National Audit of Breast Cancer in Older Patients

Part of the National Clinical Audit Patient Outcomes Programme

2017 Annual Report

NA BCOP | National Audit of **Breast Cancer in Older Patients**

This report was prepared by the members of the NABCOP project team

Member	Affiliation	Role
Prof Kieran Horgan	Leeds Teaching Hospitals NHS Trust	Clinical Lead, Surgery
Prof David Dodwell	Leeds Teaching Hospitals NHS Trust	Clinical Lead, Oncology
Prof David Cromwell	CEU, RCS	Director CEU
Ms Yasmin Jauhari	CEU, RCS	Clinical Fellow
Ms Jibby Medina	CEU, RCS	NABCOP Project Manager
Dr Carmen Tsang	CEU, RCS (until December 2016)	Methodologist

The Royal College of Surgeons of England is an independent professional body committed to enabling surgeons to achieve and maintain the highest standards of surgical practice and patient care. As part of this, it supports audit and the evaluation of clinical effectiveness for surgery.

Registered charity no: 212808

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

Commissioned by:

HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover 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 audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.

Registered charity no: 1127049

Copyright

This version (1.1) was released on 21 March 2018, and included corrections to Appendix 3. Respondents of the organisational audit on page 52.

Designed @ www.superbirdcreative.co.uk

Contents

Acknowledgements

This national clinical audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover 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 audits, also funded by the Health Department of the Scottish Government, Department of Health, Social Services and Public Safety (DHSSPS) Northern Ireland and the Channel Islands.

We would like to acknowledge the support of the breast cancer specialists and staff at English NHS trusts and Welsh health boards who have participated in the National Audit of Breast Cancer in Older Patients (NABCOP) and the time they have devoted to participating in the organisational audit and case vignettes.

We would like to thank:

- Jem Rashbass (Director for National Disease Registration at Public Health England), Karen Clements (NABCOP Project Manager) from National Cancer Registration and Analysis Service, Public Health England
- Marianne Dillon (Breast Cancer for Wales Audit Lead) and Hywel Morgan (Network Director, South Wales Cancer Network)
- Carmen Tsang, who as a member of the project team helped establish the project and develop the organisational audit and case vignettes before moving to a new job in December 2016.
- Lucy Davies (Association Manager) from the Association of Breast Surgery.

We would also like to extend our thanks to the members of the Clinical Steering Group (CSG) and Project Board (PB) for their advice and contributions to the Audit (see appendix 1).

Hospital Episode Statistics (HES) data was re-used with the permission of NHS Digital. All rights reserved. Copyright ©2016.

Patient Episode Database for Wales was re-used with permission of the NHS Wales Informatic Service bespoke analysis service.

National Audit of Breast Cancer in Older Patients

Tel: 020 7869 6600
E: nabcop@rcseng.ac.uk
W: www.nabcop.org.uk

Foreword

It is my great pleasure to introduce the first publication from the National Audit of Breast Cancer in Older Patients (NABCOP), another valuable collaboration between HQIP, RCS England and ABS.

The overarching programme objective is to optimise breast cancer care in the older woman.

Of the 50,000 new breast cancers each year in the UK, 16,000 are in woman over 70 years. Whilst cancer outcomes have been improving for younger women, this is not the case for older women: the reasons for this are complex and multifactorial, and some will be explainable. But, as natural life-expectancy improves, we need to be confident that we are offering older women individualised cancer care that will not only optimise survival but will also support a good quality of life.

The audit clearly demonstrates variations in patterns of breast cancer care between older and younger women, in particular, highlighting significant regional differences, which are unlikely to be due to patient demographics alone, suggesting how health care professionals respond to a woman's age at diagnosis may be a factor. With this information, we can start to better understand how these (potentially) age-biased treatment variations may translate into less favourable outcomes and how we can optimise cancer treatments for the older woman.

As our population ages, providing appropriate and individualised cancer care in the older person is a topical and pressing health priority. The challenge for us healthcare professionals is acquiring the skills and knowledge that will allow us to support older women in individualised treatment planning. Such planning requires careful discussions and decision-making, taking account of a woman's general health and personal preferences as well as carefully balancing the risks and benefits of radical but potentially life-saving treatments with competing life-limiting co-morbidities. Working with, and learning from, Teams for the Care of Older Patients will be essential if we are to successfully tailor cancer treatment plans to an individual.

The NABCOP team are to be congratulated; this timely and highly relevant clinical audit may be ambitious in scope but it will set the benchmark in breast cancer care for the older woman. These initial findings should stimulate every member of the breast multidisciplinary team to ask 'what can WE do to optimise cancer outcomes for our older breast cancer patients?'

Fiona MacNeill
President, Association of Breast Surgery

Executive Summary

The National Audit of Breast Cancer in Older Patients (NABCOP) was commissioned to evaluate the quality of care provided to women aged 70 years or older by breast cancer services in England and Wales. It was established to explore why older women with breast cancer appear to have worse outcomes than younger women and to investigate apparent differences in the patterns of care delivered to older women. The Audit will examine the care pathway from initial diagnosis to the end of primary treatment and provide information on the comparative performance of NHS breast cancer units in relation to:

- method of detection (eg, screening, symptomatic)
- staging, comorbidity and frailty assessment and treatment planning
- the type of treatments received (neoadjuvant, surgery, adjuvant)

The patterns of breast cancer care observed for women aged 70 years and over will be compared with those among women diagnosed aged 50-69 years.

The results of the Audit's work during its first year are described in this Annual Report. The main components have been:

1. An analysis of existing national hospital datasets to provide comparative background information on patterns of breast cancer treatment in England and Wales
2. An organisational audit to examine the structures of breast cancer services in England and Wales
3. A series of case vignettes to explore which patient factors are most important for breast cancer clinicians in determining treatment options for older patients
4. Developing a set of process and outcome indicators for the prospective patient-level audit.

1. Patterns of breast cancer treatment in England and Wales

Previous studies have highlighted that UK breast cancer services have a varied approach to the management of older women, particularly when compared to the care of younger women. Reasons for the variations in care include:

1. differences in the nature and extent of disease in women of increasing age
2. the increasing prevalence of comorbidities that contra-indicate surgery and anaesthesia, chemotherapy (+/- trastuzumab) or radiotherapy
3. patient preferences and cultural attitudes.

The variation may also arise from other, less desirable aspects of planning of care, such as older women being less involved in the decision-making process than younger women, and a different approach to treatment selection by clinicians in response to a patient's age.

The Audit examined the patterns of surgical treatment in England and Wales between 2011 and 2015 for women with breast cancer using published data on the number of cancer registrations, and patient-level data from the national NHS hospital datasets used in England and Wales (Hospital Episode Statistics (HES) database and the Patient Episode Database for Wales (PEDW)). On a national level, the results of this analysis demonstrated:

- around 90% of women aged 50-69 years diagnosed with invasive disease had surgery to remove their breast cancer
- among women aged 70 years and over with invasive disease, the proportion of women who had surgery fell steadily with increasing age, and was approximately 15% for women aged 90+ years
- among women having surgery, the proportion who had breast conserving surgery (BCS) fell as the age at which women were diagnosed increased.

When patterns of surgery were examined by geographical region, we found variation between regions for women of all age groups, but that this was greater among older groups of women in terms of:

- the proportion of women having BCS
- the proportion of women having axillary node surgery
- the proportion of women who stayed in hospital after mastectomy (without immediate reconstruction) for more than 2 days.

It is unlikely that this regional variation can be fully explained by differences in the type and extent (stage) of breast cancers in older women across England and Wales. In future Annual Reports, we will present the results of analyses of data on tumour size, grade and stage from the national cancer registration datasets and we will be able to provide greater insight into the reasons for these differences. Nonetheless, the results in this report suggest that NHS hospitals could explore whether their current practices can be improved and regional variation diminished.

2. Organisational audit of breast cancer services

All NHS breast cancer units in England and in Wales were invited to participate in an organisational audit. The aim of this Audit was to evaluate the structure and range of breast cancer services available, with particular emphasis on those services with greatest relevance for older patients. The Audit received responses from 129 out of 142 NHS providers: 123 NHS trusts in England and 6 health boards in Wales.

In relation to the general organisation of breast cancer services, the Audit found that:

- Multidisciplinary teams (MDTs) held meetings at least weekly to discuss the management of newly diagnosed patients. The core membership of MDTs consisted of a breast surgeon, breast clinical nurse specialist (CNS), pathologist, radiologist, medical / clinical oncologist, and MDT coordinator
- All responding NHS providers could perform axillary sentinel lymph node biopsy (SLNB). Intraoperative SLNB assessment was available in 27 of 123 NHS trusts in England and 2 of 6 health boards in Wales
- All but one responding NHS trusts and health boards had at least 2 breast cancer CNS on-site, but there was considerable variation in the number of newly diagnosed patients who would be under the care of one breast cancer CNS each year.

In relation to the organisation of breast cancer services for older patients, the Audit found that:

- Multidisciplinary teams caring for the older patient were rarely involved in the formal management of breast cancer patients
- There was considerable variation between NHS providers in England and Wales in the methods and tools used to make formal assessments of how older patients' general health was affected by comorbidities, cognitive function and frailty
- 93% of responding English NHS trusts and 100% of Welsh health boards reported that they perform HER2 tumour testing for women of all ages with breast cancer.

Overall, these results highlight some specific areas for breast cancer units to review their own practice in relation to the management of older patients with breast cancer in England and Wales.

3. Organisational audit of breast cancer services: data flows

An important aspect of the national cancer registration systems is the timely reporting of data on newly diagnosed patients by NHS trusts and health boards. The Cancer Outcomes and Services Dataset (COSD)/ Cancer Network Information System Cymru (CaNISC) data returns were reported to be reviewed regularly in 65% of NHS trusts in England and in 2 of 5 responding health boards in Wales. This review of data returns was mostly performed by units on a monthly basis.

4. Organisation of breast cancer services: case vignettes

For older patients, decisions about their breast cancer treatment can be made complicated by the impact of other chronic conditions. A challenge for clinicians is determining what primary treatments are appropriate for an individual given her type of cancer and level of general health. NABCOP sent a series of five case vignettes to all breast cancer units that examined what breast cancer specialists thought were viable treatment options for older patients with ER positive tumours, given their specific type of cancer, other medical conditions and personal circumstances. Participants were also asked to estimate the life expectancy of the patient described in the vignette, as this is often an important determinant of whether surgery or primary endocrine therapy (PET) is most beneficial. In summary:

- In the vignette describing a 75-year-old woman with a small tumour who was otherwise in good health, 96% of respondents favoured surgery, and 64% estimated her life expectancy to be at least 10 years.
- There was also general agreement that PET would be appropriate for an 85-year-old woman with multiple comorbid conditions and in general poor health. The estimated life expectancy was typically between 2-3 years.
- There was considerable variation in whether respondents considered surgery or PET the most appropriate treatment option when (a) the vignette described a patient with severe cognitive impairment or (b) the vignette described a patient with multiple comorbidities but who had good functional ability. The estimates of life expectancy were also very diverse.

The emphasis on sharing decision making about treatments between patients and clinicians makes it important for clinicians to provide patients with clear information about appropriate treatment options. The results highlight the difficulties that clinicians face in this regard when considering breast cancer patients with complex health care needs. The results confirm the

tendency of respondents to consider PET as the appropriate treatment for older women who they estimated had a poorer life expectancy, which is consistent with guideline recommendations [Biganzoli et al 2012]. The results also highlight a lack of information and in-depth understanding in the breast clinical community on how medical comorbidities, cognitive impairment and functional ability affect the life expectancy of an older woman with breast cancer. This lack of information may be contributing to variation in the management of older women with breast cancer.

5. NABCOP Prospective Audit: process and outcome indicators

Future Annual Reports will publish information on the comparative performance of NHS breast cancer units in England and Wales using patient-level data. The data will cover women aged 50 years or older who are diagnosed with breast cancer between 1 January 2014 and 31 December 2017, and will enable the Audit to publish a set of process and outcome indicators that describe the comparative performance of NHS breast cancer units.

The core set of indicators were selected after an initial review of the literature and clinical guidelines, as well as consultation with the NABCOP Clinical Steering Group (CSG) and additional expert stakeholders. These indicators were chosen because of their clinical importance, the data required are currently collected nationally, an ability to highlight variations in treatment outcomes and an ability to support hospitals and clinicians to improve the quality of care.

The final 13 core process and outcome indicators describe the care pathway from initial diagnosis to the end of primary therapy/treatment (surgical and non-surgical). The indicators are published on the NABCOP website (https://www.nabcop.org.uk), along with the corresponding dataset for the prospective audit (in year 2).

6. Feasibility studies

The Audit team was asked to examine how feasible it was to use data from the Cancer Patient Experience Survey (CPES) to explore issues related to the care of older patients with breast cancer. Since HQIP's decision to proceed with NABCOP, the National Cancer Intelligence Network (NCIN) has demonstrated that the linkage of CPES data to Cancer Registration and HES data was indeed feasible. Further development of this work by Public Health England has resulted in the CPES datasets from 2010 to 2015 being made available for analysis.

The NABCOP team examined which questions from the 2014 CPES questionnaire were relevant to understanding the breast cancer care of older patients, and concluded that data from the 2014 CPES could be used to provide NHS breast cancer units with information on:

- Whether delayed diagnosis is more common in older women
- Access to information on side-effects of treatment
- Involvement in decisions about care
- Ease of contacting the clinical nurse specialist
- Providing information for families to help care for patients at home.

A second feasibility study examined whether it was possible to identify patients who develop recurrent disease at some point in time after the completion of their treatment for the primary breast cancer. To date, data held by national cancer registration services has not recorded this well. Again, a number of groups have examined this issue, and an algorithm to identify such patients is expected to be published in March 2018. The initial algorithm was designed to use data from English health care databases. It is currently unclear to what degree it might also be applicable to data collected in Wales.

Recommendations

Breast cancer units within NHS trusts / health boards

Breast cancer units should review the results for their organisation to ensure care is consistent with the recommendations in clinical guidelines on the management of older patients with breast cancer, such as those published by the International Society of Geriatric Oncology (SIOG) and European Society of Breast Cancer Specialists (EUSOMA).

- Units should review whether patients and carers feel they are involved adequately in decision making and receive sufficient information on treatment options
- Local protocols should be developed and implemented (1) to improve the formal assessment of older patients' health in order to guide decision making about treatment and (2) to improve the identification of patients who could benefit from access to Teams Caring for the Older Person
- Clinicians and hospital managers should review their hospital length of stay figures. The variation described in this report suggests that there is room for greater consistency and efficiency among hospitals
- Local providers should regularly monitor the completeness and accuracy of data submitted to the national cancer registration services.

For Commissioners / Regional Networks

Commissioners (in England) and Welsh health boards should review the results for the organisations within their regions to assure themselves of the quality of care provided to their patients. They should work with NHS providers to develop strategies for addressing areas of variation. In addition, they should ensure local providers have processes in place to ensure data submitted to the national cancer registration services are complete and accurate.

For Professional Stakeholder Organisations

Professional stakeholders, such as Royal Colleges and Specialist Societies, should collaborate to:

- Define the contributions of specialists such as the Team Caring for the Older Person, specialist nurses, anaesthetists and palliative care in the delivery of breast cancer services for older patients.
- Provide practical advice on the formal assessment of patient characteristics, and methods of assessing patient comorbidities, cognitive function and frailty. The focus should be on delivering individualised care as well as pre-operative anaesthetic assessment.
- Outline the supportive services available for patients with early breast cancer who are treated with primary endocrine therapy/non-surgically.
- Improve access to information for breast cancer clinicians about the estimation of average life expectancy for women with different patterns of comorbid conditions.

NABCOP | National Audit of **Breast Cancer in Older Patients**

Annual Report 2017

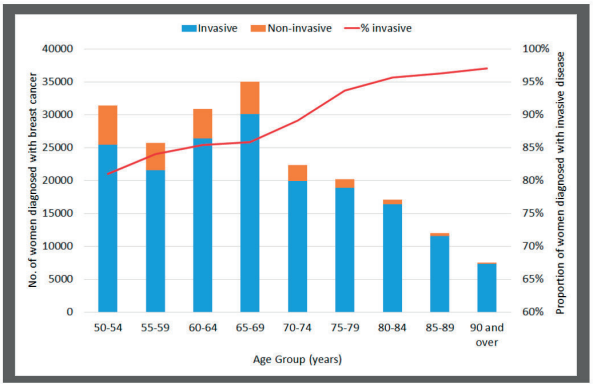
The aim of NABCOP is to evaluate process of care and outcomes for women, aged 70 years or over, diagnosed with breast cancer in England and Wales.

Breast cancer is the most common female cancer, with approximately 45,000 new cases diagnosed in women each year in England and Wales (1).

The proportion of women with invasive breast cancer increases with age (see graph)

The proportion of patients with medical comorbidities increases among older women (2)

Clinical guidelines emphasise that breast cancer treatment should be based on clinical need and fitness for treatment rather than age (3)



Number of women diagnosed in England between 2011 and 2015, by type of breast cancer across different age groups

Executive Summary

90% of women aged 50 - 74 years diagnosed with invasive breast cancer had a surgical resection

proportion of women undergoing surgery decreases with age

15% of women aged 90+ years had surgery for invasive breast cancer

Regional variation in treatment patterns for older women

- in types of breast and axillary surgery
- in duration of post-breast cancer surgery hospital stay
- in tools/methods of formal assessments of older patients

Teams caring for the older person (TCOP) were rarely involved in the formal management of breast cancer patients

Recommendations

- **For breast cancer units within NHS trusts/health boards:** To ensure local practices are consistent with clinical guidelines and support the development and implementation of formal assessment processes for older patients.
- **For commissioners/ regional networks:** To review results of their local organisations with a view to addressing areas of variation, including the processes for data submission to cancer registration services.
- **For professional stakeholder organisations:** To collaborate and define contributions of specialists (e.g. TCOP) in the delivery of breast cancer services, including advising on formal assessment methods for older patients

Sources of information

(1) ONS, 2015

(2) Lavelle et al 2012; Richards et al 2016

(3) NICE 2009; Biganzoli et al 2012

1. The National Audit for Breast Cancer in Older Patients (NABCOP)

1.1. Background

Breast cancer is the most common female cancer in the UK. About 45,000 new cases of breast cancer are diagnosed in women each year in England and Wales, about one third of which are in women aged over 70 years [ONS 2015]. In addition, a considerable number of women who have been previously treated with curative intent subsequently develop recurrent disease.

Clinical guidelines emphasise that breast cancer treatment should be based on clinical need and fitness for treatment rather than age [NICE 2009; Biganzoli et al 2012]. Breast Cancer Quality Standards [NICE 2016] explicitly state that women:

> *"irrespective of age, are offered surgery, radiotherapy and appropriate systemic therapy, unless significant co-morbidity precludes it."*

However, when various studies have examined the delivery of care by NHS services in the UK, they have found breast cancer services have a non-standard and variable approach to the management of older patients [NCIN 2011]. This might be one reason why the survival of women aged 75 years and older is lower in the UK compared to other European countries, as well as why survival appears to be improving more slowly than in younger patients [De Angelis et al 2014].

The differences in the patterns of care among young and older patients may arise for various reasons, and are not in themselves evidence of deficiencies in breast cancer care among older women. These reasons include:

- differences in the nature and extent of disease
- the increasing prevalence of comorbidities that contra-indicate surgery, chemotherapy or radiotherapy
- patient preferences and cultural attitudes.

The variation may also arise because of reasons linked with clinical practice. There is currently a lack of advice in clinical guidelines about the best way to tailor treatments to the individual needs of older women, which can lead to different treatment preferences among clinicians. There is also evidence that older women are less involved in the decision-making process than younger women, and that clinicians have a different approach to communication and management in response to a patient's age [WMCIU 2011; Lavelle et al 2014; Morgan et al 2017].

1.2. Aim of the Audit

The **National Audit of Breast Cancer in Older Patients (NABCOP)** was established to evaluate the process of care and outcomes for women, aged 70 years or over, diagnosed with breast cancer and treated in NHS hospitals within England and Wales. The Audit will examine the care pathway from initial diagnosis to the end of the primary therapy, and provide information on the comparative performance of NHS breast cancer units related to:

- method of detection
- staging, frailty assessment and treatment planning
- the treatments received (neoadjuvant, surgery, adjuvant).

A weakness of current clinical guidelines (and the evidence base that they draw on) is the lack of specific guidance on the management of breast cancer in older women. Concerns about patterns of care are therefore usually highlighted when they differ from the care received by younger women who have a similar type and stage of disease. The design of this audit follows this comparative approach. The patterns of breast cancer care observed for women aged 70 years and over will be compared with those among women diagnosed aged 50-69 years. This will enable services to consider whether older women with breast cancer receive equitable care compared to younger women. Moreover, while issues around age are a fundamental part of the design of NABCOP, the audit will also examine issues of equity with respect to ethnicity, deprivation and place of residence.

The Audit will investigate whether the care received by older patients with breast cancer is consistent with recommended practice for breast cancer management, as described by (among others) the NICE guidelines [NICE 2009], and will identify areas of care where improvements can be made. It is a collaboration between the Association of Breast Surgery (ABS) and the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England (RCS), and was commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Patient Outcomes Programme. The Audit is supported by a Clinical Steering Group (CSG), whose role includes advising on the priorities for the audit and helping with the interpretation of its results. The CSG has members from patient associations, medical associations, multidisciplinary experts in the area of breast cancer and medical care of the older person, and policy makers (see appendix 1).

The results from NABCOP will support breast cancer services in England and Wales to improve the quality of care delivered to older patients. It will publish information:

- At hospital level on different components of the care pathway, to enable organisations to compare their performance to national standards and their peers. This will help those responsible for the organisation of cancer services to reflect on current practices and

to determine where and how to implement quality improvement initiatives.

- At appropriate regional levels, to enable commissioners to understand how care is delivered in their geographical areas.

- At national level, to support medical associations such as the Association of Breast Surgery, the Care Quality Commission, and other stakeholder organisations to make recommendations about how NHS providers in the UK can improve the quality of breast cancer care.

More information about the audit can be found on the website: www.nabcop.org.uk.

1.3. Overview of the First NABCOP Annual Report

The audit started on the 1st April 2016. The first year of NABCOP consisted of the following principal components:

1. An **organisational audit** that examined the structures of care for women with breast cancer in England and Wales

2. An analysis of **existing patient data** (e.g. patient data from cancer registries linked to Hospital Episode Statistics and the Patient Episode Database for Wales) to provide comparative background information on differences in care received by older and younger women

3. **Developing a national set of process and outcome indicators,** and a **corresponding dataset for the prospective audit** that uses the current data flows from NHS hospitals to the national registration services in England and Wales.

The results of the work conducted in the first year are published in this first Annual Report. The report also describes the results from two small feasibility studies that examined (a) extending the audit to cover patients with metastatic disease, and (b) the value of linking data from the National Cancer Patient Experience Survey with the patient-level prospective audit data.

In the second year of the Audit, and onwards, the focus will be on describing the patterns of treatment and outcomes of women (aged 50 years or over) with breast cancer using patient-level data from the national cancer registration services. The Audit will begin receiving regular extracts of prospectively collected data from the English and Welsh Cancer Registration Services, and will use these data to produce indicators that describe the process and outcome of care at national, regional and NHS trust / health board levels. The results of this prospective audit will be published in annual "state of the nation" reports as well as in other appropriate ways, such as on the Audit website.

1.4. Management of older women with breast cancer

The management of breast cancer for an individual woman will reflect the characteristics of the disease, her ability to tolerate different therapies, and her personal preferences (see box for a general overview of care pathway). While these factors will play a key role for individuals, there are also considerations that reflect the age at which a woman is diagnosed. As a result, older women have different needs for care from breast cancer services.

There is no agreed definition of an "older woman with breast cancer", but the phrase is often used to refer to women aged 70 years or older when diagnosed. This partly reflects how the characteristics of the disease vary across age groups, with the majority of women aged 70 or over being diagnosed with endocrine receptor positive (ER+) breast cancer. It also partly reflects the pathway to diagnosis, with breast screening offered to women aged 50-70 years. We will follow this conventional definition of an older woman in this report.

One important aspect in the management of older women is that they tend to be diagnosed with comparatively larger tumours than younger women, and are also more likely to be diagnosed with higher rates of nodal spread [Rutherford et al, 2015]. This mostly reflects the fact that breast screening is limited to younger women, but may also reflect lower rates of self-examination among older women.

A second important aspect is the considerable variation among women aged over 70 years in terms of their general health. Consequently, chronological age alone does not correspond well to the notion of biological age, which takes into account how someone's health is affected by chronic conditions (both physical and mental) and frailty. Ageing is associated with a natural decline in a person's physical fitness and life expectancy [Clegg et al 2013]. The changes in physical fitness are partly associated with the greater incidence of different conditions such as chronic obstructive pulmonary disease, diabetes, and cardiovascular disease, but the change is also associated with a general increase in frailty and decline in physical function. In addition, ageing is associated with greater levels of cognitive impairment, and risk of dementia.

These factors have a major influence on management decisions. Examples include:

- The short-term risks of surgery and anaesthesia are exacerbated by the presence of cardiovascular, lung and kidney disease. Consequently, in frail women for whom surgery may pose a significant risk, it may be appropriate to offer primary endocrine therapy instead [Morgan et al 2015]

- The ability to tolerate chemotherapy and radiotherapy may also be reduced by poor physical function and frailty [Biganzoli et al 2012]

- The benefits of different treatments may be influenced by whether or not a woman's life expectancy is likely to be affected by the breast cancer or other co-existing conditions [Lavelle et al 2014].

Because of this, it is recommended that an older woman's health and well-being is assessed across various domains (such as comorbidities, nutrition, functional status, mood, polypharmacy etc.) to ensure she receives a personalised approach to treatment that appropriately reflects her needs [Biganzoli et al 2012]. There have been some initiatives to standardize such assessments, with the Comprehensive Geriatric Assessment (CGA) being one of the most commonly used among cancer patients [Puts et al 2014]. The CGA includes tools to evaluate physical function, physical illnesses, medications, mental health and need for social support. A drawback of the CGA is that it is time-consuming to administer, and it has not been widely adopted in routine clinical practice. Instead, the general health of breast cancer patients is more commonly assessed with simpler tools such as the Eastern Cooperative Oncology Group (ECOG) performance status score and the American Society of Anaesthesiology (ASA) grade. However, both tools are fairly crude and are mainly of use to identify those patients with the most severe levels of physical ill-health.

Finally, it is worth noting that older women with breast cancer may differ from younger women in how they balance a desire to extend their life by having potentially unpleasant treatments against a desire to maintain their current quality of life [Wedding et al 2007]. Such decisions are complex and are another important reason why older women have different needs for care from breast cancer services.

Box: Summary of the care pathway in England and Wales for women with breast cancer

Cancer develops when there is uncontrolled growth of abnormal cells in part of the body. In non-invasive breast cancer, these abnormal cells are restricted to the walls of the milk ducts (called in-situ). In invasive breast cancer, there is spread of cancerous cells beyond the wall lining of the milk ducts into other parts of the breast.

A tumour is graded based on how differently the cancerous cells appear compared to normal cells, and how fast they are growing. Non-invasive tumours are graded as low, intermediate or high, with high grade tumours being the most likely to progress to invasive cancer. Invasive tumours are classified as either grade 1, 2, or 3. In Grade 3, the cells in a tumour look the most transformed from their original cells. This type of cancer tends to be faster growing than lower grade tumours.

There are also different subtypes of breast cancer that are based on whether or not the cancerous cells are sensitive to hormones such as oestrogen (ER), progesterone (PR) or carries the human epidermal growth factor receptor (HER2).

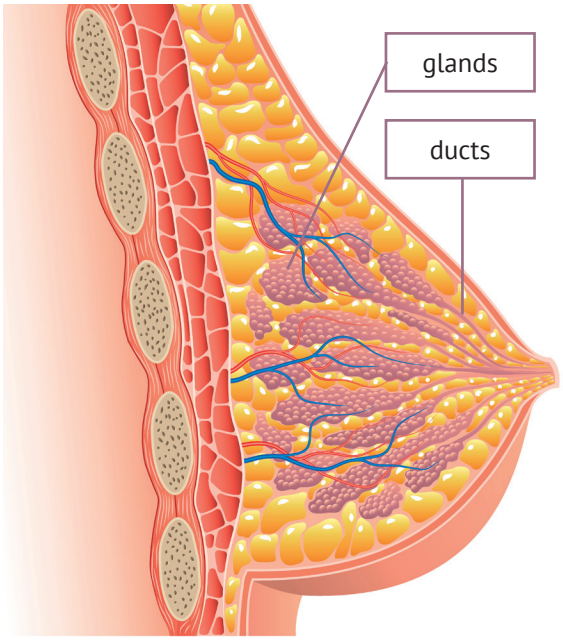


Figure 1: Anatomy of the breast

Diagnosis and assessment of breast cancer

In NHS hospitals in England and Wales, patients mainly present with suspected breast cancer to a breast clinic by following one of three routes:

- they may be referred by a general practitioner (GP) after experiencing symptoms associated with the cancer, or
- they may be referred from the NHS Breast Screening Programme (NHSBSP). Or
- they may be referred after a clinical investigation (eg, CT scan) performed for another disease has identified a potential breast cancer (incidental referral). This group of women are often elderly as they are more likely to have other chronic conditions.

The NHSBSP is a national screening programme for breast cancer which invites women aged 50 to 70 years to undergo a mammogram assessment every three years (or women aged 47 to 73 years in some regions). Women of any age with breast symptoms and older women outside the NHSBSP invitation age criteria usually present to a breast clinic following a GP referral.

In a breast clinic, patients with suspected breast cancer will undergo a "triple assessment".

This is comprised of:

1. Clinical assessment – the breast clinician / specialist nurse will take a full history and perform a physical examination.

2. Imaging – ultrasound of the symptomatic breast area or mammographic abnormality. A mammogram to assess the presence of breast tumours (for patients aged over 40 years and not referred through the NHSBSP. Screened patients will have already had imaging). Patients will also undergo ultrasound of their axillary nodes and any abnormal nodes are biopsied to determine whether the cancer has spread to those nodes. If cancer has spread to the nodes, patients are typically candidates for surgery but there is also relatively greater concern about the presence of occult metastatic disease which will be reflected in the subsequent decisions about the use of systemic therapies.

3. Cytopathology assessment – tissue biopsies are obtained from lesions in the breast (+/- axilla) that are suspicious of cancer.

The results of the triple assessment and the appropriate management of patients are discussed in multidisciplinary team (MDT) meetings at several points in the care pathway. Various healthcare professionals who care for patients with breast cancer attend this meeting.

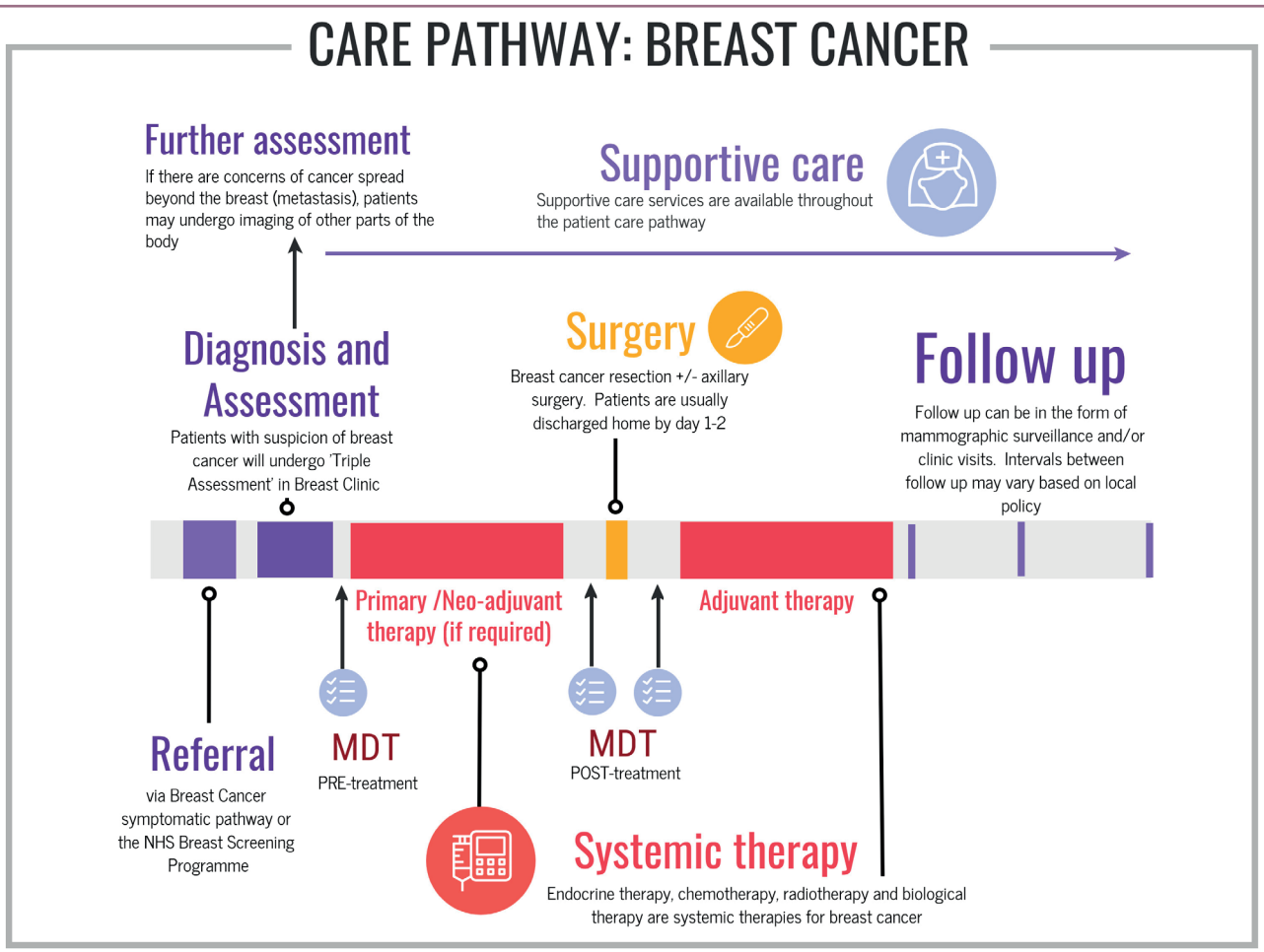


Figure 2: An example of a breast cancer care pathway in English and Welsh NHS hospitals

Management of breast cancer: surgery

Surgical resection is a central treatment for both non-invasive and invasive breast cancer [NICE 2009a; 2009b], and will involve either a mastectomy (removal of all the breast tissue) or breast conserving surgery (BCS, removal of the tumour without the removal of all the breast tissue). The type of procedure performed is based on patient preference and tumour characteristics. A small tumour in relation to the size of the breast is optimal for BCS. For patients having a mastectomy, some may also have breast reconstruction at the same time (immediate reconstruction) or as a separate planned procedure (delayed reconstruction).

Patients with invasive breast cancer also undergo axillary surgery. This is usually performed at the same time as the breast cancer resection (BCS or mastectomy). If the ultrasound assessment of the armpit lymph nodes shows the cancer has spread to the axillary lymph nodes, all the lymph nodes are often removed in a surgical procedure called axillary node dissection. If the ultrasound shows no evidence of spread, patients will undergo a less invasive procedure called 'sentinel lymph node biopsy' (SLNB). This involves the examination of the first few lymph nodes (sentinel node) into which a tumour is likely to spread. If the sentinel node contains cancer cells, a patient may go on to have an axillary node dissection, or axillary radiotherapy.

Management of breast cancer: other therapy

There are a number of non-surgical therapies that women with breast cancer can have to treat potential occult metastatic disease and reduce the risk of cancer recurrence and improve survival rates. These therapies include: endocrine therapy, chemotherapy, and biological therapy. These treatments are often given in combination with surgery, either before (= neo-adjuvant) or after surgery (= adjuvant). The choice and order of treatment(s) given depend upon the tumour characteristics as well as the physical fitness of the patient. Radiotherapy is given in combination with surgery to optimise the minimisation of locoregional cancer recurrence. In advanced breast cancer, systemic therapies are used as primary treatment modalities (together with radiotherapy), with/without surgical management.

Management of breast cancer: follow up

For patients diagnosed with early breast cancer, the recommended pattern of follow up has radically changed in recent years, being substantially reduced from previous protocols. It is common for patients to be offered regular annual mammographic surveillance (usually up to 5 years) and early contact with their breast care nurse or return to clinic if they have concerns. However, there is variation in the frequency of clinical and mammographic follow-up across breast cancer services.

2. Patterns of breast cancer treatment in England and Wales

2.1. Introduction

The number of women diagnosed with breast cancer has steadily risen over the last 20 years because of demographic change, the rising incidence of breast cancer and the impact of mammographic screening. The treatment options available for these women have expanded and become more complex, being driven by the development of new therapies. Publications, such as the National Cancer Intelligence Network (NCIN) Second All Breast Cancer Report [NCIN 2011], have provided information on the management of women with breast cancer within the UK, but the results were produced using data from 2007 and it is unclear how patterns of care have changed since then, particularly in relation to older women. In this chapter, we provide an up-to-date picture of current patterns of treatment in older women with breast cancer, with a particular focus on surgery. In particular, the chapter describes, by patient age, the:

- % of women who undergo breast cancer surgery
- % of women who had breast conserving surgery among all those having breast cancer surgery
- % of women who had axillary nodal dissection
- distribution of length of stay.

The results are presented at a national and, where possible, a regional level. The results at the regional level are described using the 44 geographical areas defined by the Sustainability and Transformation Plans (STPs), see Appendix 2.

The results presented in this chapter were derived using aggregate data on cancer registrations that have been published by the Office for National Statistics (ONS)/ Welsh Cancer Intelligence and Surveillance Unit (WCISU), and patient-level data from the routine administrative hospital datasets used in England and Wales, respectively, the Hospital Episode Statistics (HES) database [NHS Digital 2017] and the Patient Episode Database for Wales (PEDW) [NHS Wales 2017]. The HES and PEDW databases contain summary records that describe medical, demographic and administrative data relating to all patients admitted to NHS hospitals in England and Wales. Unfortunately, HES and PEDW contain only basic information about the type (invasive / non-invasive) of cancer and its location, and do not provide detailed information about the disease such as stage, tumour size or grade. These characteristics play an important role in deciding what treatments are appropriate for individuals, and, for this reason, the results described in this chapter are preliminary, and simply highlight issues that local services may wish to investigate.

2.2. Methods

The number of women diagnosed with breast cancer in England was obtained from the cancer registrations published by ONS, and covered both invasive (C50) and non-invasive (D05) cancers for the period 2011 to 2015 (NB: figures for 2015 were preliminary). The number of women diagnosed with breast cancer in Wales was obtained from WCISU, and covered only invasive (C50) cancers for the period 2011 to 2015.

The information on patterns of surgery was derived using the data extracted from HES and PEDW. These data extracts contained the records for all female patients (aged 50 years or older) with a diagnosis of either invasive or non-invasive breast cancer between 1 April 2011 and 31 March 2016 (ICD-10 diagnosis codes C50 and D05, respectively). Patients undergoing either primary breast conserving surgery (OPCS procedure codes: B28.1-3, B28.5-9) or mastectomy (B27) procedures were then identified, as well as those who had a sentinel lymph node biopsy. The presence of comorbidity at the time of surgery was measured using the Royal College of Surgeons of England (RCS) modified Charlson score [Armitage et al 2010].

2.3. Overall patterns of surgery among women with breast cancer

The number of women (aged 50 or more) diagnosed with breast cancer in England increased from 37,256 in 2011 to 42,743 in 2015 [ONS 2016]. The majority of cases (88% over the 5 years) were invasive carcinomas. In Wales, the numbers increased from 2129 in 2011 to 2375 in 2015 (invasive only). Among the women diagnosed in 2015, the number who were aged 70 years and over were 16879 in England and 995 in Wales (invasive only).

The pattern of invasive and non-invasive tumours differed across the various age groups (Figure 2.1). Among women under 70 years, around 15% were diagnosed with non-invasive disease. This fell to less than 5% among women aged 85 years or older. This difference probably reflects the use of breast screening in patients under 70 years.

Figure 2.2 shows the proportion of women with invasive disease who had breast surgery by age. For women aged between 50 and 74 years, the proportion who had primary breast surgery between 2011 and 2015 was relatively stable at around 90%. However, among women aged 75+ years, the proportion who had surgery declined steeply to around 15% among women aged 90+ years.

Figure 2.1: Number of women diagnosed in England between 2011 and 2015 by type of breast cancer across the different age groups

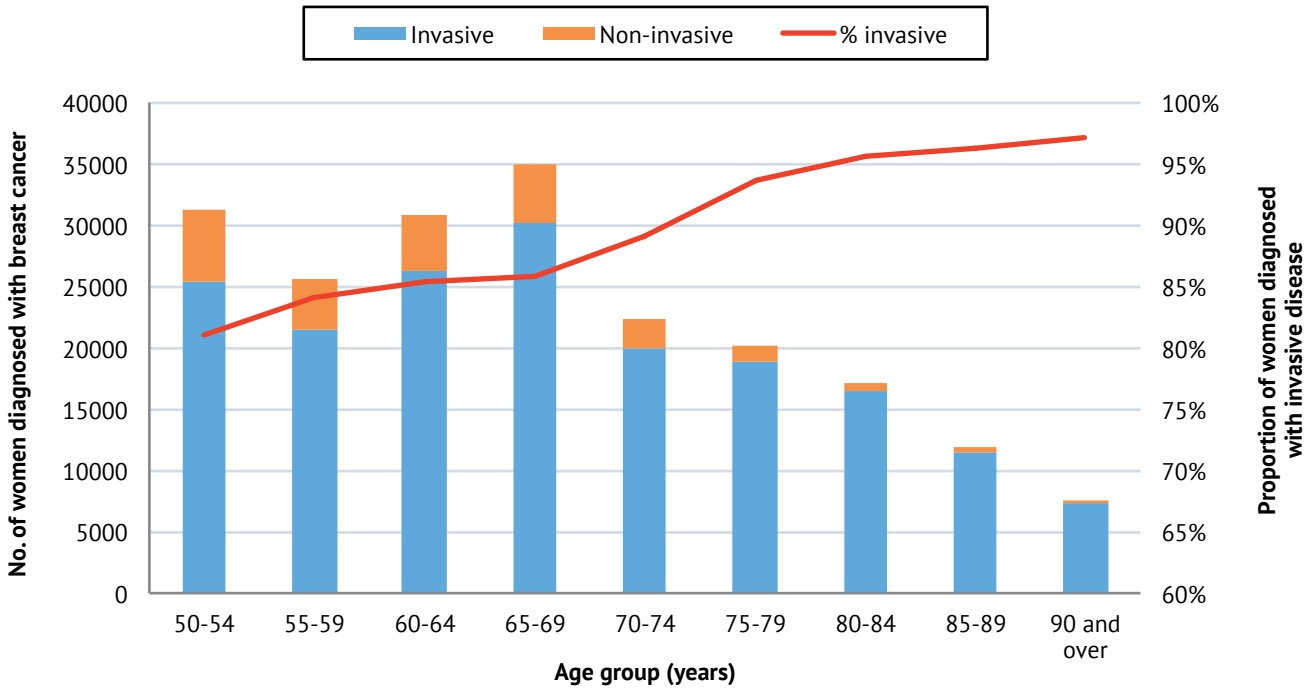
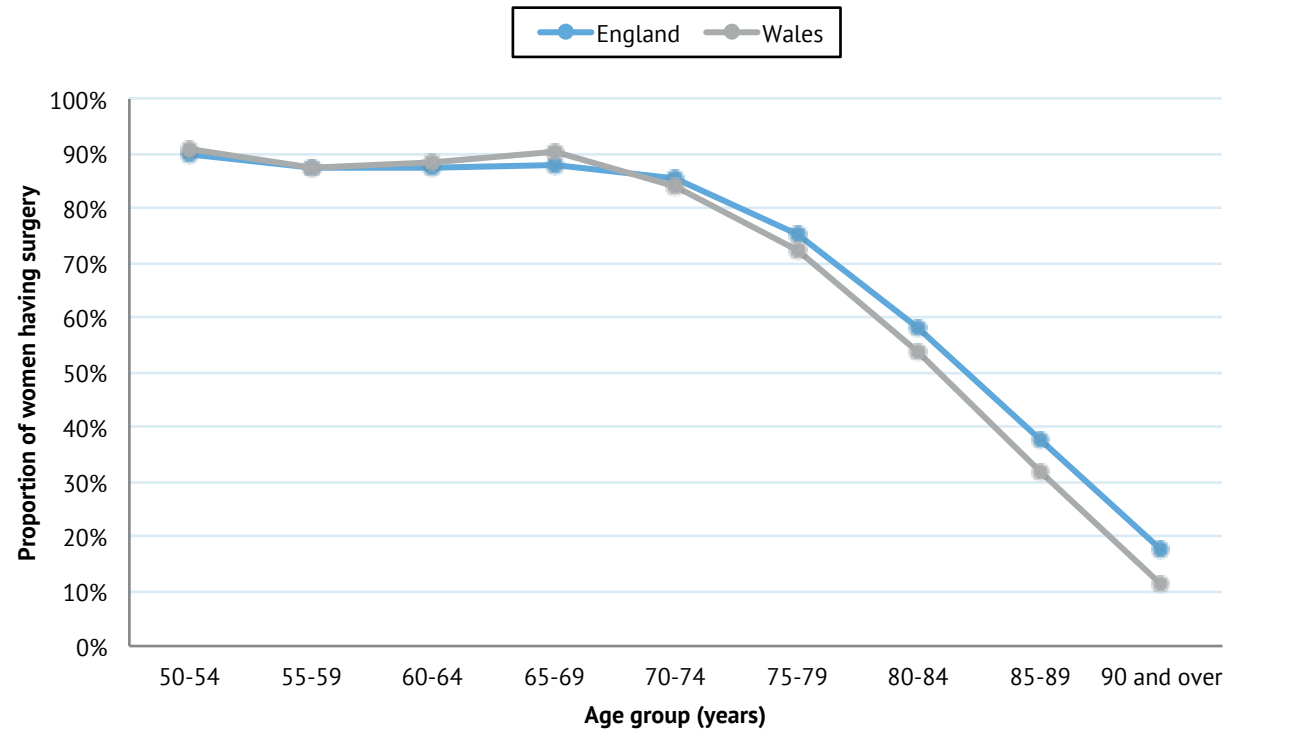


Figure 2.2: Percentage of women diagnosed with invasive breast cancer who had primary BCS or mastectomy in England and Wales between 2011 and 2015



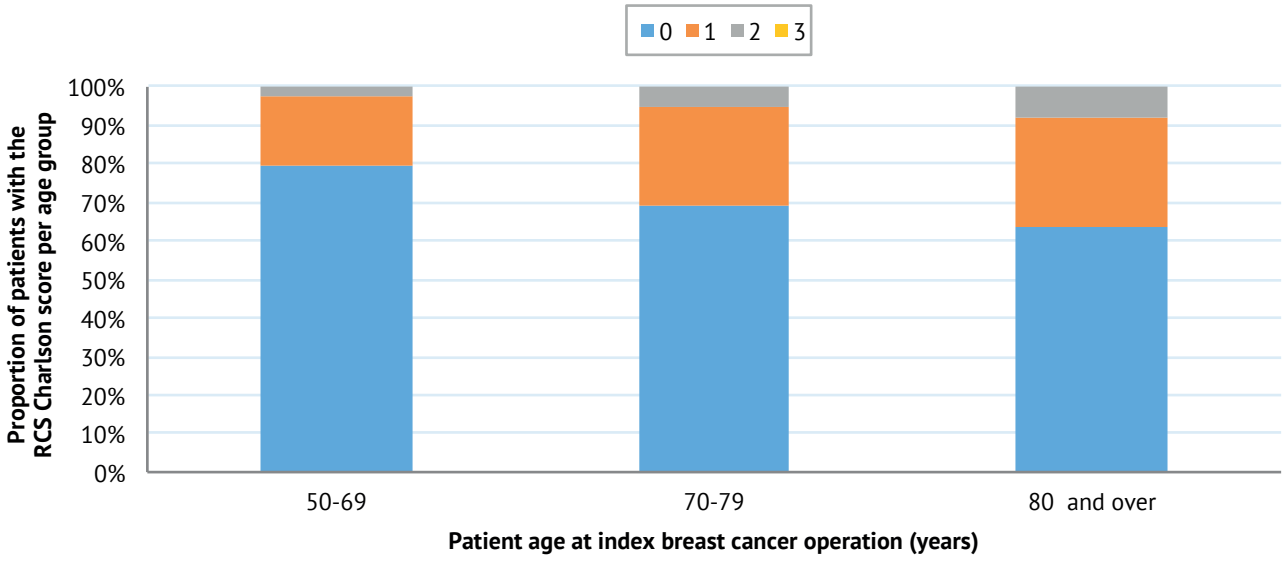
There are various possible reasons for this decline in the proportion of women having surgery as part of their primary treatment. One contributing factor is the proportion of women with comorbidities increasing with age. Studies that have examined the influence of comorbidities on the management of women with breast cancer have demonstrated that rates of surgery are lower in women with a greater burden of comorbid disease (see Table 2.1).

Table 2.1: Selected studies that have estimated the effect of comorbidity on surgery for early breast cancer

Study	**Lavelle et al 2012**	**Richards et al 2016**
Setting	West Midlands and Northern & Yorkshire region	West Midlands and Northern & Yorkshire region
Patient group	Women (aged 65+) with invasive disease	Women (aged 70+) with ER+ operable cancer
Time period	Apr 1997 - Mar 2005	2002 - 2010
Sample size	23,038	17,129
Comorbidity Index	Charlson	Charlson
	%Women having surgery	**%Women having surgery**
No. of comorbidities	0 = 73.4	0 = 71.1
	1 = 66.2	1 = 46.9
	2+ = 49.1	2 = 44.4
		>2 = 22.9

With the data available, it was only possible to measure the burden of comorbidity among women who had undergone surgery. Our results are consistent with previous studies of the impact of comorbidity on the receipt of surgery – the majority of patients undergoing breast cancer surgery have few major comorbidities. Nonetheless, there is still a noticeable increase in the burden of comorbid disease among older women (Figure 2.3).

Figure 2.3: RCS Charlson comorbidity score at index breast cancer operation in England and Wales, stratified by patient age. Coloured columns indicate 0, 1, 2 or 3 comorbidities



2.4. Variation in type of surgery among women with breast cancer

For women with early breast cancer, the standard primary treatment will typically involve either breast conserving surgery followed by radiotherapy, or mastectomy with or without postoperative chest wall radiotherapy. Which surgery is offered depends upon the dimensions of a woman's tumour, her breast shape and size, and her personal preferences. Mastectomy is recommended for large or multifocal tumours that do not allow the breast to be conserved.

Clinical guidelines recommend that, clinical factors being the same, older women should be offered similar surgical choices to younger patients [NICE 2009a, 2009b].

Figure 2.4 describes the variation in the use of BCS (compared to any surgery (BCS or mastectomy)) by age, for patients with invasive cancer. As described earlier, the use of BCS decreased with increasing age. While the increasing prevalence of comorbidities may influence this to some degree, it does not fully explain the falling trend. Moreover, there is greater regional variation among older age groups in the proportion of women having BCS (Figure 2.5).

Figure 2.4: Proportion of patients undergoing breast conserving surgery as their breast cancer resection for invasive cancer, as a percentage of women having breast cancer surgery, stratified by age

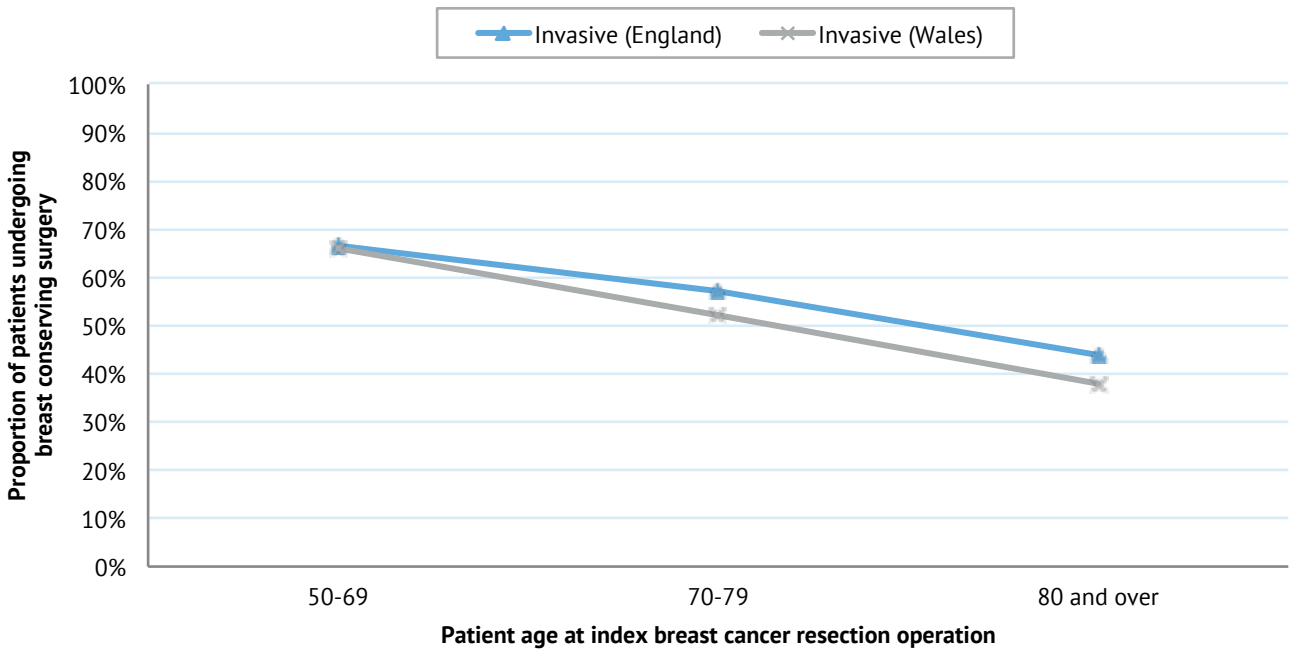
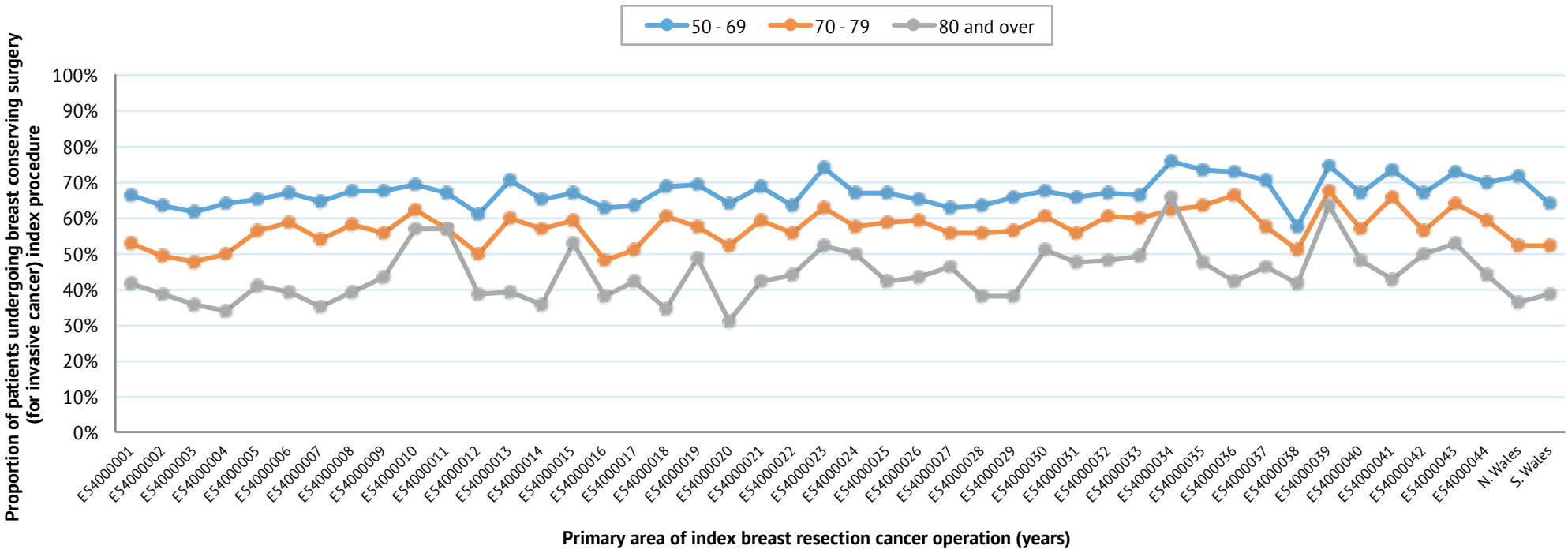


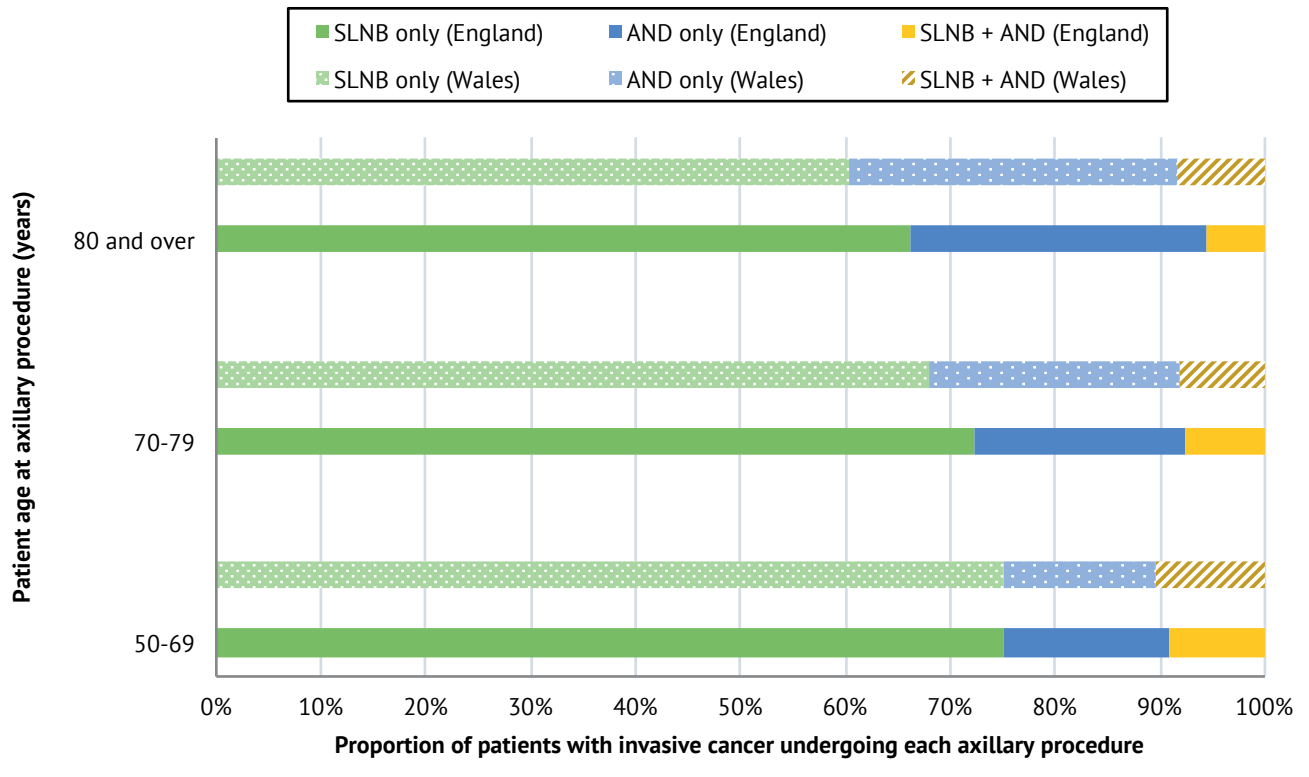
Figure 2.5: Proportion of patients admitted to hospitals in England and Wales for BCS as the index breast cancer resection procedure for invasive breast cancer, by patient age and STP



The proportion of patients undergoing SLNB as an axillary procedure in invasive breast cancer has gradually increased over time, across all age groups. This is in accordance with NICE guideline recommendations [NICE 2009a, 2009b]. However, older women appear more likely to undergo axillary nodal dissection (AND) without prior SLNB than younger patients (Figure 2.6). This may be because these patients' tumour characteristics tend to be more aggressive (e.g. higher grade, larger tumour), which is likely to reflect the lack of routine screening among older women and reduced levels of breast cancer awareness. It is possible it also reflects a difference in the type of surgery offered based on age.

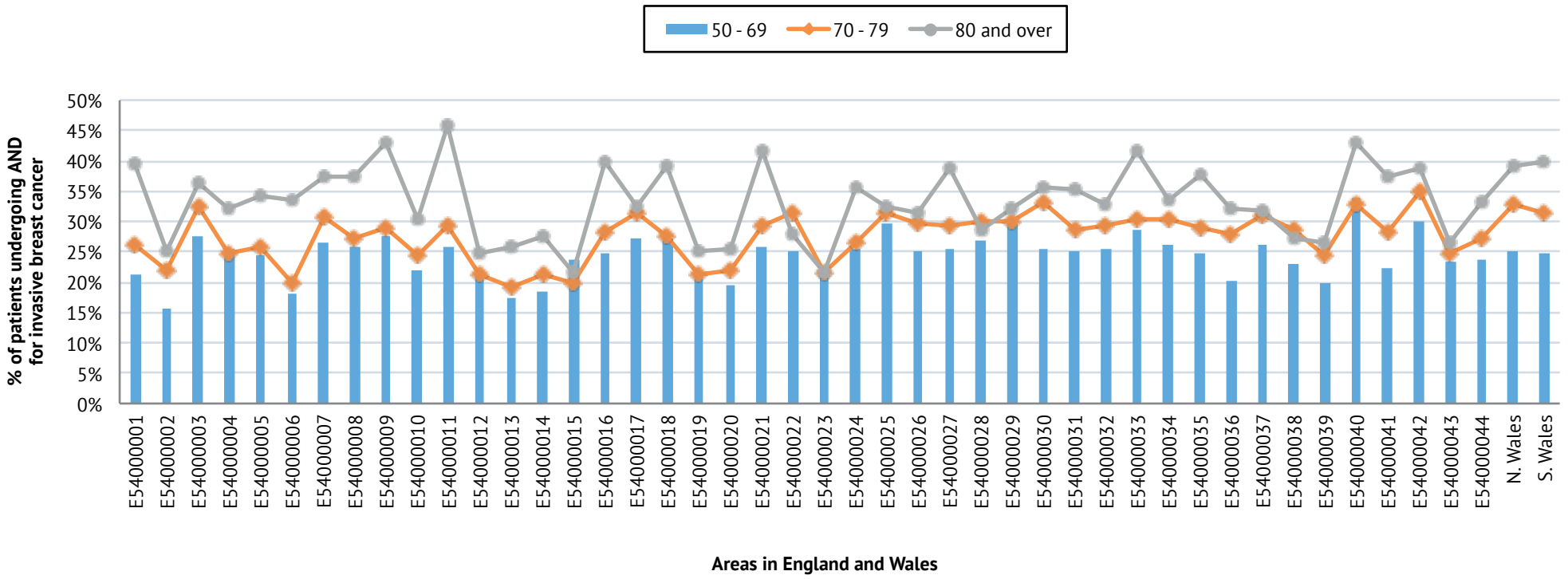
Figure 2.7 shows the variation in the proportion of women having axillary nodal dissection by age group. Among women aged 50-69 years, the variation between the 46 regions is fairly limited, with 80% of the regions having values between 20% and 28%. There is a noticeable increase in this variation among the older patients. Among women aged 80 years or older, the range among the middle 80% of regions has doubled, with values lying between 25% and 41%.

Figure 2.6: Types of axillary procedures performed in patients with invasive breast cancer in England and Wales, by patient age



Abbreviations: AND - Axillary Nodal Dissection, SLNB - Sentinel Lymph Node Biopsy

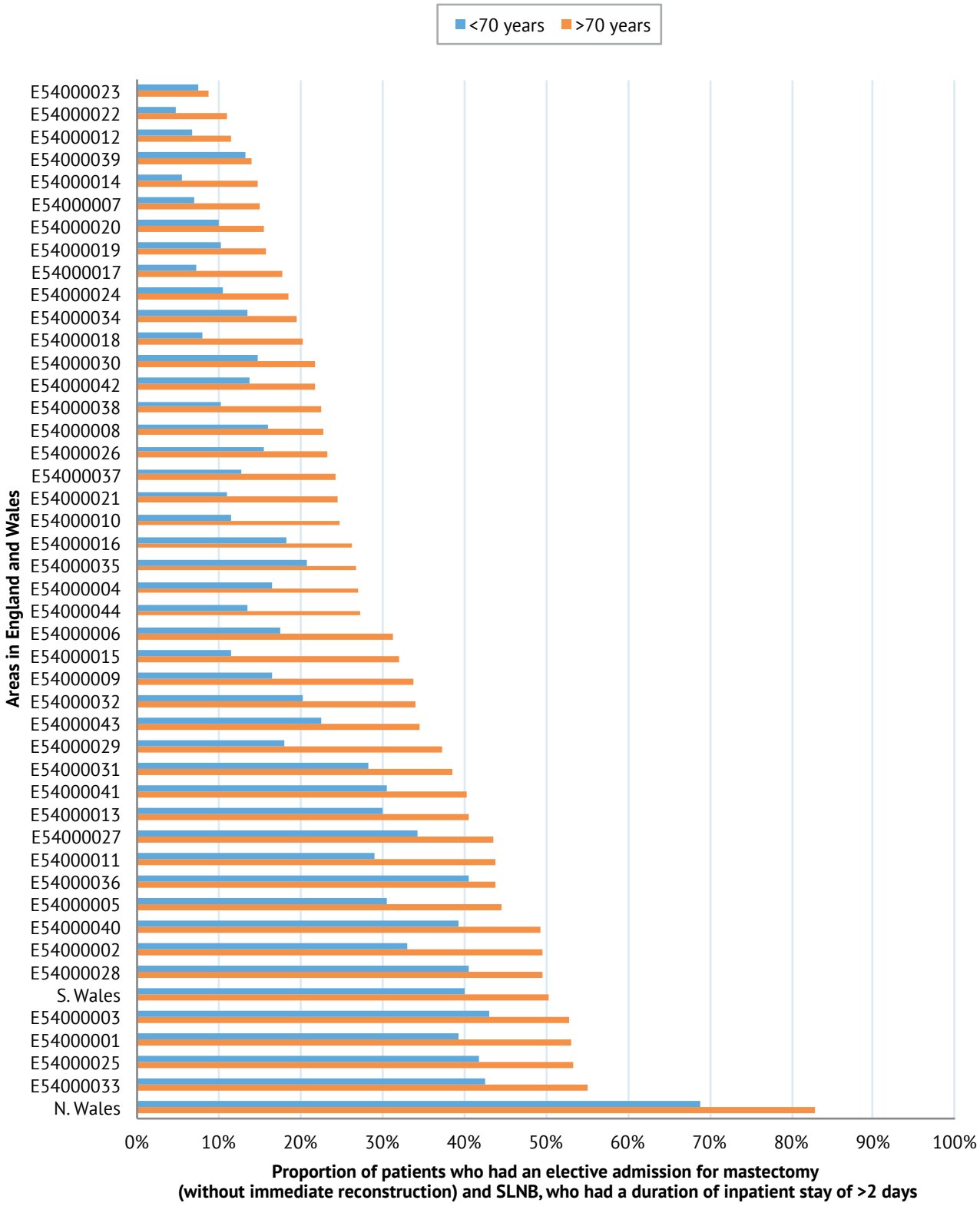
Figure 2.7: Proportion of patients having axillary node dissection (AND) in England and Wales for invasive breast cancer, by patient age and STP



2.5. Length of stay among women having mastectomy

For many patients who underwent breast cancer surgery, the time that they stayed in hospital was short, with patients admitted and discharged as day cases or within two days. In particular, for women who underwent breast conserving surgery, only around 10% stayed beyond 2 days. For patients having mastectomy (without breast reconstruction), there was a slight increase in the typical lengths of stay among older patients, but this is quite small in comparison with the differences observed across the 46 regions (Figure 2.8).

Figure 2.8: Proportion of patients admitted for longer than 2 days for mastectomy without breast reconstruction, by patient age and STP



2.6. Summary

This chapter provides an overview of patterns of surgical treatment among women with breast cancer. It confirms that past observations about patterns of surgery among older women have not changed much over time, most clearly in relation to the proportion of women who have surgery as part of their primary treatment.

In the absence of information on the clinical characteristics of these women's tumours, it is difficult to draw definitive conclusions about these patterns. However, the variation between regions is unlikely to be explained by differences in the distribution of the type or stage of disease across England and Wales. In future reports, we will be able to explore the reasons for these differences in greater depth because data on tumour size, grade and stage are collected within the national cancer registration datasets. Nonetheless, the results presented here demonstrate that hospitals within each region could explore which aspects of their current practice might be improved.

3. Organisation of breast cancer services in England and Wales

3.1. Introduction

Various publications have shown the lack of a standardised approach to breast cancer management in the older patient in the UK [WMCIU 2011; Bate et al 2012; Richards et al 2016]. This chapter presents the results of an organisational audit that was undertaken to evaluate the structure and range of breast cancer services available at NHS trusts and Welsh health boards, with particular emphasis on services relevant to older patients. The role of clinical decision-making based on patient characteristics has been explored using case vignettes (see Chapter 4).

The results of the organisational audit provide a baseline for the interpretation of other findings on the management of older patients with breast cancer. They should also stimulate discussion and analysis about what improvements in the organisation of services are required to improve clinical outcomes for older patients.

The audit consisted of an online questionnaire that was circulated to breast cancer MDT leads in each NHS trust in England and health board in Wales during between December 2016 and March 2017. A list of contacts for all NHS providers with breast cancer services was created from various sources. Prior to circulation of the questionnaire, individuals from the list of providers were contacted for confirmation of up-to-date contact information. Non-responders were followed up by email and telephone.

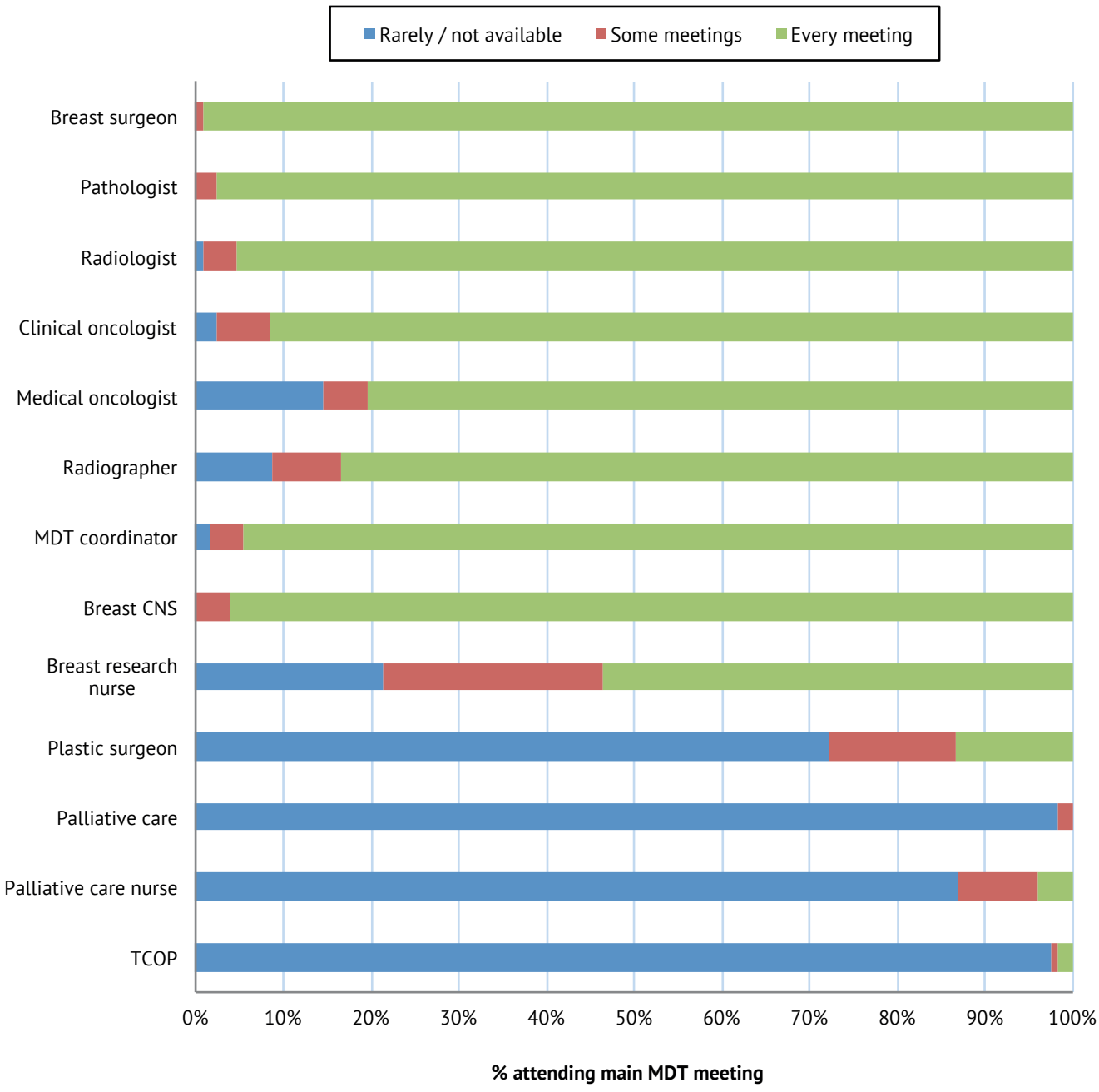
Overall, 129 (91%) out of 142 NHS providers of breast cancer care in England and Wales participated in the organisational survey (Appendix 3). There were 123 responses from NHS trusts in England and 6 responses from health boards in Wales. Tertiary centres providing delayed reconstruction without therapeutic resection or chemo/radiotherapy services only were excluded from the survey.

3.2. Breast cancer services: multidisciplinary team (MDT)

A fundamental component of current breast cancer services is the multidisciplinary team (MDT) [DH, 2000]. It is composed of hospital staff from a variety of medical and allied disciplines who work together to deliver breast cancer services. Teams meet regularly to discuss the treatment options for individual patients, and this collaborative approach has been reported to improve patient outcomes [Selby et al 1996; Kesson et al 2012]. The MDT is central to the delivery of patient-centred care in the NHS.

These survey results reveal that all MDTs at primary treating breast cancer units in England and Wales meet at least once a week. Some NHS hospitals have several breast cancer MDT meetings in a week, either due to a large patient population and/or in order to cater for different types of patients (early stage disease vs metastatic). The combination of staff who attend these MDT meetings is described in Figure 3.1. As might be expected, responding NHS providers reported that the following MDT members were nearly always in attendance: the breast surgeon, medical/clinical oncologist, breast cancer clinical nurse specialist, pathologist, radiologist, and MDT coordinator.

Figure 3.1: Composition of MDT members at the main MDT meeting in NHS trusts and health boards in England and Wales



Abbreviations: CNS – clinical nurse specialist, TCOP – Teams Caring for the Older Person

Palliative care is a vital part of supportive care services for patients with advanced breast cancer. The delivery of this service is not exclusive to specialist palliative care clinicians/nurses, and also includes other health professionals involved with the day-to-day care of patients with breast cancer. This inter-professional approach is designed to provide a continuous and holistic approach to assessment and management of the needs of a breast cancer patient.

NHS providers reported that palliative care clinicians and nurses are rarely present at breast cancer MDT meetings (Figure 3.1). This may reflect the existing, satisfactory pathways for referral to palliative care for selected patients.

It is recommended that decisions on primary management, including oncoplastic reconstruction, adjuvant therapy planning and management of metastatic disease are discussed at an MDT meeting [NICE 2009a; 2009b]. The survey found that 98% of NHS breast cancer units always discuss new patients with biopsy confirmed breast cancer in the main MDT meeting (NB: some NHS providers allocate their 'main' MDT for the discussion of post-surgery patients only). For patients presenting with metastatic disease (local or distant), 95% of units said these patients were always discussed at MDT meetings. The proportions of units that discussed every patient with recurrent local or metastatic disease were 95% and 87%, respectively.

3.3. Breast cancer services: surgical resources

Surgical resection is the main treatment for invasive and non-invasive breast cancer. This is usually in the form of mastectomy or breast conserving surgery (BCS) to the breast with axillary surgery and (commonly) reconstructive procedures. If appropriate, patients who have a mastectomy should be given the opportunity to discuss and undergo immediate (at the same time) or delayed (at a later stage) breast reconstruction [NICE 2009a]. Patients with invasive breast cancer will usually also undergo axillary nodal surgery at the same time as their breast cancer resection.

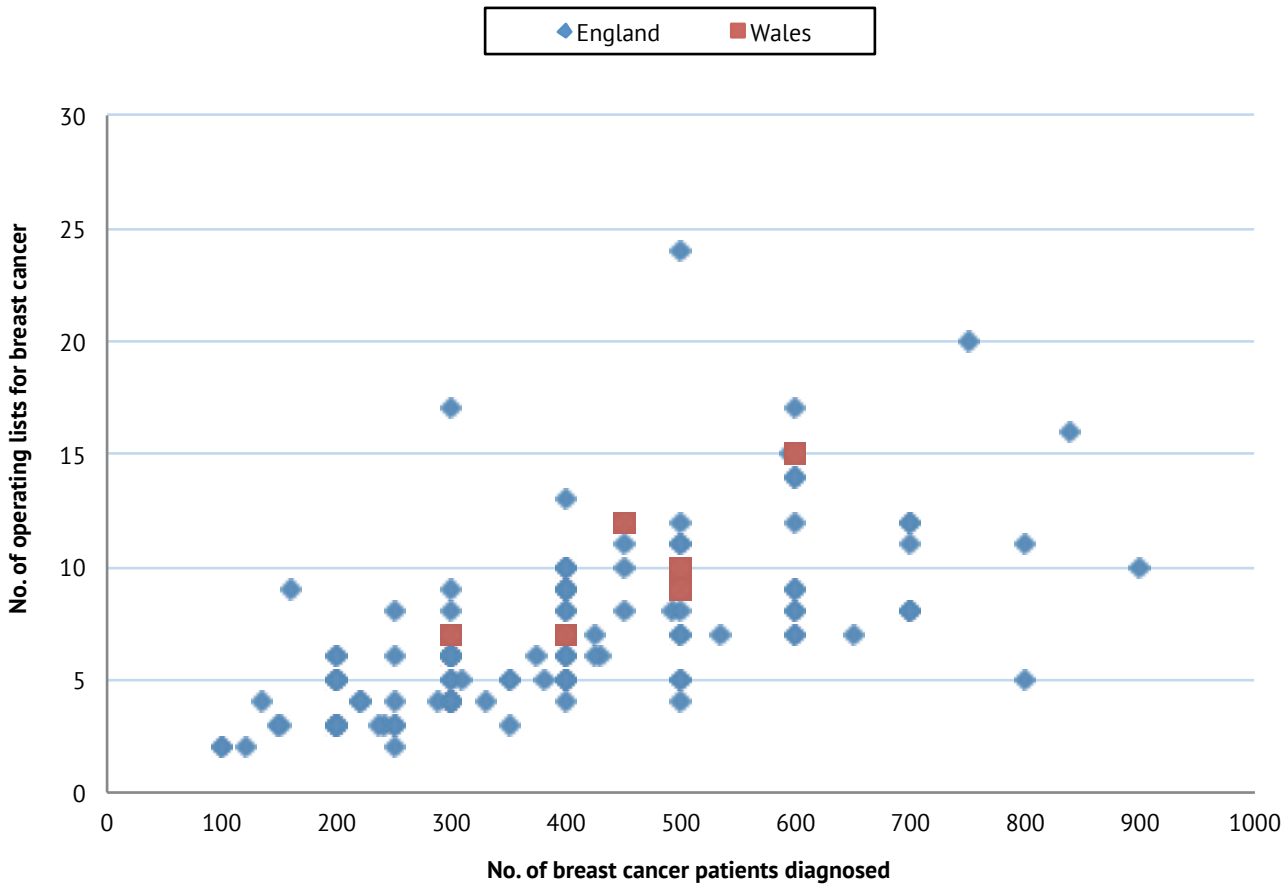
All primary treating breast cancer units in England and Wales have on-site breast surgeons (Table 3.1). 96% of these trusts/health boards provide immediate breast reconstruction services. On-site free flap breast reconstruction is available in 30% (n=34) of trusts in England but in none of the health boards in Wales.

Table 3.1: Availability of whole time equivalent (WTE) breast cancer surgeons in NHS Trusts in England and health board in Wales (consultant and SAS grade doctors)

	On-site only	Cross-cover from another site only	On-site and cross-cover from another site
England (n=122)	116 (95%)	-	6 (5%)
Wales (n=6)	5 (83%)	-	1 (17%)

Based on the number of new patients with invasive cancers diagnosed in 2015, there is the expected trend of more operating lists available for breast cancer patients in the larger NHS trusts/ health boards in England and Wales (Figure 3.2). There was also a similar broad trend between the number of new cancer patients and the size of the surgical team. Breast cancer units caring for 350 or fewer new cancer patients typically reported having 2-3 breast surgeons, while units caring for more than 350 new cancer patients generally had 4-5 surgeons. Beneath these general patterns, however, there was considerable variation across the breast cancer units in terms of the ratio of new cancer patients to breast surgeons. There was more similarity between units in the ratio of operating lists to breast surgeons, with typically two lists per surgeon (the inter-quartile range extended from 1.4 to 2.2 lists per surgeon).

Figure 3.2: The number of operating lists per week available for breast surgery at NHS providers, in relation to the number of new invasive breast cancers diagnosed in 2015



All patients diagnosed with invasive breast cancer undergo ultrasound imaging of axillary lymph nodes to investigate whether the cancer has spread beyond the breast to the armpit [NICE 2009a]. The results of the ultrasound guide treatment decisions:

- If there is evidence of breast cancer spread to any of the axillary lymph nodes, all the lymph nodes are usually removed at the same time as the breast cancer resection surgery.

- If the ultrasound does not detect anything abnormal in the axilla, patients will undergo a surgical procedure called 'sentinel lymph node biopsy' (SLNB) [NICE 2009a; 2009b]. This examines the first lymph node to drain the breast and is usually the first to contain nodal metastasis if it is present. If patients are found to have cancer in the sentinel node an axillary node dissection (or in some circumstances axillary radiotherapy) is usually recommended.

All NHS trusts in England and health boards in Wales perform SLNB, but there was variation in the method used to identify the sentinel node:

- 86 (68%) units reported using radioactive injection and dye, while 31 (24%) used radioactive injection and selective dye

- 4 (3%) units used dye only

- 6 (5%) units used radioactive injection only.

It is recommended that a dual method of sentinel node localisation is used because it improves the accuracy of the examination [NICE 2009a; Kim et al 2006].

The analysis of the sentinel node may be performed using the One Step Nucleic Acid Amplification (OSNA) system or metasin test [NICE 2013]. A potential advantage of these methods is that they enable surgeons to make a decision at the time of the initial surgery on whether to proceed to an axillary node dissection if a sentinel node is found to contain cancer. Currently, 27 of 123 responding English NHS trusts (22%) provided this service; in Wales, it is provided at 2 of 6 health boards.

3.4. Other breast cancer services

Breast cancer oncologists are responsible for advising on, and providing, treatments such as chemotherapy, radiotherapy and endocrine therapy. In women with early stage cancer, these treatments are often used in combination with surgery to reduce the risk of cancer recurrence and improve survival rates. In advanced breast cancer, the treatments can be used as the primary mode of therapy. Older patients may be less able to tolerate some breast cancer therapies, including surgery needing general anaesthesia and chemotherapy. In these situations, it is common for older women to be offered alternative treatment modalities. Older patients with hormone positive breast cancer may be offered primary endocrine therapy (PET). This treatment is usually recommended for patients who have a shorter life expectancy or are unsuitable for surgery or who do not wish to have surgery [Biganzoli et al. 2012].

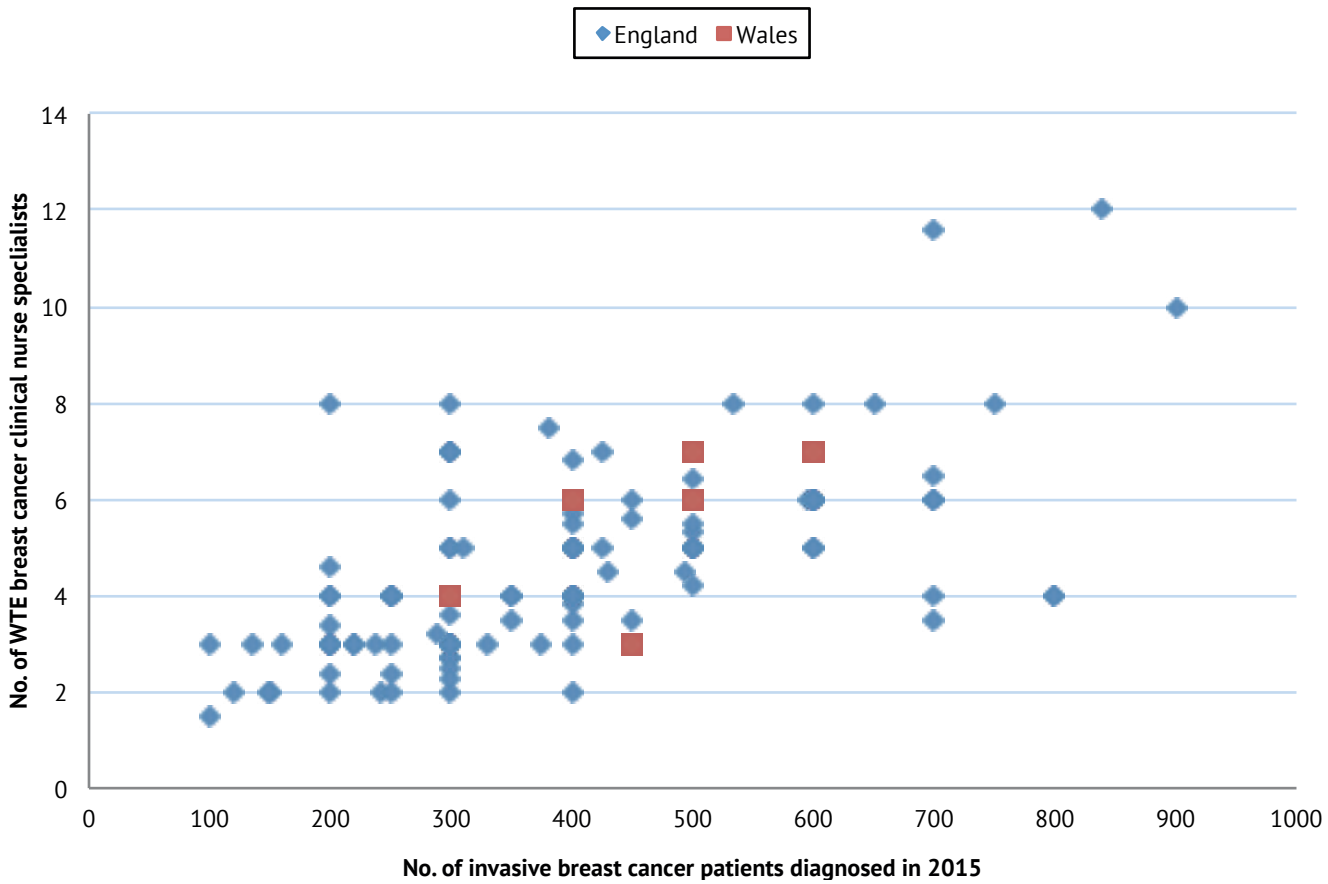
The majority of NHS trusts in England and health boards in Wales providing breast cancer surgery also deliver an on-site chemotherapy service (Table 3.2). Radiotherapy is a more centralised service with one specialist unit often serving a number of breast cancer units. Overall, it appears that current geographical arrangements ensure oncological services are available to patients diagnosed at every NHS trust / health board, although this might involve some travel for radiotherapy.

Table 3.2: Availability of oncology services in NHS trusts in England and health board Wales

	Clinical/medical breast cancer oncologists (consultants and SAS grade)		
	On-site only	Cross-cover from another site only	On-site and cross-cover from another site
England (%)	58 (48)	21 (17)	43 (35)
Wales (%)	1 (17)	3 (50)	2 (33)
	On-site chemotherapy		
	Available	Not available	
England (%)	117 (95)	6 (5)	
Wales (%)	6 (100)	0 (0)	
	On-site radiotherapy		
	Available	Not available	
England (%)	58 (47)	65 (53)	
Wales (%)	3 (50)	3 (50)	

It is recommended that a named breast clinical nurse specialist (CNS) is assigned to each patient, to provide relevant information, psychological support and help guide the patient and family through their diagnosis, treatment and follow up [NICE 2009a; 2009b]. All but one of the responding NHS trusts and health boards in England and Wales had at least two whole time equivalent (WTE) breast CNS on-site, with variable workload distributions between hospitals (Figure 3.3). On average, 90 new breast cancer patients (per annum) are under the care of one breast CNS in each NHS trust / health board, but this figure ranged across units from 25 to 200 patients per breast CNS.

Figure 3.3: The number of WTE breast CNS in NHS trusts/health boards in relation to the annual number of new invasive breast cancers diagnosed (2015)



3.5. Breast cancer services for older patients with breast cancer

As noted in section 1.5, older women with breast cancer often have different needs when compared to younger patients. To ensure services understand these needs, it has been recommended that Teams Caring for the Older Person (TCOP) - also as known as Care of the Elderly teams - are involved with breast cancer MDTs so that breast cancer care can be tailored to an individual [Biganzoli et 2012].

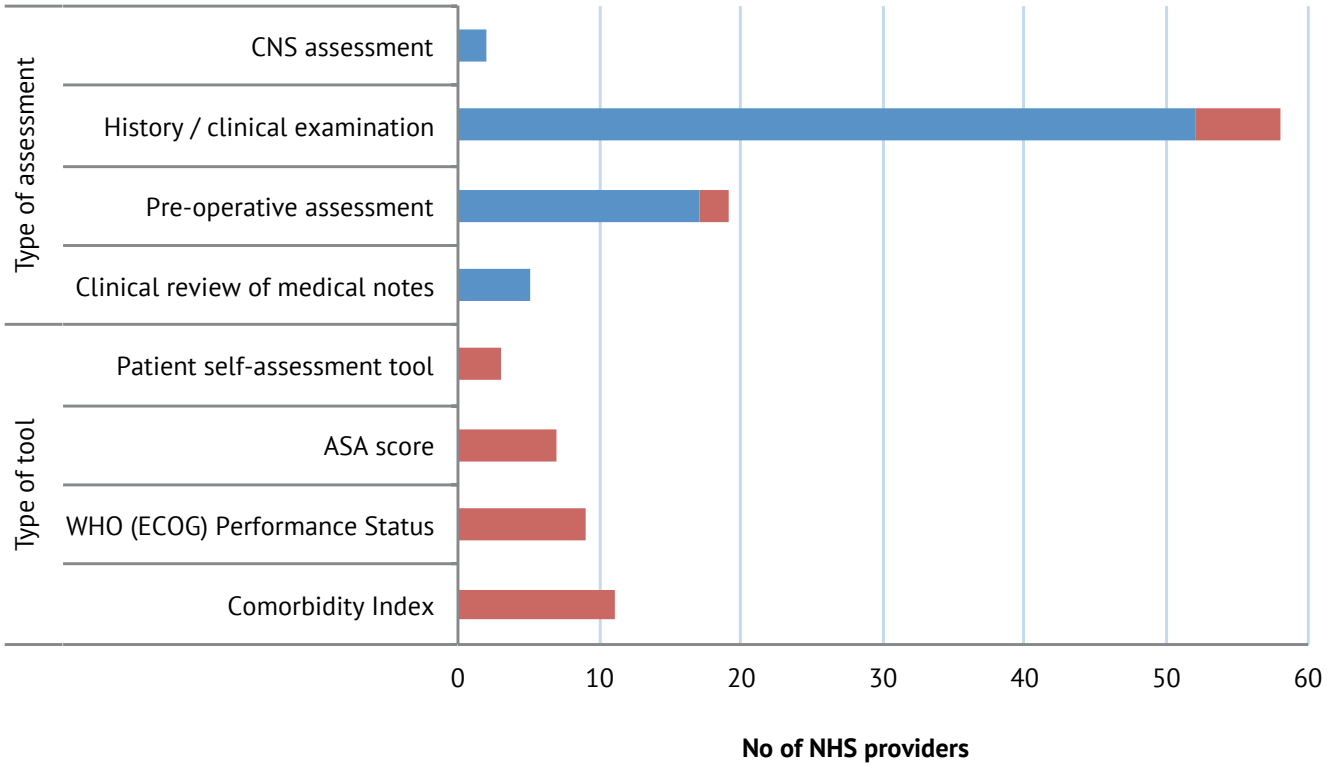
When asked about the involvement of TCOP in the care of older patients with breast cancer, NHS breast cancer units in England and Wales reported that these teams had either ad-hoc (n=61; 47%) or no formal involvement (n=60; 47%). In 14 of the units reporting ad-hoc involvement, the TCOP only saw patients with significant medical comorbidities / functional impairments. In 8 English NHS trusts, TCOP were also consulted for palliative care advice.

Some guidelines on the management of breast cancer in older women recommend that patients are assessed for medical comorbidities, cognitive function and frailty/functional status [Biganzoli et al 2012]. There are specific tools for assessing frailty recommended by NICE [2016] and include gait assessment, self-reported health status and the PRISMA-7 questionnaire. However, there is no universally accepted approach for this aspect of care.

The organisational audit included several questions about the assessment of patient comorbidities, cognitive function and frailty/functional status. These questions used open-response answers to capture the range of approaches.

Responding NHS breast cancer units reported that they had a 'formal' assessment process for patient comorbidities (84%), cognitive function (46%) and frailty/functional status (69%). The interpretation of this formal assessment process varied. Some units described the method in terms of process, or which clinician assessed it. Other units described the tool used to undertake the assessment. Some provided both pieces of information. Figure 3.4 highlights the variety of processes used as well as the different types of tools employed to measure comorbidity.

Figure 3.4: Descriptions of the 'formal' assessments of comorbidity among older women with breast cancer in NHS providers in England and Wales, separated by type of assessment and whether any specific tool was mentioned.



NOTE: The red segments on the type of assessment bars indicate that these responses also mentioned the type of tool used.

Abbreviations: CNS - clinical nurse specialist, ASA - American Society of Anesthesiologists, WHO (ECOG) - World Health Organisation (Eastern Cooperative Oncology Group)

In terms of the assessment of cognitive function and frailty, few respondents provided information on the tools used. The most commonly mentioned cognitive assessment tool was the Mini-Mental State Examination (4 units). Among those units making a formal assessment of frailty, the most common tool mentioned was the WHO / ECOG performance status scale; which was used by 36 NHS trusts in England (and 0 health boards in Wales).

In response to the questions on whether the formal assessment process was different for patients aged 70 and over, 9.4% of NHS trusts in England (n=12) that reported having a different preoperative assessment: This process involved a consultant anaesthetic review, with or without the input of a clinician from the TCOP.

Acknowledging the data limitations caused by the different types of responses to the open-response questions, the overall results suggest that there is considerable variation in the approaches and methods used to assess the health of older women with breast cancer. This variation may reflect the absence of widely adopted guidelines on how older patients should be assessed for treatment.

3.6. Other aspects of breast cancer services

It is recommended that all patients diagnosed with invasive breast cancer have their oestrogen receptor (ER) status and human epidermal growth factor 2 (HER2) status assessed [NICE 2009a]. ER status provides predictive information on the effectiveness of endocrine therapy, whilst the HER2 status test identifies patients who may benefit from trastuzumab and other anti-HER2 therapies. The anti-HER2 drugs target cancers with over-amplified HER2 receptors and are usually given with or after chemotherapy [NICE 2006].

Patients undergoing chemotherapy with or without trastuzumab are at risk of significant toxic side effects. This risk should be assessed in terms of patients' pre-existing medical comorbidities and/or frailty, rather than age [Biganzoli et al 2005]. The survey results showed that, in invasive breast cancer patients aged 70+ years, HER2 testing is routinely performed in all responding Welsh health boards (n=6) and in 93% (n=113) of English NHS trusts.

Endocrine therapy works by reducing levels of oestrogen in the body or blocking its action. Oestrogen is important for bone growth and health. Consequently, major potential side effects of some forms of endocrine therapy are bone loss and osteoporosis. The risk of developing osteoporosis is higher in older patients and in women taking aromatase inhibitors (the most commonly used agents in post-menopausal women with ER positive invasive breast cancer).

Current clinical guidelines recommend the use of a dual energy X-ray absorptiometry (DEXA) scan to evaluate baseline bone health in patients if women start taking aromatase inhibitors [NICE 2006]. Among responding NHS providers, 71% routinely advised patients aged >70 years to undergo bone health checks.

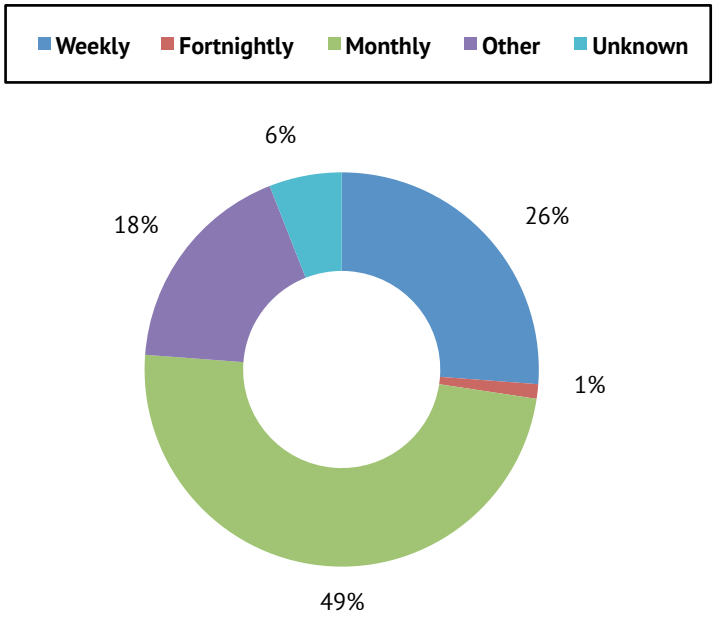
Following primary treatment, all patients with early breast cancer are recommended to undergo annual mammography for 5 years. The rationale for imaging follow-up is the desire to promptly detect local recurrence in the treated breast or a new primary breast cancer in the treated or opposite breast [NICE 2009a], but the benefits of such protocols have not been thoroughly assessed in older patients.
Among responding NHS providers, all patients (irrespective of age) with early breast cancer were reported to undergo annual follow up mammograms for 5 years in 94% (n=115) of English NHS trusts and 100% (n=6) of Welsh health boards. There is no consensus nor guidelines on the frequency or duration of clinical follow-up, which is mainly dictated by local service provision. This includes follow-up arrangements for patients on primary endocrine therapy.

3.7. Review of cancer registry data submissions

The Cancer Outcomes and Services Dataset (COSD) has been the national standard dataset for recording details of cancer patients within the English NHS since January 2013. English NHS trusts are required to submit COSD data items electronically to the National Cancer Registration and Analysis Service (NCRAS) on a monthly basis. The cancer dataset is then compiled by combining the COSD data with information from other NHS IT systems such as pathology and the Patient Administration System (PAS). In Wales, health boards submit cancer data to the 'Cancer Network Information System Cymru' (CaNISC). Once datasets are compiled by these central registration databases, the data are returned to Trusts/ health boards for review and 'sign-off'.

It was important for NABCOP to understand the COSD / CaNISC data flows from NHS hospitals because these datasets will be the main source of data for the Audit. The results of this survey suggest that, currently, COSD/ CaNISC returns are reviewed by a member of the breast cancer service in 65% (n=80) of NHS trusts in England and 67% (4 of 6) health boards in Wales. The frequency with which the data returns are reviewed is summarised below.

Figure 3.5: Frequency at which NHS trusts in England and health boards in Wales review the COSD/CaNISC data returns (84 responses)



3.8. Key findings

This chapter has described a number of aspects of the organisation of breast cancer services in England and Wales, and highlighted the services relevant to older patients with breast cancer. In summary:

- 100% of NHS trusts in England and health boards in Wales who participated in the survey provide on-site breast cancer surgical services, with 96% of these providing immediate breast reconstruction services. There is variation in the operative workload between NHS trusts/health boards.

- 100% of NHS trusts and health boards provide a Sentinel Lymph Node Biopsy service. Intraoperative SLNB assessment is available in 22% of NHS providers in England and 33% of health boards in Wales.

- All but one of the responding NHS trusts/health boards have a minimum of 2 breast CNS on-site. On average, 90 patients are under the care of one breast CNS but this figure ranged across units from 25 to 200 patients per breast CNS

- There are inconsistencies in the breast cancer services provided to older women across England and Wales. "Teams Caring for the Older Person" are rarely involved in the management of these patients.

- There is variation in the methods of assessment of patient characteristics (e.g. comorbidities, cognitive function and frailty) between NHS providers in England and Wales.

- There is no upper age limit for HER2 testing and follow-up mammogram surveillance in trusts/health boards in England and Wales.

- 65% of trusts in England and 67% of health boards in Wales reported reviewing COSD/CaNISC data returns regularly. These reviews are mostly performed on a monthly basis.

This organisational survey has revealed a non-standardised approach to delivering breast cancer services for older patients in England and Wales. This may be in part due to deficiencies in current national recommendations in addressing the specific care needs of this population. Therefore, in future revisions of guidelines on breast cancer, particular areas of focus should include:

- Defining the contributions of other specialists e.g. TCOP, anaesthetists and palliative care, in the delivery of breast cancer services for older patients. This also includes the role of supportive services e.g. specialist nurses.

- Describing the need for patient assessment, and standardising the methods of evaluating patient comorbidities, cognitive function and frailty. The emphasis should be towards delivering individualised care, which is a separate process from pre-operative assessment.

- Outlining the information and supportive services available for patients with early breast cancer who are treated with primary endocrine therapy/non-surgically. This includes the follow up arrangements for these patients.

COSD/CaNISC data returns provide an overview of essential summary information, and performance indicators at a local level. Therefore, we also recommend that NHS trusts/health boards improve their review practices as part of their clinical governance processes.

4. Organisation of breast cancer services: case vignettes

4.1. Introduction

The management of breast cancer for an individual woman will reflect the characteristics of the disease, her ability to tolerate different therapies, and her personal preferences. As noted earlier, older women tend to differ from younger women in the type of cancer they have, and in their overall level of general health, both of which have a major influence on the treatment options available.

The primary treatment for women with early stage breast cancer is the surgical removal of the breast tumour. As an alternative to surgery, older patients with ER positive disease may have primary endocrine therapy (PET) as their primary therapy. Clinical trials have demonstrated this is equivalent to surgery in terms of lengthening survival, but it is also less effective at preventing cancer progression [Morgan et al 2014]. Consequently, PET is recommended primarily for patients with an estimated life expectancy of less than 2 to 3 years, who are considered unfit for surgery, or who do want surgery [Biganzoli et al 2012].

When the use of PET among older women with breast cancer has been examined, UK studies have reported significant variation between hospitals in the proportion of women having PET after adjusting for differences in disease characteristics, age and comorbidities [Morgan et al 2015]. Some variation is likely to reflect the influence of the patient's preference but this finding has also raised questions about how clinicians take account of the individual characteristics of patients when formulating treatment options. In this chapter, we describe the results from a small series of case vignettes which we used to examine, at a national level, the patient factors which may be of importance to breast cancer clinicians in determining treatment options for older patients with operable breast cancer. The results of these case vignettes provide a national snapshot of clinical decisions and practices on the primary management of breast cancer in older patients.

4.2. Methods

Five case vignettes were designed to simulate older patients who could be discussed at a breast cancer MDT meeting. These vignettes were circulated as an online survey, alongside the organisational survey, to the breast cancer MDT leads in each NHS provider in England and Wales in December 2016 (n=142; 136 in England and 6 in Wales).

Participants were able to either complete the case vignettes during an MDT meeting or individually on behalf of the MDT.

Each vignette was designed with 'fixed' and 'varied' patient characteristics (Table 4.1). Characteristics associated with clear clinical guidelines or standards for treatment were 'fixed' in each scenario to minimise ambiguity. Specifically, NICE [2009] recommends that:

> *"patients with early invasive breast cancer should be treated, irrespective of age, with surgery and appropriate systemic therapy, rather than endocrine therapy alone, unless significant comorbidity precludes surgery".*

Other patient characteristics were 'varied' in the vignettes to investigate their influence on primary treatment decisions.

Overall, 119 NHS providers (84%) of breast cancer services in England and Wales completed these case vignettes.

In this chapter, we describe the key findings and comments from each case vignette.

Table 4.1: Patient characteristics	
Fixed	**Varied**
Invasive tumour (no carcinoma in-situ) Hormone status = ER positive, PR negative, HER2 negative Tumour grade = 2 Good family support network	Age Tumour characteristics (size and axillary node involvement) ASA and other medical comorbidities Performance status Cognitive impairment status

The format of the answers to each case vignette is shown below:

1. *In my professional opinion, this woman should be (please select only one answer):*

   a) *Advised to have a surgical resection*
   b) *Offered a choice but strongly favouring a surgical resection*
   c) *Offered an equal choice of surgery or primary endocrine therapy*
   d) *Offered a choice but strongly favouring primary endocrine therapy*
   e) *Advised to have primary endocrine therapy*

2. *Based on the information above, my best estimate of this patient's current life expectancy is ____ (months).*

3. *Please use the space below to tell us about any comments that you have on this case vignette:*

Understanding the case vignettes

Tumour characteristics:

- **Size** is the widest diameter of the tumour.
- **In invasive cancer**, there is invasion of the cancerous cells within the breast ducts/glands of origin (non-invasive = cancerous cells are limited to the walls of the duct/gland)
- Breast **cancers** are graded from 1-3 based on how different the cancerous cells appear compared to normal cells (differentiation), and how fast they are growing. Grade 3 cancer is faster growing and has cells that are most transformed from their original cells.

Ultrasound is used to investigate the spread of breast cancer to nearby **lymph nodes** in the armpit (axilla) before surgery.

If there is evidence of cancerous lymph nodes, all the lymph nodes in the axilla will be removed (axillary node dissection). This is usually performed at the same time as the breast surgery.

If there is no evidence of spread to the axillary nodes, patients will undergo a less invasive procedure called sentinel node biopsy (SLNB).

In these case vignettes, the **age** range of the 'older patient' is 75 to 85 years.

A 75-year-old woman has an 18mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has no positive lymph nodes on ultrasound. She has mild chronic obstructive pulmonary disease (ASA II) and a performance score of 0. She has no cognitive impairment and has good family support network. She does not express a strong preference for either surgery or primary endocrine therapy.

- Breast cancer cells can have receptors that pick up signals from **hormones** (oestrogen (ER), progesterone) promoting cell growth. ER positive confirms the presence of these receptors, and implies the cancer is sensitive to anti-oestrogen therapy.
- **HER-2** stands for human epidermal growth factor receptor 2. It is present on normal breast cells, but there are a higher number on breast cancer cells. It can promote division and growth of abnormal and cancerous cells, which makes tumours sensitive to specific anti-HER2 drugs.

American Society of Anaesthesiologists (ASA) score is a commonly used physical status classification based on the perioperative health and comorbidities of a surgical patient.

See Glossary for the full ASA classification.

WHO/ ECOG Performance status is a measure of how disease(s) impacts a patient's ability to manage on a daily basis.

See Glossary for the Performance Score scale.

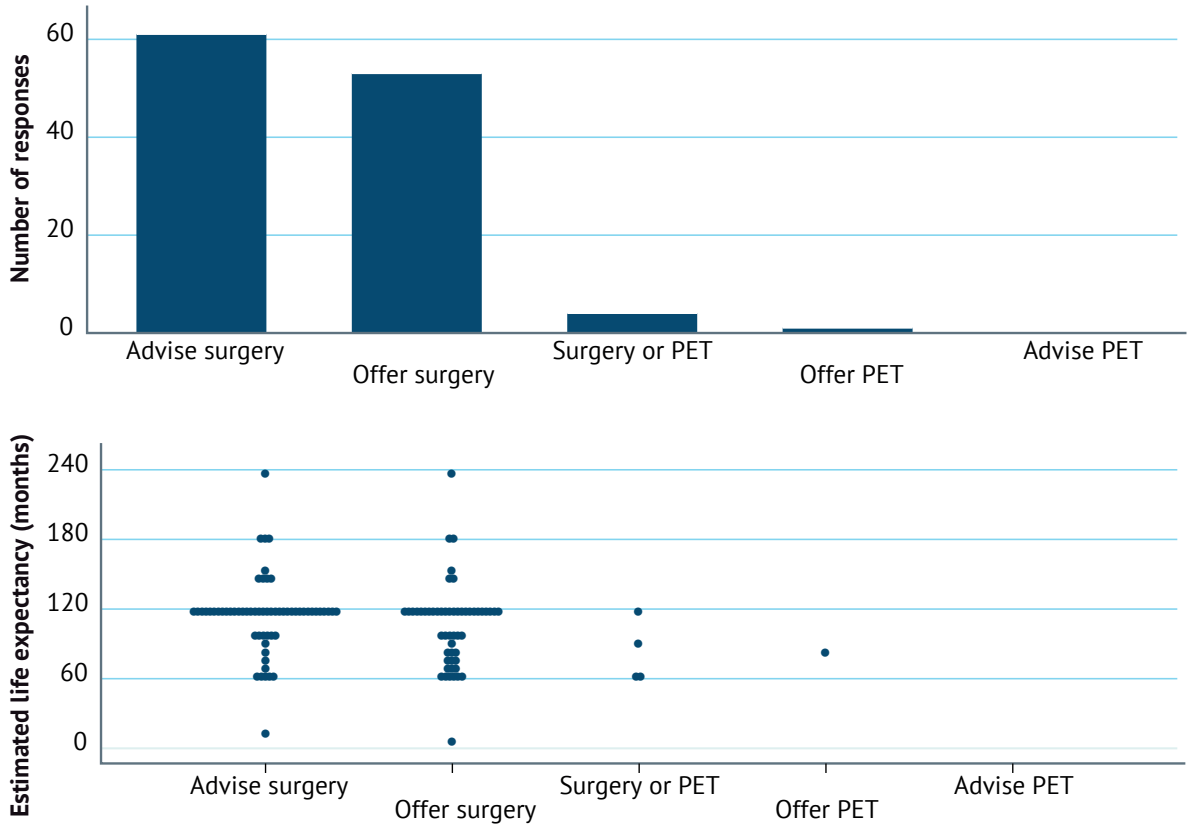
4.3. Case vignettes

Case vignette #1

A 75-year-old woman has an 18mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has no positive lymph nodes on ultrasound. She has mild chronic obstructive pulmonary disease (ASA II) and a performance score of 0. She has no cognitive impairment and has a good family support network. She does not express a strong preference for either surgery or primary endocrine therapy.

This patient has few medical comorbidities, no cognitive impairment and no limitations to her daily functioning. These factors are unlikely to have a significant influence on her life expectancy or surgical/anaesthetic risk. Her cancer is operable and there is no evidence of cancer spread beyond her primary tumour.

Figure 4.1: Results of the primary treatment choices for case vignette #1 and the life expectancy estimates (months) for each treatment choice



There were 114 respondents (95.8%) who favoured surgical resection for this patient, with comments that surgery would *"have the greatest impact on breast cancer survival"* and *"provide best local control"*. Respondents were also in agreement that this patient's age did not influence their treatment decisions, with typical comments being: *"This patient would be treated no differently to a patient <70 years of age"* and that she should be *"offered standard management with no adjustment for her age"*. The patient's good performance status and minimal comorbidities further supported this decision as it was felt that she should be *"treated according to fitness rather than age"*.

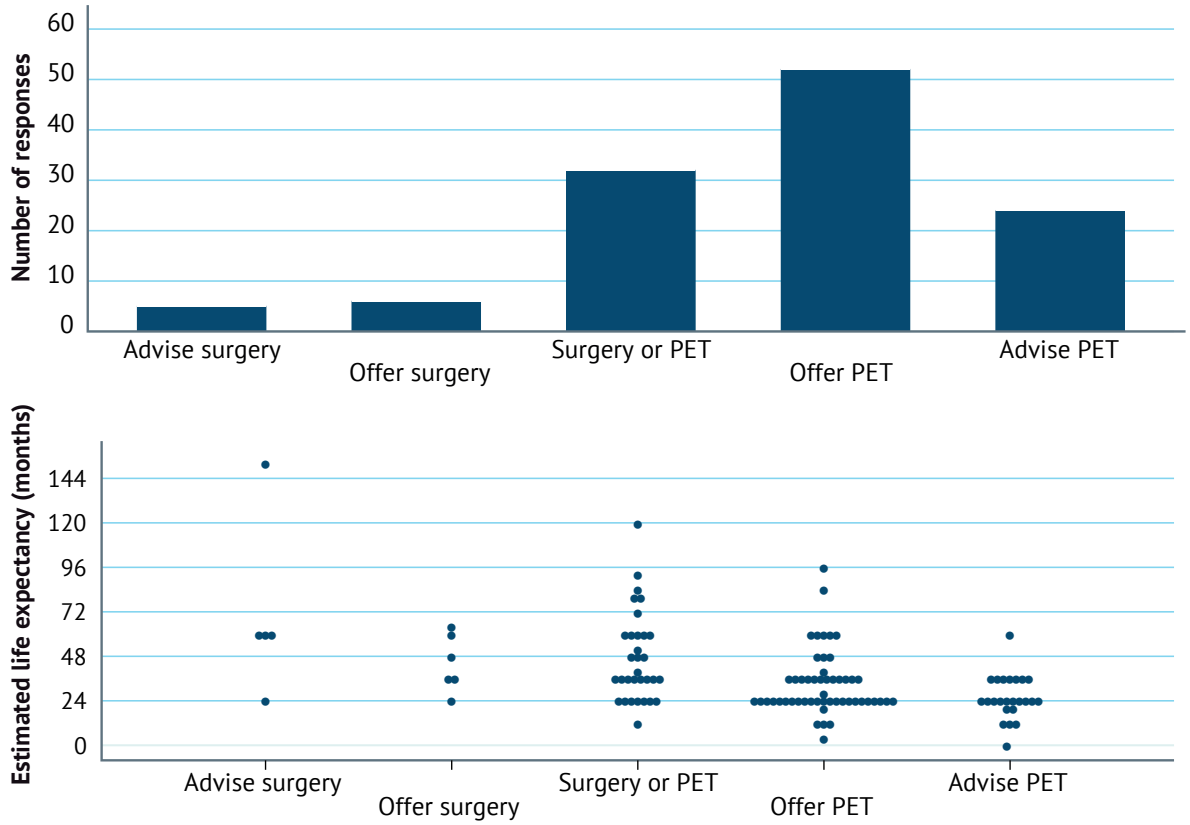
Respondents typically estimated life expectancy to be 10 years, with 64% expecting this patient to live at least this long. There was general uncertainty regarding the accuracy of these life expectancy estimates, with some participants admitting that it was a *"guess"*. Stated reasons for respondents' estimates ranged from *"the patient should have good/normal life expectancy"*, *"presumed on the basis of tumour prognosis"* and *"life expectancy likely to be related to age and COPD rather than breast cancer"*.

Case vignette #2

An 85-year-old woman has an 18mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has no positive nodes on ultrasound. She is an ASA III (moderate aortic stenosis, moderate congestive heart failure, osteoarthritis) and has a performance score of 3. She has mild cognitive impairment and a good family support network. She does not express a strong preference for either surgery or primary endocrine therapy.

This patient has severe medical comorbidities, mild cognitive impairment and significant limitations to her daily functioning. She has an operable cancer with no evidence of cancer spread beyond the primary tumour. In this case, the main issues to consider are the benefit of a surgical resection on cancer control and overall survival versus the risk of surgery / anaesthetic given her background.

Figure 4.2: Results of the primary treatment choices for case vignette #2 and the life expectancy estimates (months) for each treatment choice



There were 76 respondents (63.9%) who favoured PET over surgery for this patient. Among these, the main reason provided for the choice was the patient's medical comorbidities and the role of these as a *"competing cause of mortality"*. Conversely, among participants who favoured surgery, comments included that their *"decision would be guided by a formal anaesthetic +/- cardiology risk assessment"* as the *"risk of anaesthetic may outweigh surgical benefit"*. Eight participants specifically commented that they would consider *"surgical resection without an axillary procedure under local/regional anaesthesia"*.

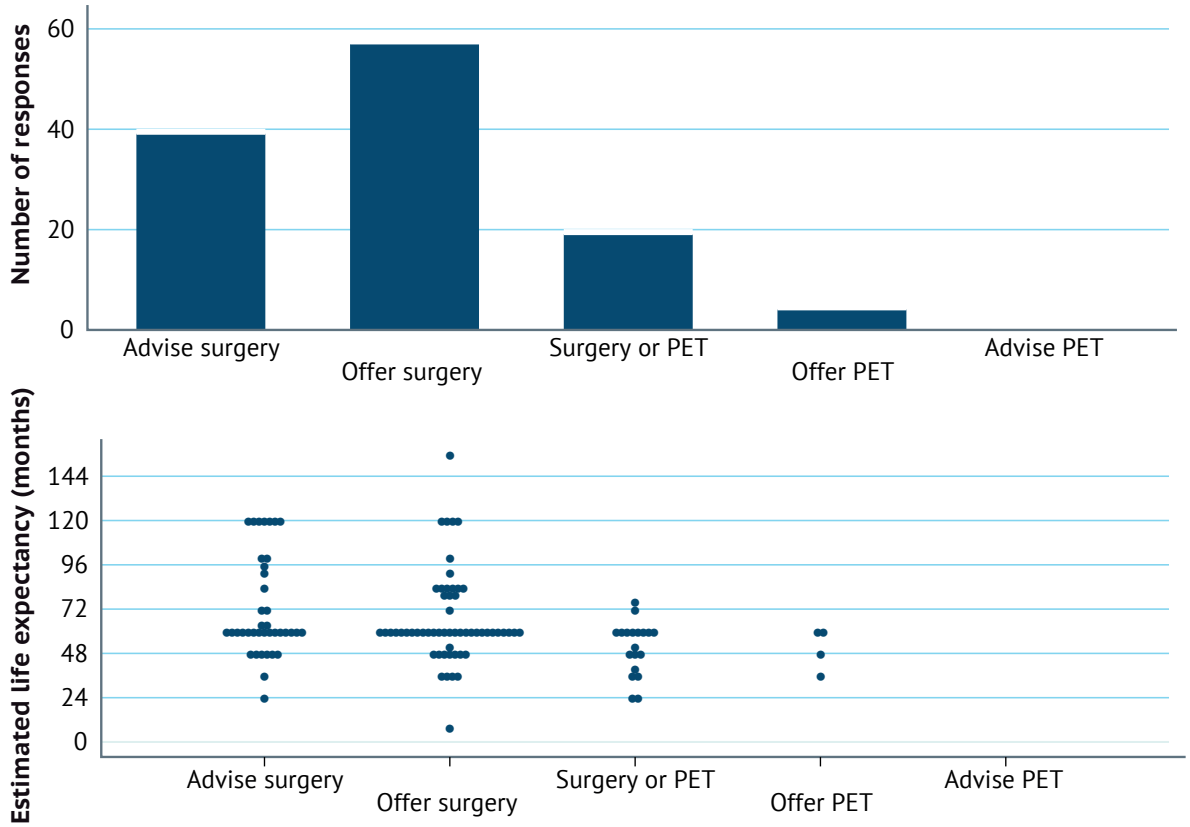
There was a wide range of estimates for the life expectancy of this patient. Respondents who advocated surgery for this patient tended to have higher estimates (mostly between 3 and 5 years) than those who would offer PET (typically between 2 to 3 years). However, one participant acknowledged that they *"did not feel well trained in assessing life expectancy in terms of months based on comorbidities"*. None of the respondents commented on age as an influence on their primary treatment decisions or estimates of life expectancy.

Case vignette #3

A 75-year-old woman has an 35mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has malignant nodes on ultrasound guided biopsy. She is an ASA II (BMI 37kg/m², hypertension, smoker) and has a performance score of 1. She has mild cognitive impairment and a strong family support network. She does not express a strong preference for either surgery or primary endocrine therapy.

This patient has several medical comorbidities, mild cognitive impairment and limitations on her daily functioning. She would require a surgical resection and axillary node clearance for cancer control and survival. However, the potential benefit of surgery needs to be weighed against her surgical/anaesthetic risk, as well as the influence of her background factors on her life expectancy.

Figure 4.3: Results of the primary treatment choices for case vignette #3 and the life expectancy estimates (months) for each treatment choice



In this vignette, 96 respondents (80.7%) favoured surgical resection for this patient. *"Local disease control"* was cited as one of the main reasons for this decision. Several participants commented on the value of surgically treating her breast cancer *"now"* before she had *"local disease progression on PET"* or before she is *"less fit and less able to undergo general anaesthetic"*. There were various opinions on (a) the role of neoadjuvant endocrine therapy, (b) patient suitability for adjuvant chemotherapy, and (c) how the latter would influence primary treatment decisions. One participant stated that they *"advise staging CT prior to any surgical procedure as de-bulking may not offer symptomatic relief in the presence of metastatic disease"*.

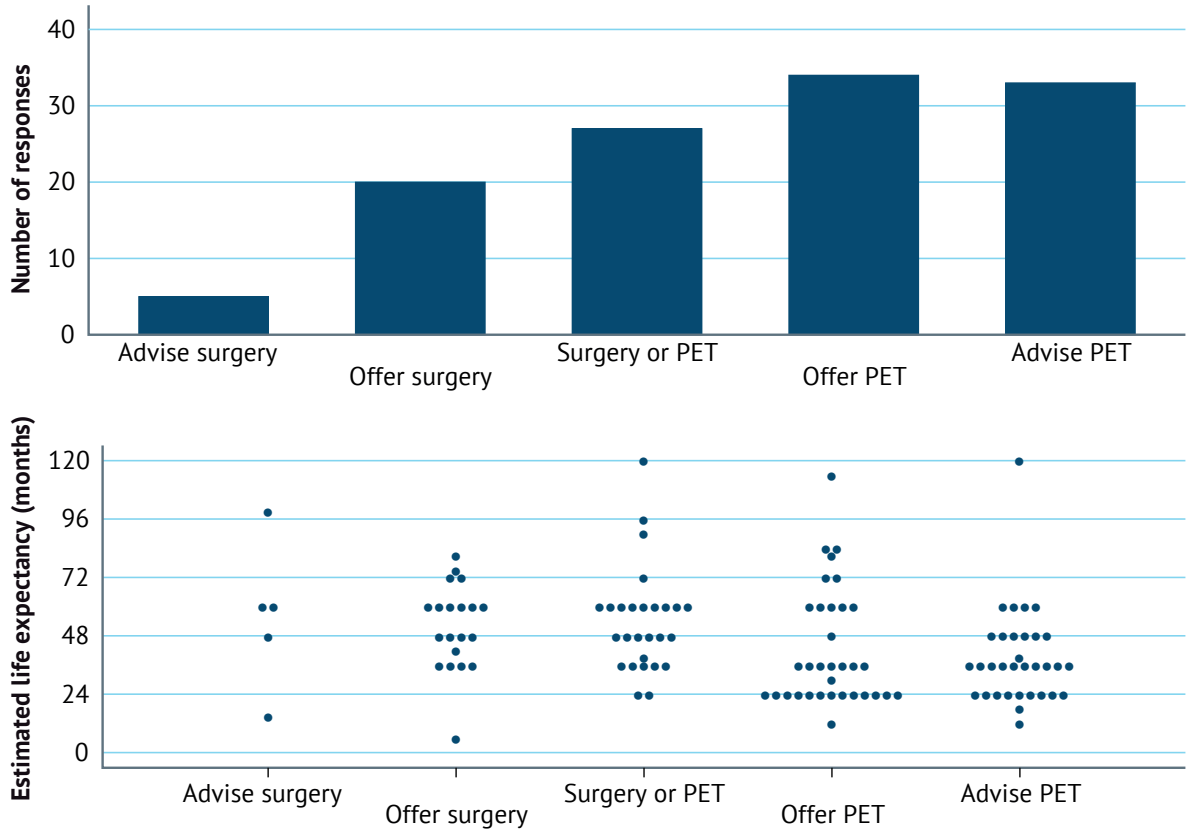
It was felt that mild cognitive impairment did not preclude surgical intervention provided that there was *"capacity and a significant degree of (patient) coordination"* and if the surgical experience wasn't *"distressing"* for the patient. Estimates of life expectancy clustered between 4 and 7 years, and there was only a small difference in the typical estimates across the different types of recommended treatments.

Case vignette #4

An 80-year-old woman has an 18mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has malignant nodes on ultrasound guided biopsy. She has osteoporosis (ASA II), severe cognitive impairment and a performance score of 2. She has a strong family support network. She does not express a strong preference for either surgery or primary endocrine therapy.

This patient has few medical comorbidities, severe cognitive impairment and limitations on her daily functioning. She would require a surgical resection and axillary node clearance for disease control and survival. However, the decision on primary treatment in this case would also have to consider her risk versus the benefit of surgery, weighed alongside the impact of her comorbidities on her quality of life and life expectancy.

Figure 4.4: Results of the primary treatment choices for case vignette #4 and the life expectancy estimates (months) for each treatment choice



As shown in figure 4.4, there was no consensus among respondents regarding their choice of primary breast cancer treatment, although there was a small majority (67 respondents, 56.3%) who would advise / offer PET over surgery for this patient. Many comments highlighted the difficulties in making a decision on primary treatment in a patient with severe cognitive impairment. The challenges raised include issues of *"capacity and consent"*, *"compliance with PET"*, whether the patient would find the perioperative period *"distressing"* and *"limited choice"* of PET agents in the presence of osteoporosis. Several participants felt that the opinion of the patient's family on treatment options would be helpful, although in one participant's experience *"most relatives will favour endocrine treatment where the patient is unable to express a choice"*.

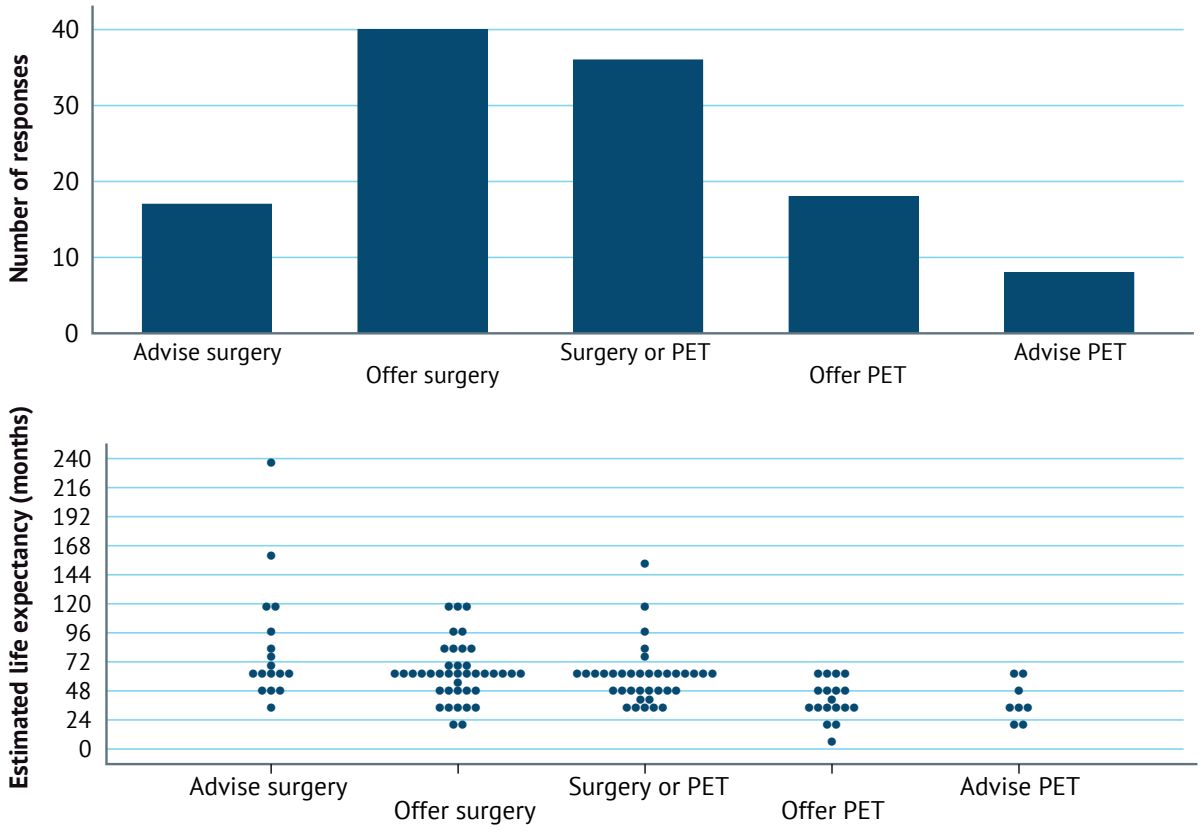
Participants' comments highlighted that life expectancy would be shorter in the presence of cognitive impairment, with the range of estimates being related to the type of treatment clinicians would advise. Among respondents who would offer / advise PET, 95% expected the patient to live at least 2 years; among respondents who would offer / advise surgery, 72% estimated the patient would live at least 4 or more years.

Case vignette #5

A 75-year-old woman has a 35mm grade 2 invasive breast cancer which is ER positive and HER2 negative. She has no positive nodes on ultrasound. She is an ASA III (coronary artery bypass graft last year with permanent pacemaker insertion, hypertension and diabetes mellitus) and has a performance score of 1. She has no cognitive impairment and a strong family support network.

This patient has several medical comorbidities, no cognitive impairment and a mild limitation to her daily functioning. Her comorbidities may influence her surgical/anaesthetic risk and pose a challenge for potential future radiotherapy considerations. Her cancer is operable with no evidence of disease spread beyond her primary tumour. Therefore, the decision on primary treatment in this patient would also have to consider her risk versus benefit of surgery, weighed alongside the impact of her comorbidities on her quality of life and life expectancy.

Figure 4.5: Results of the primary treatment choices for case vignette #5 and the corresponding life expectancy estimates (months) for each treatment choice



There was a wide range of opinions for this patient among respondents. There were 57 respondents (47.9%) who would either advise or offer surgery, while 26 favoured PET. There were 36 who expressed no preference for either primary treatment. Among the latter group of respondents, several commented that they would offer surgery if the patient was deemed fit following an anaesthetic +/- cardiologist assessment. The timing of surgery in this patient was also a consideration. Some participants discussed the option of neoadjuvant therapy or a trial of endocrine therapy, whilst others commented that there was a *"current window of opportunity"* for surgery whilst her *"medical comorbidities were optimised"*.

Several participants took the permanent pacemaker in this patient into account in their decision for surgery and potential adjuvant therapy.

The majority of the 57 respondents (70.2%) who favoured surgery estimated the average life expectancy to be at least 5 years. Participants who favoured PET gave estimates for life expectancy between 2 and 5 years. Opinions on the estimated life expectancy ranged from a *"high 5 year mortality, probably about 70%"* to *"her predicted 2 year survival is 63.6%, whereas 5 year survival is only 22.7%"*.

4.4. Key findings

This survey of case vignettes has demonstrated a range of opinions among clinicians on primary treatment decisions and estimates of life expectancy in older patients with operable breast cancer. In summary:

- Surgical treatment decisions are influenced by patient medical comorbidities, cognitive impairment and functional ability, but to varying degrees.
- There is poor understanding of the impact of medical comorbidities, cognitive impairment and functional ability on the life expectancy of an older patient with breast cancer.
- Survey participants were more likely to offer PET to the patients whom they estimated to have poorer life expectancy.

In addition, the respondents' comments highlight an appreciation for the complex interaction between age, comorbidities, cognitive impairment and functional status on disease and treatment outcomes. These results reflect the known national variation in surgical management of breast cancer in older patients [Richards et al, 2016; Bates et al 2014; Morgan et al 2015a, 2017].

Current national guidelines could do more to support clinicians to address the specific issues that arise in the management of breast cancer in older patients. Therefore, in future revisions of guidelines on management of breast cancer in older patients, there should be an agreement on the appropriate consideration of non-cancer patient factors in the formulation of treatment options and how they should form part of the shared decision making process with patients and their relatives. There should be a particular focus on:

- Practical assessment methods within the clinical setting for cognitive function and functional ability, including measures of frailty.
- Educating breast cancer clinicians and CNS on factors that may influence life expectancy in older patients. This may include validating the role of decision supporting instruments and online prognostic calculators in this older population.

5. Breast cancer treatments and outcomes: process and outcome indicators

In the next Annual Report, the NABCOP will publish information on the comparative performance of NHS breast cancer units in England and Wales using patient-level data. In the initial phase of the audit, we have undertaken a series of preparatory tasks in order to develop an initial set of process and outcome measures that will form the basis of the published information. The aim of these tasks was to select a set of process and outcome indicators that are clinically important, able to highlight variations in outcomes of treatment, and able to support hospitals and clinicians to improve the quality of care.

The development process began with a rapid review of:

1. literature on the various quality indicators used in breast cancer, and

2. the recommendations in national guidelines on the management of breast cancer.

The review focused on finding recommendations for examples of quality indicators used in breast cancer as well as evidence of variation in treatment patterns among women of different ages. The review covered the following areas of clinical care:

- Method of detection
- Staging, frailty assessment and treatment planning
- Sequence of treatments received (neoadjuvant, surgery, adjuvant)
- Outcomes of treatment, including survival and rates of complications
- Treatments and outcomes of patients with metastatic cancer (to inform feasibility study)
- Patient experience (to inform feasibility study)

Table 5.1 (overleaf) summarises the clinical guidelines reviewed as part of this process. Recommendations or standards of care related to the management of older patients with breast cancer, and therefore relevant to this audit, were identified from the guidelines.

Table 5.1: Summary of national guidelines on breast cancer

Guidelines and standards for:	Diagnosis and staging	Treatment	Surgery	Chemotherapy	Radiotherapy	Acute care	Outcomes
Department of Health. Cancer Reform Strategy. London: Department of Health; 2007.		✓					
National Institute for Health and Care Excellence. Clinical Guideline (CG81): Advanced breast cancer: diagnosis and treatment NICE; 2009.	✓				✓		
National Institute for Health and Care Excellence. NICE Clinical Guideline (CG80). Early and locally advanced breast cancer: diagnosis and treatment. London: NICE; 2009.	✓		✓	✓	✓		
Department of Health. Improving Outcomes: A Strategy for Cancer. London: Department of Health; 2011.		✓					
Biganzoli L, Wildiers H, Oakman C, Marotti L, Loibl S, Kunkler I, et al. Management of elderly patients with breast cancer: updated recommendations of the International Society of Geriatric Oncology (SIOG) and European Society of Breast Cancer Specialists (EUSOMA). Lancet Oncol. 2012;13(4):e148-e60.	✓		✓	✓	✓		
NHS Improvement. Ambulatory breast surgical care: day case and one night stay. London: NICE; 2012.						✓	
National Institute for Health and Care Excellence. NICE Diagnostic Guidance (DG8): Intraoperative tests (RD-100i OSNA system and Metasin test) for detecting sentinel lymph node metastases in breast cancer. London: NICE; 2013.	✓						
Scottish Intercollegiate Guidelines Network. SIGN 134. Treatment of primary breast cancer. A national clinical guideline. Edinburgh: Healthcare Improvement Scotland: SIGN, 2013.	✓			✓	✓		
Department of Health. The NHS Outcomes Framework 2015/16. London: Department of Health; 2014.							✓
Department of Health. Public Health Outcomes Framework. Improving outcomes and supporting transparency. Part 1A: A Public Health Outcomes Framework for England, 2013-2016. London: Department of Health; 2013.							✓
National Institute for Health and Care Excellence. NICE Quality Standard (QS12). Breast Cancer. London: NICE; 2016.	✓						
Scottish Cancer Taskforce NCQSG. Breast Cancer Clinical Quality Performance Indicators. National Cancer Quality Steering Group, 2016.						✓	

The outcome of this review was the development of an initial list of process and outcome indicators. This list was circulated to the audit's Clinical Steering Group and additional expert stakeholders for comment and assessment. In particular, the group and expert stakeholders were asked to assess the indicators against the criteria described in Table 5.2 as well as to provide general comments on the identified measures.

Table 5.2: Criteria for assessing indicators [Commonwealth fund, 2004]	
Criterion	**Description**
Acceptable	Agreement among stakeholders on the measure, data source(s) and analysis method.
Feasible	Accurate and consistent data are available. Low or acceptable burden of data acquisition, processing and analysis.
Clinically important	Clinically important due to burden of disease, or resource use. Reflects the priorities of policymakers and stakeholders.
Relevant	Measures a process or outcome that can be potentially improved and is meaningful and relevant to clinical practice.
Scientifically sound	Valid and reliable measure with clinical evidence.
Sensitive to change	Measures a process or outcome that can be directly influenced by changes to health care policy or practice.

Based on the feedback, the Audit selected an initial set of 13 core process and outcome indicators that describe the care pathway from initial diagnosis to the end of the primary therapy/treatment (surgical and non-surgical). These are listed overleaf.

Details of process and outcome indicators are published on the NABCOP website (https://www.nabcop.org.uk/resources/nabcop-core-indicators/), along with the corresponding dataset for the prospective audit (in Year 2) – using the current data flows to the national registration services in England (https://www.nabcop.org.uk/).

The dataset for Wales will be published on the NABCOP website in summer 2017.

Core Indicators			
Pathway	**Indictor**	**Type**	**Evidence from the literature**
Diagnosis and staging	1. Triple diagnostic assessment in a single visit	Process	Guideline-based (see Table 5.1)
Diagnosis and staging	2. Referral route to diagnosis	Process	Guideline-based (see Table 5.1)
Diagnosis and staging	3. Recorded hormone status	Process	Guideline-based (see Table 5.1)
Diagnosis and staging	4. Metastatic disease at initial presentation	Process	Older women are more likely to present with more advanced tumours and are less likely to have surgery for operable breast cancer [Bates]
Diagnosis and staging	5. Seen by a breast CNS/named key worker	Process	Guideline-based (see Table 5.1)
Treatment	6. Time to first treatment	Process	
Surgery	7. Surgery for DCIS or early stage invasive breast cancer	Process	• Women ⩾70 years are less likely have surgery for operable breast cancer compared to younger patients [Bates, Richards] • Older women with medical comorbidities are less likely to be offered surgery for operable breast cancer [Richards, Lavelle, Morgan]
Surgery	8. Mastectomy for early invasive breast cancer	Process	• Women ⩾80 years with early breast cancer are more likely to receive mastectomy or BCS than BCS and radiotherapy [Shonberg]
Diagnosis and staging	9. Any axillary nodal surgery	Process	• Axillary node sampling during BCS is less likely among women with at least two comorbidities (and older women more likely to have more comorbidities) [Janssen-Heijnen] • Women ⩾80 years with lymph node involvement have worse breast cancer-specific survival [Besic] • Older patients with a positive sentinel lymph node biopsy (SLNB) are less likely to undergo completion axillary node dissection [Biganzoli]
Chemotherapy	10. Chemotherapy for invasive breast cancer	Process	• Older women are less likely to receive local and systemic adjuvant therapies, especially in the presence of comorbidities [Biganzoli] • Older women, especially ⩾80 years, who are ER positive and lymph node negative with early breast cancer, are less likely to receive chemotherapy [Shonberg] • Women ⩾65 years with T1-T3 cancer reported fewer provider discussions about chemotherapy [Shelton]
Radiotherapy	11. Radiotherapy after breast cancer surgery	Process	• Older women are less likely to be treated with adjuvant radiotherapy after BCS [Lavelle, Shonberg, Truong] • Older women with invasive breast cancer who do not receive radiotherapy after BCS have worse 5 year survival (all-cause and breast cancer-specific) [Truong] • Older women with several comorbidities are less likely to be offered adjuvant radiotherapy [Janssen-Heijnen]
Acute care	12. Length of hospital stay after surgery	Process	Guideline-based (see Table 5.1)
Outcomes	13. Mortality at one, three and five years	Outcome	

6. Feasibility studies

Three small feasibility studies were included in the work specified for the Audit, two of which were to be undertaken in its first year. The aim of these studies was to examine the potential of expanding the sources of data that it could draw upon. The first study examined the value and feasibility of linking to data collected as part of the patient experience survey of cancer care. The second study examined the potential of the audit capturing patients who develop recurrent / metastatic disease.

6.1. The value of linking data from the National Cancer Patient Experience Survey with the patient-level prospective audit data

The Cancer Patient Experience Survey (CPES) has been running in England since 2010, with the most recent report published by NHS England / Quality Health for patients diagnosed in 2014. The 2014 survey achieved a response rate of 64% from an overall sample of 109,760 patients across the breadth of all cancers.

When NABCOP was commissioned, the Audit team was asked to examine how feasible it would be to use CPES data to explore issues related to the care of older patients with breast cancer. This work had two principal objectives: (1) to establish if CPES data could be used alongside the patient-level information collected by the national cancer registration services, and (2) to determine how the CPES questions might provide greater insight into different elements of care addressed by the Audit.

Around the time that NABCOP was commissioned, the National Cancer Intelligence Network (NCIN) began work to assess which patients responding to the 2010 CPES survey could be matched with patients in the linked Cancer Registration-HES dataset that was used in their "Routes to diagnosis" project. This project made considerable progress in a short period of time, and demonstrated that the linkage of CPES data to Cancer Registration and HES data was indeed feasible. Further development of this work by Public Health England has resulted in the following CPES datasets being made available for analysis:

Wave 1 – 2010: Patients discharged between 01/01/2010 – 31/03/2010 (data available)

Wave 2 – 2011/12: Patients discharged between 01/09/2011 – 30/11/2011 (data available)

Wave 3 – 2013: Patients discharged between 01/09/2012 – 30/09/2012 (data available)

Wave 4 – 2014: Patients discharged between 01/09/2013 – 30/11/2013 (data available)

Wave 5 – 2015: Patients discharged between 01/04/2015 – 30/06/2015 (data available later in 2017)

Regarding the second objective, the NABCOP team examined which questions from the 2014 CPES questionnaire were relevant to understanding the breast cancer care of older patients. Although there is a 93% overall level of satisfaction among breast cancer patients, CPES highlights various areas of concern, with lower satisfaction scores reported for:

- Access to information on side-effects of treatment (79%)
- Involvement in decisions about care (74%)
- Ease of contacting the clinical nurse specialist (71%)
- Providing information for families to help care for patients at home (61%).

These four areas of concern (and others) are particularly pertinent to the delivery of care to older patients. Their greater burden of comorbidity means that a greater proportion of patients may be susceptible to side-effects, and higher levels of frailty mean that more families require information on caring for patients at home. There is also evidence of older patients being less involved in decisions about their care and of them finding it harder to contact nurse specialists.

In view of this, there is value in NABCOP taking forward the work to use relevant data items from the 2014 CPES to provide NHS breast cancer units with information on:

- Whether delayed diagnosis is more common in older women
- Access to information on side-effects of treatment
- Involvement in decisions about care
- Ease of contacting the clinical nurse specialist
- Providing information for families to help care for patients at home.

6.2. Extending the audit to cover patients with recurrent disease

The focus of this feasibility study was to determine whether it was possible to identify patients who develop recurrent disease at some point in time after the completion of their treatment for the primary breast cancer. To date, data held by national cancer registration services has not recorded this well.

A number of groups have examined this issue, and have made progress. The West Midlands Cancer Intelligence Unit (WMCIU) started the process a few years ago, and developed an algorithm using linked Registry-HES data for

the West Midlands region which was reported to correctly identify the type and date of disease progression (if there had been any). This work has been extended recently and is being adapted for use nationally. The results are expected to be published in March 2018. The refined algorithm is expected to enable the identification of all recurrent invasive breast tumours in women, resident in England, and who had an initial diagnosis after 1997.

The algorithm uses data from the English Cancer Registration system, Hospital Episode Statistics, Cancer Waiting Times (CWT) and Radiotherapy Dataset (RTDS). There are future plans to also incorporate data from the Systemic Anti-Cancer Therapy (SACT) and the Diagnostic Imaging Dataset (DID) datasets, as well as possibly primary care prescription data.

The progress made by these groups means that, within a short period, there should be an externally validated approach to identifying patients with recurrent disease that NABCOP could adopt. The initial algorithm is designed to use data from English health care databases. It is currently unclear to what degree it might also be applicable to data collected in Wales, but as the datasets in the two countries share many similarities, it seems likely that the algorithm could be applied to data of patients diagnosed and treated in Wales.

References

Association of Breast Surgery. Surgical Guidelines for the Management of Breast Cancer. European Journal of Surgical Oncology (EJSO) 2009; 35 (Suppl 1):1-22.

Bang D, Piccirillo JF, et al. The Adult Comorbidity Evaluation-27 (ACE-27) test: a new comorbidity index for patients with cancer. Annual meeting of the American Society of Clinical Oncology. May 20, 2000.

Bates T, Evans T, Lagord C, Monypenny I, Kearins O, Lawrence G. A population based study of variations in operation rates for breast cancer, of comorbidity and prognosis at diagnosis: Failure to operate for early breast cancer in older women. European Journal of Surgical Oncology (EJSO). 2014; 40(10):1230-6.

Besic N, Besic H, Peric B, Pilko G, Petric R, Zmuc J, Dzodic R, Perhavec A. Surgical treatment of breast cancer in patients aged 80 years or older--how much is enough? BMC Cancer. 2014; 14: 700.

Biganzoli L, Aapro M. Elderly breast cancer patients: adjuvant chemotherapy and adjuvant endocrine therapy. Gynakol Geburtshilfliche Rundsch. 2005; 45(3):137-42.

Biganzoli L, Wildiers H, Oakman C, Marotti L, Loibl S, et al. Management of elderly patients with breast cancer: updated recommendations of the International Society of Geriatric Oncology (SIOG) and European Society of Breast Cancer Specialists (EUSOMA). Lancet Oncology. 2012; 13(4): e148-60.

Cancer Research UK. Statistics http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/breast-cancer#heading-Zero

Cappellani A, Vita MD, Zanghì A, Cavallaro A, Piccolo G, Majorana M, et al. Prognostic factors in elderly patients with breast cancer. BMC Surgery. 2013; 13(Suppl 2):S2-S.

Clegg A, Young J, Iliffe S, Rikkert MO, Rockwood K. Frailty in elderly people. Lancet. 2013; 381: 752-62.

The Commonwealth Fund. First report and recommendations of the Commonwealth Fund's International Working Group on quality indicators: A report to Health Ministers of Australia, Canada, New Zealand, the United Kingdom and the United States. The Commonwealth Fund; 2004.

De Angelis R, Sant M, Coleman MP, Francisci S, Baili P, et al. Cancer Survival in Europe 1999-2007 by Country and age: Results of EUROCARE-5 - a population-based study. Lancet Oncology 2014; 15: 23-34.

Department of Health. The NHS Cancer plan: a plan for investment, a plan for reform. London: Department of Health, 2000.

Handforth C, Clegg A, Young C, Simpkins S, Seymour MT, Selby PJ, et al. The prevalence and outcomes of frailty in older cancer patients: a systematic review. Annals of Oncology. 2015; 26(6):1091-101.

Janssen-Heijnen ML, Houterman S, Lemmens VE, Louwman MW, Maas HA, Coebergh JW. Prognostic impact of increasing age and co-morbidity in cancer patients: a population-based approach. Crit Rev Oncol Hematol. 2005; 55(3):231-40.

Kesson EM, Allardice GM, George WD, Burns HJG, Morrison DS. Effects of multidisciplinary team working on breast cancer survival: retrospective, comparative, interventional cohort study of 13,722 women. BMJ. 2012; 344.

Kim T, Giuliano AE, Lyman GH. Lymphatic mapping and sentinel lymph node biopsy in early-stage breast carcinoma. Cancer. 2006; 106(1):4-16.

Lavelle K, Sowerbutts AM, Bundred N, Pilling M, Degner L, Stockton C, et al. Is lack of surgery for older breast cancer patients in the UK explained by patient choice or poor health? A prospective cohort study. British Journal of Cancer. 2014; 110(3):573-83.

Mansel RE, Fallowfield L, Kissin M, Goyal A, Newcombe RG, Dixon JM, et al. Randomized Multicenter Trial of Sentinel Node Biopsy Versus Standard Axillary Treatment in Operable Breast Cancer: The ALMANAC Trial. JNCI: Journal of the National Cancer Institute. 2006; 98(9):599-609.

Marengoni A, Rizzuto D, Wang H-X, Winblad B, Fratiglioni L. Patterns of Chronic Multimorbidity in the Elderly Population. Journal of the American Geriatrics Society. 2009; 57(2):225-30.

Marengoni A, Von Strauss E, Rizzuto D, Winblad B, Fratiglioni L. The impact of chronic multimorbidity and disability on functional decline and survival in elderly persons. A community-based, longitudinal study. Journal of Internal Medicine. 2009; 265(2):288-95.

Mitnitski AB, Graham JE, Mogilner AJ, Rockwood K. Frailty, fitness and late-life mortality in relation to chronological and biological age. BMC Geriatrics. 2002; 2:1-8.

Morgan J, Wyld L, Collins KA, Reed MW. Surgery versus primary endocrine therapy for operable primary breast cancer in elderly women (70 years plus). Cochrane Database of Systematic Reviews 2014, Issue 5. Art. No.: CD004272. DOI: 10.1002/14651858.CD004272.pub3

Morgan JL, Collins K, Robinson TG, Cheung KL, Audisio R, Reed MW, et al. Healthcare professionals' preferences for surgery or primary endocrine therapy to treat older women with operable breast cancer. European Journal of Surgical Oncology. 2015; 41(9):1234-42.

Morgan JL, Richards P, Zaman O, Ward S, Collins K, Robinson T, et al. The decision-making process for senior cancer patients: treatment allocation of older women with operable breast cancer in the UK. Cancer Biology & Medicine. 2015; 12(4):308-15.

Morgan J, Richards P, Ward S, Francis M, Lawrence G, Collins K, et al. Case-mix analysis and variation in rates of non-surgical treatment of older women with operable breast cancer. British Journal of Surgery. 2015; 102(9):1056-63.

Morgan JL, Walters SJ, Collins K, Robinson TG, Cheung KL, Audisio R, Reed MW, Wyld L. What influences healthcare professionals' treatment preferences for older women with operable breast cancer? An application of the discrete choice experiment. EJSO 2017; in press.

National Institute for Health and Care Excellence. Technology appraisal guidance (TA107): Trastuzumab for the adjuvant treatment of early stage HER2-positive breast cancer. NICE, 2006.

National Institute for Health and Clinical Excellence (NICE). Clinical Guideline (CG80): Guideline on early and locally advanced breast cancer. London: NICE, 2009

National Institute for Health and Care Excellence. Clinical Guideline (CG81): Advanced breast cancer: diagnosis and treatment NICE, 2009.

National Institute for Health and Care Excellence. NICE Diagnostic Guidance (DG8): Intraoperative tests (RD-100i OSNA system and Metasin test) for detecting sentinel lymph node metastases in breast cancer. NICE, 2013 August 2013.

National Institute for Health and Clinical Excellence (NICE). Breast cancer, Quality standard [QS12]. First published: September 2011; Last updated: June 2016. https://www.nice.org.uk/guidance/qs12

National Institute for Health and Care Excellence. NICE guideline (NG56). Multimorbidity: clinical assessment and management 2016.

NHS Digital. Hospital Episode Statistics. Leeds: NHS Digital, 2016. http://content.digital.nhs.uk/hes

NHS Wales Informatics Service. Cardiff: NHS Wales, 2017. http://www.infoandstats.wales.nhs.uk/page.cfm?orgid=869&pid=40977

Office for National Statistics. Cancer Registration Statistics, England, 2013 (Series MB1), No. 44. London: ONS, 2015.

Puts MT, Santos B, Hardt J, Monette J, Girre V, Atenafu EG, et al. An update on a systematic review of the use of geriatric assessment for older adults in oncology. Ann Oncol. 2014;25(2):307-15.

Richards P, Ward S, Morgan J, Lagord C, Reed M, Collins K, et al. The use of surgery in the treatment of ER+ early stage breast cancer in England: Variation by time, age and patient characteristics. European Journal of Surgical Oncology. 2016; 42(4):489-96.

Schonberg MA, Marcantonio ER, Li D, Silliman RA, Ngo L, McCarthy EP. Breast cancer among the oldest old: tumor characteristics, treatment choices, and survival. J Clin Oncol. 2010; 28(12):2038-45.

Scottish Intercollegiate Guidelines Network. SIGN 134. Treatment of primary breast cancer. A national clinical guideline. Edinburgh: Healthcare Improvement Scotland; 2013.

Selby P, Gillis C, Haward R. Benefits from specialised cancer care. Lancet 1996; 348(9023): 313-8

Shamliyan T, Talley KMC, Ramakrishnan R, Kane RL. Association of frailty with survival: A systematic literature review. Ageing Research Reviews. 2013; 12(2):719-36.

Shelton RC, Clarke Hillyer G, Hershman DL, Leoce N, Bovbjerg DH, Mandelblatt JS, et al. Interpersonal influences and attitudes about adjuvant therapy treatment decisions among non-metastatic breast cancer patients: an examination of differences by age and race/ethnicity in the BQUAL study. Breast Cancer Res Treat. 2013; 137(3):817-28.

St Sauver JL, Boyd CM, Grossardt BR, Bobo WV, Finney Rutten LJ, Roger VL, et al. Risk of developing multimorbidity across all ages in an historical cohort study: differences by sex and ethnicity. BMJ Open. 2015; 5(2).

Truong PT, Bernstein V, Lesperance M, Speers CH, Olivotto IA. Radiotherapy omission after breast-conserving surgery is associated with reduced breast cancer–specific survival in elderly women with breast cancer. Am J Surg. 2006; 191(6): 749-55

West Midlands Cancer Intelligence Unit. The second all breast cancer report. Focusing on Inequalities: Variation in breast cancer outcomes with age and deprivation. West Midlands Cancer Intelligence Unit, 2011.

Wedding U, Pientka L, Hoffken K. Quality-of-life in elderly patients with cancer: a short review. Eur J Cancer. 2007;43(15):2203-10.

Welsh Cancer Intelligence & Surveillance Unit (WCISU) 2011 http://www.wcisu.wales.nhs.uk/home

Xue QL. The Frailty Syndrome: Definition and Natural History. Clin Geriatr Med 2011; 27(1): 1-15.

Appendix 1. Project Board and Clinical Steering Group members

Project Board members (excluding project team)		
Name	**Organisation**	**Role**
Mr Nick Markham	Royal College of Surgeons of England	Project Board Chair, Invited Review Mechanism Chair
Miss Fiona MacNeill	Association of Breast Surgery	President
Ms Maggie Wilcox	Independent Cancer Patients' Voice	Patient Representative
Ms Mairead MacKenzie	Independent Cancer Patients' Voice	Patient Representative
Ms Karen Clements	Public Health England - National Cancer Registration and Analysis Service	NABCOP Project Manager
Prof. Peter Barrett-Lee	Velindre Cancer Centre, Cardiff	Clinical Oncologist and Medical Director
Mr Mirek Skrypak	Healthcare Quality Improvement Partnership	Associate Director for Quality and Development
Ms Sarah Walker	Healthcare Quality Improvement Partnership	Project Manager

Clinical Steering Group members (excluding project team)		
Name	**Organisation**	**Role**
Miss Marianne Dillon	Abertawe Bro Morgannwg University health board Breast Cancer for Wales	Breast Surgeon Audit lead
Dr Stanley Ralph	Age Anaesthesia Association Royal Derby Hospitals NHS Trust	Honorary Secretary Anaesthetist
Mr Ashu Gandhi	Association of Breast Surgery University Hospital of South Manchester NHS Foundation Trust NHS Breast Screening Program	Chair of Professional Standards, ABS Oncoplastic Breast and Endocrine Surgeon Surgical Chair
Dr Emma Pennery	Breast Cancer Care	Clinical Director
Ms Eluned Hughes	Breast Cancer Now	Head of Public Health and Information
Prof. Margot Gosney	British Geriatrics Society University of Reading Royal Berkshire NHS Foundation Trust	Deputy Chair of the Academic & Research Committee Director of Clinical Health Sciences Honorary Consultant in Elderly Care Medicine
Ms Maggie Wilcox	Independent Cancer Patients' Voice	Patient Representative
Ms Mairead MacKenzie	Independent Cancer Patients' Voice	Patient Representative
Dr Nisha Sharma	Leeds Teaching Hospitals NHS Trust British Society of Breast Radiology	Director of Breast Screening (Leeds-Wakefield & Clinical Lead for Breast Imaging Secretary
Prof. Ian Kunkler	University of Edinburgh NHS Lothian	Professor of Clinical Oncology Clinical Oncologist
Mr Andrew Murphy	Public Health England - National Cancer Registration and Analysis Service	Head of Cancer Datasets

Name	Organisation	Role
Prof. Mick Peake (interim)	Public Health England - National Cancer Registration and Analysis Service, University of Leicester	Clinical Lead for Early Diagnosis Honorary Consultant and Professor of Respiratory Medicine
Ms Lis Grimsey	Association of Breast Surgery	Macmillan Nurse Consultant
Prof. Chris Holcombe	Royal Liverpool and Broadgreen University Hospitals NHS Trust National Breast Clinical Reference Group	Oncoplastic Breast Surgeon Deputy Chair
Dr Alistair Ring	Royal Marsden NHS Foundation Trust	Medical Oncologist
Prof. Tom Robinson	University of Leicester University Hospitals of Leicester NHS Trust	Head of Department and Professor of Stroke Medicine Honorary Consultant Physician
Miss Lynda Wyld	University of Sheffield Jasmine Breast Centre, Doncaster Bridging the Age Gap Study	Reader in Surgical Oncology Honorary Consultant Breast Surgeon Principal Investigator
Dr Deborah Fenlon	University of Southampton National Cancer Research Institute	Associate Professor in Cancer Care Chair of the National Cancer Research Institute's Symptom Management Group for Breast Cancer

Project Team	
Name	**Role / Job Title**
Professor Kieran Horgan	Consultant breast surgeon, Chair Breast SSCRG (NCRAS)
Professor David Dodwell	Consultant clinical oncologist, Chair SACT
Professor David Cromwell	Clinical Effectiveness Unit (CEU) Director
Ms Jibby Medina	Project Manager, CEU
Dr Yasmin Jauhari	Clinical Research Fellow, CEU

Appendix 2. Geographical regions

E54000001	Northumberland, Tyne and Wear
E54000002	West, North and East Cumbria
E54000003	Durham, Darlington, Tees, Hambleton, Richmondshire and Whitby
E54000004	Lancashire and South Cumbria
E54000005	West Yorkshire
E54000006	Coast, Humber and Vale
E54000007	Greater Manchester
E54000008	Cheshire and Merseyside
E54000009	South Yorkshire and Bassetlaw
E54000010	Staffordshire
E54000011	Shropshire and Telford and Wrekin
E54000012	Derbyshire
E54000013	Lincolnshire
E54000014	Nottinghamshire
E54000015	Leicester, Leicestershire and Rutland
E54000016	The Black Country
E54000017	Birmingham and Solihull
E54000018	Coventry and Warwickshire
E54000019	Herefordshire and Worcestershire
E54000020	Northamptonshire
E54000021	Cambridgeshire and Peterborough
E54000022	Norfolk and Waveney
E54000023	Suffolk and North East Essex
E54000024	Milton Keynes, Bedfordshire and Luton
E54000025	Hertfordshire and West Essex
E54000026	Mid and South Essex
E54000027	North West London
E54000028	North Central London
E54000029	North East London
E54000030	South East London
E54000031	South West London
E54000032	Kent and Medway
E54000033	Sussex and East Surrey
E54000034	Frimley Health
E54000035	Surrey Heartlands
E54000036	Cornwall and the Isles of Scilly
E54000037	Devon
E54000038	Somerset
E54000039	Bristol, North Somerset and South Gloucestershire
E54000040	Bath, Swindon and Wiltshire
E54000041	Dorset
E54000042	Hampshire and the Isle of Wight
E54000043	Gloucestershire
E54000044	Buckinghamshire, Oxfordshire and Berkshire West

Appendix 3. Respondents of the organisational audit

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ≥70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ≥70 years?	Q27. Are patients aged ≥70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
NORTH																										
Northumberland, Tyne and Wear (E54000001)	Newcastle Upon Tyne NHS FT	700	1,2,3,4,5	X		3/0	4/0	6/0	8	X	1	1	1	2	PS	X	X	X	D	h	√	X	√		√	
	Gateshead Health NHS FT	595	1,2,4	X		2/0	5/0	6/0	15	X	1	1	1	3	POA	X	X	X	E		√	√	√		√	
	Northumbria Healthcare NHS FT	200	1,2,3,4	X		0/2	4/0	8/0	5	X	1	2	1	2	CA	CA	CA	X	E		√	√			√	
West, North and East Cumbria (E54000002)	North Cumbria University Hospitals NHS Trust	300	1,2,3,4,5	√		0/1	3/0	5/0	7	X	1	1	1	2	CA	X	X	X	E		√	√			√	
Durham, Darlington, Teeside, Hambleton, Richmondshire and Whitby (E54000003)	Durham and Darlington NHS FT	400	1,2,3,4,5	X		5/0	5/0	5/0	4	X	1	1	1	2	CA	CA	X		E	e	√	√			√	
	North Tees and Hartlepool NHS FT	500	1,2,4	X		0/2	8/0	5/0	10	X	1	1	1	1	MHNA, POA	MHNA	MHNA	X	D	h	√	X	X		√	
	South Tees Hospital NHS FT[1]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

[1] Breast Cancer MDTs have been held at North Tees only since late 2015 (for both North and South Tees) as North Tees is the screening unit for both sites. The re-arrangement of these services became formalised on the 1 October 2016.

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Lancashire and South Cumbria (E54000004)	Blackpool Teaching Hospitals NHS FT	350	1,2,3,4	√	M	3/3	4/0	4/0	3	X	1	1	2	3	CA	CA	CA	X	E		√	√	√		√	
	East Lancashire Hospitals Trust	450	1,2,4	√	M	0.5/ 1.5	4/0	5.6/0	10	X	1	1	1	2	CA	X	PS	X	D	h	√	√	√		√	
	University Hospitals of Morecambe Bay NHS FT	400	1,2,4	X		3/2	3/3	5/0	7	X	1	1	1	2	CA, POA	X	X	X	E		√	X			√	
	Lancashire Teaching Hospitals NHS FT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
West Yorkshire and Harrogate (E54000005)	Airedale NHS FT	200	1,2,4	√	M	3/0	1.6/0	2.4/0	3	X	1	1	1	2	X	X	PS	X	E		√	√	√		√	
	Bradford Teaching hospitals NHS FT	300	1,2,3,4	X		2/0.5	3/0	4/0	4	X	1	1	1	3	CA	X	PS	X	E		√	X	√		√	
	Harrogate and District NHS FT	200	1,2,4	√		2/1	3/0	4/0	6	X	1	1	1	2	CA	CA	CA	X	C, D	h	√	√	√		√	
	Calderdale and Huddersfield NHS Trust	400	1,2,4	√	W	2/0	2/0	4/0	6	X	2	1	1	1	CA, PS	CA, PS	CA, PS	X	E		√	√	√		√	
	Leeds Teaching Hospitals NHS Trust	600	1,2,4,5	√	M	6/0	6/0	6/0	17	X	1	1	1	2	X	X	X	X	C, D, E	h	√	√	X	≈ 80	√	
	Mid Yorkshire Hospitals NHS Trust	500	1,2,3,4,5	X		3/0	7/0	6/0	4	X	1	1	1	2	CA	CA	CA	X	D	h	√	X	√		√	
Humber, Coast and Vale (E54000006)	Hull and East Yorkshire NHS Trust	500	1,2,3,4,5	√	M	7/0	7/0	7/0	12	X	1	1	2	2	CA	X	X	X	E		√	X	√		√	
	Northern Lincolnshire and Goole NHS FT	300	1,2,4	√		2/1	4/0	7/0	6	X	1	1	1	2	X	X	X	X	E		√	X			√	
	York Teaching Hospital NHS FT	534	1,2,4	√		2/1	5/0	8/0	7	X	1	1	1	2	POA	X	Q	X	E		√	X			√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Greater Manchester (E54000007)	Pennine Acute Hospital NHS Trust	300	1,2,4,5	√	F	2/2	6/0	7/0	9	X	1	1	1	1	CA	CA	CA	X	C, D	f, g, h	√	√			√	
	Tameside Hospital NHS FT	135	1,2,4	√	W	1/0	2/0	3/0	4	X	1	1	1	2	CA	CA	PS	X	C	c, f, g, h	√	X			√	
	University Hospitals of South Manchester NHS FT	750	1,2,3	X		0/3	8/0	8/0	20	X	1	1	1	1	CA	X	X	X	E		√	√			√	
	Bolton Hospital NHS FT	400	1,2,4,5	√	W	0/0.5	4/0	5.7/0	9	X	1	1	1	3	CA	CA	CA	X	E		√	√	√		√	
	Wrightington Wigan and Leigh NHS FT	400	1,2,4	√	M	2/1	4/0	3/0	6	X	1	1	1	1	CA	CA	CA	X	D	h	√	√			√	
	Salford Royal NHS FT[2]	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
	Stockport NHS FT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
	The Christie NHS FT	◊	◊	◊	◊	◊	◊	◊	◊	◊		◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

[2] Salford Royal NHS FT breast cancer service merged with University Hospitals of South Manchester in April 2017.

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Cheshire and Merseyside (E54000008)	Aintree University Hospital NHS FT	250	1,2,4,5	√	D	0/3	3/0	4/0	8	X	1	1	1	2	√	√	√	X	D	h	√	√	√		√	
	Countess Of Chester NHS FT	300	1,2	√	M	0/2	2.6/0	3.6/0	17	X	1	1	1	1	PS	MMSE	PS	X	C, D	h	√	√	X		√	
	East Cheshire NHS Trust	287	1,2,4	X		0/ 0.59	2/0	3.2/0	4	X	1	1	1	2	POA	POA	POA	X	D	h	√	√	√		√	
	Mid Cheshire Hospitals NHS FT	300	1,2,4	√		0/1	3.6/0	2.7/0	4	X	1	1	1	2	ACE-27	X	√	X	E		√	X	√		√	
	St Helens and Knowsley Teaching Hospital NHS Trust	300	1,2,3,4,5	√	W	2/2	5/0	4/1	8	X	1	1	1	1	CCI	MMSE	PS	X	E		√	X			√	
	The Royal Liverpool University Hospital NHS Trust	400	1,2,4	√	M	4/0	6/0	4/0	10	√	1	1	1	1	√	X	Yes	X	E		√	√			√	
	Warrington and Halton Hospitals NHS FT	300	1,2	X		0/3	3/0	2.25/0	4	X	1	1	1	2	CA	CA	CA	X	E		√	√			X	
	Wirral University Teaching Hospital NHS FT	450	1,2	√	M	0/3	4/0	6/0	8	X	1	1	1	1	ASA, PS	X	X	X	C, D	c, h	√	√			√	
	The Clatterbridge Cancer Centre NHS FT	◊ (1500)	◊ (4,5)	◊ (√)	◊ (M)	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ≥70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ≥70 years?	Q27. Are patients aged ≥70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
South Yorkshire and Bassetlaw (E54000009)	Barnsley Hospital NHS FT	200	1,2,4	√	M	1/0	3/0	3/0	3	X	1	1	2	2	CA	X	PS	X	D	h	√	√	√		√	
	Doncaster and Bassetlaw Hospitals NHS FT	493	1,2,4	√	M	0/3	4.5/0	4.5/0	8	X	1	1	1	1	CA	CA	PS	X	E		√	X	√		√	
	The Rotherham NHS FT	220	1,2,4,	X		0.5/ parent trust	2/0	3/0	4	X	1	1	1	1	CA	CA	CA	X	E		√	X			√	
	Sheffield Teaching Hospitals NHS Trust	500	1,2,3,4,5	√	M	3.5/0	4/0	5/0	10	√	1	1	1	1	PS	PS	PS	X	D	h	X	√			√	
MIDLANDS AND EAST																										
Staffordshire and Stoke on Trent (E54000010)	University Hospitals of North Midlands NHS Trust	600	1,2,3,4,5	X		5/0	5/0	8/0	8	√	1	1	1	1	CA	X	CA	X	E		√	√			√	
	Burton Hospitals NHS FT	300	1,2,4	√	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
Shropshire and Telford & Wrekin (E54000011)	Shrewsbury and Telford Hospitals NHS Trust	600	1,2,4,5	√	W	2.5/0	4/0	6/0	9	X	1	1	1	1	CA	CA	CA	X	D	c, d	√	√			√	
Derbyshire (E54000012)	Chesterfield Royal Hospital NHS FT	300	1,2,4	√	W	1/1	3/0	2.7/0	6	X	1	1	1	1	ACE-27	CA	PS	X	D	h	√	X	√		√	
	Derby Teaching Hospitals NHS FT	500	1,2,4,5	√	M	3/0	5/0	5/0	9	X	1	1	1	2	CA	X	X	X	E		√	√	√		√	
Lincolnshire (E54000013)	United Lincolnshire Hospitals NHS Trust (Boston)	700	1,2,4,5	X		5/0	7/0	6/0	11	X	1	1	1	2	CA	CA	CA, PS	X	D	h	√	√	√		√	
	United Lincolnshire NHS Trust (Lincoln)	600	1,2,4,5	X		4/0	7/0	5/0	11	X	1	1	1	2	CA	CA	PS	X	D	h	√	√	√		√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Nottinghamshire (E54000014)	Nottingham University hospitals NHS Trust	700	1,2,3,4,5	√	M	5/0	5.5/0	11.6/0	12	X	1	1	1	3	X	X	X	X	D	h	√	√			√	
	Sherwood Forest Hospitals NHS FT	300	1,2,4	√	M	2/0	2/0	2.5/0	4	X	1	1	1	1	CA	CA	CA	X	B, D	h	√	√			√	
Leicester, Leicestershire and Rutland (E54000015)	University Hospitals of Leicester NHS Trust (Glenfield Hospital)	840	1,2,3	X		6/0	8/0	12/0	16	X	1	1	1	1	CCI	MMSE	Barthel index	√	B, C	c, d, f, g	√	X			√	One stop elderly care cancer clinic
The Black Country (E54000016)	The Royal Wolverhampton NHS Trust	400	1,2,4,5	√	O	3/0	5/0	5/0	5	X	1	1	1	2	CA	CA	CA	X	C	h	√	√			√	
	Sandwell and West Birmingham Hospitals NHS Trust	500	1,2,3,4,	X		2/1	5/0	5/0	8	X	1	1	1	2	CA	CA	PS	X	E		√	√			√	
	Walsall Healthcare NHS Trust	300	1,2,4	X		0/2	3/0	3/0	6	X	1	1	1	2	PS	X	PS	X	D	h	√	√			√	
	Dudley Group NHS FT	400	1,2,3,4	√	M	2/2	2.5/0	4/0	5	X	2	2	2	2	X	X	X	X	E		√	√	√		√	
Birmingham and Solihull (E54000017)	University Hospitals Birmingham NHS FT	350	1,2,3,4,5	√	M	3/0	3/0	4/0	5	X	1	1	1	2	X	X	ASA	X	D	h	√	√			√	
	Heart of England NHS FT	500	1,2,3,4	√	M	1/3	4/0	9.24/0	8	√	1	1	1	2	√	X	X	X	E	h	√	X	√	*	√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Coventry and Warwickshire (E54000018)	George Eliot Hospital NHS Trust	150	1,4	X		2/2	2.7/0	2/0	3	X	1	1	1	1	CA	X	X	X	E		√	X	√		√	
	University Hospitals Coventry and Warwickshire NHS Trust	500	1,2,3,4,5	X					24	√	1	1	1	1	CA	MHNA	CA, MHNA	√	D	f, h	X	√			X	
	South Warwickshire NHS FT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
Herefordshire and Worcestershire (E54000019)	Worcestershire Acute Hospitals NHS Trust	650	1,2,4,5	√		5/0	5/0	8/0	7	X	1	1	1	1	CA	X	X	X	D	h	√	√			√	
	Wye Valley NHS Trust	200	1,2,3,4,5	√	M	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		√	
Northamptonshire (E54000020)	Kettering General Hospital	300	1,2,4	√	M	1/1	3/0	4/0	6	X	1	1	1	2	√	CA	CA	√	C	f, h	√	√	√		√	
	Northampton General Hospital NHS Trust	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
Cambridgeshire and Peterborough (E54000021)	Cambridge University Hospital NHS FT	500	1,2,3,4,5	√	M	7/0	3/0	5/0	7	√		*	*	*	*	*	*	*	*	*	*	*	*	*	X	
	Hinchingbrooke Health Care NHS Trust	120	1,2,3,4,	√	M	1/1	2/0	2/0	2	√	1	1	1	2	CA	CA	CA	√	D	h	√	√	√		√	
	Peterborough and Stamford NHS FT	400	1,2,4,5	X		4/0	4.5/0	2/0	8	X	1	1	1	2	X	X	X	X	E		√	X			√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Norfolk and Waveney (E54000022)	James Paget University Hospital NHS FT	220	1,2,4	X		0/1	3/0	3/0	4	X	1	1	1	2	CA	X	PS	X	E		X	√	√		√	
	Norfolk and Norwich University Hospitals NHS FT	700	1,2,3,4,5	√	W	4/0	4/0	6.5/0	8	X	1	1	1	2	X	X	X	X	E		X	X	√		√	
	Queen Elizabeth Hospital King's Lynn NHS FT	250	1,2,4	√	M	2/0	2/0	4/0	6	X	1	1	1	2	CA	CA	Q	X	C,D	c,e,f,g	√	√	√		√	
Suffolk and North East Essex (E54000023)	Colchester Hospital NHS FT	500	1,2,4,5	√	D	2/0	4/0	5.3/0	5	X	1	1	2	2				X	D	h	√	√	√		√	
	Ipswich Hospital NHS Trust	350	1,2,4,5	X		2/0	3/0	3.5/0	5	X	1	1	1	3	ACE-27	X	PS	X	D	h	√	√	√		√	
	West Suffolk NHS FT	310	1,2,4	√	M	2/2	2/0	5/0	5	X	1	1	2	2	CA	CA	CA	X	D	h	√	√			√	
Milton Keynes, Bedforshire and Luton (E54000024)	Bedford Hospital NHS Trust	200	1,2,4	√	W	3 /0	3/0	3/0	3	X	1	1	1	1	CA	X	PS	X	E		√	X	√		√	
	Luton and Dunstable University Hospital NHS Trust	300	1,2,4	X		0/1	3/0	4/0	4	X	1	1	1	2	Q	X	Q	X	D	h	√	√	√		√	
	Milton Keynes University Hospital NHS FT	300	1,2,4	√	W	4/1	5/0	4/0	6	X	1	1	1	2	X	X	X	X	D	h	√	√	√		√	
	Princess Alexandra Hospital NHS Trust	300	1,2,4	√	M	2/0	2/0	3/0	4	√	1	1	2	2	X	X	EF	√	D	h	√	√			√	EF as a screening tool for referral to high risk anaesthetic clinic

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Hertfordshire and West Essex (E54000025)	East & North Hertfordshire NHS Trust	400	1,2,3,4	X		2/0	3/0	5.5/0	5	X	1	1	1	2	X	X	X	X	D	h	√	√	√		√	
	West Herts Hospitals NHS Trust	400	1,2	√	M	0/2	5/0	6.3/0.5	9	X	1	1	1	2	Q, CA, POA	CA	MHNA	X	E		√	X			√	
Mid and South Essex (E54000026)	Basildon and Thurrock University Hospitals NHS FT	250	1,2	√	W	2.5/0	4/0	4/0	2	√	1	1	1	1	ASA	X	X	X	E		√	√	√		X	
	Mid Essex Hospitals Trust	426	1,2,3,4	X		1.5/0	2.5/0	5/0	7	X	1	1	1	2	Q	X	X	X	E		√	X	X		√	
	Southend University Hospital NHS Trust	500	1,2,4,5	√	W	2.5/0	3.7/0	4.2/0	5	X	1	1	2	2	ASA	X	PS	X	E		√	√			√	severe dementia or age >90 years are not assessed for HER2
LONDON																										
North West London (Ealing) (E54000027)	The Hillingdon Hospitals NHS FT	160	1,2,4,5	√		10/0	0/0	3/0	9	X	1	1	1	1	CA	X	PS	X	A	h	√	√			√	
	London North West Healthcare	400	1,2,4	√		2/0	5/0	5/0	7	X	1	1	2	3	CA	X	PS	X	E		√	√	√		√	
	Imperial Healthcare NHS trust	300	1,2,3,4,5	X		3/0	3.5/ 0.1	7/0	7	X	1	2	1	3	CA	X	X	X	E		√	√	√		√	
	Royal Marsden Hospital NHS FT	900	1,2,3,4,5	√	W	10/0	5/0	10/0	10	√	1	1	1	2	CA	X	X	X	D	h	√	X			√	
	Chelsea and Westminster NHS Foundation Trust	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
North Central London (E54000028)	Whittington Health NHS Trust	100	1,4	√		0.7/0.1	1.3/0	1.5/0	2	X	1	1	1	2	CA	X	PS	X	C, D	g	√	√			√	
	University College London Hospitals NHS FT	200	1,2,4,5	X		2/0	3.4/0	4.6/0	5	X	1	1	1	2												
	Royal Free London NHS FT (Royal Free)	600	1,2,3,4,5	√	M	5/0	7/0	7/0	14	√	1	1	1	1	X	X	X	X	D, E	h	√	√			√	
	Royal Free London NHS Foundation Trust (Chase Farm)	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊		◊	
	Royal Free London NHS Foundation Trust (Barnet Hospital)	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊		◊	
	North Middlesex University Hospital NHS Trust	200	1,2,4,5	√		2/1	3/0	3/0	3	X	1	1	1	2	CA, MHNA	X	X	X	D	h	√	X			√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
North East London (E54000029)	Barking Havering and Redbridge University Hospitals NHS Trust	600	1,2,4,5	√	W	4/0	9/0	6/0	7	X	1	1	1	1	CA	CA	CA	√	C	h	√	√	√		√	
	Barts Health NHS Trust (St Bartholomew's Hospital)	700	1,2,3,4,5	√	A	3/0	3/0	4/0	12	X	1	2	2	2	√	√	X	X	D	h	√	√	√		√	
	Barts Health NHS Trust (Newham University Hospital)	400	1,2,4,5	√	M	5/0	8/0	4/0	13	X	1	1	1	3	CA	CA	CA	X	C	c, h	√	√	√		X	
	Barts Health NHS Trust (Whips Cross Hospital)	238	1,2,3,4,5	√	M	1/2	3/2	3/0	3	X	1	1	1	2	CA	CA	CA	X	C, D	h	√	X			X	
	Homerton University Hospitals NHS FT	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	
South East London (E54000030)	Kings College Hospital NHS FT	242	1,4	X		3/0	3/0	2/0	3	X	1	1	1	1	Q	Q	Q	√	C	c, d, f, g	√	√	√		√	
	Queen Elizabeth Hospital, Lewisham and Greenwich NHS Trust	250	1,4	√	A	0/1	3/0	2/0	3	X	1	1	1	1	CA, ASA	CA	PS	√	E		√	√			√	
	Guy's and St Thomas' NHS FT	380	1,2	√	M	7/7	7/4	7/8	8	√	1	1	1	1	X	X	X	X	A, B, C, D, E						√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
South West London (E54000031)	Croydon University Hospital NHS Trust	200	1,2	√	M	2/0	3/0	3/0	6	√	1	1	1	2	ASA	√	PS	X	E		√	√	√		√	
	Kingston Hospital NHS FT	200	1,2,4	X		0.5/0.1	1.7/0	3.4/0	5	X	1	1	1	2	COSD grading	X	PS	X	E		√	√	√		√	
	St George's University Hospitals NHS FT	300	1,2,3,4	√	M	2/0	3/0	5/0	7	√	1	1	1	1	CA	POA, MMSE	√	X	C, D	h	√	√			√	
SOUTH																										
Kent and Medway (E54000032)	East Kent Hospitals NHS Trust	500	1,2,4,5	X		3/3	4/0	7/0	10	X	1	1	1	3	CA	X	CA	X	D	h	√	√	√		√	
	Medway NHS FT	300	1,2,4	√	W	0/1.9	4.5/0	3/0	5	X	1	1	1	1	CA	CA	PS	X	E		√	√	√		√	
	Maidstone and Tunbridge Wells NHS Trust	600	1,2,4,5	√	M	3/0	4/0	6/0	8	X	1	1	1	2	PS	X	PS	X	D	h	√	√	√		√	
	Dartford and Gravesham NHS Trust	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Sussex and East Surrey (E54000033)	Brighton and Sussex University Hospitals NHS Trust	300	1,2,4,5	√	M	3/1	4/1	8/0	7	X	1	1	1	1	PS	CA	CA	√	C	other	√	√	√		√	combined care of the elderly physician & surgeon clinic
	East Sussex Healthcare NHS Trust (Conquest Hospital)	400	1,2,4,	√	W	0/3	4/0	5/0	9	√	1	1	1	1	POA	X	X	X	E		√	√	√		√	
	East Sussex Healthcare NHS Trust (Eastbourne District General Hospital)	400	1,2,4	X		0.5/0.25	4/0	4/0	8	X	1	1	1	2	PS	√	√	√	D	h	√	√	√		√	
	Queen Victoria Hospital NHS FT	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	◊	
	Surrey and Sussex Healthcare NHS Trust	300	1,2,4,5	√	M	0/1	2/0	2/0	5	X	1	1	1	1	CA	PS	CA	X	E		√	X			√	
	Western Sussex Hospital NHS FT	500	1,2,4	√	W	2/2	6.5/0	5.5/0	11	√	1	1	1		CA	CA	CA	X	D	h	√	√			√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Frimley Health (E54000034)	Frimley Health NHS FT (Frimley Park Hospital)	300	1,2,4	√	W	0/2	3/0	3/0	6	√	1	1	1	1	CA	CA	CA	X	E		√	√	√		X	
	Frimley Health NHS FT (Heatherwood and Wexham Park Hospitals)	430	1,2,3,4	√	W	3/3	3/0	4.5/0	6	X	1	1	1	2	PS	PS	PS	X	E	h	√	√	√		√	
Surrey Heartlands (E54000035)	Ashford & St Peters NHS FT	300	1,2,4	√	M	2/0	3/0	3/0	6	√	1	1	1	2	PS	PS	PS	X	C, D	h	√	X	√		√	
	Royal Surrey County Hospital NHS FT	400	1,2,4,5	√	M	3/3	4/0	3.5/0	9	√	1	1	1	2	X	X	PS	X	D	h	√	X			√	
Cornwall and the Isles of Scilly (E54000036)	Royal Cornwall NHS Trust	500	1,2,4,5	√	M	3/0	5/0	6/0	10.25	X	1	1	1	2	CA	√	MHNA	X	E		√	√			√	
Devon (E54000037)	North Devon Hospital NHS Trust	100	1,4	X		1/0	1/0	3/O	2	X	1	1	1	2				√	E		√	√			√	
	Plymouth Hospitals NHS Trust	425	1,2,3,4,5	√	M	2/0	4/0	7/0	6	X	1	1	2	3				X	E		√	√			√	
	Royal Devon and Exeter NHS FT	600	1,2,3,4,5	√		5/1	4/0	5/0	12	√	1	2	1	2	CA	CA	CA	√	D	h	X	X			√	
	Torbay & South Devon NHS FT	400	1,2,4,5	√		3/0	3/0	4/0	5	√	1	1	1	3	Q	X	PS	X	D	h	√	√		80	√	
Somerset (E54000038)	Taunton & Somerset NHS FT	400	1,2,4,5	√	M	3/0	4/0	3.8/0	6	√	1	1	1	2	POA	POA	No	X	D	h	√	√			√	
	Yeovil District Hospital NHS FT	200	1,2,4	√	M	1.5/0	3/0	3.5/0	3	√	1	1	1	1	PS	√	PS	X	D	h	√	√	√		√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Bristol, North Somerset and South Gloucestershire (E54000039)	University Hospitals Bristol NHS FT	800	1,2,3	X		0/4	5/0	4/0	11	√	1	1	2	2				X	E		√	X	√		√	
	Weston Area Health NHS Trust	149	1,2,4	X		1/0	2/1	2/0	3	X	1	1	1	2	X	X	X	X	E		√	√			√	
Bath and North East Somerset, Swindon and Wiltshire (E54000040)	Salisbury NHS FT	250	1,2,3,4	√	W	1/?	3.4/0	2.4/0	3	√	1	1	1	1	CA	CA	CA	X	D	h	√	√			√	
	Royal United Hospitals Bath NHS FT	400	1,2,4,5	√	W	3/0	4/0	4/0	10	X	1	1	2	2	CA	CA	CA	X	C, D	h	√	√			X	
	Great Western Hospitals NHS FT	400	1,2,4	√	M	3/2	3/0	5/0	10	X	1	1	1	2	CA	X	PS	X	E		X	X	√		√	HER2 status is not performed > 76 years unless the the patient will be offered chemotherapy if positive
Dorset (E54000041)	Dorset County Hospital NHS FT	250	1,2,4	√	M	1/2	3.2/0.2	3/0	4	X	1	1	1	1	CCI	X	PS	X	D	h	√	√	√		√	
	Poole Hospital NHS FT	330	1,2,4,5	X		2/0	2/0	3/0	4	X	1	1	1	1	X	X	X	X	D	h	√	√			√	
	The Royal Bournemouth and Christchurch NHS FT	375	1,2,4	X		2/0.5	3/0	3/0	6	X	1	1	1		√	X	X	X	D	h	√	√			√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
Hampshire and Isle of Wight (E54000042)	Hampshire Hospitals NHS Trust	500	1,2,4,5	X		2/1	5.5/0	6.4/0	7	√	1	1	1	1	CA	CA	PS	X	C, D	h	√	√	√		√	
	Portsmouth Hospitals NHS Trust	700	1,2,3,4,5	√	W	4/0	4.5/0	3.5/0	8	√	1	1	2	2	CA	X	CA	X	E		√	X			√	
	Isle of Wight NHS Trust	200	1,2,4	√	W	0/0.5	2/0	2/0	3	√	1	1	1	1	CA	X	CA	X	E		√	√	√		√	
	University Hospital Southampton NHS FT	800	1,2,3,4,5	√	W	4.5/0	4/0.1	4/0	5	√	1	1	2	1	CA, POA	CA, POA	CA, POA	X	E		X	√			√	
Gloucestershire (E54000043)	Gloucestershire Hospitals NHS FT	600	1,2,4,5	X		19	6/0	6/0	14	X	1	1	1	2	X	X	X	X	D	h	√	√	X	75	√	
Buckinghamshire, Oxfordshire and Berkshire West (E54000044)	Royal Berkshire NHS FT	450	1,2,4,5	X		5/0	4.6/0	3.5/0	11	√	1	1	1	3	POA	X	X	X	D	h	√	X			√	
	Oxford University Hospitals NHS FT	600	1,2,3,4,5	√	M	5/0	4.8/0	6/0	9	X	1	1	1	3	ACE-27	X	PS	X	C, D	h	√	X			√	
	Buckinghamshire Healthcare NHS Trust	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	X	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

Table Key: * = data not available, ◊ = tertiary breast cancer treatment centres (not reported in section 3)

STP Footprint area (footprint code)	NHS trust/health board	Q4. The number of new breast cancers (invasive/non-invasive) diagnosed in 2015 (To the nearest 100)	Q5. On-site breast cancer services	Q6. Breast cancer team review of COSD returns	Q8. Timing of COSD returns review	WTE breast cancer MDT (Based on-site/ cross covering from another trust)			Q13. Number of dedicated breast cancer operating lists per week?(1 = 0.5 day list)	Q16. Intraoperative SLN analysis	Q19. Discussion of specific patients at the main breast cancer MDT meeting				Q20. Formal assessment of patient characteristics			Q22. Is there a different pre-operative anaesthetic assessment process for patients aged ⩾70?	Q24. Which breast cancer patients are the Care of the Elderly team involved with during their breast cancer care?	Q25. How is the Care of the Elderly team involved in breast cancer care at your trust?	Q26. Is HER2 testing routinely performed for all patients aged ⩾70 years?	Q27. Are patients aged ⩾70 years routinely recommended to undergo bone health checks as part of their breast cancer management?	Q28. Do all patients (irrespective of age) with early breast cancer undergo annual follow up mammography for 5 years?	Q29. Upper age for mammographic surveillance	Completion of case Vignettes (section 4)	Additional information
						Q10. Breast oncologists (consultant or SAS)	Q11. Breast surgeons (consultant or SAS)	Q12. Breast cancer nurse specialists			new patients with biopsy confirmed breast cancer	new patients with metastatic disease	previous breast cancer patients with metastatic disease	patients requiring palliative care input	Comorbidities	Cognition	Frailty									
WALES[3]																										
	Hywel Dda University health board	500	1,2,4,5	X		0/1	4.5/0	7/0	9	√	1	1	1	2	CA	X	Q	X	C	h	√	√	√		√	
	Abertawe Bro Morgannwg University health board	500	1,2,4,5	√	O	4/1	8/0	6/0	10	X	1	1	1	1	X	X	X	X	D, E	h	√	√	√		√	
	Aneurin Bevan University health board	450	1,2,4	√	F	0/2	5/0	3/0	12	X	1	2	2	2	CA	CA	CA	X	E		√	√	√		√	
	Cardiff and Vale University health board	400	1,2	√	A	1/0.5	4/0.5	6/0	7	X	1	1	1	2	X	X	X	X	E		√	√	√		√	
	Cwm Taf University health board	300	1,2,4	√		0/2	3/0	4/0	7	X	1	1	1	2	X	X	X	X	D	f, g, h	√	√	√		√	
	Betsi Cadwaladr University health board	600	1,2,4,5	√	M	3/4	3/3	3/4	15	√	1	1	1	1	CA	X	CA	X	D	h	√	√	√		√	

Key (see report glossary for detailed information):

Q5: 1 = breast cancer resection surgery, 2 = immediate breast reconstruction, 3 = free flap breast reconstruction, 4 = chemotherapy, 5 = radiotherapy

Q8: D = daily, W = weekly, F = fortnightly, M = monthly, A = annually, O = other

Q19: 1=always, 2=sometimes, 3=never

Q20: ACE-27 = Adult comorbidity evaluation-27 score, CA = clinical assessment, including patient notes review, CCI = Charlson comorbidity index, EF = Edmonton Frailty scale, MHNA = McMillan holistic needs assessment, MMSE= mini mental state examination, POA = preoperative assessment, PS = WHO/ECOG performance status, Q = patient questionnaire (self-assessment)

Q24: A = All patients >70, B = All patients >80, C = only patients with significant comorbidities, D = Case by case basis, E = no formal involvement

Q25: a= attendance at MDT meetings, b = POA, c = decision making before primary treatment, d = assessment before starting chemotherapy, e = review during chemotherapy, f = palliative care, g = end of life care, h = case by case consultation

[3]In Chapter 2 (Patterns of breast cancer treatment in England and Wales), Welsh patients were reported on by North/South Wales based on the previous North/South Wales cancer networks (not on current Health Boards).

Glossary

ABS - The Association of Breast Surgery (ABS) is the association that represents healthcare professionals treating malignant and benign breast disease in the UK, Ireland and worldwide. It focuses on education, audit and guidelines to enhance the treatment of patients with breast disease. Registered charity no: 1135699

ACE-27 score – The Adult Comorbidity Evaluation-27 score was developed [Bang 2000] for evaluating comorbidity in patients with cancer. The score is calculated from 27 medical diseases, based on the grade of decompensation: mild (1) moderate (2) and severe (3) of specific medical problems.

ASA score - The American Society of Anaesthesiologists classification is a scoring system based on perioperative health and comorbidities of a surgical patient. A high ASA score denotes a higher risk of perioperative complications in the short and long term.

ASA classification	Definition	Examples
I	A normal healthy patient	Healthy, non-smoking, minimal alcohol use
II	A patient with mild systemic disease	Disease with minimal functional limitations e.g. current smoker, well controlled diabetes mellitus
III	A patient with severe systemic disease	Diseases with substantive functional limitations e.g. poorly controlled diabetes mellitus, end stage renal failure (ESRF) with regular dialysis, history (>3 months) of myocardial infarction
IV	A patient with severe systemic disease that is a constant threat to life	e.g. recent (<3 months) myocardial infarction, ESRF without regular dialysis
V	A moribund patient who is not expected to survive without the operation	e.g. ruptured abdominal/thoracic aneurysm
VI	A declared brain-dead patient whose organs are being removed for donor purposes	

AND – Axillary node dissection is a procedure to remove the majority of the glands (lymph nodes) under the armpit (axilla). This is performed in patients with evidence of cancer in the axillary lymph nodes.

BCS – Breast conserving surgery is a procedure to remove a discrete lump or abnormal area of tissue from the breast, without the removal of all breast tissue.

Breast reconstruction surgery - The surgical recreation of the breast mound (or shape) after some or all of this has been removed (e.g. after breast cancer surgery).

CANISC – The Cancer Network Information System Cymru is a cancer registry service for Wales.

Charlson Comorbidity Index - This is a commonly used scoring system for medical comorbidities. The score is calculated based on the absence (0) and presence (≥1) of specific medical problems. The conditions covered by the index include: myocardial infarction, congestive cardiac failure, cerebrovascular disease, dementia, chronic pulmonary disease, rheumatological disease, liver disease, hemiplegia or paraplegia, renal disease, any malignancy, metastatic solid tumour and AIDS/HIV infection.

Chemotherapy - Drug therapy used to treat cancer. It may be used alone, or in conjunction with other types of treatment (e.g. surgery or radiotherapy).

CNS – Cancer nurse specialists are specially trained nurses who provide an essential role in supporting the various aspects of care for a cancer patient.

Comorbidity – A coexisting medical condition that is unrelated to the primary breast cancer.

COSD – The Cancer Outcomes and Services Dataset is the national standard dataset for recording details of cancer patients in England. NHS providers submit COSD data items to NCRAS who compile the dataset by combining it with information from other NHS systems.

Delayed breast reconstruction - The reconstruction of the breast mound (or shape) after a mastectomy has already been performed. This is undertaken as a separate operative procedure.

DEXA scan – A special X-ray which measures bone density and an assessment of the risk of bone fractures.

Endocrine therapy – Anti-oestrogen drug therapy used to treat 'hormone positive' breast cancer. This treatment reduces the levels of oestrogen and progesterone in the body or blocks its action.

HER2 - HER2 protein is a receptor that is present on normal breast cells. It is involved in the signalling and promotion of cell growth. Breast cancer cells with higher levels HER2 receptors (HER2 positive) are more aggressive and may grow more quickly. These receptors are the target of anti-HER2 therapies such as trastuzumab.

HES - Hospital Episode Statistics is a database that contains data on all inpatients treated within NHS trusts in England. This includes details of admissions, diagnoses and treatments.

Hormone status – Breast cancers can grow in response to the sex hormones: oestrogen and progesterone. Approximately 70% of invasive breast cancers are 'hormone positive' as they have receptors to the aforementioned hormones. These receptors are targets for endocrine therapy.

HQIP - Healthcare Quality Improvement Partnership (HQIP). It aims to promote quality improvement in healthcare, and in particular increase the impact of clinical audit on the services provided by the NHS and independent healthcare organisations.

ICD10 – International Classification of Diseases, Tenth Revision. This is the World Health Organisation international standard diagnostic classification, and is used to code diagnoses and complications within the Hospital Episode Statistics database of the English NHS.

Immediate breast reconstruction - The reconstruction of the breast mound (or shape) at the same time as the mastectomy, undertaken as part of the same operative procedure.

Invasive breast cancer – There is invasion of cancerous cells in the breast beyond the original lining of breast ducts/ glands.

Lymph nodes – These glands are part of the lymphatic network in the body, which plays an important role in the immune system. Cancer can spread from its area of origin to other parts of the body via the lymphatic network.

Mastectomy – A type of surgical procedure for breast cancer treatment, which involves removing all breast tissue.

MDT – The multidisciplinary team is a team of specialist health care professionals from various backgrounds (e.g. doctors, nurses, administrative staff) who collaborate to organise and deliver care for patients with a specific condition (e.g. breast cancer).

Metastatic disease - When cancer has spread from the place in which it started to other parts of the body

NCRAS – The National Cancer Registration and Analytical Service collects, analyses and reports on cancer data for the NHS population in England.

NHSBSP – In the NHS breast screening programme, asymptomatic women aged 47–70 (or 50-73 in some areas) are invited for three yearly mammograms for the detection of early breast cancer.

NICE - The National Institute of Health and Care Excellence is an organisation responsible for providing national guidance on the promotion of good health and the prevention and treatment of ill health.

Non-invasive breast cancer – Cancerous cells are restricted to the walls of the breast duct/gland of origin (= in-situ).

ONS - The Office for National Statistics (ONS) is the government department responsible for collecting and publishing official statistics about the UK's society and economy. This includes cancer registration data.

PEDW – The Patient Episode Database for Wales is a database that contains data on all inpatient and day case activity in NHS Wales hospitals. This includes details of admissions, diagnoses and those treatments undergone.

(WHO/ECOG) Performance Status – The World Health Organisation (WHO)/ Eastern Cooperative Oncology Group (ECOG) performance status indicator is a measure of how disease(s) impacts a patient's ability to manage on a daily basis. It was initially developed in the research setting to standardise the reporting of chemotherapy toxicity and response in clinical trials in cancer patients. However, it is now in the public domain and is routinely used in other research and clinical settings.

Grade	ECOG
0	Fully active, able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature
2	Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about more than 50% of waking hours
3	Capable of only limited self-care, confined to bed or chair more than 50% of waking hours
4	Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair
5	Dead

PET – In primary endocrine therapy, patients are treated with endocrine therapy rather than surgery as their main treatment for breast cancer.

Radiotherapy – The use of high energy X-ray beams to kills cancer cells.

RCS - The Royal College of Surgeons of England is an independent professional body committed to enabling surgeons to achieve and maintain the highest standards of surgical practice and patient care. As part of this it supports audit and the evaluation of clinical effectiveness for surgery.

SAS grade doctor – Specialty and associate specialist (SAS) doctors is an umbrella term for grades of doctors who work in the NHS but have not gone through a formal NHS training scheme to obtain their expertise or specialty.

Screening – Breast screening involves women being invited to have an x-ray examination called a mammogram. It aims to diagnose women early because it can enable clinicians to identify cancers when they are too small to feel. Typically, all women aged between 50 and 70 years are invited for breast cancer screening every three years.

SLNB – The sentinel lymph node is the first few lymph nodes into which a tumour is likely to spread. A biopsy of the sentinel node (SLNB) allows identification of spread of cancer cells outside the area of origin.

STP – Sustainability and Transformation Plans are regional five-year plans developed across 44 geographical ('footprint') areas in England to meet the challenge of transforming the delivery of healthcare and sustainable finance.

Symptomatic breast cancer – The term used to refer to women who are diagnosed with breast cancer after presenting with symptoms to their GP, as opposed to women diagnosed after being screened.

Systemic therapy – An additional therapy (e.g. chemotherapy, endocrine therapy HER2 targeting therapy) provided to improve the effectiveness of the primary treatment (e.g. breast cancer surgery). This aims to reduce the chance of recurrence of the cancer and to improve the patient's overall chance of survival. These treatments may be provided before (neo-adjuvant) or after (adjuvant) surgery.

TCOP – Teams caring for the older person (aka Care of the Elderly teams) specialise in managing the multiple medical needs of older patients. They provide inpatient and outpatient services, and members (such as geriatricians) liaise with other medical specialities and healthcare professionals to provide advice and support in delivering care to older patients.

Trastuzumab – A drug therapy (whose brand name is Herceptin) used to treat breast cancer in women who have tumours that are HER2 receptor positive. It may be used on its own or in combination with other chemotherapy drugs.