BreastScreen Australia programme are as follows: to achieve, after 5 years, 60% participation by women aged 50–69 years and access by women aged ≥40 years; to rescreen all participants at 2-year intervals; to achieve agreed performance outcomes to minimise recalls, invasive procedures, false positives and negatives, and to maximise cancers detected (especially small cancers ≤10 mm in diameter); to refer women to appropriate treatment services and collect treatment information; and to ensure that funding is used only for services accredited according to national guidelines. In addition, BreastScreen Australia aims to: recognise and minimise real costs to participants; make information about mammographic screening available to all women in a comprehensible form; achieve patterns of participation representative of the target population’s socioeconomic–ethnic–cultural profile; provide services in accessible non-threatening and comfortable environments; provide appropriate counselling, education and information; adopt sensitive procedures for notification of recall and minimise time between initial screen and assessment [3].
BreastScreen Australia has developed mechanisms to monitor performance. Programme sensitivity, rates of participation, re-screening, small cancer detection, ductal carcinoma in situ (DCIS) detection and interval cancers are reported on an annual basis by state and territory programmes and for Australia in addition to breast cancer incidence and mortality rates. With the intention of more comprehensive evaluation at the national level, a broad evaluation plan is being developed that would include morbidity indicators such as treatment types and patterns, waiting time in the assessment pathway, technical recalls and early reviews, invasive procedures, true- and false-positive outcomes, and true- and false-negative outcomes. Other monitoring areas that might be included in this plan concern equity of access, efficiency and satisfaction.

Essential to evaluation has been the development of systems and standards for data collection. Informed consent is obtained from participants so that their data are available for evaluation and research to improve the programme. In this way, programmes are matched to state and territory cancer registries and death registries to facilitate death clearance and interval cancer identification. A data dictionary has been developed to standardise definitions as these varied between geographic jurisdictions when the programme commenced, delaying national reporting. Information with which to measure national performance is contained in reports for 1994–95, 1996–97 and 1996–98 [4–6]. A report for women screened in 1999 and 2000 is in preparation.

Evidence of potential benefit

The programme is only a decade old and it is too early to observe consequent reductions in breast cancer mortality. Also, any effect on mortality will not be easy to detect in the presence of unmeasured screening in the private sector and possible increased survival due to changes in treatment. In the absence of lengthy follow-up, however, the likelihood of the programme achieving its long-term objectives can be indicated by measures of the quality of the screening and assessment process.

The most recent national report [6] included three process indicators: the participation rate, the small cancer detection rate and programme sensitivity. The programme minimum standards require participation by 60% of women aged 50–69 years for screening services that have been established for 5 years or more; and women aged 50–69 years to be >60% of the total number screened. The crude participation rate in 1997–98 was 54.3%. Women aged 50–69 years comprised 67.4%.

In 1998, 70% of all small invasive cancers were detected in women aged 50–69 years. For women screened for the first time in 1998, the age-standardised rate (ASR) of small cancer detection was 18.6 of 10 000 women screened. The crude rates for all screening rounds combined ranged from 12.9 to 20.2 per 10 000 women screened in the target age group across the state and territory programmes. These rates comply with the National Accreditation Standard (more than eight cancers per 10 000 women screened). For women who had previously attended the programme, the ASR of small cancer detection for 1998 was 14.6 of 10 000 women screened aged 50–69 years. Women attending for a subsequent screen had ASRs of small cancer detection ranging from 12.6 to 17.4 per 10 000 women screened in women aged 50–69 years.

In 1998, 37% of invasive breast cancers were ≤10 mm. For women attending their first screening round, the ASR of all invasive breast cancers for women aged 50–69 years was 59.3 per 10 000 women screened. The crude cancer detection rates for all women attending for the first time in 1998 was 47.5 cancers per 10 000 women screened (excluding DCIS), just under the National Accreditation Standard (>50 cancers, including DCIS, detected per 10 000 women screened). The ASR of all cancers for women aged 50–69 years attending a subsequent screen in 1998 was 35.9. For women attending the programme for a subsequent screen in 1998, the crude national rate was 36.6 cancers per 10 000 women screened (excluding DCIS). These rates for the subsequent round comply with the National Accreditation Standard (>20 cancers, including DCIS, detected per 10 000 women screened).

Interval cancer rates were not available from all state and territory programmes and those from small services were based on small numbers. Excluding rates from programmes with <30 000 women screened aged 50–69 years in a 2-year period, the range for first attendees is 2.4–6.5 and subsequent attendees 5.2–7.8 per 10 000 women years of observation (0–12 months after screening). Similarly, after excluding the smaller services, the age-standardised programme sensitivities for asymptomatic women aged 50–69 years screened in 1996 ranged from 88.9% to 94.7%. These sensitivities are for women screened for the first time in 1996 and followed for 12 months after screening. The age-standardised programme sensitivity for asymptomatic women aged 50–69 years who attended for a subsequent screen in 1996 ranged from 75.0% to 83.7%.

The management of breast cancer in BreastScreen Victoria

A detailed report comprising data on the characteristics of women screened, outcomes of screening and assessment is produced on an annual basis by the BreastScreen Victoria programme. The most recent report details the experience of women screened in Victoria in 2000. In addition, for all women diagnosed with invasive breast cancer or DCIS, information is collected on subsequent treatment received [7]. Table 1 outlines breast cancer treatment patterns in 2000 in Victoria for women with a diagnosis of invasive breast cancer or DCIS for whom treatment information was available (>90%). Among women with invasive breast cancer who had an axillary dissection, 78% were node-negative (88% 0–10 mm, 83% 11–15 mm and 63% >15 mm). Eighty-eight per cent of women undergoing breast-conserving surgery and 16% of women undergoing mastectomy received radiotherapy. Compared with previous annual reports, these data reflect an increasing trend in the proportion of women receiving breast-conserving surgery, a steady decline in the proportion of women diagnosed with DCIS undergoing axillary dissection and a change over time towards increasing use of combination therapies with a corresponding decrease in the use of hormonal therapy alone [7].
Breast cancer incidence and mortality trends in Australia

Figure 1 illustrates trends in breast cancer incidence and mortality in Australia from 1982 to 2000 in three age groups: <50, 50–69 and ≥70 years. There have been increases in incidence and falls in mortality for each age group but the largest changes have occurred in women aged 50–69 years. We cannot confidently ascribe falling mortality trends to BreastScreen, but it will certainly have influenced the rise in incidence. In years to come, as the BreastScreen database is routinely linked to population–cancer registries and screen-detected cancers are flagged, the true extent to which the programme reduces mortality from breast cancer will be able to be estimated with precision.

Table 1. Treatment patterns for women diagnosed by BreastScreen Victoria in 2000. Data are presented as proportion of women diagnosed

<table>
<thead>
<tr>
<th>Treatment Pattern</th>
<th>Invasive cancer (%)</th>
<th>DCIS (%)</th>
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<tbody>
<tr>
<td>Breast conservation surgery</td>
<td>74.7</td>
<td>80.5</td>
</tr>
<tr>
<td>Mastectomy</td>
<td>24.7</td>
<td>19.4</td>
</tr>
<tr>
<td>Axillary dissection</td>
<td>90.8</td>
<td>7.0</td>
</tr>
<tr>
<td>No adjuvant therapy</td>
<td>5.1</td>
<td>53.5</td>
</tr>
<tr>
<td>Radiotherapy only</td>
<td>12.0</td>
<td>23.5</td>
</tr>
<tr>
<td>Chemotherapy only</td>
<td>6.4</td>
<td>0</td>
</tr>
<tr>
<td>Hormonal therapy only</td>
<td>17.9</td>
<td>19.8</td>
</tr>
<tr>
<td>Combination therapy</td>
<td>58.6</td>
<td>3.2</td>
</tr>
</tbody>
</table>

DCIS, ductal carcinoma in situ.

References