TE AHO O TE KAHU CANCER CONTROL AGENCY

Te Rēhita Mate Ūtaetae Breast Cancer Foundation National Register

Te Kāwanatanga o Aotearoa New Zealand Government

BREAST CANCER QUALITY PERFORMANCE INDICATOR TECHNICAL SPECIFICATIONS

2025

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We acknowledge that each data point that appears in or has contributed to the breast cancer reports represents a person or cluster of people who have been diagnosed with breast cancer. We extend our support to those people and their whānau whose lives will have been significantly affected by breast cancer. We are committed to sharing this data with the wider health sector to improve breast cancer screening, diagnosis and treatment across the country for all people in New Zealand.

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INTRODUCTION

Document purpose

This document provides technical specifications for the 10 breast cancer quality performance indicators (QPIs). For each QPI we have provided supporting information, a table and a flow diagram to help analysts replicate our calculations.

Please read this document in conjunction with the *Breast Cancer Quality Improvement Monitoring Report* (the monitoring report).

How the QPIs were developed

The breast cancer QPIs are part of the QPI programme of Te Aho o Te Kahu – Cancer Control Agency.

In early 2022, the Agency established the National Breast Cancer QPI Working Group (the working group) via a public call for nominations.

Together, we developed 26 potential breast cancer-specific QPIs. Drafts of these were publicly consulted on in August and September 2022.

In 2023, following feedback received during the consultation, the Agency undertook an analysis of the appropriateness of using Te Rēhita Mate Ūtaetae – Breast Cancer Foundation National Register (Te Rēhita) as the data source to calculate the breast cancer QPIs. This analysis looked at the completeness, quality and equity of the data Te Rēhita captured. It found Te Rēhita to be exemplary in all three areas. Additionally, the audit and governance processes for data in Te Rēhita were of high quality.

In late 2023, the Agency contracted the Breast Cancer Foundation New Zealand, as the funders of Te Rēhita, to work with the Breast Cancer New Zealand National Register Trust, which manages Te Rēhita, to calculate the breast cancer QPIs.

In 2024, the Agency, the Breast Cancer New Zealand National Register Trust and the working group developed the monitoring report, using 10 QPIs that were agreed had the greatest potential to inform clinical quality improvement based on need.

These technical specifications were developed in collaboration with the technical team of Te Rēhita and complement the monitoring report.

The 10 QPIs in this document

This document provides technical specifications for the following QPIs. Please note, from this point on, the abbreviation BrCQI is used – breast cancer quality indicator.

Indicator	Measure	Measure abbreviation	Measure type
BrCQI 1: Route to detection	Proportion of people with breast cancer by route to detection (BSA-detected vs non-BSA image detected vs symptomatic)	ClinicalStage	Quality improvement
BrCQI 2: Histological grading	Proportion of people with invasive breast cancer whose cancer had a histological grade of 3	HistoGrade3	Quality improvement
BrCQI 5: Breast-conserving surgery	Proportion of females with breast cancer (invasive and/or DCIS) who undergo breast-conserving surgery	FinalBreastSurgeryBCS	Quality improvement
BrCQI 6: Immediate reconstruction at the time of mastectomy	Proportion of females receiving reconstruction at the same time as a mastectomy	ImmediateRecon	Quality improvement
BrCQI 11: Chemotherapy with or without trastuzumab	Proportion of people: A. with triple-negative stage I–III breast cancer with a tumour >1 cm or node-positive who received chemotherapy B. with HER2-positive stage I–III breast cancer with a tumour >1 cm or node-positive who receive chemotherapy and trastuzumab	Chemo ChemoBio	Quality improvement
BrCQI 13: Neoadjuvant chemotherapy	Proportion of people with stage II or III breast cancer who are either triple-negative or HER2-positive and receive neoadjuvant chemotherapy, including neoadjuvant trastuzumab	NeoAdjChemo	Quality improvement

Indicator	Measure	Measure abbreviation	Measure type
BrCQI 14: Adjuvant endocrine therapy adherence	Proportion of females with endocrine-sensitive stage I–III breast cancer who complete two years of endocrine therapy (after their first script is dispensed) Measure: proportion still being dispensed endocrine therapy at: A. six months B. 12 months C. 24 months	EndxAdhere	Quality improvement
BrCQI 23: Timely diagnosis	Proportion of patients for whom time from referral to diagnosis of breast cancer is within 28 days This time period is measured as: A. for BSA-detected females, the date of the screening mammogram, to the date of diagnostic biopsy (including cytological procedure) B. for symptomatic females, the date of the receipt of specialist referral to the date of diagnostic biopsy (including cytological procedure) C. for females with non-BSA image detected breast cancer, the date of the initial abnormal imaging to the date of diagnostic biopsy (including cytological procedure)	TimetoDiag	Quality improvement
BrCQI 24: Time to surgery	Proportion of females treated with surgery (excluding females having neoadjuvant chemotherapy or neoadjuvant endocrine therapy) within: A. six weeks of decision to treat with breast surgery B. eight weeks of decision to treat with breast surgery and undergoing immediate reconstruction	TimetoSurg6wk TimetoSurg8wk	Quality improvement
BrCQI 26: Access to radiation therapy	Proportion of patients with invasive cancer who start adjuvant radiation therapy within: A. eight weeks of surgery B. six weeks of completing adjuvant chemotherapy	SurgtoRad ChemotoRad	Quality improvement

Data sources

Te Rēhita Mate Ūtaetae Mate Ūtaetae – Breast Cancer Foundation National Register

Te Rēhita is a national collection of information on breast cancer from people diagnosed in New Zealand. It collects data from a broad range of sources to identify new diagnoses and local and distant recurrences and to ensure data quality and completeness. Sources include the New Zealand Cancer Registry (NZCR), other national collections, local hospital lists (multidisciplinary team meetings, Faster Cancer Treatment data, oncology and palliative care), New Zealand electronic Prescribing Service (NZePS), Breast Screening Aotearoa (BSA), private providers, GPs and other sources to help ensure that all cases are collected, including those who do not have a tissue biopsy diagnosis (eg, metastatic and elderly endocrine-only people).

People with synchronous bilateral breast cancer are counted once, unless noted in the BrCQI. Likewise, people who had two primary breast cancers diagnosed (one in 2020 and a second in 2021) are counted once using their earliest diagnosis.

Te Rēhita data was used to derive further variables:

- Rurality: Urban/rural population profile was derived using the register field DomicileCodeAtDiagnosis and geographic classification for health (GCH) rural–urban codes.
- Deprivation: Socioeconomic deprivation level was derived using the register field DomicileCodeAtDiagnosis and New Zealand Index of Deprivation (NZDep18) codes.
- Diagnosis type: High-level diagnosis type (invasive or DCIS) was derived using the pathological TNM stage group and the clinical TNM stage group where no surgery occurred, or neo-adjuvant treatment was given. Stage I-IV are derived to invasive, and Stage 0 to DCIS.
- Stage: Anatomic stage group is derived from clinical and pathological TNM stage fields using AJCC Breast Cancer Staging System 8th edition Anatomic Stage table, p 625.[1] This is based solely on anatomic extent of cancer as defined by the T, N and M categories. Note: Clinical stage is used for BrCQI 1 – Route to diagnosis, while other indicators use overall stage. See the Appendices for the calculation tables.

Te Rēhita contributing regions

Before 1 January 2020, breast cancer data was collected in four regions: Auckland (inception date, 1 June 2000) Waikato (inception date, 1 June 2005, prospective and retrospective data from 1991), Wellington (inception date, 1 January 2010) and Christchurch (inception date, 15 June 2009), covering the following Health New Zealand | Te Whatu Ora (Health New Zealand) districts, previously known as district health boards

[1] American Joint Committee on Cancer. 2018. *AJCC Cancer Staging Manual* (Vol 4). Springer. https://doi.org/10.10007/978-3-319-40618-3

(DHBs) – Auckland, Canterbury, Capital & Coast, Counties Manukau, Hutt Valley, Waikato, Wairarapa, Waitematā and West Coast.

From 1 January 2020, data from every Health New Zealand region has been collected in Te Rēhita. The new Health New Zealand districts that joined in 2020 are Northland, Bay of Plenty, Tairāwhiti, Lakes, Taranaki, Hawke's Bay, MidCentral (Palmerston North), Wairarapa, Nelson Marlborough, South Canterbury and Southern. National data from 1 January 2020 is used in this report unless specified.

Te Rēhita ineligible people

Te Rēhita excludes any people diagnosed overseas and as described below.

- Female and male people who do not reside in New Zealand at the time of their confirmed diagnosis of invasive breast cancer, DCIS or LCIS, and other breast lesions (Paget's disease, breast sarcomas and borderline/malignant phyllodes tumours).
- Any patient with a previous history of breast cancer before the regional register inception dates (see dates under contributing regions), diagnosed with loco-regional recurrence or metastatic disease.

Pharmaceutical Collection data set

The Health New Zealand national Pharmaceutical Collection (PHARMS) holds all community/pharmacy dispensed medications and excludes hospital dispensed medications. Dispensing data (chemical name, date dispensed, quantity dispensed and days of supply) was sourced from Pharms for BrCQI 14 – Adjuvant endocrine therapy adherence.

Te Rēhita NHIs were data matched to the PHARMS database by Health New Zealand. All dispensed medication for each matched NHI was extracted and returned to Te Rēhita on 9 January 2024. At the time of the data request Health New Zealand was only able to provide medication dispensed up to 21 December 2022. All females with at least one dispensed endocrine therapy after the date of primary surgery were deemed to have started adjuvant endocrine therapy.

Endocrine data for females who died during the follow up period (2020–2022) was sourced from Te Rēhita. This data was entered by the data team using NZePS. Both the PHARMS and Te Rēhita endocrine patient data sets were then joined with Te Rēhita data.

Exclusions

The following additional exclusions have been applied to the 10 breast cancer BrCQIs.

- People aged older than 18 years at the time of diagnosis.
- People with morphology of invasive carcinoma (histological type) = "Neuroendocrine tumour – well differentiated" or "Neuroendocrine tumour poorly differentiated".
- For all BrCQIs, except 1, 2 and 23, – people who receive all their treatment (surgery, chemotherapy, biological, endocrine, immunotherapy or radiation therapy) at a private facility. If a person has a mixture of public and private treatment they are counted in the denominator but not the numerator.
- Episodes of loco-regional recurrences of 2020–2021 diagnoses.

BrCQI 1: Route to detection

Proportion of people with breast cancer by route to detection:

A. Proportion of females with breast cancer by BSA-detection

B. Proportion of people with breast cancer by non-BSA image detection

C. Proportion of people with breast cancer detected by symptomatic presentation.

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/ core biopsy/cytology) was performed that confirmed invasive breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented date is used (history, clinical exam, mammogram, ultrasound, bone scan, haematology, biochemistry, tumour markers, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High-level diagnosis category: invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern[2]
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019

[2] The register and Te Aho o Te Kahu regional hubs differ slightly with Taranaki DHB covered under Midland hub in Te Rēhita, but Taranaki is part of the central hub for Te Aho o Te Kahu.

[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis[3]	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_PreProcedure]	SourceOfReferral	Source of referral. Categorised as Breast Screen Aotearoa; Symptomatic (GP (symptomatic), Emergency department, A&E after hours, Other (specify), Other department; same hospital, Other hospital, Private hospital and Private specialist); and Non-BSA image detected (high risk surveillance imaging, private screening, and annual follow-up imaging after a breast cancer episode)
[WORKUP_PreProcedure]	ClinicalTStage	Clinical tumour (T) stage pre-surgery using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalNStage	Clinical node (N) stage pre-surgery, using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalMStage	Clinical metastatic disease (M) stage pre-surgery, using AJCC edition 8

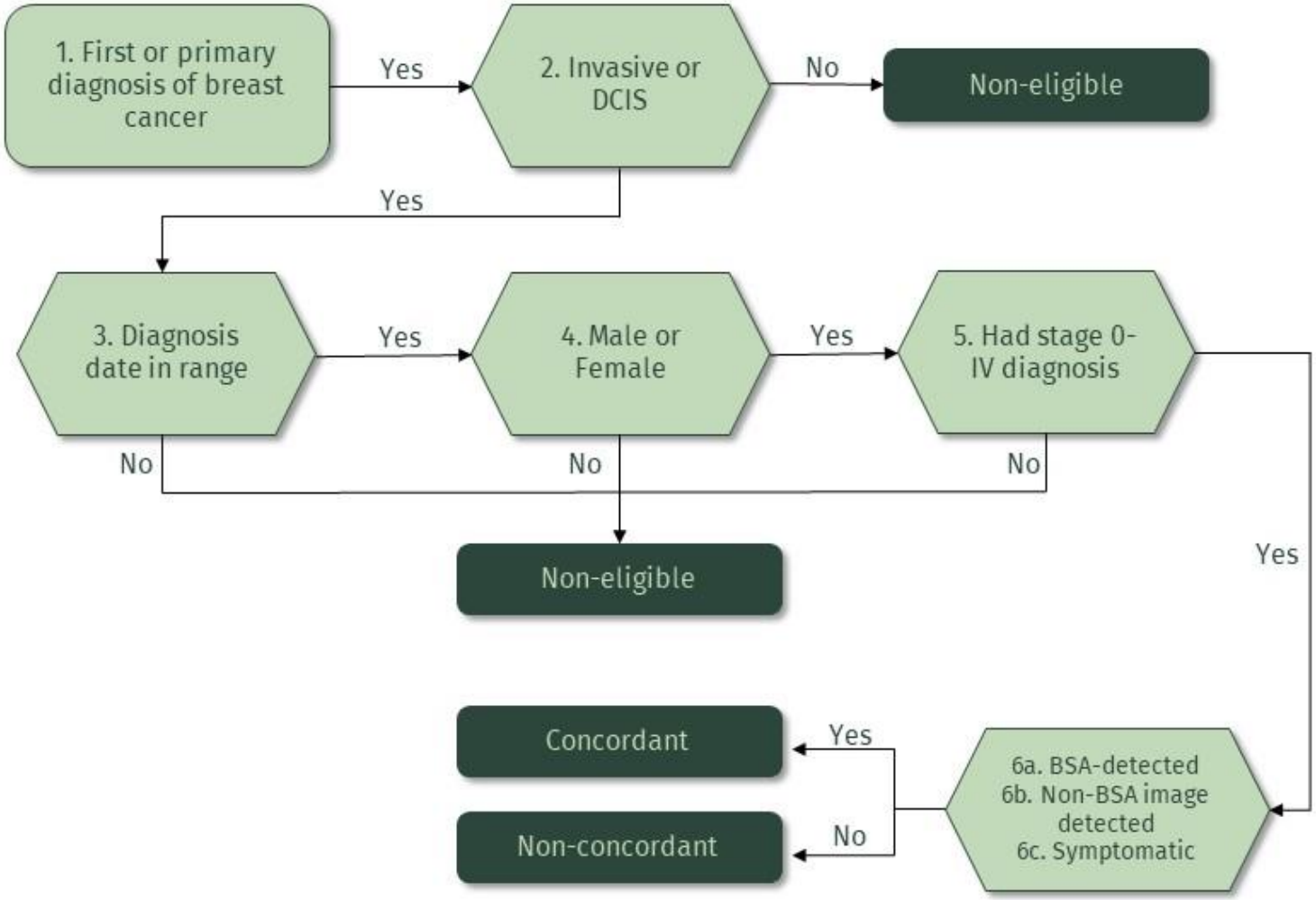
[3] DomicileCodeAtDiagnosis will be used to derive the socioeconomic deprivation level and urban/rural population profile.

Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509, D051, D058, D059)
2	Eligible patient	DiagnosisType	Invasive and DCIS
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female
5	Stage	ClinicalStage	0, I, II, III, IV Derived from clinical TNM stage fields

Numerator criteria

Diagram reference	Assessment	Item	Codes
6	Number of people with breast cancer by route to detection: A. BSA-detected B. Non-BSA image detected C. Symptomatic	SourceOfReferral	A. BSA-detected = [BreastScreen Aotearoa] B. Non-BSA image detected = [Screen detected - non BSA] C. Symptomatic = [GP (symptomatic)], [Emergency department], [A&E after hours], [Other (specify)], [Other department; same hospital], [Other hospital, [Private hospital], [Private specialist]


1. First or primary diagnosis of breast cancer
Yes
2. Invasive or DCIS
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Had stage 0-IV diagnosis
No
No
No
Non-eligible
Yes
Concordant
Yes
Non-concordant
No
6a. BSA-detected
6b. Non-BSA image detected
6c. Symptomatic

BrCQI 2: Histological grading

Proportion of people with invasive breast cancer whose cancer had a histological grade of 3.

Data items

Data set (table)	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High-level diagnosis category: invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis

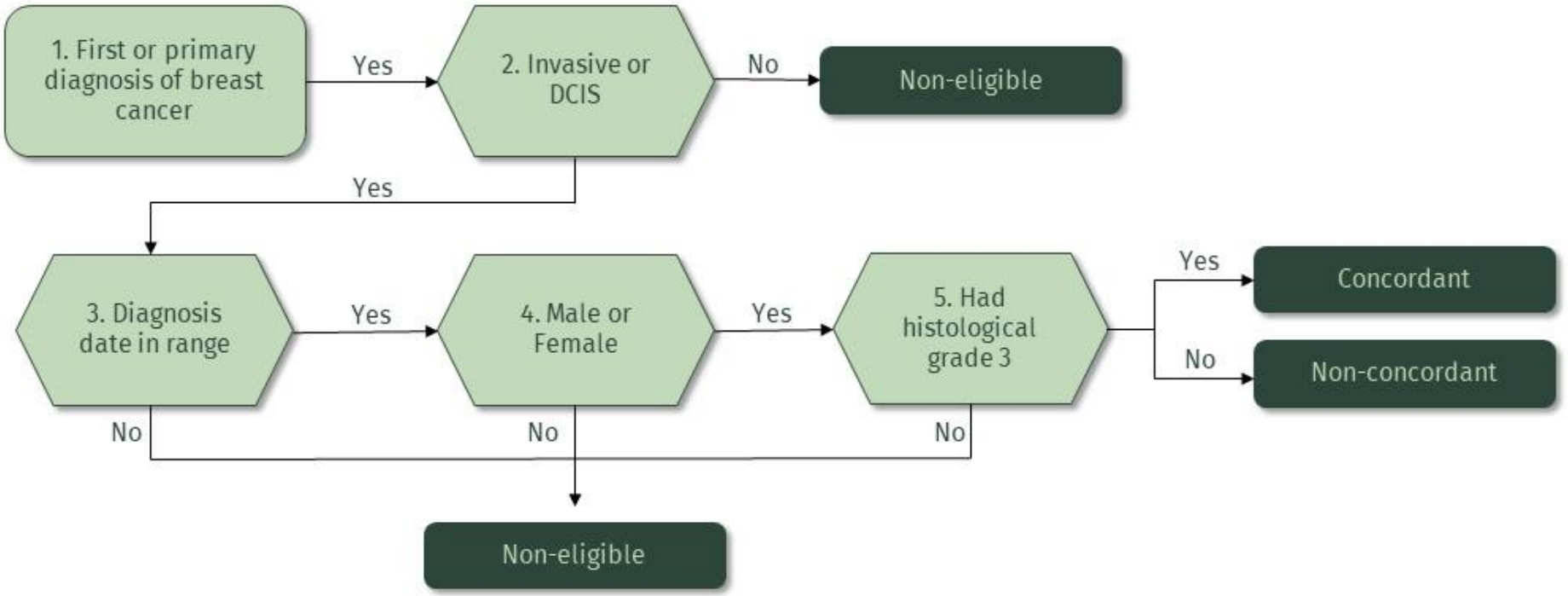
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_SubProcedure]	Lesion	The number of lesions (up to three lesions). For multiple lesions, the most invasive one is chosen first and then largest
[WORKUP_SubProcedure]	BreastSide	Left or right
[WORKUP_SubProcedure]	CoreBiopsyBreastResult	The result of Core Biopsy which may be described as Normal (B1), Benign (B2), Uncertain malignant potential/ indeterminate (B3), Suspicious (B4), Malignant in situ (B5a), Malignant invasive (B5b)
[WORKUP_SubProcedure]	HistologicalInvasiveCancerGrade	The degree of differentiation of the breast cancer or the degree to which it resembles normal tissue as assessed by the pathologist according to three components of the tumour based on surgical excision. This is recorded for up to 3 lesions per diagnosis
[WORKUP_SubProcedure]	CoreBiopsyInvasiveCancerGrade	Invasive cancer grade at the time of core biopsy. This is recorded for up to 3 lesions per diagnosis

Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509)
2	Eligible patient	DiagnosisType	Invasive
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female

Numerator criteria

Diagram reference	Assessment	Item	Codes
5	Number of people with invasive breast cancer with a final histological grade of 3 who meet case eligibility criteria	HistoGrade 3	Take the highest recorded grade across all lesions from either [HistologicalInvasiveCancerGrade] or [CoreBiopsy InvasiveCancerGrade] Grade = 3


1. First or primary diagnosis of breast cancer
Yes
2. Invasive or DCIS
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Had histological grade 3
Yes
Concordant
No
Non-concordant
No
No
No
Non-eligible

BrCQI 5: Breast-conserving surgery

Proportion of females with breast cancer (invasive and/or DCIS) who undergo breast-conserving surgery (BCS).

Data items

Data set (table)	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High-level diagnosis category: Invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019

[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_PreProcedure]	PrimarySurgery	If surgical procedure has been performed
[SXPRIMARY_SubProcedure]	SiteHealthFacilityOfSurgery	Type (public or private) health facility or hospital where surgery was performed
[SXPRIMARY_SubProcedure]	DHBOfPrimarySurgery	DHB of service where surgery was performed
[SXPRIMARY_SubProcedure]	DateOfSurgery	Date surgical procedure performed
[SXPRIMARY_SubProcedure]	RightBreastTypeOfBreastSurgery	Type of surgical procedure performed on right breast
[SXPRIMARY_SubProcedure]	LeftBreastTypeOfBreastSurgery	Type of surgical procedure performed on left breast

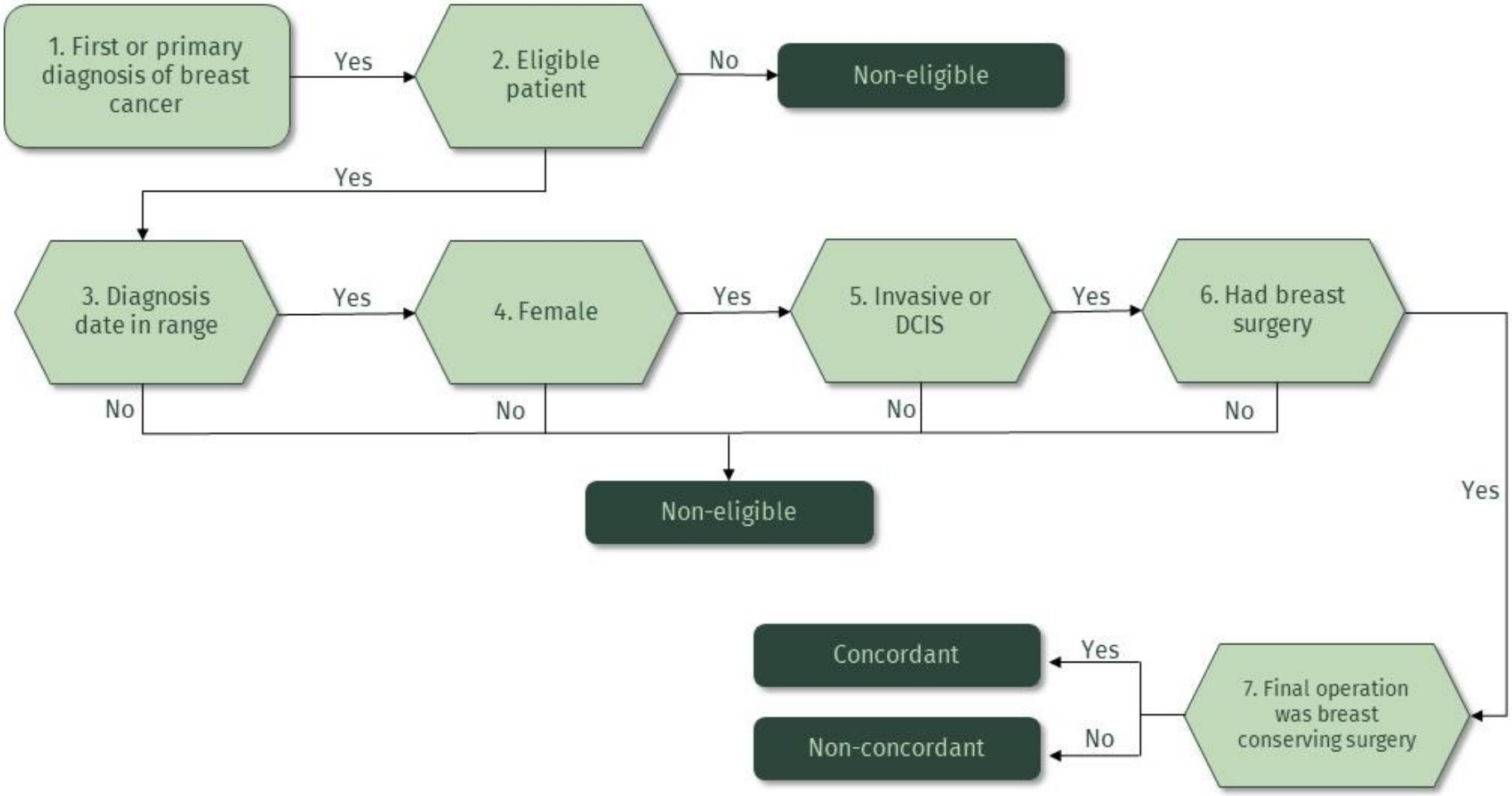
Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509, D051, D058, D059)
2	Eligible patient	SiteHealthFacilityOfSurgery	Public Note. Where a person has a mix of private and public breast surgeries, include this person as public
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Female
5	Diagnosis type	DiagnosisType	Invasive and DCIS
6	Breast Surgery Type	LeftBreastTypeOfBreastSurgery, RightBreastTypeOfBreastSurgery	Type of final surgical procedure performed on either breast when Final [RightBreastTypeOfBreastSurgery] is either Lumpectomy/ excision biopsy, WLE/ Partial mastectomy, Axillary surgery only, or mastectomy Or [LeftBreastTypeOfBreastSurgery] is either Lumpectomy/ excision biopsy, WLE/ Partial mastectomy, Axillary surgery only, or mastectomy

Numerator criteria

Diagram reference	Assessment	Item	Codes
7	Number of newly diagnosed people whose primary breast cancer (invasive and/or DCIS) operation is a form of breast-conserving surgery.	FinalBreastSurgeryBCS	When Final LeftBreastTypeOfBreastSurgery= Lumpectomy/ excision biopsy, WLE/ Partial mastectomy or Final RightBreastTypeOfBreastSurgery= Lumpectomy/ excision biopsy, WLE/ Partial mastectomy or Axillary surgery only is the sole surgery performed then Yes Else No[4]

[4] Note: there is no limitation on when a final surgery is performed.


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Female
Yes
5. Invasive or DCIS
Yes
6. Had breast surgery
No
No
No
No
Non-eligible
Yes
Concordant
Yes
Non-concordant
No
7. Final operation was breast conserving surgery

BrCQI 6: Immediate reconstruction at the time of mastectomy

Proportion of females receiving breast reconstruction at the same time as a mastectomy.

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/ core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age

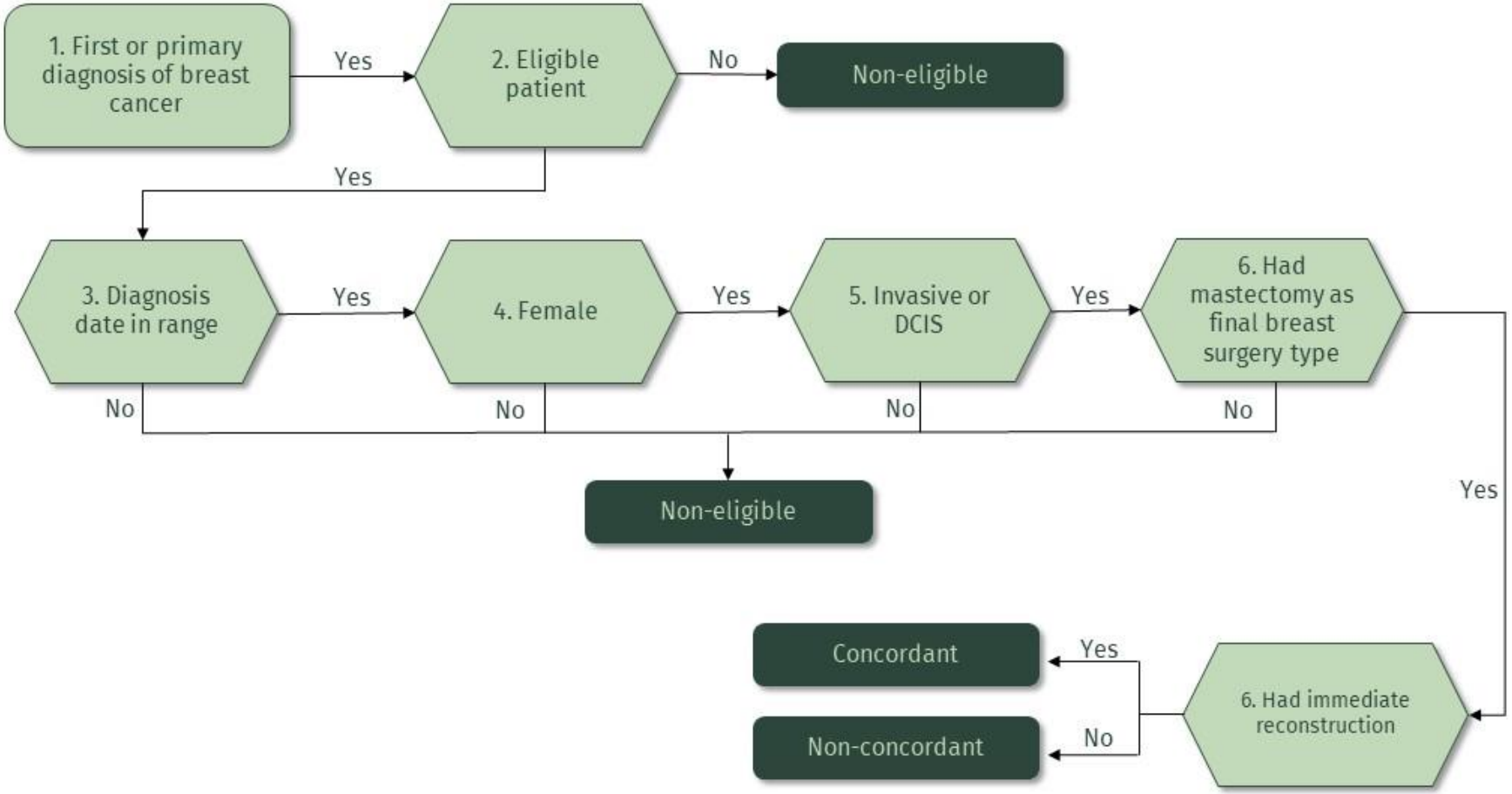
		groupings, <20, 20-24, 25-29, 30-34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[SXPRIMARY_SubProcedure]	DateOfSurgery	DHB of service where surgery was performed
[SXPRIMARY_SubProcedure]	SiteHealthFacilityOfSurgery	Type (public or private) health facility or hospital where surgery was performed
[SXPRIMARY_SubProcedure]	DHBOfPrimarySurgery	DHB of service where surgery was performed
[SXPRIMARY_SubProcedure]	RightBreastTypeOfBreastSurgery	Type of surgical procedure performed on right breast
[SXPRIMARY_SubProcedure]	LeftBreastTypeOfBreastSurgery	Type of surgical procedure performed on left breast
[RECONSTRUCT_SubProcedure]	DateOfReconstruction	Date of reconstruction surgery
[RECONSTRUCT_SubProcedure]	SiteHealthFacilityOfReconstruction	Type (public or private) health facility or hospital where reconstruction was performed
[RECONSTRUCT_SubProcedure]	DHBOfReconstruction	DHB where reconstruction was performed
[RECONSTRUCT_SubProcedure]	TimingOfReconstruction	If timing of reconstruction is delayed or immediate

Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509, D051, D058, D059)
2	Eligible patient	SiteHealthFacilityOfSurgery	Public
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Female
5	Diagnosis type	Diagnosis Type	Invasive and DCIS
6	Mastectomy surgery	LeftBreastTypeOfBreastSurgery, RightBreastTypeOfBreastSurgery	Mastectomy [Derivation: Type of surgical procedure performed on either breast When LeftBreastTypeOfBreastSurgery, or RightBreastTypeOfBreastSurgery =Mastectomy then Mastectomy]

Numerator criteria

Diagram reference	Assessment	Item	Codes
7	Numerator: Number of people who receive reconstruction at the same time as mastectomy	Immediate Recon	Females who have breast reconstruction AND TimingOfReconstruction == “Immediate”


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Female
Yes
5. Invasive or DCIS
Yes
6. Had mastectomy as final breast surgery type
No
No
No
No
Non-eligible
Yes
Concordant
Yes
Non-concordant
No
6. Had immediate reconstruction

BrCQI 11: Chemotherapy with or without trastuzumab

Proportion of patients:

A. with triple-negative stage I–III breast cancer with a tumour >1 cm or node-positive who received chemotherapy

B. with HER2-positive stage I–III breast cancer with a tumour >1 cm or node-positive who receive chemotherapy and trastuzumab.[5]

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern

[5] Trastuzumab includes trastuzumab biosimilars, eg, Herzuma, and trastuzumab subcutaneous injection.

[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[CT_SubProcedure]	DHBOfChemotherapy	DHB of service where chemotherapy treatment was given
[CT_SubProcedure]	SiteHealthFacilityOfChemotherapy	Type (public or private) health facility or hospital where chemotherapy was given
[CT_SubProcedure]	StartDateOfChemotherapy	Date chemotherapy was started
[CT_SubProcedure]	TimingOfChemotherapy	Timing of when chemotherapy was given, (ie, neo-adjuvantly, adjuvantly, for a recurrence, or for metastatic disease)
[WORKUP_PreProcedure]	PrimarySurgery	If surgical procedure has been performed
[Histopath SubProcedure]	NumberofNodesInvolvedByTumour	Total number of positive nodes found after all surgical procedures are complete
[Workup_SubProcedure]	InvasiveTumourSize	Maximum diameter in millimetres of the furthest points of extension of the invasive tumour cells in the principal tumour after all surgical procedures. Note. Micro-invasive tumours (sized >0 and ≤1mm) are counted as invasive tumours. For multiple invasive tumours, use the largest invasive tumour diameter
[WORKUP_SubProcedure]	OestrogenResult	Oestrogen (ER) result from surgical histopathology
[WORKUP_SubProcedure]	ProgesteroneResult	Progesterone (PR) result from surgical histopathology

[WORKUP_SubProcedure]	CoreBiopsyOestrogenResult	Oestrogen (ER) result from core biopsy
[WORKUP_SubProcedure]	CoreBiopsyProgesteroneResult	Progesterone (PR) result from core biopsy
[MARKERS_SubProcedure]	ResultofIHCHer2testing	HER2 (Human Epidermal Growth Factor Receptor 2) result using Immunohistochemistry (IHC) Positive: IHC: 3+ or FISH amplified (use ASCO CAP guidelines 2018) Negative: IHC: 0, 1+ or 2+ and/or not amplified by FISH
[MARKERS_SubProcedure]	IHCHer2result	Positive or Negative
[MARKERS_SubProcedurE]	FISHHer2result	HER2 result using fluorescence in situ hybridisation (FISH). FISH should be tested when HER2 result is equivocal (2+)
[BIOLOGICALS_SubProcedure]	TimingOfTherapy	Was therapy prescribed prior to (neo-adjuvant) or after (adjuvant) any breast surgery
[BIOLOGICALS_SubProcedure]	SiteHealthFacilityOfBiologicalTherapy	Type (public or private) health facility or hospital where biological or targeted therapy was given
[BIOLOGICALS_SubProcedure]	DHBOfBiologicalTherapy	DHB of service where therapy was first given
[BIOLOGICALS_SubProcedure]	BiologicalTherapy	Biological or targeted therapy medication name prescribed
[BIOLOGICALS_SubProcedure]	HormoneTherapy	Hormone therapy medication name prescribed (eg, tamoxifen)
[BIOLOGICALS_SubProcedure]	Therapy	Type of therapy (hormone, biological)
[BIOLOGICALS_SubProcedure]	StartDate	Date when therapy was started (hormone, biological)
[BIOLOGICALS_SubProcedure]	StopDate	Last date therapy was taken (hormone, biological)
[WORKUP_PreProcedure]	ClinicalTStage	Clinical tumour (T) stage pre-surgery using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalNStage	Clinical node (N) stage pre-surgery, using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalMStage	Clinical metastatic disease (M) stage pre-surgery, using AJCC edition 8
[HISTOPATH_SubProcedure]	PathologicalTStageBasedOnPrimaryTumour	Pathological tumour (T) stage after surgery, using AJCC edition 8. Based on the size of the primary tumour
[HISTOPATH_SubProcedure]	PathologicalNStage	Pathological node (N) stage after surgery, using AJCC edition 8. Based

		on the number of positive nodes found in all surgical procedures
[HISTOPATH_SubProcedure]	PathologicalMStage	Pathological metastatic disease (M) stage after surgery, using AJCC edition 8. Where pM1 should only be assigned for histologically proven metastases

Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509)
2	Eligible people	SiteHealthFacilityOfChemotherapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
		SiteHealthFacilityOfBiological Therapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
3	Diagnosis date	DateOfTissue Diagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female
5	Diagnosis type	Invasive/ In situ	Invasive
6	Stage (EBC)	AnatomicStage	I, II, III Derived from Clinical and Pathological TNM stage fields If patient had neo-adjuvant chemotherapy or neo-adjuvant biological therapy or neo-adjuvant hormone therapy for 3+ months or did not have any surgery use derived clinical anatomic stage; If a patient had surgery but did not have neo-adjuvant chemotherapy or neo-adjuvant biological therapy or neo-adjuvant hormone therapy for 3+ months use pathological anatomic stage

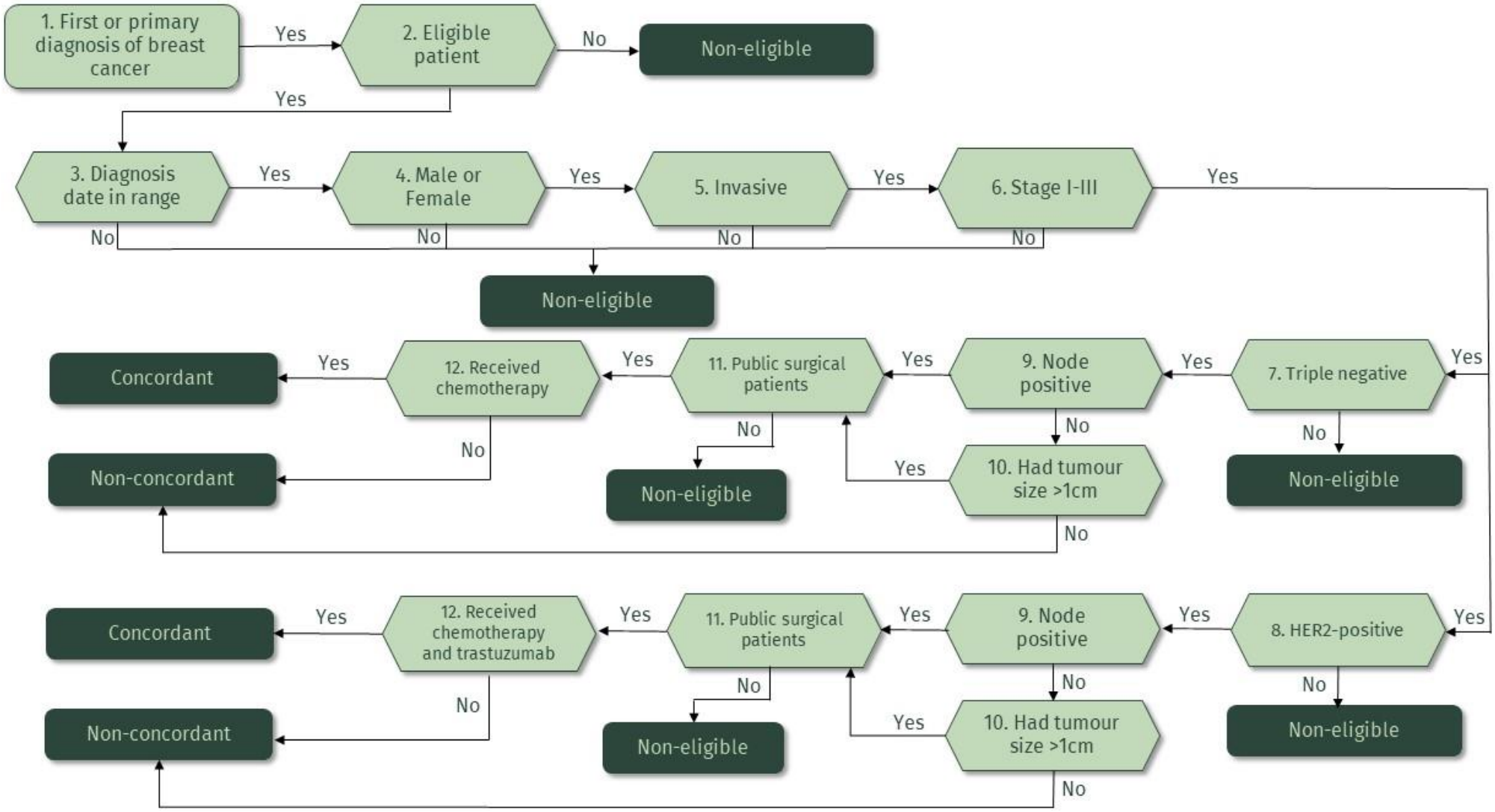
7	Denominator A: Triple Negative	TNBC	All of ER, PR and HER2 results are negative ER/PR derivation: If either core biopsy or surgical histopathology ER/PR result is positive for any lesion, then final ER/PR result is positive HER2 derivation: If IHC result 3+, then final HER2 result is positive; If IHC result 2+ and FISH result is positive, then final HER2 result is positive; Else If IHC result 2+, and there is no FISH result then final HER2 result is negative; If IHC result 0+ or 1+, then final HER2 result is negative; If IHC result missing and FISH result positive, then final HER2 result is positive; If IHC result missing and FISH result negative, then final HER2 result is negative; If IHC result and FISH result missing, then final HER2 result is blank (null)
8	Denominator B: HER2 Positive	HER2Pos	Positive HER2 derivation: If IHC result 3+, then final HER2 result is positive; If IHC result 2+ and FISH result is positive, then final HER2 result is positive; Else If IHC result 2+, and there is no FISH result then final HER2 result is negative; If IHC result 0+ or 1+, then final HER2 result is negative; If IHC result missing and FISH result positive, then final HER2 result is positive; If IHC result missing and FISH result negative, then final HER2 result is negative; If IHC result and FISH result missing, then final HER2 result is blank (null)
9	Nodes positive	Node positive	If TimingOfChemotherapy == 'Neo-adjuvant' and [ClinicalNStage] is > 0 Else if [NeoAdjuvantChemotherapy] = No and [PrimarySurgery] = Yes and NumberofNodesInvolvedByTumour is not null nor 0

10	Tumour size	Invasive tumour size	Tumour size >10mm If TimingOfChemotherapy == 'Neo-adjuvant' and [ClinicalTStage] in (1c, 2, 3, 4, 4a, 4b, 4c, 4d) Else if [NeoAdjuvantChemotherapy] = No and [PrimarySurgery] = Yes and [InvasiveTumourSize] is >10 mm

Numerator criteria

Diagram reference	Assessment	Item	Codes
11	Public surgical people	SiteHealthFacilityOfChemotherapy	SiteHealthFacilityOfChemotherapy == "Public"
		SiteHealthFacilityOfBiological Therapy	SiteHealthFacilityOfBiological Therapy == "Public"
12	Numerator A: Number of people with triple-negative EBC, with a tumour >1 cm or node-positive who received chemotherapy	Chemo	Patient received chemotherapy (either neo-adjuvant or adjuvant[6])
13	Numerator B: Number of people with HER2-positive EBC, and either a tumour >1 cm or node-positive who received chemotherapy and trastuzumab	ChemoBio	Patient received chemotherapy (either neo-adjuvant or adjuvant) And biological therapy (either neo-adjuvant or adjuvant) is trastuzumab (Herceptin)

[6] Where a patient received both neo-adjuvant and adjuvant chemotherapy they are counted as adjuvant.


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Invasive
Yes
6. Stage I-III
Yes
No
No
No
No
Non-eligible
Concordant
Yes
12. Received chemotherapy
Yes
11. Public surgical patients
Yes
9. Node positive
Yes
7. Triple negative
Yes
No
No
No
Non-concordant
Non-eligible
Yes
10. Had tumour size >1cm
Non-eligible
No
Concordant
Yes
12. Received chemotherapy and trastuzumab
Yes
11. Public surgical patients
Yes
9. Node positive
Yes
8. HER2-positive
Yes
No
No
No
Non-concordant
Non-eligible
Yes
10. Had tumour size >1cm
Non-eligible
No

BrCQI 13: Neoadjuvant chemotherapy

Proportion of people with stage II or III breast cancer who are either triple-negative or HER2-positive and receive neoadjuvant chemotherapy, including neoadjuvant trastuzumab.[7]

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019.
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc

[7] Trastuzumab includes trastuzumab biosimilars, eg, Herzuma, and trastuzumab subcutaneous injection.

[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_PreProcedure]	PrimarySurgery	If surgical procedure has been performed
[Workup_SubProcedure]	InvasiveTumourSize	Maximum diameter in millimetres of the furthest points of extension of the invasive tumour cells in the principal tumour after all surgical procedures. Note. Micro-invasive tumours (sized >0 and ≤1mm) are counted as invasive tumours. For multiple invasive tumours, use the largest invasive tumour diameter
[CT_SubProcedure]	SiteHealthFacilityOfChemotherapy	Type (public or private) health facility or hospital where chemotherapy was given
[CT_SubProcedure]	DHBOfChemotherapy	DHB where chemotherapy treatment was given
[CT_SubProcedure]	TimingOfChemotherapy	Timing of when chemotherapy was given (ie, neo-adjuvantly, adjuvantly, for a recurrence, or for metastatic disease)
[CT_SubProcedure]	StartDateOfChemotherapy	Date chemotherapy was started
[CT_SubProcedure]	DateofFinalCycleOfChemotherapy	Last date chemotherapy was given
[BIOLOGICALS_SubProcedure]	SiteHealthFacilityOfBiologicalTherapy	Type (public or private) health facility or hospital where biological or targeted therapy was given
[BIOLOGICALS_SubProcedure]	DHBOfBiologicalTherapy	DHB of service where therapy was first given
[BIOLOGICALS_SubProcedure]	TimingOfTherapy	Timing of when biological, hormone or targeted therapy was given, (ie, neo-adjuvantly, adjuvantly, for a recurrence, or for metastatic disease)
[BIOLOGICALS_SubProcedure]	BiologicalTherapy	Biological or targeted therapy medication name prescribed (eg, T-DM1)
[BIOLOGICALS_SubProcedure]	HormoneTherapy	Hormone therapy medication name prescribed (eg, tamoxifen)

[BIOLOGICALS_SubProcedure]	StartDate	Date when therapy was started (hormone, biological)
[BIOLOGICALS_SubProcedure]	StopDate	Last date therapy was taken (hormone, biological)
[BIOLOGICALS_SubProcedure]	Therapy	Type of therapy (hormone, biological)
[Workup_SubProcedure]	CoreBiopsyOestrogenResult	Oestrogen (ER) result from core biopsy
[Workup_SubProcedure]	CoreBiopsyProgesteroneResult	Progesterone (PR) result from core biopsy
[MARKERS_SubProcedure]	IHCHer2result	HER2 (Human Epidermal Growth Factor Receptor 2) result using Immunohistochemistry (IHC). Positive: IHC: 3+ or FISH amplified (use ASCO CAP guidelines 2018) Negative: IHC: 0, 1+ or 2+ and/or not amplified by FISH.
[MARKERS_SubProcedure]	FISHHer2result	HER2 result using fluorescence in situ hybridisation (FISH). FISH should be tested when HER2 result is equivocal (2+)
[WORKUP_PreProcedure]	ClinicalTStage	Clinical tumour (T) stage pre-surgery using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalNStage	Clinical node (N) stage pre-surgery, using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalMStage	Clinical metastatic disease (M) stage pre-surgery, using AJCC edition 8
[HISTOPATH_SubProcedure]	PathologicalTStageBasedOnPrimaryTumour	Pathological tumour (T) stage after surgery, using AJCC edition 8. Based on the size of the primary tumour
[HISTOPATH_SubProcedure]	PathologicalNStage	Pathological node (N) stage after surgery, using AJCC edition 8. Based on the number of positive nodes found in all surgical procedures
[HISTOPATH_SubProcedure]	PathologicalMStage	Pathological metastatic disease (M) stage after surgery, using AJCC edition 8. Where pM1 should only be assigned for histologically proven metastases

Case eligibility criteria (denominator)

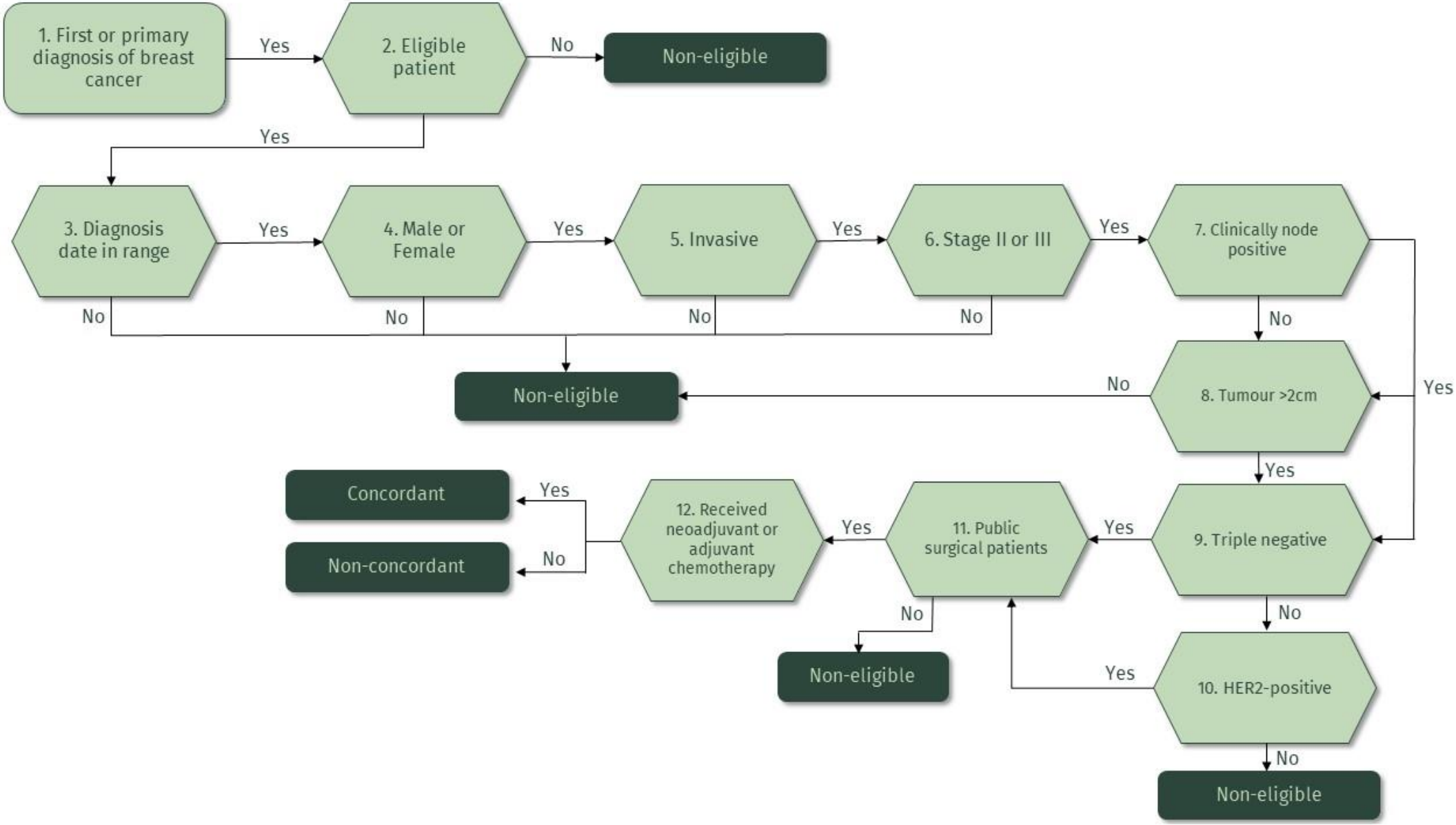
Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509)
2	Eligible people	SiteHealthFacilityOfChemotherapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
		SiteHealthFacilityOfBiologicalTherapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female
5	Diagnosis type	Invasive/In situ	Invasive
6	Stage (EBC)	AnatomicalStage	II or III Derived from Clinical and Pathological TNM stage fields Derived from Clinical and Pathological TNM stage fields If patient had neo-adjuvant chemotherapy or neo-adjuvant biological therapy or neo-adjuvant hormone therapy for 3+ months or did not have any surgery use derived clinical anatomic stage; If a patient had surgery but did not have neo-adjuvant chemotherapy or neo-adjuvant biological therapy or neo-adjuvant hormone therapy for 3+ months use pathological anatomic stage
7	Clinically node positive	Clinically node positive	ClinicalNStage != X|0
8	Invasive Tumour size	Invasive Tumour size	Invasive Tumour size > 20mm If [TimingOfChemotherapy] == 'Neo-adjuvant' and [ClinicalTStage] in (2, 3, 4, 4a, 4b, 4c, 4d) Else if [NeoAdjuvantChemotherapy] = No and [PrimarySurgery] = Yes and [InvasiveTumourSize] is >20 mm

9	Triple Negative	TNBC	All of ER, PR and HER2 results are negative If either core biopsy or surgical histopathology ER/PR result is positive, then final ER/PR result is positive If IHC result 3+, then final HER2 result is positive; If IHC result 2+ and FISH result is positive, then final HER2 result is positive; Else If IHC result 2+, and there is no FISH result then final HER2 result is negative; If IHC result 0+ or 1+, then final HER2 result is negative; If IHC result missing and FISH result positive, then final HER2 result is positive; If IHC result missing and FISH result negative, then final HER2 result is negative; If IHC result and FISH result missing, then final HER2 result is blank (null)
10	HER2 Positive	HER2Pos	If IHC result 3+, then final HER2 result is positive; If IHC result 2+ and FISH result is positive, then final HER2 result is positive; Else If IHC result 2+, and there is no FISH result then final HER2 result is negative; If IHC result 0+ or 1+, then final HER2 result is negative If IHC result missing and FISH result positive, then final HER2 result is positive; If IHC result missing and FISH result negative, then final HER2 result is negative; If IHC result and FISH result missing, then final HER2 result is blank (null)

Numerator criteria

Diagram reference	Assessment	Item	Codes
11	Public surgical people	SiteHealthFacilityOfChemotherapy	SiteHealthFacilityOfChemotherapy == “Public”
		SiteHealthFacilityOfBiologicalTherapy	SiteHealthFacilityOfBiologicalTherapy == “Public”

12	Numerator: Number of people with triple-negative or HER2-positive stage II or III breast cancer (>2 cm and/or clinically node-positive) treated with neo-adjuvant chemotherapy +/- trastuzumab before breast cancer surgery	NeoAdjChemo	Yes


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Invasive
Yes
6. Stage II or III
Yes
7. Clinically node positive
No
No
No
No
No
Non-eligible
No
8. Tumour >2cm
Yes
Yes
Yes
Concordant
Non-concordant
No
12. Received neoadjuvant or adjuvant chemotherapy
Yes
11. Public surgical patients
Yes
9. Triple negative
No
No
Non-eligible
Yes
10. HER2-positive
No
Non-eligible

BrCQI 14: Adjuvant endocrine therapy adherance

Proportion of females with endocrine-sensitive[8] stage I–III breast cancer who complete two years[9] of endocrine therapy (after their first script is dispensed).

Measure: proportion still being dispensed endocrine therapy at:

A. six months
B. 12 months
C. 24 months.

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: Invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules

[8] Endocrine-sensitive = either oestrogen result (ER) or progesterone result (PR) is positive.

[9] This report covers patients diagnosed in 2020 to 2021, so the maximum time a patient is still receiving endocrine therapy is 24 months. The latest date of available pharmaceutical data is 31 December 2022.

[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeatTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[Demographics_Patient]	DateOfDeath	Date patient deceased
[BIOLOGICALS_SubProcedure]	SiteHealthFacilityOfBiologicalTherapy	Type (public or private) health facility or hospital where biological or targeted therapy was given
[BIOLOGICALS_SubProcedure]	DhbOfBiologicalTherapy	DHB of service where therapy was first given
[BIOLOGICALS_SubProcedure]	HormoneTherapy	Hormone therapy medication name prescribed (eg, tamoxifen)[10]
[BIOLOGICALS_SubProcedure]	Therapy	Type of therapy (hormone, biological)
[BIOLOGICALS_SubProcedure]	TimingOfTherapy	Was therapy prescribed prior to (neo-adjuvant) or after (adjuvant) any breast surgery
[WORKUP_PreProcedure]	ClinicalTStage	Clinical tumour (T) stage pre-surgery using AJCC edition 8

[10] Medication includes anastrozole, exemestane, goserelin, letrozole, leuprorelin, progestagen (Megestrol), tamoxifen and triptorelin.

[WORKUP_PreProcedure]	ClinicalNStage	Clinical node (N) stage pre-surgery, using AJCC edition 8
[WORKUP_PreProcedure]	ClinicalMStage	Clinical metastatic disease (M) stage pre-surgery, using AJCC edition 8
[HISTOPATH_SubProcedure]	PathologicalTStageBasedOnPrimaryTumour	Pathological tumour (T) stage after surgery, using AJCC edition 8. Based on the size of the primary tumour
[HISTOPATH_SubProcedure]	PathologicalNStage	Pathological node (N) stage after surgery, using AJCC edition 8. Based on the number of positive nodes found in all surgical procedures
[HISTOPATH_SubProcedure]	PathologicalMStage	Pathological metastatic disease (M) stage after surgery, using AJCC edition 8. Where pM1 should only be assigned for histologically proven metastases
[WORKUP_SubProcedure]	OestrogenResult	Oestrogen (ER) result from surgical histopathology
[WORKUP_SubProcedure]	ProgesteroneResult	Progesterone (PR) result from surgical histopathology
[WORKUP_SubProcedure]	CoreBiopsyOestrogenResult	Oestrogen (ER) result from core biopsy
[WORKUP_SubProcedure]	CoreBiopsyProgesteroneResult	Progesterone (PR) result from core biopsy
[METS_SubProcedure]	DateOfMetastaticDisease	Tissue diagnosis of metastatic disease
[RECUR_SubProcedure]	DateOfRecurrence	Tissue diagnosis of loco-regional recurrence
[Pharmaceutical claims data]	DHB of domicile	DHB of domicile (residence) when therapy was first dispensed
[Pharmaceutical claims data]	Date dispensed	Date endocrine therapy medication was dispensed
[Pharmaceutical claims data]	Chemical name	Chemical name of the medication used in endocrine therapy
[Pharmaceutical claims data]	Quantity (quantity dispensed)	Number of doses dispensed
[Pharmaceutical claims data]	Days' supply	Number of days the medication was supplied. Where days' supply = 0 it is assumed the script was not collected

Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509)
2	Eligible people	Site/HealthFacilityOf HormoneTherapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
3	Diagnosis date	DateOfTissue Diagnosis	2020-01-01 to 2021-12-31
4	Male or Female	Sex	Female
5	Diagnosis Type	DiagnosisType	Invasive
6	Stage (EBC)	AnatomicalStage	I, II, III Derived from Clinical and Pathological TNM stage fields If patient had neo-adjuvant chemotherapy or neo-adjuvant biological therapy or neo-adjuvant hormone therapy for 3+ months or did not have any surgery use derived clinical anatomic stage; If a patient had surgery but did not have neo-adjuvant chemotherapy nor neo-adjuvant biological therapy nor neo-adjuvant hormone therapy for 3+ months use pathological anatomic stage
7	Adjuvant endocrine	AdjuvantHormoneTherapy	Yes: ER or PR result == "Positive" & date_of_surgery >= dispensed_date (adjuvant) & SiteHealthFacilityOfHormonelTherapy == "Public"; Exclude people who are:[11] • ER and PR result == Negative; • Where first endocrine prescription is issued later than a year after the date of diagnosis (min(dispensed_date) > date_of_tissue_diagnosis + 360);

[11] Inclusions and exclusions follow the methodology outlined in: Seneviratne S, Campbell I, Scott N, et al. 2015. Adherence to adjuvant endocrine therapy: Is it a factor for ethnic differences in breast cancer outcomes in New Zealand? *Breast* 24(1): 62–7, and in consultation with the National Breast Cancer QPI Working Group.

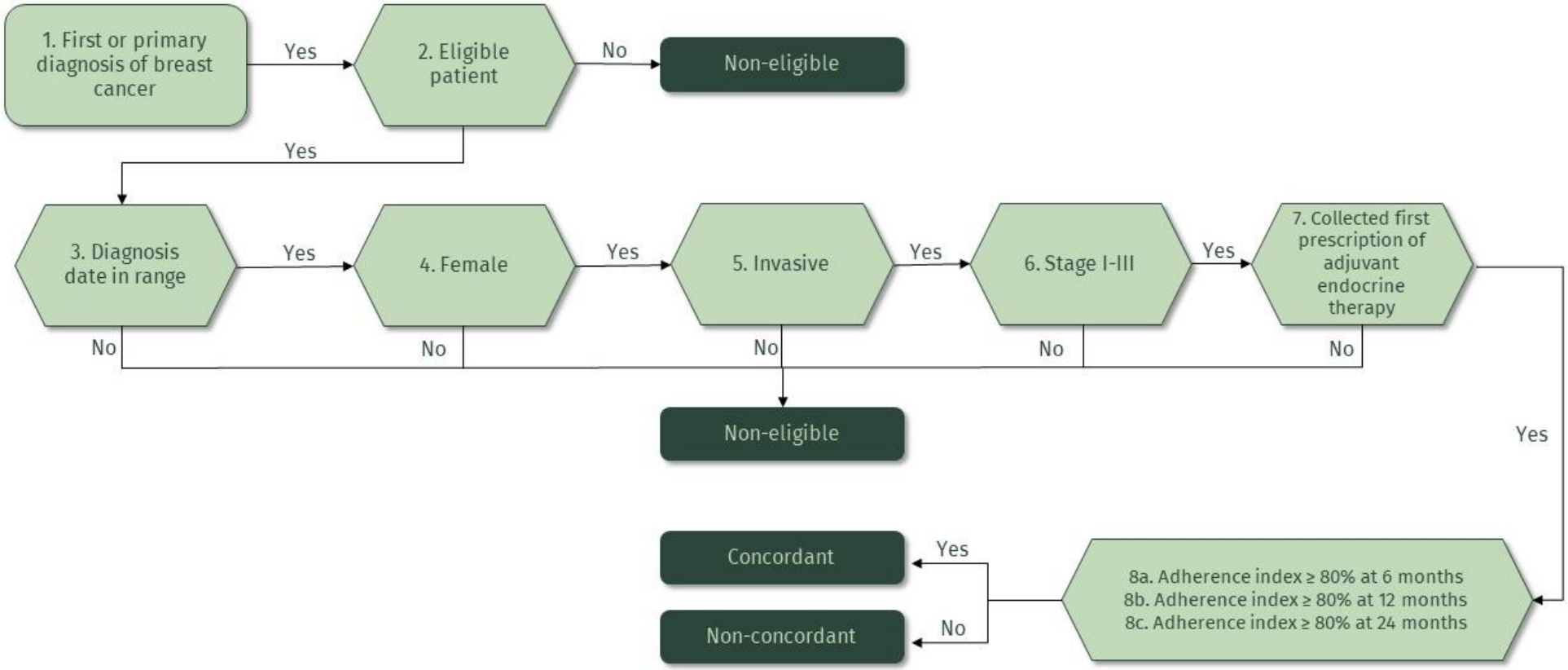
			• Where Goserelin monotherapy is used for ovarian function preservation during chemo and Palbociclib is given for advanced unresectable disease. Exclude patient if any(chemical_name == "Palbociclib") or all(chemical_name == "Goserelin")
			• First dispensed date > start date of metastatic or start date of recurrence
			• Where no scripts were collected, that is, all(days_supply == 0)
			Exclude records, that met the following criteria:
			• Start or continue endocrine therapy after metastatic or Loco-regional recurrence start date, that is, date_of_recurrence > date_dispensed or date_of_metastatic_disease > date_dispensed;
			  • Where Days_supply ==0
			  • Where chemical_name == "Goserelin"

Numerator criteria

Diagram reference	Assessment	Item	Codes
8	Adherence Index at: A. 6 months (180 days) B. 12 months (360 days) C. 24 months	EndxAdhere	(number of days covered by prescriptions/total number of days in treatment period) x 100 is ≥ 80% Eligibility for 6 months: first dispensed date ≤2022-06-30, Eligibility for 12 months: first dispensed date ≤2021-12-31, Eligibility for 24 months: first dispensed date ≤2020-12-31 If gap between dispensed date[12]

[12] This rule follows the methodology outlined in: Seneviratne S, Campbell I, Scott N, et al. 2015. Adherence to adjuvant endocrine therapy: Is it a factor for ethnic differences in breast cancer outcomes in New Zealand? *Breast* 24(1): 62–7.

	>180 days then stop_date == lag(dispensed_date) + days_supply (exclude subsequent records with a gap >180 days) The treatment duration was calculated from the first_dispensed_date of adjuvant endocrine treatment to the pmin(stop_date, date_of_death, date_of_metastatic, date_of_recurrence) Number of days covered is calculated as sum(days_supply) within 6/12/24 months from first dispensed date. For instance, to identify eligible people at 6 months: the difference between first_dispensed_date and stop_date ≤180 days Stop date may be date of death. 111 people were eligible for six months, 106 people for 12 months and 44 for 24 months cohort


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Female
Yes
5. Invasive
Yes
6. Stage I-III
Yes
7. Collected first prescription of adjuvant endocrine therapy
No
No
No
No
No
Non-eligible
Yes
Concordant
Yes
Non-concordant
No
8a. Adherence index ≥ 80% at 6 months
8b. Adherence index ≥ 80% at 12 months
8c. Adherence index ≥ 80% at 24 months

BrCQI 23: Timely diagnosis

Proportion of patients for whom time from referral to diagnosis of breast cancer is within 28 days.

This time period is measured as:

A. for BSA-detected females, the date of the screening mammogram, to the date of diagnostic biopsy (including cytological procedure)

B. for females with non-BSA image detected breast cancer, the date of the initial abnormal imaging to the date of diagnostic biopsy (including cytological procedure)

C. for symptomatic females, the date of the receipt of specialist referral to the date of diagnostic biopsy (including cytological procedure).

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/ core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High-level diagnosis category: Invasive, DCIS or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules

[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_PreProcedure]	DateOfReceiptOfReferral	Date of receipt of referral. For symptomatic females, the date of the receipt of specialist referral to the date of diagnostic biopsy (including cytological procedure). Where no referral letter is found, the Faster Cancer Treatment referral date is used, and if both documents are unavailable then the initial mammogram date is entered as the referral date;[13] for screen detected females, the date of the screening mammogram, after all reads,

[13] Please note there is also a referral process variation for two of the DHBs (known to us):

- Tairāwhiti – Specialist referrals do not always come in via a GP. They should but do not, so the Breast Nurse creates an internal referral from radiology after histology is back.
- West Coast – Patients are referred by the GP to Canterbury breast imaging, so there are long delays as West Coast as patients must travel to Christchurch for imaging before then being referred to Christchurch hospital specialist.

		to the date of diagnostic biopsy (including cytological procedure); for females undergoing non-BSA surveillance, the date of the initial abnormal imaging to the date of diagnostic biopsy (including cytological procedure)
[WORKUP_PreProcedure]	SourceofReferral	Source of referral. Categorised as Breast Screen Aotearoa; Symptomatic (GP (symptomatic), Emergency department, A&E after hours, Other (specify), Other department; same hospital, Other hospital, Private hospital and Private specialist); and Non-BSA image detected (high risk surveillance imaging, private screening, and annual follow-up imaging after a breast cancer episode)

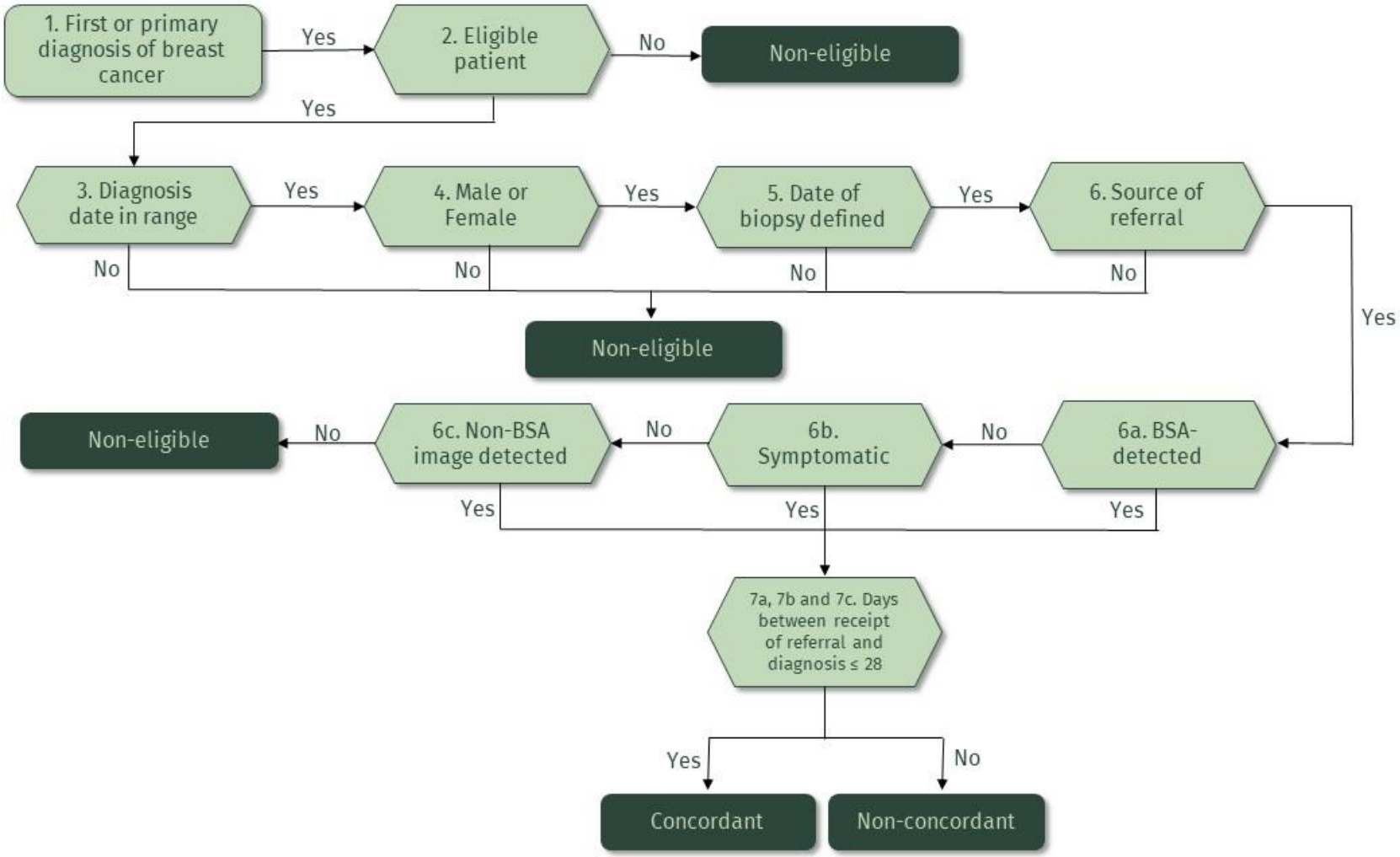
Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509, D051, D058, D059)
2	Eligible people	DiagnosisType	Invasive and DCIS
3	Diagnosis date	DateOfTissue Diagnosis[14]	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female
5	Date of Biopsy	DateOfDiagnostic biopsy	[DateOfTissueDiagnosis]
6	Referral Source	SourceOfReferral	A. Symptomatic (GP, or other primary care provider) B. BSA-detected; Screen detected BSA C. Non-BSA image detected: image detected non BSA

[14] The denominator includes people (8.4%) who have a date of diagnosis before date of receipt of referral resulting in a negative day's count between referral and diagnosis), while the numerator excludes these people.

Numerator criteria

Diagram reference	Assessment	Item	Codes
7	Numerator: Number of people diagnosed within 28 days from referral. This time period is measured as: A. for BSA-detected females, the date of the screening mammogram, to the date of diagnostic biopsy (including cytological procedure) B. for symptomatic females, the date of the receipt of specialist referral to the date of diagnostic biopsy (including cytological procedure) C. for females with non-BSA image detected breast cancer, the date of the initial abnormal imaging to the date of diagnostic biopsy (including cytological procedure)	TimetoDiag	[DateOfdiagnosticbiopsy]-[DateOfReceiptOfReferral]<=28


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Date of biopsy defined
Yes
6. Source of referral
No
No
No
No
Yes
Non-eligible
Non-eligible
No
6c. Non-BSA image detected
No
6b. Symptomatic
No
6a. BSA-detected
Yes
Yes
Yes
7a, 7b and 7c. Days between receipt of referral and diagnosis ≤ 28
Yes
No
Concordant
Non-concordant

BrCQI 24: Time to surgery

Proportion of females treated with surgery (excluding females having neoadjuvant chemotherapy[15] or neoadjuvant endocrine therapy) within:

A. six weeks of decision to treat with breast surgery

B. eight weeks of decision to treat with breast surgery and undergoing immediate reconstruction.

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: Invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age

[15] Chemotherapy includes chemotherapy, biological and targeted therapy.

		groupings, <20, 20–24, 25–29, 30–34, etc
[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[WORKUP_PreProcedure]	PrimarySurgery	If surgical procedure has been performed
[SXPRIMARY_SubProcedure]	SiteHealthFacilityOfSurgery	Type (public or private) health facility or hospital where surgery was performed
[SXPRIMARY_SubProcedure]	DateofSurgery	Date surgical procedure performed
[SXPRIMARY_SubProcedure]	DHBOfPrimarySurgery	DHB of service where surgery was performed
[SXPRIMARY_SubProcedure]	RightBreastTypeOfBreastSurgery	Type of surgical procedure performed on right breast
[SXPRIMARY_SubProcedure]	LeftBreastTypeOfBreastSurgery	Type of surgical procedure performed on left breast
[WORKUP_PreProcedure]	DateofDecisionToTreat	Date of decision to treat. This is the date the patient agreed to the treatment plan and was placed on the surgical waitlist. This date is sourced from the clinical letters/MDM summary. If this is unavailable the informed date is used, or if this is unknown the FSA or cancer tracking document
[RECONSTRUCT_SubProcedure]	DateOfReconstruction	Date of reconstruction surgery
[RECONSTRUCT_SubProcedure]	TimingOfReconstruction	If timing of reconstruction is delayed or immediate
[RECONSTRUCT_SubProcedure]	SiteHealthFacilityOfReconstruction	Type (public or private) health facility or hospital where reconstruction was performed
[RECONSTRUCT_SubProcedure]	DHBOfReconstruction	DHB where reconstruction was performed
[CT_SubProcedure]	TimingOfChemotherapy	Timing of when chemotherapy was given, (ie, neo-adjuvantly, adjuvantly, for a recurrence, or for metastatic disease)

[BIOLOGICALS_SubProcedure]	TimingOfTherapy	Was therapy prescribed prior to (neo-adjuvant) or after (adjuvant) any breast surgery
[BIOLOGICALS_SubProcedure]	Therapy	Type of therapy (hormone, biological)
[BIOLOGICALS_SubProcedure]	StartDate	Date when therapy was started (hormone, biological)
[BIOLOGICALS_SubProcedure]	StopDate	Last date therapy was taken (hormone, biological)

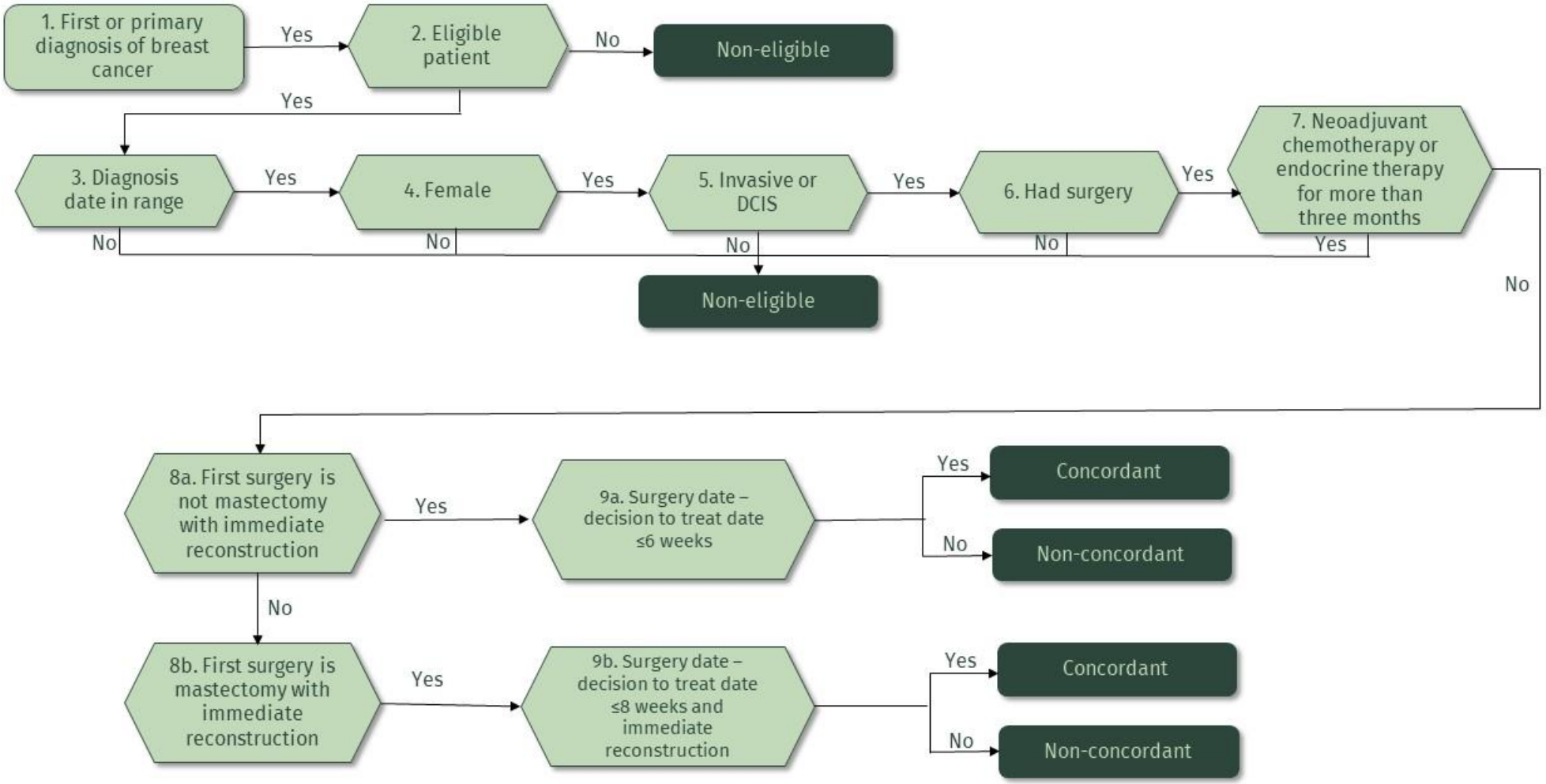
Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509, D051, D058, D059)
2	Eligible people	SiteHealthFacilityOfSurgery And SiteHealthFacilityOfReconstruction	Public, or Public and Private mix or no treatment or unknown (excludes fully private) Public, or Public and Private mix or no treatment or unknown (excludes fully private)
3	Diagnosis date	DateOfTissueDiagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Female
5	Diagnosis type	DiagnosisType	Invasive and DCIS
6	Breast surgery	Primarysurgery	Yes (First surgery if multiple surgeries were performed)
7	Neoadjuvant chemo or endocrine for more than three months	NeoAdjCTorET	**Exclude** if TimingOfChemotherapy == 'Neo-adjuvant' OR (TimingOfTherapy=='Neo-adjuvant' & Therapy='Biological') OR TimingOfTherapy=='Neo-adjuvant' & Therapy='Hormone' & [StopDate]-[StartDate] > 90 Days)

8A	First surgery is not mastectomy with immediate reconstruction	NoMasRecon	Had breast surgery Exclude if First ([RightBreastTypeOfBreastSurgery] or [LeftBreastTypeOfBreastSurgery]) == Mastectomy and Timing_of_reconstruction== “Immediate”
8B	First surgery is mastectomy with immediate reconstruction	MasRecon	First ([RightBreastTypeOfBreastSurgery] or [LeftBreastTypeOfBreastSurgery]) == Mastectomy and Timing_of_reconstruction== “Immediate”

Numerator criteria

Diagram reference	Assessment	Item	Codes
9	A. Had first surgery within six weeks of being placed on the waiting list for surgery but didn’t have mastectomy surgery with immediate reconstruction	TimetoSurg6wk	Min[DateOfSurgery]-[DateOfDecisionToTreat]<=6 weeks Excludes if: TimingOfreconstruction ==”Immediate” where leftsurgerytype == “Mastectomy” or where rightsurgerytype == “Mastectomy”
	B. Had mastectomy surgery within eight weeks of being placed on the waiting list for surgery, for females having immediate breast reconstruction	TimetoSurg8wk	TimingOfreconstruction ==”Immediate” where leftsurgerytype == “Mastectomy” or where rightsurgerytype == “Mastectomy” And [DateOfSurgery]-[DateOfDecisionToTreat]<=8 weeks


1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Female
Yes
5. Invasive or DCIS
Yes
6. Had surgery
Yes
7. Neoadjuvant chemotherapy or endocrine therapy for more than three months
No
Yes
No
No
No
No
Non-eligible
No
8a. First surgery is not mastectomy with immediate reconstruction
Yes
9a. Surgery date – decision to treat date ≤6 weeks
Yes
Concordant
No
Non-concordant
No
8b. First surgery is mastectomy with immediate reconstruction
Yes
9b. Surgery date – decision to treat date ≤8 weeks and immediate reconstruction
Yes
Concordant
No
Non-concordant

BrCQI 26: Access to radiation therapy

Proportion of patients with invasive cancer who start adjuvant radiation therapy within:

A. eight weeks of surgery
B. six weeks of completing adjuvant chemotherapy.

Data items

Data set	Data item	Description
[WORKUP_PreProcedure]	PatientId	A unique auto-generated and de-identified ID
[WORKUP_PreProcedure]	DateOfTissueDiagnosis	Date first definitive tissue diagnosis (ie, proven malignancy seen in FNA/core biopsy/cytology) was performed that confirmed breast cancer or in situ disease of the breast; where tissue diagnosis date is unavailable earliest documented abnormal diagnostic date is used (clinical exam, mammogram, ultrasound, MRI, bone scan, etc) in a public or private facility
[WORKUP_PreProcedure]	EligibilityStatus	Eligibility status of the person
[WORKUP_PreProcedure]	DiagnosisType	High level diagnosis category: Invasive, DCIS, or other breast condition
[Demographics_Patient]	Ethnicity	Description of person's ethnic origins coded according to MOH ethnicity code table Level 1. Prioritised ethnicity is derived from Ethnicity 1–3 fields based on MOH prioritisation rules
[WORKUP_PreProcedure]	Region	Geographical location in New Zealand based on [DHBRegionCode]. Derived to follow Te Aho o Te Kahu – Cancer Control Agency regions of Northern, Midland, Central and Southern
[WORKUP_SubProcedure]	PrimarySiteICD	Primary site/location of lesion coded using International Classification of Diseases (ICD)-10 version 2019
[WORKUP_PreProcedure]	AgeAtTissueDiagnosis	Age at time of diagnosis, calculated from date of birth and date of tissue diagnosis. Derived five-year age groupings, <20, 20–24, 25–29, 30–34, etc

[WORKUP_PreProcedure]	Clinic	Clinic/treatment facility with overall responsibility for the person's care and follow up
[RT_SubProcedure]	SiteHealthFacilityOfRadiationTherapy	Type (public or private) health facility or hospital where radiotherapy was given
[WORKUP_PreProcedure]	DHBRegionCode	District health board (DHB) where a person lives at the time of diagnosis
[RT_SubProcedure]	DHBOfRadiationTherapy	DHB of service where radiation therapy was given
[WORKUP_PreProcedure]	DomicileCodeAtDiagnosis	Domicile code at the time of diagnosis
[Demographics_PatientExtra]	Sex	Male or Female
[SXPRIMARY_SubProcedure]	PrimarySurgery	If surgical procedure has been performed
[SXPRIMARY_SubProcedure]	DateOfSurgery	Date surgical procedure performed
[RT SubProcedure]	RadiationTherapyStartDate	Start date of radiation therapy
[CT_SubProcedure]	TimingOfChemotherapy	Timing of when chemotherapy was given, (ie, neo-adjuvantly, adjuvantly, for a recurrence, or for metastatic disease)
[CT_SubProcedure]	StartDateOfChemotherapy	Date chemotherapy was started
[CT_SubProcedure]	DateofFinalCycleOfChemotherapy	End date of chemotherapy

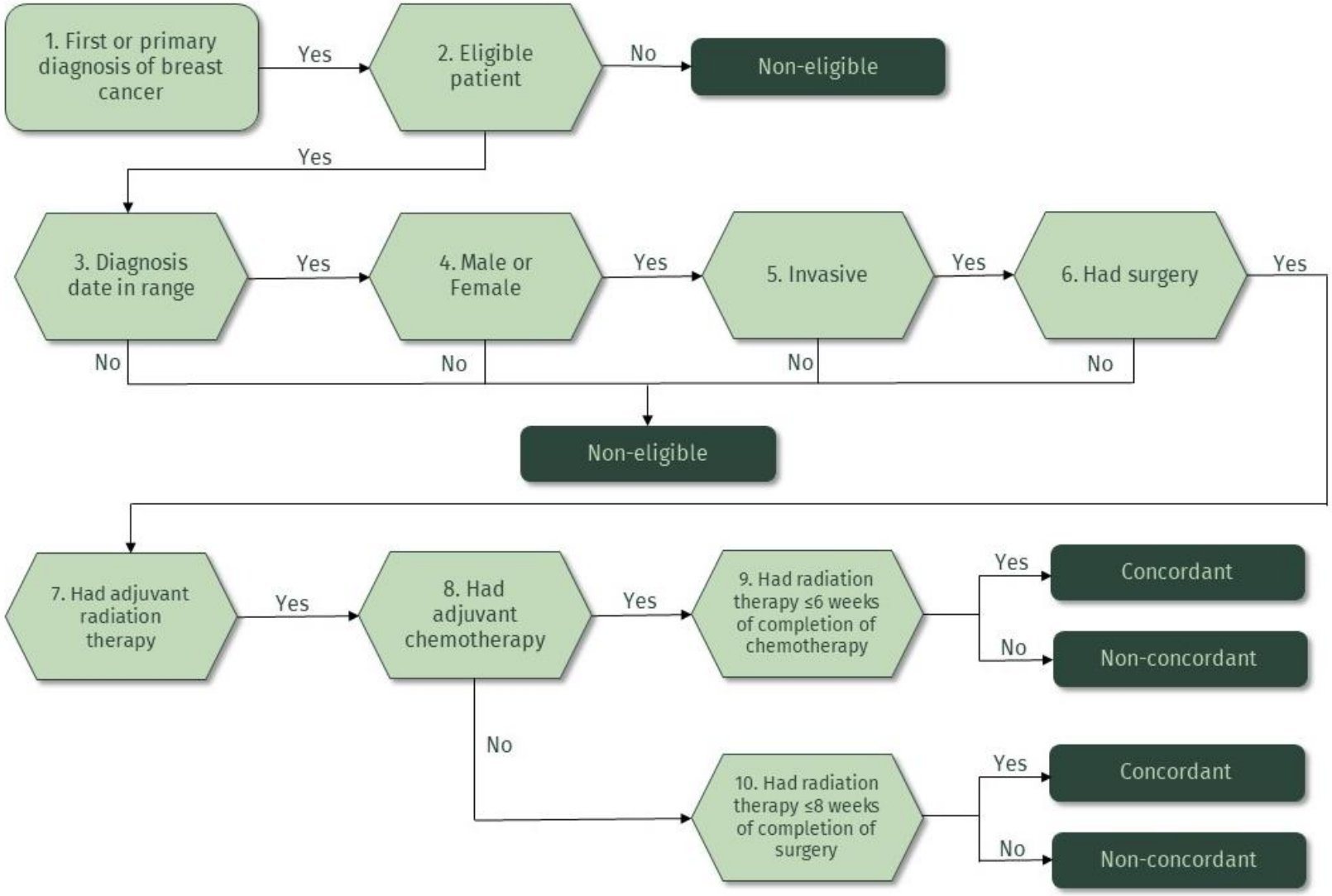
Case eligibility criteria (denominator)

Diagram reference	Assessment	Item	Codes
1	First or primary diagnosis	PrimarySiteICD	First diagnosis of breast cancer (C500-C506, C508, C509)
2	Eligible people	SiteHealthFacilityOfRadiationTherapy	Public, or Public and Private mix or no treatment or unknown (excludes fully private)
		And	
		SiteHealthFacilityOfSurgery	Public, or Public and Private mix or no treatment or unknown (excludes fully private)

3	Diagnosis date	DateOfTissue Diagnosis	2020-01-01 to 2021-12-31
4	Male or female	Sex	Male or Female
5	Diagnosis type	DiagnosisType	Invasive
6	Have surgery	PrimarySurgery	Yes
7	Radiotherapy	AdjuvantRadiotherapy	Yes
8	Chemotherapy	AdjuvantChemotherapy	Yes or No

Numerator criteria

Diagram reference	Assessment	Item	Codes
9	Number of people who received adjuvant radiation therapy within six weeks of completing adjuvant chemotherapy	ChemotoRad	AdjuvantChemotherapy = Yes [RadationTherapyStartDate] - [DateOfFinalCycleOfChemotherapy] <= 6 weeks
10	Number of people who have undergone surgery for invasive breast cancer, but are not receiving adjuvant chemotherapy, who received radiation therapy within eight weeks of completion of their final surgery given before radiation therapy	SurgtoRad	Diagnosis Type = Invasive AdjuvantChemotherapy = No SXPrimary Side = RT (Radiotherapy) Side RadiationTherapyStartDate] – Max [DateOfSurgery] before RT <= 8 weeks

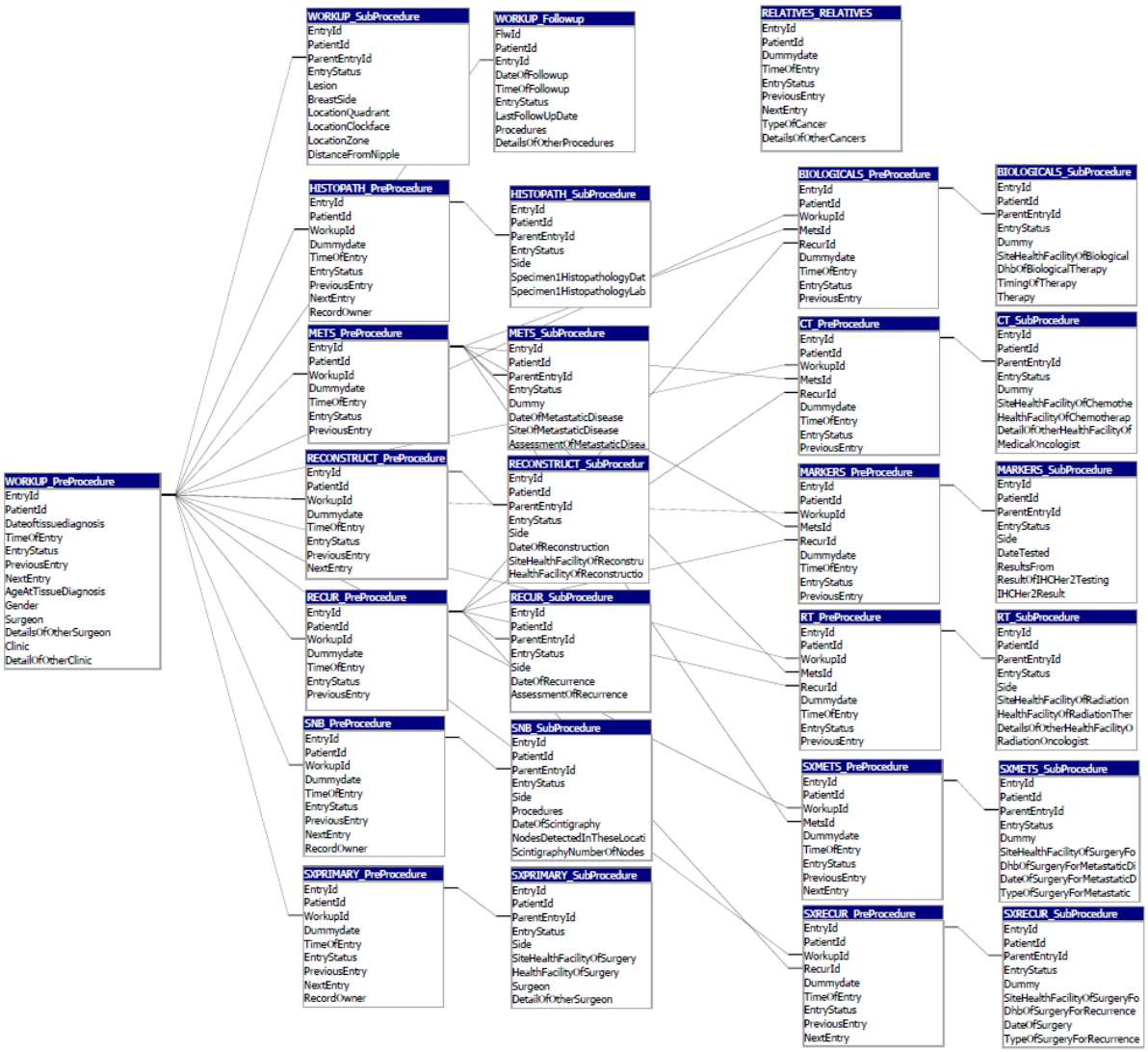

1. First or primary diagnosis of breast cancer
Yes
2. Eligible patient
No
Non-eligible
Yes
3. Diagnosis date in range
Yes
4. Male or Female
Yes
5. Invasive
Yes
6. Had surgery
Yes
No
No
No
No
Non-eligible
7. Had adjuvant radiation therapy
Yes
8. Had adjuvant chemotherapy
Yes
9. Had radiation therapy ≤6 weeks of completion of chemotherapy
Yes
Concordant
No
Non-concordant
No
10. Had radiation therapy ≤8 weeks of completion of surgery
Yes
Concordant
No
Non-concordant

APPENDICES

Table name, description and relationships

Name	Description
Demographics_Patient	Patient demographics including NHI, date of birth, ethnicity, date and cause of death
Demographics_PatientExtra	
BIOLOGICALS_PreProcedure	Biological, immunotherapy and hormone therapies including timing, drugs, clinic and reason for discontinuation
BIOLOGICALS_SubProcedure	
CT_PreProcedure	Chemotherapy data including timing, regimens, clinic, and reason for discontinuation
CT_SubProcedure	
Histopath_PreProcedure	Breast histopathology details including breast side, specimen and macroscopic findings, microscopic findings, margins and lobular neoplasia, nodal and tumour staging
Histopath_ SubProcedure	
MARKERS_PreProcedure	Biological markers data such as HER2 and FISH results, and multigene tests performed
MARKERS_SubProcedure	
RECONSTRUCT_PreProcedure	Reconstruction data
RECONSTRUCT_SubProcedure	
RT_ PreProcedure	Radiotherapy data – timing, regimen, clinic, etc
RT_ SubProcedure	
SXPRIMARY_PreProcedure	Surgical data for people with early breast cancer (primary surgery)
SXPRIMARY_SubProcedure	
Workup_Followup	Follow-up data such as follow-up date, current status of disease, follow-up clinic, GP details and subsequent new primary carcinomas
Workup_PreProcedure	Initial diagnosis details including eligibility status, referral, risk factors, faster cancer tracking, previous history, clinical staging, clinical trials and treatment referral status
Workup_SubProcedure	Lesion pre-operative diagnostic methods data including lesion location, clinical exam, imaging and biopsy, and also lesion-specific histopathology results

Te Rēhita Mate Ūtaetae table relationships



Common stratifications

All indicators will be summarised and counts and percentages by each of the following stratifications will be produced by Te Rēhita Mate Ūtaetae.

Data Item	Output Variable	Labels
Total	TOTAL	TOTAL
Ethnicity	ETHNICITY	Māori
Ethnicity	ETHNICITY	Pacific
Ethnicity	ETHNICITY	Asian
Ethnicity	ETHNICITY	Other
Ethnicity	ETHNICITY	Unknown
Sex	Sex	Female
Sex	Sex	Male
AgeAtTissueDiagnosis	AGEGROUP_5yr	18–24
AgeAtTissueDiagnosis	AGEGROUP_5yr	25–29
AgeAtTissueDiagnosis	AGEGROUP_5yr	30–34
AgeAtTissueDiagnosis	AGEGROUP_5yr	…
AgeAtTissueDiagnosis	AGEGROUP_5yr	70–74
AgeAtTissueDiagnosis	AGEGROUP_5yr	74–79
AgeAtTissueDiagnosis	AGEGROUP_5yr	80+
AgeAtTissueDiagnosis	AGEGROUP_5yr	TOTAL
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	18–24*Māori
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	18–24*Pacific
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	18–24*Asian
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	18–24*Other
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	18–24*Unknown
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	25–29*Māori
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	25–29*Pacific
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	25–29*Asian

AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	25–29*Other
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	25–29*Unknown
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	30–34*Maori
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	…
AgeAtTissueDiagnosis*Ethnicity	AGEGROUP_5yr*ETHNICITY	80+*Māori
Region	Region	Ngā Hau Ki Te Raki – Northern Hub
Region	Region	Te Manawa Taki – Midland
Region	Region	Te Hokai o Te Ika – Central
Region	Region	Te Waipounamu – Southern
Region	Region	TOTAL
Rurality	GCH2018	Rural 1
Rurality	GCH2018	Rural 2
Rurality	GCH2018	Rural 3
Rurality	GCH2018	Urban 1
Rurality	GCH2018	Urban 2
Rurality status	GCH2018	TOTAL
Deprivation	DEPQ18	Quintile 1 – least deprived
Deprivation	DEPQ18	Quintile 2
Deprivation	DEPQ18	Quintile 3
Deprivation	DEPQ18	Quintile 4
Deprivation	DEPQ18	Quintile 5 – most deprived
Deprivation	DEPQ18	Unknown
Deprivation	DEPQ18	TOTAL

Clinical and overall stage calculation

For the monitoring report, a mixture of clinical anatomic stage and pathological stage was used. Below outlines how the clinical and overall stages were calculated. AJCC anatomic stage groups were used. Overall staging was derived based on clinical and anatomic stage with the following rules.

1. If the patient had neoadjuvant chemotherapy or neoadjuvant biological therapy or neoadjuvant hormone therapy for three or more months or did not have any surgery use clinical anatomic stage.
2. If a patient had surgery but did not have neoadjuvant chemotherapy or neoadjuvant biological therapy or neoadjuvant hormone therapy for three or more months use pathological anatomical stage.
3. If the patient did not have chemotherapy but had surgery use pathological stage.

Table 1: AJCC anatomic stage groups*

Stage†	TNM	Comments
Stage 0	Tis, N0, M0	
Stage IA	T1, N0, M0	T1 always includes 1mi
Stage IB	T0, N1mi, M0	
	T1, N1mi, M0	
Stage IIA	T0, N1, M0	
	T1, N1, M0	
	T2, N0, M0	
Stage IIB	T2, N1, M0	If M stage missing, assume 0
	T3, N0, M0	
Stage IIIA	T0, N2, M0	If Tis and node positive then recode as T0
	T1, N2, M0	
	T2, N2, M0	
	T3, N1, M0	
	T3, N2, M0	
Stage IIIB	T4, N0, M0	If pNX and T>0 then recode as N0
	T4, N1, M0	
	T4, N2, M0	
Stage IIIC	Any T, N3, M0	
Stage IV	Any T, Any N, M1	

Note: is includes is (DCIS)m is (LCIS), is (Paget's). If deriving pathological stage and pathological n stage is missing, substitute clinical n stage.

* Source: American Joint Committee on Cancer. 2018. *AJCC Cancer Staging Manual* (Vol 4). Springer. https://doi.org/10.10007/978-3-319-40618-3

† Derives DCIS and invasive breast cancer.

Table 2: Rules for deriving overall staging based on clinical or pathological stage

Overall stage	Primary surgery	Neoadjuvant chemotherapy	Neoadjuvant biological therapy	Neoadjuvant hormone therapy	Neoadjuvant hormone therapy for more than 3 months
Clinical anatomical stage	No				
Clinical anatomical stage		Yes			
Clinical anatomical stage*			Yes		
Clinical anatomical stage				Yes	Yes
Pathological stage	Yes	No			
Pathological stage	Yes		No		
Pathological stage	Yes			No	No
Pathological stage	Otherwise for other conditions				

* How to calculate the time of hormone therapy: If is.na(stop date) then first surgery date, else min(stop date, first surgery date)