



Annual Report 2019

Version 1.0

September 2021

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FOREWORD

From the Chair, BreastSurgANZ Quality Audit

The 2019 BreastSurgANZ Quality Audit (BQA) 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 report is an opportunity to reflect on what the program has achieved and areas for improvement. Significant findings can be drawn from the 13,074 cases of breast cancer submitted to the BQA in 2019 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. This report demonstrates that surgeons in Australia and New Zealand are meeting all 6 KPIs.

Our audit should be evidenced-based and rigorously reviewed for its relevance in modern practice. Benchmarks may need to be replaced and new biomarkers and treatments may need to be added. Where thresholds have not been met, it is necessary to explore the reasons why.

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 program could not continue without the ongoing support of Breast Surgeons of Australia and New Zealand Inc., in providing funding and for the continued pursuit of quality assurance of its members and improving the outcomes for breast cancer patients.

David Walters

Dr David Walters FRACS

Chair, BQA Committee



From the President, BreastSurgANZ

Congratulations to David Walters and the BQA team for another year of hard work and this annual report. I would ask all members to read through the report and reflect on their own practice.

For over 20 years Australian and New Zealand breast surgeons have been contributing to this rich data set. The BQA is an incredible resource for members, this is your data, for you to utilise, for research and presentation, for quality assurance activities and credentialling.

The BQA has had a number of changes since its inception, it will continue to evolve to reflect the needs of the membership. Please do not hesitate to contact BreastSurgANZ and the BQA Committee with any suggestions for the future direction of the BQA.

As always, we continue to work on improving data capture and compliance. I strongly encourage all members to submit all their cases, particularly as we look to the finalisation of the Quality Improvement Program and closing the audit loop, one of the primary goals of the BQA.

Melanie Walker

Dr Melanie Walker

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 compiled by members of the RACS Morbidity Audits Department. The report was authored by Michelle Ogilvy and Eloise Spooner under the guidance of Kylie Harper, 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), Prof. 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), Prof. Ian Campbell (New Zealand), Mr David Moss (New Zealand), and Ms Maryanne Maher (Breast Cancer Network Australia, consumer representative).

BreastSurgANZ membership

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

BreastSurgANZ aims for the audit to be relevant to the needs of its membership and to assist in ensuring that patients receive the highest level of care. As always, feedback is very welcome from members on their experiences with the audit and how BreastSurgANZ and RACS may better serve their requirements.

1. EXECUTIVE SUMMARY

The BreastSurgANZ Quality Audit (BQA) is a quality assurance activity for members of Breast Surgeons of Australia and New Zealand (BreastSurgANZ). This report provides an overview of data submitted to the audit for the 2019 calendar year in addition to summarising audit activities conducted in the 2020 calendar year.

2019 results

This report examines data for breast cancers diagnosed in 2019. There were 13,074 records submitted by 289 participants from 238 hospitals across Australia and New Zealand.

- Most patients treated in 2019 were above 49 years of age and 99% were female.
- Patients with in situ tumours or smaller invasive tumours were most likely to be referred from BreastScreen, while larger invasive tumours were more likely to be a symptomatic referral from a general practitioner (GP).
- Breast conserving surgery was the most common 'final' treatment for breast cancer, particularly for patients referred by BreastScreen, patients aged over 40, and for 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 increased with expanding tumour size and decreased with advancing age.
- Most invasive tumours were treated with some form of axillary surgery, commonly sentinel node biopsy. Axillary node dissection was more frequent as tumour size increased.
- Patients with small in situ tumours were the 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](#).

Audit activities

- Review of the institutional upload program led to the implementation of new processes that should improve the timeliness of data submission.
- The data release request process was reviewed and improved in line with the needs of the BQA Subcommittee and researchers.
- Enhancements continue to be made to the BQA online portal to improve usability.

Future considerations

- The BreastSurgANZ Council has approved the implementation of the BQA Clinical Quality Improvement Program for 2021.
- The pilot collection of breast cancer patient-reported outcome measures experienced delays in 2020 due to COVID-19 risks. This pilot is now due for completion in 2021.
- Implementing quality thresholds for High Quality Performance Indicators will be considered in 2021.

2. RECOMMENDATIONS

Based on the 2019 data, the following recommendations are made to improve the utility of the audit:

- Implement a formal review of recent literature to ensure the BQA performance indicators accurately reflect current practice in Australia and New Zealand.
- Explore opportunities to increase reporting of performance indicator compliance to BreastSurgANZ members to ensure that members who seldom use the BQA portal receive this information in a timely manner.
- Encourage BreastSurgANZ members to use the extensive longitudinal BQA data for research.
- Continue improvements to the data collection process to ensure 100% audit compliance and data coverage.

3. BACKGROUND

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

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

Participation in the audit is compulsory for all members of BreastSurgANZ. Participants are encouraged to self-assess their clinical performance against set key performance indicators (KPIs) via 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 audit process and [Appendix 3](#) for details on data collected).

4. AUDIT PARTICIPATION

BreastSurgANZ members are expected to submit data to the BQA on all cases of early and locally advanced breast cancer.

Generally, members are asked to submit data by 30 April of the year following diagnosis. An extension was given for 2019 data due to the impact of COVID-19: participants were requested to have all 2019 cases submitted by 1 June 2020.

At the time of reporting, the database contained 13,074 records of breast cancer diagnosed in 2019. Of these records, 41% (5,338 records) were submitted in 2019, with the remainder submitted in 2020.

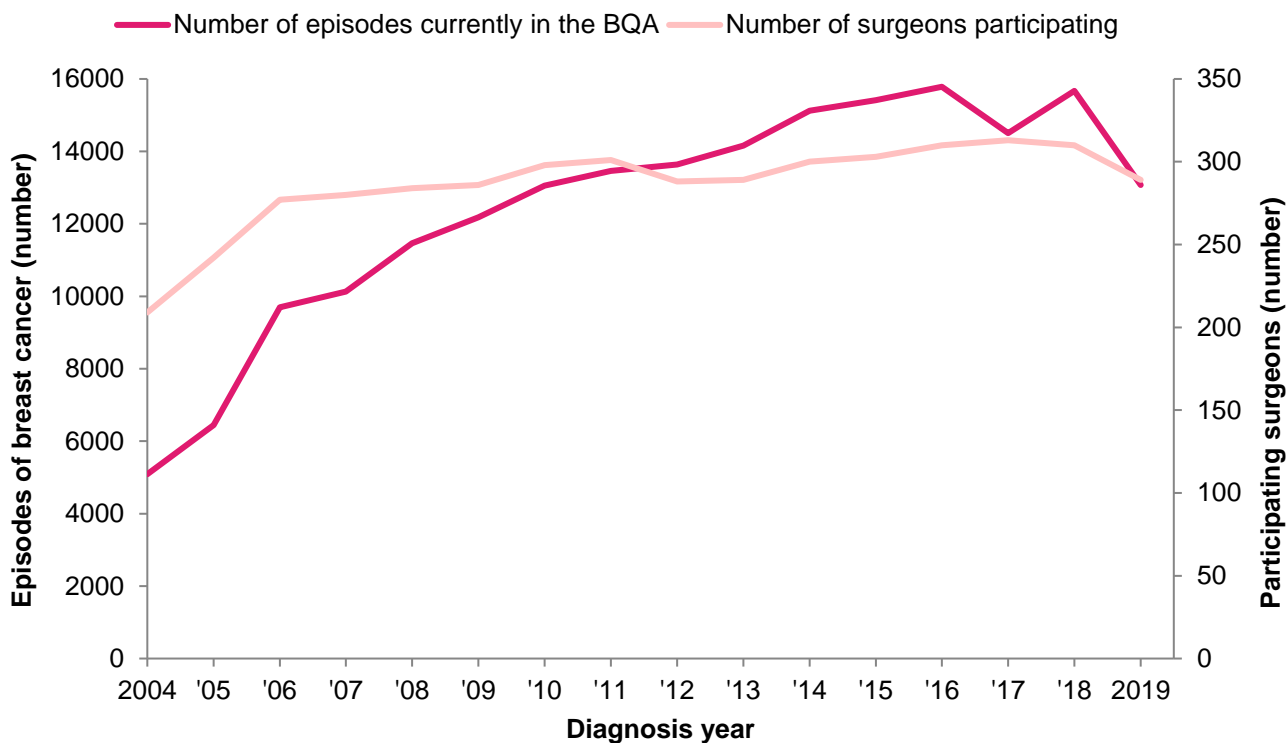
This data was received from 238 hospitals in Australia and New Zealand for 289 surgeons (see list of participating hospitals, [Appendix 4](#)).

Figure 1 shows data submitted annually over the last sixteen years of the audit. The number of BQA cases is generally trending upward. The number of surgeons participating each year appears to have plateaued.

As expected, numbers of cases and participants are lower in 2019 than in previous years. This is due to an issue with timeliness of submissions and is seen each year. Participants continue to submit data after the deadline, even when the deadline was extended in 2020. It is anticipated that the 2019 data will be in line with previous years when the trend is re-examined in 2021.

The figure does show an unexplained dip in cases submitted for 2017 (approximately 1,000 fewer cases than previous and subsequent years). It is now unlikely that significantly more 2017 data will be received.

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



Note: Data provided in Appendix 5, **Table 1**.

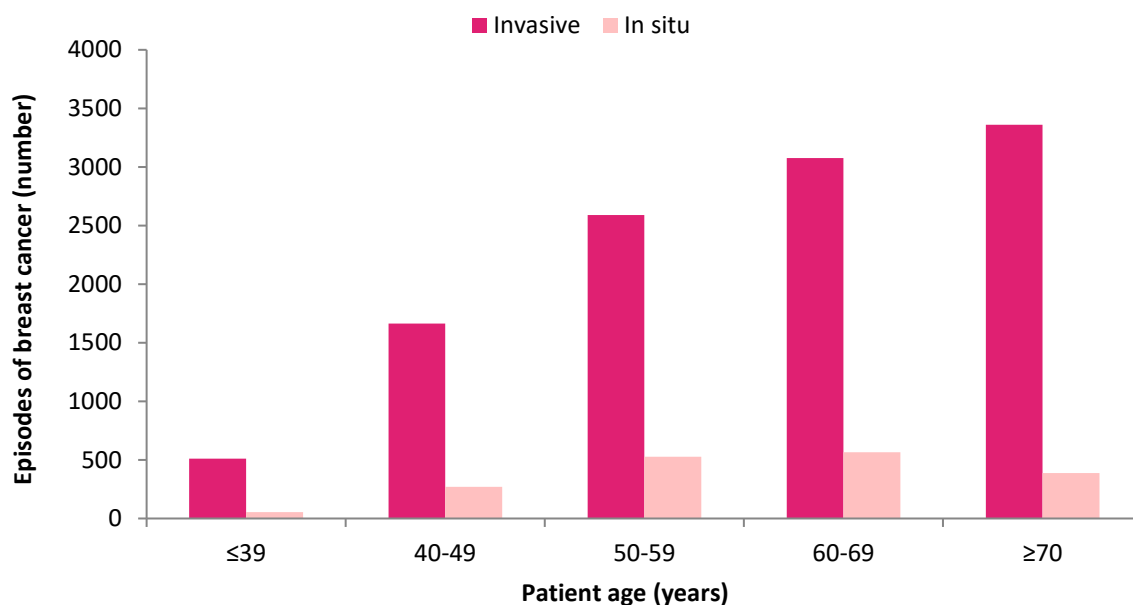
5. DATA SUMMARY

The BQA contains 13,074 records for episodes of early or locally advanced breast cancer diagnosed in 2019. Section 5 shows a descriptive analysis of this data.

5.1. Patient demographics

The incidence of patients diagnosed with invasive breast cancer increased with age (Figure 2). A total of 57% of invasive episodes occurred in patients above 59 years of age. In contrast, the incidence of in situ tumours peaked in the age group 50–59 and 60–69 years, with a total of 61% of in situ episodes in these age brackets. The incidence of in situ tumours then declined after age 70.

Figure 2: Patient age distribution of breast cancer episodes diagnosed in 2019



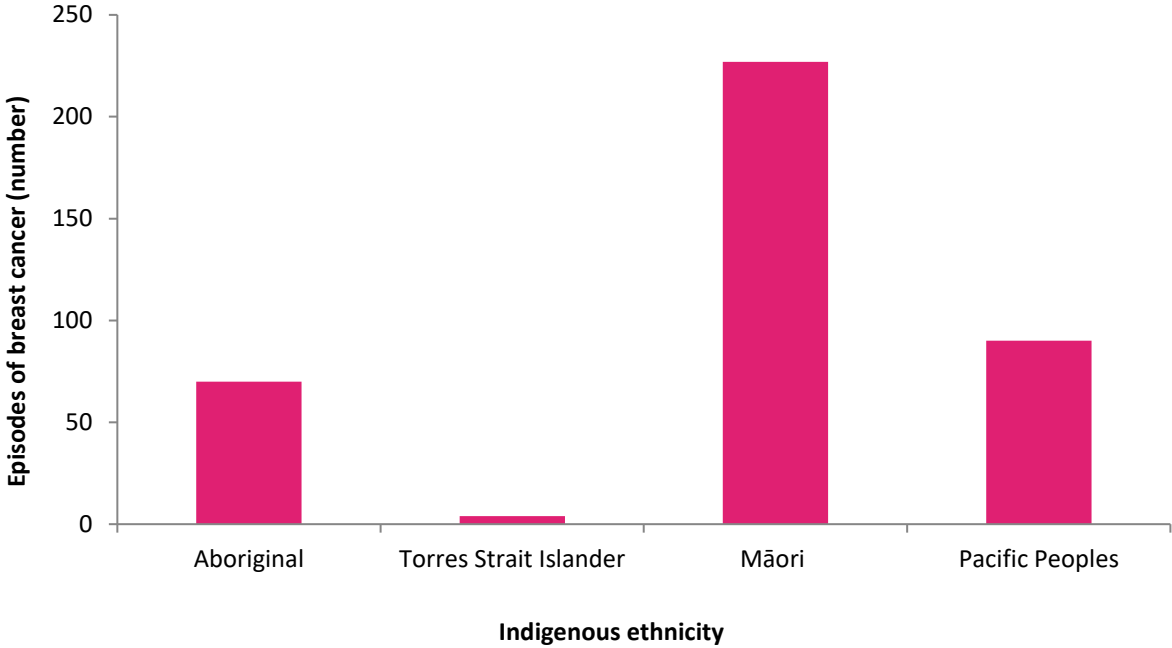
Note: Excludes 67 episodes with missing information on invasive/in situ. Data provided in Appendix 5, Table 2.

Male breast cancer was rare, accounting for only 1% of all breast cancer episodes diagnosed in 2019 (data not shown).

Aboriginal, Māori, Torres Strait Islander and Pacific Peoples accounted for 4% of BQA cases with known indigenous status recorded. Māori patients comprised the largest group of indigenous patients (Figure 3), accounting for 2% of the overall cases. This is in line with other sources showing a high number of Māori women experiencing breast cancer (Lawrenson et al., 2016).

The low rate of diagnosis of early and locally advanced cancer in Aboriginal and/or Torres Strait Islander patients is consistent with other sources (National Breast Cancer Foundation, 2019) and is likely due to these patients being diagnosed with advanced breast cancer outside the scope of the BQA (Banham et al., 2019) or under-reporting of indigenous ethnicity in Australian patients.

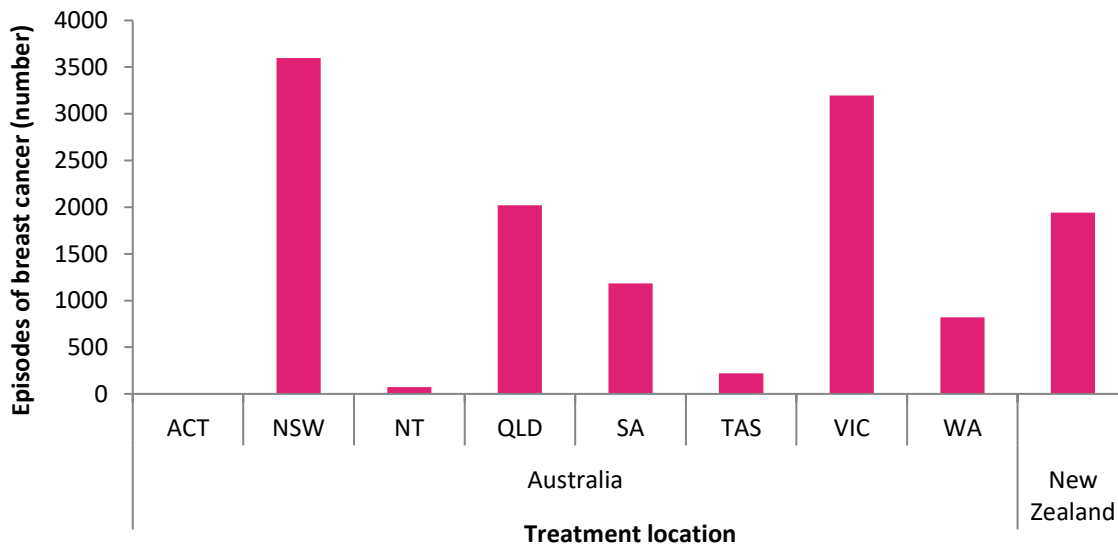
Figure 3: Indigenous ethnicity for breast cancer episodes diagnosed in 2019



Note: Data excluded for 1,933 episodes where indigenous status unknown. Data not shown for category 'both Aboriginal and Torres Strait Islander' due to small number in this subgroup. Data not shown for category 'non-indigenous'. Data provided in Appendix 5, Table 3.

Figure 4 shows that the largest submission of episodes was from New South Wales (28% of episodes), followed by Victoria (25%). The smallest submission came from the Australian Capital Territory (less than 1% of episodes), closely followed by the Northern Territory (1%) and Tasmania (2%). This pattern of submission is consistent with the population of breast cancer episodes treated in these locations. A total of 1,940 cases were submitted from New Zealand and 11,107 were submitted from Australia.

Figure 4: Treatment location of breast cancer episodes diagnosed in 2019



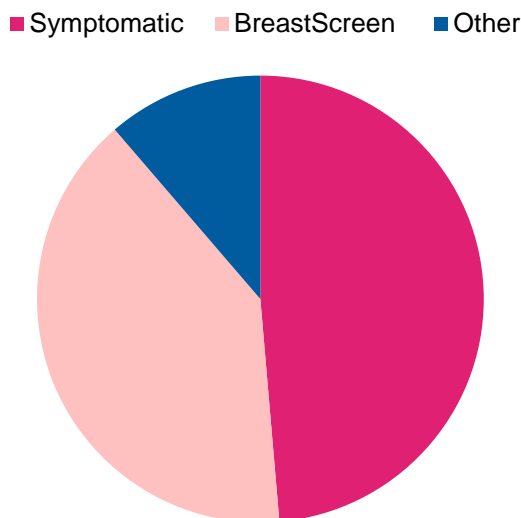
Note: Excludes 27 episodes where treatment location is missing. Data provided in Appendix 5, Table 4.

Due to the small number of submissions from the Australian Capital Territory, this region has been excluded from further cross-tabulation by treatment location in this report.

5.2. Referral source

Almost half (6,323 episodes; 49%) of the cancers diagnosed in 2019 were symptomatic referrals from a GP (Figure 5). A further 5,207 episodes (40%) were referred from BreastScreen programs in Australia or New Zealand. The remainder (1,469 episodes; 11%) were referred from other sources such as private screening programs.

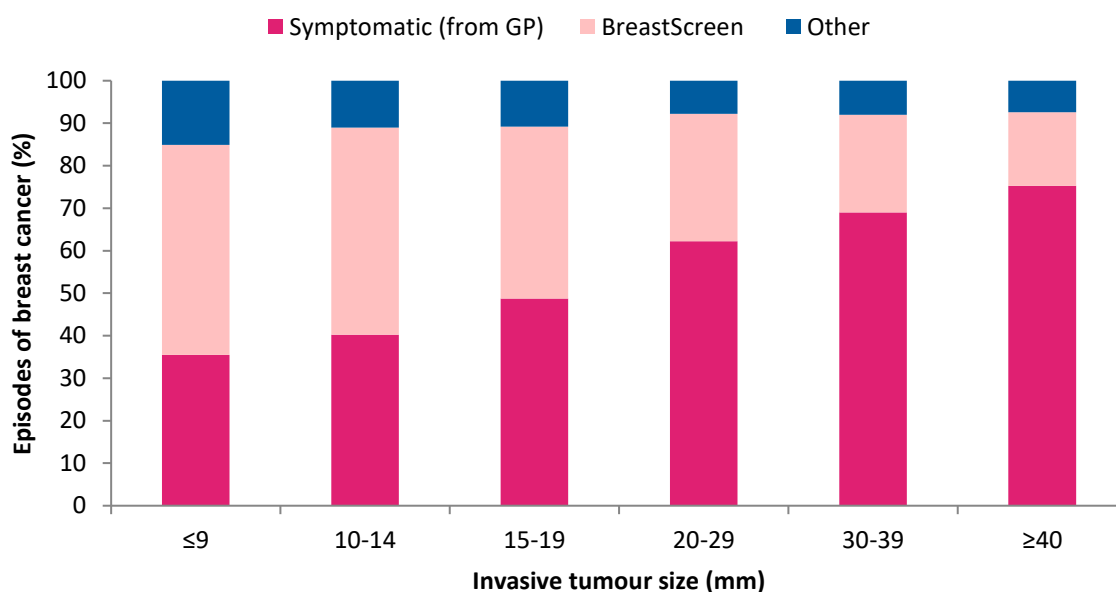
Figure 5: Referral source of breast cancer episodes diagnosed in 2019



Note: Excludes 75 episodes where referral source is missing. Patients referred from 'other' sources may include private screening programs. Data provided in Appendix 5, **Table 5**.

Figure 6 shows that BreastScreen referral for invasive cancer was most common for smaller tumours. Almost half of all referrals (49%) were for tumours ≤ 14 mm. Referral was least common (17%) for large tumours of 40mm or greater. For larger invasive tumours, patients were more likely to be referred from a GP as symptomatic (Figure 6).

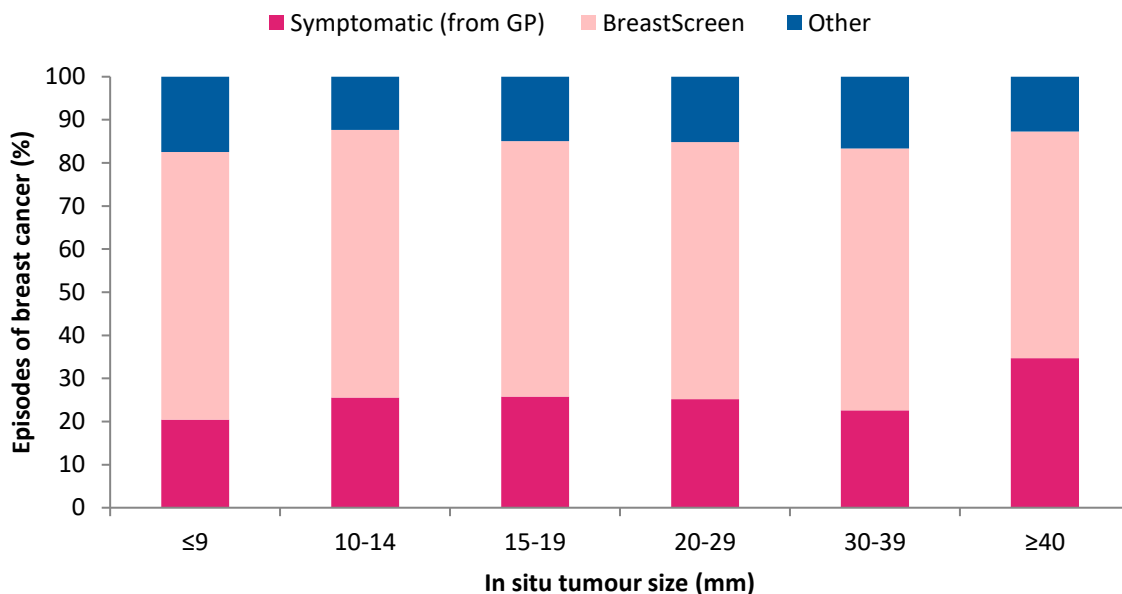
Figure 6: Referral source for invasive tumours for breast cancer episodes diagnosed in 2019, by tumour size



Note: Excludes 43 episodes with missing information on referral source and 321 episodes where tumour size is missing. Patients referred from 'other' sources may include private screening programs. Data provided in Appendix 5, **Table 6**.

Figure 7 shows that in situ tumours (regardless of size) were most commonly referred from BreastScreen. Patients with the largest in situ tumours (≥ 40 mm, see Figure 7) had similar GP referral rates to those with the smallest invasive tumours (≤ 9 mm, see Figure 6).

Figure 7: Referral source for in situ tumours for breast cancer episodes diagnosed in 2019, by tumour size

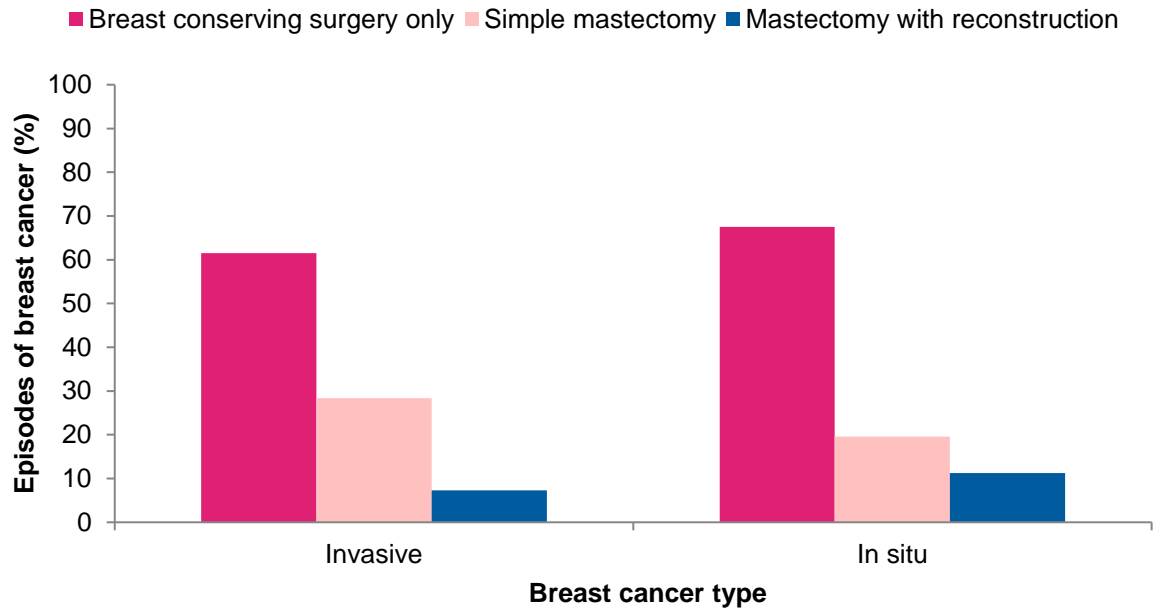


Note: Excludes 2 episodes with missing information on referral source and 110 episodes where tumour size is missing. Patients referred from 'other' sources may include private screening programs. Data provided in Appendix 5, **Table 7**.

5.3. Surgical treatment

Figure 8 shows that the majority of patients treated for invasive or in situ breast cancer received only breast conserving surgery (61% and 68%, respectively). This surgical treatment aligns with the relevant guidelines for managing early breast cancer (Cancer Australia, 2020).

Figure 8: Final surgery type for breast cancer episodes diagnosed in 2019



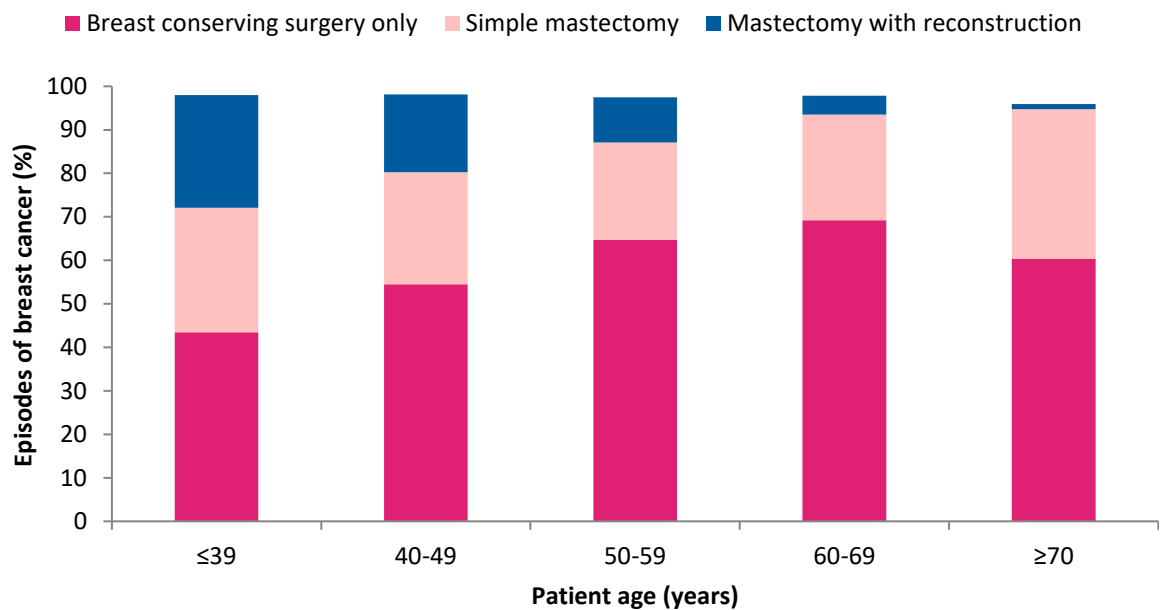
Note: Breast conserving surgery consists of the BQA data items 'complete local excision', 're-excision', 'open biopsy' and 'ABBI' (Advanced Breast Biopsy Instrumentation system, or similar technique). Patients treated with both breast conserving surgery and mastectomy have been categorised as mastectomy.

Excludes 67 episodes with missing information on cancer type (invasive or in situ) and an additional 194 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 8**.

Receiving breast conserving surgery only was most common in patients aged 60 to 69 years (69%) and least common in patients aged less than 40 years (43%), as shown in Figure 9. Recent literature shows no significant difference in outcomes between breast conserving surgery only and mastectomy for patients less than 40 years of age, so patient choice should largely determine the type of surgery undertaken (Vila, Gandini and Gentilini, 2015).

Mastectomy with reconstruction was most common among patients under 40 years (26%) and least common in those aged 70 years or more (1%). Recent literature shows that women over 60 years of age have no statistically significant difference in outcomes post breast reconstruction to women in other age groups (Santosa et al., 2016). Most women aged 60 or more years who have had a reconstruction do not feel that age should be a determining factor in breast reconstruction after mastectomy (Bowman et al., 2006).

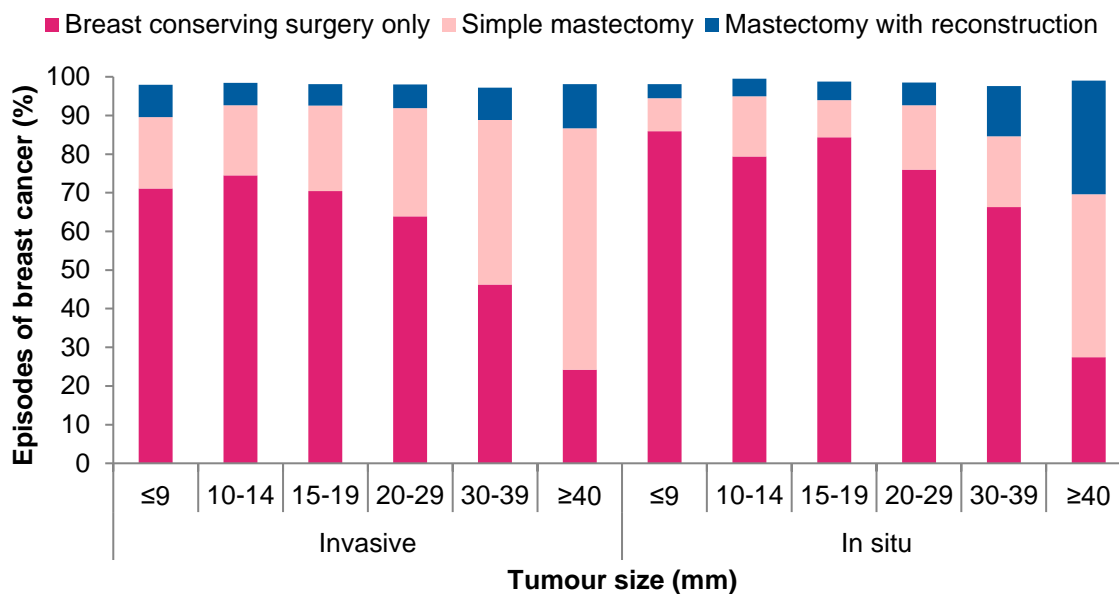
Figure 9: Final surgery for breast cancer episodes diagnosed in 2019, by patient age



Note: Excludes 247 episodes with missing information on surgery type. 'Other surgery' and 'no surgery' not shown due to very small numbers. Mastectomy totals include patients who underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5, **Table 9**.

As tumour size increased—either invasive or in situ—the incidence of breast conserving surgery only decreased, while the incidence of simple mastectomy increased (see Figure 10). Mastectomy with reconstruction rates did not vary significantly with invasive tumour size, but did increase in response to increasing in situ tumour size.

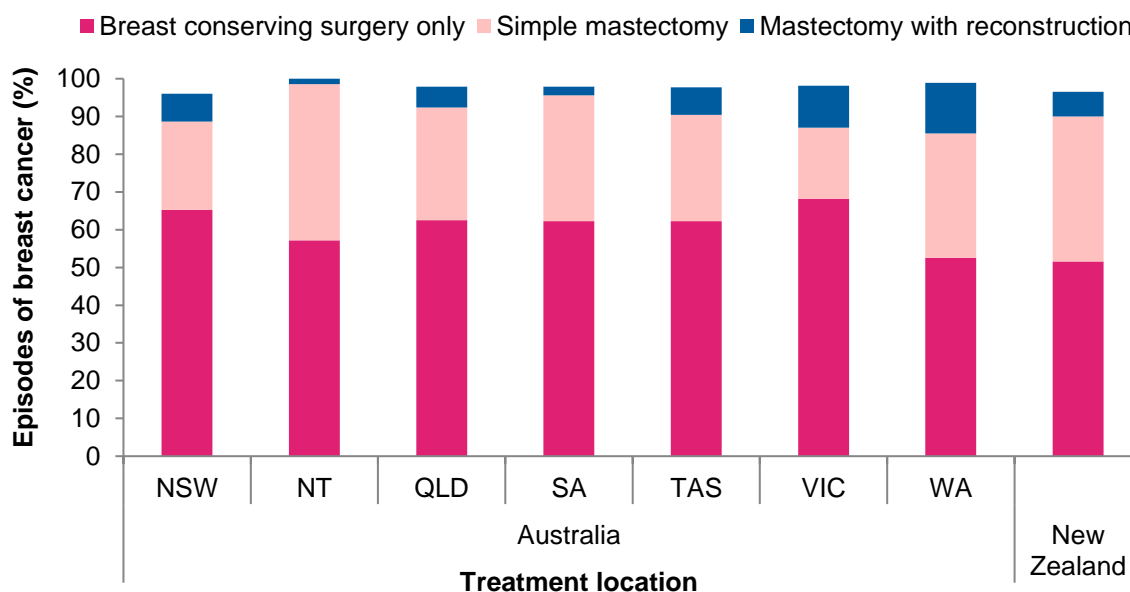
Figure 10: Final surgery for breast cancer episodes diagnosed in 2019, by tumour size



Note: Excludes 194 episodes with missing information on surgery type and an additional 264 episodes with missing tumour size. 'Other surgery' and 'no surgery' not shown due to very small numbers. Mastectomy totals include patients who underwent both mastectomy and breast-conserving surgery. Data provided in Appendix 5, Table 10.

Figure 11 shows that, in Australia, breast conserving surgery only is most common in Victoria (68%) and least common in Western Australia (52%); simple mastectomies are most frequent in the Northern Territory (41%) and least frequent in Victoria (19%); and mastectomy with reconstruction is most common in Western Australia (13%) and least common in the Northern Territory (1%). In New Zealand, just over half of cases had breast conserving surgery only (52%) and 38% had a simple mastectomy.

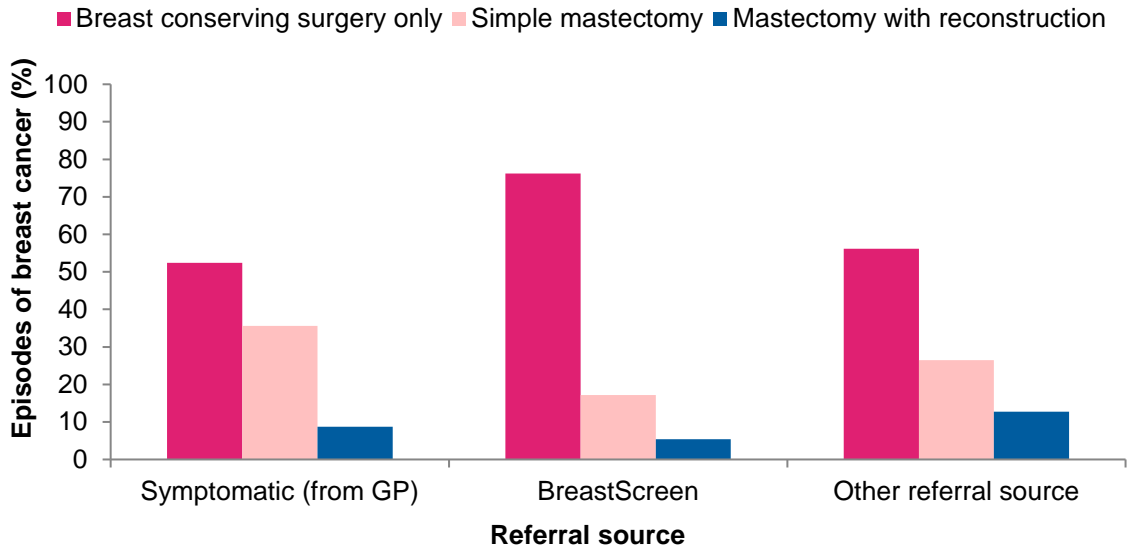
Figure 11: Final surgery for breast cancer episodes diagnosed in 2019, by treatment location



Note: Excludes 247 episodes with missing information on surgery type and 27 episodes with missing location. 'Other surgery' and 'no surgery' not shown due to very small numbers. Mastectomy totals include patients who underwent both mastectomy and breast-conserving surgery. Data provided in Appendix 5, Table 11.

Figure 12 shows that treatment by breast conserving surgery only was most common for patients referred by BreastScreen (76%), likely due to smaller and less invasive tumours being referred via BreastScreen (Figure 6 and Figure 7). Treatment by breast conserving surgery only was less common for symptomatic patients referred from GPs (52%) and those referred from other sources (56%).

Figure 12: Final surgery for breast cancer episodes diagnosed in 2019, by referral source

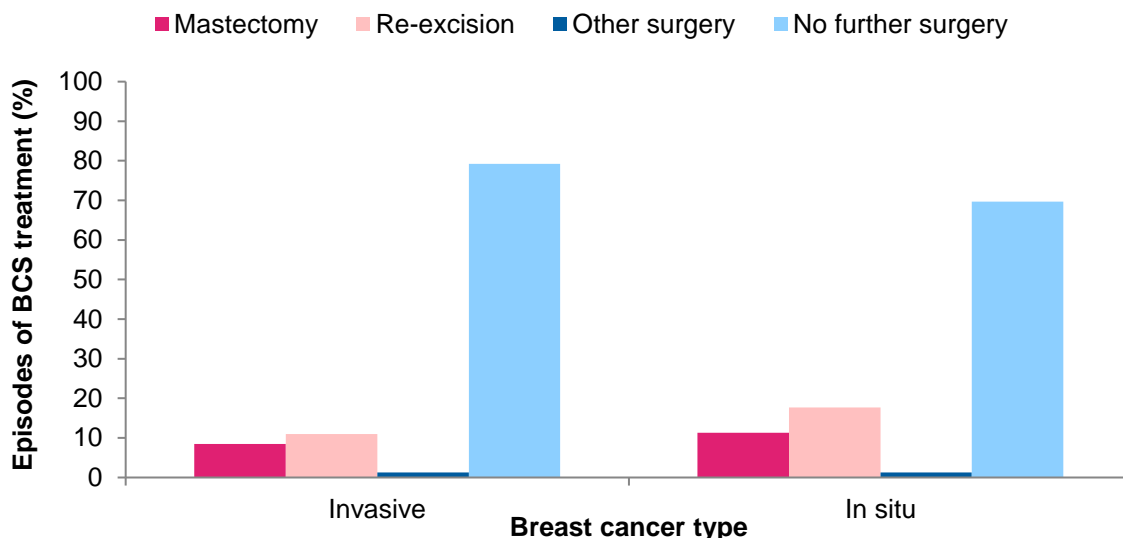


Note: Excludes 247 episodes with missing information on surgery type and an additional 34 episodes with missing referral source. 'Other surgery' and 'no surgery' not shown due to very small numbers. Patients referred from other sources may include private screening programs. Mastectomy totals include patients who underwent both mastectomy and breast conserving surgery. Data provided in Appendix 5, **Table 12**.

5.4. Further surgical treatment after breast conserving surgery

As shown in Figure 13, 79% of invasive cancers treated with breast conserving surgery received no further surgery, compared with 70% of in situ tumours. The most common additional surgery was re-excision (11% of invasive cancers and 18% of in situ), followed by mastectomy (9% of invasive and 11% of in situ).

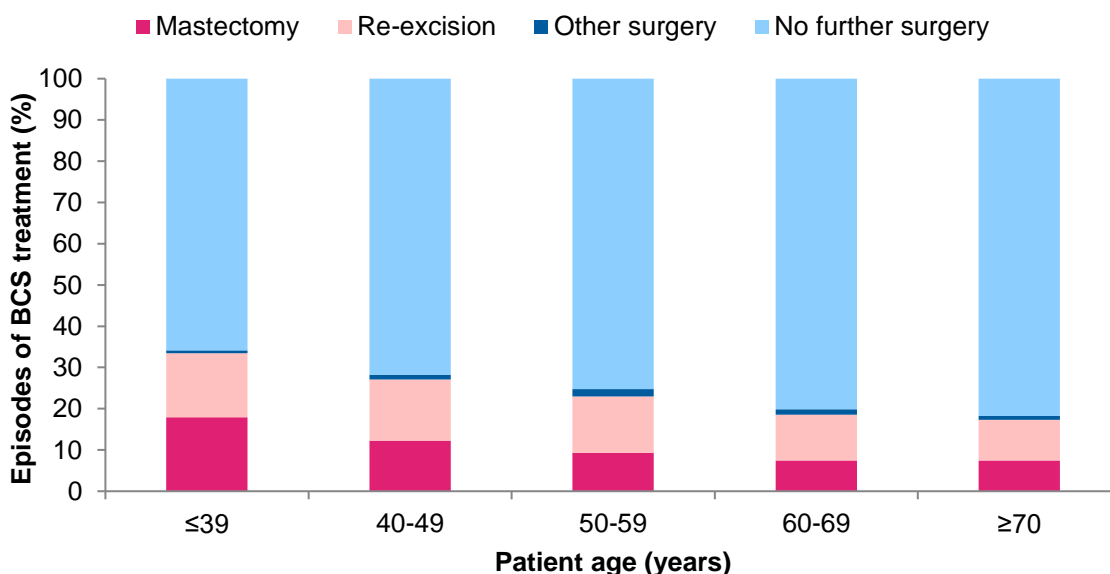
Figure 13: Surgery after breast conserving surgery (BCS) for breast cancer episodes diagnosed in 2019



Note: Further surgery is defined by intrusiveness e.g. a patient who had re-excision and a complete mastectomy would be counted under mastectomy. Excludes 5 breast conserving surgery episodes with missing information on cancer type (invasive or in situ). Data provided in Appendix 5, Table 13.

Figure 14 shows that as a patients age increases, they are less likely to undergo further surgery after breast conserving surgery. The proportion of episodes of breast conserving surgery that received no further surgery increased with patient age, with 66% of patients under 40 years of age receiving no further surgery compared with 82% of those above 69 years of age.

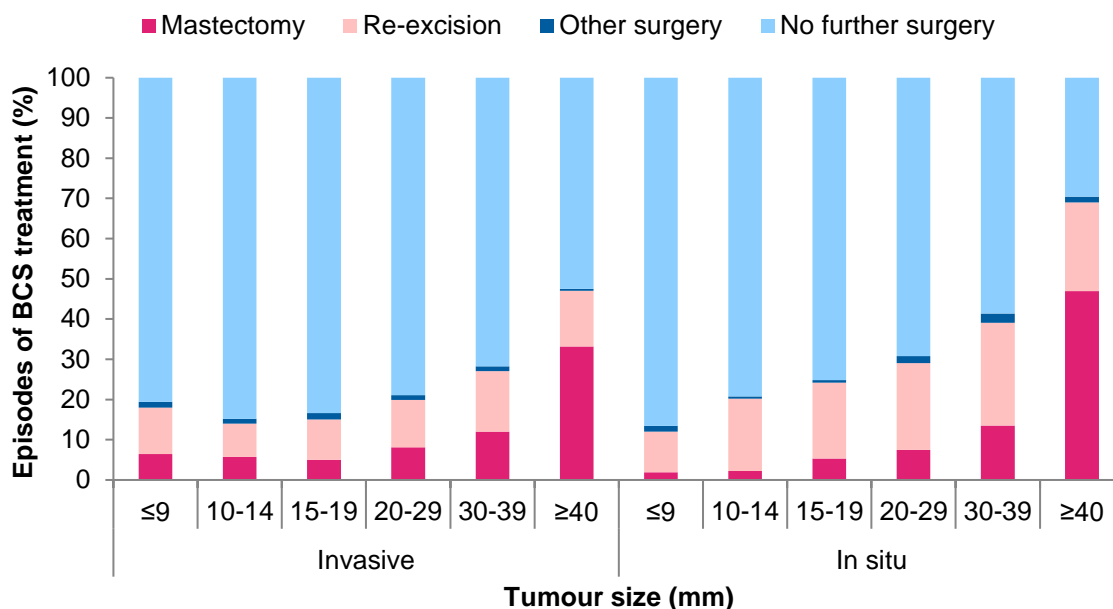
Figure 14: Surgery after breast conserving surgery (BCS) for breast cancer episodes diagnosed in 2019, by patient age



Note: 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 number of mastectomies increased with increasing tumour size, increasing greatly for tumours larger than 40mm, as shown in Figure 15. The incidence of re-excisions remained broadly similar across all classes of tumour sizes.

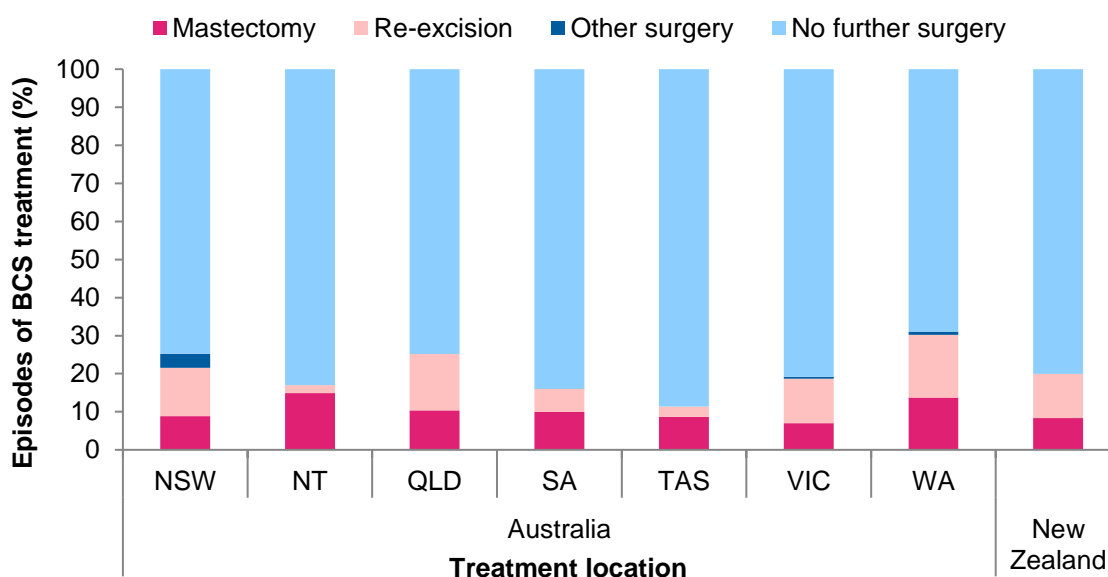
Figure 15: Surgery after breast conserving surgery (BCS) for breast cancer episodes diagnosed in 2019, by tumour size



Note: Excludes 109 breast conserving surgery episodes with missing information on tumour size. 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.

Across Australia and New Zealand, additional surgery after breast conserving surgery was most common in Western Australia (31%) and least common in Tasmania (11%) (see Figure 16). Mastectomy was the most common type of additional surgery in the Northern Territory (15%) and least common in Victoria (7%). Re-excision was most common in Western Australia (17%) and least common in Northern Territory (2%).

Figure 16: Surgery after breast conserving surgery (BCS) for breast cancer episodes diagnosed in 2019, by treatment location

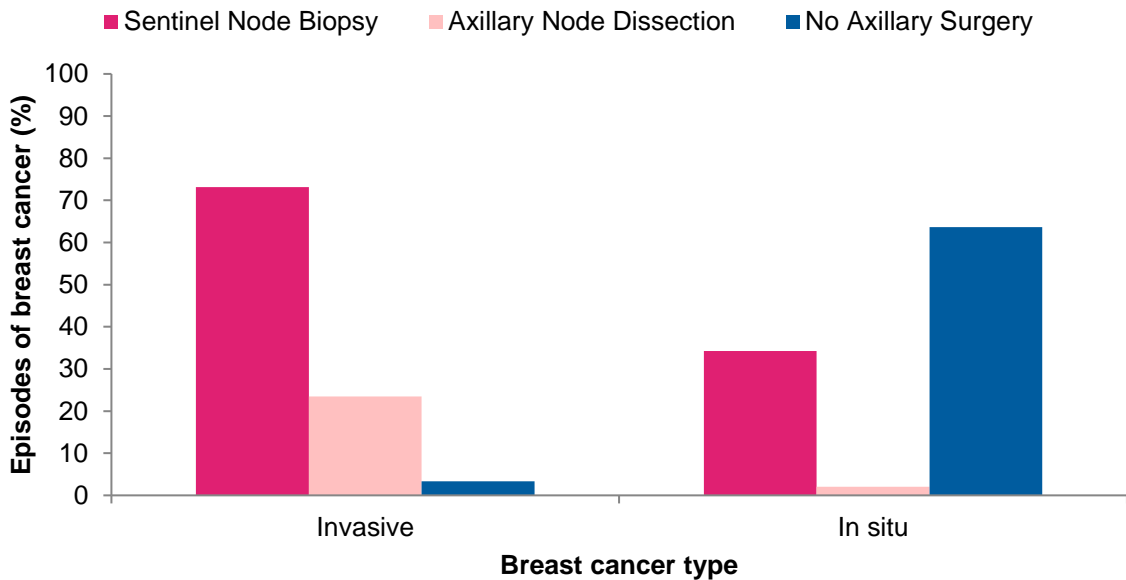


Note: Excludes 11 breast conserving surgery episodes with missing information on region. ACT data excluded due to small numbers. Further surgery is defined by intrusiveness e.g. a patient who had re-excision and a mastectomy would be counted under mastectomy. Data provided in Appendix 5, Table 16.

5.5. Axillary surgery

The majority of invasive tumours receive some form of axillary surgery (97%), compared with only a third (36%) of in situ tumours (see Figure 17). Most commonly, patients who have axillary surgery will have sentinel node biopsy only (73% of invasive cancers and 34% of in situ).

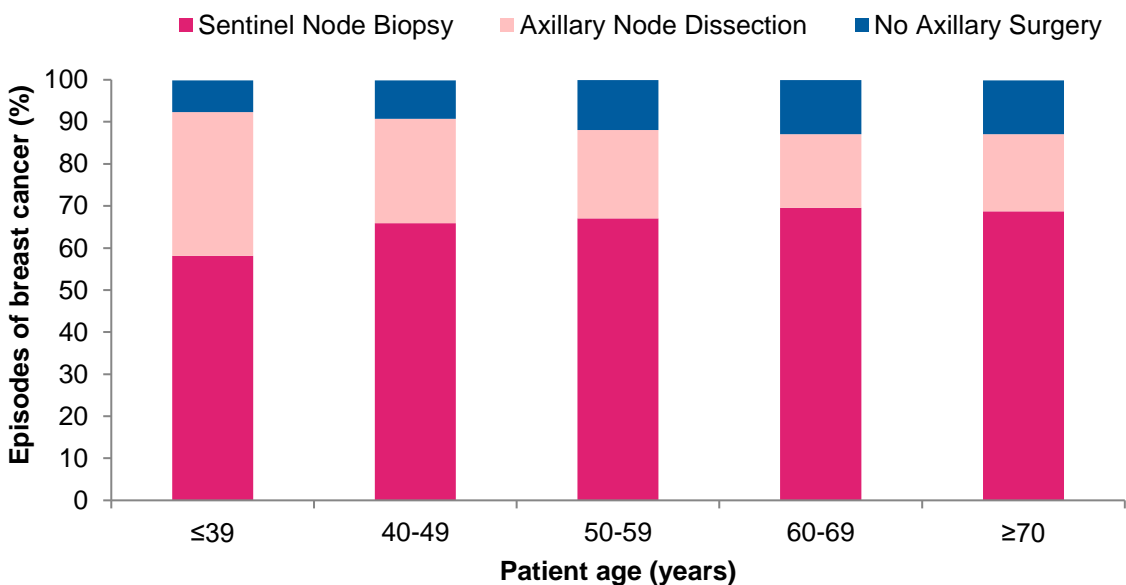
Figure 17: Axillary surgery for breast cancer episodes diagnosed in 2019, by cancer type



Note: Excludes 452 episodes with missing information on axillary surgery and 10 episodes with missing information on cancer type (invasive/in situ). 'Unknown level of axillary surgery' not shown due to very small numbers. Data provided in Appendix 5, Table 17.

Figure 18 shows that axillary node dissection was most common among patients under 40 years of age (34%) and decreased with increasing patient age. Sentinel node biopsy was most common among those aged 60–69 years (70%).

Figure 18: Axillary surgery for breast cancer episodes diagnosed in 2019, by patient age

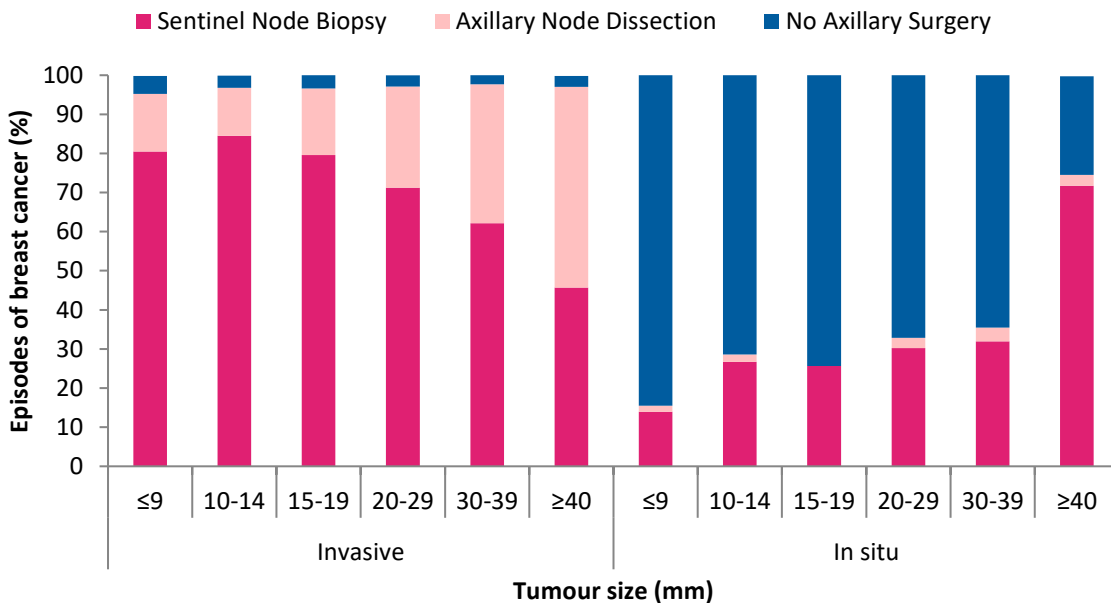


Note: Excludes 452 episodes with missing information on axillary surgery. 'Unknown level of axillary surgery' is not shown due to very small numbers. Data provided in Appendix 5, Table 18.

As shown in Figure 19, small invasive tumours are most likely to have only sentinel node biopsy (81% of tumours ≤ 9 mm). Axillary node dissection becomes more common for invasive cases as tumour size increases (from 15% of tumours ≤ 9 mm to 51% of tumours ≥ 40 mm).

Small in situ tumours are least likely to have any axillary surgery (15% of tumours ≤ 9 mm). As the tumour becomes larger, the likelihood of sentinel node biopsy increases (from 14% of tumours ≤ 9 mm to 72% of tumours ≥ 40 mm). Axillary node dissection is rare for in situ tumours.

Figure 19: Axillary surgery for breast cancer episodes diagnosed in 2019, by tumour size



Note: Excludes 395 episodes with missing information on axillary surgery and 164 episodes with missing tumour size. 'Unknown level of axillary surgery' is not shown due to very small numbers. Data provided in Appendix 5, **Table 19**.

5.6. Key Performance Indicators (KPIs)

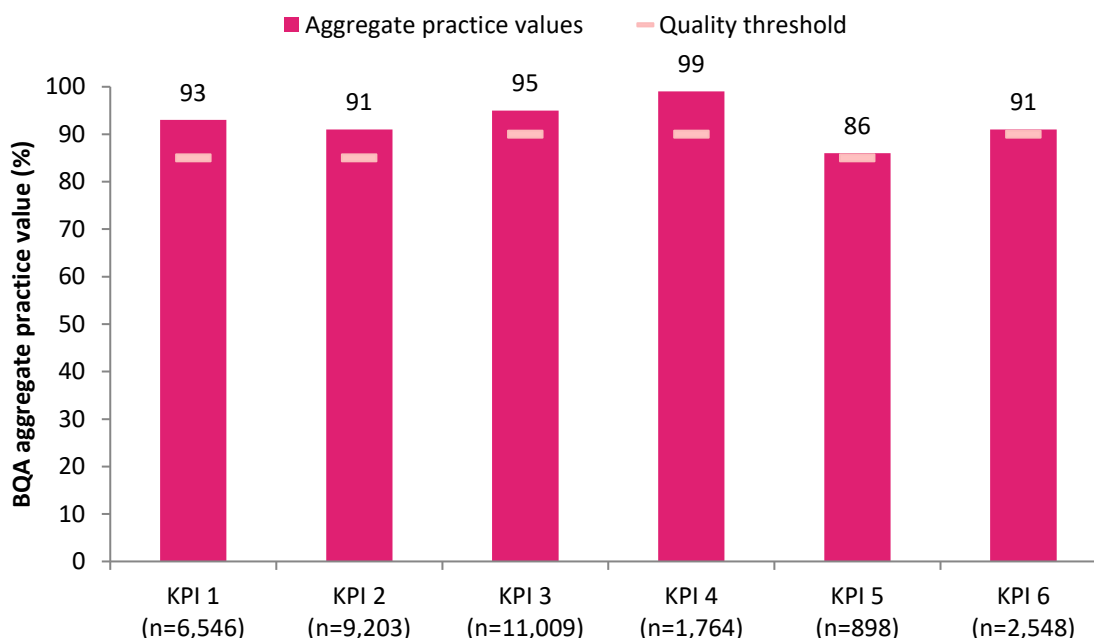
The BreastSurgANZ Quality audit is currently a self-reflective tool, with each surgeon having access via the audit portal to real-time results of their own performance against the KPI thresholds.

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 <i>in situ</i> 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 20 shows the combined performance of surgeons in Australia and New Zealand, for cases with diagnosis dates in 2019, through analysis of the aggregate dataset (i.e. combined data of all surgeons contributing data to the BQA for 2019). Aggregate data across Australia and New Zealand show BreastSurgANZ members are meeting all BQA KPIs, with performance on the first four KPIs (all introduced in 2004) well above the quality threshold. Performance for the more recent additions (KPI 5 and KPI 6 introduced in 2010 and 2016, respectively) is closer to the relevant quality thresholds.

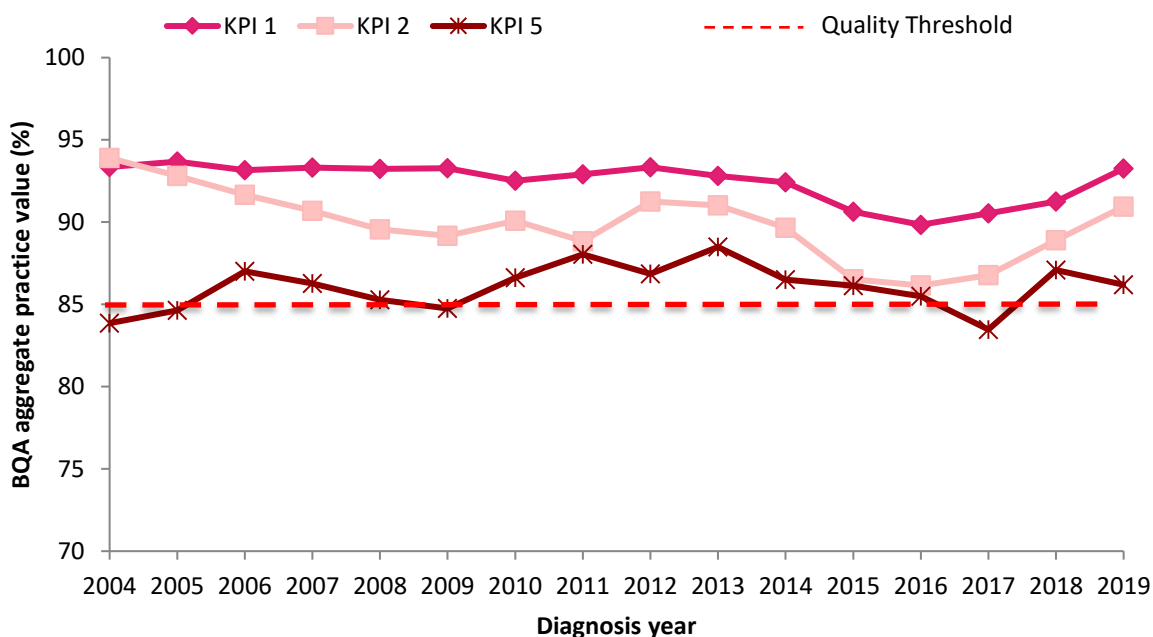
Figure 20: Key Performance Indicators – overall compliance for episodes diagnosed in 2019



Note: Excluded case counts for missing data are: 352 for KPI 1, 549 for KPI 2, 259 for KPI 3, 98 for KPI 4, 276 for KPI 5, and 289 for KPI 6. Data provided in Appendix 5, Table 20.

Figure 21 shows performance over time for KPIs with a quality threshold of 85% (KPI 1, 2 and 5). Performance against KPIs 1 and 2 has slowly been increasing since 2016 and is currently sitting at its highest rate in the last 10 years (93% for KPI 1 and 91% for KPI 2). Compliance with KPI 5 fluctuates, tending to fall just above the quality threshold of 85%.

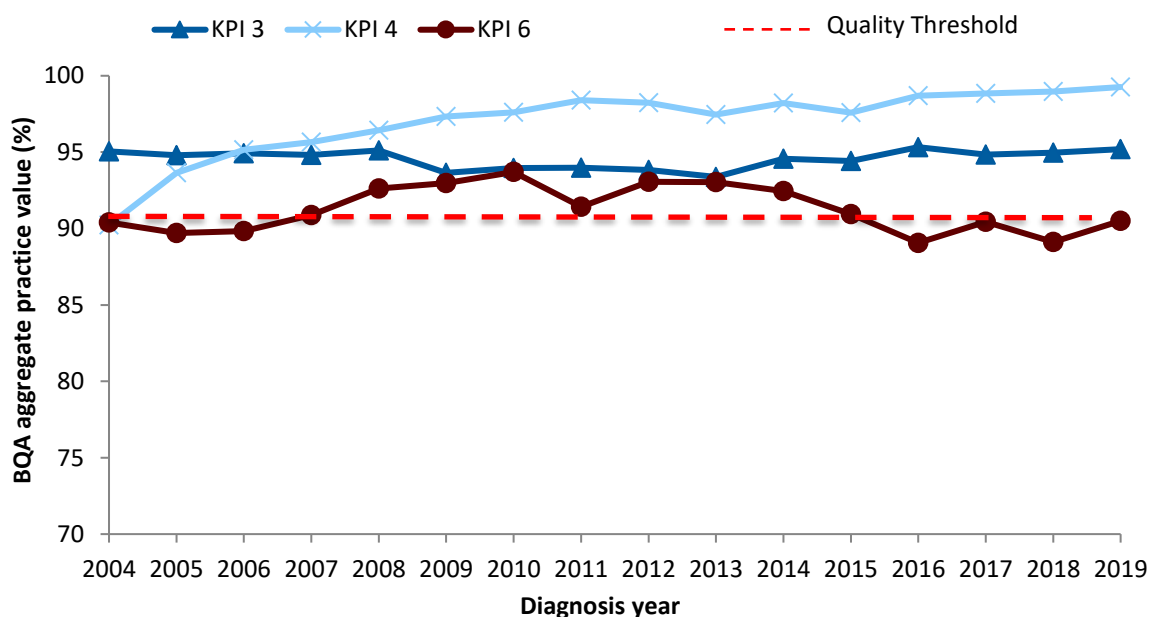
Figure 21: Key Performance Indicators with quality threshold at 85% – overall compliance by year



Note: Aggregate practice value is the combined data of all surgeons contributing data to the BQA for that year. Data provided in Appendix 5, Table 21.

Figure 22 shows performance over time for KPIs with a quality threshold of 90% (KPI 3, 4 and 6). Compliance with KPI 3 has been steady since its introduction. Performance against KPI 4 has slowly been increasing each year since the KPI was introduced and it had the highest compliance rate (99%) of all KPIs in 2019. Compliance with KPI 6 fluctuates, currently sitting at 91% in 2019.

Figure 22: Key Performance Indicators with quality threshold at 90% – overall compliance by year

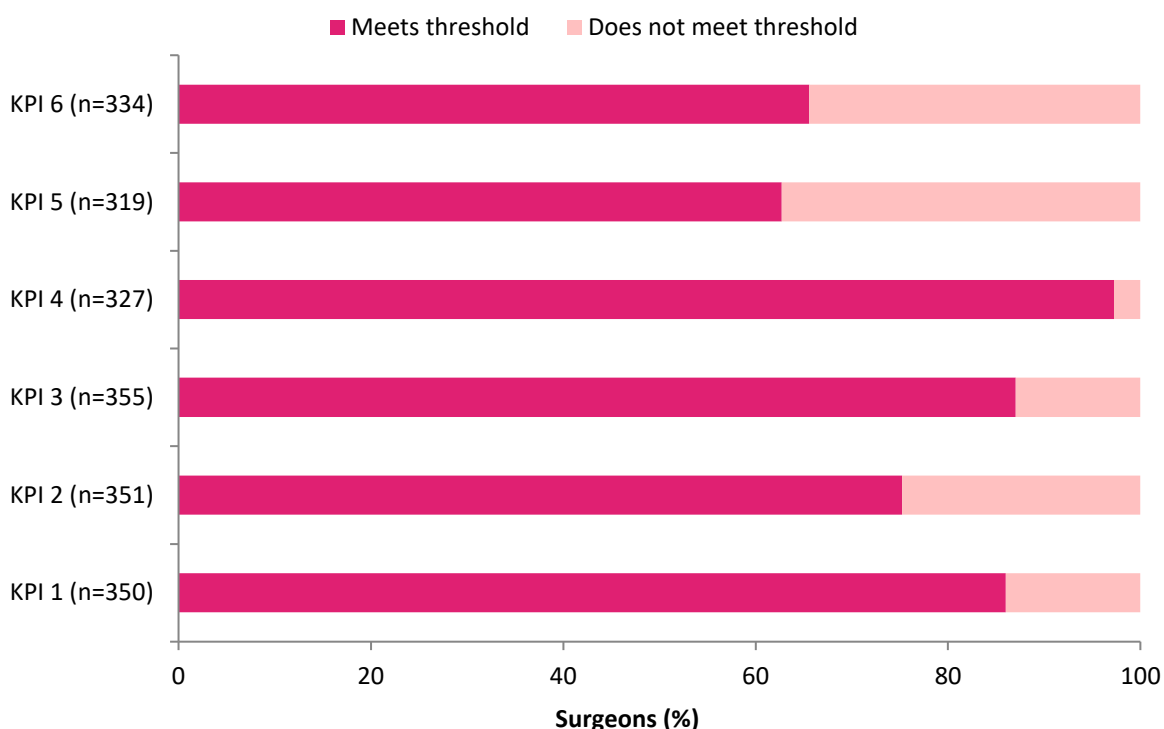


Note: Aggregate practice value is the combined data of all surgeons contributing data to the BQA for that year. Data provided in Appendix 5, Table 22.

Figure 23 provides a summary of whether surgeons are individually meeting the quality threshold set for each KPI. This figure shows a similar pattern to that of the combined aggregate compliance (see Figure 20: Key Performance Indicators – overall compliance for episodes diagnosed in 2019, with the proportion of surgeons meeting the threshold highest for KPI 4 (97%) and lowest for KPI 5 (63%). The proportion of surgeons meeting each KPI is lower than the aggregated KPI calculations, indicating that surgeons with lower KPI compliance may also be those submitting fewer cases to the audit.

Figure 23 highlights considerable variation in the KPI compliance of surgeons, with up to 36% of surgeons being non-compliant in some KPIs. The BQA recommends the roll out of a full cycle of clinical audit which would involve investigating surgeons who are non-compliant to discover why and offer additional support where appropriate. In addition to the expansion of the feedback loop providing additional support to BreastSurgANZ members, this program will help to bring the BQA in line with most of the Australian Commission on Safety and Quality in Health Care’s Framework for Australian clinical quality registries (*National arrangements for clinical quality registries*, no date). For further information on future plans in this area, see [section 7.1](#) of this report.

Figure 23: Key Performance Indicators – individual surgeon compliance for episodes diagnosed 2017–2019



Note: Analysis is performed on a three-year period so there are sufficient data to make meaningful conclusions. Surgeons who have no cases relevant to a KPI in the indicated period are excluded from that KPI calculation. Data provided in Appendix 5, **Table 23**.

6. RECENT AUDIT ACTIVITIES

6.1. Review of upload program

A review of the institutional upload program resulted in the audit team identifying areas for improvement. New processes have been implemented to address the timeliness of data submission via this method.

In addition, a research project is underway to provide further insight into the issues needing to be addressed. Interviews with data managers, being conducted by a student from the University of Adelaide, aim to offer a better understanding of their processes for submitting complete and accurate data to the BQA.

6.2. Review of data request process

Feedback from data requesters has revealed that there are gaps in the current process for requesting and retaining BQA data for research. The process and documentation has been reviewed and amended to take into consideration standard time periods of data retention for projects where research is published in peer-reviewed journals; the inclusion of multiple investigators on a project rather than the sole requester; and amendments to existing requests being treated as such rather than as new requests.

6.3. Updates to the BQA online portal

Small anomalies and inconsistencies in the BQA portal have been addressed in the following areas:

- data entry/edit rules
- completeness rules
- export report
- incomplete cases report
- surgeon summary screen auto-refresh
- administration functions

7. FUTURE CONSIDERATIONS

7.1. Full implementation of the BQA Clinical Quality Improvement Program

The BQA Clinical Quality Improvement Program will involve peer review of practice results for individual surgeons against each current [KPI](#). BreastSurgANZ Council has approved this process, with further information being disseminated to members. Implementation is expected in 2021.

7.2. Patient-reported outcome measures

Patient-reported outcome measures (PROMs) are assessments by patients on 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 PROM pilot for BQA patients in South Australia. The pilot will run separately from the audit and will not involve audit staff or data. Pilot collection of breast cancer PROMs in Adelaide commenced in 2020 but a suspension of in person recruitment at breast cancer clinics (to minimise the number of people and potential spread of COVID-19 through the oncology department) has led to a delay in the program completion.

This project is now due for completion in 2021 and the results will help to inform the BQA Subcommittee in deciding whether PROMs should be collected as a part of the BQA.

7.3. High Quality Performance Indicators (HQPIs)

[HQPIs](#) were introduced to the audit in 2017 as additional indicators for measuring quality care. The pilot period for these indicators has ended (as previously reported) and thresholds have been established by the BQA Subcommittee.

BreastSurgANZ Council is considering implementing these thresholds within the audit for surgeons to self-assess their performance. They will not form part of the BQA Clinical Quality Improvement Program mentioned in section 7.1.

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 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). After the success of the pilot, the National Breast Cancer Audit (as it was originally named) was implemented throughout Australia and New Zealand in 1999.

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

KPIs

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

The audit was launched as a stand-alone database where participants sent in their data to be entered by audit staff. In 2004, the audit moved online, providing a portal for participants to enter their data directly.

The BQA

In 2010, 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 via the audit. In late 2010, the society assumed ownership of the audit and it was 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 assessment for outliers, that is, those with low compliance with 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 BreastSurgANZ. Staff employed by RACS operate the audit under direction from BreastSurgANZ. The BQA Subcommittee acts as an advisory committee, which provides recommendations 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 in time to the point of care as feasible.

The audit collects patient treatment data under opt-out consent. Patient information forms are available from the audit website at www.surgeons.org/bqa for participants to provide to their patients.

Data collection

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 that the surgery is performed wholly or entirely by another surgeon (e.g. a surgical trainee was 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 every BreastSurgANZ member. Data is recorded against the account of the individual surgeon, rather than at the patient level (i.e. the audit reports on how an individual surgeon treats their patients, rather than on how an individual patient is treated across multiple surgeons). Each surgeon can see only 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* (National Health and Medical Research Council, 2001), that is, 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 currently defined as T 1–2, N 0–1, and M0 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 KPIs. It is optional to complete some or all of the fields in the Full Dataset, which contains more detailed datapoints, including follow-up. These fields are completed at the discretion of the surgeon (see [Appendix 3](#) for copies of each dataset).

The audit website publishes a data dictionary that is updated as changes to the dataset are made. It was originally created to conform to recommendations for minimum data requirements in breast cancer made by the National Breast Cancer Centre (now Cancer Australia), the College of Pathologists and the Department of Health.

Data submission

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

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

Data is submitted either directly by participants via the online portal, 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 data, and the need to work with timelines of other hospitals and audits for finalising their cases.

Participants can log into the online portal to:

- enter data
- view or add to existing data
- check their compliance with KPIs
- check their compliance with HQPIs
- check how many episodes they have entered
- export their data as an Excel file
- see a list of their incomplete cases and export these into Excel
- select the hospitals at which they operate, 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 with the signed permission of the surgeon concerned (data manager access application form available from the audit website). This allows the data manager to access and enter records on behalf of the surgeon at the hospitals indicated on the form. Data manager access enables:

- data entry and editing, and ability to see a list of incomplete cases and export those to Excel
- provision of a table summarising total annual episodes for each surgeon for whom data is entered (total episodes for that surgeon only against each hospital the data manager has access to for that surgeon).

Data manager access 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.
- 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 (Non-members are excluded from any quality assurance performance outliers process conducted by BreastSurgANZ).

Assessment

Participants can self-assess against six KPIs 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* (National Health and Medical Research Council, 2001) 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 (New Zealand Guidelines Group, 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%

For KPI 5, high risk is defined as invasive tumours of at least 50mm or with at least 4 positive lymph nodes.

For KPI 6, high risk is defined as 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 help desk for assistance.

Data protection and privacy

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 that 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. 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 must be informed of the audit prior to their data being entered, giving them the opportunity to opt out of having their medical information recorded. A patient information sheet available from the audit website outlines everything a patient needs 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 2019, audit staff were contacted directly by one patient who requested to opt out of the audit.

Data release requests and research

The BQA data release 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. Requests may be for custom extractions of a participant's own data or that of a hospital unit (with permissions from all surgeons involved), or for a de-identified subset of the database (once approved by BreastSurgANZ). The BQA received 10 requests for data in 2019.

The data is available for quality assurance, planning, and research purposes. All requests for data are reviewed by the BQA Subcommittee and endorsed by the BreastSurgANZ Council. The [audit webpage](#) provides the data release policy and application form.

Research using BQA data has resulted in a significant number of publications in internationally recognised journals. The audit has also engaged in 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 are available from the [audit 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		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Unknown		
Gender		Clinic reference				
<input type="checkbox"/> Female <input type="checkbox"/> Male		Hospital				
Indigenous Status <input type="checkbox"/> Non-Indigenous <input type="checkbox"/> Aboriginal <input type="checkbox"/> Torres Strait Islander <input type="checkbox"/> Both Aboriginal and Torres Strait Islander <input type="checkbox"/> Maori <input type="checkbox"/> Pacific Peoples <input type="checkbox"/> Unknown		Breast Care Nurse		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
		Multi-disciplinary Treatment		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
Diagnosis						
Diagnosis date (dd-mm-yyyy)		Menopausal status		<input type="checkbox"/> Pre <input type="checkbox"/> Peri <input type="checkbox"/> Post <input type="checkbox"/> Male		
Referral source		Gestational status		<input type="checkbox"/> Currently pregnant <input type="checkbox"/> Recently pregnant (last 12 months) <input type="checkbox"/> Not pregnant (now or last 12 mths)		
<input type="checkbox"/> Symptomatic from GP <input type="checkbox"/> Breast Screen Australia <input type="checkbox"/> Breast Screen Aotearoa (NZ) <input type="checkbox"/> Other						
Bilateral synchronous				<input type="checkbox"/> Yes <input type="checkbox"/> No		
Surgery – date (dd-mm-yyyy) No breast surgery <input type="checkbox"/>						
Open biopsy	CLE	Re-excision				
Total mastectomy	Reconstruction					
Axillary surgery – date (dd-mm-yyyy) No axillary surgery <input type="checkbox"/>						
Sentinel node	Level 1	Level 2	Level 3			
Invasive pathology						
Tumour size in mm		Histological grade of tumour		<input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2 <input type="checkbox"/> Grade 3		
Total extent of lesion in mm (DCIS plus invasive carcinoma)		Vascular/lymphatic invasion		<input type="checkbox"/> Present <input type="checkbox"/> Absent		
Histological type of tumour <input type="checkbox"/> Ductal NOS <input type="checkbox"/> Basal-like <input type="checkbox"/> Other neoplasm <input type="checkbox"/> Tubular <input type="checkbox"/> Invasive Lobular <input type="checkbox"/> Mixed type <input type="checkbox"/> Medullary <input type="checkbox"/> Mucinous		Receptor status Oestrogen Progesterone HER 2 Positive <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Negative <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Not done <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred but not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neoadjuvant therapies						
	Radiotherapy	Chemotherapy	SERMs	Ovarian ablation	Aromatase inhibitors	Herceptin (immunotherapy)
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refusal of any recommended treatment (multi-select)						
<input type="checkbox"/> No <input type="checkbox"/> BCS <input type="checkbox"/> Mastectomy <input type="checkbox"/> Axillary surgery <input type="checkbox"/> Radiotherapy <input type="checkbox"/> Chemotherapy <input type="checkbox"/> Hormone therapy <input type="checkbox"/> Unspecified refusal <input type="checkbox"/> Herceptin <input type="checkbox"/> Reconstruction						
Please note that all questions require a response except Gestational status, and Total extent of lesion.						

REPORT

Minimum Dataset: In situ (DCIS)

		<p>DCIS minimum data set form</p>	
Surgeon			
Patient details			
Surname (first 3 letters)		Postcode	
Date of birth	(dd-mm-yyyy)	Private/Public	<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Unknown
Gender	<input type="checkbox"/> Female <input type="checkbox"/> Male	Clinic reference	
Indigenous Status	<input type="checkbox"/> Non-Indigenous <input type="checkbox"/> Aboriginal <input type="checkbox"/> Torres Strait Islander <input type="checkbox"/> Both Aboriginal and Torres Strait Islander <input type="checkbox"/> Maori <input type="checkbox"/> Pacific Peoples <input type="checkbox"/> Unknown	Hospital	
		Breast Care Nurse	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
		Multi-disciplinary Treatment	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
Diagnosis			
Diagnosis date	(dd-mm-yyyy)		
Referral source	<input type="checkbox"/> Symptomatic from GP <input type="checkbox"/> Breast Screen Australia <input type="checkbox"/> Breast Screen Aotearoa (NZ) <input type="checkbox"/> Other		
Bilateral synchronous	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Menopausal status	<input type="checkbox"/> Pre <input type="checkbox"/> Peri <input type="checkbox"/> Post <input type="checkbox"/> Male		
Gestational status	<input type="checkbox"/> Currently pregnant <input type="checkbox"/> Recently pregnant (last 12 months) <input type="checkbox"/> Not pregnant (now or last 12 mths)		
Surgery date (dd-mm-yyyy)			
Open biopsy		CLE	
Total mastectomy		Reconstruction	No breast surgery <input type="checkbox"/>
Axillary surgery date (dd-mm-yyyy)			
Sentinel node		Level 1/sampling	Level 2
Level 3		No axillary surgery <input type="checkbox"/>	
DCIS pathology			
Tumour size in mm		Histological grade of tumour	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> 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	<input type="checkbox"/> No necrosis <input type="checkbox"/> Necrosis <input type="checkbox"/> Not applicable		
Adjuvant therapies			
	Radiotherapy	SERMs	Aromatase inhibitors
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred but not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refusal of any recommended treatment (multi-select)			
<input type="checkbox"/> No <input type="checkbox"/> BCS <input type="checkbox"/> Mastectomy <input type="checkbox"/> Axillary surgery <input type="checkbox"/> Radiotherapy <input type="checkbox"/> Chemotherapy <input type="checkbox"/> Hormone therapy <input type="checkbox"/> Unspecified refusal <input type="checkbox"/> Herceptin <input type="checkbox"/> Reconstruction			
Please note that all questions require a response except Gestational status			

Full Dataset



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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referred but not used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neo-adjuvant? Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Procedures

Diagnostic Procedures			Surgical Events #			Axillary Procedures #		
Diagnosis Method	Tick if applicable	Positive Y/N	Surgical Event	Surgery Date	Discharge Date	Surgical Event	Surgery Date	Discharge Date
Clinical Exam	<input type="checkbox"/>		Open Biopsy			Sentinel Node		
Mammography	<input type="checkbox"/>		CLE			Level 1		
Ultrasound	<input type="checkbox"/>		Re Excision			Level 2		
FNA-Cytology	<input type="checkbox"/>		Total Mastectomy			Level 3		
Core	<input type="checkbox"/>		Reconstruction			Unknown		
Other	<input type="checkbox"/>		Other					
			ABBI					

No Breast Surgery No Axillary surgery



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 #

<i>Receptor status #</i>	<i>Oestrogen</i>	<i>Progesterone</i>	<i>HER 2</i>
Positive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ordered but not yet known*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*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.

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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

Hospitals for which the audit has data with a 2019 diagnosis date (at point of data extraction, 21 September 2020).

AUSTRALIA: ACT

Calvary Private Hospital
National Capital Private Hospital

AUSTRALIA: NEW SOUTH WALES

Albury Base Hospital
Albury Wodonga Private Hospital
Auburn Hospital
Ballina District Hospital
Bankstown Lidcombe Hospital
Baringa Private Hospital
Bathurst Base Hospital
Belmont District Hospital
Blacktown Hospital
Bowral and District Hospital
Brisbane Waters Private Hospital
Calvary Hospital
Calvary Mater Newcastle
Campbelltown Hospital
Campbelltown Private 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
Griffith Base Hospital
Hornsby Ku-Ring-Gai Hospital
Hospital for Specialist Surgery
Hunters Hill Private Hospital
Hunter Valley Private Hospital
Lake Macquarie Private Hospital
Lingard Private Hospital
Lismore Base Hospital
Liverpool Hospital

Macquarie University Hospital
Mater Hospital
Moruya District Hospital
Mount Druitt Hospital
Nepean Private Hospital
Nepean Public Hospital
Newcastle Private Hospital
North Shore Private Hospital
Northern Beaches Hospital
Norwest Private Hospital
Orange Base Hospital
Port Macquarie Private Hospital
Prince of Wales Hospital
Prince of Wales Private Hospital
Royal Hospital for Women
Royal North Shore 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
Wagga Wagga Base Hospital
Waratah Private Hospital
Westmead Hospital
Westmead Private Hospital
Wollongong Hospital
Wollongong 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 – 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
Noosa Hospital – Mayne Health
Northwest 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 Andrew’s Private Hospital
St Andrew’s 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
Central Districts Private Hospital
Flinders Medical Centre
Flinders Private Hospital
Lyell McEwin Health Service
Millicent and District Hospital and Health Service
Modbury Public Hospital
Naracoorte Health Service
Royal Adelaide Hospital
St Andrew’s Hospital
The Queen Elizabeth Hospital
Western Hospital

AUSTRALIA: TASMANIA

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

AUSTRALIA: VICTORIA

Alfred Hospital
Austin Hospital
Ballarat Health Services
Barwon Health Geelong Hospital
Beleura Private Hospital
Bendigo Health Care Group
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
Frankston Hospital
Holmesglen Private Hospital

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John Fawkner Moreland Private Hospital
Knox Private Hospital
La Trobe Regional Hospital
Maroondah Hospital
Maryvale Private Hospital
Mildura Base Hospital
Mildura Private Hospital
Mitcham Private Hospital
Mount Waverley Private Hospital
Mulgrave Private Hospital
North East Health Wangaratta
Northpark Private Hospital
Northern Hospital
Peninsula Private Hospital
Peter MacCallum Cancer Institute
Ringwood Private Hospital
Royal Melbourne Hospital
Royal Women's Hospital
Southern Health – Dandenong 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)
The Bays 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
Ashburton Hospital
Auckland Hospital
Bidwill Trust Hospital
Boulcott Hospital
Bowen Hospital
Braemar Hospital
Breast Associates
Canterbury Breast Care
Christchurch Hospital
Dunedin Hospital
Gisborne Hospital
Hawkes Bay Hospital
Hutt Hospital
Manuka Street Hospital
Masterton Hospital
Mercy Hospital (Auckland)
Mercy Hospital (Dunedin)
Middlemore Hospital
Nelson Hospital
North Shore Hospital
Rotorua Hospital
Royston Hospital
Southern Cross Hospital (Epsom)
Southern Cross Hospital (Hamilton East)
Southern Cross Hospital (Invercargill)
Southern Cross Hospital (New Plymouth)
Southern Cross Hospital (Rotorua)
Southland Hospital
St Marks Breast Centre
Taranaki Base Hospital
Tauranga Hospital
Timaru Hospital
Waikato Hospital

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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
2004	5089	209
2005	6442	242
2006	9697	277
2007	10127	280
2008	11463	284
2009	12178	286
2010	13053	298
2011	13463	301
2012	13640	288
2013	14163	289
2014	15124	300
2015	15418	303
2016	15784	310
2017	14503	313
2018	15674	310
2019	13074	289

Table 2: PATIENT AGE DISTRIBUTION FOR EPISODES DIAGNOSED IN 2019

Cancer type	≤39	40–49	50–59	60–69	≥70	Total
Invasive	510	1664	2590	3076	3361	11201
In situ	55	269	528	565	389	1806
Cancer type missing	2	9	13	15	28	67
Total	567	1942	3131	3656	567	13074

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Table 3: INDIGENOUS ETHNICITY FOR EPISODES DIAGNOSED IN 2019

Non-Indigenous	Aboriginal	Torres Strait Islander	Both Aboriginal and Torres Strait Islander	Maori	Pacific Peoples	Unknown	Total
10749	70	4	1	227	90	1933	13074

Table 4: TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2019

Australia								New Zealand	Location missing	Total
ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
2	3597	71	2019	1182	220	3197	819	1940	27	13074

Table 5: REFERRAL SOURCE FOR EPISODES DIAGNOSED IN 2019

Symptomatic (from GP)	BreastScreen	Other	Referral Source missing	Total
6323	5207	1469	75	13074

Table 6: REFERRAL SOURCE FOR INVASIVE TUMOURS DIAGNOSED IN 2019

Referral Source	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	Total
Symptomatic (from GP)	892	808	837	1388	732	983	201	5841
BreastScreen	1243	980	693	669	244	226	75	4130
Other	380	221	186	173	85	97	45	1187
Referral source missing	5	7	5	10	3	1	12	43
Total	2520	2016	1721	2240	1064	1307	333	11201

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Table 7: REFERRAL SOURCE FOR IN SITU TUMOURS DIAGNOSED IN 2019

Referral Source	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	Total
Symptomatic (from GP)	96	56	43	68	38	139	28	468
BreastScreen	291	136	99	161	102	211	61	1061
Other	82	27	25	41	28	51	21	275
Referral source missing	0	0	0	1	1	0	0	2
Total	469	219	167	271	169	401	110	1806

Table 8: FINAL SURGERY FOR EPISODES DIAGNOSED IN 2019

Surgery category	Invasive	In situ	Cancer type missing	Total
Breast conserving surgery only	6776	1210	5	7991
Simple mastectomy	3126	351	4	3481
Mastectomy with reconstruction	801	201	2	1004
Other surgery	103	21	0	124
No surgery	215	9	3	227
Surgery information missing	180	14	53	247
TOTAL	11201	1806	67	13074

Table 9: FINAL SURGERY BY PATIENT AGE FOR EPISODES DIAGNOSED IN 2019

Surgery category	≤39	40–49	50–59	60–69	≥70	Total
Breast-conserving surgery only	241	1038	1991	2497	2224	7991
Simple mastectomy	159	491	690	875	1266	3481
Mastectomy with reconstruction	144	341	319	156	44	1004
Other surgery	2	15	46	37	24	124
No surgery	9	21	31	41	125	227
Surgery information missing	12	36	54	50	95	247
Total	567	1942	3131	3656	3778	13074

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Table 10: FINAL SURGERY BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2019

Surgery category	Invasive							Total
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Breast-conserving surgery only	1792	1501	1210	1428	491	316	38	6776
Simple mastectomy	464	367	380	627	452	814	22	3126
Mastectomy with reconstruction	211	117	96	136	89	149	3	801
Other	29	19	21	22	8	3	1	103
No surgery	23	12	11	23	22	22	102	215
Surgery information missing	1	0	3	4	2	3	167	180
Total	2520	2016	1721	2240	1064	1307	333	11201

Surgery category	In situ							Total
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Breast-conserving surgery only	403	173	140	206	112	110	66	1210
Simple mastectomy	40	34	16	45	31	169	16	351
Mastectomy with reconstruction	17	10	8	16	22	118	10	201
Other	8	1	1	4	4	3	0	21
No surgery	1	0	1	0	0	1	6	9
Surgery information missing	0	1	1	0	0	0	12	14
Total	469	219	167	271	169	401	110	1806

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Table 11: FINAL SURGERY BY TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2019

Surgery category	Australia								New Zealand	Treatment location missing	Total
	ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
Breast conserving surgery only	1	2303	40	1250	659	137	2169	430	991	11	7991
Simple mastectomy	0	826	29	596	353	62	600	270	738	7	3481
Mastectomy with reconstruction	0	261	1	109	25	16	354	110	126	2	1004
Other	0	102	0	1	2	0	13	4	2	0	124
No surgery	0	38	0	42	20	5	45	5	65	7	227
Surgery information missing	1	67	1	21	123	0	16	0	18	0	247
Total	2	3597	71	2019	1182	220	3197	819	1940	27	13074

Table 12: FINAL SURGERY BY REFERRAL SOURCE FOR EPISODES DIAGNOSED IN 2019

Surgery category	Symptomatic (from GP)	BreastScreen	Other	Referral source missing	Total
Breast conserving surgery only	3252	3918	811	10	7991
Simple mastectomy	2207	884	382	8	3481
Mastectomy with reconstruction	542	277	184	1	1004
Other	34	47	30	13	124
No surgery	172	17	36	2	227
Surgery information missing	116	64	26	41	247
Total	6323	5207	1469	75	13074

Table 13: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY FOR EPISODES DIAGNOSED IN 2019

Surgery category	Invasive	In situ	Cancer type missing	Total
Mastectomy	639	157	0	796
Re-excision	826	245	1	1072
Other surgery	96	18	0	114
No further surgery	5950	965	4	6919
Total	7511	1385	5	8901

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Table 14: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY BY PATIENT AGE FOR EPISODES DIAGNOSED IN 2019

Surgery category	≤39	40–49	50–59	60–69	≥70	Total
Mastectomy	53	147	209	205	182	796
Re-excision	46	178	306	303	239	1072
Other surgery	2	14	40	35	23	114
No further surgery	195	860	1685	2194	1985	6919
Total	296	1199	2240	2737	2429	8901

Table 15: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2019

Surgery category	Invasive							TOTAL
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Mastectomy	125	92	65	128	68	158	3	639
Re-excision	225	134	130	185	85	66	1	826
Other surgery	28	19	20	20	7	2	0	96
No further surgery	1567	1367	1080	1243	406	250	37	5950
Total	1945	1612	1295	1576	566	476	41	7511

Surgery category	In situ							TOTAL
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Mastectomy	8	4	8	17	18	100	2	157
Re-excision	42	32	28	49	34	47	13	245
Other surgery	6	1	1	4	3	3	0	18
No further surgery	361	141	112	157	78	63	53	965
Total	417	178	149	227	133	213	68	1385

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Table 16: FURTHER SURGERY AFTER BREAST CONSERVING SURGERY BY TREATMENT LOCATION FOR EPISODES DIAGNOSED IN 2019

Surgery category	Australia								New Zealand	Treatment location missing	Total
	ACT	NSW	NT	QLD	SA	TAS	VIC	WA			
Mastectomy	0	234	7	145	73	13	165	69	90	0	796
Re-excision	0	334	1	206	44	4	274	83	126	0	1072
Other surgery	0	98	0	0	1	0	11	4	0	0	114
No further surgery	1	1969	39	1044	615	133	1895	347	865	11	6919
Total	1	2635	47	1395	733	150	2345	503	1081	11	8901

Table 17: AXILLARY SURGERY FOR EPISODES DIAGNOSED IN 2019

Axillary surgery	Invasive	In situ	Cancer type missing	Total
Sentinel node biopsy	7931	605	4	8540
Axillary node dissection	2541	36	2	2579
Unknown level of surgery	10	1	0	11
No axillary surgery	364	1124	4	1492
Axillary surgery information missing	355	40	57	452
Total	11201	1806	67	13074

Table 18: AXILLARY SURGERY BY PATIENT AGE FOR EPISODES DIAGNOSED IN 2019

Axillary surgery	≤39	40–49	50–59	60–69	≥70	Total
Sentinel node biopsy	319	1249	2045	2477	2450	8540
Axillary node dissection	188	471	639	625	656	2579
Unknown level of surgery	1	3	1	2	4	11
No axillary surgery	41	173	364	458	456	1492
Axillary surgery information missing	18	46	82	94	212	452
Total	567	1942	3131	3656	3778	13074

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Table 19: AXILLARY SURGERY BY TUMOUR SIZE FOR EPISODES DIAGNOSED IN 2019

Surgery category	Invasive							Total
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Sentinel node biopsy	2021	1697	1359	1581	646	587	40	7931
Axillary node dissection	369	246	291	573	370	659	33	2541
Unknown level of surgery	5	2	0	1	0	2	0	10
No axillary surgery	115	63	58	64	24	36	4	364
Axillary surgery information missing	10	8	13	21	24	23	256	355
Total	2520	2016	1721	2240	1064	1307	333	11201

Surgery category	In situ							Total
	≤9mm	10–14mm	15–19mm	20–29mm	30–39mm	≥40mm	Tumour size missing	
Sentinel node biopsy	65	58	42	81	54	284	21	605
Axillary node dissection	7	4	0	7	6	11	1	36
Unknown level of surgery	0	0	0	0	0	1	0	1
No axillary surgery	393	155	122	180	109	100	65	1124
Axillary surgery information missing	4	2	3	3	0	5	23	40
Total	469	219	167	271	169	401	110	1806

Table 20: KEY PERFORMANCE INDICATORS – OVERALL COMPLIANCE FOR EPISODES DIAGNOSED IN 2019

	Compliance	Threshold	Numerator	Denominator	Excluded
KPI 1	93%	85%	6105	6546	352
KPI 2	91%	85%	8369	9203	549
KPI 3	95%	90%	10481	11009	259
KPI 4	99%	90%	1751	1764	98
KPI 5	86%	85%	774	898	276
KPI 6	91%	90%	2306	2548	289

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Table 21: KEY PERFORMANCE INDICATORS WITH QUALITY THRESHOLD AT 85% – OVERALL COMPLIANCE BY YEAR

KPI1				
Diagnosis year	Compliance	Numerator	Denominator	Excluded
2004	93%	2092	2241	311
2005	94%	2622	2799	264
2006	93%	4089	4389	359
2007	93%	4240	4544	421
2008	93%	4681	5021	383
2009	93%	4764	5108	370
2010	93%	5089	5501	469
2011	93%	5722	6159	267
2012	93%	5679	6085	235
2013	93%	5880	6335	228
2014	92%	6282	6797	387
2015	93%	6553	7231	285
2016	90%	6764	7529	277
2017	91%	6421	7092	247
2018	91%	6906	7568	324
2019	93%	6105	6546	352

KPI2				
Diagnosis year	Compliance	Numerator	Denominator	Excluded
2004	94%	2644	2816	713
2005	93%	3565	3841	671
2006	92%	5515	6017	870
2007	91%	5594	6168	991
2008	90%	6455	7208	931
2009	89%	6943	7786	992
2010	90%	7639	8479	997
2011	89%	8153	9177	726
2012	91%	8511	9326	714
2013	91%	8884	9760	646
2014	90%	9213	10277	837
2015	87%	9180	10611	657
2016	86%	9526	11058	502
2017	87%	8929	10290	427
2018	89%	9785	11006	534
2019	91%	8369	9203	549

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KPI5				
Diagnosis year	Compliance	Numerator	Denominator	Excluded
2004	84%	374	446	478
2005	85%	556	657	386
2006	87%	790	908	430
2007	86%	842	976	351
2008	85%	1002	1175	352
2009	85%	1001	1181	322
2010	87%	1101	1271	303
2011	88%	1171	1330	272
2012	87%	1143	1316	218
2013	88%	1184	1338	179
2014	87%	1161	1342	363
2015	86%	1168	1356	239
2016	85%	1143	1337	269
2017	83%	1005	1204	228
2018	87%	1065	1223	283
2019	86%	774	898	276

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Table 22: KEY PERFORMANCE INDICATORS WITH QUALITY THRESHOLD AT 90% – OVERALL COMPLIANCE BY YEAR

KPI3					KPI4				
Diagnosis year	Compliance	Numerator	Denominator	Excluded	Diagnosis year	Compliance	Numerator	Denominator	Excluded
2004	95%	3895	4098	330	2004	90%	397	440	300
2005	95%	4976	5249	333	2005	94%	574	613	340
2006	95%	7422	7818	619	2006	95%	826	868	465
2007	95%	7904	8336	422	2007	96%	967	1011	419
2008	95%	9175	9646	318	2008	96%	1192	1236	345
2009	94%	9618	10271	202	2009	97%	1602	1646	149
2010	94%	10465	11137	144	2010	98%	1671	1712	107
2011	94%	10920	11619	117	2011	98%	1654	1681	68
2012	94%	10983	11705	128	2012	98%	1727	1758	64
2013	93%	11213	12008	194	2013	97%	1840	1888	99
2014	95%	11967	12654	279	2014	98%	2035	2072	158
2015	94%	12215	12936	266	2015	98%	2110	2162	100
2016	95%	12632	13251	309	2016	99%	2104	2132	136
2017	95%	11713	12350	216	2017	99%	1887	1909	65
2018	95%	12540	13205	278	2018	99%	2107	2129	112
2019	95%	10481	11009	259	2019	99%	1751	1764	98

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KPI6				
Diagnosis year	Compliance	Numerator	Denominator	Excluded
2004	90%	696	770	1766
2005	90%	1228	1369	1260
2006	90%	2052	2284	831
2007	91%	2153	2369	870
2008	93%	2611	2819	767
2009	93%	2578	2773	694
2010	94%	2856	3048	743
2011	91%	2900	3172	613
2012	93%	3043	3270	487
2013	93%	2997	3221	423
2014	92%	2988	3232	607
2015	91%	3052	3356	473
2016	89%	2932	3292	466
2017	90%	2752	3043	334
2018	89%	2842	3189	295
2019	91%	2306	2548	289

Table 23: KEY PERFORMANCE INDICATORS – INDIVIDUAL SURGEON COMPLIANCE FOR EPISODES DIAGNOSED 2017–2019

	Threshold	Surgeons meeting threshold	Surgeons not meeting threshold	Surgeons with no relevant cases	Total
KPI 1	85%	301	49	6	356
KPI 2	85%	264	87	5	356
KPI 3	90%	309	46	1	356
KPI 4	90%	318	9	29	356
KPI 5	85%	200	119	37	356
KPI 6	90%	219	115	22	356

APPENDIX 6: REFERENCES

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