

Cancer Monitoring

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Breast cancer size and nodal status

Introduction

The aim of the BreastScreen Australia Program is to detect invasive breast cancers in women early while they are small and before they have spread beyond the breast; this gives the best chance of effective treatment.

Features generally associated with a less favourable outcome include larger breast cancer size, the presence of cancer in the nearby lymph nodes ('positive nodes') and the number of nodes that have cancer present ('number of positive nodes'). The larger the breast cancer the more likely it is that the nodes will be positive.

Removal of lymph nodes from the axilla is an important part of surgery for breast cancer. Nodal status is determined by whether excised lymph nodes are found to have cancer in them (positive) or not (negative).

Information about these features is well recognised as important for clinicians and women when discussing treatment options and prognosis. It is also important in monitoring breast cancer control.

This report presents information on breast cancer size and nodal status supplied by BreastScreen Australia and State and Territory cancer registries. It is based on all invasive breast cancers diagnosed in Australia in 1997, and includes tumours diagnosed in women known to have had breast cancer previously.

Key points

- Almost 10,400 cases of invasive breast cancer held by Australian cancer registries in 1997 were analysed for this report. Approximately 30% were cases detected by the BreastScreen Australia Program, with the remainder identified through hospital, pathology, radiotherapy and physician records.
- 42.7% of invasive breast cancers in women of all ages were 15 mm or smaller in diameter. In the BreastScreen program, which targets women aged 50–69 years, the proportion was 60.3%.
- Cancers 30 mm or larger in diameter were more common in women under 30 years of age.

State and Territory cancer registries

Cancer notification is required under State and Territory legislation. The cancer notifications are collated by cancer registries, which are supported by a mix of State and Territory government and non-government charity organisations. Information is obtained from screening programs and hospital, pathology, radiology and physician records. All women diagnosed with breast cancer in Australia are notified to the cancer registries, including those women detected within the BreastScreen Australia Program.

BreastScreen Australia Program

BreastScreen Australia is a Commonwealth–State funded public health program which offers free population-based breast cancer screening to eligible women. Women in the target age group 50–69 years are actively recruited to participate in the Program. Women aged 40–49 years and 70 years and over are also able to access screening in the Program. Women are usually self-referred, as a doctor's referral is not required. Mammography screening also occurs in the private sector.

Cancer size

Cancer size refers to the largest reported diameter of an invasive tumour. For multicentric or multifocal cancer, size was taken as the diameter of the largest focus. This applied in all jurisdictions except South Australia and the Northern Territory cancer registries where the sizes of multicentric and/or multifocal cancers were summed. This latter practice complied with standards existing in some registries around 1980 and was still being maintained in 1997 to facilitate analyses of time trends. The effect has been to artificially increase the measure of sizes of South Australian and Northern Territory tumours relative to those for other jurisdictions.

Nodal status

Nodal status is determined by whether excised lymph nodes are found to have cancer in them (positive) or not (negative). Cases where no nodes were examined (21% of cancer registry cases, 17% of BreastScreen Australia cases) were excluded from the nodal status analysis.

Table 1: Cancer registry cases of invasive breast cancer: size of cancer by State and Territory, 1997

State/ Territory	Breast cancer size												Total	
	0–10 mm		11–15 mm		16–19 mm		20–29 mm		30+ mm		Unknown			
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	% of total
NSW	719	20.4	744	21.1	385	10.9	759	21.6	564	16.0	349	9.9	3,520	34.0
Vic	533	19.6	586	21.6	272	10.0	577	21.3	403	14.8	344	12.7	2,715	26.2
Qld	470	25.5	395	21.4	191	10.3	352	19.1	312	16.9	126	6.8	1,846	17.8
WA	199	20.8	210	22.0	101	10.6	183	19.2	134	14.0	128	13.4	955	9.2
SA*	121	13.5	174	19.5	90	10.1	183	20.5	203	22.7	122	13.7	893	8.6
Tas	43	18.7	57	24.8	26	11.3	43	18.7	48	20.9	13	5.7	230	2.2
ACT	23	16.3	37	26.2	14	9.9	33	23.4	24	17.0	10	7.1	141	1.4
NT*	7	13.0	13	24.1	7	13.0	8	14.8	10	18.5	9	16.7	54	0.5
Australia	2,115	20.4	2,216	21.4	1,086	10.5	2,138	20.6	1,698	16.4	1,101	10.6	10,354	100.0
Australia ex SA, NT		21.1		21.6		10.5		20.7		15.8		10.3		90.9

* Differences in measurement methodology (see Cancer size).

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

Table 2: Cancer registry cases of invasive breast cancer: size of cancer by age group, 1997

Age at diagnosis	Breast cancer size												Total	
	0–10 mm		11–15 mm		16–19 mm		20–29 mm		30+ mm		Unknown			
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	% of total
0–19 years	0	0.0	0	0.0	0	0.0	1	33.3	1	33.3	1	33.3	3	0.0
20–29 years	8	12.3	9	13.8	9	13.8	15	23.1	19	29.2	5	7.7	65	0.6
30–39 years	124	19.6	125	19.7	79	12.5	135	21.3	117	18.5	53	8.4	633	6.1
40–49 years	369	18.8	417	21.2	203	10.3	465	23.6	362	18.4	151	7.7	1,967	19.0
50–59 years	634	24.7	604	23.6	276	10.8	483	18.8	401	15.6	166	6.5	2,564	24.8
60–69 years	530	24.3	526	24.1	224	10.3	435	19.9	297	13.6	172	7.9	2,184	21.1
70+ years	450	15.3	535	18.2	295	10.0	604	20.6	501	17.1	553	18.8	2,938	28.4
Total	2,115	20.4	2,216	21.4	1,086	10.5	2,138	20.6	1,698	16.4	1,101	10.6	10,354	100.0
Average age	58.8		59.2		59.3		59.6		59.6		67.0		60.1	

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

This report analysed 10,354 cases of invasive breast cancer diagnosed in 1997 of which 89% had size information. Cancers in the unknown size group were either not measured or the size information was not available.

The majority of invasive breast cancers were smaller than 20 mm in diameter. Cases diagnosed by BreastScreen Australia had a high proportion of small cancers compared with women who had been diagnosed elsewhere since BreastScreen specifically aims to maximise the early detection of breast cancer in asymptomatic women (Fig. 1). Cancers 30 mm or more in size were proportionately more common in women under 30 years of age than in women of other ages (Table 2).

The majority of cancer registry cases with unknown sizes were in the 70+ age group, in contrast to the BreastScreen Australia cases where the youngest age group (40–49 year olds) had the largest proportion of unknown sizes (Tables 2 and 4).

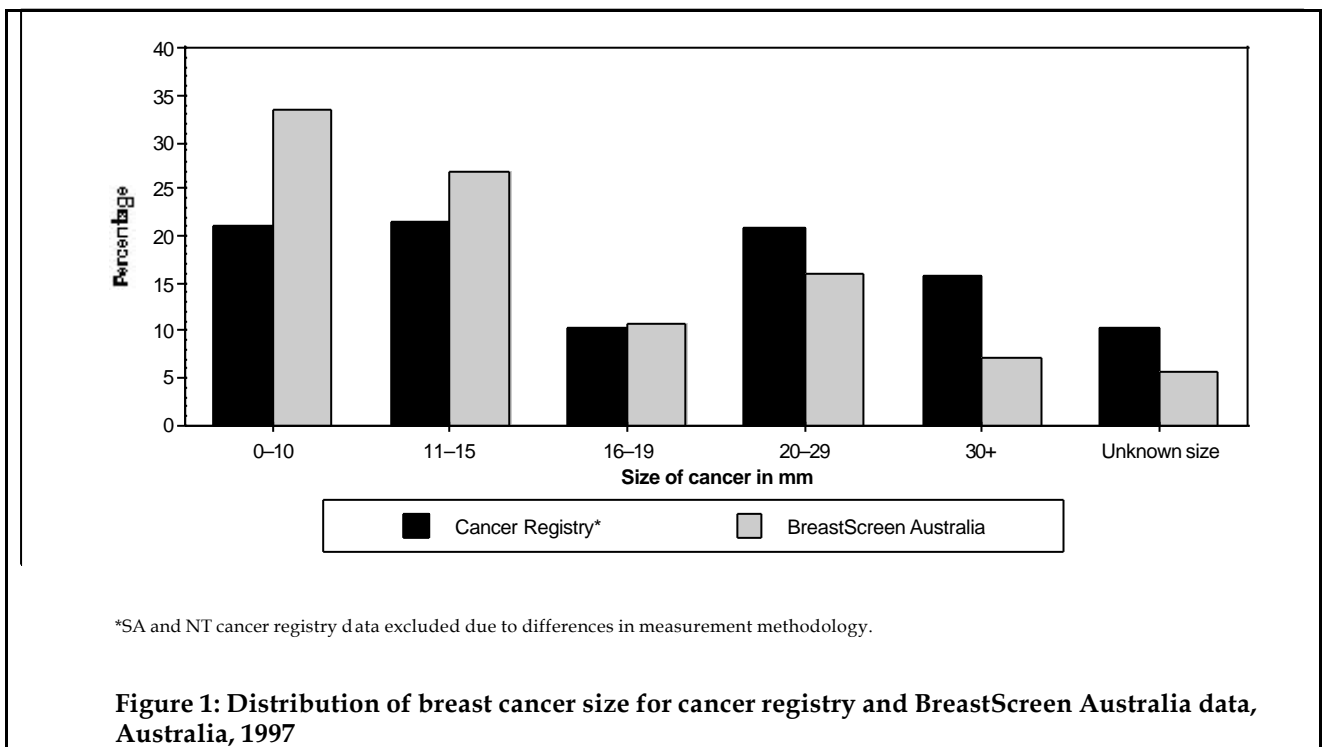


Table 3: BreastScreen Australia cases of invasive breast cancer: size of cancer by State and Territory, 1997

State/ Territory	Breast cancer size												Total	
	0–10 mm		11–15 mm		16–19 mm		20–29 mm		30+ mm		Unknown			
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	% of total
NSW	406	31.1	306	23.4	142	10.9	212	16.2	103	7.9	138	10.6	1,307	42.5
Vic	258	37.3	195	28.2	70	10.1	111	16.1	37	5.4	20	2.9	691	22.5
Qld	166	33.5	142	28.7	58	11.7	82	16.6	41	8.3	6	1.2	495	16.1
WA	81	36.5	68	30.6	19	8.6	39	17.6	15	6.8	0	0.0	222	7.2
SA	87	34.4	76	30.0	32	12.6	35	13.8	15	5.9	8	3.2	253	8.2
Tas	10	22.7	20	45.5	6	13.6	5	11.4	3	6.8	0	0.0	44	1.4
ACT	11	23.4	17	36.2	3	6.4	9	19.1	7	14.9	0	0.0	47	1.5
NT	5	38.5	4	30.8	1	7.7	1	7.7	2	15.4	0	0.0	13	0.4
Australia	1,024	33.3	828	27.0	331	10.8	494	16.1	223	7.3	172	5.6	3,072	100.0

Source: AIHW from BreastScreen Australia data.

Table 4: BreastScreen Australia cases of invasive breast cancer: size of cancer by age group, 1997

Age at diagnosis	Breast cancer size												Total	
	0–10 mm		11–15 mm		16–19 mm		20–29 mm		30+ mm		Unknown			
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	% of total
40–49 years	73	22.5	74	22.8	40	12.3	67	20.7	40	12.3	30	9.3	324	10.5
50–59 years	339	31.7	298	27.9	120	11.2	172	16.1	77	7.2	64	6.0	1,070	34.8
60–69 years	359	35.2	287	28.1	103	10.1	160	15.7	62	6.1	50	4.9	1,021	33.2
70+ years	253	38.5	169	25.7	68	10.4	95	14.5	44	6.7	28	4.3	657	21.4
Total	1,024	33.3	828	27.0	331	10.8	494	16.1	223	7.3	172	5.6	3,072	100.0
Average age	60.3		59.2		59.3		59.6		59.6		66.2		60.1	

Source: AIHW from BreastScreen Australia data.

Lymph nodes were examined in 79% of cancer registry cases. There was, however a considerable variation among the States and Territories, from a low of 64% in Tasmania to a high of 92% in ACT. Despite this, the variation in the proportion of positive nodes was relatively small (Table 5).

Table 5: Cancer registry cases of invasive breast cancer: nodal status by State and Territory, 1997

State/Territory	Cases	Nodes positive		Nodes negative		Node status unknown ^(a)	
		n	%	n	%	n	%
NSW	3,520	1,062	30.2	1,751	49.7	707	20.1
Vic	2,715	810	29.8	1,149	42.3	756	27.8
Qld	1,846	515	27.9	738	40.0	593	32.1
WA	955	270	28.3	392	41.0	293	30.7
SA	893	283	31.7	490	54.9	120	13.4
Tas	230	63	27.4	84	36.5	83	36.1
ACT	141	45	31.9	76	53.9	20	14.2
NT	54	14	25.9	21	38.9	19	35.2
Australia	10,354	3,062	29.6	4,701	45.4	2,591	25.0

(a) Includes cases where no examination undertaken or cases where node status could not be determined after examination.

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

Table 6: Cancer registry cases of invasive breast cancer: nodal status by age group, 1997

Age at diagnosis	Cases	Nodes positive		Nodes negative		Node status unknown ^(a)	
		n	%	n	%	n	%
0–19 years	3	0	0.0	0	0.0	3	100.0
20–29 years	65	26	40.0	26	40.0	13	20.0
30–39 years	633	253	40.0	267	42.2	113	17.9
40–49 years	1,967	747	38.0	891	45.3	329	16.7
50–59 years	2,564	826	32.2	1,331	51.9	407	15.9
60–69 years	2,184	595	27.2	1,113	51.0	476	21.8
70+ years	2,938	615	20.9	1,073	36.5	1,250	42.5
Total	10,354	3,062	29.6	4,701	45.4	2,591	25.0

(a) Includes cases where no examination undertaken or cases where node status could not be determined after examination.

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

Of the 8,162 women with breast cancer who had their nodes examined, 3,062 (30%) were known to have positive nodes and 4,701 (45%) negative nodes. The proportion with positive nodes varied with age, with the highest proportion found in women aged 20–39 years (40% positive). This proportion was slightly lower for the 40–49 year olds (38%) and lower again for the 50–59 year olds (32%) and the 60–69 year olds (27%). In older women a smaller proportion of cases had nodes examined, and of those examined, 21% were positive in women aged 70 or more (Table 6).

Table 7: BreastScreen Australia cases of invasive breast cancer: nodal status by State and Territory, 1997

State/Territory	Cases	Nodes positive		Nodes negative		Node status unknown ^(a)	
		n	%	n	%	n	%
NSW	1,307	291	22.3	706	54.0	310	23.7
Vic	691	146	21.1	464	67.1	81	11.7
Qld	495	123	24.8	305	61.6	67	13.5
WA	222	43	19.4	150	67.6	29	13.1
SA	253	66	26.1	162	64.0	25	9.9
Tas	44	8	18.2	26	59.1	10	22.7
ACT	47	10	21.3	30	63.8	7	14.9
NT	13	3	23.1	4	30.8	6	46.2
Australia	3,072	690	22.5	1,847	60.1	535	17.4

(a) Includes cases where no examination undertaken or cases where node status could not be determined after examination.

Source: AIHW from BreastScreen Australia data.

Of the 3,072 women detected by BreastScreen Australia with breast cancer, 2,541 (83%) had one or more lymph nodes examined, and 22.5% of cases were positive (Table 7). As noted earlier, BreastScreen aims to maximise early detection of breast cancer in asymptomatic women who are 40 years of age and older. Because of this aim, a higher proportion of cancers diagnosed in BreastScreen would not have spread to the lymph nodes than would cancers detected elsewhere, outside of the BreastScreen Australia Program.

Table 8: BreastScreen Australia cases of invasive breast cancer: nodal status by age group, 1997

Age at diagnosis	Cases	Nodes positive		Nodes negative		Node status unknown ^(a)	
		n	%	n	%	n	%
40–49 years	324	92	28.4	184	56.8	48	14.8
50–59 years	1,070	267	25.0	671	62.7	132	12.3
60–69 years	1,021	229	22.4	621	60.8	171	16.7
70+ years	657	102	15.5	371	56.5	184	28.0
Total	3,072	690	22.5	1,847	60.1	535	17.4

(a) Includes cases where no examination undertaken or cases where node status could not be determined after examination.

Source: AIHW from BreastScreen Australia data.

Table 9: Cancer registry cases of invasive breast cancer where nodes have been examined: nodes by State and Territory, 1997

State/Territory	Number of nodes examined					Number of positive nodes				
	Unknown	1–5	6–12	13–18	19–45	0	1	2–3	4–8	9+
Number of patients										
NSW	318	128	862	964	843	1,751	345	311	247	159
Vic	21	78	832	716	312	1,149	277	228	182	123
Qld	90	110	446	412	284	738	165	150	114	86
WA	1	53	317	217	74	392	89	72	67	42
SA	773	—	—	—	—	490	105	81	58	39
Tas	3	21	85	31	7	84	23	19	15	6
ACT	8	5	35	46	35	76	17	14	6	8
NT	35	—	—	—	—	21	5	6	1	2
Australia	1,249	395	2,577	2,386	1,555	4,701	1,026	881	690	465
Percentage of patients										
NSW	10.2	4.1	27.7	30.9	27.1	56.2	11.1	10.0	7.9	5.1
Vic	1.1	4.0	42.5	36.5	15.9	58.7	14.1	11.6	9.3	6.3
Qld	6.7	8.2	33.2	30.7	21.2	55.0	12.3	11.2	8.5	6.4
WA	0.2	8.0	47.9	32.8	11.2	59.2	13.4	10.9	10.1	6.3
SA	100.0	—	—	—	—	63.4	13.6	10.5	7.5	5.0
Tas	2.0	14.3	57.8	21.1	4.8	57.1	15.6	12.9	10.2	4.1
ACT	6.2	3.9	27.1	35.7	27.1	58.9	13.2	10.9	4.7	6.2
NT	100.0	—	—	—	—	60.0	14.3	17.1	2.9	5.7
Australia	15.3	4.8	31.6	29.2	19.1	57.6	12.6	10.8	8.5	5.7

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

Of the 8,162 women with breast cancer who had their nodes examined the majority had 6–12 (32%) or 13–18 (29%) nodes examined (Table 9). These percentages rose to 37% and 35% respectively if only data with known number of nodes examined were taken into account.

Most cases with positive nodes had between one and three nodes affected by cancer (62%); 15% had 9 or more nodes affected. There was very little variation among the States and Territories.

Table 10: Cancer registry cases of invasive breast cancer where nodes have been examined: nodes by age, 1997

Age at diagnosis	Number of nodes examined					Number of positive nodes				
	Unknown	1–5	6–12	13–18	19–45	0	1	2–3	4–8	9+
Number of patients										
20–29 years	6	2	12	23	11	26	5	6	9	6
30–39 years	77	16	161	140	147	267	85	77	49	42
40–49 years	208	50	477	563	390	891	243	220	176	108
50–59 years	296	94	692	671	462	1,331	272	225	184	145
60–69 years	243	87	585	539	318	1,113	220	170	120	85
70+ years	419	146	650	450	227	1,073	201	183	152	79
Total	1,249	395	2,577	2,386	1,555	4,701	1,026	881	690	465
Percentage of patients										
20–29 years	11.1	3.7	22.2	42.6	20.4	48.1	9.3	11.1	16.7	11.1
30–39 years	14.2	2.9	29.6	25.7	27.0	49.4	15.7	14.2	9.1	7.8
40–49 years	12.3	2.9	27.8	32.9	22.8	52.8	14.4	13.0	10.4	6.4
50–59 years	13.4	4.2	31.0	30.0	20.7	60.1	12.3	10.2	8.3	6.5
60–69 years	13.7	4.8	32.6	30.0	17.7	62.8	12.4	9.6	6.8	4.8
70+ years	22.1	7.4	33.1	22.9	11.6	56.7	10.6	9.7	8.0	4.2
Total	15.3	4.8	31.6	29.2	19.1	57.6	12.6	10.8	8.5	5.7

Source: AIHW from State and Territory Cancer Registries data, which includes cases detected by BreastScreen Australia.

The distribution of nodes examined and positive nodes was fairly uniform across all age groups, with only the 70+ age group having less nodes examined and more cases where the number of nodes examined was unknown than the other age groups (Table 10).

Older women detected by BreastScreen Australia had fewer nodes examined than younger women but there were no clear age-related trends for the number of positive nodes found (Table 11).

Table 11: BreastScreen Australia cases of invasive breast cancer where nodes have been examined: nodes by age, 1997

Age at diagnosis	Number of nodes examined					Number of positive nodes				
	Unknown	1–5	6–12	13–18	19–45	0	1	2–3	4–8	9+
Number of patients										
40–49 years	1	9	90	107	70	184	27	38	17	10
50–59 years	2	39	328	345	225	671	92	84	59	32
60–69 years	4	40	337	308	163	621	94	71	43	21
70+ years	5	31	208	154	86	375	43	29	18	15
Total	7	119	962	909	544	1,847	254	221	137	78
Percentage of patients										
40–49 years	0.4	3.2	32.5	38.6	25.3	66.4	9.7	13.7	6.1	3.6
50–59 years	0.2	4.2	34.9	36.7	24.0	71.5	9.8	8.9	6.3	3.4
60–69 years	0.5	4.7	39.6	36.2	19.1	72.9	11.0	8.3	5.0	2.5
70+ years	1.0	6.4	43.0	31.8	17.8	77.5	8.9	6.0	3.7	3.1
Total	0.3	4.7	37.9	35.8	21.4	72.7	10.0	8.7	5.4	3.1

Source: AIHW from BreastScreen Australia data.

Table 12: BreastScreen Australia cases of invasive breast cancer where nodes have been examined: nodes by State and Territory, 1997

State/Territory	Number of nodes examined					Number of positive nodes				
	Unknown	1–5	6–12	13–18	19–45	0	1	2–3	4–8	9+
Number of patients										
NSW	0	34	314	342	307	706	95	89	73	34
Vic	2	15	256	250	87	464	60	43	23	20
Qld	0	31	163	132	102	305	45	46	20	12
WA	0	22	79	81	11	150	17	11	11	4
SA	0	12	109	82	25	162	27	23	10	6
Tas	0	5	23	6	0	26	3	5	0	0
ACT	0	0	17	11	12	30	5	3	0	2
NT	5	0	1	5	0	4	2	1	0	0
Australia	7	119	962	909	544	1,847	254	221	137	78
Percentage of patients										
NSW	—	3.4	31.5	34.3	30.8	70.8	9.5	8.9	7.3	3.4
Vic	0.3	2.5	42.0	41.0	14.3	76.1	9.8	7.0	3.8	3.3
Qld	—	7.2	38.1	30.8	23.8	71.3	10.5	10.7	4.7	2.8
WA	—	11.4	40.9	42.0	5.7	77.7	8.8	5.7	5.7	2.1
SA	—	5.3	47.8	36.0	11.0	71.1	11.8	10.1	4.4	2.6
Tas	—	14.7	67.6	17.6	—	76.5	8.8	14.7	—	—
ACT	—	—	42.5	27.5	30.0	75.0	12.5	7.5	—	5.0
NT	45.5	—	9.1	45.5	—	36.4	18.2	9.1	—	—
Australia	0.3	4.7	37.9	35.8	21.4	72.7	10.0	8.7	5.4	3.1

Source: AIHW from BreastScreen Australia data.

Of the 2,541 women with breast cancer detected by BreastScreen Australia who had their nodes examined, the majority had 6–12 (38%) or 13–18 (36%) nodes examined (Table 12).

Most cases with positive nodes had between one and three nodes affected by cancer (69%); 11% had 9 or more positive nodes.

Cancer registry cases where nodes had been examined were further analysed to investigate the relationship between size of the cancer and positive nodes. The percentage of positive nodes increased as cancer size increased. Taken by cancer size, 15% of cancers up to 10mm in size, 32% of cancers 11–19mm, 46% at 20–29 mm and 63% at 30 mm or larger had positive nodes.

Related publications

Further cancer monitoring reports and information can be found at the following Internet sites:

Australian Institute of Health and Welfare	www.aihw.gov.au
Australasian Association of Cancer Registries	www.aihw.gov.au/cancer/index.html
BreastScreen Australia	www.breastscreen.info.au
Department of Health and Aged Care	www.health.gov.au
National Breast Cancer Centre	www.nbcc.org.au