Indicator 3
Sensitivity

Sensitivity

3a. Interval cancer rate

An interval cancer is an invasive breast cancer that is diagnosed after a screening episode that detected no cancer and before the scheduled next screening episode. This measure is the rate of interval invasive breast cancers per 10,000 women years stratified by 10-year age groups (40–49, 50–59, 60–69, 70+ years), symptom status (symptomatic/asymptomatic), time since screen (0–12 months, 13–24 months) and screening round (first or subsequent). This report contains data from 0 to 12 months following a 1996 screening episode. (See glossary for a definition of symptom.)

3b. Program sensitivity

Program sensitivity measures the ability of the Program to detect invasive breast cancers in women attending for screening. This is measured by the percentage of women with screen-detected invasive breast cancer amongst all women diagnosed with invasive breast cancers during the screening interval (screen-detected and interval cancers) stratified by 10-year age groups (40–49, 50–59, 60–69, 70+ years), symptom status (symptomatic/asymptomatic), time since screen (0–12 months, 13–24 months) and screening round (first or subsequent). This report contains data from 0 to 12 months following a 1996 screening episode.

Why measure sensitivity?

Sensitivity measures how effective the BreastScreen Australia Program is at detecting the presence of breast cancer in well women. Measuring the interval cancer rate and program sensitivity aims to:

- obtain an early measure of the likely impact of the screening program on mortality;
- monitor trends in the performance of the BreastScreen Australia Program over time;
- allow comparisons of the performance of the BreastScreen Australia Program across the States and Territories;
- allow comparisons of the Australian Program with overseas programs and trials; and
- provide important information to guide the review and determination of BreastScreen Australia Program policy (Kavanagh et al. 1999a).

Sensitivity data issues

The interval cancer rate is calculated by using various data sources. These are the databases of BreastScreen Australia and the State and Territory cancer registries. Information about women with cancer is matched between State/Territory cancer registries and the BreastScreen Programs in each State/Territory in order to identify women who attended the Program for a mammogram but had a cancer detected outside of the

Program. Such women will be recorded on the cancer registry database but not recorded as having a cancer on the Program database. When matching these data together, there are several problems that need to be addressed. States and Territories may differ in:

- the accuracy and completeness of information collected by the BreastScreen services (for example, the absence of a unique identifier for each woman);
- variation in policies regarding data collection;
- the completeness of the cancer registries for breast cancer data;
- the timely registration of breast cancers to the cancer registries;
- migration of women between States and Territories; and
- the type of matching algorithms and software used.

Variation in the above processes makes its difficult to reliably compare interval cancer rates between States and Territories. This in turn affects the comparability of the Program sensitivity indicator between States and Territories. Nevertheless, the reporting of sensitivity data for women screened in 1996 will provide a benchmark for comparisons in future reports. A validation of the methods of matching data is planned and will be reported on in the next monitoring report. Appendix 1 provides further information about the current matching processes.

Interval cancer rates for 1996 from BreastScreen NSW are not available stratified by symptom status. This means that Australian totals could not be calculated for the stratified rates in this report. However, a non-stratified rate is reported for NSW and other States and Territories on page 23.

How is sensitivity measured?

Interval cancer rate

The interval cancer rate is calculated here as the number of invasive interval cancers detected in women attending the Program for screening in 1996. The interval cancers for each 10-year age group are divided by the number of 'women years at risk' (see glossary) for each time period since screening. The rate is expressed per 10,000 women years (Kavanagh et al. 1999a). This rate indicates how good mammographic screening is at detecting cancers for a given age group. A low interval cancer rate suggests that the screening process is sensitive. This chapter uses age-standardised rates where States and Territories are compared. Age-standardised rates enable comparisons to be made between populations which have different age structures.

Program sensitivity

Program sensitivity is the proportion of invasive breast cancers that are detected within the BreastScreen Australia Program out of all breast cancers (interval cancers plus screen-detected cancers) diagnosed in Program-screened women in the screening interval.

Ideally, sensitivity incorporates the number of interval cancers in the 24-month period after a negative screen, 24 months being the recommended screening interval. However, breast cancer data are not currently available from all cancer registries for the full 24-month period following a 1996 screen. As a result, this report contains data from 0 to 12 months only following a 1996 screen. Such data do not provide a comprehensive picture of interval cancer rate and program sensitivity for BreastScreen Australia. It is planned that future reports will refine this indicator so that it includes the full 24 months following a screen.

Standards for sensitivity

This is the first year that indicators of sensitivity have been reported for the BreastScreen Australia Program at a national level. The Minimum Standard for sensitivity requires the Program to have less than 6 per 10,000 screened women develop an interval breast cancer.

The National Accreditation Requirements (NARs) for BreastScreen Australia are currently under review. While the new NARs have not yet been finalised, the current Minimum Standards are the main benchmark by which the Program can be measured. This report includes current Minimum Standards as a reference point. However, some inconsistencies exist between the definition of these Minimum Standards and the indicator specifications. In this context, the following two points should be considered when interpreting the interval cancer rates given below.

- The Minimum Standard for interval cancer measurement includes both invasive cancers and Ductal Carcinoma In Situ (DCIS). The performance indicator for interval cancer in this report has specifically excluded DCIS in its measurement. This has been done so as to focus on the main aim of the Program—to reduce mortality. As DCIS does not cause mortality it falls outside this scope. If however the DCIS interval cases were included in the interval cancer performance indicator for this report, the resulting rate would be marginally higher.
- For the purpose of the NARs the interval cancer rates are not stratified by any other factor. However, the indicator specifications in this report include stratification by screening round and by symptom status. Stratification by screening round allows for expected variation in interval cancer rates between rounds, while stratification by symptom status is important for the following reasons:
  - the underlying breast cancer rate is higher in symptomatic women than in asymptomatic women;
  - the proportion of symptomatic women attending for screening varies between States/Territories; and
  - policies in relation to symptomatic women differ between States/Territories.

Crude interval cancer rates achieved by BreastScreen Australia nationally and across the States/Territories

	NAR	Australia	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Rate	6.0	6.5	7.8	6.2	5.5	5.7	6.0	4.2	6.2	0.0

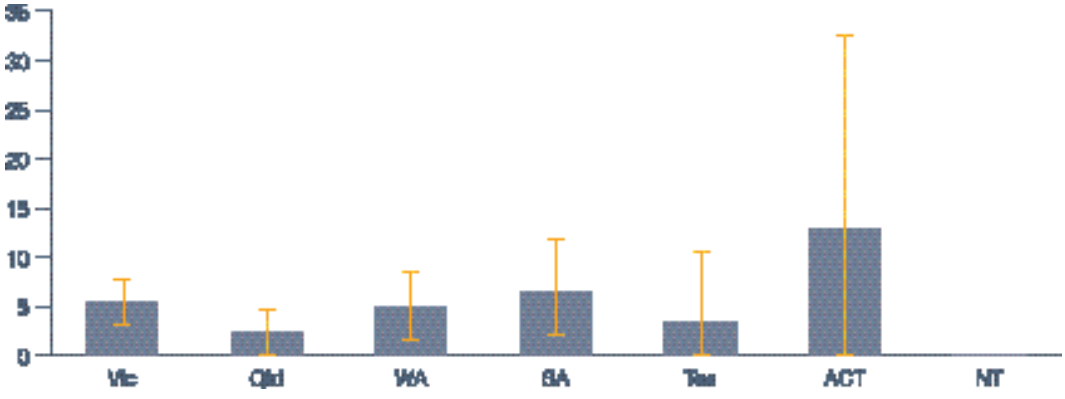
Note:

Rates are expressed per 10,000 women screened.

Sources: DHSH 1994a and BreastScreen Australia.

Interval cancer rate for asymptomatic women aged 50–69, screened during 1996, first screening round, 0–12 months follow-up

Per 10,000 women-years of observation



Bars on graphs represent 95% confidence intervals.

Source: BreastScreen Australia.

	Vic	Qld	WA	SA	Tas	ACT	NT
Rate	5.5	2.4	5.0	6.5	3.4	12.8	0.0
95% CI	3.6–7.5	0.5–4.4	2.0–8.4	2.5–11.5	0.0–10.2	0.0–32.1	..

.. means not applicable.

Notes:

1. Standardised to the Australian population of women attending a BreastScreen service in 1998.
2. None of the rates were significantly different from Victoria at the 5% level.

- The States and Territories that were able to report an interval cancer rate for asymptomatic women in the target age group screened in 1996 produced age-standardised rates ranging from 0 interval cancers to 12.8 interval cancers per 10,000 women screened. The same rates for all ages ranged from 0 to 10.6 interval cancers per 10,000 women screened (Table 13).
- The rates reported here are for women screened in 1996 (first screening round) and followed for the first 12-month period after screening. Future reporting of this indicator will include a 13–24-month follow-up period.
- States and Territories with smaller populations are less likely to have interval cancers amongst their screened population due to small numbers. This report contains the first information on interval cancer rates, which will form a basis on which future data will build. The aggregation of data over a 3-year time-period in the future will help to ensure that smaller States and Territories are more accurately represented.

For more information, see:

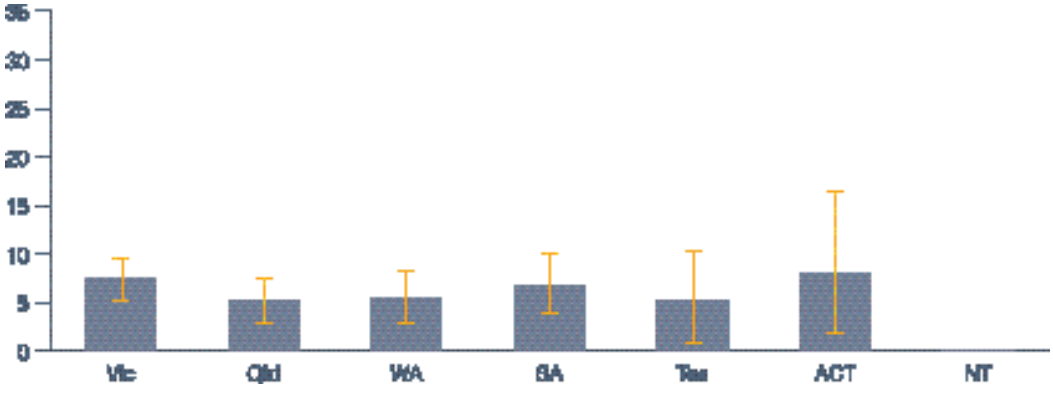
Tables 13 to 19.

Kavanagh AM, Mitchell H, Farrugia H & Giles GG 1999. Monitoring interval cancers in an Australian mammographic screening programme. J Med Screen 6:139–143.

Sylvester PA, Kutt E, Baird A, Vipond MN, Webb AJ & Farndon JR 1997. Rate and classification of interval cancers in the breast screening programme. Annals of the Royal College of Surgeons of England 79(4):276–7.

Interval cancer rate for asymptomatic women aged 50–69, screened during 1996, subsequent screening round, 0–12 months follow-up

Per 10,000 women-years of observation



Bars on graphs represent 95% confidence intervals.

Source: BreastScreen Australia.

	Vic	Qld	WA	SA	Tas	ACT	NT
Rate	7.5	5.2	5.5	6.8	5.1	7.9	0.0
95% CI	5.7–9.2	3.3–7.3	3.2–7.9	4.3–9.7	1.2–10.1	2.5–16.2	..

.. means not applicable.

Notes:

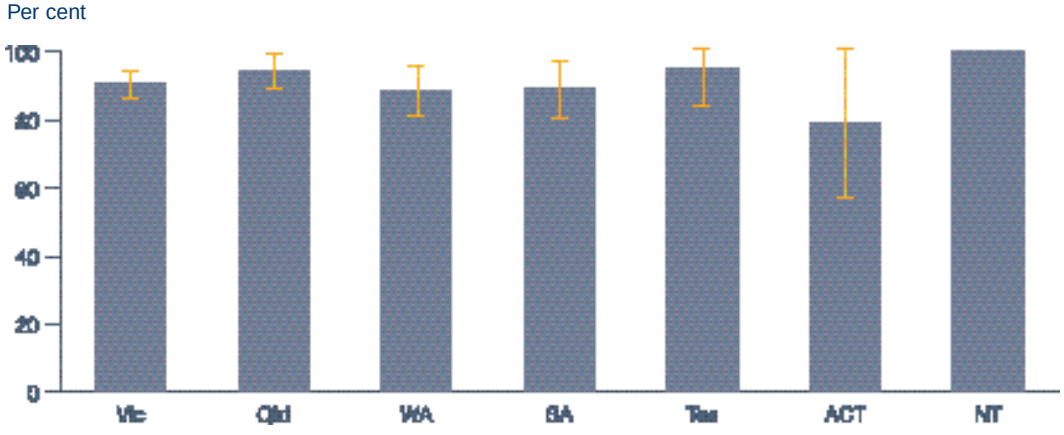
1. Standardised to the Australian population of women attending a BreastScreen service in 1998.
2. None of the rates were significantly different from Victoria at the 5% level.

- The age-standardised interval cancer rates for asymptomatic women in the target age group who attended for a subsequent screen in 1996 ranged from 0 interval cancers to 7.9 interval cancers per 10,000 women screened (Table 15).
- The same rates for all ages ranged from 0 to 5.9 interval cancers per 10,000 women screened (Table 15).

For more information, see:

Tables 13 to 19.

Program sensitivity for asymptomatic women aged 50–69, screened during 1996, first screening round, 0–12 months follow-up



Bars on graphs represent 95% confidence intervals.

Source: BreastScreen Australia.

	Vic	Qld	WA	SA	Tas	ACT	NT
%	90.9	94.7	88.9	89.3	95.1	79.2	100.0
95% CI	87.9–93.7	90.7–98.7	82.5–95.2	82.1–96.3	85.3–100.0	58.4–100.0	..

.. means not applicable.

Notes:

1. Standardised to the Australian population of women attending a BreastScreen service in 1998.
2. None of the rates were significantly different from Victoria at the 5% level.

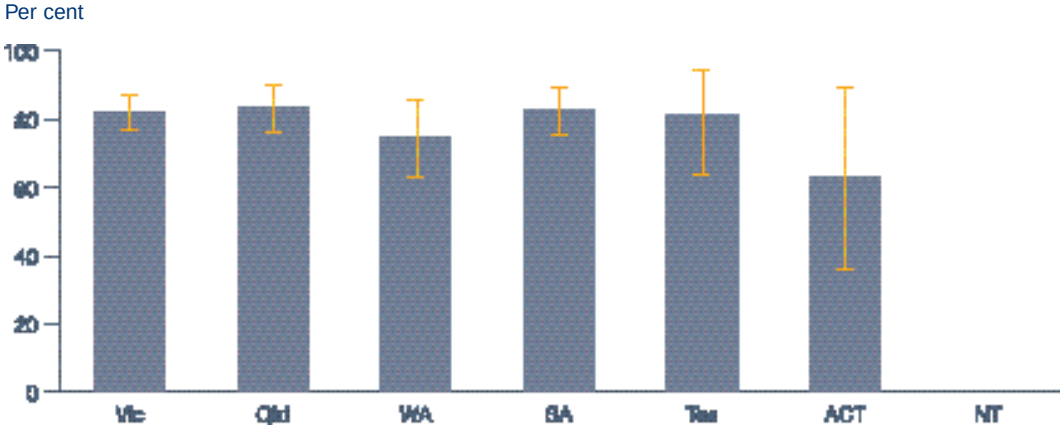
- The age-standardised program sensitivity rates for asymptomatic women aged 50–69 screened in 1996 ranged from 79.2% for the Australian Capital Territory to 100% for the Northern Territory (Table 20). The same rates for all ages ranged from 75.5% to 100%.
- These rates are for women screened for the first time in 1996 and followed for 12-months after screening. It is intended to report on a 13–24-month follow-up period in future reports.
- The rate for the Northern Territory reflects that no interval cancers were detected in the 12 months following a screen in 1996. Small States/Territories are more likely to have relatively few cancers and no interval cancers detected during a 1-year period. Aggregation of 3-years' data in future reports would provide more stability in this rate, particularly for the smaller States and Territories. This is the first information on Program sensitivity, and will form a baseline for future comparisons.

For more information, see:

Tables 20 to 23.

Kavanagh A, Amos AF & Marr GM 1999a. The ascertainment and reporting of interval cancers within the BreastScreen Australia Program. NHMRC National Breast Cancer Centre report. Sydney: National Breast Cancer Centre.

Program sensitivity for asymptomatic women aged 50–69, screened during 1996, subsequent screening round, 0–12 months follow-up



Bars on graphs represent 95% confidence intervals.

Source: BreastScreen Australia.

	Vic	Qld	WA	SA	Tas	ACT	NT
%	82.1	83.7	75.0	82.9	81.1	62.8	..
95% CI	78.0–85.8	77.6–89.6	64.1–84.9	76.6–88.6	65.1–94.0	37.2–88.3	..

.. means not applicable.

Notes:

1. Standardised to the Australian population of women attending a BreastScreen service in 1998.
2. None of the rates were significantly different from Victoria at the 5% level.

- The age-standardised program sensitivity rates for asymptomatic women in the target age group who attended for a subsequent screen in 1996 ranged from 62.8% to 83.7% (Table 21). The same rates for all ages ranged from 71.4% to 84.7%.

For more information, see:

Tables 20 to 23.