
National Audit of Primary Breast Cancer State of the Nation Report 2024

An audit of care received by people diagnosed with primary breast cancer
in England and Wales during 2019-2021

Published September 2024





NAoPri

National Audit of
Primary Breast Cancer

Citation for this document:

National Audit of Primary Breast Cancer (NAoPri) State of the Nation Report 2024.
London:
National Cancer Audit Collaborating Centre,
Royal College of Surgeons of England, 2024.

Acknowledgements:

Special thanks to Melissa Gannon for her many contributions as methodologist to NAOpri and NABCOP from September 2017 until April 2024.

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HQIP

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The National Cancer Audit Collaborating Centre (NATCAN) is commissioned by the **Healthcare Quality Improvement Partnership (HQIP)** as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). NATCAN delivers national cancer audits in non-Hodgkin lymphoma, bowel, breast (primary and metastatic), oesophago-gastric, ovarian, kidney, lung, pancreatic and prostate cancers. HQIP is led by a consortium of the Academy of Medical Royal Colleges and the Royal College of Nursing. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical, and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies.

<https://www.hqip.org.uk/national-programmes>

ABS

ASSOCIATION OF
BREAST SURGERY

The **Association of Breast Surgery** is a registered charity dedicated to advancing the practice of breast surgery and the management of breast conditions for the benefit of the public. It is a multi-professional membership association, which promotes training, education, clinical trials and guideline composition and adoption. For further information, please refer to the website www.associationofbreastsurgery.org.uk. Registered charity no: 1135699



UKBCG

The **UK Breast Cancer Group (UKBCG)** is a forum for Clinical and Medical Oncologists. The UKBCG acts as a stakeholder to NICE, NHS England and other organisations; and undertakes key pieces of work, at times in collaboration with other bodies, with the overriding endpoint of improving patient care. The Group's objectives include advancing the education of clinical and medical oncologists in the subject of breast cancer, concerning its identification, diagnosis and treatment; promoting research for the public benefit in all aspects of breast cancer and publishing the results; and assisting in the treatment and care of persons suffering from breast cancer, or in need of rehabilitation, by the provision of education for healthcare professionals. Further information on the work of the UKBCG is communicated via this website on a regular basis <https://ukbcg.org/>. Registered charity no: 1177296



NDRS

NATIONAL DISEASE REGISTRATION SERVICE

This work uses data that has been provided by patients and collected by the NHS as part of their care and support. For patients diagnosed in England, the data is collated, maintained and quality assured by the National Disease Registration Service (NDRS), which is part of NHS England. Access to the data was facilitated by the NHS England Data Access Request Service.



GIG
CYMRU
NHS
WALES

Rhwydwaith
Canser Cymru
Wales Cancer
Network

NHS Wales is implementing a new cancer informatics system. As a result, the quality and completeness of data from Wales is likely to have been impacted due to implementation of this new system across multiple NHS organisations (Health Boards), which has resulted in data being supplied by both old and new systems. Additionally, and reflecting the uncertainty of data quality, the data submitted to the audit may not have undergone routine clinical validation prior to submission to the Wales Cancer Network (WCN), Public Health Wales.

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1. Introduction

The aim of the National Audit of Primary Breast Cancer (NAoPri) is to evaluate the patterns of care and outcomes for people with primary breast cancer in England and Wales, and to support services to improve the quality of care for these patients. This work builds on that of the National Audit of Breast Cancer in Older Patients (NABCOP)¹ but has been expanded to include younger people and men with breast cancer. This State of the Nation report publishes information on the care received by people diagnosed with breast cancer during 2019-21 in England and Wales. Wales also provided 2022 data which has been included in Figure 1 only. It is the audit's first annual assessment of NHS breast services and shares examples of good practice as well as highlighting where care needs to improve.

The management of people with breast cancer is informed by various national guidelines. The NAoPri evaluates the patient care provided against the standards set for people with non-invasive and invasive disease. Clinical practice is informed by the National Institute for Health and Care Excellence (NICE) Guideline NG101² and Quality Standard Q12³ as well as guidance from the Association of Breast Surgery (ABS)⁴, United Kingdom Breast Cancer Group (UKBCG)⁵, and European Society of Breast Cancer Specialists (EUSOMA)⁶. From these, and in consultation with its professional and patient advisory groups, the NAoPri has developed five quality improvement (QI) goals and a set of associated indicators, details of which are published in the [NAoPri Quality Improvement \(QI\) Plan](#). Additional materials that accompany this report are available [here](#). This includes data tables for individual NHS organisations, a description of the audit methods, a glossary of terms, and an action plan template to support local QI. Healthcare professionals are encouraged to review the findings of this report, explore the data from their hospital, and decide how unwarranted differences in practice can be addressed. A patient summary will be published alongside this report to make the findings accessible to the wider public.

The breast cancer care described for the period 2019-21 will reflect the changes introduced in the NHS during 2020 because of the COVID-19 pandemic and will be atypical to some degree. These changes included a 3-month pause in breast screening units inviting all eligible women for breast screening, and adaptations to initial treatments offered to people diagnosed with primary breast cancer⁷. The State of the Nation Report uses National Cancer Registration Data (NCRD "gold standard" registration data) for England, which is currently available for people diagnosed up to the end of 2021⁸. The "gold standard" data contains over 98% of all the people that will eventually be found by the registration process and has better completeness of key variables compared to more recent registration data. The "gold standard" data includes tumour hormone receptor status, which enables reporting of indicators for clinically distinct subgroups. "Gold standard" cancer registration data is currently available for people diagnosed up to the end of 2021. In future years we will work to provide more timely reporting. To further support QI activities, the NAoPri publishes quarterly reports of data quality metrics and patient characteristics (England only). From October 2024 these reports will include a subset of performance indicators. The quarterly reports use more timely Rapid Cancer Registration Data (time lag 4-6 months), available here: <https://www.natcan.org.uk/audits/primary-breast/reports-2/>. The reports illustrate how services continue to recover from the impact of the COVID-19 pandemic. Whilst we have reported national figures in this report, [supplementary tables](#) provide more information about organisation and regional level variation for our key indicators. The NATCAN frequently asked questions (number 17) provides information on the NATCAN outlier policy⁹. The NAoPri pages of the NATCAN website also provide access to: (1) a description of audit methods, (2) a glossary of terms, (3) resources that support local services' QI initiatives, and (4) other sources of information about breast cancer.

1 National Audit of Breast Cancer in Older Patients. Available from: <https://www.nabcop.org.uk/>

2 National Institute for Health and Care Excellence. *Early and locally advanced breast cancer: diagnosis and management*. NICE guideline [NG101]. Available from: <https://www.nice.org.uk/guidance/ng101>.

3 National Institute for Health and Care Excellence. *Breast Cancer. Quality standard [QS12]*. Available from: <https://www.nice.org.uk/guidance/qs12>.

4 Association of Breast Surgery (ABS). *Guidelines available from*: <https://associationofbreastsurgery.org.uk/professionals/clinical/guidance-platform/>

5 UKBCG. *Neo-adjuvant chemotherapy: multidisciplinary guidance*. Available from: <https://ukbcg.org/media/31670/neoadjuvant-chemotherapy-manual-v1.pdf>

6 Biganzoli, L., et al., *Updated recommendations regarding the management of older patients with breast cancer: a joint paper from the European Society of Breast Cancer Specialists (EUSOMA) and the International Society of Geriatric Oncology (SIOG)*. *Lancet Oncol*, 2021. **22**(7): p. e327-e340

7 Lohfeld, L., Sharma, M., Bennett, D. et al. *Impact of the COVID-19 pandemic on breast cancer patient pathways and outcomes in the United Kingdom and the Republic of Ireland – a scoping review*. *Br J Cancer* (2024). <https://doi.org/10.1038/s41416-024-02703-w>

8 <https://www.natcan.org.uk/resources/timeliness-of-the-national-cancer-registration-dataset-ncrd/>

9 <https://www.natcan.org.uk/faqs/>

The NAOpri is one of ten national cancer audits delivered by the National Cancer Audit Collaborating Centre (NATCAN). These audits include the [National Audit of Metastatic Breast Cancer \(NAoMe\)](#), for which a State of the Nation report is also available. NATCAN is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit and Patient Outcomes Programme. It delivers national cancer audits in non-Hodgkin lymphoma, bowel, oesophago-gastric, ovarian, kidney, lung, pancreatic and prostate cancers as well as the two audits in breast cancer. More information about the national cancer audits can be found [here](#).

Throughout this report:

- the term NHS organisations is used to refer to English trusts and Welsh Health Boards collectively
- we refer to women and men as these correspond to the “sex” categories available in the data supplied. We acknowledge that some people may not identify using these binary woman–man genders.

1.1 Data collection

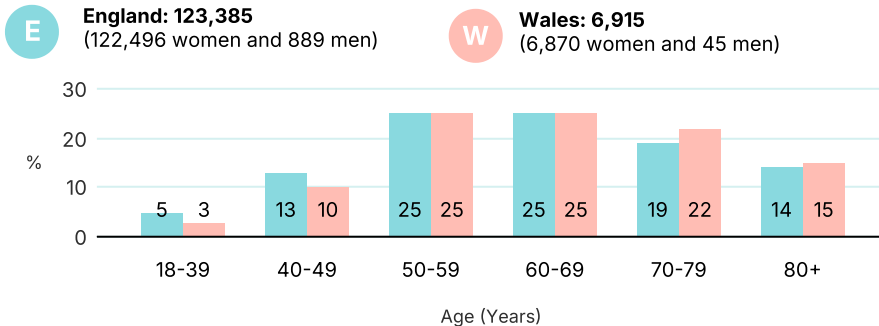
The NAOpri dataset for analysis includes people (aged ≥ 18 years at diagnosis) with primary breast cancer (ICD-10 diagnosis codes: C50; D05) located in the breast, with or without spread to regional lymph nodes (stages 0 to 3C) and who were diagnosed in an NHS hospital within England and Wales. In this report, we evaluate the care received by patients diagnosed between 1st January 2019 and 31st December 2021. Wales also provided 2022 data which has been included in Figure 1 only. Statistics are provided for various groups of individuals, with a focus on two groups: (a) non-invasive / in-situ carcinoma (stage 0), and (b) early invasive breast cancer (EIBC; stages 1–3A). The care of people who had evidence of metastatic disease (stage 4) is evaluated by the National Audit of Metastatic Breast Cancer (NAoMe). Information from 114 English NHS trusts and 6 Welsh local health boards were analysed.

The audits in NATCAN including the NAOpri do not ‘collect’ clinical data via bespoke audit specific data collection, thereby minimising the burden of data collection on hospitals. Instead, the NAOpri uses data extracts from various national cancer datasets, which are nationally mandated flows of data from hospitals. For people treated within English NHS hospitals, the data are routinely collated, maintained and quality-assured by the National Disease Registration Service (NDRS), which is part of NHS England. For people treated in Wales, the data were provided by the Wales Cancer Network (WCN) in Public Health Wales, from the Cancer Network Information System Cymru (CaNISC) electronic patient record system. For full details of the data and methods used within this report, please see the NAOpri Methodology document, available [here](#).

2. Infographic

The NAOpri reports on all people (women and men) aged 18 and over newly diagnosed with primary breast cancer (stages 0 to 3) in NHS hospitals in England and Wales.

Total: 130,300 women and men diagnosed 2019-2021



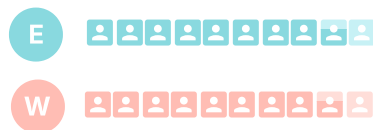
Triple Diagnostic Assessment

55% of people in England and 57% in Wales were reported to have Triple Diagnostic Assessment in a single hospital visit.



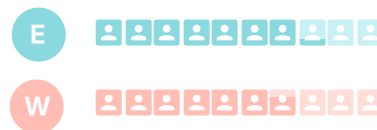
Surgery

86% of people in England and 86% in Wales received surgery within 12 months of diagnosis (stage 0 to stage 3A).



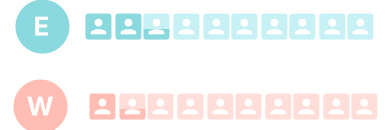
Breast Conserving Surgery (BCS)

72% of women in England and 68% in Wales had BCS. Mastectomy rates were higher with increased tumour size and older age.



Breast Reconstruction

24% of women in England and 14% in Wales had an immediate breast reconstruction following a mastectomy.



Chemotherapy

13% of people in England and 9% in Wales received neo-adjuvant chemotherapy (chemotherapy before surgery).



Among those with Early Invasive Breast Cancer (EIBC) having surgery, 33% of people in England and 29% in Wales received chemotherapy either before or after surgery.



Radiotherapy after BCS

85% of women in England with EIBC and 70% in Wales received adjuvant radiotherapy following BCS.



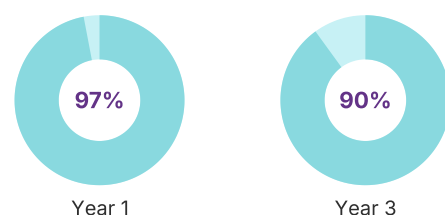
CNS Contact

For those with data available 99% of people in England and 99% in Wales had contact with a Clinical Nurse Specialist (CNS) after diagnosis. However, data completeness for England was 76%.



Survival

Percent of people who survived for 1 or 3 years after diagnosis in England and Wales (combined).



Note 1: Where we limited this information to women, this is because the number of men were too small to produce reliable statistics.

Note 2: Surgical and oncological treatment options are similar for men and women with the same tumour characteristics. We have limited the information about surgery and radiotherapy to women in this infographic because reliable statistics on the treatments received by men could not be produced using the limited data available in this report.

3. Recommendations

Recommendation	Audience	Audit Findings	Quality Improvement Goal	National guidance/standards/resources
1. Ensure that people with breast cancer have access to Triple Diagnostic Assessment (TDA) in a single visit and, if required, identify methods to increase the provision of this service.	England: Integrated Care Boards (ICB) working with breast care teams and clinical management in English NHS trusts. Wales: Breast care teams and clinical management in Welsh NHS Health Boards.	55% (England) and 71% (Wales) of people were recorded as having TDA in a single visit.	Goal #1 – Improve the movement of patients through the care pathway.	NICE Quality Standard 12 - Quality Statement 1: ¹⁰ Timely diagnosis. People with suspected breast cancer referred to specialist services are offered the triple diagnostic assessment in a single hospital visit.
2. Review the use of neo-adjuvant chemotherapy for all patients with early invasive breast cancer in order to reduce the levels of unexplained regional variation.	England: Cancer Alliances working with breast care teams and clinical management in English NHS trusts. Wales: Breast care teams and clinical management in Welsh NHS Health Boards.	Rates of neo-adjuvant chemotherapy were under 10% for 12 NHS breast units and above 30% for 11 NHS breast units.	Goal #3 – Reduce unwarranted variation for patients having non-surgical oncological treatments.	NICE NG101 summary of recommendations ¹¹ . Offer neo-adjuvant chemotherapy to people with invasive breast cancer as an option to reduce tumour size ABS Neo-adjuvant Chemotherapy: Multidisciplinary Guidance . ¹²
3. Confirm breast multidisciplinary teams (MDT) have a data lead responsible for ensuring the quality of national data submissions. Reviews of data completeness within breast MDTs should include full tumour characterisation, ER ¹³ and HER2 ¹³ status (for invasive breast cancer), performance status, the NABCOP fitness assessment ¹⁴ data items (for people aged 70+ years) as well as data on Triple Diagnostic Assessment (TDA) and contact with Clinical Nurse Specialists (CNS). <i>(Recommendation aligned with the report for the National Audit of Metastatic Breast Cancer¹⁵.)</i>	England: Integrated Care Boards (ICB) working with breast care teams and clinical management in English NHS trusts. Wales: Breast care teams and clinical management in Welsh NHS Health Boards.	Completeness of data on ER and HER2 status, and performance status items was less than 85%. Cancer Outcomes and Services Dataset (COSD) data items had recorded whether there was “contact with Clinical Nurse Specialist” for 76% of people. Triple Diagnostic Assessment had to be estimated from the dates of two of the three elements.	Goal #1 –5	The Cancer Outcome and Services Data set (COSD) ¹⁶ has been the national standard for reporting cancer in the NHS in England since January 2013. Feedback reports for the data submitted are available through the CancerStats ¹⁷ website. COSD is the main source for the rapid cancer registration dataset. Improved completeness of this dataset is required to ensure quarterly reporting. The Welsh Cancer Intelligence and Surveillance Unit ¹⁸ collects, analyses and releases information about cancer in Wales. The Welsh Health Circular mandates high quality data submissions ¹⁹ .

10 <https://www.nice.org.uk/guidance/qs12>

11 <https://www.nice.org.uk/guidance/ng101/chapter/Recommendations>

12 <https://associationofbreastsurgery.org.uk/media/515633/neooadjuvant-chemotherapy-manual-v1.pdf>

13 ER status = oestrogen receptor status, HER2 status = human epidermal growth factor receptor 2 status

14 <https://www.nabcop.org.uk/resources/fitness-assessment-tool/>

15 <https://www.natcan.org.uk/audits/metastatic-breast/reports-2/>

16 <https://digital.nhs.uk/ndrs/data/cancerstats2-platform-user-guide#the-cancerstats2-platform>

17 <https://phw.nhs.wales/services-and-teams/welsh-cancer-intelligence-and-surveillance-unit-wcisu/>

18 <https://www.gov.wales/nhs-wales-national-clinical-audit-and-outcome-review-plan-2024-2025-whc02524>

19 <https://www.natcan.org.uk/audits/metastatic-breast/reports-2/>

Recommendation	Audience	Audit Findings	Quality Improvement Goal	National guidance/standards/resources
<p>4. Ensure the recording of date and type of breast cancer recurrence in cancer datasets by:</p> <p>a) Education on the recording of recurrence, sharing the NAoMe Guide to collecting COSD data for breast cancer recurrence²⁰ with NHS organisations.</p> <p>b) Reviewing the process of capturing these data within a breast multidisciplinary team (MDT), and ensuring these data are uploaded to cancer datasets.</p> <p><i>(Recommendation aligned with the report for the National Audit of Metastatic Breast Cancer¹⁵.)</i></p>	<p>England: Breast care teams and clinical management in English NHS trusts</p> <p>Wales: Breast care teams and clinical management in Welsh NHS Health Boards.</p>	<p>Levels of data completeness for recurrence are low. Recurrence information was available for less than 1% of people diagnosed with breast cancer (2015-2021) although 6.3% of people died from breast cancer in this cohort.</p>	<p>Goal #5 – Improve and reduce unwarranted variation in primary breast cancer outcomes.</p>	<p>The Cancer Outcome and Services Data set (COSD)²¹ has been the national standard for reporting cancer in the NHS in England since January 2013. Feedback reports for the data submitted are available through the CancerStats²² website. COSD is the main source for the rapid cancer registration dataset. Improved completeness of this dataset is required to ensure quarterly reporting.</p> <p>The Welsh Cancer Intelligence and Surveillance Unit²³ collects, analyses and releases information about cancer in Wales. The Welsh Health Circular mandates high quality data submissions²⁴.</p>
<p>5. Review rates of immediate reconstruction and, where rates are identified as below the mean, act to improve access to immediate reconstruction by ensuring it is offered to all women, unless precluded by comorbidity or adjuvant therapies.</p>	<p>England: Cancer Alliances working with breast care teams and clinical management in English NHS trusts</p> <p>Wales: Breast care teams and clinical management in Welsh NHS Health Boards.</p>	<p>Rates of mastectomy with immediate reconstruction, reported against unit of diagnosis, were under 10% for 16 NHS breast units and above 40% for 10 NHS breast units. The overall mean for England and Wales was 23%.</p>	<p>Goal #4 – Improve access to breast reconstruction after mastectomy.</p>	<p>NICE NG101 recommendation 1.5 Breast Reconstruction²⁵. Offer immediate breast reconstruction to women who have been advised to have a mastectomy, including those who need radiotherapy, unless they have comorbidities that rule out reconstructive surgery.</p>

20 <https://www.natcan.org.uk/resources/guide-to-collecting-cosd-data-for-breast-cancer-recurrence/>

21 <https://digital.nhs.uk/ndrs/data/data-sets/cosd#:~:text=The%20COSD%20specifies%20the%20data,NDRS%20on%20a%20monthly%20basis.>

22 <https://digital.nhs.uk/ndrs/data/cancerstats2-platform-user-guide#the-cancerstats2-platform>

23 <https://phw.nhs.wales/services-and-teams/welsh-cancer-intelligence-and-surveillance-unit-wcisu/>

24 <https://www.gov.wales/nhs-wales-national-clinical-audit-and-outcome-review-plan-2024-2025-whc02524>

25 <https://www.nice.org.uk/guidance/ng101/chapter/Recommendations>

4. Description of people with primary breast cancer (PBC)

4.1 Data completeness

Key Messages: NHS organisations should ensure the data on key data items submitted to NDRS and CaNISC are complete. Particular attention should be given to data on “patient seen by a clinical nurse specialist (CNS) at diagnosis,” and date and type of cancer recurrence. Completeness of data on molecular markers (including hormone receptor and human epidermal growth factor receptor 2 (HER2) status), and performance status items should be improved. The reasons for poor data completeness are likely to vary across organisations and data items – recording of information at MDT, data entry/audit resource.

Treatment options for individuals with breast cancer are influenced by the characteristics of their tumour (molecular markers, grade, and stage at diagnosis) and their general health and fitness. The recording of this information in national cancer datasets is vital to understand patterns of care within the NHS. Levels of completeness were excellent for age at diagnosis (100%), sex (100%), and tumour grade (>94%), but were lower for other data items (Table 1). In particular, data completeness among people with invasive

disease was low for oestrogen receptor (ER) status (66.5%) and HER2 status (80.4%) in English data, and performance status from both countries (64.5% for England and 23.3% for Wales). In English cancer registration data, CNS contact was recorded for 76.1% of people diagnosed between 2019 and 2021.

National initiatives are ongoing to improve the recording of cancer recurrence for people with all tumour types (for more details, please see the [NDRS website](#)). The completeness of data on recurrence remained low among people with breast cancer in all the datasets supplied; for people diagnosed in calendar years from 2015 to 2021, recurrence information was available for less than 1%. As comparison, the proportion of deaths from breast cancer in this cohort was 6.3%. We encourage breast units to ensure multidisciplinary teams (MDTs) discuss people diagnosed with recurrence and ensure information about recurrent disease is submitted to national cancer datasets, particularly date of recurrence and whether it is local, regional, or distant recurrence. We recognise it would be helpful to have greater clarity on defining a local recurrence versus a new primary and for now we encourage a pragmatic MDT-led approach. See the NAO Me guide to COSD data for breast cancer recurrence, produced in collaboration with NDRS available [here](#).

Table 1. Percentage of records with complete data for selected items for people diagnosed with primary breast cancer in England and Wales (2019-21)

Item	Non-invasive disease		Invasive disease only	
	England (n=13,286)	Wales (n=676)	England (n=110,099)	Wales (n=6,239)
Tumour grade	94.6	98.1	97.1	98.2
Overall stage	100.0	100.0	87.0	86.0
Tumour stage (T stage)	n/a	n/a	94.2	90.2
Nodal stage (N stage)	n/a	n/a	93.2	100.0
ER status*	32.2	22.9	66.5	93.1
HER2 status**	5.3	8.0	80.4	86.0
PR status***	12.8	14.2	51.2	75.1
Performance status [†]	50.1	14.9	64.5	23.3

Notes: *ER status = oestrogen receptor status, **HER2 status = human epidermal growth factor receptor 2 status, ***PR status = progesterone receptor status, [†]Performance Status (scores: 0-4) is a fitness assessment tool used in oncology to stratify people based on their ability to carry out activities of daily living, n/a = not applicable. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

Consistent with good care, breast units have been encouraged to routinely measure frailty among people aged 70 years and over at their first clinic appointment. The items on the “[NABCO Fitness Assessment for Older Patients](#)” form were incorporated into Cancer Outcomes and Services Dataset (COSD) Version 9.0 (released in 2020) to support the recording of this clinically essential information. Current levels of data completeness

across all six fitness items are low and English NHS trusts are encouraged to use the fitness assessment form and ensure the information is included as part of routine data returns using the CancerStats COSD portal. Welsh data collection is being updated to mirror COSD data collection and consequently, it may be feasible for this fitness assessment data to be entered by Welsh hospitals in the future.

4.2 Patient characteristics

We analysed data on 130,300 people diagnosed with primary breast cancer in England (n=123,385) and Wales (n=6,915) between 2019 and 2021. The cohort consisted of 129,366 women (England: n= 122,496; Wales: n=6,870) and 934 men (England: n=889; Wales: n=45). We distinguish between four groups of people with breast cancer within this report:

1. All people with primary breast cancer (invasive and non-invasive),
2. People with invasive breast cancer (stages 1-3C),
3. People with early invasive breast cancer (EIBC; stages 1–3A) and
4. People with non-invasive breast cancer (stage 0).

Where clinically appropriate our analysis focuses on those with EIBC. People with Stage 3B-C breast cancer at diagnosis are managed differently to those with Stage 0-3A as they have a higher probability of undetected distant spread of their cancer and there are greater challenges in achieving control of growth of the breast cancer in the breast and lymph nodes.

There is a greater emphasis on early commencement of systemic treatments and the use of radiotherapy with a less prominent role for surgery.

Table 2 summarises the characteristics of people diagnosed between 2019 and 2021. In summary:

- The mean age at diagnosis was 63.0 years for women (IQR: 53-73) and 68.9 years for men (IQR: 60-78).
- The percentage of people with T1 (> 0.1 to 2 cm) tumours changed with age, increasing from 40.0% (18-39 years) to 64.2% (60-69) before decreasing to 38.8% (80 & over) once the age range of breast screening is exceeded.
- The distribution of nodal involvement, ER status, or HER2 status was not associated with age.
- Invasive tumours were predominantly grade 2 (Grade 1 = 14.9%; Grade 2 = 55.7%; Grade 3 = 29.5%).

Among women aged 50–69 years, the proportion diagnosed via the NHS breast screening programme was 35.9% in England and 58.4% in Wales. Rates of diagnosis after emergency presentation were low for both women and men.

Table 2. Characteristics of people diagnosed with primary breast cancer in England and Wales during 2019–21					
	England	Wales		England	Wales
No. of people			Tumour size* (reported E=84,811, W=4,204)		
2019	43,571	2,487	> 0.1 to 2 cm	53.4%	41.5%
2020	34,904	1,951	> 2 to 5 cm	40.1%	45.9%
2021	44,910	2,477	> 5 cm	6.5%	12.5%
Age (years)			Lymph nodes* (reported E=70,985, W=6,277)		
Under 40	4.5%	3.2%	0 malignant nodes	71.2%	78.7%
40-49	12.7%	10.0%	1-3 malignant nodes	22.3%	15.9%
50-59	24.8%	24.6%	4-9 malignant nodes	4.6%	3.9%
60-69	25.1%	25.4%	10+ malignant nodes	1.9%	1.5%
70-79	18.9%	21.5%	ER status* (reported E=73,173, W=5,808)		
80+	14.0%	15.2%	Positive	83.8%	85.3%
Overall stage (reported E=109,066, W=6,043)			HER2 status* (reported E=88,759, W=5,425)		
Non-invasive/Stage 0	12.2%	11.2%	Positive	12.0%	13.7%
Stage 1	39.5%	38.4%	Performance status† (reported E=77,722, W=1,555)		
Stage 2	39.3%	40.4%	0	81.4%	73.6%
Stage 3A	5.2%	6.1%	1	11.8%	15.6%
Stage 3B, 3C	3.8%	3.9%	2+	6.8%	10.9%

Notes: * For people with invasive disease only (stage 1-3). E = England, W = Wales. ER status = oestrogen receptor status, HER2 status = human epidermal growth factor receptor 2 status, †Performance Status (scores: 0-4) is a fitness assessment tool used in oncology to stratify people based on their ability to carry out activities of daily living. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5. Patterns of care in England and Wales

5.1 Patterns of care

Figure 1 shows the national performance indicator values for England and Wales, based on the year in which people were diagnosed. The figure includes results for 2022 for Wales; these data were not available for England. See the [NAoPri methodology document](#) for further information

There was a noticeable decrease in the number of people diagnosed with primary breast cancer during 2020 (Table 2). The pattern of care received by these patients over time highlights the impact of the COVID-19 pandemic in some specific areas. We note that delays to some treatments (such as surgery) are not highlighted by the graph below.

Areas where there were noticeable changes in practice during 2020 were the:

- Proportion of women having breast conserving surgery (BCS) among all those having surgery²⁵.
- Proportion of women (stage 2-3A HER2 positive) who had neo-adjuvant chemotherapy before surgery⁸.
- Proportion of women (stage 2-3A HER2 positive) who had any chemotherapy among those who had surgery⁸.
- Proportion of women who had a mastectomy and immediate reconstruction⁸.

The patterns of care in 2021 were similar to those observed in 2019.

Figure 1. Indicator values for people with breast cancer diagnosed in England and Wales, by year of diagnosis*				
		England		Wales
Percentage of people who underwent triple diagnostic assessment (TDA) in a single hospital visit. (Women referred after screening not included)	2019	54%		60%
	2020	55%		59%
	2021	56%		51%
	2022			44%
Percentage of people who had contact with a Clinical Nurse Specialist (CNS) after diagnosis. (*figures based on people with data on CNS contact)	2019	99%		100%
	2020	98%		99%
	2021	98%		99%
	2022			98%
Percentage of people who had i) breast conserving surgery or ii) mastectomy within 12 months of diagnosis	2019	87%		88%
	2020	85%		84%
	2021	87%		85%
	2022			89%
Percentage of women who received neo-adjuvant chemotherapy before surgery (stage 2-3A, HER 2 positive)	2019	55%		43%
	2020	53%		36%
	2021	61%		42%
	2022			41%
Percentage of women who had breast conserving surgery among those who had surgery within 12 months of diagnosis	2019	72%		71%
	2020	70%		64%
	2021	73%		68%
	2022			69%
Percentage of women who received adjuvant radiotherapy following breast-conserving surgery (stage 1-3A, unknown)	2019	81%		65%
	2020	80%		72%
	2021	83%		67%
	2022			52%
Percentage of women who received adjuvant radiotherapy following mastectomy (stage 1-3A, unknown)	2019	45%		29%
	2020	49%		31%
	2021	47%		27%
	2022			21%
Percentage of women who had chemotherapy among those who had surgery within 12 months (stage 2-3A, HER2 positive)	2019	82%		71%
	2020	79%		73%
	2021	82%		62%
	2022			56%
Percentage of women who had immediate reconstruction following a mastectomy	2019	26%		18%
	2020	18%		8%
	2021	25%		14%
	2022			12%

Notes: HER2 = human epidermal growth factor receptor 2. * Data from England yet to be available for 2022. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

25 We limited this information to women as the number of men were too small to produce reliable statistics.

5.2 Diagnosis and treatment planning

Key messages: The proportion of people who had Triple Diagnostic Assessment (TDA) in a single hospital visit was 56.6% in Wales. For England only, TDA status was estimated from the date of diagnosis and the date of biopsy, and it was assumed that imaging was performed prior to biopsy. We estimate the proportion of people who had TDA in England was 55.0% between 2019 and 2021. NHS organisations with low values should increase the proportion of people who have TDA.

The proportion of people in 2019-21 who saw a CNS at diagnosis was 99.4% in Wales. For England, the actual levels of performance are uncertain because information on CNS contact was only available for 76.1% of patients diagnosed between 2019 and 2021. Among people with this data, 98.8% were reported as having seen a CNS. The patterns of care were similar for women and men on these two indicators.

TDA Denominator: Women and men diagnosed with primary breast cancer between 2019 and 2021 who were not screen detected. (Patients analysed: England = 95,884, Wales = 4,416).

CNS Denominator: Women and men diagnosed with primary breast cancer between 2019 and 2021. (Patients analysed: England = 123,385, Wales = 6,915).

TDA is a key tenet of breast cancer service provision. It describes the availability and employment of the most commonly used breast cancer diagnostic methods (clinical examination, ultrasound/mammography and clinical or ultrasound-guided biopsy) at a patient's initial clinic visit and their use should allow a prompt, definitive cancer diagnosis in the majority. This is associated with high levels of patient satisfaction; it can help to reduce stress associated with multiple visits. Some people require more complex diagnostic investigations such as an MRI scan or mammographically-guided biopsy and it is expected that those procedures would require separate planned visits to allow maximum efficiency of their use. Achievement of TDA will therefore not be seen in 100% of people with breast cancer and there are ongoing discussions as to what an appropriate target should be in modern practice. Increased completeness of the TDA data item return is necessary to inform that discussion and will help identify outlying low levels of performance.

For this report, the indicator values for English NHS trusts had to be estimated using only two of the three dates - the date of diagnosis and the date of biopsy (Table 3). We will improve data provision for this measure by incorporating information from the national Diagnostic Imaging Dataset (DIDs) as well as encouraging completion of the relatively recently added COSD item for TDA.

All people should have access to and contact with a CNS. Among people diagnosed in 2019-21 who had these data recorded, over 98% were reported to see a CNS at diagnosis in England and Wales (Table 3). However, completeness of the data item on CNS contact was 76.1% for England and levels of performance are uncertain (see Section 4.1).

Table 3. Indicator values for England and Wales for people diagnosed in 2019-21

Indicator	England and Wales	England	Wales
Percentage of people who had Triple Diagnostic Assessment (TDA) in a single hospital visit	55.0%	55.0%	56.6%
Percentage of people who had contact with a Clinical Nurse Specialist (CNS) after diagnosis.	98.3%	98.8%	99.4%

NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5.3 Receipt of primary breast surgery

Key Messages: Overall, 86.4% of people diagnosed in 2019-21 received surgery in England and Wales within 12 months of diagnosis (England=86.4%; Wales=86.0%). The proportions of women and men who had surgery were similar (respectively, 86.4% and 83.2%) but the type of surgery differed, with 71.8% of women having breast conserving surgery and 93.6% of men having mastectomy (of those who had surgery).

In England and Wales, the percentage of women with non-invasive breast cancer and EIBC who had breast conserving surgery were 75.6% and 71.3%, respectively (of those who had surgery). The percentage of women with EIBC having mastectomy increased with tumour stage (T1: 15.9%; T2: 36.6%; T3: 81.1%) and increased among women aged over 70 years.

Denominator: Women and men diagnosed (2019-21) with early breast cancer stages 0-3A. (Patients analysed: England = 119,206, Wales = 6,680).

Surgical resection is a central component in the treatment of people with non-invasive or early invasive breast cancer. Options for surgery are a mastectomy or BCS, depending on the disease extent and patient preference. Men typically have mastectomy, while the majority of women have BCS.

For older people with ER positive tumours, primary endocrine therapy is an alternative option to surgery. However, for ER positive tumours, NICE guideline NG101 recommends: "Treat patients with early invasive breast cancer, irrespective of age, with surgery and appropriate systemic therapy, rather than endocrine therapy alone, unless significant comorbidity precludes surgery". Box 1 demonstrates a decrease in surgery with increasing age for women with ER positive cancers that isn't attributable to increasing comorbidity (Charlson Comorbidity Index = 0).

Box 1. Summary statistics about the proportion of women with breast surgery in England and Wales (2019-21), stratified by tumour type, age at diagnosis, and number of comorbid conditions

Table 4. Proportion of BCS among women with primary breast cancer who had breast surgery			
% BCS	All	Non-invasive	EIBC
E + W	71.8%	75.6%	71.3%
England	72.0%	75.9%	71.5%
Wales	68.0%	70.8%	67.6%
<i>Age at diagnosis (years)</i>			
18-49	60.3%	60.3%	60.3%
50-69	78.1%	79.1%	78.0%
70-79	70.7%	76.2%	70.2%
80+	56.0%	67.4%	55.4%

Figure 2. Proportion of women with EIBC who had breast surgery by ER status, age, and Charlson Comorbidity Index (CCI)

Notes: EIBC = early invasive breast cancer, ER = oestrogen receptor. The table focuses on women because most men have mastectomy. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5.4 Use of neo-adjuvant chemotherapy

Key messages: Among people with EIBC who had surgery within 12 months of diagnosis, 12.5% had neo-adjuvant chemotherapy (NACT) (England = 12.7%, Wales = 8.7%). Few men received NACT. The use of NACT was higher among women with HER2 positive or triple negative disease (stage 2-3A). The use of NACT decreased with age and was rarely used among women aged 80+ years. Rates of NACT were under 10% for 35 NHS breast units and above 20% for 12 NHS breast units (patients allocated to organisation of diagnosis).

Denominator: Women and men diagnosed (2019-21) with early invasive breast cancer (stage 1-3A, unknown) who had surgery within 12 months of diagnosis (Patients analysed: England = 90,898, Wales = 5,131).

NICE guideline NG101 recommends the use of neo-adjuvant chemotherapy (NACT) in circumstances when it can be beneficial in reducing the size of tumours and involved lymph nodes. NACT is recommended for many people with HER2 positive and ER negative invasive breast cancer where adjuvant chemotherapy would be indicated. Box 2 describes the use of NACT according to different patient and tumour characteristics.

Box 2. Summary statistics about use of neo-adjuvant chemotherapy (NACT) in England and Wales (2019-21)

Table 5. Proportion of NACT among people with EIBC				Figure 3. Use of NACT for women with stage 2 and 3A disease by age and type of cancer
	E+W	England	Wales	
All patients	12.5%	12.7%	8.7%	
Women	12.6%	12.8%	8.8%	
Men	2.6%			
<i>For women with stage 2 and 3A disease</i>				
ER*-ve, HER2**+ve	ER-ve, HER2-ve	ER+ve, HER2+ve	ER+ve, HER2-ve	
59.7%	43.6%	49.4%	6.6%	

Notes: EIBC = early invasive breast cancer, *ER = oestrogen receptor, **HER2 = human epidermal growth factor receptor 2. Women with stage 1 disease have been excluded from the EIBC analysis as they are unlikely to be treated with NACT unless deemed high risk for recurrence. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5.5 Adjuvant radiotherapy after breast surgery

Key messages: The percentage of women with EIBC (stage 1-3A) who had adjuvant radiotherapy after BCS was 84.1%, (England: 84.9%, Wales: 69.6%) between 2019 and 2021; the rates were higher among women with EIBC compared to women with non-invasive tumours (56.3%). Rates of radiotherapy after BCS varied across NHS organisations for older women.

Among women with stage 1-3A cancer who had mastectomy in England and Wales, 45.9% received post-mastectomy radiotherapy (PMRT), but this figure masked large differences between the risk groups (low-risk: 17.6%; intermediate-risk: 66.7%; high-risk: 85.0%). Rates fell slightly among women aged 80 years and over.

There was variation by NHS organisation in use of PMRT.

Denominator: Women diagnosed (2019-21) with breast cancer (stage 1-3A, unknown) who had surgery within 12 months of diagnosis. (Patients analysed: England = 90,277, Wales = 5,102).

Radiotherapy plays an important role in reducing the rates of local recurrence. It is recommended for most people who have BCS for EIBC. We report its use among women only in this report as few men had BCS.

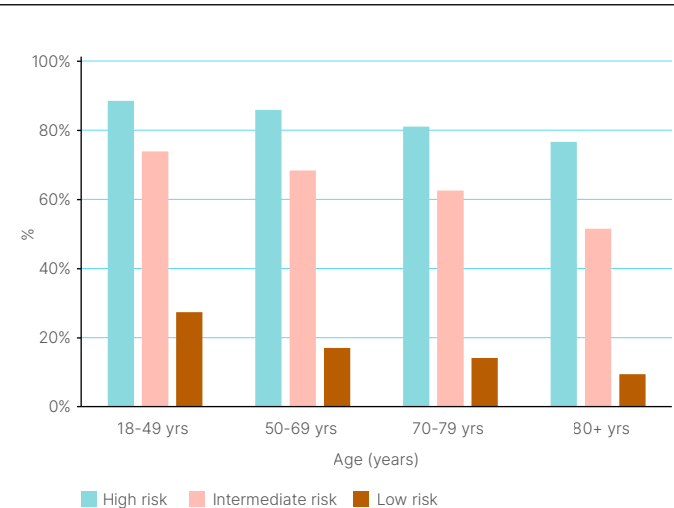
PMRT is recommended for high-risk disease (such as four or more positive lymph nodes or large (T3) tumours) but not for low-risk disease (small (T1-2) tumours, no positive nodes). For intermediate-risk breast cancer (1-3 positive lymph nodes, or node-negative with large (T3) tumours), guidelines suggest consideration of PMRT.

Box 3 shows the use of radiotherapy after BCS and mastectomy according to different patient and tumour characteristics. The proportion of men who had PMRT was similar to that reported for women.

Box 3. Summary statistics about the percentage of women who had adjuvant radiotherapy after surgery in England and Wales (2019-21)

Table 6. Use of radiotherapy after surgery			
	E+W	England	Wales
Women	69.7%	70.5%	54.4%
<i>Breast conserving surgery</i>			
Overall	80.7%	81.4%	67.5%
Non-invasive	56.3%	56.6%	51.0%
Early Invasive Breast Cancer (EIBC)	84.1%	84.9%	69.6%
<i>Mastectomy for EIBC</i>			
Low risk	17.6%	18.0%	11.0%
Intermediate risk	66.7%	68.4%	38.8%
High risk	85.0%	87.0%	55.1%

Figure 4. Use of radiotherapy after mastectomy for EIBC by age and risk of recurrence



NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5.6 Use of systemic anti-cancer therapy among people who had surgery

Key messages: Among women and men diagnosed with EIBC (2019-2021) who received primary surgery, the overall percentage of people who had adjuvant chemotherapy was 18.8%. The rates were similar for women and men. When combined with patterns of neo-adjuvant chemotherapy, the overall percentage of people who had chemotherapy was 32.4% (England: 32.6%, Wales: 28.8%).

The percentage of women who had primary surgery within 12 months and who received chemotherapy was higher among women with ER negative, ER negative/ HER2 negative and HER2 positive disease (stage 2-3A). Rates of treatment varied by age, with lower use of chemotherapy as age at diagnosis increased.

Denominator: Women and men diagnosed (2019-21) with EIBC (stage 1-3A, unknown) who had surgery (Patients analysed: England = 90,898, Wales = 5,131).

Adjuvant chemotherapy can improve disease-free and overall survival in women with EIBC. Treatment decisions are made by considering the balance between the benefits and risks of treatment, particularly for those with comorbidities. Chemotherapy is often offered to people with: (1) ER negative cancers, (2) HER2 positive cancers, (3) those who have evidence of high nodal burden, and (4) ER positive cancers with a higher genomic risk score (presence of breast cancer genes which indicate a higher risk of recurrence and therefore potential benefit from chemotherapy use).

Box 4 shows the use of systemic anti-cancer therapy in those who had surgery according to different patient and tumour characteristics. There is a noticeable proportional difference in the use of chemotherapy in younger people with ER+/HER2- cancers where age appears influential.

Box 4. Summary statistics about the proportion of people who had systemic anti-cancer therapy (SACT) among those with Early Invasive Breast Cancer (EIBC) who had surgery in England and Wales (2019-21)

Table 7. Use of SACT among people with EIBC who had surgery				Figure 5. Use of SACT after surgery by age and cancer type for women with stage 2 and 3A disease			
	E+W	England	Wales				
All patients	32.4%	32.6%	28.8%				
Women	32.4%	32.6%	28.9%				
Men	22.8%	-	-				
<i>For women with stage 2 and 3A disease in E+W</i>							
<i>ER*-ve, HER2**+ve</i>	<i>ER-ve, HER2-ve</i>	<i>ER+ve, HER2+ve</i>	<i>ER+ve, HER2-ve</i>				
83.4%	75.3%	82.3%	34.4%				

Notes: *ER = oestrogen receptor, **HER2 = human epidermal growth factor receptor 2. Where women only included in figures, this is due to methodological approach / data not available. Women with stage 1 disease have been excluded from this analysis as they are unlikely to be treated with chemotherapy unless deemed high risk for recurrence. Women with Stage 3B-C disease have also been excluded as they are managed differently to those with Stage 2-3A disease. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

5.7 Immediate breast reconstruction after mastectomy

Key messages: Among women (diagnosed 2019-21) who had mastectomy, the rates of immediate reconstruction for non-invasive and EIBC were 40.8% and 21.0%, respectively. Among women with invasive disease, the use of immediate reconstruction was less frequent among women with larger tumours. Use of immediate reconstruction was much more frequent in younger women (<70 years, 32.1%) than older women (>70 years, 3.1%). The use of immediate reconstruction was lower in Wales compared to England. There was considerable variation by English NHS organisation, with rates of immediate reconstruction less than 10% for 16 English NHS breast units and above 40% for 10 English NHS breast units (with people allocated to the organisation of diagnosis). The average for England & Wales was 23.0%.

Denominator: Women diagnosed (2019-21) with breast cancer (stage 0-3A, unknown) who had mastectomy (patients analysed: England = 28,613, Wales = 1,831).

In the UK, there has been a gradual increase in the use of breast reconstruction since 2002 when NICE recommended that reconstruction be available to patients with breast cancer undergoing mastectomy. Immediate reconstruction is a treatment option unless it is prevented by impaired fitness or comorbidities. Alternatively, reconstruction may be offered at a later time after the initial cancer surgery and any additional treatments (e.g., chemotherapy and radiotherapy). Box 5 shows the use of immediate reconstruction in women according to different patient and tumour characteristics.

Box 5. Percentage of women who had immediate reconstruction after mastectomy (MIR) among those diagnosed between 2019 and 2021 in England and Wales, by type of cancer, tumour stage and age.

Table 8. MIR among women according to type of cancer and tumour stage				Figure 6. MIR among women with EIBC by age and T stage			
	E+W	England	Wales				
Women	23.0%	23.6%	13.8%				
Non-invasive	40.8%	41.4%	31.8%				
EIBC	21.0%	21.6%	11.8%				
<i>Tumour stage among EIBC (where known)</i>							
T1	25.9%	26.5%	17.1%				
T2	18.2%	18.7%	10.1%				
T3	18.1%	18.8%	7.0%				
Notes: EIBC = Early Invasive Breast Cancer. Women with Stage 0 & 3B-C disease have also been excluded from this analysis as they are managed differently to those with Stage 1-3A disease. NOTE: Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.							

6. Patient outcomes

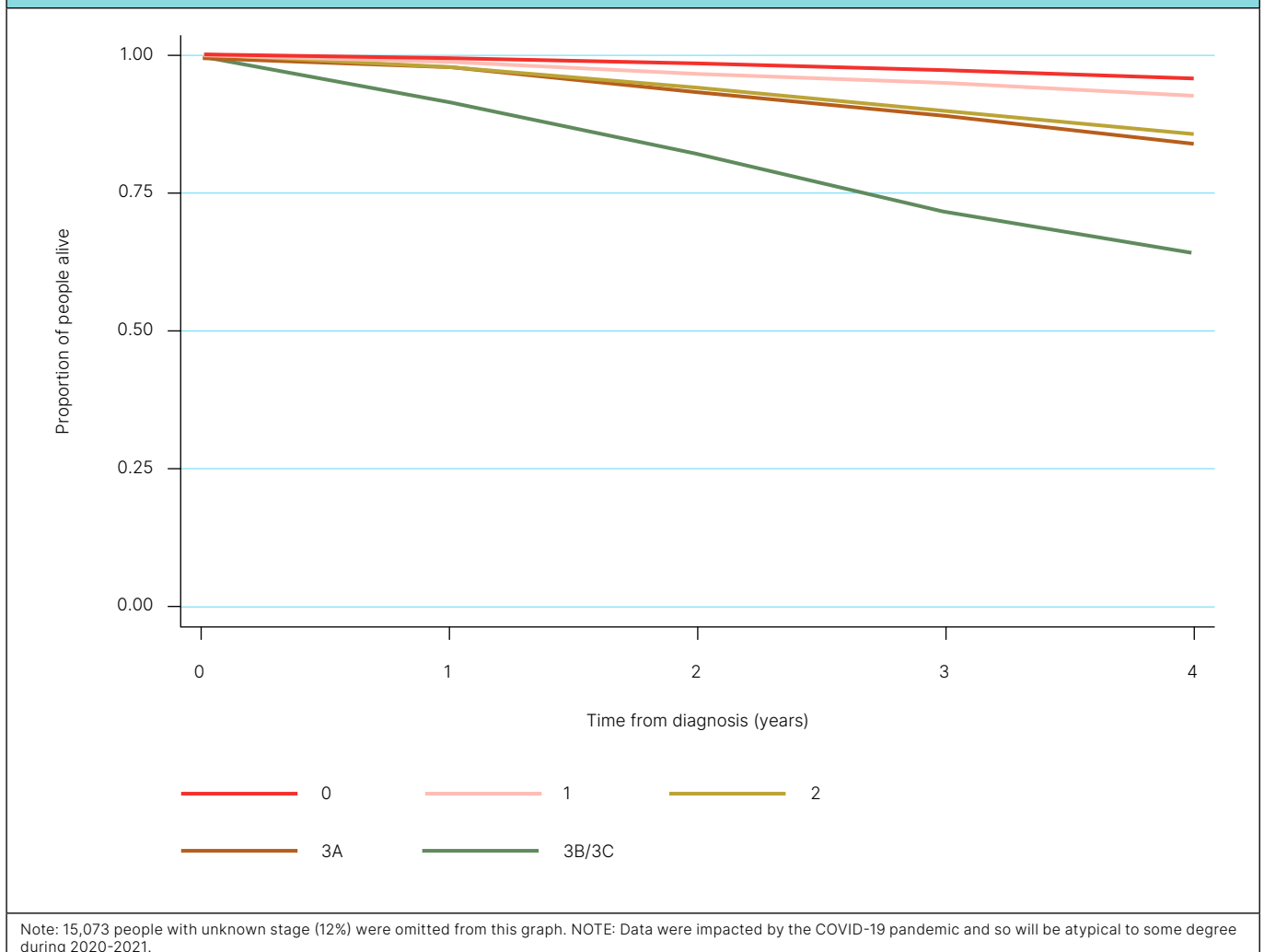
One of the five QI goals adopted by the NAOpri was to “improve and reduce unwarranted variation in primary breast cancer outcomes” (Goal 5). To achieve this aim, the audit is developing the following indicators which were included in the [NAOpri QI Plan](#):

- Percentage of patients who had a re-excision surgery within 12 months of initial breast conservation surgery.
- Percentage of patients who had an overnight hospital admission for treatment-related toxicity within 30 days of a systemic anti-cancer therapy cycle.
- Percentage of patients who survived at least 5 years from the date of breast cancer diagnosis, in addition to 1-year and 3-year survival as presented below.

As the audit matures, the NAOpri aspires to develop further data quality and contextual indicators, details of which are also published with the [NAOpri QI Plan](#). The audit team is currently developing its risk-adjustment processes to ensure the statistics for NHS breast units are comparable given differences in the mix of patients seen at units.

At a national level, 1-year and 3-year survival was 97% and 90% for people with primary breast cancer diagnosed between 2019 and 2021 in England and Wales. Within these figures, there are differences between individuals based on the stage of disease at diagnosis (Figure 7) as well as other patient characteristics including age and comorbidities. We will be providing further information on outcomes in subsequent reports.

Figure 7. Kaplan Meier survival curves from people diagnosed in England (2021) and Wales (2021) stratified by disease stage.



7. Commentary

This first NAOpri State of the Nation report provides a baseline description of the care delivered in NHS hospitals across England and Wales to people diagnosed with primary breast cancer between 2019 and 2021. The NAOpri is the first breast cancer audit within England and Wales to include younger women and men and we will provide more detail on the characteristics of their disease and patterns of care as the audit matures.

This report has focused on the patterns of care at a national level, in England and Wales, for different groups of women and men. We report on indicators that were defined to monitor progress against the 5 NAOpri healthcare QI goals:

1. Improve the movement of patients through the care pathway.
2. Reduce unwarranted variation for patients undergoing surgery.
3. Reduce unwarranted variation for patients having non-surgical oncological treatments.
4. Improve access to breast reconstruction after mastectomy.
5. Improve and reduce unwarranted variation in primary breast cancer outcomes.

The audit has analysed individuals' care based on their place of diagnosis (either at an English or Welsh breast unit). Information about the performance of NHS organisations is available on the NAOpri website and it is essential that NHS trusts and cancer alliances in England and NHS hospitals and health boards in Wales use the additional online materials to review their performance and, where indicated, initiate local QI activities (<https://www.natcan.org.uk/reports/naopri-state-of-the-nation-report-2024/>).

Data quality is a key focus for the NAOpri team. Organisation-level data completeness is published in the NAOpri quarterly reports, [available here](#). Absence of data on recurrence and poor data completeness for key data items on patient characteristics such as disease stage, performance status, ER and HER2 status, reduce the ability of NAOpri to take account of how these influence patterns of care given the nuanced recommendations in clinical guidelines. Improving data completeness and quality for these data items, as well as improving the recording of recurrence (both local and distant) will be particularly important in coming years. We encourage services to use available resources to improve data quality ([NAoMe guide to recording recurrence](#)).

Data completeness also affected our ability to draw firm conclusions about the performance of breast units on the indicators for (1) Triple Diagnostic Assessment and (2) contact with a Clinical Nurse Specialist. Triple Diagnostic Assessment has many benefits, and it is important to be able to evaluate its delivery. Yet, despite the concerns of insufficient data, the available information demonstrates many breast units in England and Wales are not providing TDA to all newly referred patients. Units should evaluate their delivery of TDA and take appropriate remedial steps to rectify deficiencies. It is encouraging that access to a Clinical Nurse Specialist at diagnosis was reported for 96% of people where this data item was completed. However, poor data completeness for this item in English Cancer Registration data leaves uncertainty about actual performance levels.

It is reassuring to see that rates of surgery are high overall. We note a fall in rates of surgery among older women with ER positive disease. This might be expected given primary endocrine therapy is an alternative. However, surgical excision in combination with systemic endocrine therapy is superior in improving survival, compared with primary endocrine therapy alone, and we encourage breast units to ensure surgical decisions are made with individual people after an objective assessment of fitness rather than based on age alone.

The report highlights other areas of care which require improvement. We observed regional variation in the use of neo-adjuvant chemotherapy and the rates of mastectomy with immediate reconstruction. Breast units should review the decision-making and service provision around these aspects of care.

To support this work, the NAOpri will introduce dashboards that are updated on a quarterly basis. The first quarterly dashboard reporting performance indicators for England are projected to publish in October 2024. These will allow regular monitoring of recent activity and will provide further impetus and opportunities to improve outcomes for people with primary breast cancer.