Annual Report 2018

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From the Chair, BreastSurgANZ Quality Audit

The 2018 BreastSurgANZ Quality Audit Annual Report provides an overview of the surgical management of breast cancer across Australia and New Zealand. It reflects the status of current practice and demonstrates changes in the management of breast cancer patients over time.

This Annual Report is an opportunity to reflect on what the program has achieved and areas for improvement in the future. Significant findings can be drawn from the 18,850 cases of breast cancer submitted to the BQA in 2018 and research output from the BQA continues to be strongly encouraged.

Key Performance Indicators (KPIs) are a fundamental component in the audits ability to monitor performance and identify areas for improvement. The continued review of the relevance of the benchmarks applied included revising KPI 6 to consider neoadjuvant therapy. The KPIs will also form the basis of a Clinical Quality Improvement Program which will be introduced shortly to close the BQA's feedback loop and increase the support provided to surgeons in improving their practice.

In 2018 the BQA completed the data collection period for the pilot on High Quality Performance Indicators (HQPIs). The HQPIs used in the pilot analysis demonstrated that the proposed indicators were aspirational for many BreastSurgANZ members. This pilot has provided the BQA Subcommittee and the Society with many opportunities to consider changes to the BQA's performance indicators.

The BQA's focus remains on supporting our members practice and improving their interactions with the BQA. With this in mind, we also seek to explore partnerships with other stakeholders to enhance the delivery of our program and increase local knowledge of breast cancer.

The valuable data within this report is due to the dedication of surgeons, researchers, administrators and patients that contribute to the BQA. Most importantly this could not have been done without the continued support of Breast Surgeons of Australia and New Zealand Inc., in not only funding this program but facilitating the quality assurance of its members and the continued pursuit of quality outcomes for breast cancer patients.

Mr David Walters FRACS
Chair, BQA Subcommittee

From the President, BreastSurgANZ

On behalf of all BreastSurgANZ members, I thank the BQA team for producing the 2018 BQA Annual Report.

This report provides an opportunity to formally reflect on the learnings and insights obtained from the longstanding capture of breast cancer patient data in the BQA. I encourage all our members to read the full report and provide any feedback to BreastSurgANZ.

The enduring success of the Audit, now in its 22nd year of operations, is due to the strong dedication and commitment of the Audit team and its Surgical leaders - including the current sub-committee Chair, Dr David Walters, and Committee members. I also acknowledge the significant membership commitment through its contribution to data submission, and the ongoing Society support, as cornerstones to the BQA accomplishments.

The primary aim of the Audit is to improve the quality of breast cancer surgery care by breast surgeons for the benefit of their patients. The value to BreastSurgANZ members of participating in the Audit arise from the opportunity to ensure they meet certain quality standards within a qualified privilege protected quality assurance activity and peer supported program.

BreastSurgANZ aims to capture 100% of patient data from early breast cancer surgery performed by our members throughout Australia and New Zealand to facilitate ongoing improvements in quality outcomes. We continue to work with the Audit team and our membership to improve data capture, compliance with standards, and assessment of high key performance indicators. Importantly, we encourage and expect our breast surgeons to submit all their early breast cases for quality assurance.

We encourage our members to better utilise the value of this extensive and comprehensive bi-national data set in research about breast cancer surgery, or for benchmarking their units. PFT trainees are strongly recommended to discuss possible worthy research projects using the BQA data for their post-fellowship training requirements with their hospital units, PFT Chairs, and our BQA team.

I am excited by the Society's plans for evolving the Audit for development and enhancement - including implementation of a Clinical Quality Improvement program policy and process, an Oncoplastic module and patient related outcome data.

I invite feedback from members regarding the 2018 Audit Report, and any suggestions to improve this important Society activity.

Associate Professor Sanjay Warrier FRACS

President, BreastSurgANZ

ACKNOWLEDGEMENTS

The BreastSurgANZ Quality Audit (BQA) is funded and directed by Breast Surgeons of Australia and New Zealand (BreastSurgANZ) and operated by the Royal Australasian College of Surgeons (RACS) under contract.

This report was undertaken by members of the Morbidity Audits team at RACS in collaboration with the BreastSurgANZ Quality Audit Steering Committee. The report was authored by Michelle Ogilvy and Eloise Spooner under the guidance of Dr Helena Kopunic and Associate Professor Wendy Babidge.

The report was prepared under the oversight of the BQA Subcommittee, whose members are Mr David Walters (Chair/South Australia & Northern Territory), Mr Andrew Spillane (New South Wales & Australian Capital Territory), Mr Jason Lambley (Queensland), Dr Melissa Bochner (South Australia), Ms Meron Pitcher (Victoria & Tasmania), Dr Saud Hamza (Western Australia), Mr Ian Campbell (New Zealand), Mr David Moss (New Zealand), Ms Maryanne Maher (BCNA Consumer Representative).

BreastSurgANZ membership

BreastSurgANZ acknowledges the dedication and enthusiasm of their members in maintaining involvement with the audit, providing time and resources to ensure the audit is an accurate and up-to-date reflection of practice in Australia and New Zealand.

The BreastSurgANZ aims for the audit to be relevant to the needs of all members, and to ensure the audit reflects current practice. As always, feedback is very welcome from the membership on their experiences with the audit, and how BSANZ and RACS may better serve their requirements.

1. EXECUTIVE SUMMARY

This report provides an overview of the activities of the audit in the 2018 calendar year. The principal activities were:

Participation in 2018

- A total of 18,850 episodes of breast cancer were submitted to the BQA in 2018, 57% directly through the portal and 43% through the upload program. Development work was completed on the upload tool in 2018, allowing the program to resume and a higher proportion of cases to be entered through this program than in previous years. At year end, there were 353 accounts for surgeons, 32 accounts for data managers, and a total of 219,659 episodes of breast cancer stored in the database.

What the data showed in 2018

- This report examines data for breast cancers diagnosed in 2018, of which there are 12,746 records, submitted by 288 participants from 247 hospitals across Australia and New Zealand.
- Most patients treated in 2018 were aged 50 years or older and 99% were female.
- Patients with *in situ tumours or smaller invasive tumours* were more likely to be referred from BreastScreen. *Larger invasive tumours* were more likely to be a symptomatic referral from a GP.
- Breast conserving surgery was the most common 'final' treatment for breast cancer, particularly for patients referred by BreastScreen patients aged over 40 and in the treatment of smaller tumours.
- Patients aged 70 or above were the least likely to receive reconstruction after mastectomy.
- Most patients treated with breast conserving surgery received no further surgical treatment. The possibility of further surgery rose with increasing tumour size and fell with increasing age.
- Most invasive tumours were treated with some form of axillary surgery, commonly sentinel node biopsy. Axillary node dissection was more common as the tumour size increased.
- Patients with small *in situ* tumours were least likely to have any axillary surgery. As the tumour became larger, the likelihood of sentinel node biopsy increased. Axillary node dissection was rare for *in situ* tumours.
- Surgeons in Australia and New Zealand are meeting all six BQA Key Performance Indicators.

Recent activities

- At the end of 2018, the data collection period for the pilot on High Quality Performance Indicators (HQPIs) was completed. Analysis showed low levels of achievement by BreastSurgANZ members and surgeons with a high volume of cases were more likely to meet the threshold levels.
- The upload tool was updated in 2018 and uploads recommenced, which inflated the proportion of cases submitted through the upload program for this year.
- The calculation for Key Performance Indicator 6 (Percentage of high-risk cases referred for chemotherapy) was amended to consider neoadjuvant therapy as well as adjuvant chemotherapy.

Future considerations

A new strategic and business plan to guide the audit into the future is to be developed, prioritising coverage and data quality, as well as enhancing the audits relevance and benefits. Further considerations include the implementation of a formal outlier's process based on the current KPIs and possible additions to data collected, such as an oncoplastic module, patient-reported outcome measures, and data on pre-surgery MRI.

2. RECOMMENDATIONS

From observing the 2018 data, the following recommendations are made with the intention of improving the utility of the audit.

- Further review should be undertaken focused on validating the BQA's performance indicators, in particular the HQPIs which have recently been piloted.
- Improvements should be made to the data collection process to ensure 100% audit compliance and data coverage.

3. BACKGROUND

The BreastSurgANZ Quality Audit (BQA) is a quality assurance activity for members of the Breast Surgeons of Australia and New Zealand (BreastSurgANZ). It aims to monitor and improve the quality of care by surgeons for patients with early and locally advanced breast cancer in Australia and New Zealand.

Initiated as a pilot study in 1998 by the Breast Surgery Section of the Royal Australasian College of Surgeons (RACS), the audit has been running continuously since then, with BreastSurgANZ taking over its direction in 2010 (see Appendix 1 for further details on the history of the audit).

Participation is required by all members of BreastSurgANZ. Participants are encouraged to self-assess their clinical performance against set key performance indicators through the online interface, and to engage with the audit's data request program for more specific quality assurance or research projects (see Appendix 2 for more information on the processes of the audit and Appendix 3 for details on data fields collected).

4. PARTICIPATION IN 2018

A total of 18,850 episodes of breast cancer were submitted to the BQA in 2018: 10,675 episodes (57%) through the online portal, and 8,175 episodes (43%) via the upload program. The number of uploaded cases was higher than usual in 2018 as a backlog of submitted cases from institutions were uploaded. This backlog was the result of changes in the BQA dataset which required updates to the upload tool before uploads could occur.

At the end of 2018, there were 353 accounts for surgeons, 32 accounts for data managers, and a total of 219,659 episodes of breast cancer stored in the database.

For breast cancers diagnosed in 2018, there were 12,746 records. Participants are asked to have data submitted by 30 April the year following diagnosis. For 2018, 43% of episodes (5465 records) were submitted in 2018, with the remaining submitted in 2019.

Data was received from 247 hospitals in Australia and New Zealand (see participating hospitals list, Appendix 4).

Figure 1 shows the data submitted annually over the course of the audit. In 2018, there was a lag in data submission which has resulted in a lower number of episodes in the database for 2018. At the time of reporting, 82% of BreastSurgANZ members had submitted their cases for 2018. We anticipate that, as in previous years, the number of 2018 cases will continue to increase and this will be reflected in subsequent reports.

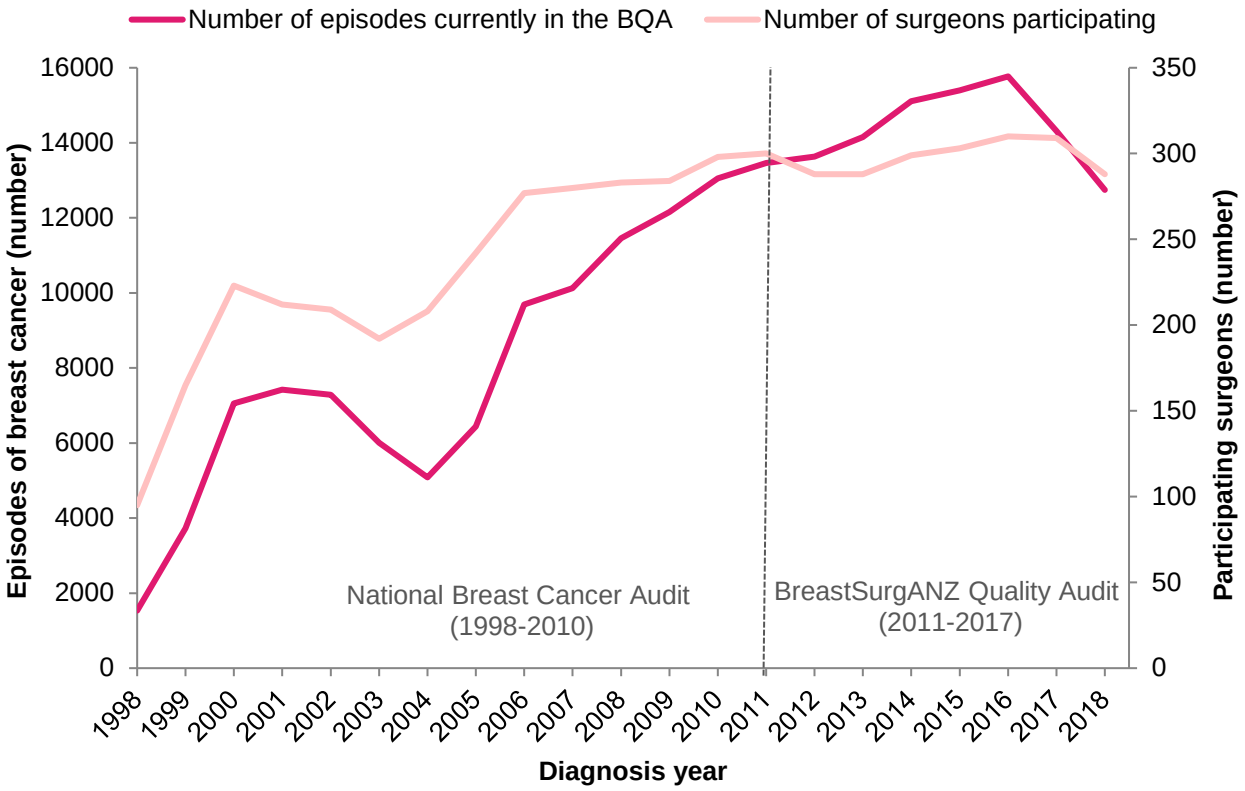

Figure 1: Annual BQA data submission (by diagnosis date)

5. SUMMARY OF 2018 DATA

The BQA contains 12,746 records for episodes of early or locally advanced breast cancer diagnosed in 2018. Section 5 shows a descriptive analysis of this data.

5.1. Patient characteristics

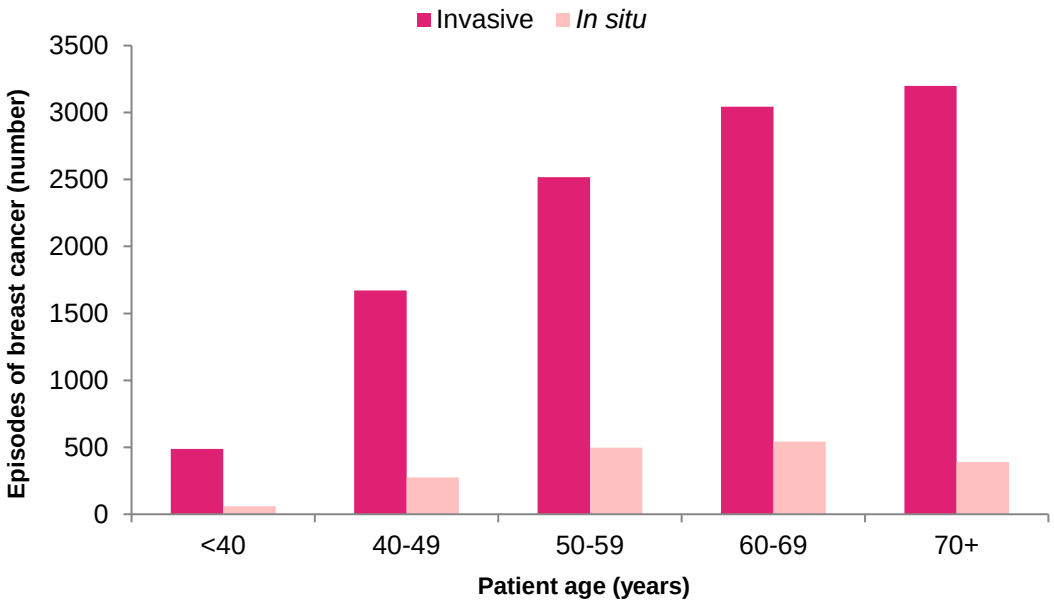

Figure 2: Patient age distribution of episodes diagnosed in 2018

Note: Excludes 65 episodes with missing information on invasive/*in situ*. Data provided in Appendix 5: Table 2.

In 2018, the incidence of patients diagnosed with invasive breast cancer increased with age (see Figure 2). A total of 57% of invasive episodes were for patients 60 years of age or older. In contrast, the incidence of *in situ* peaked in the age group 50-59 and 60-69 years, with a total of 59% of *in situ* episodes in this age bracket.

Male breast cancer was rare; accounting for only 1% of all breast cancer episodes diagnosed in 2018 (data not shown).

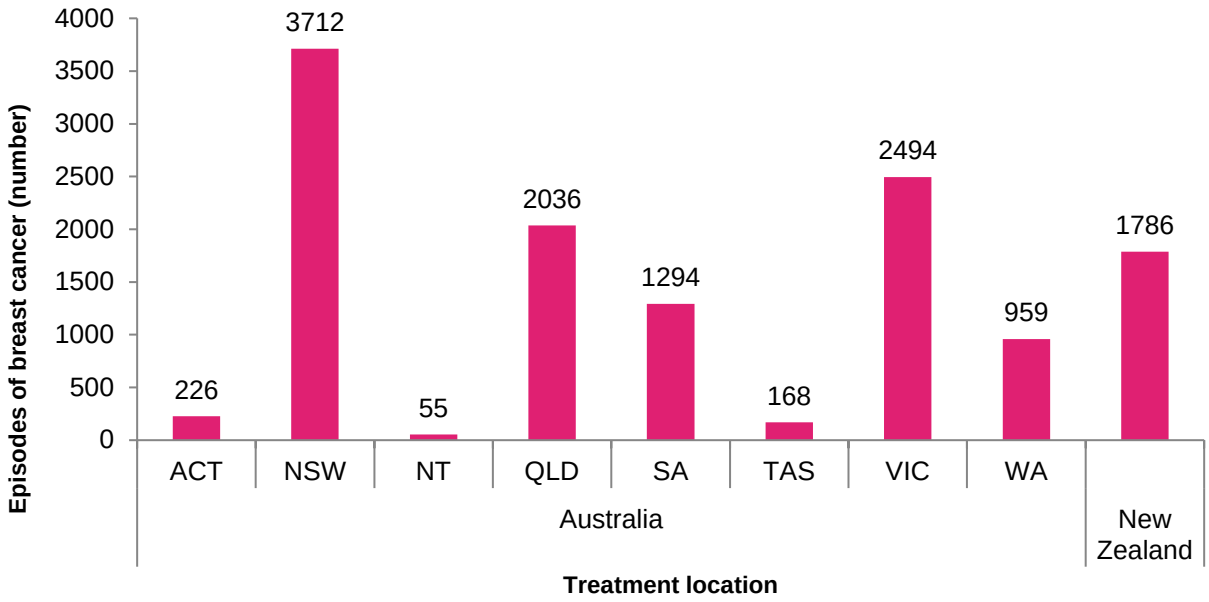

Figure 3: Treatment location of episodes diagnosed in 2018
Note: Excludes 16 episodes where treatment location is missing. Data provided in Appendix 5: Table 3.

Figure 3 shows that the largest submission of episodes were from New South Wales (29% of episodes) followed by Victoria (20% of episodes) and Queensland (16% of episodes), with the smallest submission from the Northern Territory (less than 1% of episodes) closely followed by Tasmania and the Australian Capital Territory (1% of episodes each). This is in line with the population of cancer episodes treated in these locations.

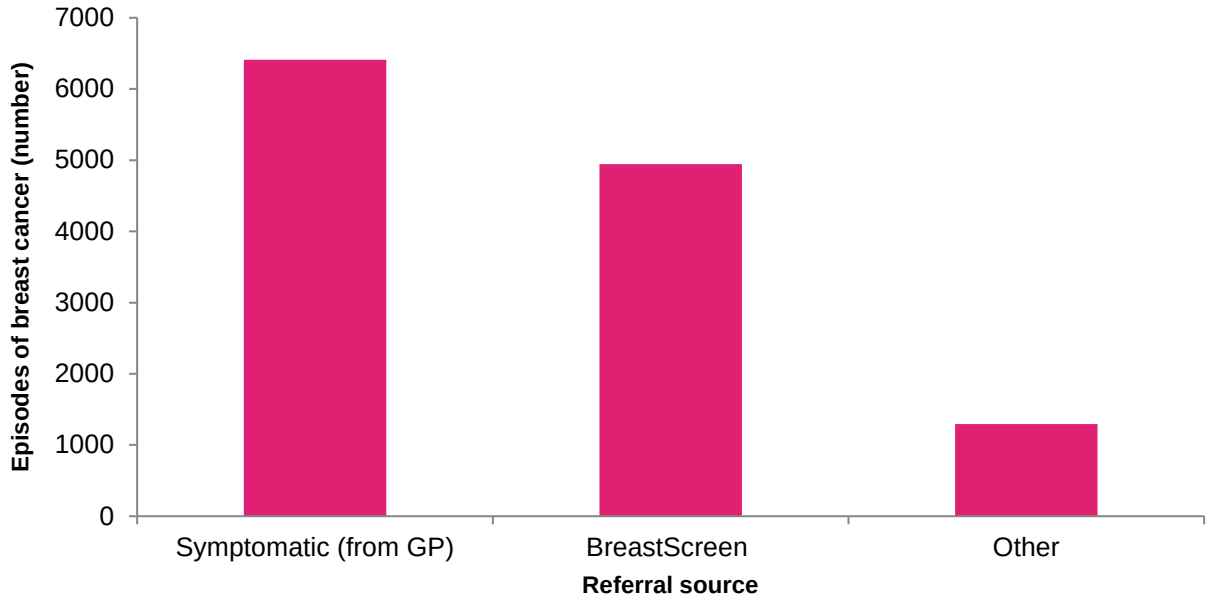

Figure 4: Referral source of episodes diagnosed in 2018
Note: Excludes 96 episodes where referral source is missing. Patients referred from 'Other' sources may include private screening programmes. Data provided in Appendix 5: Table 4.

In 2018, 51% of the cancers diagnosed were referred as symptomatic from a GP (Figure 4). A further 39% were referred from BreastScreen programs in Australia or New Zealand. The remaining 10% were referred from other sources, such as private screening programs.

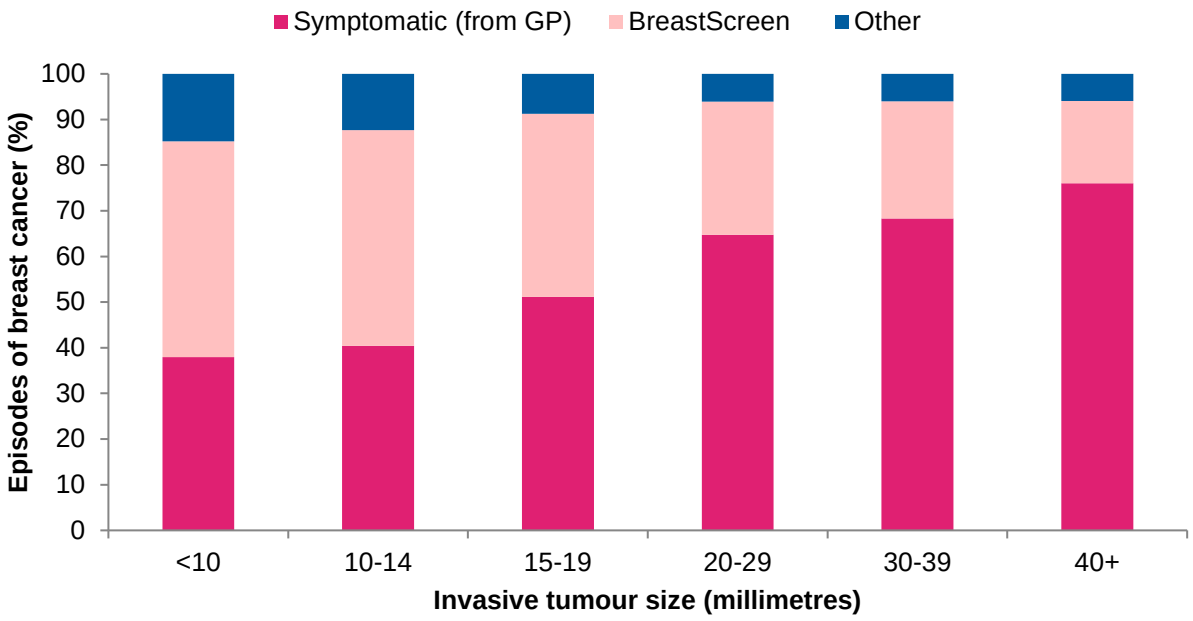

Figure 5: Referral source for invasive tumours, by tumour size for episodes diagnosed in 2018
Note: Excludes 70 episodes with missing information on referral source and 284 episodes where tumour size is missing. Patients referred from Other sources may include private screening programs. Data provided in Appendix 5: Table 5.

As shown in Figure 5, BreastScreen referral was most common for smaller tumours (<10mm and 10-14mm were both 47%) and least common for large tumours of at least 40mm (18%). For larger invasive tumours, patients were more likely referred as symptomatic from a GP (Figure 5).

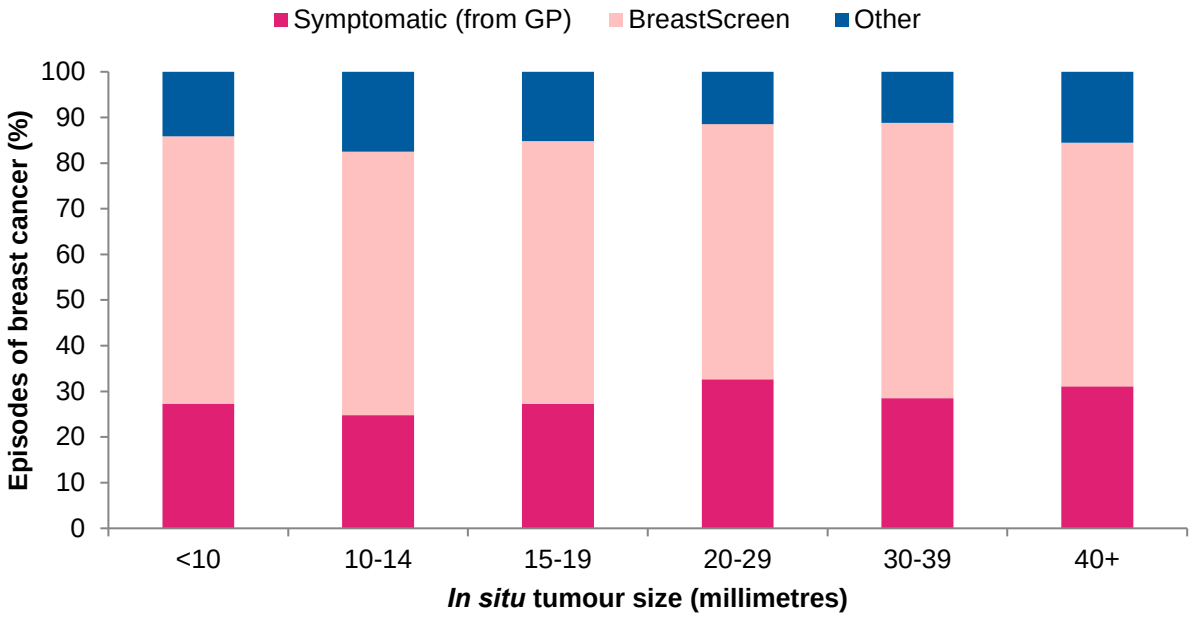

Figure 6: Referral source for *in situ* tumours, by tumour size for episodes diagnosed in 2018
Note: Excludes 10 episodes with missing information on referral source and 47 episodes where tumour size is missing. Patients referred from "Other" sources may include private screening programs. Data provided in Appendix 5: Table 6.

Figure 6 shows that *in situ* tumours (regardless of size) were most commonly referred from BreastScreen.

5.2. Surgical treatment

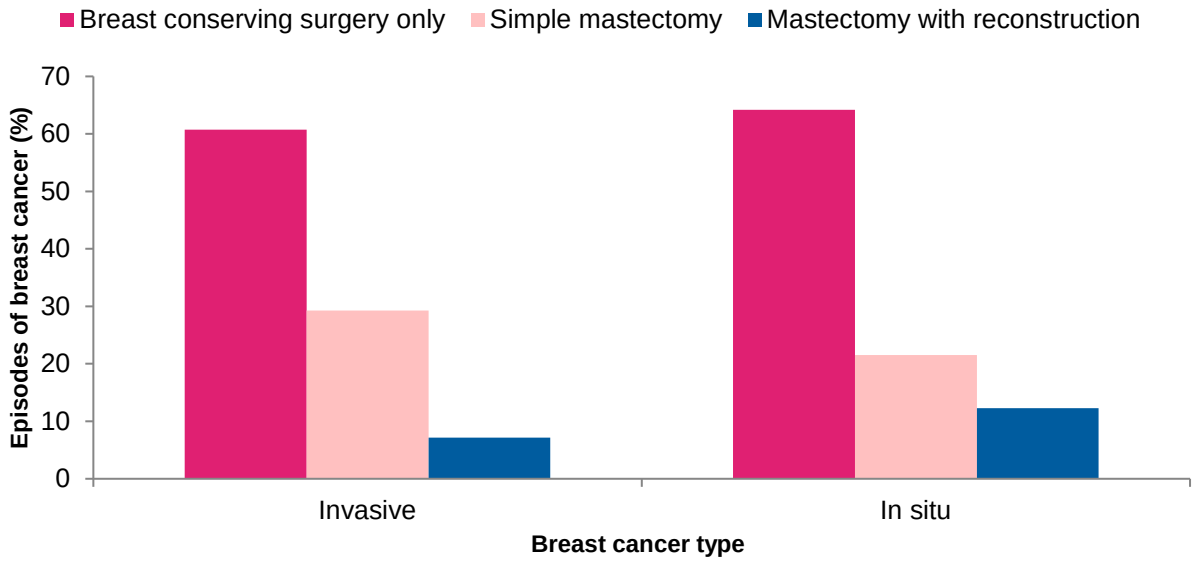

Figure 7: Final surgery for episodes diagnosed in 2018

Note: 'Breast conserving Surgery' consists of the BQA data items 'Complete local excision', "Re-excision', 'Open Biopsy' and 'ABBI'. If patients were treated with both breast conserving surgery and mastectomy, they have been categorised as mastectomy.

Excludes 65 episodes with missing information on invasive/*in situ* and 237 episodes where surgery information is missing. 'Other Surgery' and 'No Surgery' is not shown due to very small numbers. Data provided in Appendix 5: Table 7.

Figure 7 shows that most patients treated for invasive or *in situ* breast cancer received 'breast conserving surgery only'.

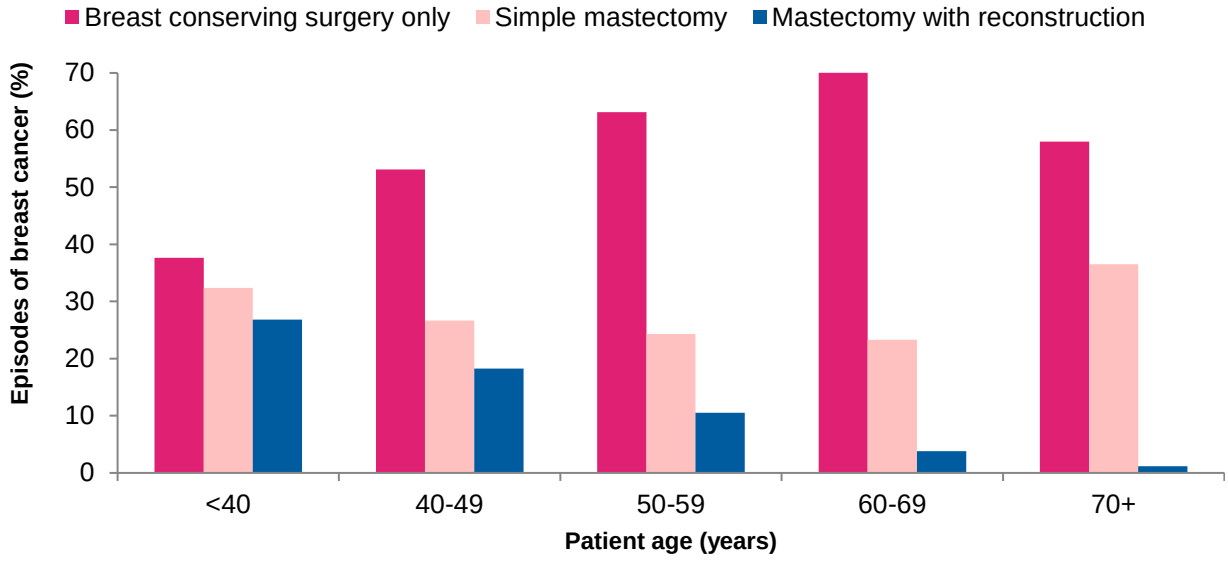

Figure 8: Final surgery, by patient age, for episodes diagnosed in 2018

Note: Excludes 290 episodes with missing information on surgery. 'Other Surgery' and 'No Surgery' not shown due to very small numbers. Mastectomy totals also include patients that underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5: Table 8.

'Breast conserving surgery only' was most common in patients aged 60 to 69 years (71%) and least common in patients under 40 years (38%), as shown in Figure 8. 'Mastectomy, with reconstruction' was most common among patients under 40 years (27%) and least common in those aged 70 years or more (1%).

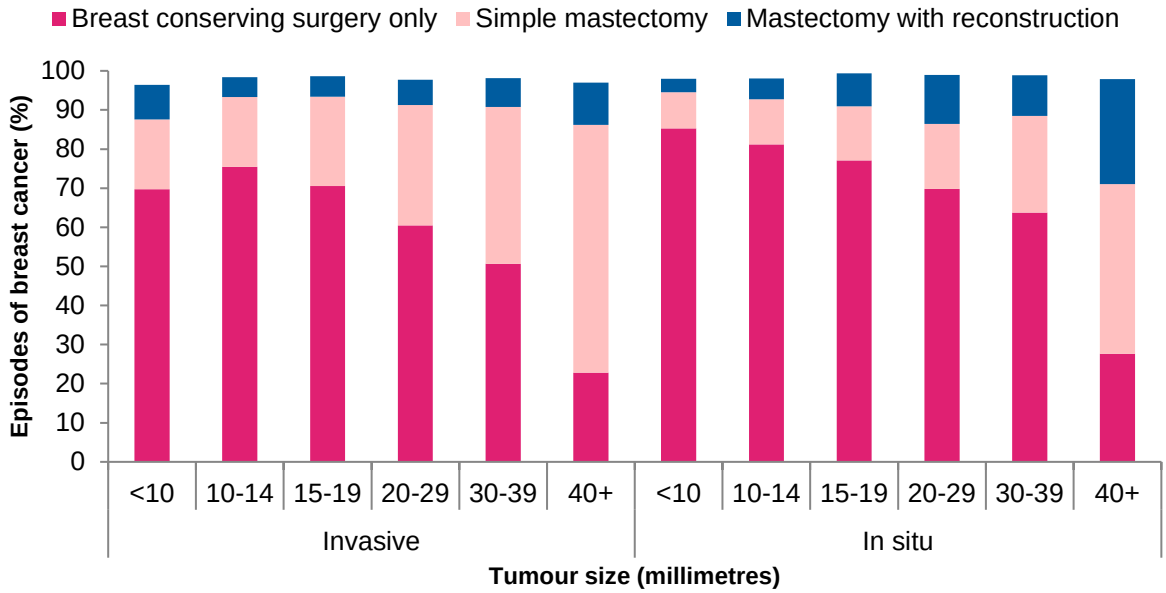

Figure 9: Final surgery, by tumour size for episodes diagnosed in 2018

Note: Excludes 237 episodes with missing information on surgery and 131 episodes with missing tumour size. 'Other Surgery' and 'No Surgery' not shown due to very small numbers. Mastectomy totals also include patients that underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5: Table 9.

The incidence of receiving 'breast conserving surgery only' decreased as tumour size increased for both invasive and *in situ* tumours. The incidence of 'simple mastectomy' rose with increased tumour size for both invasive and *in situ* tumours (Figure 9).

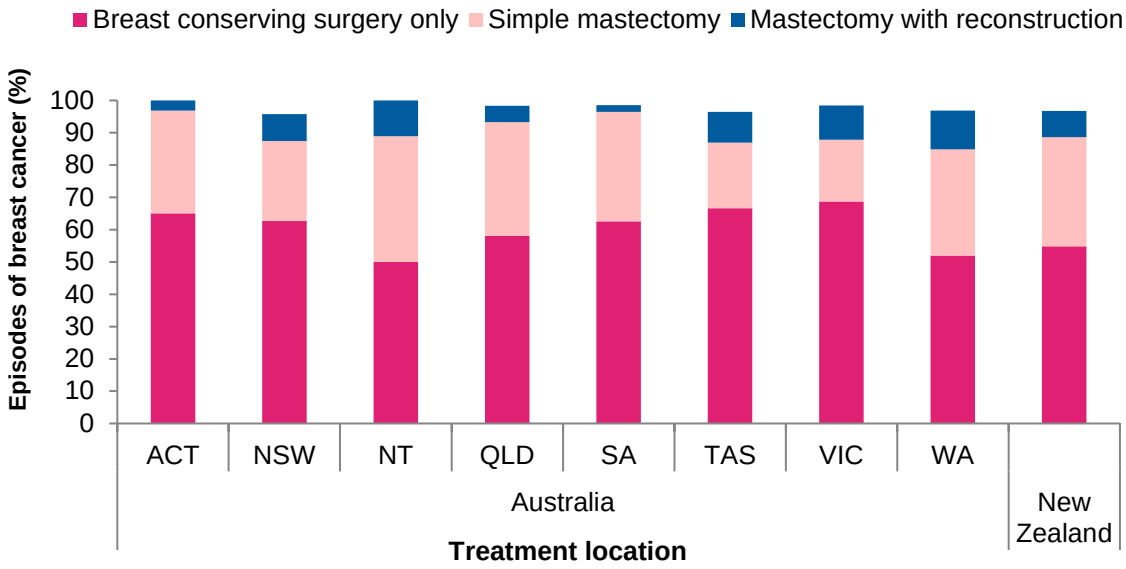

Figure 10: Final surgery, by treatment location for episodes diagnosed in 2018

Note: Excludes 290 episodes with missing information on surgery and 16 episodes with missing location. 'Other Surgery' and 'No Surgery' not shown due to very small numbers. Mastectomy totals also include patients that underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5: Table 10.

Figure 10 shows 'breast conserving surgery only' is most common in Victoria (69%) and least common in Northern Territory (50%). Simple mastectomies are most common in the Northern Territory (39%) and least common in Victoria (19%). Mastectomy with reconstruction is most common in Western Australia (12%) and least common in South Australia (2%).

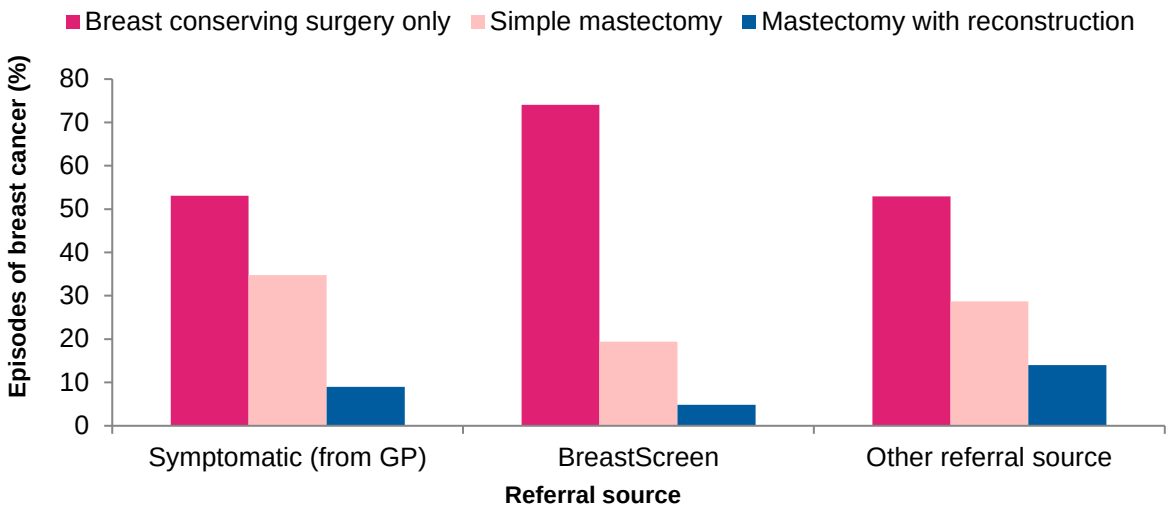

Figure 11: Final surgery, by referral source for episodes diagnosed in 2018

Note: Excludes 290 episodes with missing information on surgery and 68 episodes with missing referral source. 'Other Surgery' and 'No Surgery' not shown due to very small numbers. Patients referred from Other sources may include private screening programmes. Mastectomy totals also include patients that underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5: Table 11.

'Breast conserving surgery only' treatment was more common for patients referred by BreastScreen (74%) than symptomatic patients from GP (53%) (Figure 11).

5.3. Further surgical treatment after breast conserving surgery

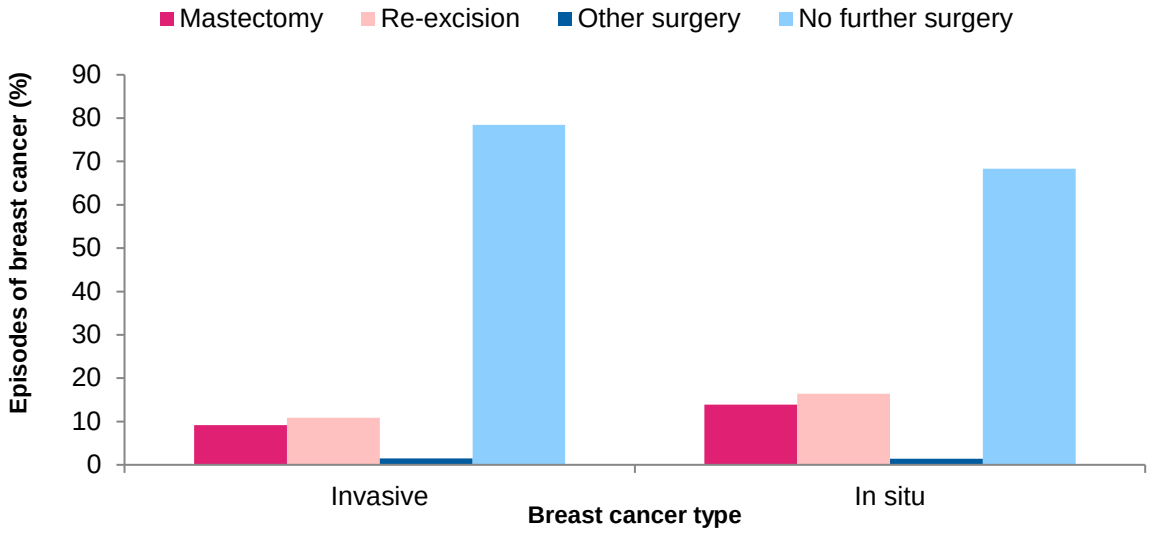

Figure 12: Surgery after breast conserving surgery for episodes diagnosed in 2018

Note: Excludes 6 breast conserving surgery episodes with missing information on invasive/*In situ*.

As surgeries often occur on the same day, for this report, further surgery is defined by intrusiveness e.g. a patient who had re-excision and a complete mastectomy would be counted under mastectomy.

Data provided in Appendix 5: Table 12.

As shown in Figure 12, 78% of invasive cancer treated with breast conserving surgery received no further surgery, compared with 68% of *in situ* tumours. The most common further surgery was re-excision (11% of invasive and 16% of *in situ*), followed by mastectomy (9% of invasive and 14% *of in situ*).

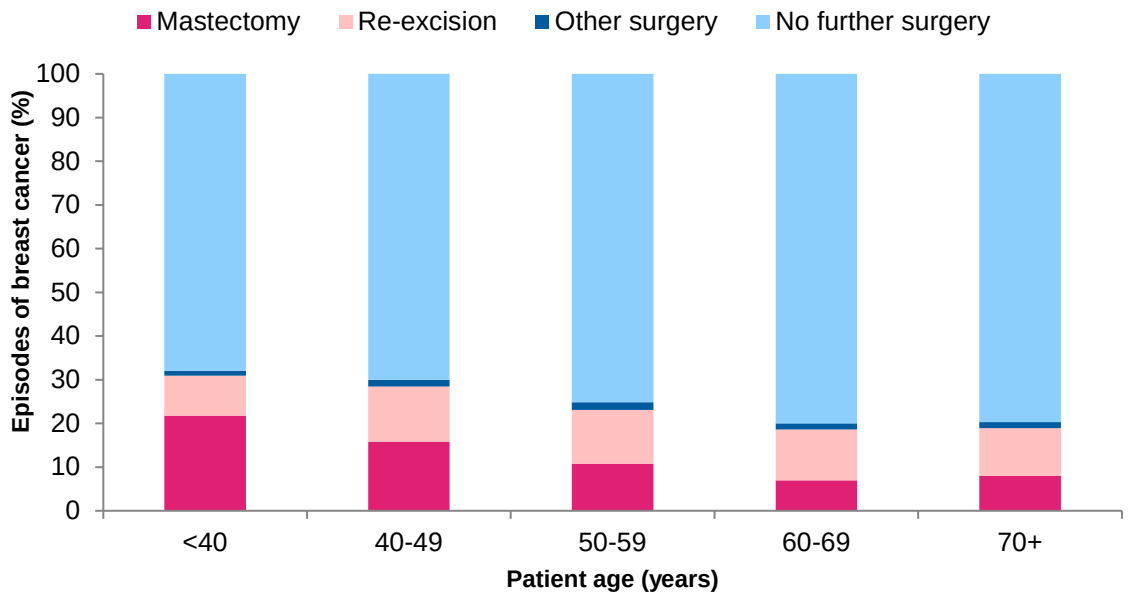

Figure 13: Surgery after breast conserving surgery, by patient age, for episodes diagnosed in 2018
Note: No missing data. As surgeries often occur on the same day, for this report, further surgery is defined by intrusiveness e.g. a patient who had re-excision and a mastectomy would be counted under mastectomy. Data provided in Appendix 5: Table 13.

Figure 13 shows the proportion of episodes of breast conserving surgery that did not receive further surgery increased with patient age (68% of those under 40 years of age to 80% of those 70 years or older). Receiving re-excision after breast conserving surgery was similar across age groups. Patients aged under 40 years had the highest proportion of mastectomies after breast conserving surgery (22%).

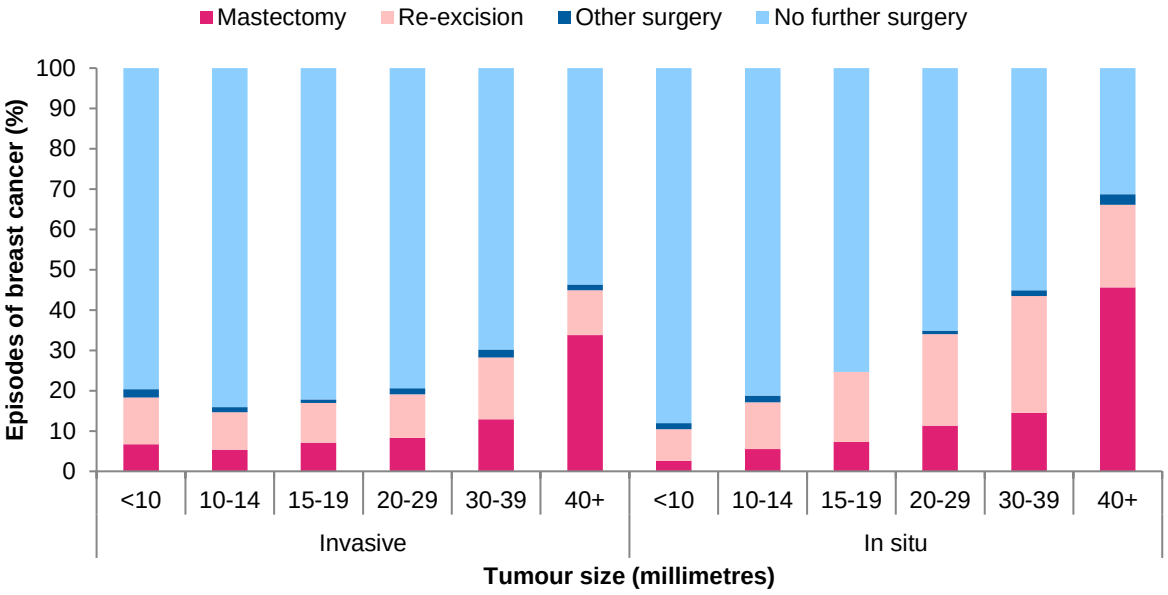

Figure 14: Surgery after breast conserving surgery, by tumour size, for episodes diagnosed in 2018
Note: Excludes 48 breast conserving surgery episodes with missing information on tumour size. As surgeries often occur on the same day, for this report, further surgery is defined by intrusiveness e.g. a patient who had re-excision and a mastectomy would be counted under mastectomy. Data provided in Appendix 5: Table 14.

The incidence of both mastectomy and re-excision increased with *in situ* tumour size, as shown in Figure 14. Mastectomy incidence increased with invasive tumour size over 40mm, but the incidence of re-excision remained similar across tumour sizes.

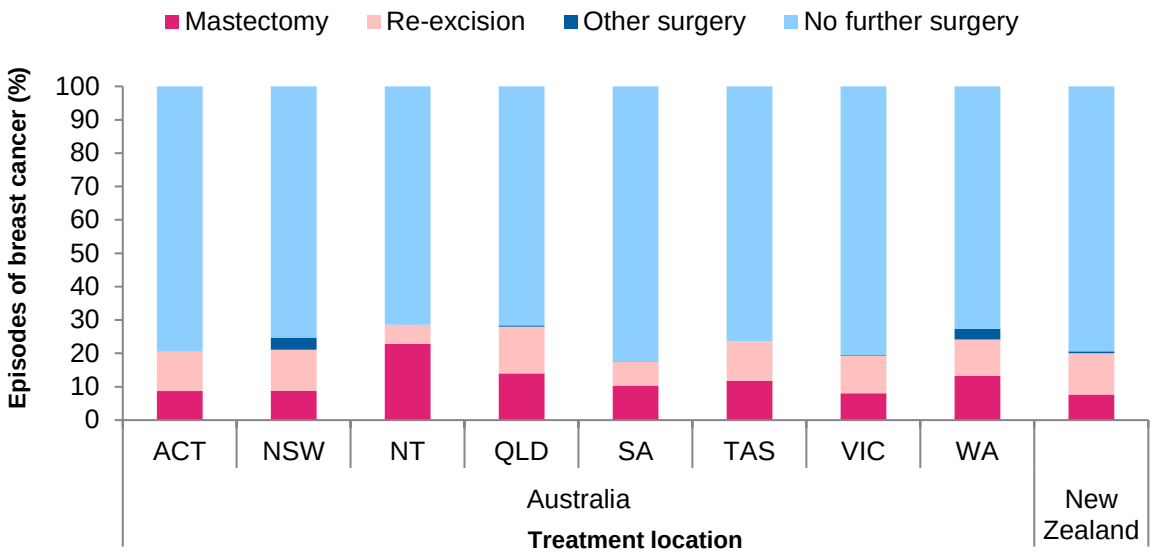

Figure 15: Surgery after breast conserving surgery, by treatment location for episodes diagnosed in 2018

Note: Excludes 6 breast conserving surgery episodes with missing information on region. As surgeries often occur on the same day, for this report, further surgery is defined by intrusiveness e.g. a patient who had re-excision and a mastectomy would be counted under mastectomy. Data provided in Appendix 5: Table 15.

Figure 15 shows that surgery after breast conserving surgery was most common in Northern Territory (29%) and least common in South Australia (17%). Mastectomy after breast conserving surgery was most common in Northern Territory (23%) and least common in Victoria and New Zealand (both 8%). Re-excision was most common in Queensland (14%) and least common in Northern Territory (6%).

5.4. Axillary surgery

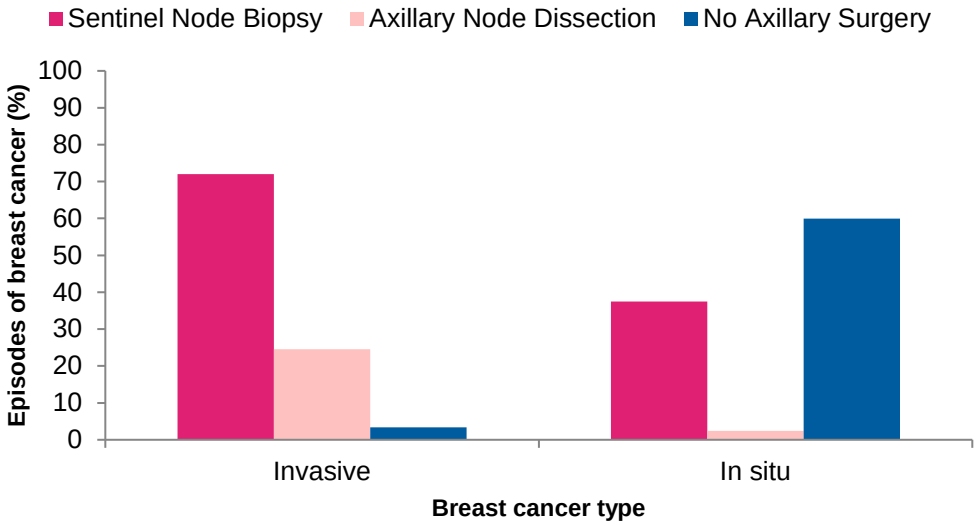

Figure 16: Axillary surgery by cancer type for episodes diagnosed in 2018

Note: Excludes 485 episodes with missing information on axillary surgery and 11 episodes with missing information on invasive/*in situ*. Data provided in Appendix 5: Table 16.

The majority of invasive tumours have some form of axillary surgery (97%), compared with 40% of *in situ* tumours as above (Figure 16). Most commonly, patients will have sentinel node biopsy only (72% of invasive and 38% of *in situ).*

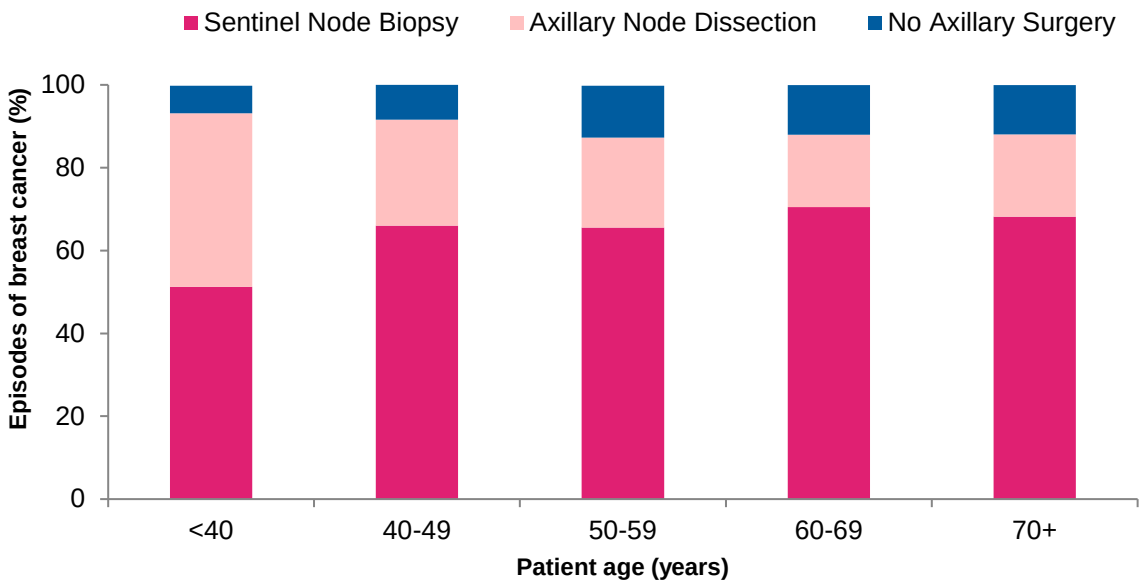

Figure 17: Axillary surgery, by patient age for episodes diagnosed in 2018
Note: Excludes 485 episodes with missing information on axillary surgery. 'Unknown level of axillary surgery' is not shown due to very small numbers. Data provided in Appendix 5: Table 17.

Figure 17 shows that axillary node dissection was most common among patients under 40 years of age (42%), and sentinel node biopsy was most common among those aged 60-69 years (71%).

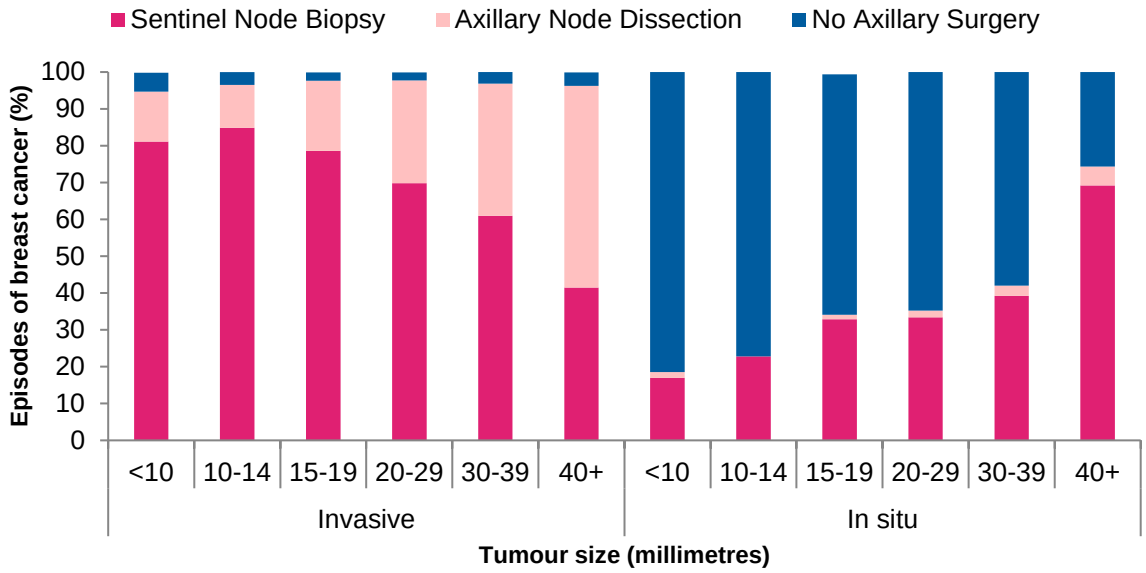

Figure 18: Axillary surgery, by tumour size for episodes diagnosed in 2018
Note: Excludes 431 episodes with missing information on axillary surgery and 73 episodes with missing tumour size. 'Unknown level of axillary surgery' is not shown due to very small numbers. Data provided in Appendix 5: Table 18.

As shown in Figure 18, small invasive tumours are most likely to only have sentinel node biopsy (83% of tumours <15mm). Axillary node dissection becomes more common as the tumour size increases (from 14% of tumours <10mm to 55% of tumours ≥40mm).

Small *in situ* tumours are most likely not to have any axillary surgery (80% of tumours <15mm). As the tumour becomes larger, the likelihood of sentinel node biopsy increases (from 17% of tumours <10mm to 69% of tumours ≥40mm). Axillary node dissection is rare for *in situ* tumours.

5.5. Key Performance Indicators

The audit is currently a self-reflective tool, with each surgeon having access to real-time results of their own performance against the KPI thresholds through the audit portal.

The current KPIs and thresholds are:

No.	Key Performance Indicator	Quality threshold
1	Percentage of invasive cases undergoing breast conserving surgery referred for radiotherapy	85%
2	Percentage of oestrogen positive invasive cases referred for hormonal therapy	85%
3	Percentage of invasive cases undergoing axillary surgery	90%
4	Percentage of *in situ* cases undergoing breast surgery without axillary clearance	90%
5	Percentage of high-risk invasive cases undergoing mastectomy referred for radiotherapy	85%
6	Percentage of high-risk cases referred for chemotherapy	90%

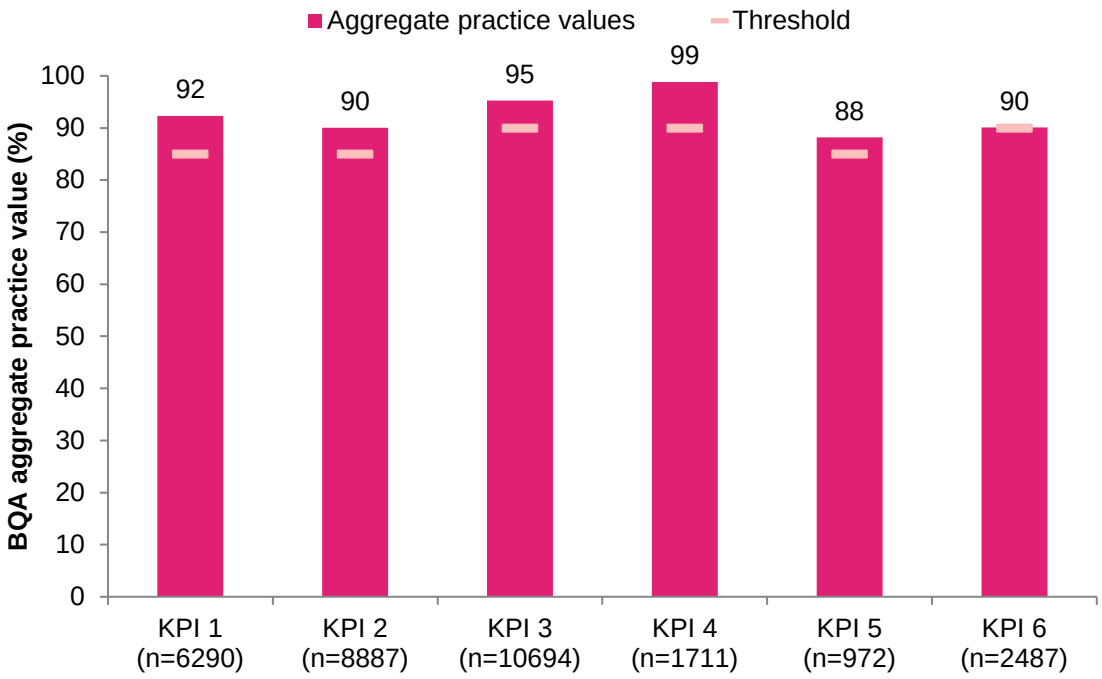

Figure 19: Key Performance Indicators - overall compliance for episodes diagnosed in 2018

Note: Excluded case counts are 358 for KPI 1, 550 for KPI 2, 287 for KPI 3, 102 for KPI 4, 305 for KPI 5, and 295 for KPI 6. KPI 6 was amended in 2019 to consider neoadjuvant chemotherapy. The above reflects the amended calculation. Data provided in Appendix 5: Table 19.

KPI 1: Percentage of invasive cases undergoing breast conserving surgery referred for radiotherapy. KPI 2: Percentage of oestrogen positive invasive cases referred for hormonal therapy. KPI 3: Percentage of invasive cases undergoing axillary surgery. KPI 4: Percentage of *in situ* cases undergoing breast surgery without axillary clearance. KPI 5: Percentage of high-risk invasive cases undergoing mastectomy referred for radiotherapy. KPI 6: Percentage of high-risk cases referred for chemotherapy.

Figure 19 shows the combined performance for all surgeons in Australia and New Zealand, for cases with diagnosis dates in 2018. Surgeons in Australia and New Zealand are meeting BQA Key Performance Indicators for all KPIs.

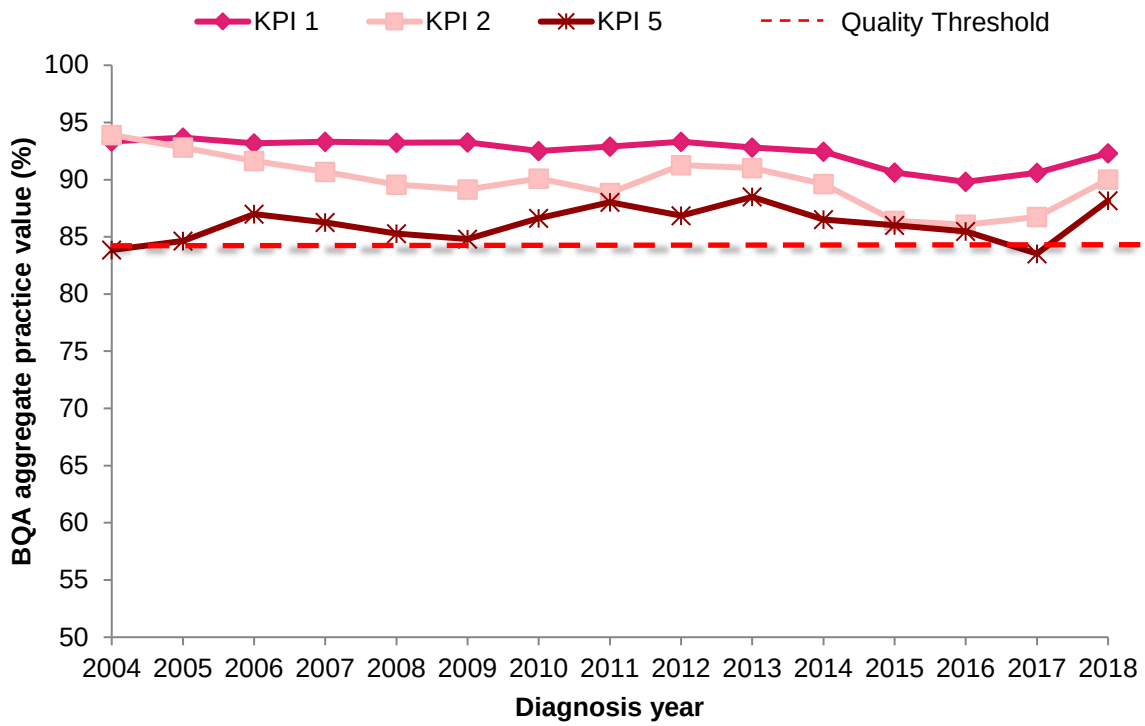

Figure 20: Key Performance Indicators with quality threshold at 85% - Overall compliance by year

Note: Data provided in Appendix 5: Table 20.

Aggregate practice value is the combined data of all surgeons contributing data to the BQA for that year.

KPI 1: Percentage of invasive cases undergoing breast conserving surgery referred for radiotherapy. KPI 2: Percentage of oestrogen positive invasive cases referred for hormonal therapy. KPI 5: Percentage of high-risk invasive cases undergoing mastectomy referred for radiotherapy. KPI 5 was added in 2010.

Figure 20 gives performance over time for KPIs with a quality threshold of 85% (KPI 1, 2 and 5).

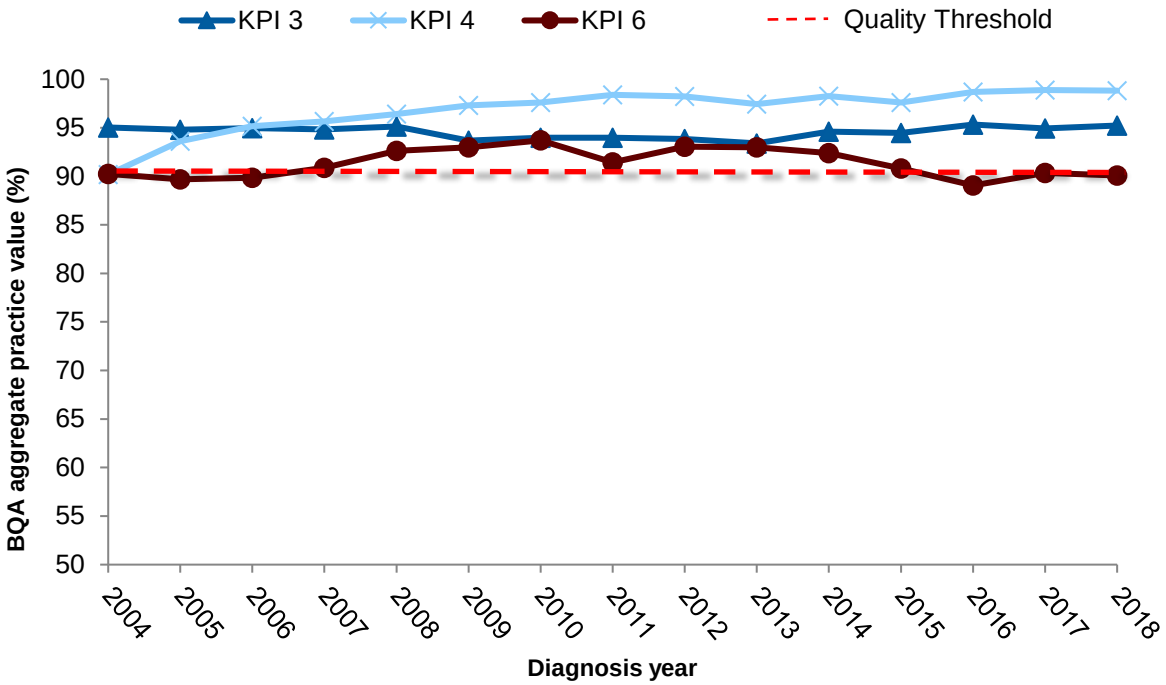

Figure 21: Key Performance Indicators with quality threshold at 90% - Overall compliance by year

Note: KPI 6 was amended in 2019 to consider neoadjuvant chemotherapy. The above is based on the new calculation. Data provided in Appendix 5: Table 21.

Aggregate practice value is the combined data of all surgeons contributing data to the BQA for that year.

KPI 3: Percentage of invasive cases undergoing axillary surgery. KPI 4: Percentage of *in situ* cases undergoing breast surgery without axillary clearance. KPI 6: Percentage of high-risk cases referred for chemotherapy.

KPI 6 was added in late 2016.

Figure 21 gives performance over time for KPIs with a quality threshold of 90% (KPI 3, 4 and 6). An issue was flagged with performance on KPI 6 in the 2017 Annual Report. The KPI calculation has since been adjusted to consider neoadjuvant chemotherapy, in addition to adjuvant chemotherapy. The adjusted performance calculations shown in Figure 21 confirms that when chemotherapy treatment is defined as either adjuvant or neoadjuvant chemotherapy, there is no longer an issue with surgeon performance.

6. RECENT AUDIT ACTIVITIES

6.1. High Quality Performance Indicators

The six High Quality Performance Indicators (HQPIs), as introduced in late 2017:

No.	High Quality Performance Indicator	Proposed threshold
1	Rate of immediate breast reconstruction for *in situ* breast cancer patients requiring mastectomy	40%
2	Rate of immediate breast reconstruction for invasive breast cancer patients requiring mastectomy	20%
3	Rate of breast conservation for tumour< 2cm	70%
4	Rate of involvement of a breast care nurse in management of the patient	90%
5	Rate of discussion of patients at a multidisciplinary meeting	90%
6	Rate of use of neo-adjuvant chemotherapy in women < 50 years	15%

The end of 2018 marked twelve months of data collection on the HQPIs. As planned, the BQA Subcommittee met to review this data and discuss quality thresholds.

Data showed low levels of achievement by BreastSurgANZ members, even at the modest proposed threshold levels show in the above table, with high volume surgeons more likely to comply.

Results of the data collection were publicly reported in The Breast (Salindera S, Ogilvy M, Spillane A. What are the appropriate thresholds for High Quality Performance Indicators for breast surgery in Australia and New Zealand? Breast. 2020 Jan 30;51:94-101. doi: 10.1016/j.breast.2020.01.007).

Future work for the audit:

- Consideration for the official setting of HQPI thresholds by BQA Subcommittee and rollout to participants
- Repeating the data analysis to track adherence to the new thresholds over time.

Possible actions for BreastSurgANZ to improve compliance:

- Broad education on patient benefits in meeting the HQPIs
- Training more oncoplastic surgeons
- Lobbying health services to provide the resources required to meet the thresholds.

6.2. Recent Updates to BQA portal

The BQA upload tool was updated in 2018 to address changes made to the database with the new online portal. This meant that uploads could resume. The backlog of data was uploaded, and the audit is back on track in 2019.

A further update to the portal in 2019 amended KPI 6 (Percentage of high-risk cases referred for chemotherapy) to take into account neoadjuvant chemotherapy. Previously, this indicator was only passed if the relevant patient received adjuvant chemotherapy. Due to changes in practice, and feedback from users, the original KPI was no longer reflecting good practice.

7. FUTURE CONSIDERATIONS

7.1. Strategic direction

A strategic and business plan will be developed to guide the audit into the future, prioritising coverage and data quality, and enhancing the audit's relevance and benefits. This planning includes the BQA Subcommittee investigating the necessary steps to move the audit to a full clinical quality registry. Although still in the early stages, many innovative suggestions have been provided from a range of stakeholders which are currently being investigated.

7.2. Full implementation of an outlier's process

An outlier's process will involve peer-review of practice results for individual surgeons against each current KPI. The details of this process are complex and still being finalised by the BQA Subcommittee and the BreastSurgANZ Council. Information about this process and rollout will be disseminated to all members once approved.

7.3. Addition of an oncoplastic dataset

The BQA Subcommittee is currently considering the technical possibilities, benefits and cost of incorporating an oncoplastic dataset into the audit.

7.4. Patient-reported outcome measures

Patient-reported outcome measures (PROMs) are patient assessments of how health services and interventions have affected their quality of life, daily functioning, symptom severity, and general health. BreastSurgANZ is collaborating with the University of South Australia on a pilot of this process for BQA patients in South Australia. This pilot will be run separate from the BQA database and daily activities, and will not involve audit staff or data.

7.5. Collecting data on pre-surgery MRI

University of Western Australia have approached the BQA Subcommittee with a request for the audit to collect data on MRI. The Subcommittee are considering the request but remain cautious about increasing the burden of data collection. An elegant solution for capturing the required data must be derived for this collection to be approved.

APPENDIX 1: AUDIT ESTABLISHMENT

This section outlines a brief history of the audit, to provide background and context.

Rationale

In 1995, the House of Representatives Standing Committee on Community Affairs recommended that the RACS establish a compulsory form of accreditation and audit process for surgeons performing breast cancer surgery. The audit was conceived in response to this recommendation.

The National Breast Cancer Audit

The audit began in 1998 as a one-year pilot in South Australia and Tasmania. It was instigated by RACS through its Breast Section and in collaboration with the National Breast Cancer Centre (now Cancer Australia). The pilot was successful so in 1999, the National Breast Cancer Audit (as it was originally named) was implemented throughout Australia and New Zealand.

The audit's original purpose was to provide a benchmarking tool for the RACS Breast Section members to self-audit their practice against key performance indicators. Initially however, the data only allowed surgeons to compare their own practice profile with the aggregated profile of their Australasian peers.

Key Performance Indicators

In 2003, the audit developed Key Performance Indicators (KPIs) based on published best practice standards and set quality threshold values (see Appendix 2 for more details on the current indicators).

Originally launched as a stand-alone database where participants sent in their data to be entered by audit staff, the audit went online in 2004, which provided a portal for participants to enter their data directly.

The BreastSurgANZ Quality Audit

In 2010, the Breast Surgeons of Australia and New Zealand (BreastSurgANZ) was established, as a specialty society for surgeons treating breast cancer. One of the key purposes of the society was to provide quality assurance of its members through the audit. In late 2010, the society assumed ownership of the audit. The audit was subsequently renamed BreastSurgANZ Quality Audit in 2014.

The current role of the audit continues to be the ability for participants to self-audit their practice through review of their performance against the KPIs. The BQA Online Portal includes real-time online assessment against the KPIs.

Steps have been made towards establishing a full Clinical Audit Cycle that includes assessing for outliers, i.e. those with low compliance of the quality thresholds.

APPENDIX 2: AUDIT PROCESS

This section describes how the audit operates.

Audit operation

The audit is operated by RACS under contract with the Breast Surgeons of Australia and New Zealand ("BreastSurgANZ"). Staff employed by RACS operate the audit under direction from BreastSurgANZ. The BreastSurgANZ Quality Audit Subcommittee acts as an advisory Committee which recommends and reports to the BreastSurgANZ Council.

Patient enrolment

Patients who meet the eligibility criteria are enrolled by the surgeon responsible for their care and data entered as close to the point of care as feasible.

The audit collects patient treatment data under Opt-Out Consent. A patient information form is available from the audit website at www.surgeons.org/bqa for participants to provide to their patients.

Data collected

Data is recorded against the audit account of the Responsible Surgeon, defined as the surgeon responsible for the patient's care pathway (and hence able to influence whether the KPIs are met). In the event the surgery is performed wholly or entirely by another surgeon (for instance a surgical trainee is the Primary Surgeon in theatre), the audit record remains under the name of the surgeon ultimately responsible for the patient's care (the Responsible Surgeon).

The audit has an account for each BreastSurgANZ member. Each surgeon is given their own individual surgeon accounts and data is recorded against this account, rather than at the patient level (i.e. the audit reports on how an individual surgeon treats their patients, rather than how an individual patient is treated across multiple surgeons). Each surgeon can only see their own data.

Each patient who meets the eligibility criteria has a single record under the surgeon's account. The audit can record multiple surgeries per episode (bilateral lesions) and multiple episodes (recurrences) per patient.

The BQA collects data on early and locally advanced breast cancer. It uses the definition of early breast cancer as stated in the NHMRC *Clinical Practice Guidelines for the Management of Early Breast Cancer:* tumours of not more than 5 cm in diameter with either impalpable or palpable but not fixed lymph nodes and with no evidence of distant metastases. This definition corresponds to tumours that are T 1-2, N 0-1, and M0 as currently defined by the Union for International Cancer Control (UICC).

Data is collected on patient demographics, cancer diagnosis, tumour pathology, surgical procedure, adjuvant and neoadjuvant therapies, and patient refusal of recommended treatment.

Datasets

Audit participants must complete the Minimum Dataset, which includes all datapoints necessary for threshold calculations on Key Performance Indicators. Optionally, all or some of the fields in the Full Dataset may be completed. This dataset contains more detailed datapoints, including Follow-up. The optional fields are completed at the discretion of the surgeon. See Appendix 3 for copies of each dataset.

A Data Dictionary is published on the audit website. It was originally created to conform to recommendations made by the National Breast Cancer Centre (now Cancer Australia), the College of Pathologists and Department of Health for minimum data requirements in breast cancer and has been updated over time as changes to the dataset are made.

Data submission

Data submission to the BQA is a requirement of membership in BreastSurgANZ. Participants are expected to have all cases submitted by April 30 of the year following diagnosis. Full Members of BreastSurgANZ are required to submit at least 10 cases of breast cancer per year to qualify for that membership category.

Data should be entered as close to the delivery of care as is feasible. The Minimum Dataset records the pathway from diagnosis to adjuvant therapy.

Data is submitted either via the online portal directly by participants, or via the upload program. The upload program allows institutions (i.e. registries, hospitals, audits) with a large case volume and sufficient commonality of fields to have their data uploaded into the system, rather than having to re-enter data manually.

While all data must be submitted by the end of April for cases diagnosed in the previous calendar year, there is typically a time lag for data submitted via the upload program due to the additional steps needed to extract, transform and upload the data, and the need to work with the timelines other hospitals and audits have for the finalisation of their cases.

Participants can log into the online portal to:

- Enter data
- View or add to existing data already entered
- Check their compliance with the Key Performance Indicators
- Check their compliance with the High Quality Performance Indicators
- Check how many episodes they have entered
- Export their data as an Excel file
- See a list of their incomplete cases, and export these cases into Excel
- Select which hospitals they operate at, which will appear in their ‘hospital’ drop-down list in the case entry form.

Data manager access was introduced in 2017. A data manager account can be created where there is signed permission from the surgeon concerned. This allows the data manager to access and enter records for the surgeon at the hospitals indicated on the signed data manager access application form (available from the audit website). Their access:

- Allows data entry, editing, as well as an ability to see a list of incomplete cases and export those cases to Excel.
- Provides a table summarising total annual episodes for each surgeon they enter data for (total episodes against each hospital the data manager has access to for that surgeon, not total entered by the data manager).
- Does not allow access to surgeon performance against the KPIs or HQPIs. This report is only available to the surgeon concerned, under their own login.
- Does not allow export of all data for a surgeon (only incomplete cases to check data entry).

Use of the database and the self-audit facility in the data portal is also available to non-member surgeons at a fee-per-case basis. This allows for wider data collection in the audit without providing the full range of member benefits to non-members (namely, they will be excluded from any quality assurance performance outliers process conducted by BreastSurgANZ).

Assessment

Participants can self-assess against six Key Performance Indicators (KPI), with quality thresholds set by the BQA Subcommittee. These indicators and thresholds have been produced according to evidence-based guidelines for care of early breast cancer patients, as well as expert advice.

The National Health and Medical Research Council (NHMRC) *Clinical Management Guidelines* were used as a basis to develop the original KPIs in 2003. The KPIs are also in line with recommendations in the New Zealand Guidelines Group *Management of Early Breast Cancer: Evidence-based Best Practice Guideline* which was released in 2009.

The current KPIs are:

No.	Key Performance Indicator	Quality threshold
1	Percentage of invasive cases undergoing breast conserving surgery referred for radiotherapy	85%
2	Percentage of oestrogen positive invasive cases referred for hormonal therapy	85%
3	Percentage of invasive cases undergoing axillary surgery	90%
4	Percentage of *in situ* cases undergoing breast surgery without axillary clearance	90%
5	Percentage of high-risk invasive cases undergoing mastectomy referred for radiotherapy	85%
6	Percentage of high-risk cases referred for chemotherapy	90%

In the KPIs, 'high risk' is defined as:

KPI 5: Invasive tumours of at least 50mm or with at least 4 positive lymph nodes.

KPI 6: Invasive tumours that fall into any of the following categories:

- Age less than 55 years AND Grade more than 1 AND Tumour size more than 2cm
- Age less than 55 years AND Grade more than 1 AND Tumour size not more than 2cm AND Nodes involved
- Age not more than 70 years AND Tumour Her2 Positive AND Tumour size more than 5mm
- Age not more than 70 years AND Receptors Triple Negative AND Tumour size more than 5mm.

The online portal provides real-time calculations of surgeon performance against the indicators. For more detailed analysis of data, participants can export their data to Excel, or can contact the audit helpdesk for assistance.

Data protection and privacy

The data collected for the BQA is protected under federal law in both Australia and New Zealand as a declared quality assurance activity. This means that data which becomes available because of the audit activity cannot be disclosed (in reports or publications) outside of that activity in a manner that identifies a patient or surgeon. The confidentiality of the information received is protected accordingly and high-level data security procedures are maintained.

The audit works under opt-out consent for patients. All patients need to be informed of the audit prior to having their data entered, giving them the opportunity to opt-out of having their medical information recorded. A patient information sheet is available from the audit website; it outlines everything a patient will need to know to make an informed choice. This sheet should be provided to patients before any data is submitted to the audit.

If a patient wishes to opt-out, they can advise their surgeon, or send the form to the audit staff. In 2018, audit staff were contacted directly by one patient who requested to opt out of the audit.

Data Requests and Research

The BQA Data Request process allows participants and external researchers to request data or analyses from the audit, within the constraints of the 'declared quality assurance activity' legislation protections. This can either be custom extractions of a participant's own data, that of a hospital unit (with permissions from all surgeons), or for a de-identified subset of the database (once approved by the BQA Subcommittee). The BQA received 10 requests in 2018.

The data is available for quality assurance, planning, and research purposes. All requests for data are reviewed by the BQA Subcommittee. The audit webpage provides the data release policy, application form, and information about completed research projects and articles published.

BQA data is also used by BreastSurgANZ for research into trends in the diagnosis and management of early breast cancer in Australia and New Zealand. This research has resulted in a number of publications in internationally recognised journals.

The audit has engaged in a number of successful collaborations with prominent Australian and New Zealand organisations such as Cancer Australia, BreastScreen Aotearoa, Breast Cancer Network Australia and the Australian Commission on Safety and Quality in Health Care.

A list of these publications and details of the collaborations is available from the audit website.

BreastScreen Aotearoa Annual Reports

The BQA has provided the New Zealand Ministry of Health with annual reports on breast cancer patients treated in New Zealand since 2010. These reports examine tumour characteristics and treatment of patients referred from BreastScreen Aotearoa compared with referrals via other means.

In 2018, the audit produced a report on New Zealand episodes diagnosed in 2016.

All reports are publicly available from the BQA webpage.

APPENDIX 3: DATASETS

Minimum Dataset: Invasive cancer

BreastSurgANZ QUALITY AUDIT

INVASIVE CANCER minimum data set form

Surgeon name	

Patient details

Surname (first 3 letters)		Postcode	
Date of birth	(dd-mm-yyyy)	Private/Public	☐ Private ☐ Public ☐ Unknown
Gender	☐ Female ☐ Male	Clinic reference	
Indigenous Status	☐ Non-Indigenous ☐ Aboriginal ☐ Torres Strait Islander ☐ Both Aboriginal and Torres Strait Islander ☐ Maori ☐ Pacific Peoples ☐ Unknown	Hospital	
		Breast Care Nurse	☐ Yes ☐ No ☐ Unknown
		Multi-disciplinary Treatment	☐ Yes ☐ No ☐ Unknown

Diagnosis

Diagnosis date	(dd-mm-yyyy)	Menopausal status	☐ Pre ☐ Peri ☐ Post ☐ Male
Referral source	☐ Symptomatic from GP ☐ Breast Screen Australia ☐ Breast Screen Aotearoa (NZ) ☐ Other	Gestational status	☐ Currently pregnant ☐ Recently pregnant (last 12 months) ☐ Not pregnant (now or last 12 mths)
Bilateral synchronous	☐ Yes ☐ No		

Surgery – date (dd-mm-yyyy) **No breast surgery ☐**

Open biopsy		CLE		Re-excision	
Total mastectomy		Reconstruction			

Axillary surgery – date (dd-mm-yyyy) **No axillary surgery ☐**

Sentinel node		Level 1		Level 2		Level 3	

Invasive pathology

Tumour size in mm		Histological grade of tumour	☐ Grade 1 ☐ Grade 2 ☐ Grade 3
Total extent of lesion in mm (DCIS plus invasive carcinoma)		Vascular/lymphatic invasion	☐ Present ☐ Absent

Histological type of tumour			Receptor status	Oestrogen	Progesterone	HER 2
☐ Ductal NOS	☐ Basal-like		Positive	☐	☐	☐
☐ Other neoplasm	☐ Tubular		Negative	☐	☐	☐
☐ Invasive Lobular	☐ Mixed type		Not done	☐	☐	☐
☐ Medullary	☐ Mucinous					

Distance (in mm) to closest circumferential margin		Number of axillary nodes examined	
Distance (in mm) to closest vertical margin		Number of positive axillary nodes	

Adjuvant therapies

	Radiotherapy	Chemotherapy	SERMs	Ovarian ablation	Aromatase inhibitors	Herceptin (immunotherapy)
Yes	☐	☐	☐	☐	☐	☐
No	☐	☐	☐	☐	☐	☐
Referred but not used	☐	☐	☐	☐	☐	☐

Neoadjuvant therapies

	Radiotherapy	Chemotherapy	SERMs	Ovarian ablation	Aromatase inhibitors	Herceptin (immunotherapy)
Yes	☐	☐	☐	☐	☐	☐
No	☐	☐	☐	☐	☐	☐

Refusal of any recommended treatment (multi-select)

☐ No	☐ BCS	☐ Mastectomy	☐ Axillary surgery	☐ Radiotherapy
☐ Chemotherapy	☐ Hormone therapy	☐ Unspecified refusal	☐ Herceptin	☐ Reconstruction

Please note that all questions require a response except Gestational status, and Total extent of lesion.

Minimum Dataset: DCIS

BreastSurgANZ QUALITY AUDIT

DCIS minimum data set form

Surgeon	

Patient details

Surname (first 3 letters)		***Postcode***	
Date of birth	(dd-mm-yyyy)	***Private/Public***	☐ Private ☐ Public ☐ Unknown
Gender	☐ Female ☐ Male	***Clinic reference***	
Indigenous Status	☐ Non-Indigenous ☐ Aboriginal ☐ Torres Strait Islander ☐ Both Aboriginal and Torres Strait Islander ☐ Maori ☐ Pacific Peoples ☐ Unknown	***Hospital***	
		Breast Care Nurse	☐ Yes ☐ No ☐ Unknown
		Multi-disciplinary Treatment	☐ Yes ☐ No ☐ Unknown

Diagnosis

Diagnosis date	(dd-mm-yyyy)
Referral source	☐ Symptomatic from GP ☐ Breast Screen Australia ☐ Breast Screen Aotearoa (NZ) ☐ Other
Bilateral synchronous	☐ Yes ☐ No
Menopausal status	☐ Pre ☐ Peri ☐ Post ☐ Male
Gestational status	☐ Currently pregnant ☐ Recently pregnant (last 12 months) ☐ Not pregnant (now or last 12 mths)

Surgery date (dd-mm-yyyy)

Open biopsy		CLE		Re-excision	
Total mastectomy		Reconstruction		No breast surgery	☐

Axillary surgery date (dd-mm-yyyy)

Sentinel node		Level 1/sampling		Level 2	
Level 3		No axillary surgery	☐		

DCIS pathology

Tumour size in mm		***Histological grade of tumour***	☐ Low ☐ Medium ☐ High
Distance (in mm) to closest circumferential margin		***Number of axillary nodes examined***	
Distance (in mm) to closest vertical margin		***Number of positive axillary nodes***	
Necrosis	☐ No necrosis ☐ Necrosis ☐ Not applicable		

Adjuvant therapies

	Radiotherapy	***SERMs***	***Aromatase inhibitors***
Yes	☐	☐	☐
No	☐	☐	☐
Referred but not used	☐	☐	☐

Refusal of any recommended treatment (multi-select)

☐ No	☐ BCS	☐ Mastectomy	☐ Axillary surgery	☐ Radiotherapy
☐ Chemotherapy	☐ Hormone therapy	☐ Unspecified refusal	☐ Herceptin	☐ Reconstruction

Please note that all questions require a response except Gestational status

Full Dataset

BreastSurgANZ QUALITY AUDIT

Surgeon name ☐

Please note that the ## marked fields are MANDATORY for a save.
The # marked fields are REQUIRED for a case to be considered complete.

Patient Details

Patient Name (first 3 letters of last name) ## ☐ *Hospital / Clinic ##* ☐

Patient Date of Birth ## ☐ *Your clinic reference ##* ☐

Patient postcode## ☐ *Diagnosis date ##* ☐

Gender ## ☐ Female ☐ Male *Private / Public ##* ☐ Private ☐ Public ☐ Unknown

Indigenous Status##
☐ Non-Indigenous
☐ Aboriginal
☐ Torres Strait Islander
☐ Both Aboriginal and Torres Strait Islander
☐ Maori
☐ Pacific Peoples
☐ Unknown

Enrolled in trial ☐ Yes ☐ No
Breast Care Nurse ☐ Yes ☐ No ☐ Unknown
Multi-disciplinary Treatment ☐ Yes ☐ No ☐ Unknown

Diagnosis

Invasive / In situ # ☐ Invasive ☐ In situ | *Bilateral synchronous#* ☐ No ☐ Yes

Referral source # ☐ Symptomatic (from GP) ☐ Breast Screen Australia ☐ Breast Screen Aotearoa (NZ) ☐ Other

Previous surgery ☐ No previous surgery ☐ Same breast ☐ Contralateral breast ☐ Both breasts ☐ Unknown

Menopausal status # ☐ Pre ☐ Peri ☐ Post ☐ Male

Gestational status ☐ Currently pregnant ☐ Recently pregnant (last 12 months) ☐ Not pregnant (now or last 12 months)

Laterality ☐ Left ☐ Right

Position of principal tumour
☐ Unknown ☐ Superolateral ☐ Inferolateral ☐ Superomedial ☐ Inferomedial ☐ Axillary tail
☐ Lateral ☐ Medial ☐ Superior ☐ Inferior ☐ Central ☐ > 1 quadrant

If the patient refused any treatment, please indicate what treatment was declined#
☐ No ☐ Conservative Tx ☐ Mastectomy ☐ Axillary surgery ☐ Radiotherapy
☐ Chemotherapy ☐ Hormone therapy ☐ Unspecified refusal ☐ Reconstruction ☐ Herceptin or other immunotherapy

Did you prescribe or refer this patient for any of the following adjuvant / neo-adjuvant therapies? #

		Radiotherapy	*Chemotherapy*	*SERMs*	*Ovarian Ablation*	*Aromatase Inhibitors*	*Herceptin or other immunotherapy*
Adjuvant?	Yes	☐	☐	☐	☐	☐	☐
	No	☐	☐	☐	☐	☐	☐
Referred but not used		☐	☐	☐	☐	☐	☐
Neo-adjuvant?	Yes	☐	☐	☐	☐	☐	☐
	No	☐	☐	☐	☐	☐	☐

Procedures

Diagnostic Procedures

Diagnosis Method	*Tick if applicable*	*Positive Y/N*
Clinical Exam		
Mammography		
Ultrasound		
FNA-Cytology		
Core		
Other		

Surgical Events#

Surgical Event	*Surgery Date*	*Discharge Date*
Open Biopsy		
CLE		
Re Excision		
Total Mastectomy		
Reconstruction		
Other		
ABBI		

No Breast Surgery ☐

Axillary Procedures #

Surgical Event	*Surgery Date*	*Discharge Date*
Sentinel Node		
Level 1		
Level 2		
Level 3		
Unknown		

No Axillary surgery ☐

BreastSurgANZ QUALITY AUDIT

Pathology - Invasive

Histological type of invasive tumour #	☐ Ductal NOS	☐ Basal-like	☐ Invasive lobular	☐ Mixed type	☐ Other neoplasm
	☐ Unknown	☐ Tubular	☐ Medullary	☐ Mucinous	

Invasive tumour size in mm # ☐☐☐

*Total extent of lesion in mm (DCIS plus invasive carcinoma) *if greater than invasive tumour size* ☐☐☐

Histological grade of invasive tumour #	☐ Grade 1	☐ Grade 2	☐ Grade 3	☐ Unknown
Number of invasive breast cancers	☐ One	☐ Two	☐ Multicentric	☐ Unknown
Vascular / Lymphatic invasion #	☐ Present	☐ Absent	☐ Unknown	

Final assessment of relevant margins – Invasive

Orientation of closest circumferential margin ☐ Lateral ☐ Medial ☐ Superior ☐ Inferior ☐ Unknown/Not available

Distance (in mm) to closest circumferential margin # ☐☐☐ (Whole numbers only)

Orientation of closest vertical margin ☐ Superficial ☐ Deep ☐ Unknown/Not available

Distance (in mm) to closest vertical margin # ☐☐☐ (Whole numbers only)

Pathology - DCIS

DCIS size in mm# ☐☐☐

Histological grade of lesion #	☐ Low	☐ Intermediate	☐ High	☐ Unknown	
Necrosis present #	☐ No necrosis	☐ Necrosis	☐ Not applicable		
Dominant pattern	☐ Solid	☐ Cribriform	☐ Micropapillary	☐ Other	☐ Unknown / na
Other pattern	☐ Solid	☐ Cribriform	☐ Micropapillary	☐ Other	☐ Unknown / na

Final assessment of relevant margins – In situ

Orientation of closest circumferential margin ☐ Lateral ☐ Medial ☐ Superior ☐ Inferior ☐ Unknown/Not available

Distance (in mm) to closest circumferential margin # ☐☐☐ (Whole numbers only)

Orientation of closest vertical margin ☐ Superficial ☐ Deep ☐ Unknown/Not available

Distance (in mm) to closest vertical margin # ☐☐☐ (Whole numbers only)

Number of nodes examined # ☐☐ *Number of positive nodes #* ☐☐

Receptor status #	*Oestrogen*	*Progesterone*	*HER 2*
Positive	☐	☐	☐
Negative	☐	☐	☐
Ordered but not yet known*	☐	☐	☐
Not done	☐	☐	☐

*If this option is checked for any field, the case will remain incomplete in the system until the answer is replaced with a positive or negative result.

Sentinel

a) Pre-operative scintigraphy

Was scintigraphy conducted? ☐ Yes ☐ No *Scintigraphy date* ☐

Number of nodes in the following locations

None ☐ Lower axilla ☐ Upper axilla ☐ Supraclavicular ☐ Internal mammary ☐

b) Sentinel Node Biopsy

Number of nodes ☐

Nodes detected with ☐ Isotope ☐ Blue dye ☐ Both ☐ Unknown

Position and number of located nodes

Lower axilla ☐ Upper axilla ☐ Supraclavicular ☐ Internal mammary ☐ Other ☐

Final pathology of sentinel nodes

Number of sentinel nodes histologically positive ☐ None ☐ One node ☐ Two nodes ☐ Three nodes ☐ > three nodes

Follow-up

Follow-up date ☐

Patient status

☐ Free of recurrence ☐ Progression of disease ☐ Local recurrence ☐ Systemic recurrence ☐ New breast cancer

☐ New unrelated cancer ☐ Death, breast cancer related ☐ Death, not related to breast cancer ☐ Death, unknown cause ☐ Transferred care

☐ Lost to follow-up ☐ Unknown ☐ Partial clinical response ☐ Complete clinical response ☐ Stable disease

Clinical Exam Results ☐ Not done ☐ No abnormality ☐ Abnormal ☐ Unknown

Mammogram Results ☐ Not done ☐ No abnormality ☐ Abnormal ☐ Unknown

Ultrasound Results ☐ Not done ☐ No abnormality ☐ Abnormal ☐ Unknown

Lymphodema ☐ None ☐ Mild ☐ Moderate ☐ Severe ☐ Extreme ☐ Unknown

Cosmetic status ☐ Good ☐ Fair ☐ Poor ☐ Mastectomy ☐ Unknown

Next appointment date (time from follow-up date)

☐ ☐ Days ☐ Weeks ☐ Months ☐ Years

Comments

APPENDIX 4: PARTICIPATING HOSPITALS

This Appendix lists the hospitals for which the audit has data with a 2018 diagnosis date (at point of data extract on 7 October 2019).

AUSTRALIA: ACT

Calvary Health Care
Calvary John James Hospital
Canberra Private Hospital
National Capital Private Hospital
The Canberra Hospital

AUSTRALIA: NEW SOUTH WALES

Albury Base Hospital
Albury Wodonga Private Hospital
Auburn Hospital
Bankstown Lidcombe Hospital
Baringa Private Hospital
Bathurst Base Hospital
Bega District Hospital
Belmont District Hospital
Blacktown Hospital
Bowral and District Hospital
Brisbane Waters Private Hospital
Calvary Hospital
Calvary Mater Newcastle (prev. Misericordiae)
Campbelltown Hospital
Campbelltown Private Hospital
Canterbury Hospital
Chris O'Brien Lifehouse
Coffs Harbour Health Campus
Concord Repatriation General Hospital
Cowra District Hospital
Dubbo Base Hospital
Dubbo Private Hospital
Dudley Orange Private Hospital
Fairfield Hospital
Figtree Private Hospital
Gosford Hospital
Gosford Private Hospital
Goulburn Base Hospital
Griffith Base Hospital
Hornsby Ku-Ring-Gai Hospital & C'ty Health
Hospital for Specialist Surgery
Hunters Hill Private Hospital
Illawarra Private Hospital
John Hunter Hospital
Lake Macquarie Private Hospital
Lismore Base Hospital
Liverpool Hospital
Macquarie University Hospital
Maitland Hospital
Maitland Private Hospital
Manly Hospital
Mater Hospital
Moruya District Hospital
Mount Druitt Hospital
Nepean Private Hospital
Nepean Public Hospital
North Shore Private Hospital
Northern Beaches Hospital
Norwest Private Hospital
Orange Base Hospital
Prince of Wales Hospital
Prince of Wales Private Hospital
Queanbeyan Hospital
Royal Hospital for Women
Royal North Shore Hospital
Royal Prince Alfred Hospital
Ryde Hospital and Community Health Service
Southern Highlands Private Hospital
St Luke's Hospital
St Vincent's General Hospital
St Vincent's Private Hospital (Bathurst)
St Vincent's Private Hospital (Darlinghurst)
St Vincent's Private Hospital (Lismore)
Strathfield Private Hospital
Sydney Adventist Hospital
Sydney Southwest Private Hospital
Tamara Private Hospital
Tamworth Base Hospital
The Tweed Hospital
The Wollongong Hospital
Wagga Wagga Base Hospital
Westmead Hospital
Westmead Private Hospital

AUSTRALIA: NORTHERN TERRITORY

Darwin Private Hospital

Royal Darwin Hospital

AUSTRALIA: QUEENSLAND

Allamanda Private Hospital
Caboolture Hospital
Cairns Base Hospital
Cairns Private
Friendly Society Private Hospital
Gold Coast Hospital - Southport
Gold Coast Hospital - Robina
Gold Coast Private Hospital
Greenslopes Private Hospital
Hillcrest-Rockhampton Private Hospital
Holy Spirit Northside
Ipswich Hospital
John Flynn-Gold Coast Private Hospital
Mackay Base Hospital
Mater Adult Hospital
Mater Hospital (North Mackay)
Mater Hospital (Rockhampton)
Mater Misericordiae Hospital (Bundaberg)
Mater Misericordiae Hospital (Gladstone)
Mater Misericordiae Hospital (Townsville)
Mater Private Hospital
Mater Private Hospital Redland
Mater Private Hospital Springfield
Nambour Selangor Private Hospital
Noosa Hospital - Mayne Health
Northwest Private Hospital
Peninsula Private Hospital
Pindara Gold Coast Private Hospital
Prince Charles Hospital
Princess Alexandra Hospital
Queen Elizabeth II Hospital
Redcliffe-Caboolture Health Service District
Redland Hospital and Health Service Centre
Rockhampton Hospital
Royal Brisbane Hospital
St Andrews Private Hospital
St Andrews Toowoomba Hospital
St Andrew's War Memorial
St Vincent's Hospital
Sunnybank Private Hospital
The Sunshine Coast Private Hospital
The Townsville Hospital
Toowoomba Base Hospital
Wesley Hospital

AUSTRALIA: SOUTH AUSTRALIA

Ashford Hospital
Burnside War Memorial Hospital
Calvary Health Care
Flinders Medical Centre
Flinders Private Hospital
Lyell McEwin Health Service
Millicent and District Hospital and Health Service
Modbury Public Hospital
Mt Barker District Soldier's Memorial Hospital
Naracoorte Health Service
Royal Adelaide Hospital
St Andrews Hospital
Stirling District Hospital
The Queen Elizabeth Hospital
Western Hospital

AUSTRALIA: TASMANIA

Calvary Health Care Tasmania
Hobart Private Hospital
Launceston General Hospital
North West Regional Hospital
St Vincent's Hospital Launceston

AUSTRALIA: VICTORIA

Alfred Hospital
Ballarat Health Services
Barwon Health Geelong Hospital
Beleura Private Hospital
Bendigo Health Care Group
Box Hill Hospital
Brighton Cabrini
Cabrini Hospital and Palliative Care Unit
Central Gippsland Health Service
Cliveden Hill Hospital
East Grampians Health Service
Echuca Regional Health
Epworth Eastern
Epworth Freemasons Hospital
Epworth Hospital
Frances Perry House
Frankston Hospital

John Fawkner Moreland Private Hospital
Knox Private Hospital
La Trobe Regional Hospital
Linacre Private Hospital
Maroondah Hospital
Maryvale Private Hospital
Mildura Base Hospital
Mildura Private Hospital
Mitcham Private Hospital
Mount Waverley Private Hospital
North East Health Wangaratta & W Base Hospit
Peninsula Private Hospital
Peter MacCallum Cancer Institute
Ringwood Private Hospital
Royal Melbourne Hospital
Royal Women's Hospital
Shepparton Private Hospital
Southern Health - Casey Hospital
Southern Health - Monash Medical Centre (Clayton)
Southern Health - Monash Medical Centre (Moorabbin)
St John of God Health Care (Bendigo)
St John of God Health Care (Geelong)
St John of God Health Care (North Ballarat)
St John of God Hospital, Berwick
St Vincent's Hospital
St Vincent's Private (East Melbourne)
St Vincent's Private (Fitzroy)
The Bays Hospital
The Northern Hospital
The Valley Private Hospital
Wangaratta Private Hospital
Warringal Private Hospital - Mayne Health
West Gippsland Hospital
Wodonga Regional Health Service

AUSTRALIA: WESTERN AUSTRALIA

Armadale Health Service
Bethesda Hospital
Bunbury Regional Hospital
Busselton District Hospital
Fiona Stanley Hospital
Fremantle Hospital
Glengarry Private Hospital
Hollywood Private Hospital
Joondalup Health Campus
Mount Hospital
Peel Health Campus
Royal Perth Hospital
St John of God Health Care (Bunbury)
St John of God Health Care (Murdoch)
St John of God Health Care (Subiaco)

NEW ZEALAND

Anglesea Procedure Centre
Ascot Integrated Hospital
Auckland Hospital
Bidwill Trust Hospital
Boulcott Hospital
Bowen Hospital
Braemar Hospital
Breast Associates
Dunedin Hospital
Gisborne Hospital
Hawkes Bay Hospital
Hutt Hospital
Manuka Street Hospital
Mercy Hospital (Dunedin)
Middlemore Hospital
Nelson Hospital
North Shore Hospital
Rotorua Hospital
Royston Hospital
Southern Cross Hospital (Hamilton East)
Southern Cross Hospital (Invercargill)
Southern Cross Hospital (New Plymouth)
Southern Cross Hospital (Palmerston North)
Southland Hospital
St Andrews Hospital
St Marks
Taranaki Base Hospital
Tauranga Hospital
Timaru Hospital
Waikato Hospital
Wakefield Hospital
Wellington Hospital
Whakatane Hospital
Whanganui Hospital
Whangarei Area Hospital

APPENDIX 5: DATA TABLES

TABLE 1: BQA DATA SUBMISSION OVER TIME (BY DIAGNOSIS DATE)

Year	Number of episodes	Number of surgeons participating
1998	1534	95
1999	3726	165
2000	7051	223
2001	7425	223
2002	7284	209
2003	6008	192
2004	5081	208
2005	6437	242
2006	9689	277
2007	10125	280
2008	11456	283
2009	12155	284
2010	13051	298
2011	13459	300
2012	13632	288
2013	14151	288
2014	15105	299
2015	15399	303
2016	15770	310
2017	14315	309
2018	12746	288

TABLE 2: PATIENT AGE DISTRIBUTION FOR EPISODES DIAGNOSED IN 2018

Cancer type	<40	40-49	50-59	60-69	70+	Total
Invasive	487	1671	2517	3043	3198	**10916**
In situ	60	276	497	542	390	**1765**
Cancer Type missing	4	3	10	15	33	**65**
Total	**551**	**1950**	**3024**	**3600**	**3621**	**12746**

TABLE 3: TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2018

Australia								New Zealand	Location missing	Total
ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
226	3712	55	2036	1294	168	2494	959	1786	16	12746

TABLE 4: REFERRAL SOURCE FOR EPISODES DIAGNOSED IN 2018

Symptomatic	BreastScreen	Other	Referral Source missing	Total
6411	4944	1295	96	12746

TABLE 5: REFERRAL SOURCE FOR INVASIVE TUMOURS, BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2018

Referral Source	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour Size missing	Total
Symptomatic	908	773	868	1396	702	1046	186	5879
BreastScreen	1130	903	681	630	263	248	78	3933
Other	354	236	149	131	62	82	20	1034
Referral Source missing	10	6	4	12	4	10	24	70
Total	**2402**	**1918**	**1702**	**2169**	**1031**	**1386**	**308**	**10916**

TABLE 6: REFERRAL SOURCE FOR *IN SITU* TUMOURS, BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2018

Referral Source	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour Size missing	Total
Symptomatic	120	51	45	94	51	134	13	**508**
BreastScreen	257	119	95	161	108	230	23	**993**
Other	62	36	25	33	20	67	11	**254**
Referral Source missing	2	1	1	0	3	0	3	**10**
Total	**441**	**207**	**166**	**288**	**182**	**431**	**50**	**1765**

TABLE 7: FINAL SURGERY FOR EPISODES DIAGNOSED IN 2018

Surgery category	Invasive	*In situ*	Cancer Type missing	Total
Breast conserving surgery only	6500	1117	5	7622
Simple mastectomy	3132	375	5	3512
Mastectomy with reconstruction	767	214	0	981
Other surgery	118	22	1	141
No surgery	187	12	1	200
Surgery information missing	212	25	53	290
TOTAL	**10916**	**1765**	**65**	**12746**

TABLE 8: FINAL SURGERY, BY PATIENT AGE, FOR EPISODES DIAGNOSED IN 2018

Surgery category	<40	40-49	50-59	60-69	70+	Total
Breast conserving surgery only	202	1020	1859	2502	2039	**7622**
Simple mastectomy	174	512	716	825	1285	**3512**
Mastectomy with reconstruction	144	351	310	135	41	**981**
Other surgery	4	21	37	43	36	**141**
No surgery	13	16	23	32	116	**200**
Surgery information missing	14	30	79	63	104	**290**
Total	**551**	**1950**	**3024**	**3600**	**3621**	**12746**

TABLE 9: FINAL SURGERY, BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2018

Surgery category	Invasive							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour Size missing	Total
Breast conserving surgery only	1673	1446	1199	1311	522	316	33	**6500**
Simple mastectomy	427	341	388	668	414	877	17	**3132**
Mastectomy with reconstruction	213	98	90	139	76	149	2	**767**
Other	37	25	12	22	12	9	1	**118**
No surgery	49	6	11	28	7	33	53	**187**
Surgery information missing	3	2	2	1	0	2	202	**212**
Total	**2402**	**1918**	**1702**	**2169**	**1031**	**1386**	**308**	**10916**

Surgery category	*In situ*							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour Size missing	Total
Breast conserving surgery only	376	168	128	201	116	119	9	**1117**
Simple mastectomy	41	24	23	48	45	187	7	**375**
Mastectomy with reconstruction	15	11	14	36	19	116	3	**214**
Other	7	3	0	2	2	8	0	**22**
No surgery	2	1	1	1	0	1	6	**12**
Surgery information missing	0	0	0	0	0	0	25	**25**
Total	**441**	**207**	**166**	**288**	**182**	**431**	**50**	**1765**

TABLE 10: FINAL SURGERY, BY TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2018

Surgery category	Australia								New Zealand	Treatment Location missing	Total
	ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
Breast conserving surgery only	147	2287	27	1168	699	112	1701	498	977	6	**7622**
Simple mastectomy	72	901	21	708	380	34	475	316	601	4	**3512**
Mastectomy with reconstruction	7	306	6	102	23	16	261	115	145	0	**981**
Other	0	98	0	7	3	0	6	20	7	0	**141**
No surgery	0	55	0	26	13	6	33	10	51	6	**200**
Surgery information missing	0	65	1	25	176	0	18	0	5	0	**290**
Total	**226**	**3712**	**55**	**2036**	**1294**	**168**	**2494**	**959**	**1786**	**16**	**12746**

TABLE 11: FINAL SURGERY, BY REFERRAL SOURCE FOR EPISODES DIAGNOSED IN 2018

Surgery category	Symptomatic	BreastScreen	Other	Referral Source missing	Total
Breast conserving surgery only	3324	3596	670	32	7622
Simple mastectomy	2180	944	363	25	3512
Mastectomy with reconstruction	565	237	177	2	981
Other	43	66	24	8	135
No surgery	154	14	31	1	200
Surgery information missing	145	87	30	28	290
Total	**6411**	**4944**	**1295**	**96**	**12746**

TABLE 12: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY FOR EPISODES DIAGNOSED IN 2018

Surgery category	Invasive	*In situ*	Cancer Type missing	Total
Mastectomy	667	183	1	851
Re-excision	790	216	0	1006
Other surgery	109	19	0	128
No further surgery	5710	901	5	6616
Total	**7276**	**1319**	**6**	**8601**

TABLE 13: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY, BY PATIENT AGE FOR EPISODES DIAGNOSED IN 2018

Surgery category	<40	40-49	50-59	60-69	70+	Total
Mastectomy	57	195	229	191	179	851
Re-excision	24	156	262	317	247	1006
Other surgery	3	19	36	39	31	128
No further surgery	178	864	1597	2185	1792	6616
Total	**262**	**1234**	**2124**	**2732**	**2249**	**8601**

TABLE 14: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY, BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2018

Surgery category	Invasive							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour size missing	TOTAL
Mastectomy	123	83	93	121	79	165	3	667
Re-excision	213	144	128	157	94	54	0	790
Other surgery	37	20	11	21	12	7	1	109
No further surgery	1460	1302	1071	1154	428	262	33	5710
Total	**1833**	**1549**	**1303**	**1453**	**613**	**488**	**37**	**7276**

Surgery category	*In situ*							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour size missing	TOTAL
Mastectomy	10	10	10	26	20	105	2	183
Re-excision	31	21	24	52	40	47	1	216
Other surgery	6	3	0	2	2	6	0	19
No further surgery	345	147	104	149	76	72	8	901
Total	**392**	**181**	**138**	**229**	**138**	**230**	**11**	**1319**

TABLE 15: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY, BY TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2018

Surgery category	Australia								New Zealand	Treatment Location missing	Total
	ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
Mastectomy	14	231	8	191	81	15	150	79	82	0	**851**
Re-excision	19	320	2	191	56	15	207	65	131	0	**1006**
Other surgery	0	94	0	5	1	0	3	19	6	0	**128**
No further surgery	128	1967	25	977	643	97	1494	433	846	6	**6616**
Total	**161**	**2612**	**35**	**1364**	**781**	**127**	**1854**	**596**	**1065**	**6**	**8601**

TABLE 16: AXILLARY SURGERY FOR EPISODES DIAGNOSED IN 2018

Axillary surgery	Invasive	*In situ*	Cancer Type missing	Total
Sentinel Node Biopsy	7587	643	5	8235
Axillary Node Dissection	2584	42	3	2629
Unknown level of surgery	11	1	0	12
No Axillary Surgery	354	1028	3	1385
Axillary surgery information missing	380	51	54	485
Total	**10916**	**1765**	**65**	**12746**

TABLE 17: AXILLARY SURGERY, BY PATIENT AGE FOR EPISODES DIAGNOSED IN 2018

Axillary surgery	<40	40-49	50-59	60-69	70+	TOTAL
Sentinel Node Biopsy	268	1259	1917	2478	2313	8235
Axillary Node Dissection	219	489	634	613	674	2629
Unknown level of surgery	1	0	6	3	2	12
No Axillary Surgery	35	160	366	420	404	1385
Axillary surgery information missing	28	42	101	86	228	485
Total	**551**	**1950**	**3024**	**3600**	**3621**	**12746**

TABLE 18: AXILLARY SURGERY, BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2018

Surgery category	Invasive							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour size missing	TOTAL
Sentinel Node Biopsy	1916	1621	1328	1497	624	560	41	7587
Axillary Node Dissection	320	224	321	597	367	739	16	2584
Unknown level of surgery	5	1	2	2	0	1	0	11
No Axillary Surgery	121	65	38	47	32	50	1	354
Axillary surgery information missing	40	7	13	26	8	36	250	380
Total	**2402**	**1918**	**1702**	**2169**	**1031**	**1386**	**308**	**10916**

Surgery category	*In situ*							
	<10mm	10-14mm	15-19mm	20-29mm	30-39mm	40+mm	Tumour size missing	TOTAL
Sentinel Node Biopsy	74	47	54	96	71	294	7	643
Axillary Node Dissection	7	0	2	5	5	22	1	42
Unknown level of surgery	0	0	1	0	0	0	0	1
No Axillary Surgery	355	159	107	186	105	109	7	1028
Axillary surgery information missing	5	1	2	1	1	6	35	51
Total	**441**	**207**	**166**	**288**	**182**	**431**	**50**	**1765**

TABLE 19: KEY PERFORMANCE INDICATORS - OVERALL COMPLIANCE FOR EPISODES DIAGNOSED IN 2018

	Compliance	Threshold	Numerator	Denominator	Excluded
KPI 1	92%	85%	5807	6290	358
KPI 2	90%	85%	8000	8887	550
KPI 3	95%	90%	10185	10694	287
KPI 4	99%	90%	1691	1711	102
KPI 5	88%	85%	857	972	305
KPI 6	90%	90%	2240	2487	295

TABLE 20: KEY PERFORMANCE INDICATORS WITH QUALITY THRESHOLD AT 85% - OVERALL COMPLIANCE BY YEAR

KPI1				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	93.3%	2086	2235	312
2005	93.7%	2620	2797	264
2006	93.2%	4086	4385	360
2007	93.3%	4238	4542	421
2008	93.2%	4678	5018	383
2009	93.2%	4752	5096	370
2010	92.5%	5089	5501	469
2011	92.9%	5721	6158	267
2012	93.3%	5679	6085	235
2013	92.8%	5879	6335	228
2014	92.4%	6276	6789	388
2015	90.6%	6544	7221	286
2016	89.8%	6459	7526	276
2017	90.6%	6344	7002	252
2018	92.3%	5807	6290	358

KPI2				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	93.9%	2639	2810	713
2005	92.8%	3562	3838	671
2006	91.6%	5509	6011	870
2007	90.7%	5593	6167	991
2008	89.6%	6451	7203	932
2009	89.2%	6929	7772	990
2010	90.1%	7637	8477	997
2011	88.8%	8151	9175	726
2012	91.3%	8507	9321	714
2013	91.0%	8878	9755	646
2014	89.6%	9197	10262	839
2015	86.4%	9156	10595	658
2016	86.1%	9503	11042	504
2017	86.7%	8794	10138	438
2018	90.0%	8000	8887	550

KPI5				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	83.9%	374	446	477
2005	84.6%	556	657	386
2006	87.0%	790	908	431
2007	86.3%	842	976	351
2008	85.3%	1002	1175	352
2009	84.8%	999	1178	321
2010	86.6%	1101	1271	303
2011	88.0%	1170	1329	272
2012	86.9%	1143	1316	218
2013	88.5%	1184	1338	179
2014	86.5%	1160	1341	364
2015	86.0%	1163	1352	239
2016	85.5%	1137	1330	270
2017	83.5%	984	1178	229
2018	88.2%	857	972	305

TABLE 21: KEY PERFORMANCE INDICATORS WITH QUALITY THRESHOLD AT 90% - OVERALL COMPLIANCE BY YEAR

KPI3				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	95.0%	3889	4092	330
2005	94.8%	4973	5246	333
2006	95.0%	7416	7810	621
2007	94.8%	7902	8334	422
2008	95.1%	9171	9642	318
2009	93.7%	9603	10251	202
2010	94.0%	10463	11135	144
2011	94.0%	10918	11617	117
2012	93.8%	10979	11699	128
2013	93.4%	11209	12002	194
2014	94.6%	11955	12639	280
2015	94.5%	12202	12918	266
2016	95.3%	12616	13234	309
2017	94.9%	11563	12182	216
2018	95.2%	10185	10694	287

KPI4				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	90.2%	395	438	300
2005	93.6%	572	611	340
2006	95.2%	824	866	465
2007	95.6%	967	1011	419
2008	96.4%	1189	1233	345
2009	97.3%	1599	1643	149
2010	97.6%	1671	1712	107
2011	98.4%	1652	1679	68
2012	98.2%	1725	1756	64
2013	97.4%	1834	1882	99
2014	98.3%	2032	2068	158
2015	97.6%	2109	2161	100
2016	98.7%	2105	2133	137
2017	98.9%	1866	1887	66
2018	98.8%	1691	1711	102

KPI6				
Diagnosis year	**Compliance**	**Numerator**	**Denominator**	**Excluded**
2004	90.2%	694	769	1768
2005	89.7%	1228	1369	1262
2006	89.8%	2052	2284	831
2007	90.9%	2152	2368	870
2008	92.6%	2610	2818	767
2009	93.0%	2576	2770	693
2010	93.7%	2856	3048	743
2011	91.4%	2900	3172	613
2012	93.1%	3042	3269	487
2013	93.0%	2994	3220	423
2014	92.4%	2982	3227	607
2015	90.8%	3042	3350	474
2016	89.1%	2930	3290	465
2017	90.3%	2705	2994	340
2018	90.1%	2240	2487	295