NHS

Cancer Screening Programmes

NHS BREAST SCREENING PROGRAMME

&

ASSOCIATION OF BREAST SURGERY AT BASO

AN AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING APRIL 2008 TO MARCH 2009

DISTRIBUTED AT THE
ASSOCIATION OF BREAST SURGERY AT BASO CONFERENCE

19th MAY 2010
YORK RACECOURSE

West Midlands
Cancer Intelligence Unit

Cancer Screening Programmes

West Midlands
Cancer Intelligence Unit

FOREWORDS

Once again I write the foreword to the annual NHS Breast Screening Programme and Association of Breast Surgery audit. The audit has now become a staple tool of the surgeon's trade for those whose practice embraces the NHS Breast Screening Programme. It describes the Programme overall and enables each surgeon to see how his/her practice compares with peers. Over time, the series of audit booklets has documented the development of the Programme itself and of breast surgery. We have seen, and are about to see again, a change in the Programme with a further extension in the eligible age group. We have seen the insistence on at least 4 nodes at axillary sampling moving to a single node as sentinel lymph node biopsy comes in. But perhaps the biggest change brought about by this exercise is the application of information to clinical practice.

The surgeons involved in the NHS Breast Screening Programme are now not only accustomed to high quality data in their every day practice, but are also demanding it in other areas of their work. Other surgical specialties have nothing like the richness of data available to breast surgeons but have something to aim for. The patterns that can be discerned in the audit have led to the improvement in care for the patient and have not been purely an intellectual exercise. The field of breast cancer has benefited more widely than only those women whose cancers are found at screening

This audit lays down a challenge to the rest of the surgical community to develop similar high quality audits for other cancer sites. This is recognised by the National Cancer Intelligence Network which is only a young organisation, but quickly establishing itself. It also lays down a challenge to those of us who work in breast cancer. That is, to bring all the information we have, on all the patients we see, up to this standard of completeness and accuracy. Having achieved such heights, we now see there is more work to do.

Professor Julietta Patnick CBE
Director for the NHS Cancer Screening Programmes

We are delighted to present the latest results of the NHSBSP and ABS audit. At a time when the media seems to be full of increasing criticism of the effectiveness of breast screening, it is essential that we are able to demonstrate that we provide very high standards of care to women with screen-detected abnormalities.

Over the years, the audit has set the standard for high quality data collection in cancer management. It is critical that surgeons and their MDT colleagues continue to have confidence in the quality of the audit which undoubtedly will be used as part of the evidence of revalidation. The process of reviewing outliers by quality assurance reference centres and their QA surgeons has now become firmly established, as has the feedback process at regional and national level.

Breast cancer diagnosis and treatment is rapidly evolving and progressing with the regular introduction of new techniques and therapies such as HER2 testing, sentinel lymph node biopsy and pre-operative ultrasound assessment of the axilla. Like an evolving species, the audit has to continue to respond and adapt to these changes by setting new standards against which we can continue to assess the introduction of new techniques. The presentation of this year's audit retains its familiar format, but new areas that have been introduced include a section on receptor status within the main audit, and information on neo-adjuvant therapies. I am grateful to all of my fellow members of the Audit Committee for their dedicated work in the ongoing development of the audit, reviewing of the data and commentary on the results.

Once again, thanks should go to all of the staff in breast screening units who undertake the onerous task of data collection. The audit could not be produced without your hard work. I am also extremely grateful to staff at QA reference centres and the West Midlands Cancer Intelligence Unit who work so hard to collate all the data required to produce the audit booklet each year. I hope that it will now provide a great stimulus for discussion at the forthcoming ABS meeting in York.

Neil Rothnie
Chair of the NHSBSP and ABS Screening Audit Group

ACKNOWLEDGEMENTS

The 2008/09 audit of screen-detected breast cancers was designed and directed by the NHS Breast Screening Programme and Association of Breast Surgery Screening Audit Group.

Mr Neil Rothnie	Chair, Consultant Surgeon, Southend Hospital, Essex
Ms Shan Cheung	Breast Screening QA Research and Information Officer, West Midlands Breast Screening QA Reference Centre
Dr Yoon C Chia	Consultant Pathologist, Wycombe Hospital, Buckinghamshire
Prof. David Dodwell	Consultant in Clinical Oncology, Cookridge Hospital, Leeds
Miss Nicola Greenway	Breast Screening QA Information Officer, West Midlands Breast Screening QA Reference Centre
Ms Olive Kearins	Deputy Director of Breast Screening Quality Assurance, West Midlands Breast Screening QA Reference Centre
Dr Gill Lawrence	Regional Director of Breast Screening Quality Assurance, West Midlands Cancer Intelligence Unit
Prof. Julietta Patnick	Director of the NHS Cancer Screening Programmes
Ms Jacquie Reed	QA Performance Manager, East Midlands Breast Screening QA Reference Centre
Dr Matthew Wallis	Consultant Radiologist, Addenbrooke's Hospital, Cambridge
Mr Roger Watkins	Consultant Breast Surgeon, Derriford Hospital, Plymouth
Mrs Margot Wheaton	Chair of the National Breast Screening System Users Group and Programme Manager, University Hospital, Coventry

The Screening Audit Group would like to extend their thanks to the following individuals and groups for their contributions to the 2008/09 audit of screen-detected breast cancer.

NHSBSP Surgical QA Co-ordinators, QA Co-ordinators and Programme Directors for overseeing regional data collection and validation at the regional QA reference centres.

QA Data Managers, Screening Office Managers and staff within the NHSBSP for collecting, collating and validating the regional data.

Regional cancer registry staff who co-operated with their regional QA reference centres to collect survival audit data.

Mrs Helen Bray from the Office for National Statistics, and Mrs Diane Edwards from the Health Geographical Information Systems Service at the West Midlands Cancer Intelligence Unit for producing the map of the NHSBSP.

Ms Lucy Davies at the ABS at BASO office for valuable assistance and support, including the distribution of booklets.

The Screening Audit Group would also like to thank the NHSBSP National Office for its financial assistance in support of the 2008/09 audit of screen-detected breast cancers.

CONTENTS

INTRODUCTION

AIMS AND OBJECTIVES

The 2008/09 NHS Breast Screening Programme (NHSBSP) and Association of Breast Surgery (ABS) audit of screen-detected breast cancer was undertaken to examine NHSBSP clinical activity in the period 1 April 2008 to 31 March 2009. The audit is designed to assess clinical performance by comparison of data with as many as possible of the clinical Quality Assurance (QA) standards recommended by the UK NHS Breast Screening Programme. These include the standards set in the following publications:

Quality Assurance Guidelines for Surgeons in Breast Cancer Screening
NHSBSP Publication No. 20, 4th Edition, March 2009

Guidelines for Quality Assurance Visits
NHSBSP Publication No. 40, Revised, October 2000

Reference is also made to the following publications:

Surgical Guidelines for the Management of Breast Cancer
Association of Breast Surgery, 2009

Guidelines for Non-operative Diagnostic Procedures and Reporting in Breast Cancer Screening. NHSBSP Publication No.50, June 2001

NICE Clinical Guideline 80 on the Diagnosis and treatment of early and locally advanced breast cancer (February 2009)

National Mastectomy and Breast Reconstruction Audit (2009) A national audit of provision and outcomes of mastectomy and breast reconstruction surgery for women in England. Second Annual Report

All Breast Cancers Report: A UK analysis of all symptomatic and screen-detected breast cancers diagnosed in 2006, NHS Breast Screening Programme and NCIN, October 2009

The audit covers the following main topic areas:

- the number and invasive status of screen detected breast cancers
- non-operative diagnosis and use of diagnostic open biopsy
- pre-operative assessment of axilla
- surgical treatment and tumour size
- waiting times
- hormone receptor status, lymph node status, invasive grade and NPI score
- surgical caseload
- repeat therapeutic operations and neo-adjuvant therapies
- adjuvant therapy
- survival analysis

ORGANISATION OF THE AUDIT

Organisation of Data Collection

As in previous years, responsibility for regional data collection was devolved to regional QA reference centres under the direction of surgical QA co-ordinators, QA directors and QA co-ordinators. Prior to

the start of data collection an information pack was sent to all surgical QA co-ordinators, QA directors, QA co-ordinators and directors of regional cancer registries. This pack included, in both electronic and paper format:

- a timetable of events (Appendix A)
- a main NHSBSP & ABS breast audit questionnaire with guidance notes (Appendix B)
- an adjuvant therapy data collection form with guidance notes (Appendix C)
- a survival audit data collection form with guidance notes (Appendix D)

The format of the audit was designed by the NHSBSP & ABS Breast Screening Audit Steering Group and was subject to comment from the surgical QA co-ordinators, QA directors and QA co-ordinators in an attempt to ensure that, as far as possible, ambiguities were eliminated. Guidance notes and data checks, designed to assist the collection of consistent data, were incorporated.

Main Audit Questionnaire

The NHSBSP & ABS breast screening audit main questionnaire was designed to enable collection of data describing breast screening activity in the 2008/09 screening year. The cohort of women included in this period was selected to be identical to that included in the statistical KC62 reports for 2008/09, from which UK NHSBSP core screening measures are routinely calculated. Information was sought in such a way as to allow comparison of findings with current QA standards.

Adjuvant Therapy Audit

Each screening surgeon was asked to collect information for women with a date of first offered screening appointment from 1 April 2007 to 31 March 2008 inclusive. Information was sought regarding start dates for radiotherapy, where applicable, and whether or not the women had started chemotherapy and/or hormone therapy. These data were linked to data collected in the main audit for 2007/08 to provide information on waiting times for adjuvant therapy and patterns of treatment.

Survival Audit

The survival audit utilised existing links between QA reference centres and regional cancer registries to obtain death data for women with screen-detected cancer. Details of the women with screen-detected breast cancer diagnosed between 1 April 2002 and 31 March 2003 were obtained by the breast screening services and matched with databases held at regional cancer registries to identify the date of death for any woman who died on or before 31 December 2009.

Responsibility for survival audit data collection rested with regional breast screening QA co-ordinators. Effective communication and collaboration with regional cancer registries is a vital element in the success of the survival audit.

Unit Level Data

Data for 95 screening units were included in the 2008/09 NHSBASP & ABS Breast Screening Audit. The smallest units, defined as the twenty units with the lowest number of women screened, are highlighted in white in the graphs throughout this booklet. The number of women screened by these units in 2008/09 varied from 6,451 to 12,581.

Responsibility for Data Collection

NHSBSP & ABS breast audit information packs were sent to NHSBSP representatives in nine QA reference centres in England and to Wales, Scotland and Northern Ireland. Data for the nine QA reference centres in England and data for Wales, Northern Ireland, Scotland and the Isle of Man are presented in this document. Screening cases in Isle of Man are managed by the Warwickshire, Solihull & Coventry Breast Screening Service.

In each region, the surgical QA co-ordinator, QA director and QA co-ordinator and their equivalents in

the Celtic countries were responsible for working together to ensure that the data were collected from their breast screening services. Lead surgeons in each breast screening service were responsible for making sure that the data were available and complete, and lead surgeons in each screening service were asked to give confirmation to their QA co-ordinator that the data for their breast screening service were a fair representation of screening activity in the audit period (to "sign off" the data). The QA co-ordinator in each region was given the responsibility for ensuring all the data were signed off before submission.

The identification of individuals with responsibility for ensuring that data are gathered and are a true reflection of clinical work is intended to clarify ownership of the information for the audit. Ownership of the information is essential if a need for change is highlighted which must be accepted and implemented.

The ground level data collection was carried out by a range of staff, including individual surgeons, QA reference centre staff, breast screening service office staff, staff at regional cancer registries, oncology staff, some non-surgical clinicians who have an interest in QA and some dedicated clinical data collection officers. For those screening services supported by the National Breast Screening System a set of standard analytical crystal reports was designed to allow the audit data to be retrieved from screening computer systems. These reports were created by Mrs Margot Wheaton and were available to all regions. Data were collated on a regional basis by QA reference centres under the direction of the surgical QA co-ordinators, QA directors and QA co-ordinators and submitted to the West Midlands QA Reference Centre for collation and evaluation.

Obtaining Complete and Valid Audit Data

Ensuring that audit data were supplied in a consistent format was essential to the validation process. The West Midlands QA Reference Centre has developed specialist spreadsheets in Microsoft Excel which are used by each regional QA reference centre to collate regional data in a standard format. Individual screening services either provide the data to their regional QA reference centre in the Excel spreadsheet or by hand on a paper copy. The spreadsheet includes data validation checks. A specially designed spreadsheet was also provided for the survival audit. The collection of data at breast screening service/unit level involved detailed consideration of cases and cross checks against existing KC62 reports.

Data Evaluation

The West Midlands QA Reference Centre, guided by the NHSBSP and ABS Breast Screening Audit Group, acted as the central collection and collation point for national data. During the collation of national data, extensive validation checks are used to ensure that the data are an accurate reflection of clinical activity in the UK NHSBSP. National data were evaluated in comparison to current QA standards where these were available. Commentary and recommendations have been made by the NHSBSP and ABS Breast Screening Audit Steering Group.

Publication of Audit Data

The NHSBSP & ABS 2008/09 audit of screen-detected breast cancers is published as a booklet with financial assistance from NHSBSP National Office. The booklet will be distributed at the ABS annual conference on **19 May 2010.** Once published, the booklet will be available to download from the following web sites.

West Midlands Cancer Intelligence Unit	www.wmpho.org.uk/wmciu/
NHS Cancer Screening Programmes	www.cancerscreening.nhs.uk

Referencing this Document

This document should be cited in the following way: *"An audit of screen-detected breast cancers for the year of screening April 2008 to March 2009", NHSBSP & ABS*.

USING THE AUDIT DATA TO IMPROVE PERFORMANCE

Recommended uses of the NHSBSP and ABS breast screening audit data are as follows:

At National Level

The NHSBSP and ABS breast audit data should be considered formally at a meeting of the regional breast screening QA directors to identify recommendations for action, where performance does not meet a QA standard. This may include suggestions for training and recommendations for the management and organisation of services.

At Local/Regional Level

The annual NHSBSP and ABS breast audit data should be considered formally at a meeting of the regional breast screening QA team and also at a regional workshop where the data for individual screening units in each region are analysed and presented.

Where the audit identifies a screening service as an 'outlier' in a particular area, regional QA reference centres and regional surgical QA co-ordinators should ensure that screening services audit the cases involved to establish whether the results reflect a data collection or recording problem. If the data are found to represent clinical practice correctly, the reasons for the failure to follow recommended guidelines should be ascertained.

Regional QA reference centres and regional surgical QA co-ordinators should follow up any failures to meet national QA standards with individual screening services. There should be formal recording of the plans put in place to achieve each of the standards failed, and routine monitoring to ensure that action has been taken to rectify the problem.

The annual NHSBSP and ABS breast audit data should also be used to celebrate high quality services. Attention should not only be focused on failure to meet QA standards. Achievement of standards should also be recorded and recognition for high quality work given. It is important that audits such as this do not demoralise the dedicated professionals within the breast cancer screening and treatment teams.

YOUR COMMENTS

The NHSBSP and ABS audit of screen-detected breast cancer has developed over the years, with improvements in design and organisation resulting in improved data quality and increasingly useful audit results. To continue this development process your comments and suggestions are extremely useful. If you have any comments or suggestions about the 2008/09 audit, about this document or about the development of future NHSBSP and ABS breast screening audits please put them in writing to:

NHSBSP and ABS Breast Screening Audit Steering Group
Dr Gill Lawrence
Director of Breast Screening Quality Assurance
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham B15 2TT

Tel: 0121 414 7713
Fax: 0121 414 7714
E-mail: breastqarc@wmciu.nhs.uk

PROVISION OF DATA FOR THE 2008/09 AUDIT

The map below shows the areas covered by the nine English QA reference centres and information centres in Wales, Scotland, Northern Ireland and the location of Isle of Man. Data from the North East and Yorkshire and Humber Strategic Health Authorities are collated in one QA reference centre, called North East, Yorkshire & Humber.

KEY FINDINGS AND RECOMMENDATIONS

CANCERS DETECTED BY SCREENING

2,116,588 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2008 and 31 March 2009. 17,045 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.1 cancers per 1,000 women screened. Overall, 79% of screen-detected breast cancers were invasive, 20% non-invasive and 1% micro-invasive. The invasive status of 22 cancers was unknown. 67% of women with a screen-detected breast cancer were aged between 50 and 64 when they were invited to attend the screening appointment leading to their diagnosis. 25% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75. The Isle of Man submitted data to the UK NHSBSP audit for the first time in 2008/09; 29 breast cancers were detected.

NON-OPERATIVE DIAGNOSIS

In 2008/09, 95% of cancers detected in the UK NHSBSP were diagnosed non-operatively. The proportion of cancers diagnosed by C5 cytology alone has fallen from 19% in 2000/01 to 3% in 2008/09. Northern Ireland had the highest proportion (31%) of cancers diagnosed by C5 cytology only in 2008/09. Regional QA reference centres should investigate why C5 cytology alone is still being used to diagnose such a high proportion of cancers in some units.

The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 84% respectively. Only 5 units failed to meet the 95% target for the non-operative diagnosis of invasive cancers. Regional QA reference centres should investigate why units in their regions failed to meet the 95% target for the non-operative diagnosis of invasive cancers. The proportion of non-invasive cancers without a non-operative diagnosis varied from 9% in Wales to 21% in East of England. 44 units failed to meet the new 85% minimum standard for the non-operative diagnosis of non-invasive cancers. 24 units have failed to meet the standard for the whole of the 3-year period 2006/07-2008/09. Regional QA reference centres should investigate the screening units in their regions which failed to meet the minimum standard

For 21% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. For 3 screening units in London, the West Midlands and the South West, the proportion of cancers with B5a (Non-invasive) diagnosis later found to have an invasive component was significantly higher than the average rate of 21%. Regional QA reference centres should carry out audits with these 3 screening units to ascertain the reason for these unusual results.

The proportion of cancers with B5a non-operative diagnosis which are confirmed as invasive after surgery has decreased markedly in Wales (from 24% to 11%) and in Northern Ireland (from 21% to 12%) since 2007/08. In 2008/09 screening units in Northern Ireland started to obtain more tissue by taking more cores from areas of micro-calcification and the use vacuum assisted biopsy equipment. In North East, Yorkshire & Humber, 27 cases were recorded as B5c (Micro-invasive, Not assessable/ unknown). All regional QA reference centres should review their B5c cases to ascertain the reason for the use of this code.

86 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease following surgery. Explanations provided included that the invasive tumour had been completely excised in the core or that the patient had received neo-adjuvant chemotherapy. For 26 cases with a B5b (Invasive) non-operative diagnosis, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the non-operative core biopsy. 96% of the 556

cancers diagnosed by C5 cytology alone were found to be invasive after surgery. Regional QA reference centres should audit the 20 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or "malignant – cytology only" at surgery. 90% of women had a non-operative diagnosis after only one assessment clinic visit. 16 units failed to achieve a non-operative diagnosis rate of 80% (the previous minimum standard for all cancers) at the first visit. Regional QA reference centres should carry out audits with these screening units.

DIAGNOSTIC OPEN BIOPSIES

In the UK as a whole, 2,567 diagnostic open biopsies were performed in 2008/09. Of these 69% were benign and 31% were malignant. The UK benign open biopsy rate was 0.83 per 1,000 women screened in 2008/09. The regional QA reference centres in London and South East Coast should investigate the reasons for their relatively high benign open biopsy rates. The UK malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.38 per 1,000 women screened in 2008/09 as the non-operative diagnosis rate has increased from 63% to 95%.

In the UK as a whole, there were 8 false positive core biopsies and 4 false positive cytology cases recorded in 2008/09. Regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reasons for these results, implementing corrective action as appropriate.

9 cancers which were diagnosed by open biopsy had a mastectomy or a mastectomy with axillary surgery as the first surgical operation. Regional QA reference centres and regional surgical QA co-ordinators should review these cases to ascertain the reason that mastectomies were performed as the first operation. 15 invasive cancers and 10 non-invasive cancers diagnosed by open biopsy had no non-operative procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit these 25 cases to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt non-operative diagnosis should be ascertained. 39% of invasive cancers and 34% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had a C4 cytology or B4 core biopsy result indicating suspicion of malignant disease. Regional QA reference centres in North West should audit their invasive cases and in South West and West Midlands their non-invasive cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result. The classification by pathologist of core biopsies which are considered to represent lobular neoplasia as B3 means that, if lobular carcinoma in situ is verified in the surgical specimen, the non-operative diagnosis rate for non-invasive cancers will appear lower than it should be.

PRE-OPERATIVE ASSESSMENT OF THE AXILLA

In the UK excluding Scotland and Wales, 6,401 (44%) cases had a record of an axillary ultrasound at assessment. This varied widely between regions from only 12% in Northern Ireland to 63% in East of England. Of the cases with axillary ultrasound recorded, 88% were confirmed to be invasive after surgery and 11% non-invasive. Overall, 49% of the invasive cancers and 25% of non-invasive cancers had axillary ultrasound recorded. 728 (13%) invasive cancers with an axillary ultrasound result recorded had an abnormal result. Of these, 401 (55%) were node positive at surgery giving a positive predictive value of an abnormal ultrasound of 55%. 11% of the invasive cancers having an axillary ultrasound examination, had an axillary biopsy at assessment. 290 (46%) of the invasive cancers had a C5/B5 biopsy. This varied between 33% in Northern Ireland and 59% in South Central. Of the invasive cancers with a C5/B5 biopsy, 248 were node positive at surgery (giving a positive predictive value of a C5/B5 of 86%). Of the 2,445 invasive cancers that were confirmed to be node positive on surgery, 259 (11%) were diagnosed pre-operatively by means of needle biopsy.

SURGICAL TREATMENT

Overall, 69% of non-invasive cancers were treated with conservation surgery. Mastectomy rates for non-invasive cancers varied from 22% in West Midlands to 38% in North East, Yorkshire and Humber.

In 2008/09, 1,924 (58%) of the surgically-treated non-invasive cancers had high cytonuclear grade, 888 (27%) had intermediate cytonuclear grade, 331 (10%) had low cytonuclear grade and for 62 (2%) the cytonuclear grade was not assessable. For 7% of non-invasive cancers (232 cases), the cytonuclear grade and/or size were not recorded. Regional QA reference centres and regional pathology QA co-ordinators should audit non-invasive cancers with unknown cytonuclear grade and/or size to ascertain the reason that these important prognostic indicators were not recorded. They should also identify which of their screening units are participating in the Sloane Project to ascertain if their practices and procedures could be used to improve data quality in other units, and to encourage units which already have high quality data to participate in the Project as recommended in NICE Clinical Guideline 80 (February 2009). 140 potentially large high cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional surgical QA co-ordinators should review the data recorded for these cases to ensure that they were not under-treated.

In the UK as a whole, the mastectomy rate for invasive cancers was 26%. Mastectomy rates in individual screening units varied between 13% and 56%. 235 invasive cancers and 39 non-invasive cancers had no surgery recorded and for 1 invasive cancer, treatment information was not available. Regional QA reference centres and regional surgical QA co-ordinators should audit these cases to ascertain why surgical treatment was not given or why the surgical treatment that was provided was not recorded. 93% of >50mm invasive cancers were treated with mastectomy compared with 17% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size.

Whole tumour size was not provided for 291 (2%) surgically treated invasive cancers. 58 (20%) of these cancers without a whole tumour size were in London, 41 (14%) were in South Central and 39 (13%) were in the North East, Yorkshire and Humber. Regional QA reference centres and regional pathology QA co-ordinators should ascertain why these important data were not available from their screening units.

Overall only 11% of cancers with whole tumour size <15mm were treated with mastectomy compared with 17% of cancers with invasive tumour size of <15mm. These data indicate that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on small (<15mm) invasive cancers. In order to ascertain the reasons for non-random variation in clinical practice, regional QA reference centres and regional surgical QA co-ordinators should review the data for all screening units lying outside (above and below) the control limits in Figure 19 which shows the inter-unit variation in the proportion of small cancers with whole tumour size <15mm which had a mastectomy.

18% of screen-detected cancers treated with mastectomy were recorded as having immediate reconstruction in 2008/09. This is somewhat lower that the 21% immediate reconstruction rate reported in the *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009*. The highest recorded immediate reconstruction rates for all screen-detected cancers were in South West (26%), South Central (24%) and East of England (24%) and the lowest in North East, Yorkshire & Humber (12%). Only 14% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 32% of non-invasive cancers treated with mastectomy. These rates are similar to the rates of 17% and 38% for invasive and non-invasive cancers reported in the *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009.* For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 9% in North East, Yorkshire & Humber to 21% in London. For non-invasive cancers, recorded immediate reconstruction rates varied from 17% in Wales to 49% in South West. Overall recorded immediate reconstruction rates in individual screening units varied from 0 cases in 5 units to over 50% of cases in two units.

WAITING TIMES

In the UK as a whole, 55% of women had their first therapeutic treatment within 31 days of their first assessment visit and the median waiting time was 29 days. Only 42% of women who did not have a non-operative diagnosis had their first diagnostic operation within 31 days of their first assessment visit and the median waiting time was 35 days. The longer waiting time seen for these patients is probably

because there have usually been several attempts to obtain a non-operative diagnosis before diagnostic surgery was carried out.

85% of women with and 71% of women without a non-operative diagnosis who did not have neo-adjuvant therapy had their first surgery within 45 days of their first assessment appointment. This suggests that neither the UK as a whole nor any individual region would have met the new 31 day cancer waiting times standard. In the UK as a whole, 95% of women who did not have neo-adjuvant therapy had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit and 76% had their first surgical treatment (therapeutic or diagnostic) within 62 days of their screening visit. As the 'date of last read' will lie somewhere between the 'date of first screen' and the 'date of first assessment', these data suggest that, with the exception of Northern Ireland and the possible exception of the East Midlands, no region in the UK would have met the new 62 day cancer waiting times standard.

RECEPTOR STATUS, NODAL STATUS, INVASIVE GRADE AND NPI

ER status was unknown for 1,925 (11%) of cases included in the main audit. The proportion of cancers with unknown ER status varied from 4% in Northern Ireland to 19% in South East Coast. In the UK as a whole, 2% of invasive cancers and 48% of non-invasive cancers had unknown ER status. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at multi-disciplinary meetings. Of the 15,120 cancers with known ER status, 13,397 (89%) were ER positive. 90% of invasive cancers with known ER status and 80% of non-invasive cancers with known ER status were ER positive. PgR status was known for 65% of all cancers. This varied from 40% in Wales to 91% in North West. Of the cancers with known PgR status, 75% were positive. Although the *NHSBSP Guidelines Pathology Reporting of Breast Disease* do not recommend the routine measurement of PgR status, recent data suggest that PgR status may be a useful prognostic marker which adds additional specificity to ER status and HER-2 status. It may also be valuable in identifying ER negative cancers which, if they are PgR positive, may benefit from hormone therapy. It therefore seems to be prudent to continue to collect information on the PgR status of invasive cancers in the NHSBSP & ABS Audit until there is greater clarity about its importance.

HER-2 status data were available for 91% of the 13,532 invasive cancers included in the main audit. The proportion of cases with known HER-2 status varied from only 71% in South East Coast to 97% in East of England. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions. Of the 12,252 invasive cancers with known HER-2 status, 12% were positive, 86% were negative and 3% were borderline.

In the UK as a whole, 98% of surgically treated invasive cancers had known nodal status. This varied between 97% in London and South East Coast and 99% in North East, Yorkshire & Humber, West Midlands, North West, Northern Ireland and Scotland. Regional QA reference centres and regional surgical QA co-ordinators should audit the cases in the 2 screening units which had more than 5% of cases with unknown nodal status in order to determine the reasons for the absence of these important prognostic data.

In 2008/09 a sentinel lymph node biopsy (SLNB) procedure was recorded for 7,533 invasive cancers (58%) with axillary surgery. Of these, 51% had the full dual SLNB procedure using isotope and blue dye recorded. This varied from 8% in Wales to 88% in East Midlands. Although the use of SLNB has increased since 2007/08, there is still widespread variation, with 76% of invasive cancers in Wales and 68% of invasive cancers in London having a SLNB compared with only 40% in Scotland, 47% in Northern Ireland and 51% in East Midlands. In 2008/09, the proportion of cases with fewer than 4 nodes examined increased to 36%. 33% of these cases involved a SLNB procedure, leaving an underlying rate of 2.5% with fewer than 4 nodes examined when a SLNB procedure was not used. In the UK, 94% of the 5,551 invasive cancers, which either did not have a SLNB procedure or where it was not known whether or not a SLNB procedure was performed, had 4 or more nodes taken. This ranged from 83% in Wales to 99% in Northern Ireland. Regional QA reference centres and regional surgical QA co-ordinators should audit all the invasive cancers without a SLNB or where the type of axillary procedure used is unknown, which have fewer than 4 nodes reported to ensure that the axilla has not been under-treated.

In the UK as a whole in 2008/09, the 22% of cases had positive nodal status; this varied from 12% to 35% in individual screening units. It would be interesting to determine whether this wide range of node positivity is related to differences between units in the number of blocks taken and the intensity with which the presence of micro-metastases is investigated. The proportion of cases with positive nodal status (16%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (29%). This is consistent with the selection of patients for axillary sampling or clearance, who were thought to be of high risk (e.g. high grade, palpable nodes) or who have positive nodes on non-operative ultrasound guided cytology or core biopsy. 10% of the 1,226 cancers which had their positive nodal status determined from a SLNB procedure where less than 4 nodes were taken, appeared to have had no subsequent axillary procedure. A further 25 invasive cancers had their positive nodal status determined on the basis of fewer than 4 nodes without a SLNB procedure. Regional QA reference centres and regional surgical QA co-ordinators should follow up all of these cases to ensure that the appropriate nodal procedures have been undertaken and that the axilla has not been under-treated.

Although nodal assessment is not always indicated for non-invasive cancers, 31% of non-invasive cancers had known nodal status. This varied from 24% in South West to 38% in East Midlands. Of the 1,032 non-invasive cancers with known nodal status, 5 (0.5%) had positive nodal status recorded. 80% of non-invasive cancers treated with mastectomy had known nodal status, compared with 10% of those treated with conservation surgery. Cases treated with mastectomy also had a higher median and maximum number of nodes taken. 42% of non-invasive cancers treated with a mastectomy had their nodal status determined on the basis of a SLNB, and 52% of mastectomy cases with known nodal status had this determined using a SLNB. 7% of non-invasive cancers treated with conservation surgery had their nodal status determined on the basis of a SLNB, and 74% of cases treated with conservation surgery with known nodal status had this determined using a SLNB. The maximum numbers of nodes taken for non-invasive cancers treated with conservative surgery and mastectomy were 12 and 35 respectively. Regional QA reference centres should audit non-invasive cancers where more than 10 nodes were taken to ascertain why the axilla appears to have been over-treated.

Overall, 26% of invasive cancers were Grade I, 53% were Grade II and 20% were Grade III. Grade was not assessable for 42 cases and unknown for 76 cases (1%). Control charts suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and regional pathology QA co-ordinators. In the Grade I control chart, 3 units have been outliers every year during the 3-year audit period 2006/07-2008/09 and 8 units have been outliers in 2 out of 3 of these years. A similar pattern is seen for the Grade III control chart; with 2 units being outliers in all 3 audit years and 8 units being outliers in 2 out of 3 audit years. Data were available to calculate a Nottingham Prognostic Index (NPI) score for 97% of surgically treated invasive cancers. Regional QA reference centres and regional pathology QA co-ordinators should investigate why the proportion of cancers with unknown NPI was particularly high in some units.

SURGICAL CASELOAD

There were 549 consultant breast surgeons working in the UK NHSBSP in 2008/09. 92% of women were treated by a surgeon with a screening caseload of at least 20 cases. Of the 149 surgeons with screening caseload of less than 10 cases, 37% treated more than 30 symptomatic breast cancers during 2008/09. Information was unavailable to explain the low caseload of 4 surgeons treating a total of 5 women. Two of these surgeons were in the East of England, 1 in London and 1 in Scotland. Regional QA reference centres and regional surgical QA co-ordinators should ensure that all screening cases treated by low caseload surgeons have received satisfactory treatment.

NUMBER AND SEQUENCE OF OPERATIONS

In the UK as a whole in 2008/09, 4,040 surgically treated patients underwent more than one operation. 23% of the invasive cancers and 28% of non-invasive cancers underwent more than one operation. The repeat operation rate for the 802 surgically treated cancers without a non-operative diagnosis was 56%. For 44% of surgically treated cancers without a non-operative diagnosis, the initial diagnostic operation was deemed to have removed the whole tumour and a second, therapeutic operation was

therefore not required. The repeat operation rate for surgically treated cancers with a non-operative diagnosis was 23%.

22% of invasive cancers and 22% of non-invasive cancers with a non-operative diagnosis had more than one therapeutic operation. 25% of the invasive cancers and 31% of the non-invasive cancers, which had a non-operative diagnosis and were initially treated by therapeutic breast conservation surgery, had repeat therapeutic operations. 13 invasive cases and 4 non-invasive cases had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit these 17 cases to ascertain the reason for this unusual practice. Of the 257 surgeons who had more than 20 cases with breast conserving surgery as the first therapeutic operation, 25 had unusually high repeat operation rates. Regional QA reference centres and regional surgical QA co-ordinators should audit the work of these surgeons to ascertain the reasons for this unusual practice. Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (20%). Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 25%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (57%).

In the UK as a whole, 21% of cancers with a non-operative diagnosis, which were initially treated with therapeutic breast conservation surgery, had repeat operations (breast conservation surgery or mastectomy) to clear involved margins and 13% underwent repeat breast conservation operations to clear margins. 7 screening units had repeat breast conservation surgery rates in excess of 20%. 25% of invasive cancers with a B5a (Non-invasive) core biopsy had a repeat therapeutic breast conservation operation to clear margins. This varied from 13% in Scotland to 40% in Northern Ireland. In the UK as a whole, 19% of invasive cancers with B5b (Invasive) core biopsy had an initial therapeutic mastectomy at the first operation and 6% had initial therapeutic conservation surgery converted to a mastectomy at a subsequent repeat operation. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial therapeutic mastectomy rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (30%). 77 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. Regional QA reference centres and regional surgical QA co-ordinators should audit these cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation. 8% of cancers had repeat operations which converted initial therapeutic breast conservation operations to a mastectomy. In 3 screening units the conversion rate to mastectomy was in excess of 15%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest conversion of therapeutic breast conservation surgery to mastectomy (21%). This varied from 0% in Northern Ireland to 32% in North West.

Axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy and 99% of invasive cancers diagnosed by C5 cytology only. For 99% and 98% of these cancers respectively, the nodal status was determined at the first operation. 93% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 47% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 46%. The proportion of these cancers having their axillary surgery at the first operation was highest in Northern Ireland (63%) and lowest in London (34%). 123 invasive cancers with a B5b (Invasive) core biopsy, 5 invasive cancers with C5 cytology and 53 invasive cancers with a B5a (Non-invasive) core biopsy had no axillary procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit the invasive cancers with no surgery to the axilla recorded to ascertain whether the data for these cases are recorded correctly and, if so, why the nodal status was not determined.

35% of invasive cancers with a positive nodal status had a repeat operation to the axilla. This varied from 20% in Northern Ireland to 49% in Wales and from 0% in 5 screening units to over 60% in 10 units. 27% of invasive cancers with positive nodal status had a repeat operation to the axilla following a SLNB and 8% after an axillary operation which did not involve a SLNB. Overall in the UK, 78% of repeat operations on the axilla were carried out on invasive cancers with positive nodal status determined on the basis of SLNB. This varied between 45% in Scotland and 90% in London and Wales. There were a small number of units with repeat operation rates above the UK average where the majority of the invasive cancers had their positive nodal status determined without a SLNB or

where the nodal procedure was not known. Regional QA reference centres and regional surgical QA co-ordinators should audit these invasive cancers to ensure that the nodal operation data for these cases are recorded correctly and to ascertain why the nodal procedure type was not known.

NEO-ADJUVANT THERAPY

5% of all cancer cases did not have a complete record of the three types of neo-adjuvant therapy. These cases were all in South Central, North West and Scotland. A total of 583 cancer patients received neo-adjuvant therapy in 2008/09. 567 patients had invasive cancer and 14 patients had non-invasive cancer. As with adjuvant chemotherapy, the use of neo-adjuvant chemotherapy was higher in younger patients. The use of neo-adjuvant hormone therapy was higher for the oldest patients aged at least 71 years; nearly half (49%) of whom had no surgery recorded, compared to 20% of the patients aged less than 50. 19 cancers were recorded as having received neo-adjuvant Herceptin; all were invasive cancers. 337 cancers (2%) had neo-adjuvant hormone therapy recorded, 322 were invasive cancers, 1 was micro-invasive and 14 were non-invasive. 298 cancers (88%) with neo-adjuvant hormone therapy recorded were ER and/or PgR positive, 9% (29 cases) had unknown ER and PgR status and the remaining 10 cases were ER negative.

ADJUVANT THERAPY

15,154 cases (90% of all cases) were included in the adjuvant therapy audit. Scotland and Wales had the highest proportion of eligible cases (100% and 99% respectively). South East Coast had the lowest proportion of eligible cases with 29% of cases excluded.

In the UK as a whole, ER status was not known for 239 (2%) invasive cancers and for 1,258 (43%) non-invasive cancers. In South East Coast, 14% of the invasive cancers did not have ER status recorded. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at the post-operative MDT meeting. Of the 11,841 invasive cancers with known ER status, 90% were ER positive. PgR status data were available for 75% of invasive cancers and 40% of non-invasive cancers. PgR status was known for 90% of the ER negative invasive cancers, suggesting that PgR status was preferentially requested for invasive cancers when the ER status was negative. HER-2 status data were available for 87% of invasive cancers compared with 78% in 2006/07. The proportion of cases with known HER-2 status varied from 55% in South East Coast to 98% in Scotland. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions. Of the 10,507 invasive cancers with known HER-2 status, 12% were positive, 87% were negative and 0.1% were borderline.

77% of invasive cancers and 41% of non-invasive cancers had radiotherapy recorded. 25% of the invasive cancers and 14 patients with non-invasive cancer had chemotherapy recorded. Regional QA reference centres should audit these 14 cases to ascertain if this is a data recording issue. 86% of invasive cancers and 22% of non-invasive cancers had hormone therapy recorded. There are differing opinions regarding the benefit of offering hormone therapy to women with non-invasive breast cancer. As NICE Clinical Guideline 80 E*arly and locally advanced breast cancer: Diagnosis and treatment* (2009) states that Tamoxifen should not be offered to these women, it will be interesting to see if the proportion of women with non-invasive breast cancer who do receive hormone therapy decreases in future audits.

Hormone therapy was the main treatment recorded for invasive cancers at all ages, followed by radiotherapy. The use of radiotherapy decreased gradually with age for both invasive and non-invasive cancers. Chemotherapy was the least used adjuvant therapy as would be expected for the high proportion of relatively early stage cancers detected by screening. 39 invasive cancers which did not have surgery had chemotherapy recorded. Regional QA reference centres should audit these cases to ascertain whether this is a data recording issue. There was a clear decrease in chemotherapy treatment with age; with only 15% of women aged 65-70 receiving chemotherapy compared with 37% of women aged 49-55. This may be because a higher proportion of younger women have aggressive, fast growing cancers, but may also indicate a reluctance to prescribe

chemotherapy to older women where the risk/benefit balance is less clear.

Overall, 54% of women received radiotherapy within 60 days of their final surgery and 90% within 90 days. 59 women (1%) had not received radiotherapy 200 days after their final surgery. Only 47% of women with invasive breast cancer had started their radiotherapy within 90 days of their first assessment visit and 3% had not started radiotherapy after 200 days. Regional QA reference centres should review all of the cases (invasive and non-invasive) where radiotherapy was not started within 200 days of final surgery. In the Cancer Reform Strategy published in December 2007, a new radiotherapy waiting times standard was introduced which specifies that the time between the date when a person is determined to be 'fit to treat' after surgery and the start of radiotherapy should be no more than 31 days. If this standard is to be achieved, considerable reductions in the time between final surgery and radiotherapy will be required in all regions.

93% of women with invasive cancer treated with breast conservation surgery had radiotherapy recorded, compared to only 56% of women with conservatively treated non-invasive cancers. 13% of conservatively treated invasive cancers without radiotherapy recorded were larger than 20mm in diameter, 12% were Grade III and 11% were node positive. Given the benefits demonstrated in clinical trials from the provision of radiotherapy to patients treated with breast conservation surgery, regional QA reference centres should audit all conservatively treated invasive breast cancers which did not have radiotherapy recorded to ascertain if this is a true reflection of clinical practice or a data recording issue. 202 non-invasive cancers without radiotherapy recorded were high cytonuclear grade and 16 were more than 40mm in diameter. In the 3 year period 2005/06-2008/09, in South East Coast, South Central and South West, more than 50% of conservatively treated non-invasive cancers do not appear to have received radiotherapy. Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive adjuvant radiotherapy. However, regional QA reference centres should ascertain each screening unit's policy regarding the provision of radiotherapy to conservatively treated non-invasive breast cancers since there is evidence from clinical trials that this can reduce recurrence rates as well as reducing the time to recurrence.

35% of women with node positive invasive cancer did not have chemotherapy recorded. Older women with node positive invasive cancers were less likely to have chemotherapy recorded than younger women. 16% of the 897 node positive invasive cancers which had no chemotherapy were Grade III and 6% were HER-2 positive. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit Grade III and/or HER-2 positive, node positive invasive cancers with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 528 ER positive, invasive cancers and 25 ER negative, PgR positive invasive cancers did not have hormone therapy recorded. 82% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 77% were node negative and 60% were <15mm in diameter. Regional QA reference centres and regional surgical QA co-ordinators should audit ER and PgR positive invasive cancers to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue. The proportion of non-invasive cancers with hormone therapy recorded varied markedly between regions from 8% in East of England to 81% in Northern Ireland. 8% of ER negative non-invasive cancers had hormone therapy recorded. Given the potential side effects of hormone treatment, regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why hormone therapy appears to have been given to invasive and non-invasive cancers with unknown or negative ER and PgR status.

12% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 44% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy. 81% of the 464 ER negative, node negative invasive cancers with chemotherapy recorded were Grade III and 33% were HER-2 positive. Older women with ER negative, node positive or node negative invasive cancers were less likely to have chemotherapy recorded than younger women. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit the ER negative, node positive invasive cancers with no chemotherapy recorded to

determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

539 (43%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 14% of these cases were greater than 20mm in diameter, 31% were Grade III, 10% were node positive and 40% were in the MPG1, MPG2 or PPG groups. In 5 screening units, all HER-2 positive invasive cancers had chemotherapy recorded, whilst in 11 units more than 70% of these cancers had no chemotherapy recorded. Given that Trastuzumab is only usually prescribed for HER-2 positive patients who have already received chemotherapy, regional QA reference centres and regional surgical QA co-ordinators should audit HER-2 positive cases with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

SURVIVAL

Of the 10,680 cancers submitted to the survival analysis for the period 1 April 2002 to 31 March 2003, 208 (2%) were excluded because they were not registered at the cancer registries. A further 181 cancers (2%) were excluded because they were not confirmed to be primary tumours and 39 because their invasive status was not known.

5-year relative survival for women with invasive cancers diagnosed in 2002/03 was 97.1% (95% CI 96.5%-97.7%). This varied from 92.5% in Northern Ireland to 98.5% in South East Coast. However, there is no significant difference between the 5-year relative survival rates in each region. 5-year relative survival for women with screen-detected invasive breast cancer has improved significantly from 95.4% in 1996/97 to 97.1% in 2002/03.

The 5-year relative survival of women with less than 15mm diameter cancers was 100% (95% CI 99.4%-100.7%) compared with a 5-year relative survival rate of 84.5% (95% CI 77.1%-92.0%) for women with tumours with a diameter greater than 50mm. At 101.2% (95% CI 100.5%-101.9%), the 5-year relative survival rate was significantly higher for women with Grade I cancers (33% of the cohort) compared with women with Grade III cancers (16% of the cohort) whose 5-year relative survival was 89.3% (95% CI 87.2%-91.3%). At 99.3% (95% CI 98.7%-99.9%), the 5-year relative survival for women with node negative cancers (72% of the cohort) was higher than for the women with node positive cancers (24% of the cohort) whose 5-year relative survival was 91.5% (95% CI 89.9%-93.0%).

The 5-year relative survival rates in 2002/03 for women with cancers in the excellent prognostic group (EPG) and good prognostic group (GPG) were 101.8% (95% CI 101.1%-102.5%) and 100% (95% CI 99.2%-100.9%) respectively. At 96.4% (95% CI 95.1%-97.7%), the 5-year relative survival rate for the 22% of women with cancers in the moderate prognostic group 1 (MPG1) was significantly worse than that of women with cancers in the EPG and GPG groups. The 5-year relative survival rates for women with the 9% of cancers in the moderate prognostic group 2 (MPG2) and the 5% of women with cancers in the poor prognostic group (PPG) were even lower at 89.7% (95% CI 87.0%-92.3%) and 77.7% (95% CI 73.3%-82.0%) respectively.

TOPICS TO BE AUDITED BY REGIONAL QA REFERENCE CENTRES

Topic	Region/unit (Number of cases affected)	Reference
High proportion of cases diagnosed with cytology alone	NI, NW	Ch2 P.21
Low non-operative diagnosis rate for invasive cancers	5 screening units	Ch2 P.22
Low non-operative diagnosis rate for non-invasive cancers	All regions	Ch2 P.24
Ascertain the reason for the use of the B5c code	All regions	Ch2 P.25
B5a cancers which become invasive after surgery	London, SC, WM	Ch2 P.26
C5 only diagnosis found to be not invasive at surgery	All (20 cases)	Ch2 P.27
Low proportion of cases diagnosed in 1 visit	16 screening units	Ch2 P.28
High benign open biopsy rates	London, SEC	Ch2 P.29
False positive cytology and core biopsy cases	All (12 cases)	Ch2 P.30
Mastectomy as diagnostic open biopsy	All (9 cases)	Ch2 P.31
No non-operative diagnosis attempted	All (25 cases)	Ch2 P.31
High proportion of C4 and/or B4 cytology/core biopsy diagnosis prior to open biopsy	NW, SW, WM	Ch2 P.31
Large non-invasive cancers with conservation surgery	All (72 cases)	Ch3 P.36
Unknown size/grade for non-invasive cancers	All (232 cases)	Ch3 P.37
Large and high/unknown grade non-invasive cancers treated with conservation surgery	All (140 cases)	Ch3 P.38
No surgery or unknown treatment for invasive cancers	All (236 cases)	Ch3 P.39
Unknown invasive whole size information	All (291 cases)	Ch3 P.41
Mastectomy rate for small invasive cancers	10 screening units	Ch3 P.42
Availability of ER status for all invasive cancers	All regions	Ch5 P.48 & Ch8 P.87
Availability of HER-2 data for all invasive cancers	All regions	Ch5 P.48 & Ch8 P.88
Nodal status data unknown for invasive cancers	London (2 screening units)	Ch5 P.50
Less than 4 nodes obtained without/unknown SLNB	19 screening units	Ch5 P.52
Positive nodal status determined by less than 4 nodes and no sentinel lymph node procedure	All (149 cases)	Ch5 P.53
Insufficient nodal information (includes invasive cancers with no lymph nodes taken in surgery)	All (682 cases)	Ch5 P.55
>10 nodes taken for non-invasive cancers	All regions	Ch5 P.57
Interpretation of invasive grade definition	All regions	Ch5 P.60
Significant variance in proportion of cancers in NPI groups	All regions	Ch5 P.61
Satisfactory treatment for low screening caseload surgeons	EoE, London, Scotland	Ch6 P.65
More than 3 therapeutic operations	17 cases	Ch7 P.67
High/low repeat operation for conservation surgery or mastectomy	36 surgeons	Ch7 P.67
Mastectomy carried out on C5 invasive cancers	All (77 cases)	Ch7 P.76
Invasive cancers with no surgery to the axilla	All regions	Ch7 P.81
High repeat operation rates to the axilla without SLNB/unknown nodal procedure type	All regions	Ch7 P.82

Topic	Region/unit (Number of cases affected)	Reference
Small, low grade with no abnormal lymph nodes invasive cancers with neo-adjuvant chemotherapy	8 cases	Ch7 P.85
Non-invasive cancers with chemotherapy recorded	14 cases	Ch8 P.89
Invasive cancers with no surgery and chemotherapy recorded	39 cases	Ch8 P.89
Radiotherapy waiting time (over 200 days after final surgery)	All (59 cases)	Ch8 P.90
No radiotherapy recorded for conservatively treated invasive cancers	548 cases	Ch8 P.95
Ascertain units policy regarding the provision of radiotherapy to conservatively treated non-invasive cancers	All regions	Ch8 P.95
No chemotherapy for Grade III and/or HER-2 positive, node positive invasive cancers	All regions	Ch8 P.96
No hormone therapy for ER positive cancers	EoE	Ch8 P.98
No hormone therapy for ER negative, PgR positive invasive cancers	All (25 cases)	Ch8 P.98
Hormone therapy given to cancers with ER negative or unknown	All (179 cases)	Ch8 P.98
ER negative, node positive invasive cancers without chemotherapy	All (33 cases)	Ch8 P.101
HER-2 positive invasive cases without chemotherapy	All (539 cases)	Ch8 P.102

CHAPTER 1
BREAST CANCERS DETECTED BY THE UK NHSBSP

1.1 Number and Invasive Status of Screen-Detected Breast Cancers and Total Women Screened

The 2008/09 UK NHSBSP audit examines surgical activity undertaken for the 2,116,588 women screened in England, Wales, Northern Ireland and Scotland between 1 April 2008 and 31 March 2009. 17,045 cancers were detected in women of all ages which equates to a cancer detection rate of 8.1 cancers per 1,000 women screened. This varied from 7.5 per 1,000 women screened in South West and North West to 9.3 per 1,000 women screened in Wales. Overall, 13,532 (79%) were invasive, 3,351 (20%) non-invasive and 140 (1%) micro-invasive. The invasive status of 22 cancers was unknown. The Isle of Man submitted data to the UK NHSBSP audit for the first time in 2008/09. In total, 29 cancers were detected. 26 (90%) were invasive and 3 (10%) were non-invasive. Due to the small numbers and the difficulties this presents when broken down into subgroups, data for the Isle of Man have only been included in Chapter 1.

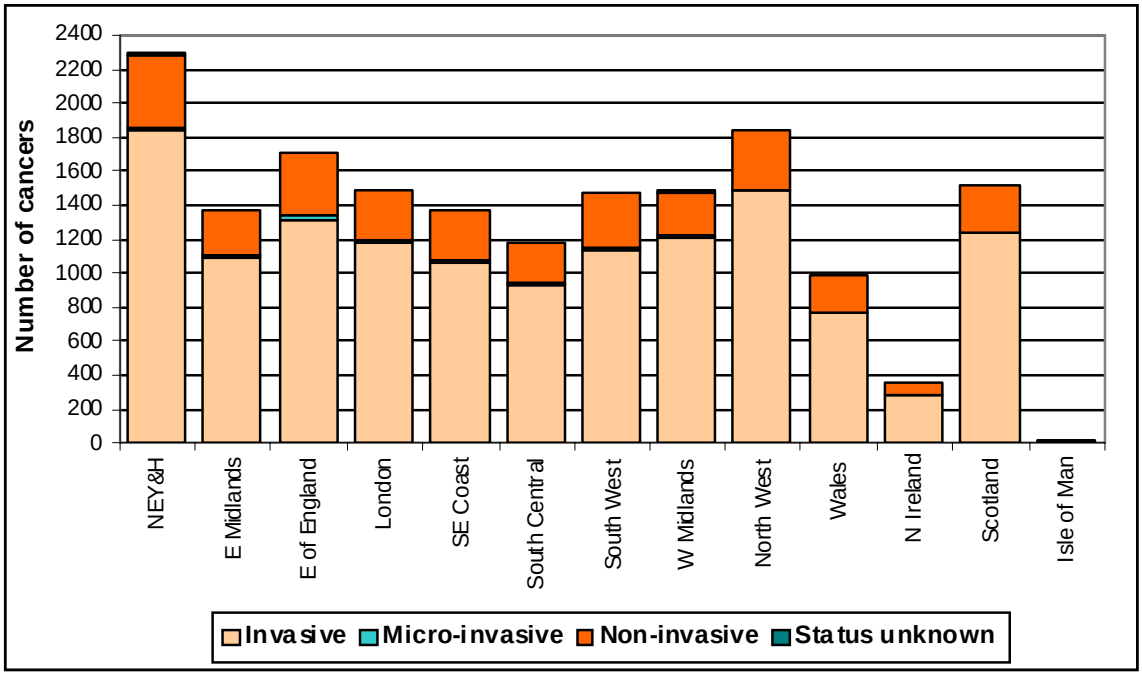

Figure 1 (Table 1): Variation in the number and invasive status of screen-detected breast cancers in each region and country contributing to the 2008/09 NHSBSP audit

In 2008/09, the UK invasive cancer detection rate was 6.4 per 1,000 women screened; varying between 5.9 per 1,000 women screened in South West and 7.2 per 1,000 women screened in Wales. The invasive cancer detection rate in South West has fallen from 6.4 per 1,000 women screened in 2007/08 to 5.9 per 1,000 women screened in 2008/09. 92 fewer invasive cancers were diagnosed in 2008/09 when 1,135 more women were screened. In South Central, the invasive cancer detection rate has fallen from 6.7 per 1,000 women screened in 2007/08 to 6.1 per 1,000 women screened in 2008/09. Only 3 more invasive cancers were diagnosed in 2008/09 when 12,905 more women were screened.

The UK cancer detection rate for non-invasive and micro-invasive cancers was 1.6 per 1,000 women screened. This rate varied from 1.4 per 1,000 women screened in West Midlands to 2.1 per 1,000 women screened in Wales. For small invasive cancers (<15mm in diameter), the UK detection rate was 3.3 per 1,000 women screened; varying between 2.7 per 1,000 women screened in Northern

Ireland and 3.8 per 1,000 women screened in East Midlands and Wales. In the Isle of Man, the non-invasive and micro-invasive cancer detection rate was lower than the UK average at 0.7 per 1,000 women screened and the small invasive cancer detection rate was higher at 5.0 per 1,000 women screened.

The following summary table shows that the number of women screened each year has risen by more than 537,000 since 2002/03 when the NHSBSP started to invite women up to 70 years of age. The age expansion and the introduction of two-view mammography has had a marked effect on the number of cancers detected; with 5,452 more cancers diagnosed in 2008/09 compared with 2002/03. After a gradual increase from 2002/03 to 2005/06, the cancer detection rate in 2006/07 showed little change. However, in the 3 most recent years, detection rates have continued to rise.

13 YEAR COMPARISON: NUMBER OF CANCERS DETECTED

Year of data collection	Number of invasive cancers	Number of non-invasive and micro-invasive cancers	Total cancers	Number of women screened	Cancer detection rates per 1,000 women screened		
					Invasive	Non-invasive	Total
1996/97	5,860	1,468	7,410	1,340,175	4.4	1.1	5.5
1997/98	6,427	1,726	8,215	1,419,287	4.5	1.2	5.8
1998/99*	6,337	1,634	8,028	1,308,751	4.7	1.2	6.1
1999/00	7,675	2,076	9,797	1,550,285	5.0	1.3	6.3
2000/01	7,945	2,080	10,079	1,535,019	5.2	1.4	6.6
2001/02	7,911	2,218	10,191	1,507,987	5.2	1.5	6.8
2002/03	8,931	2,416	11,593	1,579,165	5.7	1.6	7.3
2003/04	10,400	2,868	13,290	1,685,661	6.2	1.7	7.9
2004/05	11,063	2,953	14,040	1,748,997	6.3	1.7	8.0
2005/06	12,600	3,317	15,944	1,942,449	6.5	1.7	8.2
2006/07	12,491	3,337	15,856	1,955,825	6.4	1.7	8.1
2007/08	13,305	3,466	16,792	2,042,497	6.5	1.7	8.2
2008/09**	13,532	3,491	17,045	2,116,588	6.4	1.6	8.1

* Data from Scotland are absent in 1998/99
** Isle of Man figures not included

95 screening units in the UK were included in the 2008/09 audit. The number of women screened varied from 6,451 women in a screening unit in South Central (where 57 cancers were detected) to 60,362 women in a screening unit in Scotland (where 518 cancers were detected).

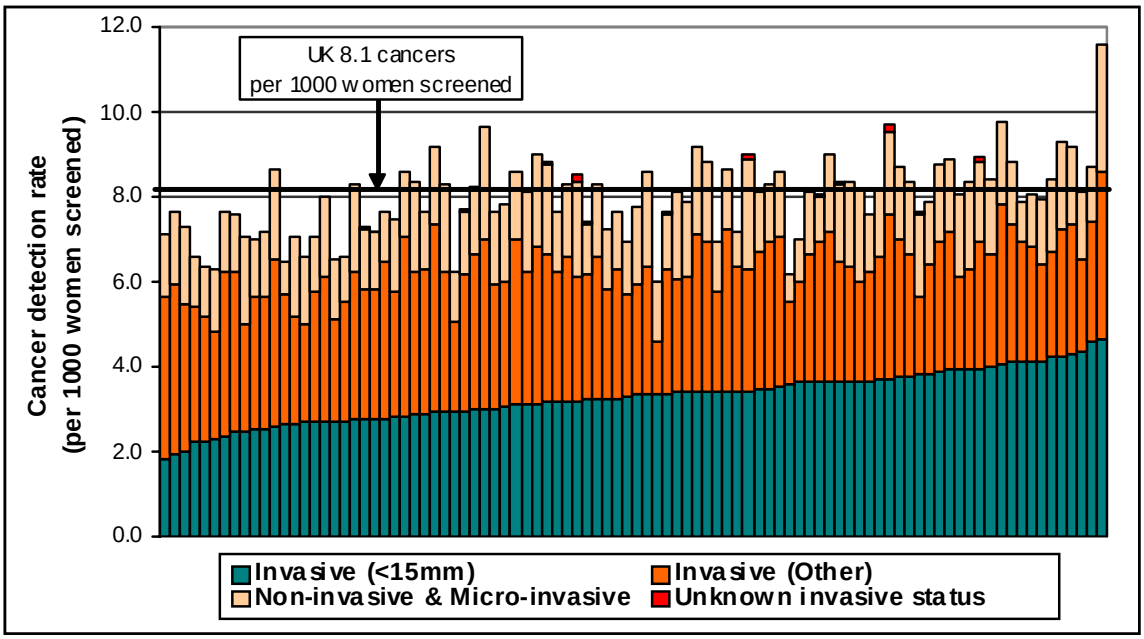

Figure 2: Variation with screening unit in the overall cancer detection rate expressed as the number of cancers detected per 1,000 women screened

Figure 2 shows how the cancer detection rates in each screening unit varied according to invasive status. The Invasive (Other) bars include invasive cancers with size larger than or equal to 15mm or with size unknown. The overall cancer detection rate varied from 6.0 per 1,000 women screened in a unit screening 8,669 women to 11.6 per 1,000 women screened in a unit screening 9,244 women annually.

1.2 Age Profile of Women with Screen-Detected Breast Cancer

The following summary table shows the effect of the age expansion in the past 7 years. In 2008/09, 67% of women with a screen-detected breast cancer were aged between 50 and 64 when they were invited for the screening appointment leading to their diagnosis. The proportion of cancers diagnosed in women aged 65 to 70 increased from 13% in 2002/03 prior to the roll out of the age expansion and levelled off at 27% between 2005/06 and 2007/08. In 2008/09, when most of screening services had completed the first round of screening for the extended population, there was a slight decrease, with 25% of cancers being diagnosed in women aged 65-70. In 2008/09, 4% of cancers were detected in women aged 71-75.

AGE DISTRIBUTION OF SCREEN-DETECTED BREAST CANCERS (%)

Age	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
<50	2	2	2	1	1	2	**2**
50-52	17	15	14	13	13	13	**13**
53-55	16	13	12	11	10	10	**10**
56-58	16	17	16	14	13	12	**12**
59-61	16	16	16	15	15	16	**16**
62-64	16	14	14	14	14	14	**16**
65-67	7	10	11	14	13	14	**13**
68-70	6	8	10	13	14	13	**12**
70+	4	5	5	6	6	6	**6**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
65+	17	23	26	33	33	33	31

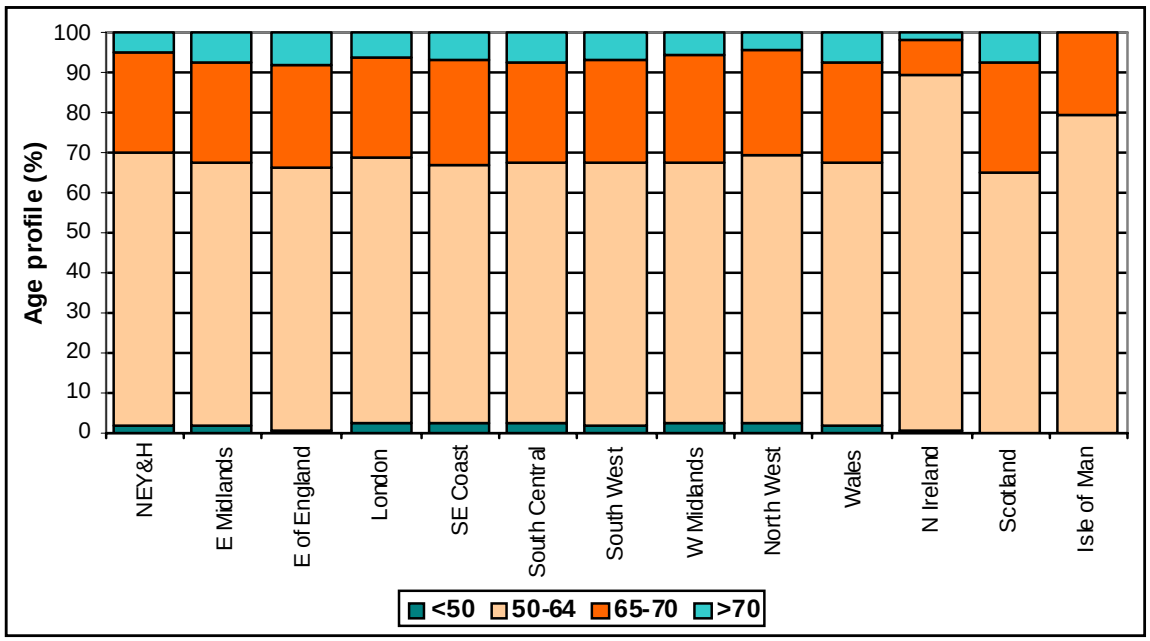

Figure 3 (Table 2): Age at screening appointment

At the start of the 2008/09 audit period, the expansion of the NHSBSP to include women aged 50-70 had been rolled out in England, Wales and Scotland but not in Northern Ireland. These changes are reflected in Figure 3 in the proportion of breast cancers detected in women aged 65-70, which ranged from 9% in Northern Ireland to 27% in South East Coast, West Midlands, North West and Scotland. The change in England in the eligible population from 50-70 years to 47-73 years that was announced

in the Cancer Reform Strategy (2008) had also started to affect the age profile of screen-detected breast cancers in the regions (London, North West and West Midlands) containing the 3 pilot sites which started the age expansion in January 2009. During the 2008/09 audit period, only women aged 47-49 years were invited as MREC approval for randomisation was still being sought.

COMMENTS:

- 2,116,588 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2008 and 31 March 2009.
- 17,045 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.1 cancers per 1,000 women screened.
- Overall, 79% of screen-detected breast cancers were invasive, 20% non-invasive and 1% micro-invasive. The invasive status of 22 cancers was unknown.
- 67% of women with a screen-detected breast cancer were aged between 50 and 64 when they were invited to attend the screening appointment leading to their diagnosis.
- 25% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75.
- The Isle of Man submitted data to the UK NHSBSP audit for the first time in 2008/09. 29 breast cancers were detected, 26 were invasive and 3 were non-invasive.

CHAPTER 2
DIAGNOSIS

2.1 Non-operative Diagnosis

The following are mutually exclusive diagnostic categories into which all screen-detected breast cancers fall:

DIAGNOSTIC CATEGORIES		
Non-operative diagnosis by C5 cytology or malignant core biopsy (B5)	Malignant open biopsy	Clinical and/or radiological grounds only, referred direct to non-surgical treatment

The UK NHSBSP definition of a non-operative diagnosis is a diagnosis by C5 cytology or B5 core biopsy. Other than cancers diagnosed by diagnostic open biopsy, the only remaining diagnostic category is that of diagnosis on radiological and/or clinical grounds alone. Such cancers are rare in the UK NHSBSP; there being only 5 in 2008/09. These cancers are included only in Table 3.

In 2008/09, 95% of cancers detected in the UK NHSBSP were diagnosed non-operatively. Figure 4 shows the non-operative diagnosis rate by C5 cytology, both C5 cytology and B5 core biopsy and B5 core biopsy alone. In Northern Ireland, Scotland and North East, Yorkshire & Humber, relatively high proportions of cancers were diagnosed by C5 cytology and B5 core biopsy (22%, 14% and 11% respectively). In one unit in Scotland, 67% of cancers were diagnosed by C5 cytology and B5 core biopsy. In two units in North East, Yorkshire & Humber and two units in Northern Ireland between 41% and 59% of cancers were diagnosed by C5 cytology and B5 core biopsy.

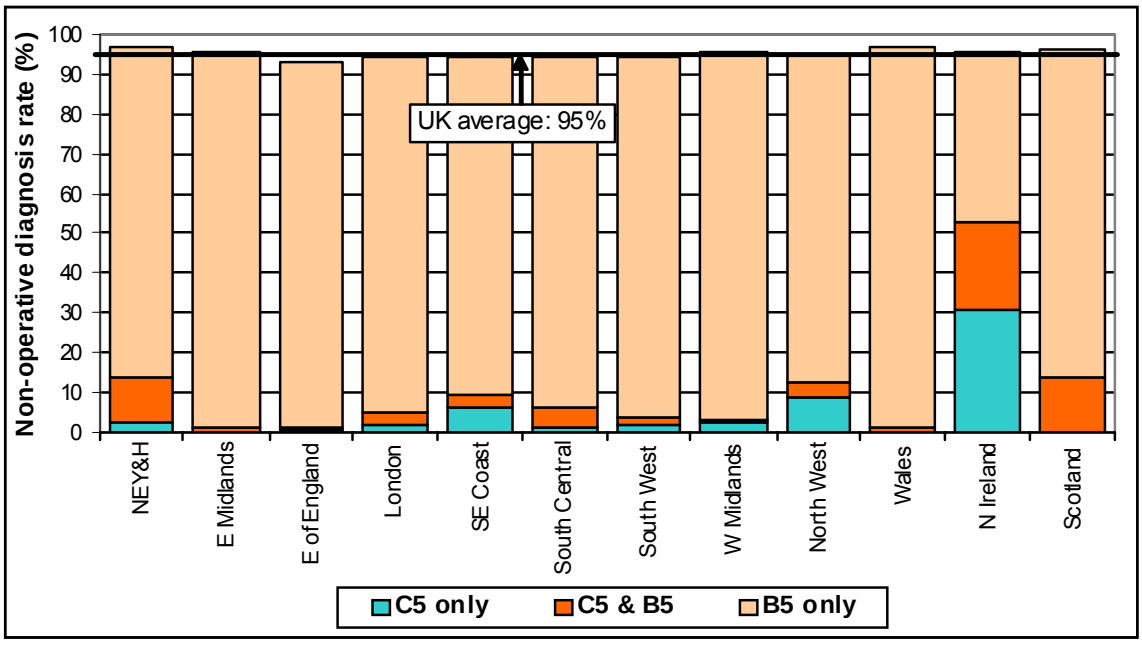

Figure 4 (Table 4): Variation in non-operative diagnosis rate and the proportion of cancers detected by cytology alone, core biopsy alone or cytology and core biopsy as a percentage of cancers detected

Northern Ireland had the highest proportion (31%) of cancers diagnosed by C5 cytology only. In one unit in Northern Ireland, 68% of cancers were diagnosed by C5 cytology only and in two units in North West, 56% and 45% of cancers were diagnosed by C5 cytology only. These figures are not substantially different to those seen in 2007/08. Regional QA reference centres should investigate why C5 cytology alone was still being used to diagnose such a high proportion of cancers in these units in 2008/09. *NHS Clinical Guidelines of Breast Cancer Screening Assessment* published in January

2005 state that core biopsy provides better sensitivity and specificity that FNA and facilitates definitive diagnosis of benign lesions. The preferred use of core biopsy will also be recommended in the *Best Practice Diagnostic Guidelines for Patients presenting with Breast Symptoms* that are to be published in 2010.

The following summary table shows that over the last 13 years the non-operative diagnosis rate for the UK as a whole has risen from 63% to 95%. This rise has been accompanied by an increase from 17% to 87% in the proportion of cancers diagnosed by B5 core biopsy alone.

13 YEAR COMPARISON: NON-OPERATIVE DIAGNOSIS RATES

Year of data collection	*Total cancers*	*Number of cancers with C5 and/or B5*	*% with non-operative diagnosis by*				*Non-operative diagnosis rate (%)*
			C5 only	*C5 and B5*	*C5 (+/- B5)*	*B5 only (no C5)*	
1996/97	*7,310*	*4,576*	*-*	*-*	*45*	*17*	*63*
1997/98	*8,215*	*5,866*	*-*	*-*	*42*	*29*	*71*
*1998/99**	*8,002*	*6,449*	*-*	*-*	*36*	*44*	*81*
*1999/00**	*8,906*	*7,590*	*-*	*-*	*31*	*54*	*85*
2000/01	*10,079*	*8,775*	*19*	*8*	*-*	*60*	*87*
2001/02	*10,191*	*9,043*	*13*	*9*	*-*	*66*	*89*
2002/03	*11,593*	*10,575*	*10*	*8*	*-*	*73*	*91*
2003/04	*13,290*	*12,338*	*8*	*7*	*-*	*77*	*93*
*2004/05**	*13,783*	*12,856*	*7*	*6*	*-*	*80*	*93*
2005/06	*15,944*	*15,000*	*5*	*6*	*-*	*83*	*94*
2006/07	*15,856*	*14,968*	*4*	*6*	*-*	*84*	*94*
2007/08	*16,792*	*15,977*	*4*	*5*	*-*	*86*	*95*
2008/09	*17,045*	*16,243*	*3*	*5*	*-*	*87*	*95*

*Data from Scotland are absent in 1998/99 and 1999/00. 275 cancers from East of England are absent in 2004/05

2.1.1 Non-operative Diagnosis Rates for Invasive Cancers

Quality Objective	**To minimise unnecessary surgery (i.e. diagnostic open surgical biopsies that prove to be malignant)**
Minimum Standard	**90% of all invasive cancers should have a non-operative pathological diagnosis**
Target Standard	**95% of all invasive cancers should have a non-operative pathological diagnosis**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

In the UK as a whole, the non-operative diagnosis rate for invasive cancers was 98% and only 265 invasive cancers did not have a non-operative diagnosis (Table 5).

Figure 5 shows the variation between screening units in the proportion of invasive cancers with a non-operative diagnosis. All units met the 90% minimum standard. 12 units achieved a 100% non-operative diagnosis rate for invasive cancers. Only 5 screening units failed to meet the 95% target, one unit in North West (94%), two in East of England (94% and 94.7%), one in West Midlands (94%) and one in South West (93%). Only one of these units was small (one of the 20 units with the lowest numbers of women screened), and in one of the units 14% of cancers were diagnosed by C5 cytology alone. Regional QA reference centres should investigate why these units failed to meet the target for the non-operative diagnosis of invasive cancers.

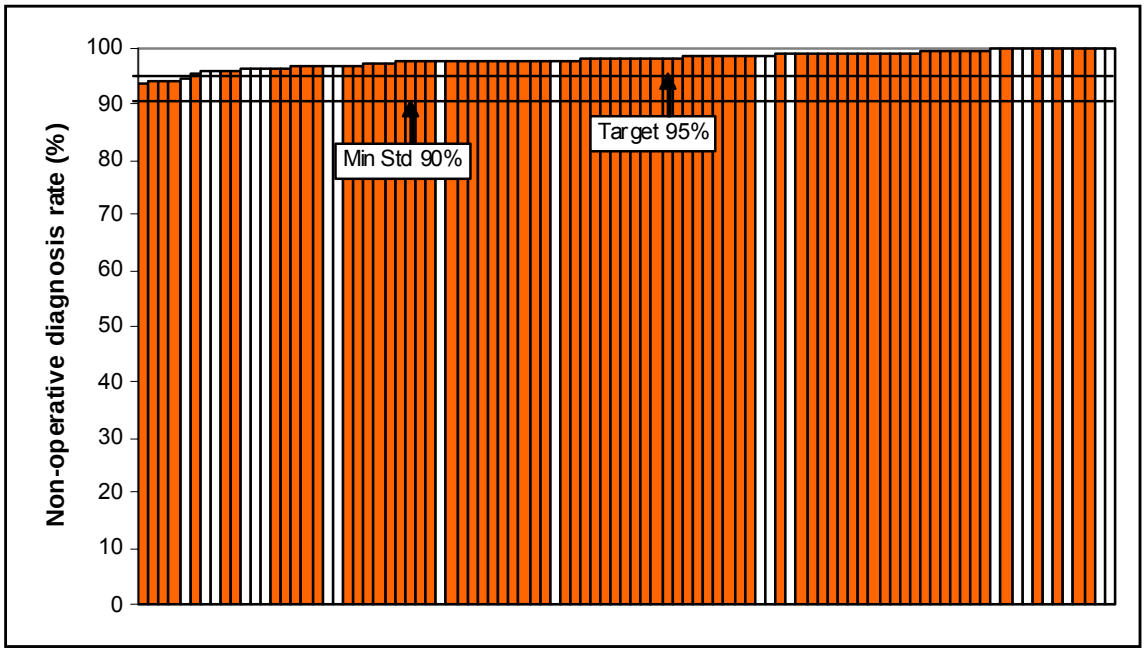

Figure 5: Variation in the proportion of invasive cancers with a non-operative diagnosis (The 20 smallest units are highlighted in white)

2.1.2 Non-operative Diagnosis Rates for Non-invasive Cancers

Quality Objective	**To minimise unnecessary surgery (i.e. diagnostic open surgical biopsies that prove to be malignant)**
Minimum Standard	**85% of all non-invasive cancers should have a non-operative pathological diagnosis**
Target Standard	**90% of all non-invasive cancers should have a non-operative pathological diagnosis**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

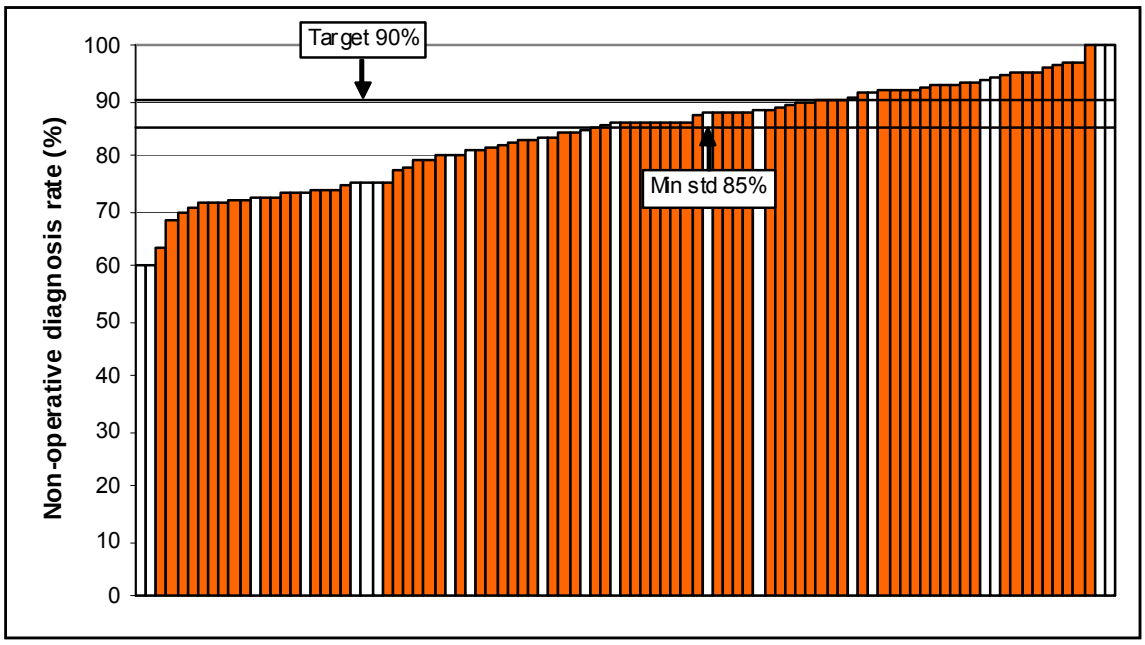

Figure 6: Variation in the proportion of non-invasive cancers with a non-operative diagnosis (The 20 smallest units are highlighted in white)

In 2008/09, the non-operative diagnosis rate for non-invasive cancers was 84%. 525 non-invasive cancers did not have a non-operative diagnosis (Table 6). The proportion of non-invasive cancers

without a non-operative diagnosis varied from 9% in Wales to 21% in East of England. Figure 6 shows the variation between screening units in the proportion of non-invasive cancers with a non-operative diagnosis. Only 29 screening units achieved the 90% non-operative diagnosis target for non-invasive cancers. Of the three units with a non-operative diagnosis rate for non-invasive cancers of 100%, one had 6 non-invasive cancers in the audit period and two had 11 non-invasive cancers.

44 units failed to meet the 85% minimum standard for the non-operative diagnosis of non-invasive breast cancers. This is a slight improvement from the 48 units failing to meet the standard in 2007/08. However, 24 units have failed to meet the standard for the whole of the 3-year period 2006/07-2008/09. The lowest proportion of non-invasive cancers with a non-operative diagnosis in 2008/09 (60%) was recorded in two small screening units in East of England and South Central. These units had non-operative diagnosis rates of 75% and 67% over the 3-year period 2006/07-2008/09. Interestingly, the four units with a non-operative diagnosis rate for non-invasive cancers below 70% in 2008/09 all achieved non-operative diagnosis rates of 95% or above for invasive cancers. However, the two units in North West with high usage of C5 cytology alone (56% and 45%) achieved non-operative diagnosis rates for non-invasive cancers of only 70% and 72% respectively (82% and 74% over the 3-year period 2006/07-2008/09). The unit in Northern Ireland where 68% of cancers were diagnosed by C5 cytology only, had a non-operative diagnosis rate for non-invasive cancers of 83%, just below the minimum standard. Regional QA reference centres should investigate why screening units in their regions failed to meet the 85% minimum standard for the non-operative diagnosis of non-invasive cancers.

The following summary table shows how the non-operative diagnosis rate for non-invasive cancers has changed over the last three audit periods. The non-operative diagnosis rate for non-invasive cancers is less consistent than that for invasive cancers. South Central, Scotland and North West have seen 9%, 7% and 6% increases, while the remaining regions show little change over the three year period. Cancers diagnosed by C5 cytology only have, in most regions decreased over time with the exception of Northern Ireland where the rate has increased from 0% to 4%.

3 YEAR SUMMARY: NON-OPERATIVE DIAGNOSIS RATES

	Non-operative diagnosis rate (%)				***Cancer diagnosed by C5 only (%)***			
Region	***2006/07***	***2007/08***	***2008/09***	***3 Year 2006-09***	***2006/07***	***2007/08***	***2008/09***	***3 Year 2006-09***
N East, Yorks & Humber	*88*	*88*	*90*	*89*	*1*	*1*	*0*	*1*
East Midlands	*85*	*86*	*85*	*85*	*0*	*0*	*0*	*0*
East of England	*79*	*79*	*79*	*79*	*0*	*0*	*0*	*0*
London	*79*	*83*	*82*	*81*	*1*	*0*	*0*	*1*
South East Coast	*80*	*81*	*81*	*81*	*0*	*1*	*0*	*0*
South Central	*75*	*74*	*84*	*78*	*0*	*0*	*0*	*0*
South West	*79*	*78*	*83*	*80*	*1*	*1*	*0*	*1*
West Midlands	*85*	*82*	*84*	*84*	*0*	*0*	*0*	*0*
North West	*78*	*85*	*84*	*82*	*1*	*1*	*1*	*1*
Wales	*90*	*89*	*91*	*90*	*0*	*0*	*0*	*0*
Northern Ireland	*78*	*82*	*82*	*81*	*0*	*1*	*4*	*2*
Scotland	*80*	*86*	*87*	*84*	*1*	*1*	*1*	*1*
United Kingdom	***81***	***83***	***84***	***83***	***1***	***1***	***0***	***1***

COMMENTS:

- In 2008/09, 95% of cancers detected in the UK NHSBSP were diagnosed non-operatively.
- The proportion of cancers diagnosed by C5 cytology alone has fallen from 19% in 2000/01 to 3% in 2008/09. Northern Ireland had the highest proportion (31%) of cancers diagnosed by C5 cytology only in 2008/09. In one unit in Northern Ireland and two units in North West, there were relatively high proportions of cancers diagnosed by C5 cytology only. Regional QA reference centres should investigate why C5 cytology alone is still being used to diagnose such a high proportion of cancers in these units.

COMMENTS:

- The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 84% respectively.
- Only 5 units failed to meet the 95% target for the non-operative diagnosis of invasive cancers. Regional QA reference centres should investigate why units in their regions failed to meet the 95% target for the non-operative diagnosis of invasive cancers.
- The proportion of non-invasive cancers without a non-operative diagnosis varied from 9% in Wales to 21% in East of England. 44 units failed to meet the new 85% minimum standard for the non-operative diagnosis of non-invasive cancers. 24 units have failed to meet the standard for the whole of the 3-year period 2006/07-2008/09. Regional QA reference centres should investigate the screening units in their regions which failed to meet the minimum standard.

2.1.3 Invasive Status at Core Biopsy

Screening units were asked to supply the invasive status predicted at core biopsy for those cancers with a B5 diagnosis. Of the 15,675 cancers with a B5 diagnosis, 3,639 (23%) were B5a (Non-invasive), 11,938 (76%) were B5b (Invasive) and 98 cancers (1%) had invasive status B5c (Micro-invasive, Not Assessable or Unknown) at core biopsy. Of the latter cancers, 27 were in North East, Yorkshire & Humber. All regional QA reference centres should review their B5c cases to ascertain the reason for the use of this code.

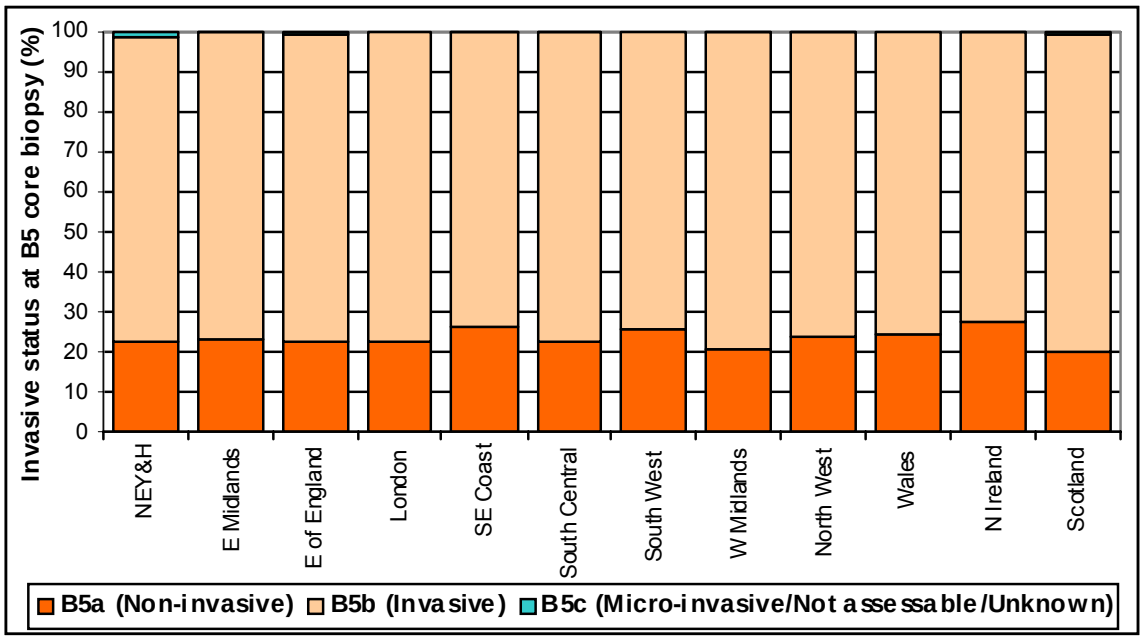

Figure 7 (Table 7): Variation in the proportion of cancers with B5a (Non-invasive), B5b (Invasive) and B5c (Micro-invasive, Not Assessable or Unknown) core biopsy, expressed as a percentage of cancers diagnosed by core biopsy

2.1.4 Invasive Status at Core Biopsy Compared with Invasive Status of Surgical Specimen

The majority of cancers diagnosed by core biopsy go on to have surgery, at which a definitive invasive status is determined. 39 of the 3,639 cancers with a B5a (Non-invasive) non-operative diagnosis had no surgery and 2 cases had unknown surgical treatment, so the non-operative diagnosis of non-invasive cancer was retained. Of the remaining 3,598 cases, 2,665 (74%) had surgical confirmation of non-invasive cancer and 119 (3%) had a diagnosis of micro-invasive cancer at surgery. For 748 (21%) cancers, invasive disease was found at surgery. This varied from 11% in Wales to 24% in South West and West Midlands.

For 61 (2%) cases, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of non-invasive cancer had been reported in the non-operative core biopsy. These cases are shown as “Non-invasive - biopsy only” in Figure 8. For a further 5 cases, the histological status after surgery was unknown. The proportion of cancers with B5a non-operative diagnosis which are confirmed as invasive after surgery has decreased markedly in Wales (from 24%

to 11%) and in Northern Ireland (from 21% to 12%) since 2007/08. In 2008/09 screening units in Northern Ireland started to obtain more tissue by taking more cores from areas of micro-calcification and the use of vacuum assisted biopsy equipment.

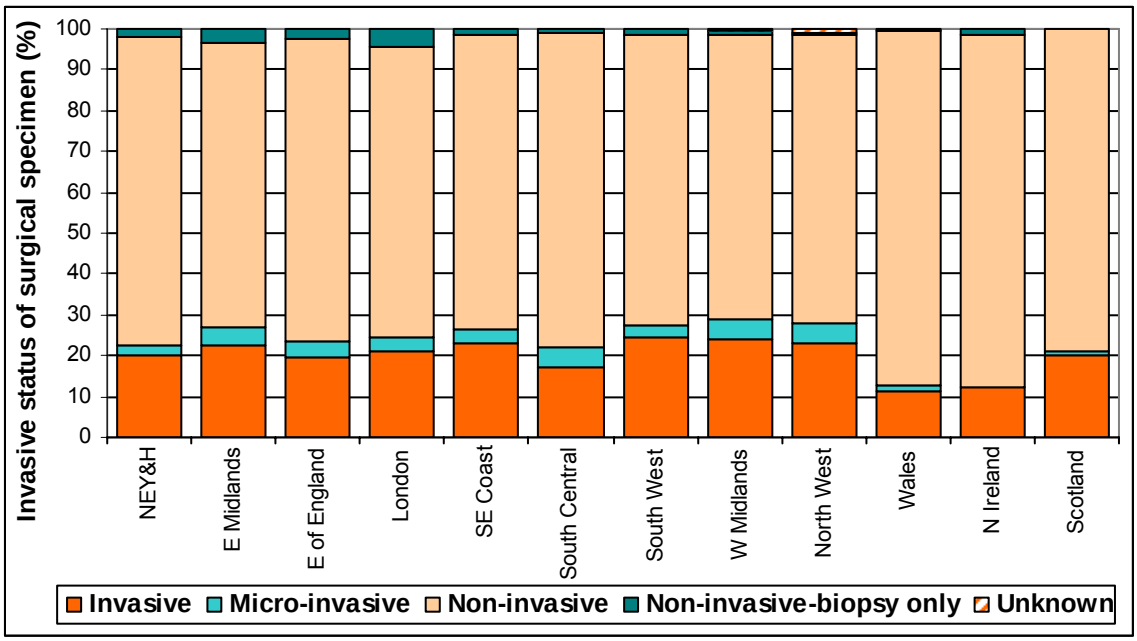

Figure 8 (Table 8): Variation in the invasive status at surgery of cases with a B5a (Non-invasive) non-operative diagnosis, expressed as a percentage of cancers diagnosed as B5a (Non-invasive)

Figure 9 shows the unit variation on the proportion of cancers with B5a (Non-invasive) diagnosis but later found to have invasive component in the surgical specimen, expressed as a percentage of cancers diagnosed as B5a (Non-invasive). The majority (68%) of these under-diagnosed cancers had an invasive size less than 10mm. The dashed lines in Figure 9 are the upper and lower control limits which approximate to the 95% confidence intervals of the average rate (solid line). In the 3 screening units (open orange diamonds) which are outside the upper control limit and have rates significantly higher than the average rate of 21%, 76% of the cases had an invasive size less than 10mm. This suggests that many of the original mammographic abnormalities may have been areas of micro-calcified DCIS with a small invasive component within a large area of non-invasive disease. Regional QA reference centres should carry out audits with these three screening units to confirm the reasons for the unusually high proportion of B5a (Non-invasive) cancers found to be invasive at surgery.

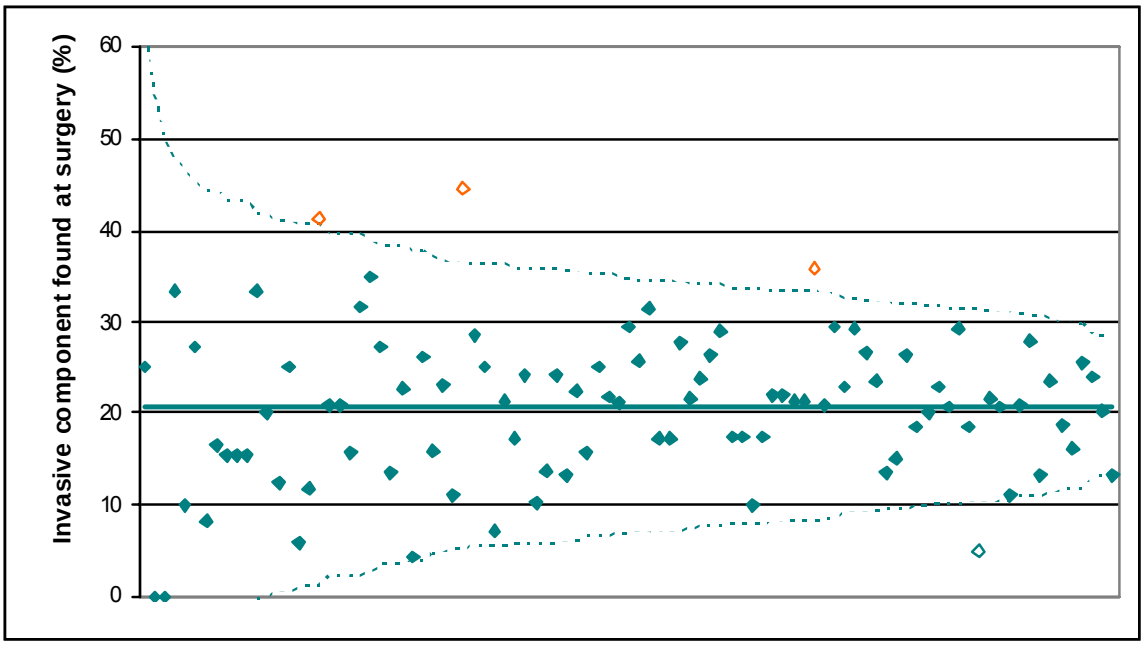

Figure 9: Variation with screening unit in the proportion of cancers with a B5a (Non-invasive) non-operative diagnosis found to be invasive at surgery (open diamonds represent units which lie outside the control limits)

Of the 11,938 cases with a B5b (Invasive) non-operative diagnosis, 235 had no surgery and 1 had unknown surgical treatment. In the UK as a whole, 99% (11,571 cases) of the remaining 11,702 cases had surgical confirmation of invasive cancer (Table 9). 86 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive (68 cases) or micro-invasive cancer (18 cases) with no associated invasive disease in the surgical specimen. Explanations provided for these cases included that the invasive tumour had been completely excised in the core or that the patient had received neo-adjuvant chemotherapy. For 26 cases no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the non-operative core biopsy. These cases are referred to as "Invasive - biopsy only". A further 19 cases had unknown histological status after surgery.

9 YEAR COMPARISON: INVASIVE STATUS FOLLOWING CORE BIOPSY

Year of data collection	B5a (Non-invasive)			B5b (Invasive)		
	Total with surgery	Not non-invasive at surgery*		Total with surgery	Not invasive at surgery**	
		No.	%		No.	%
2000/01	1,660	482	29	5,026	63	1.3
2001/02	1,881	542	29	5,405	45	0.8
2002/03	2,274	635	28	6,743	69	1.0
2003/04	2,748	717	26	8,357	95	1.4
2004/05	2,750	666	24	8,999	46	0.5
2005/06	3,267	838	26	10,685	60	0.6
2006/07	3,351	895	27	10,569	85	0.8
2007/08	3,590	967	27	11,312	105	0.9
2008/09	3,598	933	26	11,702	131	1.1

*Not non-invasive includes invasive, micro-invasive, "non-invasive - biopsy only" and unknown invasive status
**Not invasive at surgery includes non-invasive, micro-invasive, "invasive - biopsy only" and unknown invasive status

The preceding summary table shows that the proportion of cancers that had a B5a (Non-invasive) non-operative diagnosis but which were found to be "invasive - biopsy only", micro-invasive or invasive after surgery has fallen by 3% in the past 9 years (from 29% to 26%). The proportion of cases with a B5b (Invasive) core biopsy which were not confirmed to be invasive following surgery has varied between 1.4% and 0.5% during the last 9 years.

2.1.5 Invasive Status of Cancers Diagnosed by C5 Cytology Only

568 cancers were diagnosed by C5 cytology alone. 12 of these cancers had no surgery. 96% of the 556 cancers diagnosed by C5 cytology alone which received surgical treatment were invasive. This varied between 0 cases in Wales and 100% in East Midlands (6 cases) and London (25 cases) (Table 10). 15 cancers (3%) diagnosed by C5 cytology alone were non-invasive and 4 were micro-invasive. 1 case was found to be "malignant - cytology only" at surgery. Regional QA reference centres should audit the 20 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or "malignant - cytology only" at surgery.

COMMENTS:

- For 21% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. For 3 screening units in London, the West Midlands and the South West, the proportion of cancers with B5a (Non-invasive) diagnosis later found to have an invasive component was significantly higher than the average rate of 21%. Regional QA reference centres should carry out audits with these 3 screening units to ascertain the reason for these unusual results.
- The proportion of cancers with B5a non-operative diagnosis which are confirmed as invasive after surgery has decreased markedly in Wales (from 24% to 11%) and in Northern Ireland (from 21% to 12%) since 2007/08. In 2008/09 screening units in Northern Ireland started to obtain more tissue by taking more cores from areas of micro-calcification and the use vacuum assisted biopsy equipment.

COMMENTS:

- In North East, Yorkshire & Humber, 27 cases were recorded as B5c (Micro-invasive, Not assessable/unknown). All regional QA reference centres should review their B5c cases to ascertain the reason for the use of this code.
- 86 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease following surgery. Explanations provided included that the invasive tumour had been completely excised in the core or that the patient had received neo-adjuvant chemotherapy.
- For 26 cases with a B5b (Invasive) non-operative diagnosis, no malignant disease was identified at surgery, but subsequent audit confirmed that a correct diagnosis of invasive cancer had been reported in the non-operative core biopsy.
- 96% of the 556 cancers diagnosed by C5 cytology alone were found to be invasive after surgery. Regional QA reference centres should audit the 20 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or "malignant – cytology only" at surgery.

2.2 Number of Visits for Core Biopsy/Cytology Procedures

It is possible that increases in non-operative diagnosis have led to more anxiety, with women having to return to the assessment clinic for repeat diagnostic tests before receiving a definitive diagnosis. Therefore, the number of visits at which a core biopsy/cytology procedure was undertaken in order to achieve a non-operative diagnosis was requested.

The majority (90%) of women with screen-detected breast cancer had all attempts at core biopsy and/or cytology performed at one assessment clinic visit (Table 11). Figure 10 shows the non-operative diagnosis rates for invasive and micro/non-invasive cancers in each region achieved after one or more visits to an assessment clinic. In the UK as a whole, the non-operative diagnosis rate for invasive cancers was 8% higher in women having more than one assessment clinic visit. This varied between 4% in Northern Ireland and 15% in North West. For non-invasive and micro-invasive cancers, the increase in non-operative diagnosis achieved alter more than one assessment visit was higher at 13%. This varied between 5% in Northern Ireland and 21% in North West.

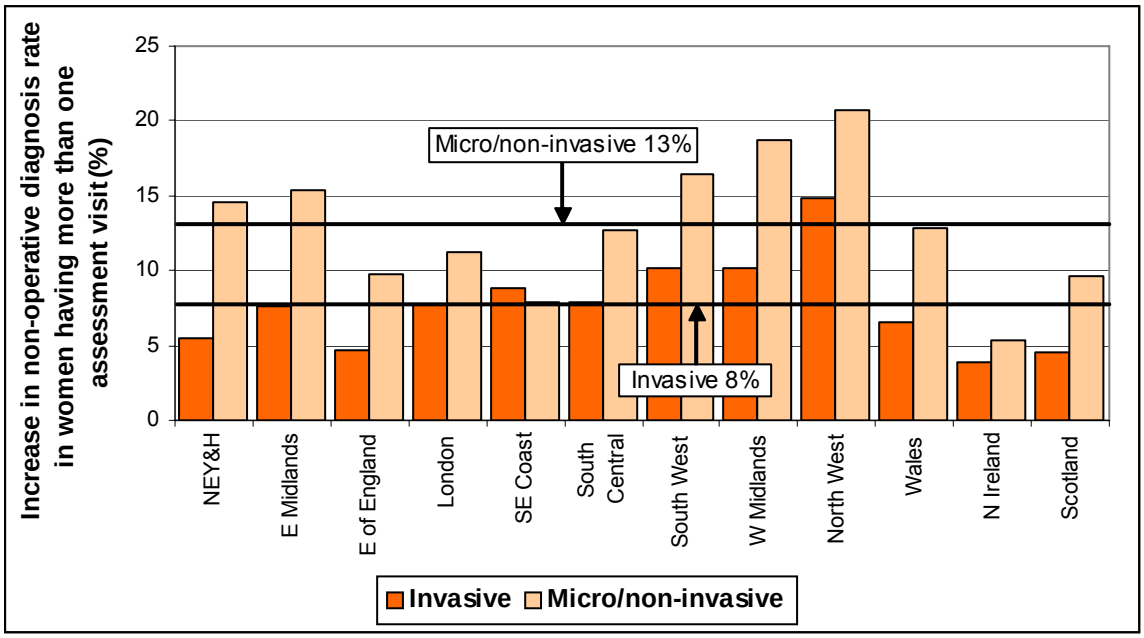

Figure 10 (Table 12 and 13): Increase in non-operative diagnosis rate in women having more than one assessment visit

Figure 11 illustrates the non-operative diagnosis rate achieved by individual screening units after one assessment visit and overall. For 16 units the non-operative diagnosis rate achieved after one assessment visit was less than 80% (the previous minimum standard for all cancers). Regional QA reference centres should carry out audits with these screening units.

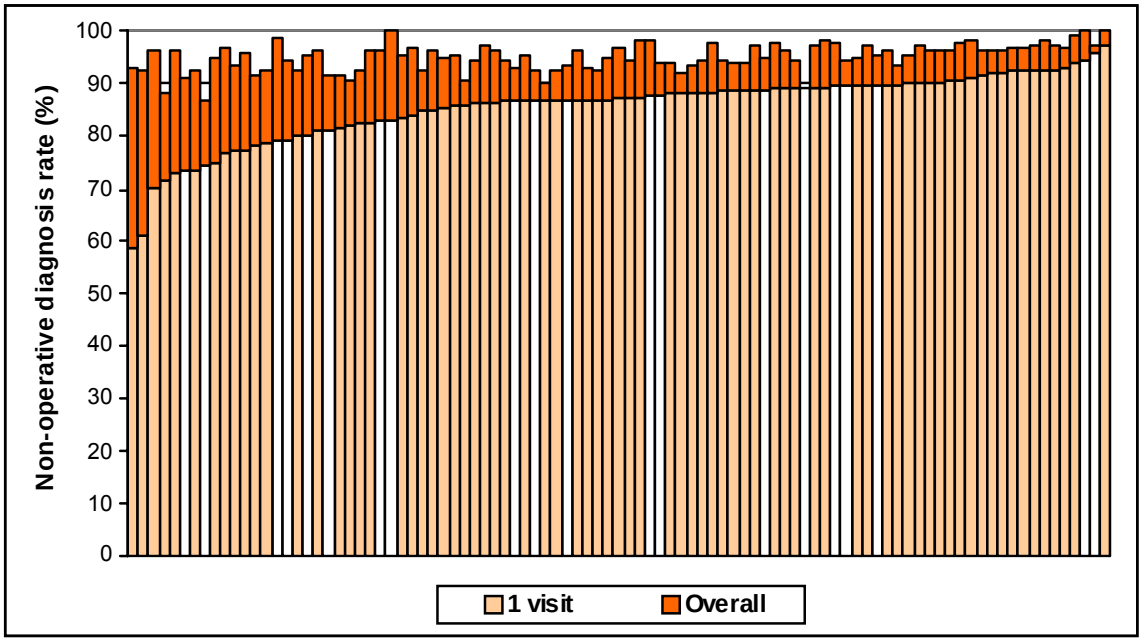

Figure 11: Variation in overall non-operative diagnosis rate and the non-operative diagnosis rate achieved after only 1 visit, presented as a proportion of all screen-detected cancers in each screening unit (The 20 smallest units are highlighted in white)

COMMENTS:

- 90% of women had a non-operative diagnosis after only one assessment clinic visit.
- 16 units failed to achieve a non-operative diagnosis rate of 80% (the previous minimum standard for all cancers) at the first visit. Regional QA reference centers should carry out audits with these screening units.

2.3 Diagnostic Open Biopsies

2.3.1 Status of Diagnostic Open Biopsies

Quality Objective	**To minimise benign diagnostic open surgical biopsies**
Maximum Standard	**<15 per 10,000 prevalent screen (1.5 per 1,000)** **<10 per 10,000 incident screen (1.0 per 1,000)**
Target Standard	**<10 per 10,000 prevalent screen (1.0 per 1,000)** **<7.5 per 10,000 incident screen (0.75 per 1,000)**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

In the UK as a whole, 2,567 diagnostic open biopsies were performed. Of these, 1,765 (69%) were benign and 802 (31%) were malignant. Figure 12 shows the regional variation in benign and malignant diagnostic open biopsy rates.

The benign open biopsy rate was 0.83 per 1,000 women screened, varying from 0.53 per 1,000 women screened in East Midlands to 1.03 per 1,000 women screened in London and 1.17 per 1,000 women screened in South East Coast. The UK benign open biopsy rate is within the minimum standard for prevalent (first) and incident (subsequent) screens, but outside the 0.75 per 1,000 women screened target for incident screens which constitute more than 80% of the total benign biopsies performed. London and South East Coast had relatively high benign open biopsy rates and they exceeded the maximum standards for incident screens. Regional QA reference centres should investigate the

reasons for these relatively high benign open biopsy rates. Overall, the malignant open biopsy rate was 0.38 per 1,000 women screened, varying from 0.24 per 1,000 women screened in North East, Yorkshire & Humber to 0.58 per 1,000 women screened in East of England.

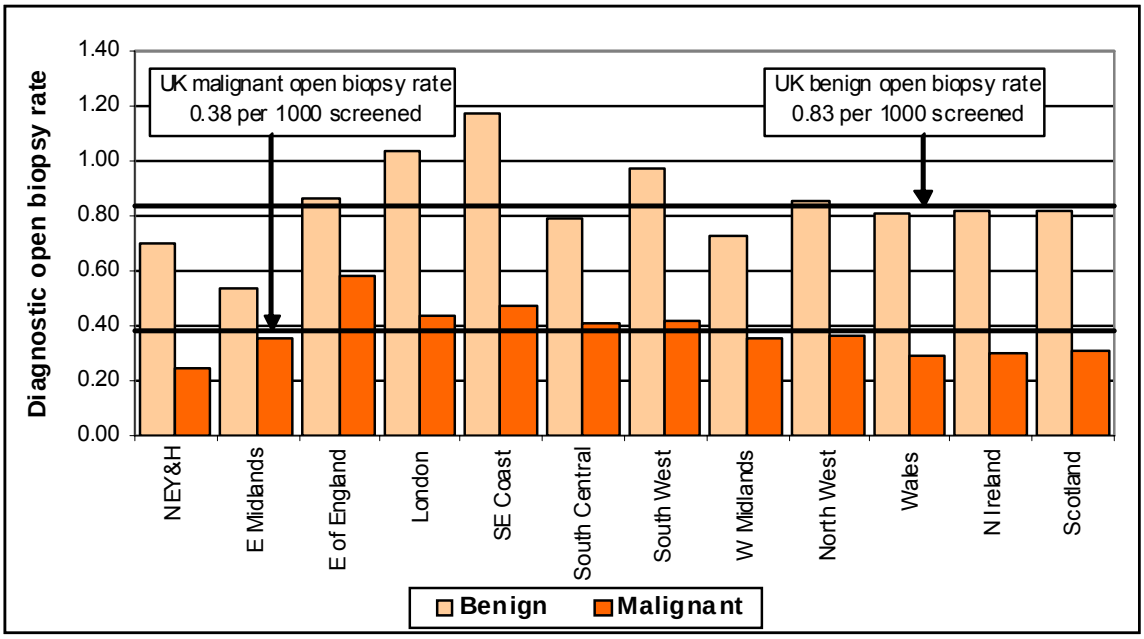

Figure 12 (Table 14): Variation in benign and malignant diagnostic open biopsy rates expressed as the number of diagnostic open biopsies undertaken per 1,000 women screened

The following summary table shows that the UK benign open biopsy rate has fallen over 13 years from 1.50 per 1,000 women screened in 1996/97 to 0.83 per 1,000 women screened in 2008/09. Over the same period, the UK malignant open biopsy rate has fallen from 2.04 per 1,000 women screened to 0.38 per 1,000 women screened as the non-operative diagnosis rate has increased from 63% to 95%.

13 YEAR COMPARISON: BENIGN AND MALIGNANT DIAGNOSTIC OPEN BIOPSY RATES

Year of data collection	*Number of women screened*	*Number of benign open biopsies*	*Number of malignant open biopsies*	*Benign open biopsy rate per 1000 women screened*	*Malignant open biopsy rate per 1000 women screened*	*Non-operative diagnosis rate (%)*
1996/97	*1,340,175*	*2,015*	*2,734*	*1.50*	*2.04*	*63*
1997/98	*1,419,287*	*2,251*	*2,349*	*1.59*	*1.66*	*71*
*1998/99**	*1,308,751*	*1,830*	*1,553*	*1.40*	*1.19*	*81*
*1999/00**	*1,429,905*	*1,838*	*1,316*	*1.29*	*0.92*	*85*
2000/01	*1,535,019*	*2,042*	*1,304*	*1.33*	*0.85*	*87*
2001/02	*1,507,987*	*2,018*	*1,148*	*1.34*	*0.76*	*89*
2002/03	*1,582,269*	*1,901*	*1,018*	*1.20*	*0.64*	*91*
2003/04	*1,685,661*	*1,825*	*952*	*1.08*	*0.56*	*93*
*2004/05**	*1,717,170*	*1,795*	*927*	*1.05*	*0.54*	*93*
2005/06	*1,942,449*	*1,847*	*944*	*0.95*	*0.49*	*94*
2006/07	*1,955,825*	*1,811*	*888*	*0.93*	*0.45*	*94*
2007/08	*2,042,497*	*1,801*	*815*	*0.87*	*0.40*	*95*
2008/09	*2,116,588*	*1,765*	*802*	*0.83*	*0.38*	*95*

*Data from Scotland are absent in 1998/99 and 1999/00. Data for 2 units from East of England are absent in 2004/05

Table 15 shows the false positive cytology and core biopsy figures obtained from CQA and BQA reports for each region. In the UK as a whole, there were 8 false positive core biopsy cases and 4 false positive cytology cases recorded. Regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reason(s) for the false positive results, implementing corrective action as appropriate.

2.3.2 Non-operative Histories for Cancers Diagnosed by Diagnostic Open Biopsy

The number of cancers diagnosed by open biopsy decreased slightly from 815 in 2007/08 to 802 in 2008/09. Of the latter, 265 (33%) were invasive, 8 (1%) micro-invasive and 525 (65%) non-invasive (Table 16). 352 (44%) of the 802 cases did not have further surgical treatment after their diagnostic open biopsy. 9 cancers diagnosed by open biopsy were treated by mastectomy or mastectomy with axillary surgery as their first surgical treatment. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reason that mastectomies were performed as the first operation for these women. Presumably this is because radiological and clinical opinion was strongly supportive of the presence of malignant disease.

Tables 17 and 18 describe the non-operative history of cancers diagnosed by open biopsy according to whether the women had no non-operative cell or tissue sample, cytology only, core biopsy only or both cytology and core biopsy. For 80% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a non-operative diagnosis using core biopsy alone (Table 17). For non-invasive cancers the proportion of cases where non-operative diagnosis had been attempted with core biopsy alone was higher at 91% (Table 18). Table 17 also shows that, of the 265 invasive cancers diagnosed by open biopsy, 15 (6%) had no non-operative procedure recorded and that, of the 525 non-invasive cancers diagnosed by open biopsy, 10 (2%) had no non-operative procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit these 25 cases to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt non-operative diagnosis should be ascertained.

The following 9 year summary table shows that, in line with the increased use of core biopsy since 2000/01, the proportion of invasive cancers undergoing cytology as the only procedure prior to a diagnostic open biopsy has decreased from 31% to 6%, while the proportion undergoing core biopsy alone has risen from 36% to 80%. For non-invasive cancers the proportion undergoing cytology as the only procedure prior to a diagnostic open biopsy has decreased from 11% to 1%, while the proportion undergoing core biopsy alone has risen from 65% to 91%.

9 YEAR COMPARISON :
PERCENTAGE OF CANCERS WITH MALIGNANT OPEN BIOPSY

	Invasive				***Non-invasive***			
Year of data collection	***No non-operative procedure***	***Cytology only***	***Core biopsy only***	***Both cytology and core biopsy***	***No non-operative procedure***	***Cytology only***	***Core biopsy only***	***Both cytology and core biopsy***
2000/01	*10*	*31*	*36*	*24*	*6*	*11*	*65*	*19*
2001/02	*9*	*23*	*43*	*25*	*5*	*7*	*69*	*20*
2002/03	*8*	*16*	*55*	*21*	*3*	*3*	*80*	*13*
2003/04	*6*	*14*	*65*	*15*	*3*	*1*	*82*	*13*
*2004/05**	*5*	*12*	*69*	*14*	*2*	*1*	*89*	*8*
2005/06	*6*	*11*	*70*	*13*	*2*	*1*	*90*	*7*
2006/07	*5*	*10*	*73*	*12*	*2*	*1*	*88*	*9*
2007/08	*3*	*9*	*75*	*12*	*2*	*2*	*90*	*6*
2008/09	*6*	*6*	*80*	*8*	*2*	*1*	*91*	*6*

*Data for 2 units from East of England are absent in 2004/05

Of the 265 invasive cancers diagnosed by open biopsy, 8% had an inadequate (C1) cytology sample or a normal (B1) core biopsy sample (Table 19). This varied from 0% in South East Coast, South Central and Northern Ireland to 19% in East of England (7 cases). 5% had a benign result (C2/B2, 14 cases), 42% were suspicious of benign disease (C3/B3, 112 cases) and 39% were suspicious of malignant disease (C4/B4, 103 cases). In North West 59% of the invasive cancers diagnosed by open biopsy (19 cases) had a B4 core biopsy or C4 cytology result indicating suspicion of malignancy prior to diagnostic surgery. The North West regional QA reference centre should audit these cases to ascertain the reasons for these results.

For the 525 non-invasive cancers which had a malignant open biopsy in 2008/09, 34% had a C4 and/or B4 cytology or biopsy result and 58% had a C3 and/B3 non-operative result (Table 20). In South West and West Midlands, 50% (27 cases) and 51% (21 cases) respectively of the non-invasive cancers diagnosed by open biopsy had a B4 core biopsy or C4 cytology result indicating suspicion of malignancy prior to diagnostic surgery. The regional QA reference centres should review these cases to ascertain the reasons for these results.

9 YEAR COMPARISON :
PERCENTAGE OF CANCERS WITH MALIGNANT OPEN BIOPSY:
WORST CYTOLOGY AND CORE BIOPSY RESULTS

Year of data collection	Invasive				Non-invasive			
	C1/B1	C2/B2	C3/B3	C4/B4	C1/B1	C2/B2	C3/B3	C4/B4
2000/01	22	15	18	46	20	14	27	39
2001/02	16	17	20	38	14	12	32	37
2002/03	15	12	22	42	12	10	36	39
2003/04	12	14	26	42	9	9	39	40
2004/05*	10	13	30	42	5	7	51	35
2005/06	10	9	34	41	3	4	57	35
2006/07	10	6	40	39	3	4	55	36
2007/08	10	14	39	34	2	5	56	34
2008/09	8	5	42	39	2	3	58	34

*Data for 2 units from East of England are absent in 2004/05

The preceding summary table shows that in first 6 years of the 9 year period studied, the highest proportion (38% - 46%) of invasive cancers diagnosed by malignant open biopsy were those with a C4 cytology or B4 core biopsy result. In the most recent 3 years, the proportion of invasive cancers with a C3 cytology or B3 core biopsy result has increased and has become higher than the proportion with a C4/B4 diagnosis. The proportion with a C1 cytology or B1 core biopsy result has fallen from 22% to 8% since 2000/01.

The summary table also shows that the proportion of non-invasive cancers diagnosed by malignant open biopsy which had a C3 cytology or B3 core biopsy result has increased over the 9 year period studied, from 27% in 2000/01 to 58% in 2008/09, while the proportion with a C1 cytology or B1 core biopsy and C2 cytology or B2 core biopsy results has fallen sharply. The proportion of non-invasive cancers with a C4 cytology or B4 core biopsy result has decreased slightly in the last 6 years while the proportion of cases with a C3 cytology or a B3 core biopsy result has increased markedly from 2004/05 onwards. As a result, the reversal in the proportions of cancers with C4/B4 and C3/B3 non-operative results seen with invasive cancers is greater and occurs earlier for non-invasive cancers.

A possible explanation for the rise in the proportion non-invasive lesions diagnosed by malignant open biopsy which had a B3 core biopsy result is the classification by pathologist of core biopsies which are considered to represent lobular neoplasia (atypical lobular hyperplasia and lobular carcinoma in situ) as B3, in line with current NHSBSP guidelines (*Guidelines for Non-operative Diagnostic Procedures and Reporting in Breast Cancer Screening, NHSBSP Publication No.50 [June 2001]*). When lobular carcinoma in situ is verified in the surgical specimen, this would, according to current guidelines, be coded as malignant and such cases could contribute to a lower non-operative diagnosis rate for non-invasive cancers.

COMMENTS:

- In the UK as a whole, 2,567 diagnostic open biopsies were performed in 2008/09. Of these 69% were benign and 31% were malignant.
- The UK benign open biopsy rate was 0.83 per 1,000 women screened in 2008/09. The regional QA reference centres in London and South East Coast should investigate the reasons for their relatively high benign open biopsy rates.
- The UK malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.38 per 1,000 women screened in 2008/09 as the non-operative diagnosis rate has increased from 63% to 95%.

COMMENTS:

- In the UK as a whole, there were 8 false positive core biopsies and 4 false positive cytology cases recorded in 2008/09. Regional QA reference centres and their pathology QA co-ordinators should review these cases to ascertain the reason(s) for these results, implementing corrective action as appropriate.
- 9 cancers which were diagnosed by open biopsy had a mastectomy or a mastectomy with axillary surgery as the first surgical operation. Regional QA reference centres and regional surgical QA co-ordinators should review these cases to ascertain the reason that mastectomies were performed as the first operation.
- 15 invasive cancers and 10 non-invasive cancers diagnosed by open biopsy had no non-operative procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit these 25 cases to establish whether they reflect a data collection problem. If the data are found to represent clinical practice correctly, the reasons for the failure to attempt non-operative diagnosis should be ascertained.
- 39% of invasive cancers and 34% of non-invasive cancers diagnosed by malignant open biopsy following cytology or core biopsy performed during the assessment process had a C4 cytology or B4 core biopsy result indicating suspicion of malignant disease. Regional QA reference centres in North West should audit their invasive cases and in South West and West Midlands their non-invasive cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result.
- The classification by pathologist of core biopsies which are considered to represent lobular neoplasia as B3 means that, if lobular carcinoma in situ is verified in the surgical specimen, the non-operative diagnosis rate for non-invasive cancers will appear lower than it should be.

2.4 Pre-operative Assessment of the Axilla

Quality Objective	**To increase the non-operative diagnosis of axillary node metastases**
Target Standard	**All patients diagnosed with invasive breast cancer undergoing surgical treatment should have a pre-operative axillary ultrasound scan, and if appropriate fine needle aspiration (FNA) or core biopsy should be carried out**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

Information related to axillary ultrasound and axillary biopsy results has been collected for the first time in the 2008/09 audit. A total of 14,536 cases have been included in this section of which 11,531 had invasive cancers and 2,851 non-invasive cancers. Scotland and Wales were not able to provide information on axillary ultrasound examinations. In the UK excluding Scotland and Wales, 6,401 (44%) cases had a record of an axillary ultrasound at assessment. Of these, 5,645 (88%) were confirmed after surgery to have an invasive cancer and 710 (11%) a non-invasive cancer. Thus, 49% of patients with invasive cancer and 25% with non-invasive cancer had axillary ultrasound recorded. The proportion of invasive cancers with axillary ultrasound recorded varied widely between regions from only 12% in Northern Ireland to 63% in East of England (Figure 13).

Of the 5,645 invasive cancers which had an axillary ultrasound result recorded, 728 (13%) had an abnormal result compared with only 23 (3%) of the 710 non-invasive cancers. There was considerable variation in the proportion of abnormal ultrasound results for invasive cancers which ranged from 4% in South East Coast and Northern Ireland to 11% in East of England. Of the 728 invasive cancers with an abnormal axillary ultrasound result recorded, 401 (55%) were node positive at surgery giving a positive predictive value of an abnormal ultrasound of 55%.

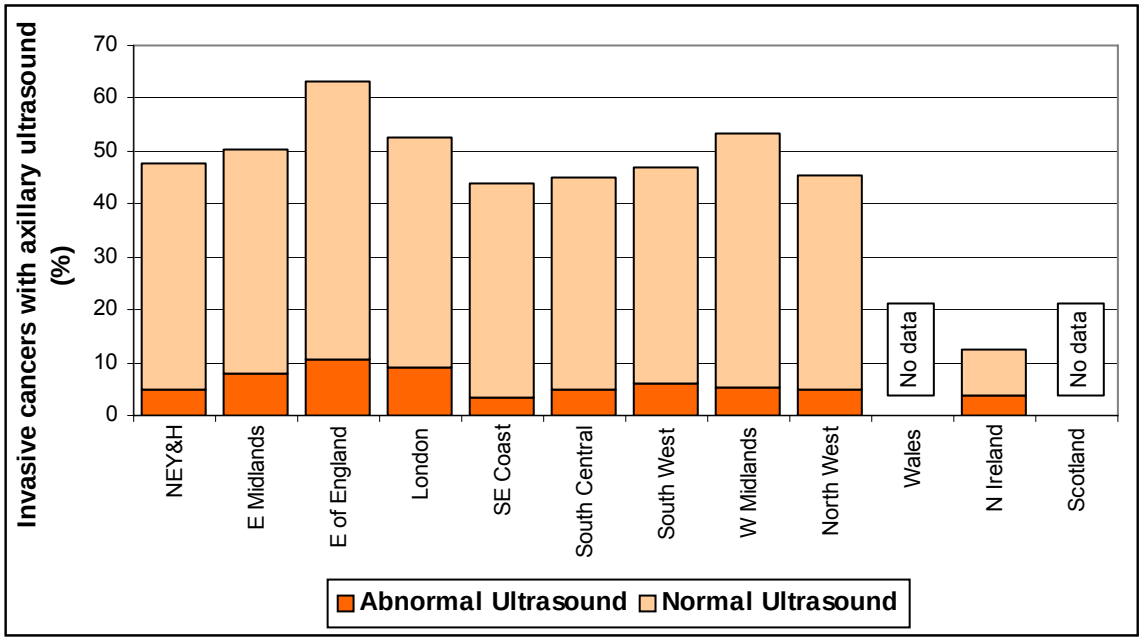

Figure 13 (Table 21 and 22): Axillary ultrasound results for invasive cancers

In the UK, excluding Scotland and Wales, 693 (5%) of the 14,536 cases included in the audit, had an axillary biopsy at assessment. 15 of the cases had a normal ultrasound result. Presumably for these cases, clinical reasons suggested that an axillary biopsy should be performed. 662 (96%) of the 693 cases were confirmed after surgery to have invasive cancer. This represents 6% of the invasive cancers included in the audit (Table 23). 23 of the 693 cases were confirmed after surgery to have non-invasive cancer.

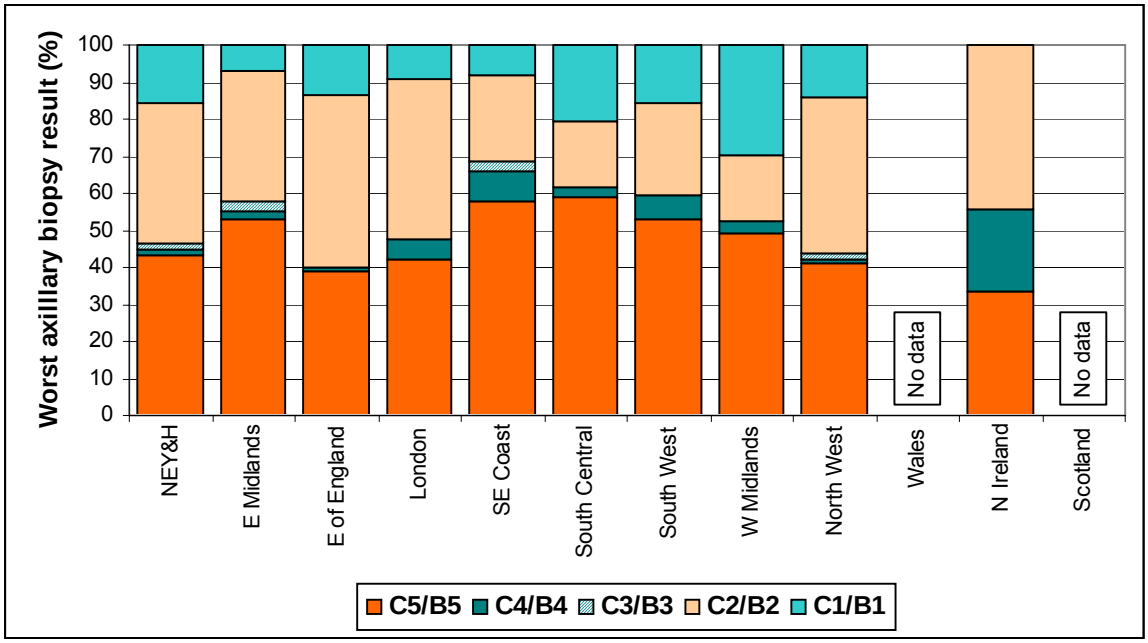

Figure 14 (Table 24) : Worst axillary sample result for invasive cancers with an axillary ultrasound examination

In the UK, excluding Scotland and Wales, 629 (11%) of the 5,645 invasive cancers with an axillary ultrasound examination, had an axillary sample (core biopsy or cytology) taken at assessment. 290 (46%) of these invasive cancers had a C5/B5 diagnosis, 252 (40%) had C2/B2 to C4/B4 diagnoses, and 87 (14%) had inadequate or normal sample (C1/B1). The proportion of invasive cancers with a C5/B5 result varied between 33% in Northern Ireland and 59% in South Central (Figure 14). Of the 290 invasive cancers with a C5/B5 diagnosis, 248 were node positive at surgery (giving a positive predictive value of a C5/B5 of 86%). This varied between 73% in London and 100% in Northern Ireland (Table 25). A further 25 (9%) were false positives, having a C5/B5 biopsy but found to be node negative at axillary surgery. Of the 252 cases with C2/B2 to C4/B4 results, 68 (27%) were

found to have positive nodes at surgery, as did 33 (38%) of the 87 cases with a C1/B1 diagnosis.

Of the 2,445 invasive cancers that were confirmed to be node positive on surgery, 259 (11%) had positive nodes diagnosed pre-operatively by means of needle biopsy. This varied from 4% in Northern Ireland to 19% in East Midlands. Of the 10,869 invasive cancers that did not have an axillary biopsy before surgery or where it was not known whether an axillary biopsy was taken, 2,082 (19%) had positive nodes found at surgery.

COMMENTS:

- In the UK excluding Scotland and Wales, 6,401 (44%) cases had a record of an axillary ultrasound at assessment. This varied widely between regions from only 12% in Northern Ireland to 63% in East of England.
- Of the cases with axillary ultrasound recorded, 88% were confirmed to be invasive after surgery and 11% non-invasive. Overall, 49% of the invasive cancers and 25% of non-invasive cancers had axillary ultrasound recorded.
- 728 (13%) invasive cancers with an axillary ultrasound result recorded had an abnormal result. Of these, 401 (55%) were node positive at surgery giving a positive predictive value of an abnormal ultrasound of 55%.
- 11% of the invasive cancers having an axillary ultrasound examination, had an axillary biopsy at assessment. 290 (46%) of the invasive cancers had a C5/B5 biopsy. This varied between 33% in Northern Ireland and 59% in South Central.
- Of the invasive cancers with a C5/B5 biopsy, 248 were node positive at surgery (giving a positive predictive value of a C5/B5 of 86%).
- Of the 2,445 invasive cancers that were confirmed to be node positive on surgery, 259 (11%) were diagnosed pre-operatively by means of needle biopsy.

CHAPTER 3
SURGICAL TREATMENT

3.1 Treatment for Non-invasive and Micro-invasive Breast Cancer

In the UK as a whole in 2008/09, 69% of the 3,351 non-invasive cancers were treated by breast conserving surgery, 30% were treated by mastectomy and 39 cancers (1%) apparently received no surgery (Table 26). The mastectomy rate varied from 22% in West Midlands to 38% in North East, Yorkshire & Humber. All 140 micro-invasive cancers included in this audit period received surgery, 61% had conservation surgery and 39% had mastectomy (Table 27).

Quality Objective	**To minimise local recurrence after breast conservation surgery for DCIS**
Outcome Measure	**Patients with extensive (>40mm diameter) or multicentric disease should usually undergo treatment by mastectomy**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

In 2008/09, 37% of the 3,312 non-invasive cases with surgery were less than 15mm in diameter and 13% were larger than 40mm (Table 28). The size of 50 cases (2%) was not assessable and for 212 cases the size was unknown. In East of England and London, 13% of non-invasive cancers had unknown or not assessable size. Of the 415 non-invasive cancers larger than 40mm, 72 (17%) had conservation surgery. Regional QA reference centres should audit these cases to ensure that they have not been under-treated.

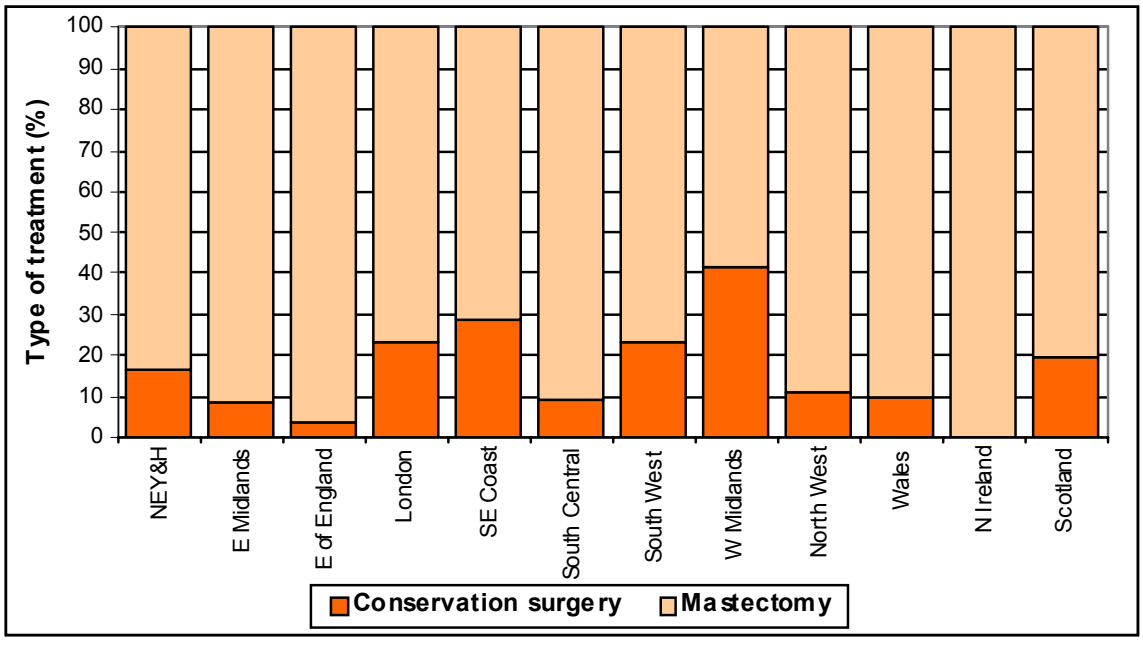

Figure 15 (Table 29): Variation in treatment of non-invasive cancers larger than 40mm

3.2 Cytonuclear Grade and Size for Non-invasive Breast Cancers

In the UK as a whole, 1,924 (58%) of the 3,312 surgically treated non-invasive cancers had high cytonuclear grade, 888 (27%) had intermediate cytonuclear grade, 331 (10%) had low cytonuclear

grade and for 62 (2%) the cytonuclear grade was not assessable (Table 30). Of the 107 non-invasive cancers with unknown cytonuclear grade, 22 (21%) were in South East Coast. The variation in the cytonuclear grade of non-invasive cancers in each screening unit is shown in Figure 16. The following summary table shows that in the UK as a whole, data completeness for non-invasive cancers has improved markedly since 2000/01.

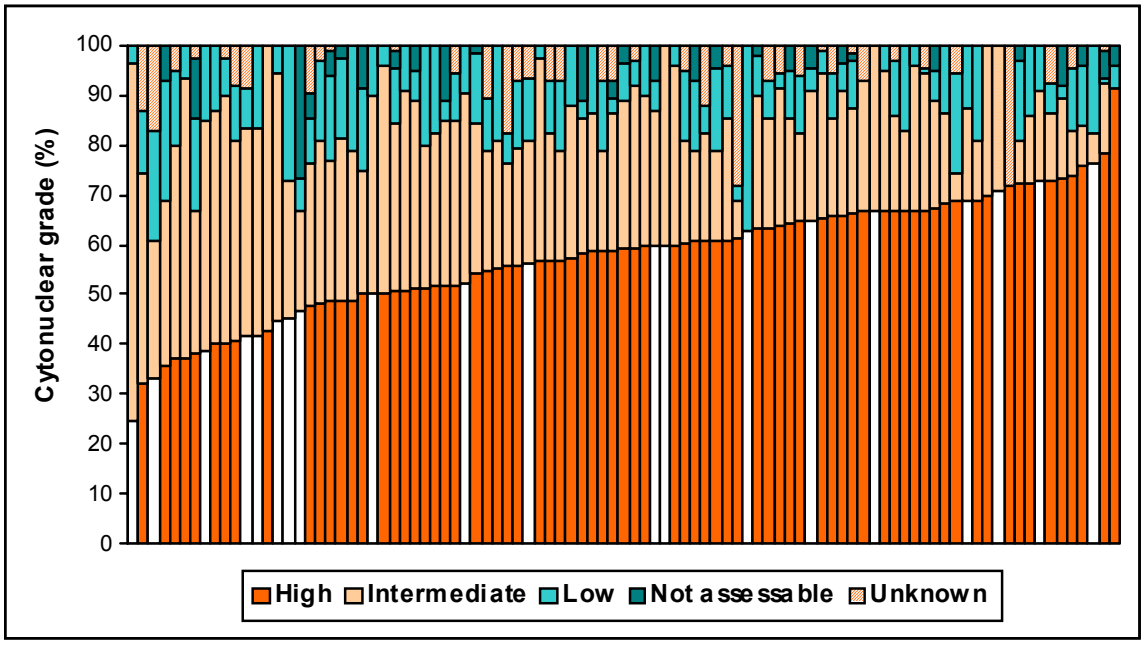

Figure 16: Variation in the cytonuclear grade of non-invasive cancers in each screening unit. (The 20 smallest units are highlighted in white) (Cases with no surgery are excluded)

9 YEAR COMPARISON: DATA COMPLETENESS FOR SURGICALLY TREATED NON-INVASIVE CANCERS (%)

Year of data collection	*Unknown cytonuclear grade*	*Unknown size*	*Unknown cytonuclear grade and/or size*
2000/01	*6*	*11*	*14*
2001/02	*10*	*13*	*19*
2002/03	*10*	*14*	*20*
2003/04	*3*	*11*	*11*
*2004/05**	*2*	*7*	*7*
2005/06	*3*	*7*	*8*
2006/07	*2*	*6*	*7*
2007/08	*4*	*7*	*8*
2008/09	*3*	*6*	*7*

*Data for 2 units from East of England are absent in 2004/05

In 2008/09, the incompleteness of cytonuclear grade and/or size data varied from 3% in Northern Ireland to 9% in East of England, London, South East Coast and North West (Table 31). Figure 17 shows for cases that were surgically treated, how the proportion of non-invasive cancers with unknown cytonuclear grade and/or size varied between screening units in 2008/09. Although 56 units were able to supply the cytonuclear grade for all their cases, only 22 units had complete cytonuclear grade and size. Overall, data were incomplete (unknown cytonuclear grade and/or size) for 232 (7%) of all surgically treated non-invasive cancers. In 18 units data incompleteness was greater than 10%. 14 of these units had similar levels of data incompleteness in 2006/07 and/or 2007/08.

Regional QA reference centres and regional pathology QA co-ordinators should audit non-invasive cancers with unknown cytonuclear grade and/or size to ascertain the reason that these important prognostic indicators were not recorded. They should also identify which of their screening units are

participating in the Sloane Project to ascertain if their practices and procedures could be used to improve data quality in other units, and to encourage units which already have high quality data to participate in the Project. It is hoped that data completeness for non-invasive cancers will further improve as screening units continue to sign up to the Sloane Project as recommended in NICE Clinical Guideline 80 on the *Diagnosis and treatment of early and locally advanced breast cancer* (2009), and in the 4th edition of NHSBSP Publication 20, *QA Guidelines for surgeons in breast cancer screening* (March 2009).

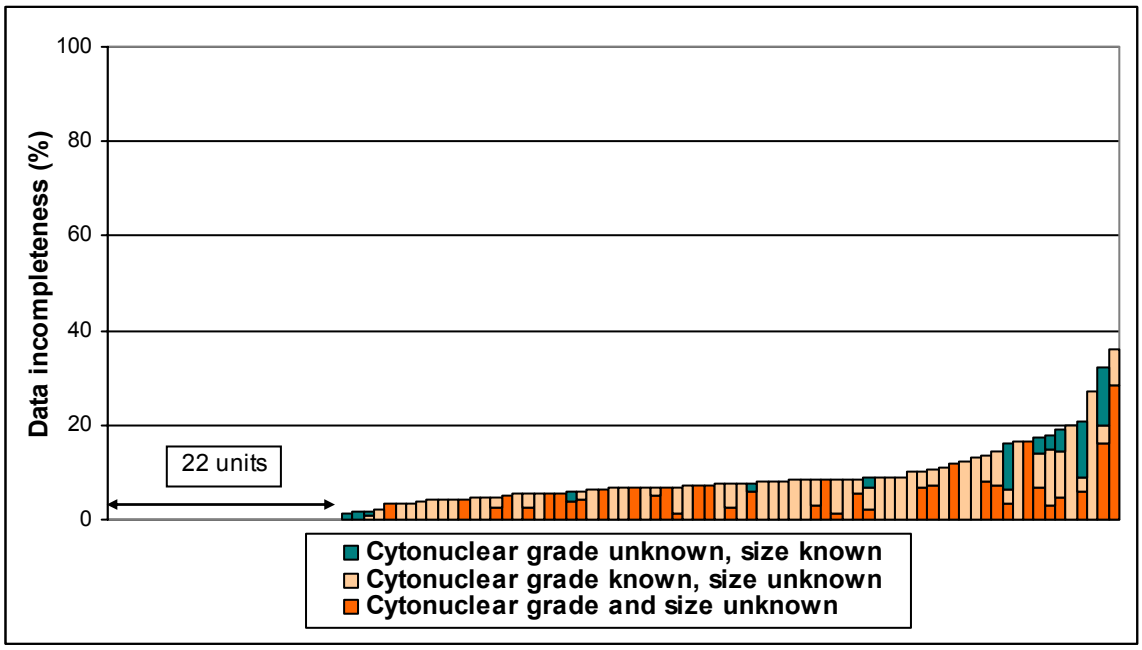

Figure 17: Variation in the data incompleteness of cytonuclear grade and size for non-invasive cancers in each screening unit (Cases with no surgery are excluded)

The following summary table shows that, in total, 140 potentially large, high cytonuclear grade or unknown cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional surgical QA co-ordinators should review the data recorded for these cases to ensure that they were not under-treated.

NUMBER OF NON-INVASIVE CANCERS TREATED WITH CONSERVATION SURGERY

	>40mm		***Unknown size***		
Region	***High cytonuclear grade*** *(Table 33)*	***Unknown cytonuclear grade***	***High cytonuclear grade***	***Unknown cytonuclear grade*** *(Table 32)*	***Total****
N East, Yorks & Humber	*8*	*0*	*1*	*10*	*19*
East Midlands	*2*	*0*	*3*	*0*	*5*
East of England	*0*	*0*	*2*	*15*	*17*
London	*8*	*0*	*1*	*0*	*9*
South East Coast	*7*	*0*	*0*	*16*	*23*
South Central	*1*	*0*	*2*	*2*	*5*
South West	*8*	*0*	*2*	*4*	*14*
West Midlands	*8*	*0*	*1*	*7*	*16*
North West	*3*	*0*	*1*	*9*	*13*
Wales	*3*	*0*	*3*	*0*	*6*
Northern Ireland	*0*	*0*	*0*	*1*	*1*
Scotland	*8*	*0*	*1*	*3*	*12*
United Kingdom	***56***	***0***	***17***	***67***	***140***

*Each non-invasive cancer is counted once only; "non-invasive - biopsy only" cases are excluded

COMMENTS:

- Overall, 69% of non-invasive cancers were treated with conservation surgery. Mastectomy rates for non-invasive cancers varied from 22% in West Midlands to 38% in North East, Yorkshire & Humber.
- In 2008/09, 1,924 (58%) of the surgically-treated non-invasive cancers had high cytonuclear grade, 888 (27%) had intermediate cytonuclear grade, 331 (10%) had low cytonuclear grade and for 62 (2%) the cytonuclear grade was not assessable.
- For 7% of non-invasive cancers (232 cases), the cytonuclear grade and/or size were not recorded. Regional QA reference centres and regional pathology QA co-ordinators should audit non-invasive cancers with unknown cytonuclear grade and/or size to ascertain the reason that these important prognostic indicators were not recorded. They should also identify which of their screening units are participating in the Sloane Project to ascertain if their practices and procedures could be used to improve data quality in other units, and to encourage units which already have high quality data to participate in the Project as recommended in NICE Clinical Guideline 80 (February 2009).
- 140 potentially large high cytonuclear grade non-invasive cancers were treated with conservation surgery. Regional QA reference centres and regional surgical QA co-ordinators should review the data recorded for these cases to ensure that they were not under-treated.

3.3 Treatment for Invasive Breast Cancer

Of the 13,532 invasive breast cancers detected by the UK NHSBSP in 2008/09, 9,831 (73%) underwent conservation surgery, 3,465 (26%) had a mastectomy and 235 cases (2%) had no surgery. Treatment information was unavailable for 1 case in London. Regional QA reference centres and regional surgical QA co-ordinators should audit these 236 cases to ascertain why surgical treatment was not given or why the surgical treatment that was given was not recorded. Figure 18 shows the regional variation in invasive cancer mastectomy rates which ranged from 20% in South West to 32% in Northern Ireland. Mastectomy rates in individual screening units varied between 13% and 56%.

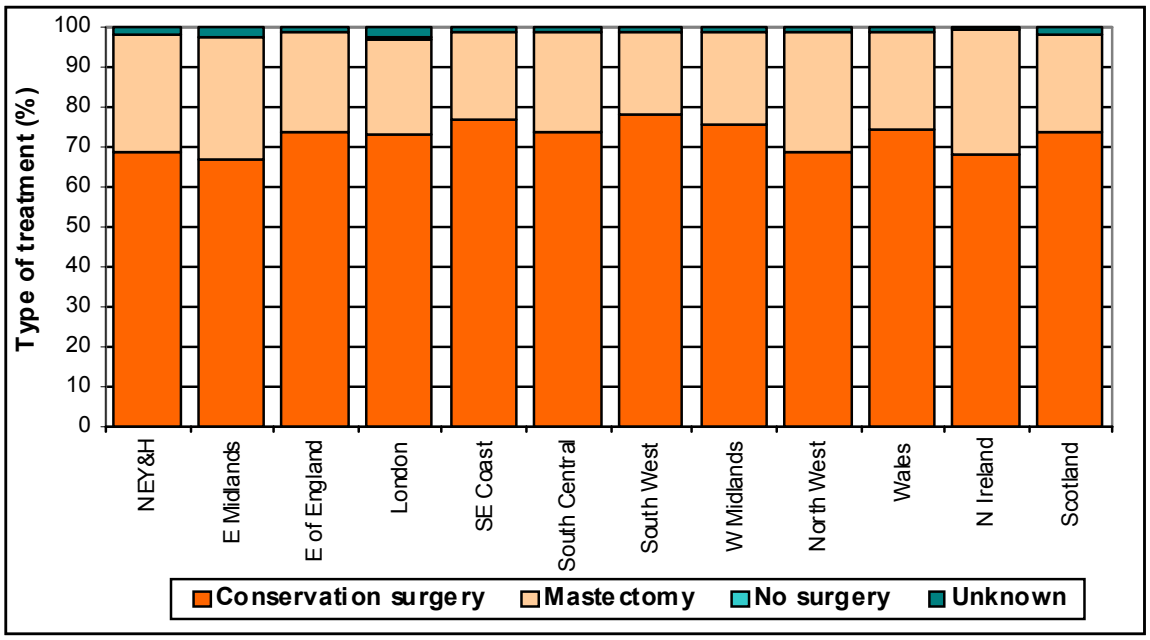

Figure 18 (Table 34): Type of treatment for invasive cancers (all sizes)

3.3.1 Treatment of Invasive Cancers According to Invasive Size

Of the 13,297 surgically treated invasive cancers, 3,479 (26%) were less than 10mm in diameter, 3,543 (27%) were 10-<15mm in diameter, 3,140 (24%) were 15-≤20mm in diameter, 2,263 (17%) were >20-≤35mm in diameter and 476 (4%) were >35-≤50mm in diameter. Only 236 cases (2%)

were greater than 50mm in diameter (Table 35). For the 160 invasive cases with unknown size, 102 (64%) had no invasive component found at surgery. Only benign, non-invasive, micro-invasive lesions were found. In most regions there was a clear variation in mastectomy rate with tumour size. In the North West, the mastectomy rate for cancers larger than 35mm and less than or equal to 50mm was similar to the mastectomy rate for cancers larger than 50mm; while in South West and Northern Ireland, the difference was 46% and 38% respectively.

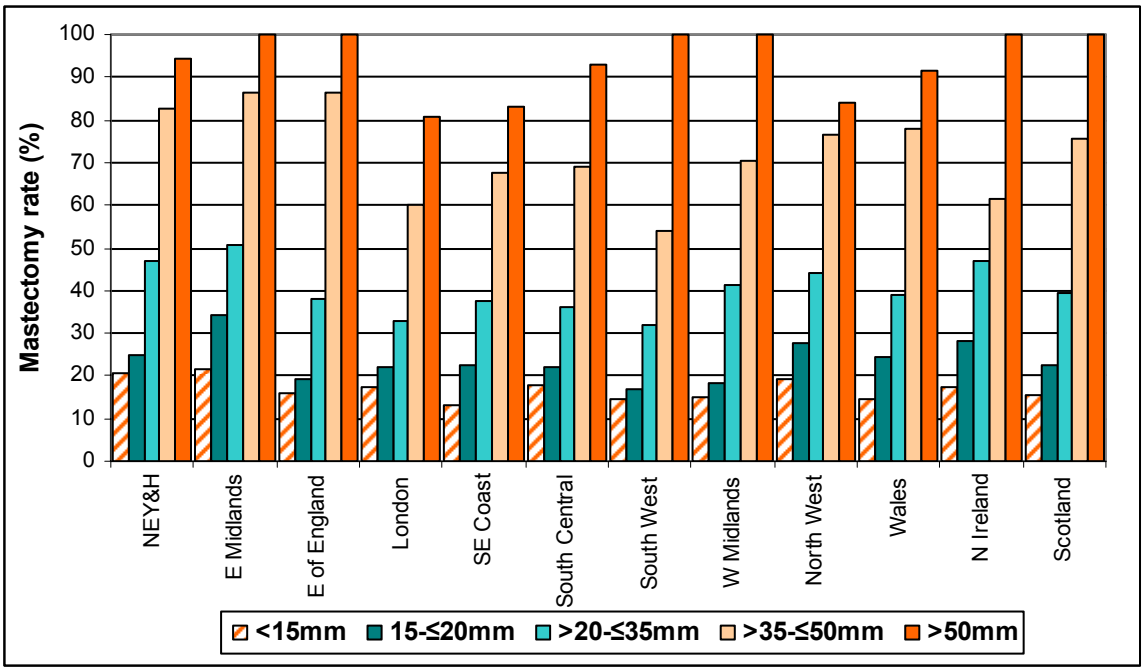

Figure 19 (Table 36): Mastectomy rates with invasive tumour size

3.3.2 Treatment of Invasive Cancers with Invasive Component <15mm in Diameter

The following summary table shows that the overall mastectomy rate for small (<15mm) invasive cancers remained fairly stable between 1996/97 and 2007/08, varying between 18% and 21%. In 2008/09 it reached its lowest rate of 17%. Table 36 shows that the highest mastectomy rates for small (<15mm) invasive cancers were recorded in East Midlands (22%) and North East, Yorkshire & Humber (21%) and the lowest rates (13%) in South East Coast.

13 YEAR COMPARISON:
TREATMENT FOR SMALL INVASIVE CANCERS (invasive size <15mm)

Year of data collection	Total invasive cases <15mm	Conservation surgery		Mastectomy	
		No.	%	No.	%
1996/97	3,135	2,449	78	601	19
1997/98	3,384	2,693	80	651	19
1998/99*	3,344	2,697	81	618	18
1999/00	4,150	3,337	80	773	19
2000/01	4,189	3,363	80	796	19
2001/02	4,233	3,333	79	879	21
2002/03	4,878	3,950	81	918	19
2003/04	5,489	4,475	82	1,006	18
2004/05	5,795	4,723	82	1,071	18
2005/06	6,678	5,424	81	1,254	19
2006/07	6,567	5,359	82	1,208	18
2007/08	7,002	5,720	82	1,282	18
2008/09	7,022	5,809	83	1,213	17

*Data from Scotland are absent in 1998/99

3.3.3 Treatment of Invasive Cancers According to Whole Tumour Size

The whole tumour size is the maximum diameter of the whole tumour, including any non-invasive component which extends beyond the invasive lesion. The whole tumour size was not provided for 291 (2%) of the 13,297 surgically treated invasive cancers (Table 37). 58 (20%) of the cancers without a whole tumour size were in London, 41 (14%) in South Central and 39 (13%) in the North East, Yorkshire & Humber. Regional QA reference centres should ascertain why these important data were not available from their screening units.

The following table shows how mastectomy rates in 2008/09 varied with the size of the invasive cancer and with whole tumour size. As expected, mastectomy rates increase with invasive tumour size from 17% for small (<15mm) tumours to 93% for very large (>50mm) tumours. For small (<15mm) invasive cancers, mastectomy rates also increase as the whole tumour size increases. Thus, while only 11% of small (<15mm) cancers with whole tumour size <15mm have mastectomies, 90% of small (<15mm) tumours with whole size >50mm have mastectomies. The lower mastectomy rate for small (<15mm) cancers with whole tumour size <15mm indicates that the presence of *in situ* disease which extends beyond the invasive lesion accounts for a proportion of the mastectomies performed on small (<15mm) invasive cancers.

INVASIVE CANCER TREATMENT - NUMBER AND MASTECTOMY RATE

Size	*Invasive size* (Table 36)		*Whole tumour size for cancers with invasive component <15mm* (Table 39)	
	No.	***Mastectomy Rate (%)***	***No.***	***Mastectomy Rate (%)***
<15mm	*1,213*	*17*	*551*	*11*
15-≤20mm	*730*	*23*	*154*	*20*
>20-≤35mm	*910*	*40*	*216*	*34*
>35-≤50mm	*349*	*73*	*127*	*61*
>50mm	*219*	*93*	*134*	*90*

Tables 36 and 39 show that in every region, the mastectomy rate for cancers with whole tumour size <15mm was lower than that for cancers with an invasive tumour size <15mm. The difference was greatest in North East, Yorkshire & Humber (21% compared to 12%) and East Midlands (22% compared to 13%), and least in Northern Ireland (17% compared to 14%).

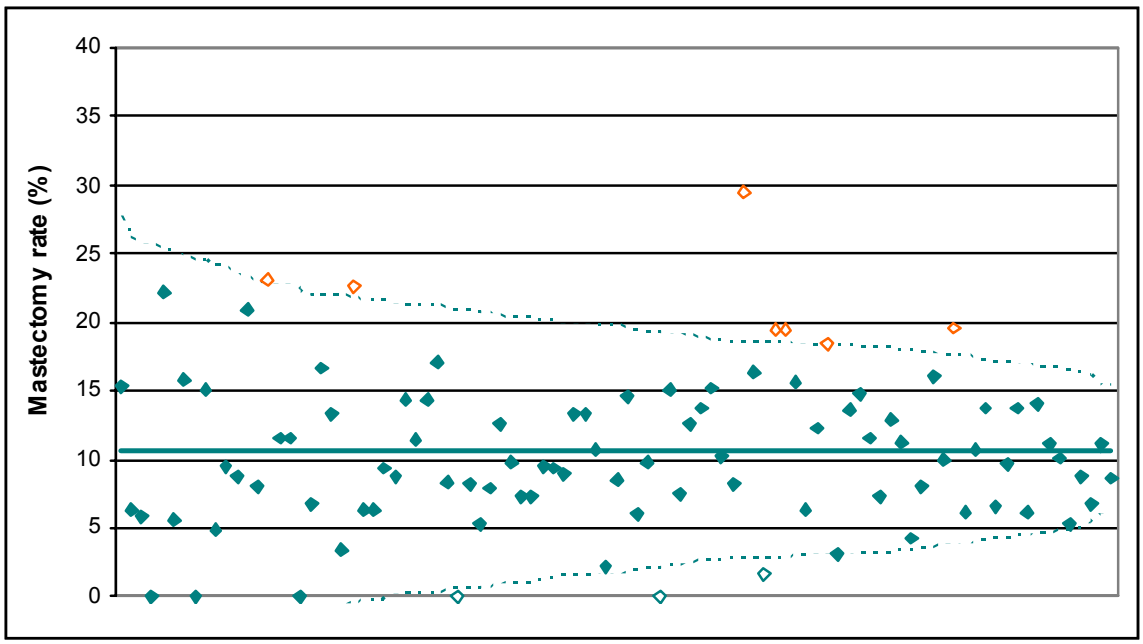

Figure 20: Variation in the mastectomy rates for invasive cancers with a whole tumour size <15mm in each screening unit (open diamonds represent units which lie outside the control limits)

Figure 20 uses a control chart to demonstrate the variation between screening units in the mastectomy rates for invasive cancers with whole tumour size <15mm. The two dashed lines are the upper and lower control limits which approximate to the 95% confidence intervals of the average mastectomy rate (solid line). Mastectomy rates which are outside the control limits are significantly higher (7 units) or lower (3 units) than the average rate of 11%. Two of the units with unusually high mastectomy rates have been outliers throughout the 3-year audit period 2006/07-2008/09. Regional QA reference centres and regional surgical QA co-ordinators should review the data for screening units lying outside (above and below) the control limits to ascertain the reasons for this unusual clinical practice. For units with unusually high mastectomy rates, access to reconstruction (immediate and delayed) and the role of patient choice would be of particular interest. For units with unusually low mastectomy rates, cosmetic outcomes and recurrence rates would be of particular relevance.

3.4 Immediate Reconstruction Following Mastectomy

Overall, of the 17,045 cancers detected in 2008/09, 4,525 (27%) were treated with mastectomy. Of these, 833 (18%) were recorded as having immediate reconstruction. 3,383 (75%) cases had no immediate reconstruction recorded and for 309 (7%) cases it was unknown whether or not immediate reconstruction was performed. Information regarding delayed reconstruction was not collected.

The *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009* shows that the immediate reconstruction rate in England for all breast cancers (screen-detected and symptomatic) treated with mastectomy in the period 1 January 2008 to 31 March 2009 was somewhat higher at 21%. This could reflect differences in the availability of immediate reconstruction for women with screen-detected and symptomatic breast cancer. However, this seems unlikely as the *All Breast Cancer Report, 2009,* reported that patients diagnosed with screen-detected breast cancer in 2006 were more likely to have an immediate reconstruction than symptomatic patients (13% compared with 9%). Alternative explanations could be that patients who did not receive immediate reconstruction formed a greater proportion of the 26% of cases not entered into the National Mastectomy and Breast Reconstruction Audit or that a significant proportion of the 309 cases in the present report where it was unknown whether or not immediate reconstruction was performed did have immediate reconstruction.

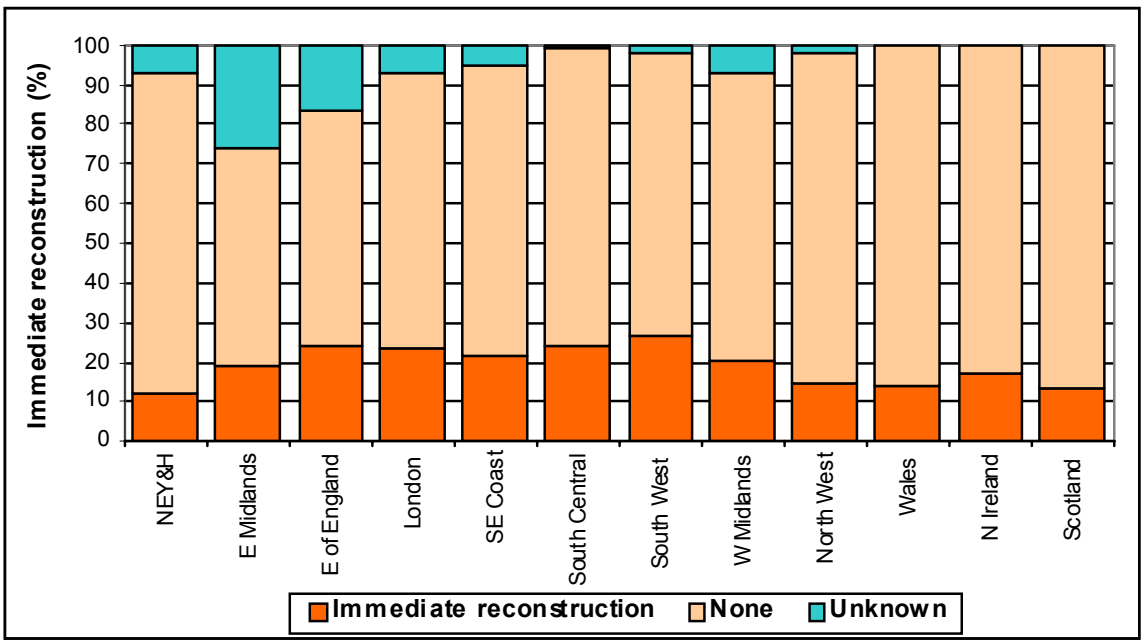

Figure 21 (Table 40): Proportion of cancers having immediate reconstruction

Figure 21 shows how recorded immediate reconstruction rates for all screen-detected cancers treated with mastectomy varied with region in 2008/09. The highest recorded immediate reconstruction rates were in South West (26%), South Central (24%) and East of England (24%) and the lowest in North East, Yorkshire & Humber (12%). In the East Midlands, it was not known whether or not immediate reconstruction was performed in 26% of cases.

Table 41 shows that, of the 833 cancers known to have had immediate reconstruction following mastectomy, 493 (59%) were invasive, 22 (3%) were micro-invasive and 318 (38%) were non-invasive. Thus, only 14% of the 3,465 invasive cancers treated with mastectomy (Table 34) had immediate reconstruction recorded compared with 32% of the 1,005 non-invasive cancers treated with mastectomy. These differences are similar to those reported in the *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009* where 17% of women with invasive breast cancer were reported to have had immediate reconstruction compared with 38% of women with non-invasive breast cancer.

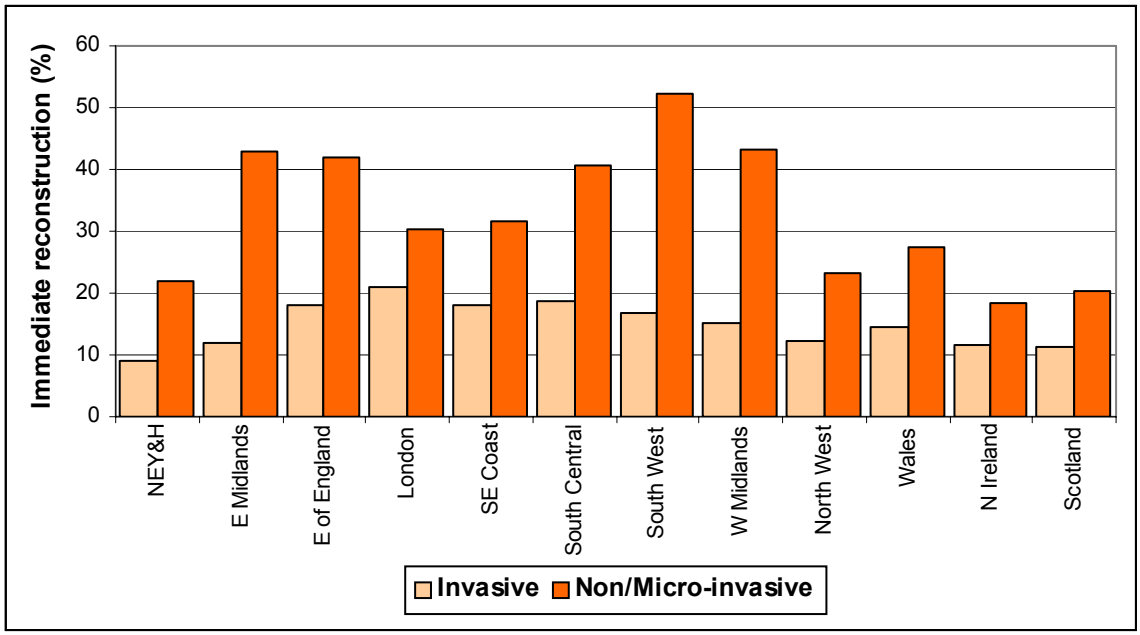

Figure 22: Variation in the proportion of invasive and non/micro-invasive cancers with immediate reconstruction

Figure 22 shows that for invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 9% in North East, Yorkshire & Humber to 21% in London, and that for non/micro-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 17% in Wales to 49% in South West. Figure 23 shows an even wider range of recorded immediate reconstruction between screening units in 2008/09; with rates ranging from 0 cases in 5 screening units to over 50% of cases in two units. There was no obvious relationship between reported immediate reconstruction rates and whole tumour size.

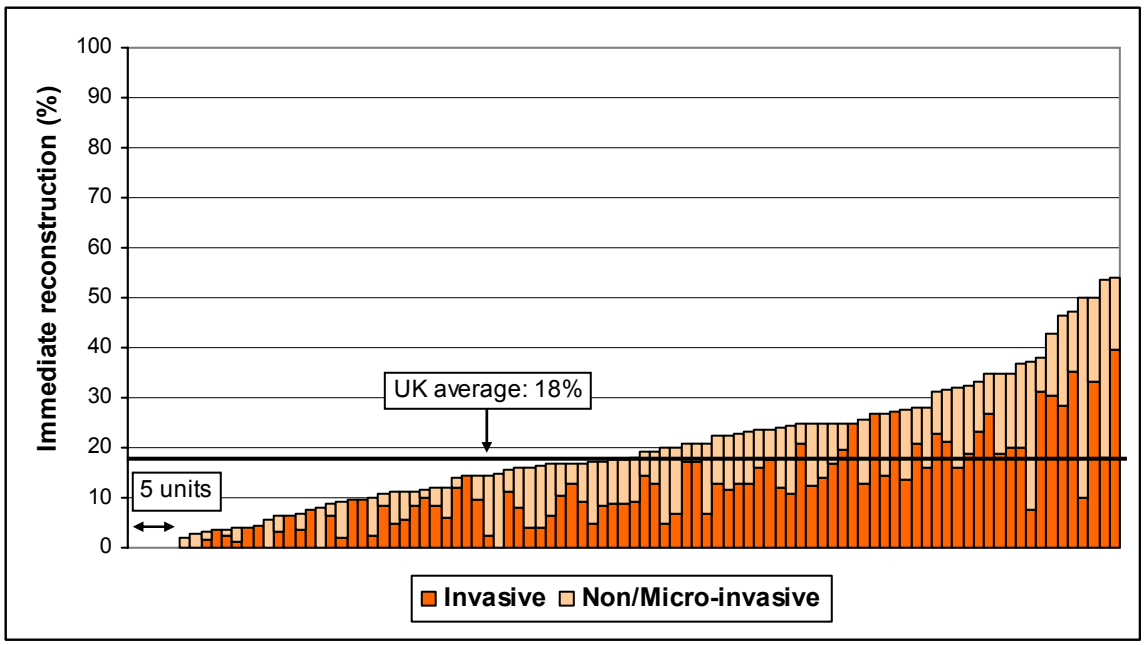

Figure 23: Variation in the proportion of immediate reconstruction in each screening unit

COMMENTS:

- In the UK as a whole, the mastectomy rate for invasive cancers was 26%. Mastectomy rates in individual screening units varied between 13% and 56%.
- 235 invasive cancers and 39 non-invasive cancers had no surgery recorded, and for 1 invasive cancer, treatment information was not available. Regional QA reference centres and regional surgical QA co-ordinators should audit these cases to ascertain why surgical treatment was not given or why the surgical treatment that was provided was not recorded.
- 93% of >50mm invasive cancers were treated with mastectomy compared with 17% of small (<15mm) invasive cancers. In most regions there was a clear variation in mastectomy rate with tumour size.
- Whole tumour size was not provided for 291 (2%) surgically treated invasive cancers. 58 (20%) of the cancers without a whole tumour size were in London, 41 (14%) were in South Central and 39 (13%) were in the North East, Yorkshire & Humber. Regional QA reference centres and regional pathology QA co-ordinators should ascertain why these important data were not available from their screening units.
- Overall only 11% of cancers with whole tumour size <15mm were treated with mastectomy compared with 17% of cancers with invasive tumour size of <15mm. These data indicate that the presence of *in situ* disease which extends beyond the invasive lesion accounts for a proportion of the mastectomies performed on small (<15mm) invasive cancers.
- In order to ascertain the reasons for non-random variation in clinical practice, regional QA reference centres and regional surgical QA co-ordinators should review the data for all screening units lying outside (above and below) the control limits in Figure 19 which shows the inter-unit variation in the proportion of small cancers with whole tumour size <15mm which had a mastectomy.
- 18% of screen-detected cancers treated with mastectomy were recorded as having immediate reconstruction in 2008/09. This is somewhat lower that the 21% immediate reconstruction rate reported in the *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009*.
- The highest recorded immediate reconstruction rates for all screen-detected cancers were in South West (26%), South Central (24%) and East of England (24%) and the lowest in North East, Yorkshire & Humber (12%).
- Only 14% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 32% of non-invasive cancers treated with mastectomy. These rates are similar to the rates of 17% and 38% for invasive and non-invasive cancers reported in the *National Mastectomy and Breast Reconstruction Audit Second Annual Report, 2009.*
- For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 9% in North East, Yorkshire & Humber to 21% in London. For non-invasive cancers, recorded immediate reconstruction rates varied from 17% in Wales to 49% in South West. Overall recorded immediate reconstruction rates in individual screening units varied from 0 cases in 5 units to over 50% of cases in two units.

CHAPTER 4
WAITING TIMES

The *NHS Cancer Plan*, which was published in 2000, set out the goal that by 2001 no breast cancer patient should wait longer than one month from diagnosis to first treatment, and that by 2002 no patient should wait longer than two months between an urgent referral by their GP for suspected breast cancer and the start of treatment; the only exceptions being if there is a good clinical reason or personal choice.

The *NHS Cancer Plan* (September 2000) cancer waiting time targets:
- **31 days from decision to treat to first treatment**
- **62 days from urgent GP referral to first treatment**

In the 4th Edition of the *NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening* published in March 2009, the following waiting time standards were included in an attempt to bring the screening standards in line with those in the *NHS Cancer Plan*.

Quality Objective	**To minimise patient anxiety between a decision that a therapeutic operation is required for cancer and the date for operation**
Outcome Measure	**If surgery is the primary treatment, then patients should be offered a date for surgery within 31 days of the 'decision to treat'. 100% of patients should be admitted for operation within 31 days of the 'decision to treat'.**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

Quality Objective	**To minimise the delay between referral for investigation and first breast cancer treatment.**
Outcome Measure	**If surgery is the primary treatment, then patients should be offered a date for surgery within 62 days of the date of referral. 100% of patients should be admitted for operation within 62 days of the date of referral.**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

As from 1 January 2009, screening cases have been included in the new Going Forward on Cancer Waits (GFoCW) cancer waiting time performance monitoring system. In order to monitor performance against the 31 and 62 day standards, the 'date of the last read' of the screening mammogram recorded on the National Breast Screening System (NBSS) has been taken as the 'date of referral'. In GFoCW, instead of a 100% standard with adjustments to allow clock pauses (i.e. periods of time that can be removed from the calculation of how long a patient waited), an unadjusted 31 day standard of 96% has been set for all cancer patients and an unadjusted 62 day standard of 90% has been set for patients with screen-detected breast cancer. These standards are 4% and 10% lower than the 100% standards included in the new *NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer*.

The 'date of last read' and 'decision to treat date' were not collected for screen-detected cases included in the 2008/09 audit. It is therefore not possible to assess performance against the new surgical QA and GFoCW 31 and 62 day standards accurately. However, the 'date of first screen' and the 'date of

first assessment' were recorded in the audit. The 'date of last read' must lie between these two dates and it is reasonable to assume that the 'decision to treat date' would normally lie within one or at the most two weeks of the 'date of first assessment'. An approximate indication of whether or not breast screening patients invited for screening between 1 April 2008 and 31 March 2009 would have met the new 31 day and 62 day standards can therefore be obtained. 736 cases have been excluded from these analyses because they had no surgery, unknown surgery or assessment dates or received neo-adjuvant therapy prior to surgery.

In Figure 24, the cumulative percentage curve for the UK as a whole is drawn as a solid line and dashed lines represent the regions with the maximum and minimum cumulative percentages at each point. The data in Figure 24 show that in the UK as a whole, 55% of women had their first therapeutic surgery within 31 days of their first assessment visit. The median waiting time was 29 days (Table 42). The proportion of women having their first therapeutic surgery within 31 days of assessment varied from 24% in South East Coast to 81% in Northern Ireland. Only 42% of women who did not have a non-operative diagnosis had their first diagnostic operation within 31 days of their first assessment visit. The median waiting time was 35 days (Table 43).

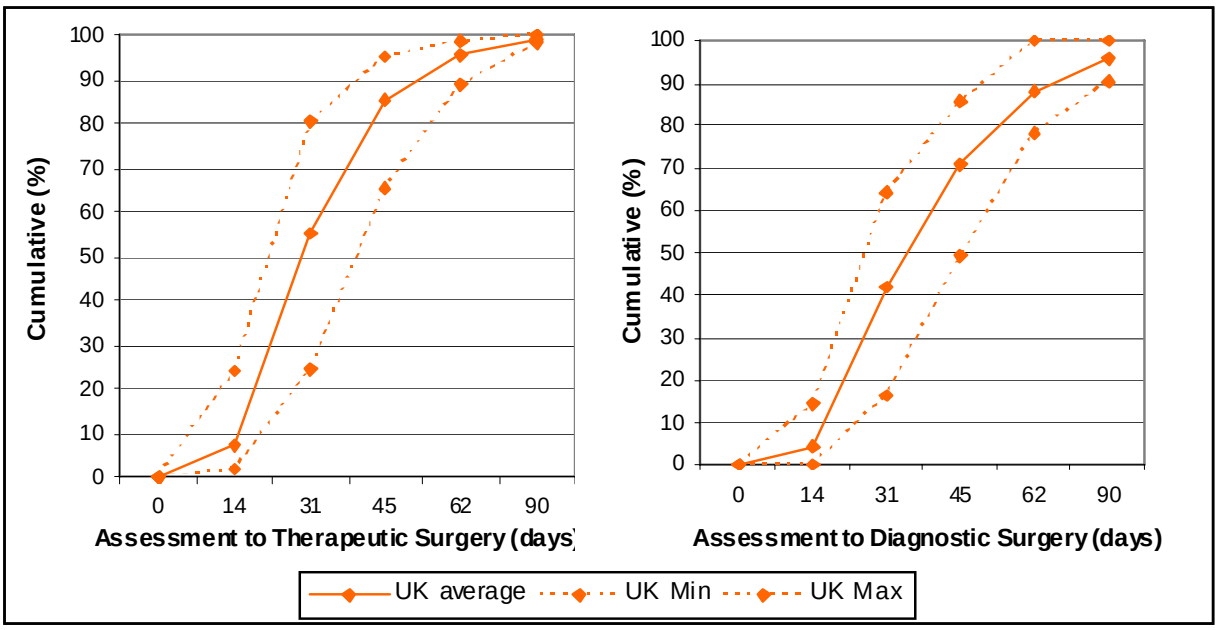

Figure 24 (Tables 37 and 40): Time from assessment to first therapeutic or diagnostic surgery (excludes cases having neo-adjuvant therapy prior to surgery)

The proportion of women having their first diagnostic surgery within 31 days of assessment varied from 16% in South East Coast to 64% in Northern Ireland. The longer waiting times seen for these patients is probably because there have usually been several attempts to obtain a non-operative diagnosis before their diagnostic surgery was carried out. This interpretation is supported by the data in Tables 44 and 45 which show that 58% of cases where the non-operative diagnosis was obtained at one assessment visit (91% of the total) had their first therapeutic operation within 31 days compared with only 31% of cases where more than one assessment visit was required to obtain the non-operative diagnosis. For cases without a non-operative diagnosis, 48% of those having only one assessment visit (72% of the total) had their diagnostic surgery within 31 days compared with only 24% of those having more than one assessment visit.

In order to compare these data with the new 31 day standard set in GFoCW, it has been assumed that the 'decision to treat date' is no more that 14 days after the first assessment appointment (i.e. that the time from assessment to first surgical operation is no more than 45 days). In the UK as a whole, 85% of women with a non-operative diagnosis and who did not have neo-adjuvant therapy had their first therapeutic surgery within 45 days of their first assessment appointment (Table 42) and 71% of women without a non-operative diagnosis and who did not have neo-adjuvant therapy had their first diagnostic operation within 45 days (Table 43). These data suggest that, neither the UK as a whole, nor any of the individual regions is likely to meet the new 31 day cancer waiting times standard.

In the UK as a whole, 95% of women who did not have neo-adjuvant therapy had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit (Table 47) and 76% had their first surgical treatment (therapeutic or diagnostic) within 62 days of their screening visit (Table 46). Figure 25 shows the proportion of women in each region who did not have neo-adjuvant therapy who had their first surgical operation (therapeutic or diagnostic) within 62 days of their screening visit or their first assessment visit. In South East Coast, only 61% of women received their first surgical treatment within 62 days of their screening visit. In Northern Ireland, this figure was 93%. Considering that the 'date of last read' will lie somewhere between the 'date of first screen' and the 'date of first assessment', these data suggest that for screen-detected cancers diagnosed in 2008/09, with the exception of Northern Ireland and the possible exception of the East Midlands, no region in the UK would have met the new 62 day cancer waiting times standard.

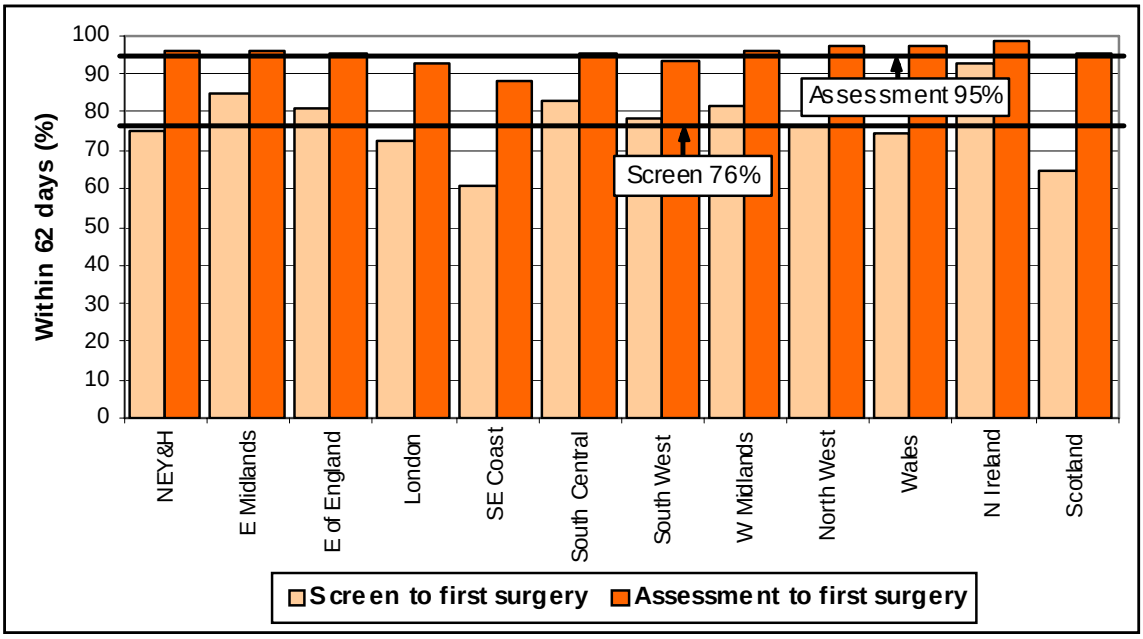

Figure 25 (Tables 46 & 47): Percentage of women who did not have neo-adjuvant treatment who had their surgery (therapeutic or diagnostic) within 62 days of their screening or assessment visit

COMMENTS:

- In the UK as a whole, 55% of women had their first therapeutic surgery within 31 days of their first assessment visit and the median waiting time was 29 days.
- Only 42% of women who did not have a non-operative diagnosis had their first diagnostic operation within 31 days of their first assessment visit and the median waiting time was 35 days. The longer waiting time seen for these patients is probably because there have usually been several attempts to obtain a non-operative diagnosis before diagnostic surgery was carried out.
- 85% of women with and 71% of women without a non-operative diagnosis who did not have neo-adjuvant therapy, had their first surgery within 45 days of their first assessment appointment. This suggests that neither the UK as a whole nor any individual region would have met the new 31 day cancer waiting times standard.
- In the UK as a whole, 95% of women who did not have neo-adjuvant therapy had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit and 76% had their first surgical treatment (therapeutic or diagnostic) within 62 days of their screening visit.
- As the 'date of last read' will lie somewhere between the 'date of first screen' and the 'date of first assessment', these data suggest that, with the exception of Northern Ireland and the possible exception of the East Midlands, no region in the UK would have met the new 62 day cancer waiting times standard.

CHAPTER 5
HORMONE RECEPTORS, NODAL STATUS, GRADE AND NPI

5.1 Hormone Receptor Status

Oestrogen Receptor (ER), Progesterone Receptor (PgR) and Human Epidermal Growth Factor Receptor 2 (HER-2) status were collected for the first time this year as part of the main audit. Receptor status results should be available when a case is discussed at multi-disciplinary meetings in order to plan the most appropriate neo-adjuvant or adjuvant treatment.

In the UK as a whole, ER status was unknown for 1,925 (11%) of all cancers included in the main audit (Table 48). This may be because the test was not done, the test result was unknown or no information on ER status was provided. The proportion of cancers with unknown ER status varied from 4% in Northern Ireland to 19% in South East Coast. Of the 15,120 cancers with known ER status, 13,397 (89%) were ER positive. In the UK as a whole, ER status was not known for 2% of invasive cancers and for 48% of non-invasive cancers (Figure 26). At 11%, the proportion of invasive cancers with unknown ER status was highest in South East Coast. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at multi-disciplinary meetings. 90% of invasive cancers with known ER status and 80% of non-invasive cancers with known ER status were ER positive.

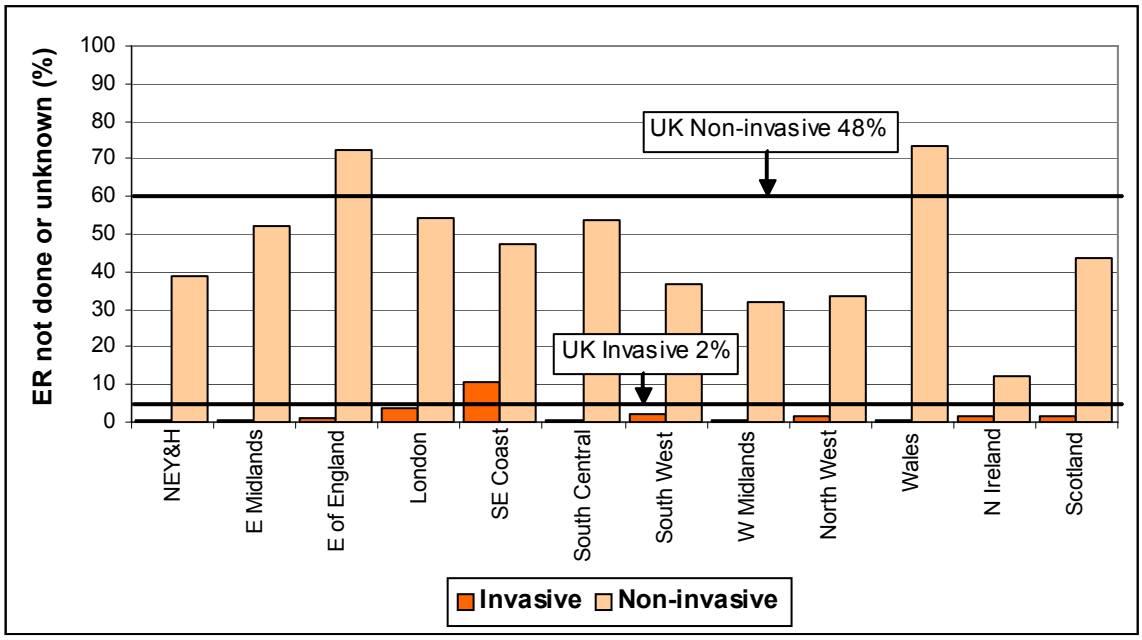

Figure 26 (Table 49 and 50) : Variation in the proportion of invasive and non-invasive cancers with ER status unknown or not provided

PgR status was known for 65% of all cancers (Table 51). This varied from 40% in Wales to 91% in North West. Of the cancers with known PgR status, 75% were positive. Of the 1,343 invasive cancers that were known to be ER negative, 71 were recorded as PgR positive and 1,158 were recorded as PgR negative.

HER-2 status data were available for 91% of the 13,532 invasive cancers included in the main audit (Table 52). This is an increase from 87% for cancers diagnosed in 2007/08 (see Chapter 8). The proportion of cases with known HER-2 status varied from only 71% in South East Coast to 97% in East of England (Figure 27). Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions. Of the 12,252 invasive cancers with known HER-2 status, 12% were positive, 86% were negative and 3% were borderline.

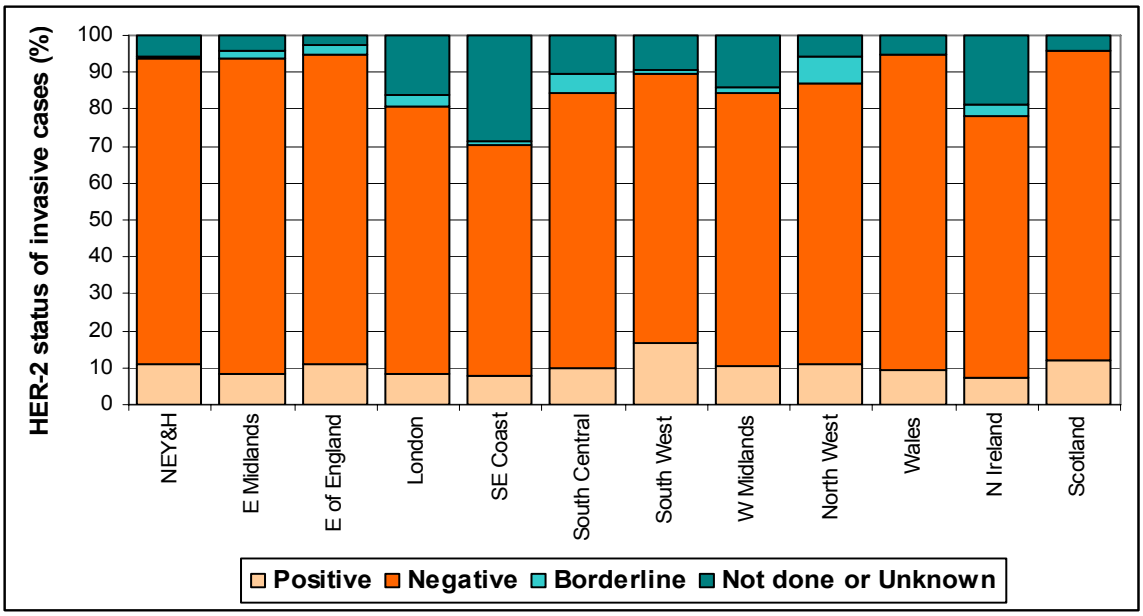

Figure 27 (Table 52) : Variation in HER-2 status for invasive cancers

COMMENTS:

- ER status was unknown for 11% of cases included in the main audit. 2% of invasive cancers and 48% of non-invasive cancers had unknown ER status. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at multi-disciplinary meetings.
- Of the 15,120 cancers with known ER status, 13,397 (89%) were ER positive. 90% of invasive cancers with known ER status and 80% of non-invasive cancers with known ER status were ER positive.
- PgR status was known for 65% of all cancers. This varied from 40% in Wales to 91% in North West. Of the cancers with known PgR status, 75% were positive.
- HER-2 status data were available for 91% of the 13,532 invasive cancers included in the main audit. The proportion of cases with known HER-2 status varied from only 71% in South East Coast to 97% in East of England. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions.
- Of the 12,252 invasive cancers with known HER-2 status, 12% were positive, 86% were negative and 3% were borderline.

5.2 Lymph Node Status for Invasive Cancers

Screening guidelines recommend that invasive cancers should have axillary node assessment. 235 invasive cancers which did not have surgery have been excluded from this section as no information was available concerning their lymph node status and grade.

Quality Objective	**To ensure adequate staging of the axilla in patients with invasive breast cancer**
Minimum Standard	**>90% of women treated for early invasive cancers should have an axillary staging procedure carried out if metastatic nodal metastasis is not confirmed non-operatively**
Target Standard	**100% of women treated for early invasive cancers should have an axillary staging procedure carried out if metastatic nodal metastasis is not confirmed non-operatively**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

5.2.1 Availability of Nodal Status for Invasive Cancers

In 2008/09, nodal status was known for 98% of surgically treated invasive cancers, varying from 97% in London and South East Coast to 99% in North East, Yorkshire & Humber, West Midlands, North West, Northern Ireland, and Scotland (Table 53). In London and South East Coast, 36 (3%) and 28 (3%) invasive cancers respectively were recorded as having no nodes obtained. In the UK, 7 invasive cancers did not have a record of whether or not nodes were obtained.

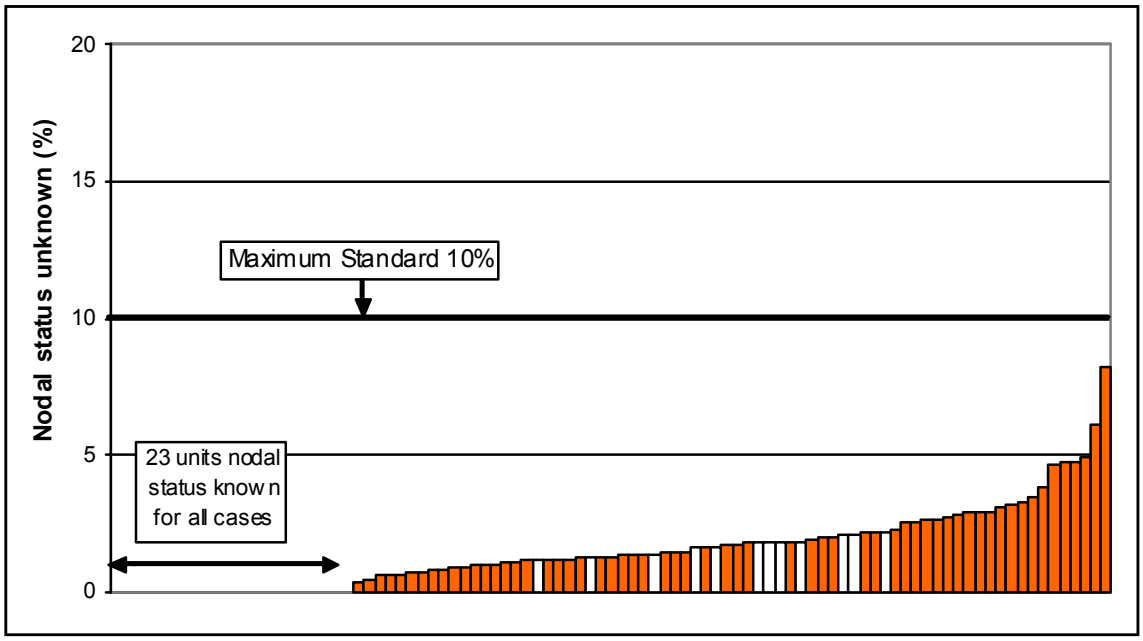

Figure 28: The non-availability of lymph node status for invasive breast cancers in each screening unit (12 of the 20 smallest units are highlighted in white)

The availability of nodal status for invasive cancers is shown for individual screening units in Figure 28. Where nodal status is unknown, this may be because no nodes were obtained, because it is not known whether or not nodes were obtained or because the number of positive nodes was not recorded. Nodal status was known for 100% of invasive cancers in 23 screening units. All screening units met the minimum standard of 90%. Regional QA reference centres and regional surgical QA co-ordinators should audit the cases in the 2 screening units which had more than 5% of cases with unknown nodal status in order to determine the reasons for the absence of these important prognostic data.

5.2.2 Sentinel Lymph Node Biopsy Technique

Quality Objective	**To minimise morbidity from axillary surgery to obtain staging information**
Outcome Measure	**Sentinel node biopsy using the combined blue dye/radioisotope technique is a recommended axillary staging procedure for the majority of patients with early invasive breast cancer**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

For the 13,083 invasive cancers with axillary surgery, 7,533 (58%) had a sentinel lymph node biopsy (SLNB) and 5,510 (42%) did not (Table 54). There were only 40 cases where the axillary lymph node procedure was not specified, a decrease from 349 cases in 2007/08. The use of SLNB has increased in all regions and Celtic Countries since 2007/08, but there is still widespread variation, with 76% of invasive cancers in Wales and 68% of invasive cancers in London having a SLNB compared with only 40% in Scotland, 47% in Northern Ireland and 51% in East Midlands. The use of SLNB varies even more between screening units (Figure 29) ranging from 97% in a screening unit in South Central to 0% in two units in East of England and North West.

SENTINEL LYMPH NODE BIOPSY					
		Technique Used (%)			
Region	% cases with SLNB	Isotope and blue dye	Blue dye only	Isotope only	SLNB unknown type
N East, Yorks & Humber	55	60	9	2	29
East Midlands	51	88	7	5	0
East of England	56	26	9	33	32
London	68	35	35	2	28
South East Coast	53	51	23	1	25
South Central	65	64	5	0	31
South West	60	59	14	1	26
West Midlands	60	81	14	2	3
North West	61	45	27	0	27
Wales	76	8	2	0	89
Northern Ireland	47	41	36	18	5
Scotland	40	39	1	0	60
United Kingdom	**58**	**51**	**15**	**4**	**30**

The preceding table shows the technique used for the invasive cancers recorded as having had a SLNB. Of the 7,533 invasive cases with a SLNB, 51% were recorded as having had the full dual SLNB procedure using isotope and blue dye. In East Midlands and the West Midlands, 88% and 81% of cases respectively had the recommended dual procedure, but in Wales and East of England in only 8% and 26% of cases respectively was the recommended dual procedure recorded as having been used. For 30% of cases in the UK, the SLNB technique used was not specified; the highest percentages of cases with unknown SLNB type being in Wales (89%) and Scotland (60%). In Wales, the type of SLNB technique has only recently been added to the computer system. Figure 29 shows that the SLNB technique recorded also varied between screening units. In two screening units, none of their patients who were diagnosed with an invasive cancer received a SLNB to the axilla. In 17 screening units, less than 20% of the invasive breast cancer patients had a SLNB biopsy; while in 30 screening units, over 80% of the invasive cancer patients had a SLNB biopsy.

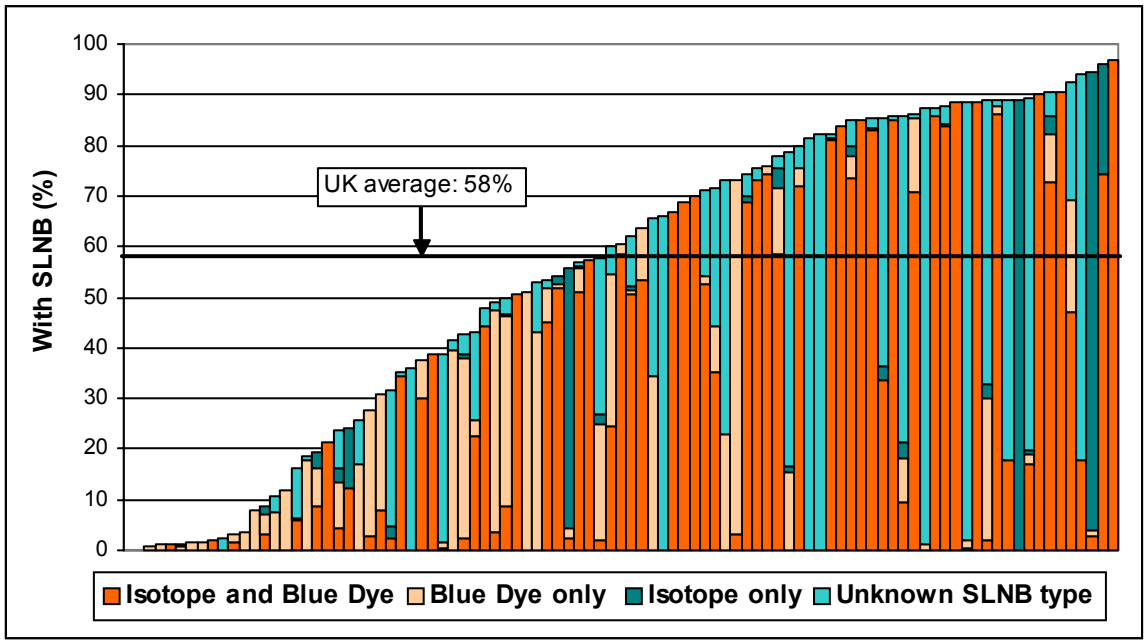

Figure 29: Use of SLNB for invasive breast cancers in each screening unit

5.2.3 Number of Nodes Examined

Quality Objective	**To ensure adequate staging of the axilla in patients with invasive breast cancer**
Minimum Standard	**>90% of patients should have at least four nodes retrieved when axillary node sampling is carried out**
Target Standard	**100% of patients should have at least four nodes retrieved when axillary node sampling is carried out**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

13 YEAR COMPARISON: NODAL STATUS ASSESSED ON THE BASIS OF <4 NODES

Year of data collection	*Number of invasive cancers with known nodal status*	*% with <4 nodes examined*		
		Overall	*With SLNB*	*No SLNB*
1996/97	*4,773*	*10.6*	*-*	*10.6*
1997/98	*5,585*	*9.0*	*-*	*9.0*
*1998/99**	*5,574*	*6.7*	*-*	*6.7*
1999/00	*7,126*	*5.5*	*-*	*5.5*
2000/01	*7,379*	*5.0*	*-*	*5.0*
2001/02	*7,465*	*5.1*	*-*	*5.1*
2002/03	*8,607*	*5.2*	*-*	*5.2*
2003/04	*9,811*	*4.8*	*-*	*4.8*
*2004/05**	*10,322*	*8.6*	*4.1*	*4.5*
2005/06	*12,063*	*13.4*	*8.8*	*4.6*
2006/07	*11,993*	*19.1*	*16.0*	*3.1*
2007/08	*12,850*	*27.3*	*24.0*	*3.3*
2008/09	*13,074*	*35.9*	*33.4*	*2.5*

*Data from Scotland and Northern Ireland are absent in 1998/99. Data for 2 units from East of England are absent in 2004/05

The preceding summary table shows that the proportion of invasive cancers for which nodal status was recorded based on the examination of fewer than 4 nodes decreased from 10.6% in 1996/97 to 4.8% in 2003/04. In the most recent 5 year period, this figure has started to rise again because of the increased use of SLNB procedures, and in 2008/09 the proportion of cases with fewer than 4 nodes examined was 36%. However, when cases with a SLNB are excluded, there is a continuous decrease in the proportion of invasive cancers with nodal status based on the examination of fewer than 4 nodes, and in 2008/09 this applied to only 2.5% of cases.

In the UK, 94% of the 5,551 invasive cancers, which either did not have a SLNB procedure or where it was not known whether or not a SLNB procedure was performed, had 4 or more nodes taken (Table 55). This ranged from 83% in Wales to 99% in Northern Ireland. Figure 30 shows that in 2008/09, 23 screening units achieved the 100% target that all their invasive cancers without a SLNB or with unknown SLNB should have at least 4 nodes obtained. 19 screening units did not achieve the 90% minimum standard. Regional QA reference centres and regional surgical QA co-ordinators should audit all the invasive cancers without a SLNB or with an unknown nodal procedure type which had fewer than 4 nodes reported to ensure that the axilla has not been under-treated.

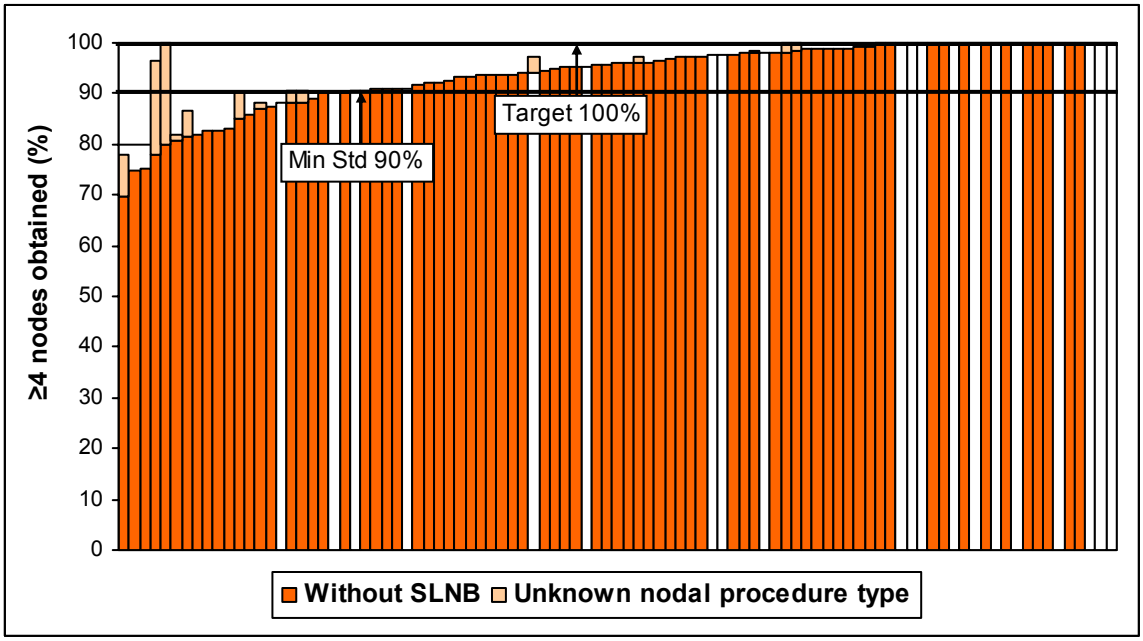

Figure 30: Invasive cancers with at least 4 nodes obtained presented as a proportion of invasive cancers recorded as without sentinel procedure or with unknown nodal procedure type (The 20 smallest units are highlighted in white)

5.2.4 Lymph Node Status

Of the 13,074 invasive cancers with known nodal status, 2,862 (22%) had positive nodes (Table 56). There was some regional variation in lymph node status; with the proportion of node positive cancers varying from 19% in East Midlands and Wales to 27% in Northern Ireland. A wider variation in nodal status was apparent in individual screening units where the proportion of positive nodes varied from 12% (82 cancers) to 35% (48 cancers). It would be interesting to determine whether this wide range of node positivity is related to differences between units in the number of blocks taken, and the intensity with which the presence of micro-metastases is investigated.

Table 57 shows that the proportion of cases with positive nodal status (16%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (29%). This is consistent with the selection of patients for axillary sampling or clearance, who were considered to be of high risk (e.g. high grade, palpable nodes) or who had positive nodes on non-operative ultrasound guided cytology or core biopsy. Of the 1,226 cases which had their positive nodal status determined from a SLNB procedure, 782 (64%) had a subsequent axillary procedure (Table 58). For 320 cases (26%), four or more nodes were taken in the only axillary operation, indicating that other nodes were taken as well as the sentinel node at this time. This has decreased from 33% in 2007/08 when the higher level probably reflects the larger number of surgeons who were doing the audit phase of the New Start Programme when a SLNB procedure and routine axillary surgery are carried out in the same operation.

For 129 cases (Table 59), the positive nodal status was determined on the basis of fewer than 4 nodes with a SLNB, and 124 of these cases (Table 58) had no subsequent axillary procedures recorded. 86 (69%) of these cancers had an invasive tumour size of 20mm or less and 100 (81%) were Grade I or Grade II. However, only 17 (14%) were in the Excellent or Good Nottingham Prognostic Index Groups. A further 25 invasive cancers (0.2%) had their positive nodal status determined on the basis of fewer than 4 nodes without a SLNB procedure. 5 of these patients are known to have had radiotherapy to the axilla, one died within a month of her operation and one had liver metastases. Regional QA reference centres and regional surgical QA co-ordinators should, however, follow up all of the cases where the positive nodal status was determined on the basis of fewer than four nodes to ensure that the axilla has not been under-treated.

Overall, 305 (2.3%) of the invasive cancers for which nodal status was recorded had their negative nodal status determined on the basis of fewer than 4 nodes without a SLNB procedure. Figure 31 shows that this varied from 0 cases in Northern Ireland to 5.8% (59 cancers) in South East Coast. A

further 4,235 cancers (32%) had their negative nodal status determined by a SLNB procedure. This varied from 16% in Scotland to 47% in Wales.

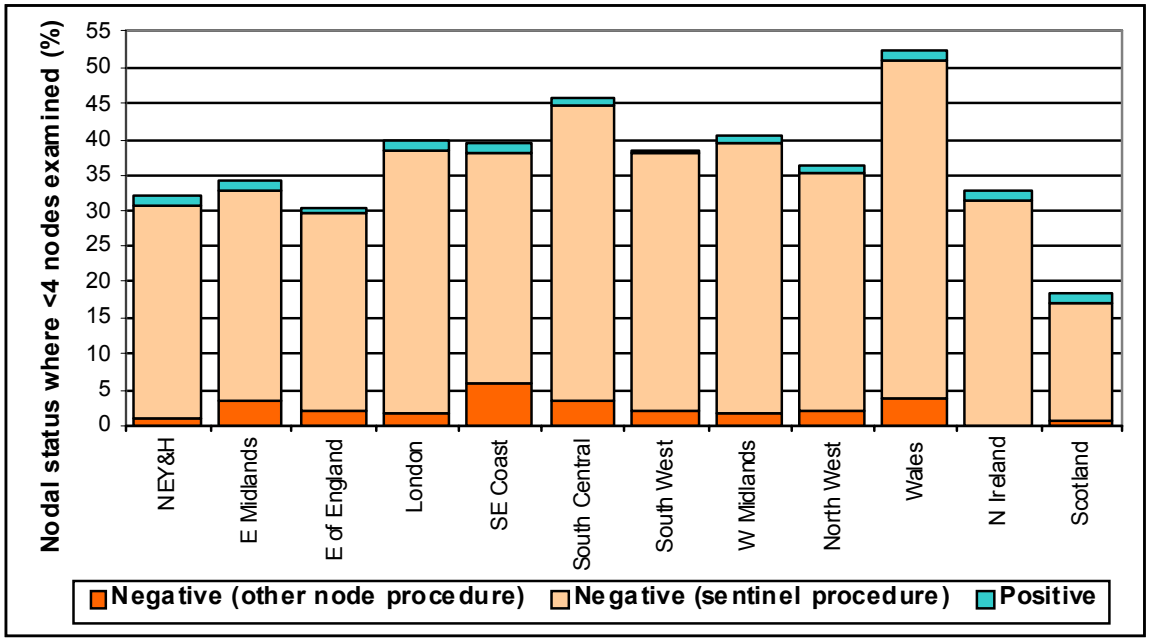

Figure 31 (Table 59): Nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

INVASIVE CANCERS WITH INSUFFICIENT NODAL INFORMATION

	Total invasive cancers with surgery	***Unknown nodal status*** *(Table 53)*	***Negative <4 nodes*** *(Not sentinel procedure - Table 59)*	***Positive <4 nodes*** *(Table 59)*	***Insufficient nodal information***	
Region	***No.***	***No.***	***No.***	***No.***	***No.***	***%***
N East, Yorks & Humber	*1,806*	*23*	*20*	*24*	*67*	*4*
East Midlands	*1,065*	*17*	*34*	*15*	*66*	*6*
East of England	*1,299*	*20*	*25*	*10*	*55*	*4*
London	*1,145*	*39*	*20*	*17*	*76*	*7*
South East Coast	*1,045*	*28*	*59*	*14*	*101*	*10*
South Central	*918*	*20*	*29*	*9*	*58*	*6*
South West	*1,125*	*25*	*26*	*3*	*54*	*5*
West Midlands	*1,190*	*10*	*19*	*15*	*44*	*4*
North West	*1,458*	*17*	*33*	*17*	*67*	*5*
Wales	*753*	*12*	*29*	*9*	*50*	*7*
Northern Ireland	*280*	*2*	*0*	*3*	*5*	*2*
Scotland	*1,213*	*10*	*11*	*18*	*39*	*3*
United Kingdom	***13,297***	***223***	***305***	***154***	***682***	***5***

The preceding summary table shows that of the 13,297 surgically treated invasive cancers, 223 (2%) had unknown nodal status, 305 (2%) had their negative nodal status determined on the basis of 1, 2 or 3 nodes with no known SLNB procedure and 154 (1%) had their positive nodal status determined on the basis of 1, 2 or 3 nodes using any type of nodal procedure. 682 (5%) of the 13,297 invasive cancers therefore appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. This proportion varied from 2% in Northern Ireland to 10% in South East Coast.

Figure 32 shows how the proportion of invasive cancers with unknown nodal status and with negative nodal status determined on the basis of less than 4 nodes without a sentinel lymph node procedure or positive nodal status determined on the basis of 1, 2 or 3 nodes using any type of nodal procedure

varied in individual screening units. The proportion of invasive cancers with insufficient nodal information to provide a satisfactory diagnostic work-up varied between 0% and 15%. Regional QA reference centres and regional surgical QA co-ordinators should audit all of these cases to ascertain whether the data are a true reflection of clinical practice, as these cancers may have had an inadequate diagnostic work-up.

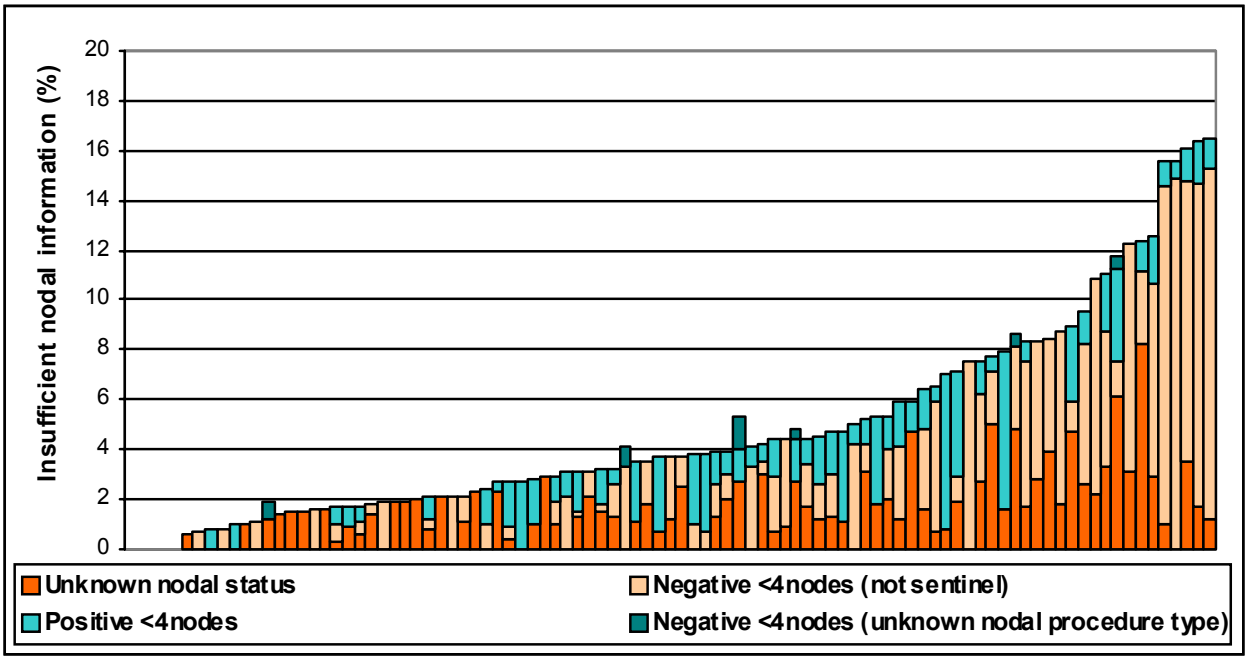

Figure 32: Proportion of invasive cancers with insufficient nodal information in each screening unit

COMMENTS:

- In the UK as a whole, 98% of surgically treated invasive cancers had known nodal status. This varied between 97% in London and South East Coast and 99% in North East, Yorkshire & Humber, West Midlands, North West, Northern Ireland and Scotland. Regional QA reference centres and regional surgical QA co-ordinators should audit the cases in the 2 screening units which had more than 5% of cases with unknown nodal status in order to determine the reasons for the absence of these important prognostic data.
- In 2008/09 a sentinel lymph node biopsy (SLNB) procedure was recorded for 7,533 invasive cancers (58%) with axillary surgery. Of these, 51% had the full dual SLNB procedure using isotope and blue dye recorded. This varied from 8% in Wales to 88% in East Midlands.
- Although the use of SLNB has increased since 2007/08, there is still widespread variation, with 76% of invasive cancers in Wales and 68% of invasive cancers in London having a SLNB compared with only 40% in Scotland, 47% in Northern Ireland and 51% in East Midlands.
- In 2008/09, the proportion of cases with fewer than 4 nodes examined increased to 36%. 33% of these cases involved a SLNB procedure, leaving an underlying rate of 2.5% with fewer than 4 nodes examined when a SLNB procedure was not used.
- In the UK, 94% of the 5,551 invasive cancers, which either did not have a SLNB procedure or where it was not known whether or not a SLNB procedure was performed, had 4 or more nodes taken. This ranged from 83% in Wales to 99% in Northern Ireland. Regional QA reference centres and regional surgical QA co-ordinators should audit all the invasive cancers without a SLNB or where the type of axillary procedure used is unknown, which have fewer than 4 nodes reported to ensure that the axilla has not been under-treated.
- In the UK as a whole in 2008/09, the 22% of cases had positive nodal status; this varied from 12% to 35% in individual screening units. It would be interesting to determine whether this wide range of node positivity is related to differences in the number of blocks taken and the intensity with which the presence of micro-metastases is investigated.

COMMENTS:

- The proportion of cases with positive nodal status (16%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (29%). This is consistent with the selection of patients for axillary sampling or clearance, who were thought to be of high risk (e.g. high grade, palpable nodes) or who had positive nodes on non-operative ultrasound guided cytology or core biopsy.
- 10% of the 1,226 cancers which had their positive nodal status determined from a SLNB procedure where less than 4 nodes were taken, appeared to have had no subsequent axillary procedure. 86 (69%) of these cancers had an invasive tumour size of 20mm or less and 100 (81%) were Grade I or Grade II. However, only 17 (14%) were in the Excellent or Good NPI Groups.
- A further 25 invasive cancers had their positive nodal status determined on the basis of fewer than 4 nodes without a SLNB procedure. In total, 682 (5%) invasive cancers appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. Regional QA reference centres and regional surgical QA co-ordinators should follow up all of these cases to ensure that the appropriate nodal procedures have been undertaken and that the axilla has not been under-treated.

5.3 Lymph Node Status of Non-invasive Cancers

39 non-invasive cancers which did not have surgery have been excluded from this section as no data were available concerning their lymph node status and grade. Although nodal assessment is not always indicated for non-invasive cancers, nodes are usually obtained when a mastectomy is performed, especially if the assessment process provides suspicion of invasive disease.

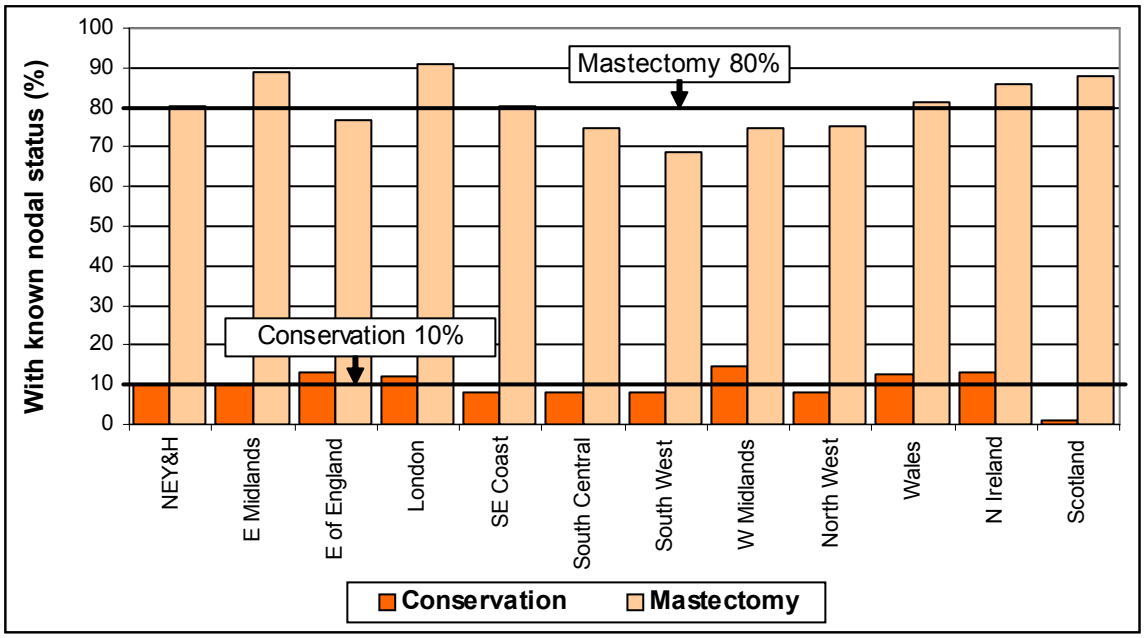

Figure 33 (Table 61): The proportion of non-invasive cancers treated with conservation surgery or mastectomy with known nodal status

Of the 3,312 surgically treated non-invasive cancers, 31% had known nodal status. This varied from 24% in South West to 38% in East Midlands (Table 60). For three cases in London and one case in Scotland, it was not known whether or not nodes were taken. 80% of the non-invasive cancers treated by mastectomy had known nodal status, varying from 69% in South West to 91% in London (Figure 33). In contrast, only 10% of non-invasive cancers treated with conservation surgery had known nodal status. Of the 1,032 non-invasive cancers with known nodal status, 5 (0.5%) had positive nodal status recorded (Table 62).

In the UK as a whole the median numbers of nodes taken for non-invasive cancers undergoing conservative surgery and mastectomy were 2 and 4 respectively (Table 63). The maximum numbers

of nodes taken for cases treated with conservative surgery and mastectomy were 12 and 35 respectively. The maximum number of nodes taken for mastectomy cases varied from 8 in Wales to 35 in South Central. Regional QA reference centres should audit non-invasive cancers where more than 10 nodes were taken to ascertain why the axilla appears to have been over-treated.

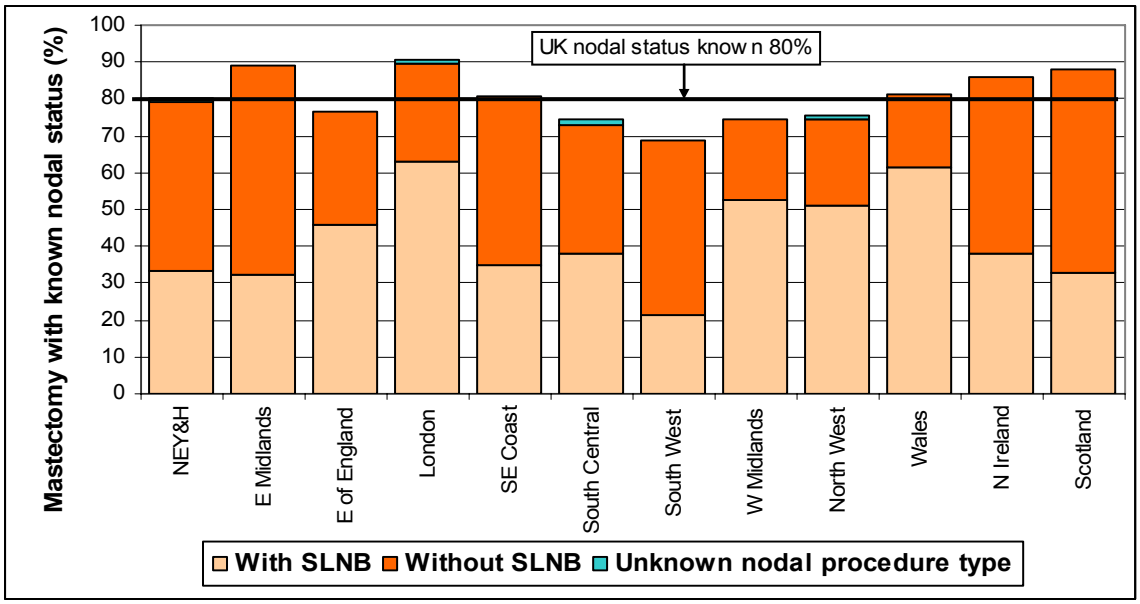

Figure 34 (Table 64): Use of sentinel lymph node biopsy for non-invasive cancers with known nodal status treated with a mastectomy

The nodal status of non-invasive cancers was more likely to have been determined by SLNB if the cancers were treated with conservation surgery rather than mastectomy. Figure 34 shows the proportion of cases with known nodal status in each region treated with a mastectomy that had their nodal status determined on the basis of a SLNB. In the UK as a whole, 42% of mastectomy cases had their nodal status determined on the basis of a SLNB. This varied from 21% in South West to 63% in London. Excluding cases with unknown nodal status, 52% of non-invasive cancers treated with a mastectomy had their nodal status determined using a SLNB (Table 64). This varied between 31% in South West and 75% in Wales.

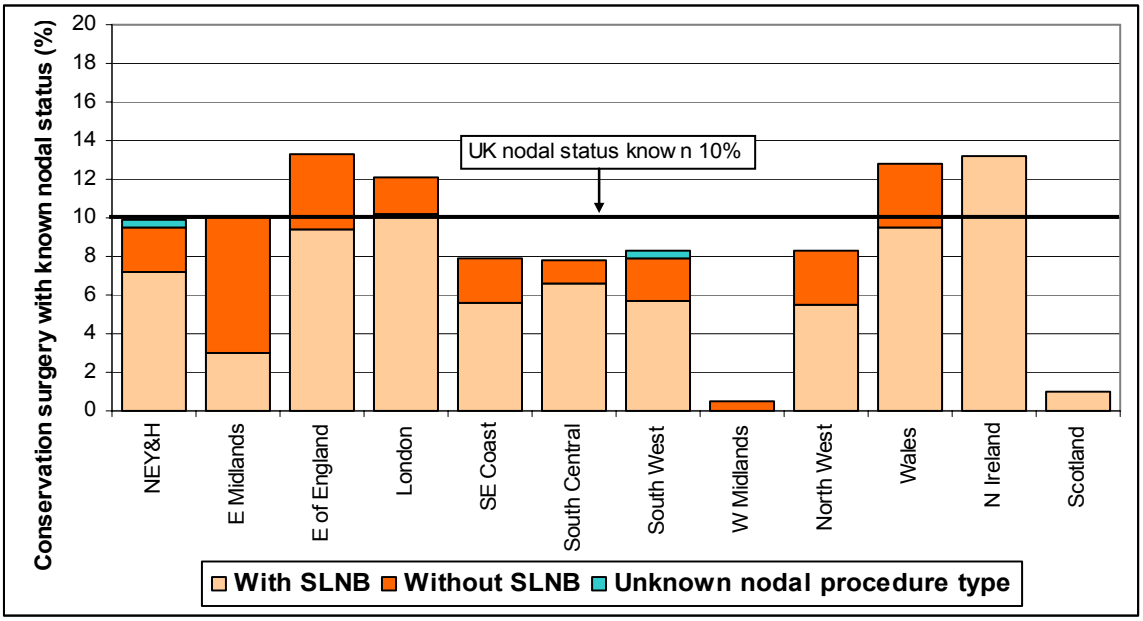

Figure 35 (Table 65): Use of sentinel lymph node biopsy on non-invasive cancers with known nodal status treated with conservation surgery

10% of non-invasive breast cancers treated with conservation surgery had known nodal status and 7% had their nodal status determined on the basis of a SLNB (Table 65). This varied from 0 cases in West Midlands to 13% of cases in Northern Ireland (Figure 35). Excluding cases with unknown nodal status,

74% of non-invasive cancers treated with conservation surgery had their nodal status determined using a SLNB. This varied between 0% in West Midlands and 100% in Scotland (7 cases) and Northern Ireland (2 cases). It is anticipated that, as the use of SLNB increases, the proportion of non-invasive cancers with known nodal status treated with conservation surgery may increase.

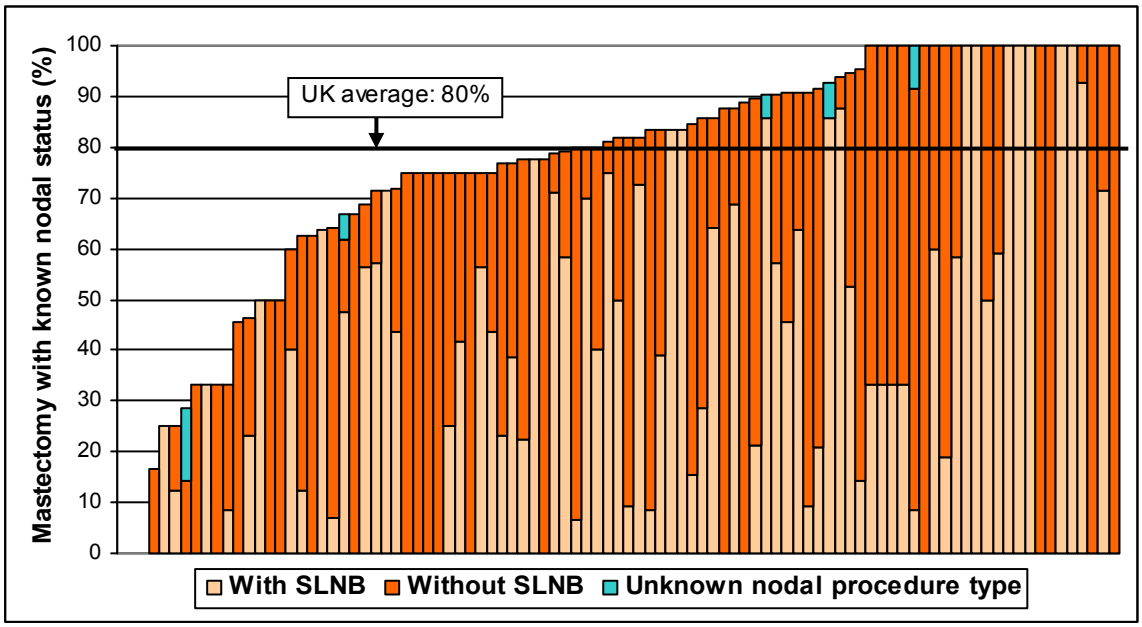

Figure 36: Use of sentinel lymph node biopsy for non-invasive cancers with known nodal status treated with a mastectomy

Figure 36 a shows that, although in the UK as a whole 80% of non-invasive breast cancers treated with mastectomy had known nodal status and 42% of non-invasive breast cancers had their nodal status determined on the basis of a SLNB, these proportions varied very widely between screening units. For example, in 7 screening units where the nodal status was known for all cancers, the status was always determined by a SLNB, while in a further 5 units where the nodal status was known for all cancers, the status was always determined without a SLNB.

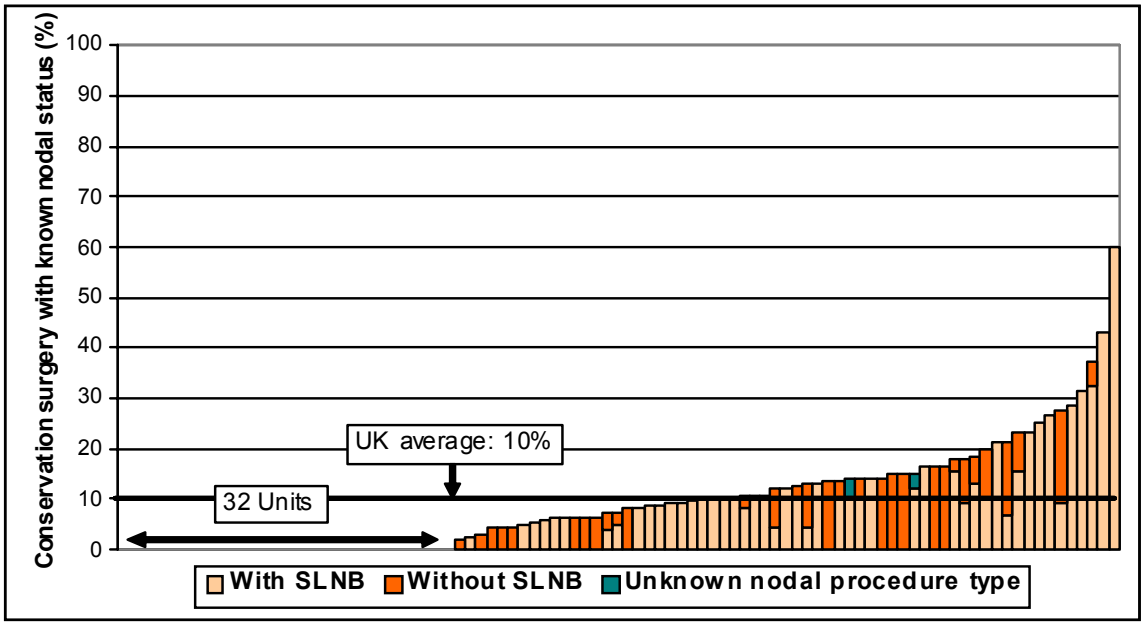

Figure 37: Use of sentinel lymph node biopsy on non-invasive cancers with known nodal status treated with conservation surgery

Figure 37 shows that variation in practice between screening units was less marked for the 10% of non-invasive breast cancers treated with conservation surgery that had known nodal status, with most units determining the nodal status on the basis of a SLNB.

COMMENTS:

- Although nodal assessment is not always indicated for non-invasive cancers, 31% of non-invasive cancers had known nodal status. This varied from 24% in South West to 38% in East Midlands.
- Of the 1,032 non-invasive cancers with known nodal status, 5 (0.5%) had positive nodal status recorded.
- 80% of non-invasive cancers treated with mastectomy had known nodal status, compared with 10% of those treated with conservation surgery.
- 42% of non-invasive cancers treated with a mastectomy had their nodal status determined on the basis of a SLNB, and 52% of mastectomy cases with known nodal status had this determined using a SLNB. 7% of non-invasive cancers treated with conservation surgery had their nodal status determined on the basis of a SLNB, and 74% of cases treated with conservation surgery with known nodal status had this determined using a SLNB.
- The maximum numbers of nodes taken for non-invasive cancers treated with conservative surgery and mastectomy were 12 and 35 respectively. Regional QA reference centres should audit non-invasive cancers where more than 10 nodes were taken to ascertain why the axilla appears to have been over-treated.

5.4 Grade of Invasive Cancers

Of the 13,297 invasive cancers which had surgery, 3,413 (26%) were Grade I, 7,054 (53%) were Grade II and 2,712 (20%) were Grade III (Table 66). Grade was not assessable for 42 cases (0.3%) and grade was unknown for 76 cases (1%).

The control charts in Figure 38 show the variation in the proportions of Grade I, II and III cancers recorded for individual screening units. The cases were plotted with the assumption that the proportions are normally distributed. The screening units are positioned with the same x-value in the 3 graphs, according to the total number of invasive cancers which had surgery, so that the units with the highest number of invasive cancers are located at the right hand side of the graphs. The three points (Grade I, II and III) for a single unit can thus be compared vertically. Any points that are outside the 2 dashed lines (95% upper and lower control limits) are considered as significantly higher or lower than the average represented by the solid line.

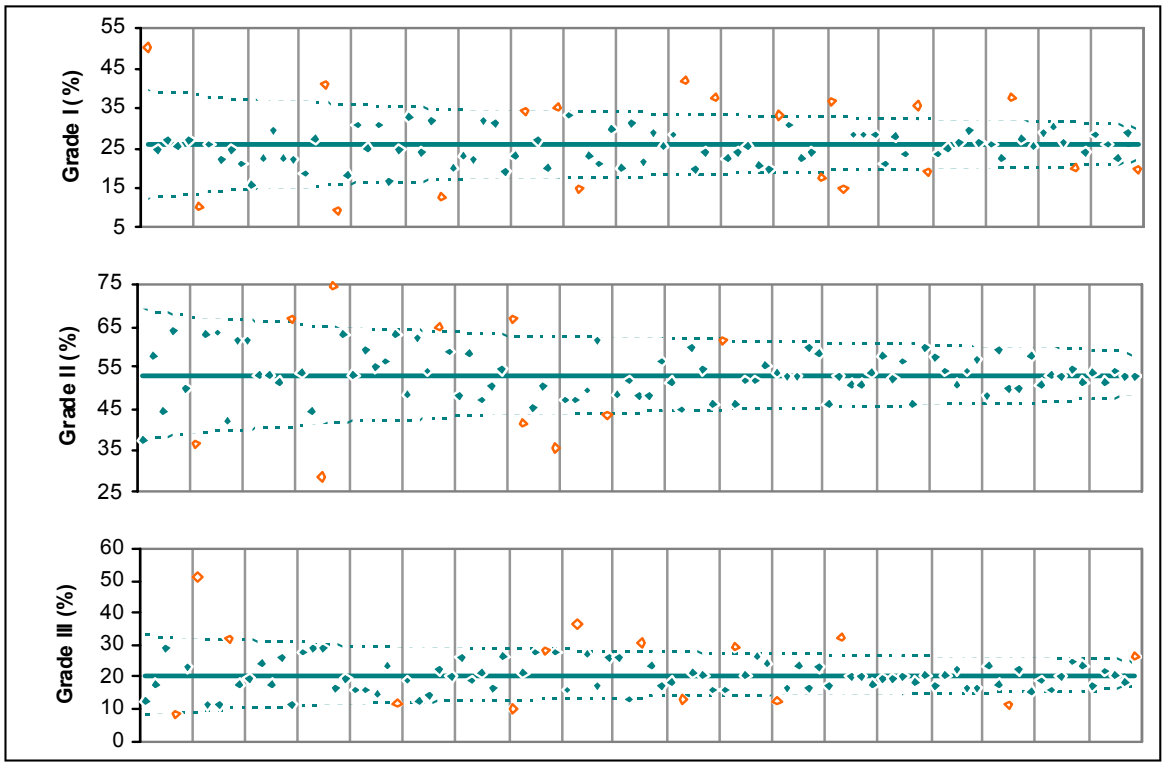

Figure 38: Variation in the grade of surgically treated invasive cancers in each screening unit (open diamonds represent units which lie outside the control limits)

The control charts in Figure 38 suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and their regional pathology QA co-ordinators. For example, 5 of the 11 units in North East, Yorkshire & Humber are outliers in the Grade I control chart, 2 of the 8 units in East Midlands and West Midlands are outliers in the Grade II control chart and 4 of the 11 units in East of England are outliers in the Grade III control chart. In the Grade I control chart, 3 units have been outliers every year during the 3-year audit period 2006/07-2008/09 and 8 units have been outliers in 2 out of 3 of these years. A similar pattern is seen for the Grade III control chart; with 2 units being outliers in all 3 audit years and 8 units being outliers in 2 out of 3 audit years.

5.5 NPI of Invasive Cancers

NPI Score = 0.2 x Invasive Size (cm) + Grade + Nodes
where Nodes equals 1 (0 positive nodes), 2 (1, 2 or 3 positive nodes) or 3 (≥4 positive nodes)

EPG	(Excellent Prognostic Group)	≤2.4
GPG	(Good Prognostic Group)	2.401-3.4
MPG1	(Moderate Prognostic Group 1)	3.401-4.4
MPG2	(Moderate Prognostic Group 2)	4.401-5.4
PPG	(Poor Prognostic Group)	>5.4

The Nottingham Prognostic Index (NPI) score was calculated for invasive cancers in order to allocate them to one of five prognostic groups. An NPI score was calculated for all invasive cancers with complete size, grade and nodal status information, even if nodal status was based on fewer than 4 nodes. It should be noted that the differences in invasive grade outlined in Figure 39 will have affected the NPI groupings.

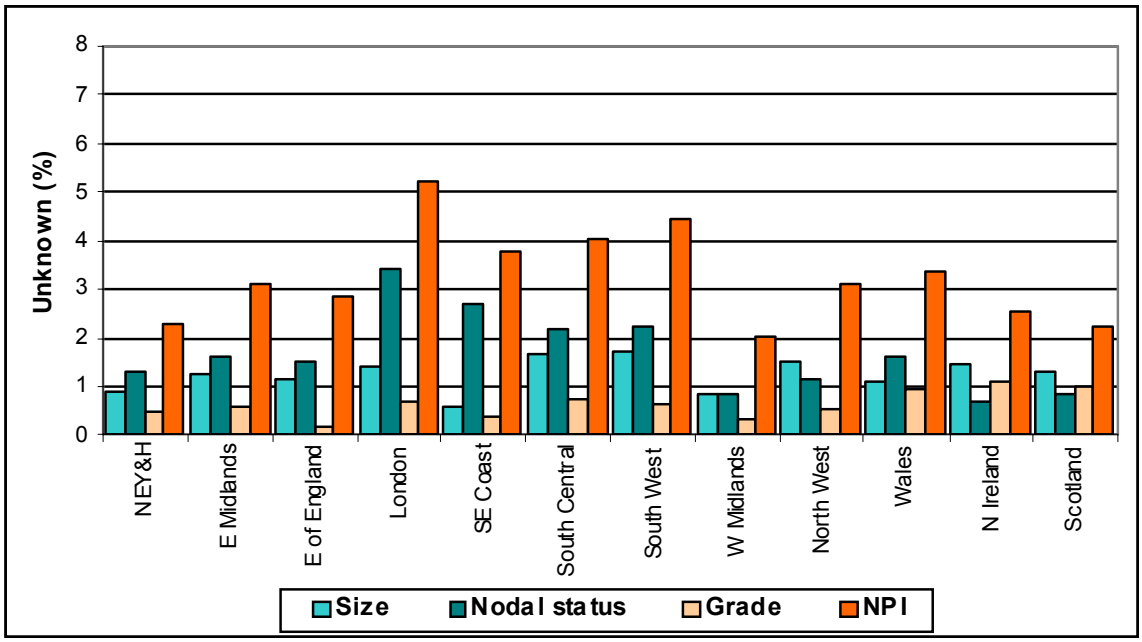

Figure 39 (Table 67): Data completeness of tumour characteristics of surgically treated invasive cancers

An NPI score cannot be calculated if size, nodal status or grade is unknown or if grade is not assessable. Overall, an NPI score could not be calculated for 3% (425 cases) of the 13,297 invasive cancers which had surgery. Figure 39 shows that the proportion of cancers with unknown NPI was the lowest in North East, Yorkshire & Humber, West Midlands and Scotland (2%) and highest in London (5%). The high proportion of cancers with an unknown NPI score in London was due to unknown nodal status. Northern Ireland has shown the greatest improvement in data completion; having only 2.5% of invasive cancers with an unknown NPI in 2008/09 compared to 8% in 2007/08.

Of the 12,872 surgically treated invasive cancers with known NPI score, the highest proportion fell

into the Good Prognostic Group (37%), with only 6% (809 cases) in the Poor Prognostic Group (Table 68). As expected with cancers detected by screening, in the UK as a whole the majority (58%) of cancers fell into the two best prognostic groups, EPG (Excellent Prognostic Group) and GPG (Good Prognostic Group). The proportion of EPG and GPG cancers varied from 49% in Northern Ireland to 63% in East Midlands.

In Figure 40, the proportion of invasive cancers for individual screening units in each NPI group and with unknown NPI group is plotted in the control charts. As in Figure 38, data for the same unit can be compared vertically across the 4 graphs. Any points that are outside the 2 dashed lines (95% upper and lower control limits) are considered as significantly higher or lower than the average, represented by the solid line.

The first control chart in Figure 40 shows that 19 units have a significantly higher or lower proportion of EPG and GPG cancers than the UK as a whole. The third control chart shows that 5 units have a significantly higher proportion of PPG cancers. 7 units have a significantly higher proportion than the average with unknown NPI group (fourth control chart). In the EPG and GPG control chart, 1 unit has been an outlier every year during the 3-year audit period 2006/07-2008/09 and 10 units have been outliers in 2 out of 3 of these years. Less consistent patterns are seen for the other control charts; with only 1 or 2 units being outliers in 2 out of 3 audit years. Regional QA reference centres and their regional pathology QA co-ordinators and surgical QA co-ordinators should investigate the reasons for the unusual NPI distributions and the high proportion of cases with unknown NPI group seen in some screening units.

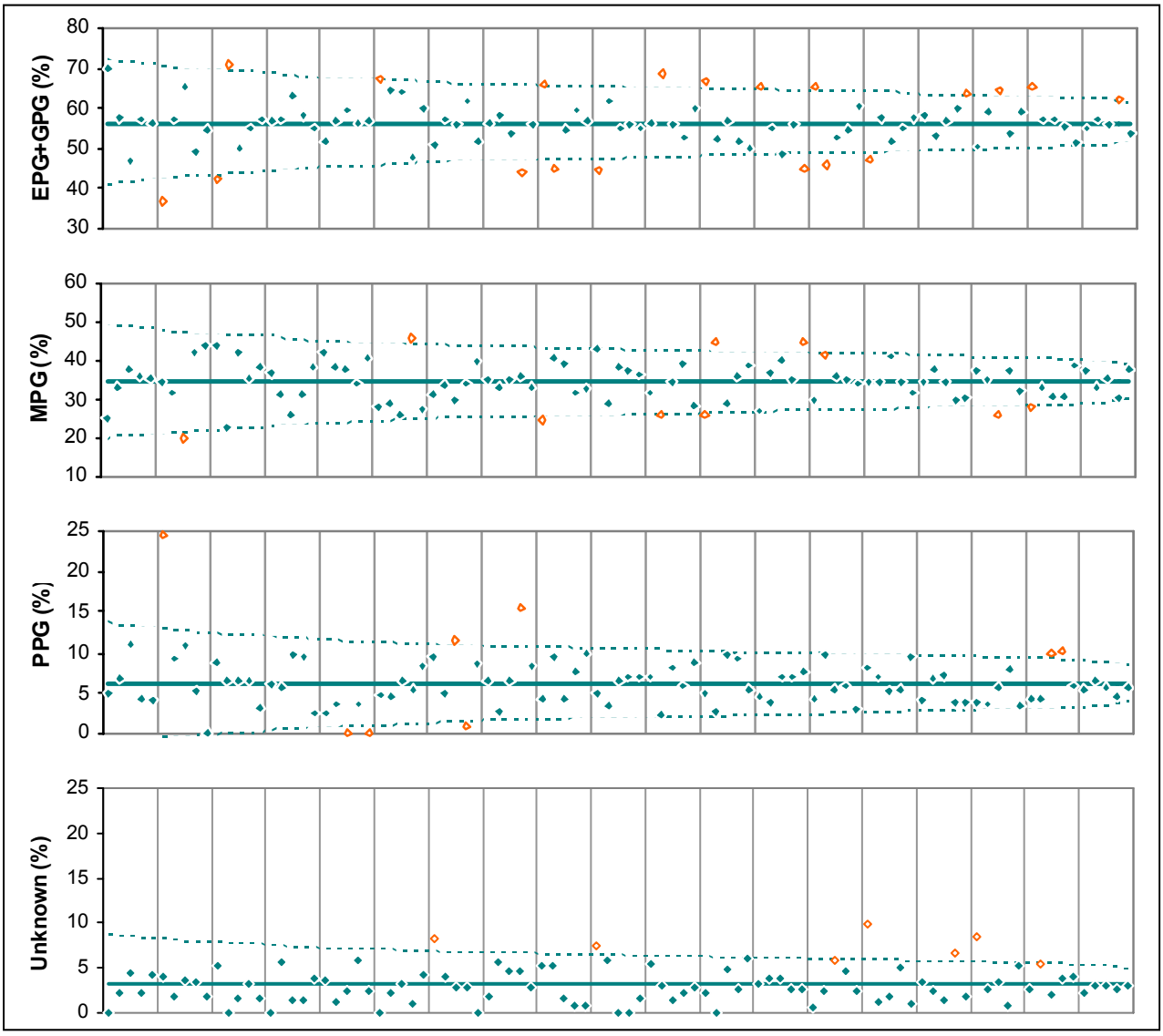

Figure 40: NPI groups for surgically treated invasive cancers in each screening unit (open diamonds represent units which lie outside the control limits)

COMMENTS:

- Overall, 26% of invasive cancers were Grade I, 53% Grade II and 20% Grade III. Grade was not assessable for 42 cases and unknown for 76 cases (1%).
- Control charts suggest that there are local variations in the interpretation of invasive grade definitions which should be investigated by regional QA reference centres and regional pathology QA co-ordinators.
- In the Grade I control chart, 3 units have been outliers every year during the 3-year audit period 2006/07-2008/09 and 8 units have been outliers in 2 out of 3 of these years. A similar pattern is seen for the Grade III control chart; with 2 units being outliers in all 3 audit years and 8 units being outliers in 2 out of 3 audit years.
- Data were available to calculate a Nottingham Prognostic Index (NPI) score for 97% of surgically treated invasive cancers. Regional QA reference centres and their regional pathology QA co-ordinators and surgical QA co-ordinators should investigate the reasons for the unusual NPI distributions and the high proportion of cases with unknown NPI seen in some screening units.

CHAPTER 6
SCREENING SURGICAL CASELOAD

Quality Objective **To ensure specialist surgical care**

Outcome Measure **Breast cancer surgery should be performed only by surgeons with a specialist interest in breast disease (defined as at least 30 surgically treated cases per annum [screening and symptomatic]). Each surgeon involved in the NHSBSP should maintain a surgical caseload of at least 10 screen-detected cancers per year averaged over a three year period.**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

There were 549 consultant breast surgeons working in the UK NHSBSP in 2008/09. This UK figure counts only once the 55 surgeons who worked in more than one region. Throughout this section, each surgeon is credited with their total UK screening caseload. Surgeons who share cases are each credited with the case. 489 of the 549 consultant surgeons were identified by their unique GMC registration code. A code other than the GMC code was provided for a further 54 surgeons from Scotland. Data for the remaining 6 unidentified surgeons have been assumed to be for 6 individual surgeons, 5 of which were from overseas.

9 YEAR SUMMARY : SCREENING SURGICAL CASELOAD

Year of data collection	*Number of screening surgeons*	*Median screening caseload*	*Proportion of women treated by a surgeon with screening caseload 20+ (%)*	*Number of surgeons with screening caseload <10*	*Number of surgeons with no information to explain screening caseload <10*
2000/01	*419*	*17*	*86*	*159*	*25*
2001/02	*439*	*18*	*85*	*156*	*52*
2002/03	*472*	*18*	*86*	*174*	*55*
2003/04	*481*	*19*	*89*	*161*	*15*
*2004/05**	*484*	*20*	*91*	*151*	*10*
2005/06	*511*	*23*	*93*	*149*	*11*
2006/07	*559*	*22*	*91*	*186*	*16*
2007/08	*526*	*29.5*	*92*	*142*	*6*
2008/09	*549*	*27*	*92*	*149*	*4*

*Data for 2 units from East of England are absent in 2004/05

The summary table shows that the proportion of women treated by surgeons with a screening caseload of 20 or more has increased from 86% in 2000/01 to 91% to 93% from 2004/05 onwards. In 2008/09, 82% women were treated by surgeons with an annual caseload of more than 30 screen-detected cancers and 3% (466) were treated by surgeons with an annual caseload of less than 10 screen-detected cancers (Table 69). Combining the data submitted for 2006/07, 2007/08 and 2008/09 NHSBSP & ABS audits, an annual average screening caseload can be calculated for 630 consultant surgeons who managed or treated patients with screen-detected cancers (Table 70). Of these, 257 (41%) had an annual average caseload of less than 10 cases and 5 treated an average of more than 90 cases per year. 76 of the low caseload surgeons had an annual symptomatic caseload in excess of 30 cases, 36 joined or left the NHSBSP during the three year period, 37 were surgeons from another region and 25 were plastic surgeons. 24 low caseload surgeons operated on patients privately (17 in London) and for 42 no information was available (Table 71).

The screening surgical caseload in 2008/09 is shown for each region in Figure 41. The 55 surgeons working in more than one region appear in each region's figures. 251 surgeons (46%) treated 30-99 cases and 8 surgeons (1%) treated more than 100 cases. 69 surgeons (13%) treated 20-29 screening cases and 72 (13%) treated 10-19 screening cases. 149 surgeons (27%) had a screening caseload of less than 10 cases. The highest proportions of surgeons with a screening caseload of fewer than 10 were in South Central (44%) and London (44%). Surgical specialisation was most advanced in Wales where only 24% of surgeons (5 in total) treated fewer than 10 screening cases. Table 73 shows that the highest median surgical caseload was in Wales (55 cases) and the lowest in London (12 cases). The highest caseload for a single surgeon was in Scotland, where one surgeon was clinically responsible for 221 cases. Seven other surgeons had a screening caseload of at least 100 cases in 2008/09.

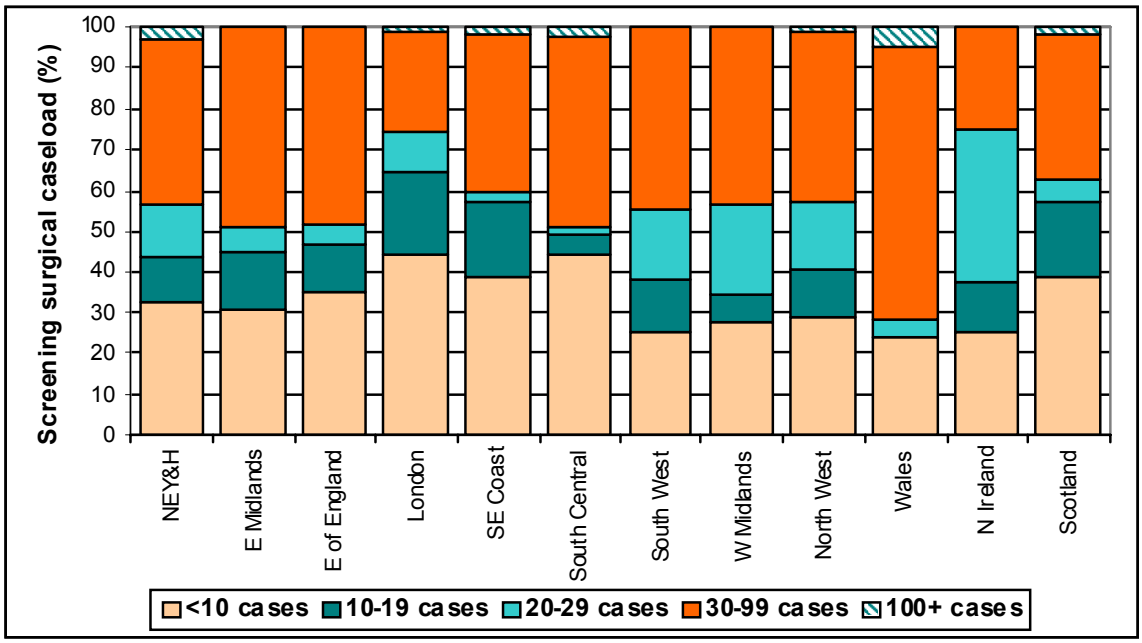

Figure 41 (Table 72): Variation in screening surgical caseload expressed as number of cases per surgeon

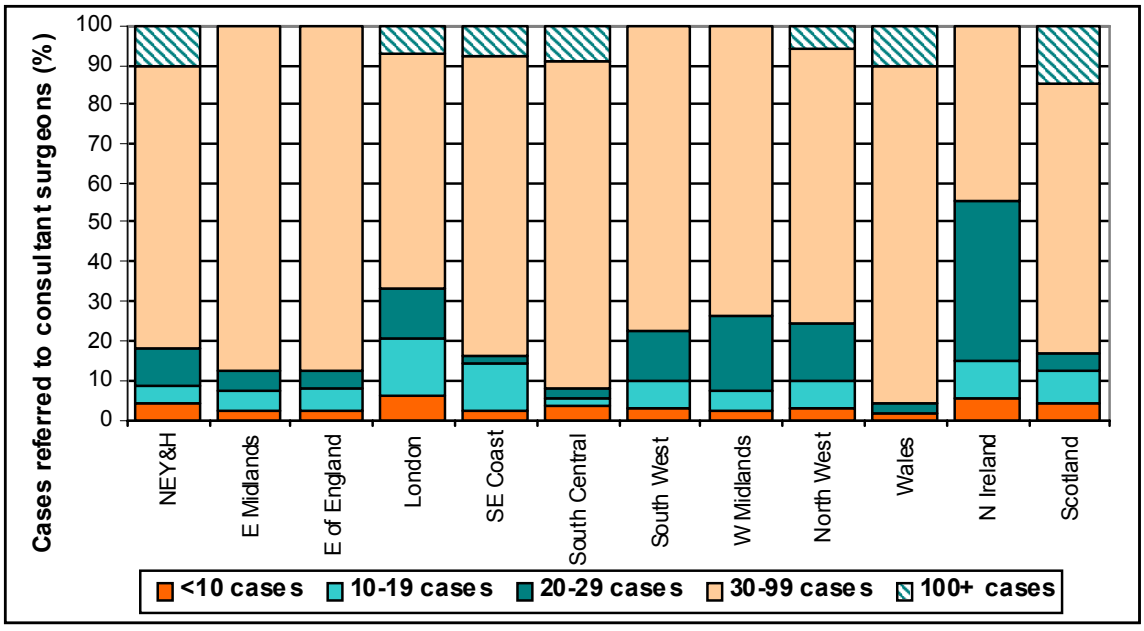

Figure 42 (Table 74): Variation in the proportion of women treated by surgeons with differing screening caseloads

Figure 42 shows the variation in the proportion of women treated by surgeons with differing screening caseloads in 2008/09. Of the 16,968 women who were under the care of a consultant surgeon, 13,019 (76%) were treated by a surgeon with a screening caseload of 30-99 cases. A further 973

women (6%) were treated by 8 surgeons with a screening caseload of 100 cases or more. In the UK as a whole, 466 women (3%) were treated by a surgeon with a screening caseload of less than 10 cases. 88 (19%) of these women were in North East Yorkshire & Humber and 87 (19%) were in London. Table 75 shows the number of women treated in 2008/09 by 1, 2, 3 or more surgeons and those with no referral to a consultant surgeon. Of the 17,045 screen-detected cases included in the audit, the majority (98%) were recorded under 1 consultant surgeon, 191 (1%) were recorded under 2 surgeons and 77 had no consultant surgeon recorded.

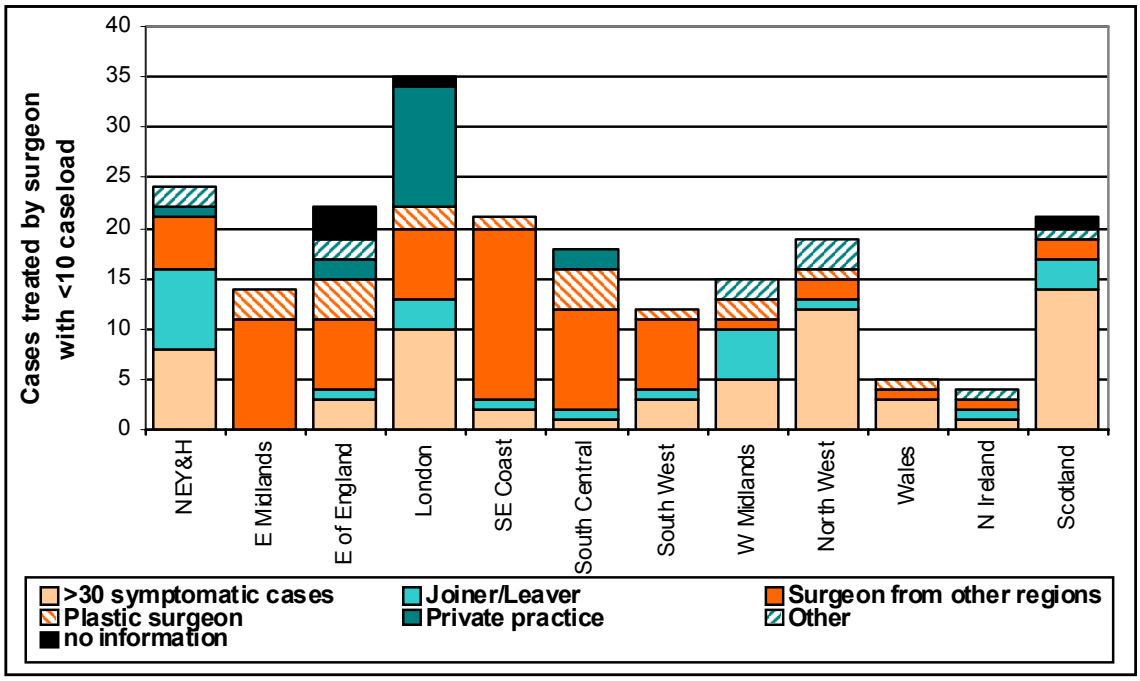

Figure 43 (Table 75): Explanations provided for surgeons treating less than 10 screening cases in 2008/09

Each region was asked to explain why surgeons had a screening caseload of less than 10 cases. A list of 6 possible reasons was provided (see Appendix B). If multiple reasons were given, only one was included. The reasons given to explain why surgeons had a screening caseload of fewer than 10 cases are shown in Figure 43. Of the 149 surgeons in the UK with a screening caseload of less than 10 cases in 2008/09, 55 (37%) treated more than 30 symptomatic breast cancers during this period and 20 (13%) either joined or left the NHSBSP in 2008/09. Other reasons (plastic surgeon, private practice, surgeons from other region) were given for 58 surgeons (39%). 12 of the 14 surgeons who had a screening caseload of <10 because of their private practice were in London, an increase from 5 in 2007/08. For 12 surgeons who treated a total of 33 women, a reason other than one of the 6 listed was given. These were: patient choice, locum surgeon, surgeons from outside the UK and not screening in his area during 2008/09. No information was available to explain the low screening caseload recorded for 4 surgeons who treated a total of 5 women. Two of these surgeons were in East of England, 1 in London and 1 in Scotland. Regional QA reference centres and regional surgical QA co-ordinators should ensure that all screening cases treated by low caseload surgeons have received satisfactory treatment.

COMMENTS:

- There were 549 consultant breast surgeons working in the UK NHSBSP in 2008/09.
- 92% of women were treated by a surgeon with a screening caseload of at least 20 cases.
- Of the 149 surgeons with screening caseload of less than 10 cases, 37% treated more than 30 symptomatic breast cancers during 2008/09. 12 of the 14 surgeons who had a screening caseload of <10 because of private practice were in London, an increase from 5 in 2007/08.
- Information was unavailable to explain the low caseload of 4 surgeons treating a total of 5 women. Two of these surgeons were in East of England, 1 in London and 1 in Scotland. Regional QA reference centres and regional surgical QA co-ordinators should ensure that all screening cases treated by low caseload surgeons have received satisfactory treatment.

CHAPTER 7
THERAPEUTIC INTERVENTIONS

Details of each operation were requested so that the reasons for repeat therapeutic operations could be examined. All operations, both diagnostic and therapeutic, were coded as either breast conservation surgery alone (Cons), mastectomy alone (Mx), axillary surgery alone (Ax) or a combination (e.g. Cons & Ax, Mx & Ax). Diagnostic open biopsies were coded as breast conservation surgery. For a cancer without a non-operative diagnosis by C5 cytology or B5 core biopsy, the first operation was defined to be diagnostic even if there was also therapeutic intent. The number of therapeutic operations is thus one fewer than the total number of operations and the number of therapeutic operations is counted from the second operation. The number of therapeutic operations for cases with a non-operative diagnosis is the same as the total number of operations. It should also be noted that attempting axillary surgery does not necessarily mean that axillary lymph nodes are successfully harvested. Conversely, incidental axillary lymph nodes can be obtained during a mastectomy or breast conservation surgery procedure.

In the UK as a whole, 4,040 (24%) of the 16,756 surgically treated patients underwent more than one operation. Overall, 3,059 invasive cancers (23%) and 925 non-invasive cancers (28%) underwent more than one operation. Figure 44 shows how repeat operation rates for patients who had invasive and non-invasive breast cancers varied between regions. The highest repeat operation rate for non-invasive cancers was in Northern Ireland (34%) and the highest repeat operation rates for invasive cancers were in North East, Yorkshire & Humber, East of England, London and South West (all 25%).

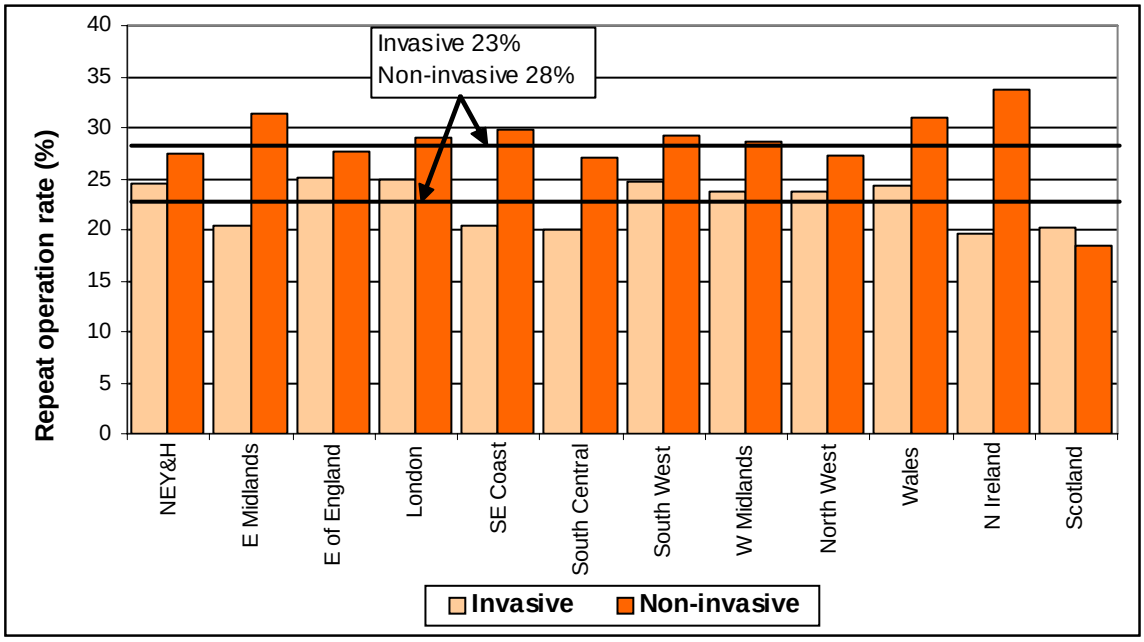

Figure 44 (Table 66): Proportions of surgically treated invasive and non-invasive cancers undergoing two or more operations

The repeat operation rate for the 802 surgically treated cancers without a non-operative diagnosis was 56% (450 cases). For 44% of surgically treated cancers without a non-operative diagnosis, the initial diagnostic operation was deemed to have removed the whole tumour and a second therapeutic operation was therefore not required. The repeat operation rate for surgically treated cancers with a non-operative diagnosis was 23% which is very similar to the overall repeat operation rate of 24%. Repeat operations for cancers without a non-operative diagnosis formed only 11% of the total repeat operations.

7.1 Repeat Therapeutic Operations

Quality Objective	**To minimise the number of therapeutic operations in women undergoing conservation surgery for an invasive cancer or DCIS**
Minimum Standard	**>95% of women should have three or fewer operations**
Target Standard	**100% of women should have three or fewer operations**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

Of the 16,756 surgically treated cancers, 3,652 (22%) cancers with a non-operative diagnosis underwent more than one therapeutic operation, 2% less than the repeat operation rate for all operations. 2,876 (22%) invasive cancers with a non-operative diagnosis and 725 (22%) non-invasive cancers with a non-operative diagnosis underwent more than one therapeutic operation.

Of the 13,267 invasive cancers with a non-operative diagnosis, 10,291 were initially treated by therapeutic breast conservation surgery in 2008/09. Of these, 25% had repeat therapeutic operations (Figure 45). 178 cases had three operations and 13 cases had more than three operations. Of the 2,099 non-invasive cancers with a non-operative diagnosis and initially treated by therapeutic breast conservation surgery, 31% had repeat therapeutic operations. 87 had three operations and 4 had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit the 17 cases which had more than three therapeutic operations to ascertain the reason for this unusual practice.

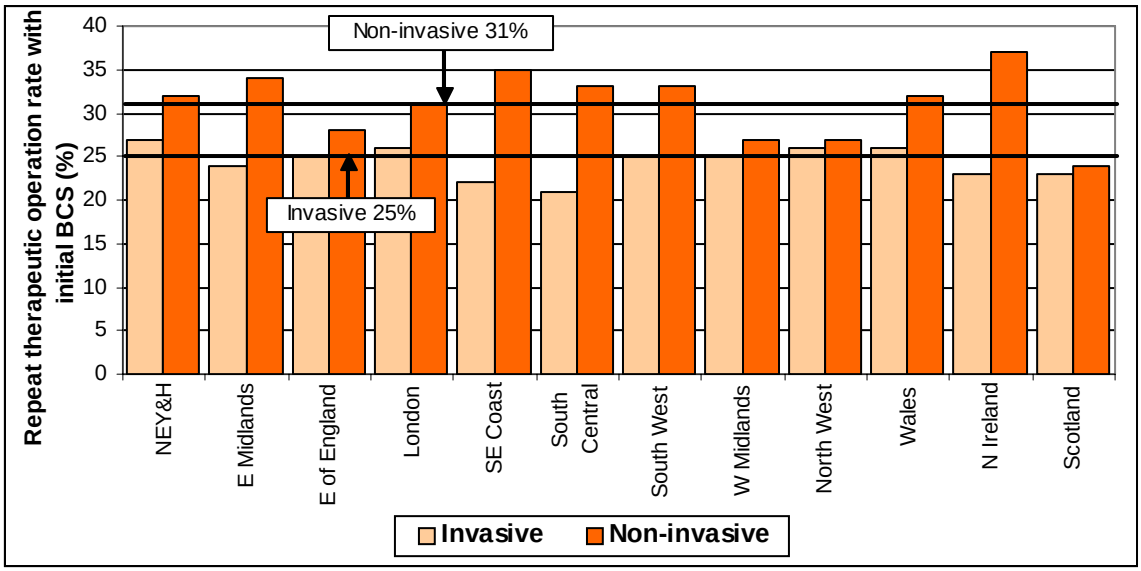

Figure 45 (Tables 77 & 78): Proportions of invasive and non-invasive cancers undergoing two or more operations after initial therapeutic breast conservation surgery (BCS)

Figure 46 shows how the proportion of cases with a non-operative diagnosis undergoing repeat breast conservation surgery or mastectomy after initial therapeutic breast conservation surgery varied between surgeons. Surgeons who initially treated fewer than 20 cases with conservation are shaded. Overall, 20% of cases with initial therapeutic breast conservation surgery had one or more repeat therapeutic operations (breast conservation surgery or mastectomy). Of the 257 surgeons who had more than 20 cases with initial breast conservation surgery, 25 had a repeat therapeutic operation rate above the 95% upper control limit and 11 had a rate under the 95% lower control limit. Regional QA reference centres and regional surgical QA co-ordinators should audit the work of these surgeons to ascertain the reasons for this unusual practice.

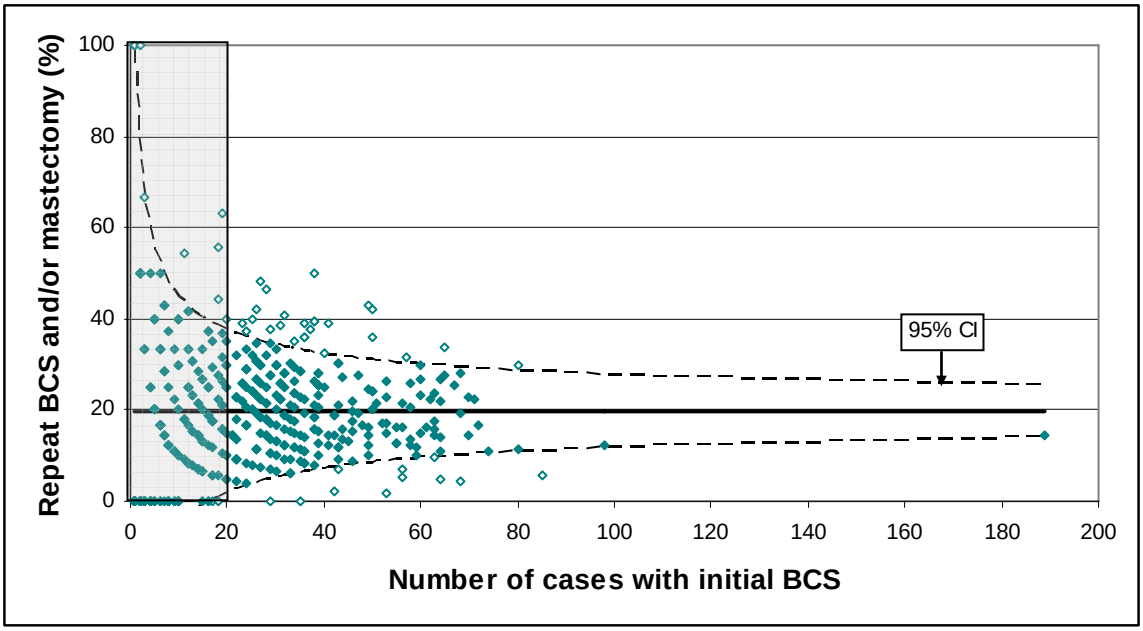

Figure 46: Variation between surgeons in the proportion of cases initially treated with breast conservation surgery (BCS) that underwent repeat operations (only patients treated by 1 surgeon included) (open diamonds represent units which lie outside the control limits)

Repeat therapeutic operations may be carried out for a variety of reasons including re-excision to clear margins involving either an invasive tumour or associated non-invasive disease, an axillary procedure to obtain lymph nodes when these were not taken in the first therapeutic operation or when a sentinel lymph node is found to be positive, and re-excision to improve cosmesis. The reasons for repeat therapeutic operations for cancers with a non-operative diagnosis vary with the invasive status predicted by the non-operative diagnosis. The following hypothetical scenarios could all result in a requirement for a repeat therapeutic operation.

Scenario 1 : Invasion present which was not predicted by the non-operative diagnosis and a repeat operation is undertaken to obtain axillary lymph nodes

- cancers with a B5a (Non-invasive) non-operative diagnosis found to be invasive after surgery where nodes were not taken at first operation
- cancers with a C5 diagnosis where the invasive status could not be predicted and where nodes were not taken at the first operation in line with local protocol

Scenario 2 : Margins not clear for the expected tumour component (invasive or non-invasive)

- repeat operation (conservation or mastectomy) to clear involved margin(s)

Scenario 3 : Margins not clear because of an unexpected tumour component (invasive or non-invasive) and a repeat operation (conservation or mastectomy) undertaken to clear involved margin(s)

- multi-focal invasive or non-invasive cancer present
- small cancers with a B5b (Invasive) non-operative diagnosis found after surgery to have DCIS present which reaches the excision margin(s)

Scenario 4 : Additional therapeutic nodal procedure(s)

- insufficient number of nodes harvested at first operation
- therapeutic clearance of nodes when a large number of the nodes taken at the first operation are positive
- clearance of nodes following a positive sentinel lymph node biopsy procedure

7.2 Type and Sequence of Therapeutic Operations

Repeat operation rates for various groups of screen-detected breast cancers with differing non-operative diagnoses are presented in flow charts which show the number and proportion of the different types and sequences of therapeutic operation undertaken in the UK as a whole.

The types and sequences of therapeutic operations undertaken in the UK as a whole are shown in Figure 47 for cancers with a B5b (Invasive) core biopsy, in Figure 48 for cancers with C5 cytology only, in Figure 49 for non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy and in Figure 50 for cancers with a B5a (Non-invasive) core biopsy which were found to be invasive at surgery. Each flow chart shows the type of surgery performed at the first, second, third or, in rare cases, fourth operation.

99% of cancers with a B5b (Invasive) core biopsy result proved to be invasive following therapeutic surgery (Table 9). The therapeutic surgery can thus be planned in advance and these cases are least likely to require a repeat therapeutic operation. Of the 114 B5b (Invasive) cancers with a first therapeutic operation involving only the axilla (Figure 47), 86 (75%) used a SLNB procedure and for 7 of the 20 cases where the only therapeutic operation was to the axilla, a SLNB procedure was used. Of the 114 cases, 73 had a subsequent mastectomy and 33 (45%) had an immediate reconstruction recorded.

96% of cancers with C5 cytology only and no B5 core biopsy proved to be invasive after surgery (Table 10). For these cancers, where the invasive status cannot be distinguished microscopically, radiological or clinical features are of increased importance when planning the therapeutic operation. In the UK as a whole, 77% of cancers with a B5a (Non-invasive) core biopsy result were confirmed following surgery to be non-invasive or micro-invasive and 21% were identified as having invasive disease (Table 8). There was, however, wide variation between individual screening units in the latter; with the proportion of cancers with a B5a (Non-invasive) core biopsy found to be invasive after surgery varying between 0% and 44%.

The summary table on page 74 shows the regional variation in repeat operation rates for cancers with each type of non-operative diagnosis. The data in this and all of the other summary tables in this chapter exclude the 125 cancers with a B5b (Invasive) core biopsy for which the invasive status was not confirmed after surgery (see Figure 47) and the 68 cancers with a B5a (Non-invasive) core biopsy which had no tumour in the surgical resection specimen or had unknown invasive status at surgery (see Figure 49).

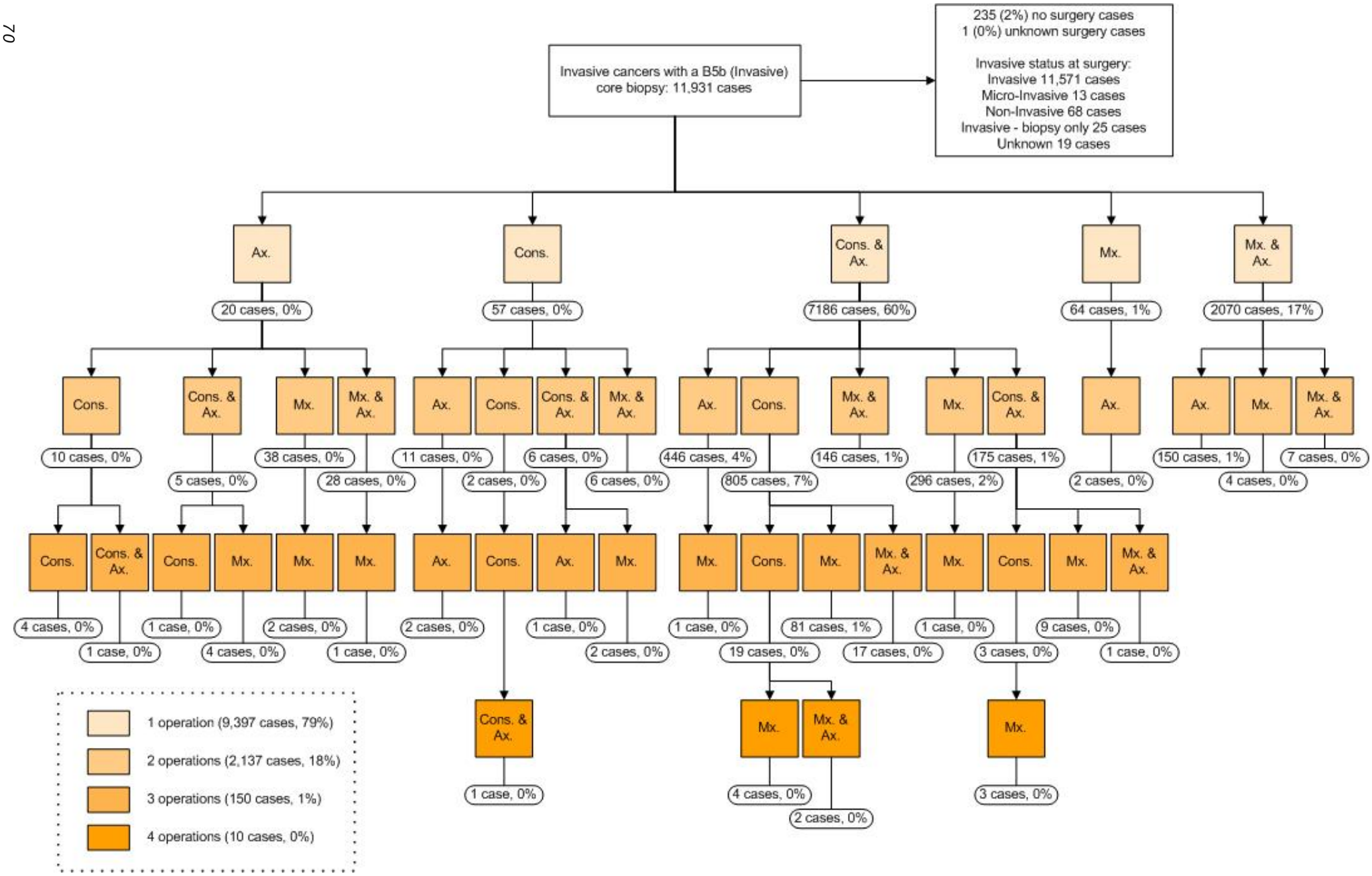

Figure 47: Sequence of operations for Invasive cancers with a B5b (Invasive) core biopsy

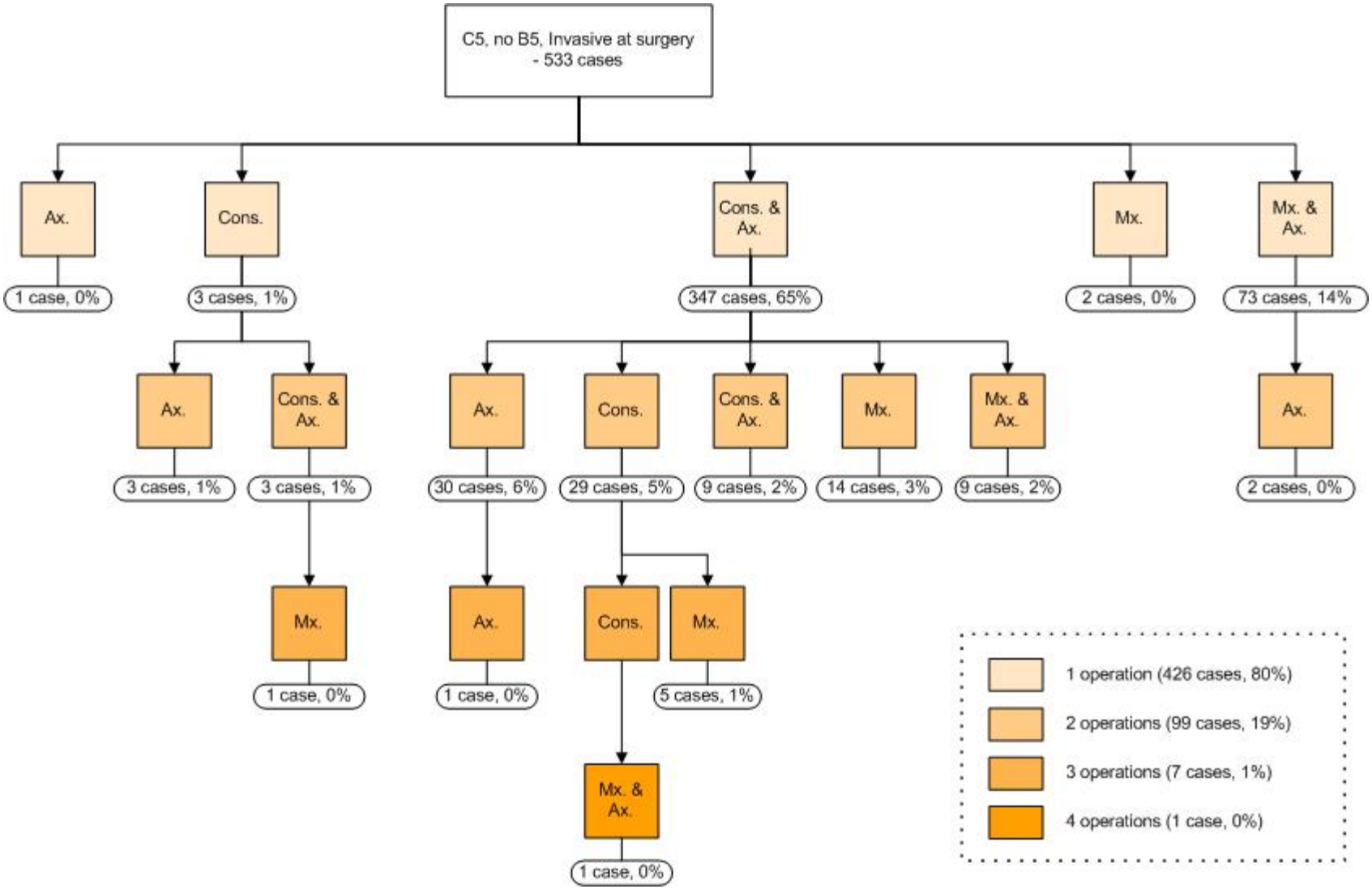

Figure 48: Sequence of operations for invasive cancers with C5 Cytology only, no B5 core biopsy

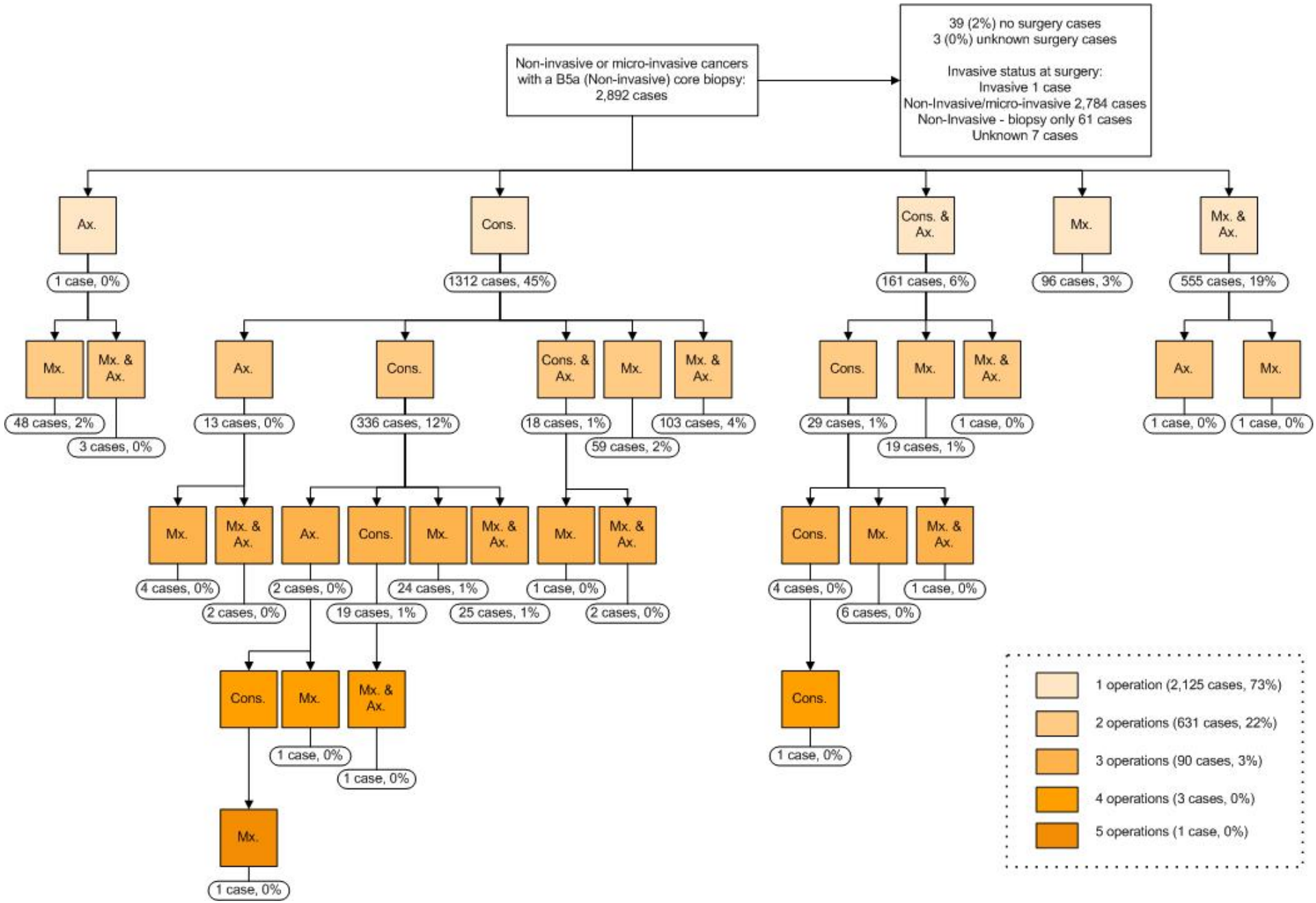

Figure 49: Sequence of operations for non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy

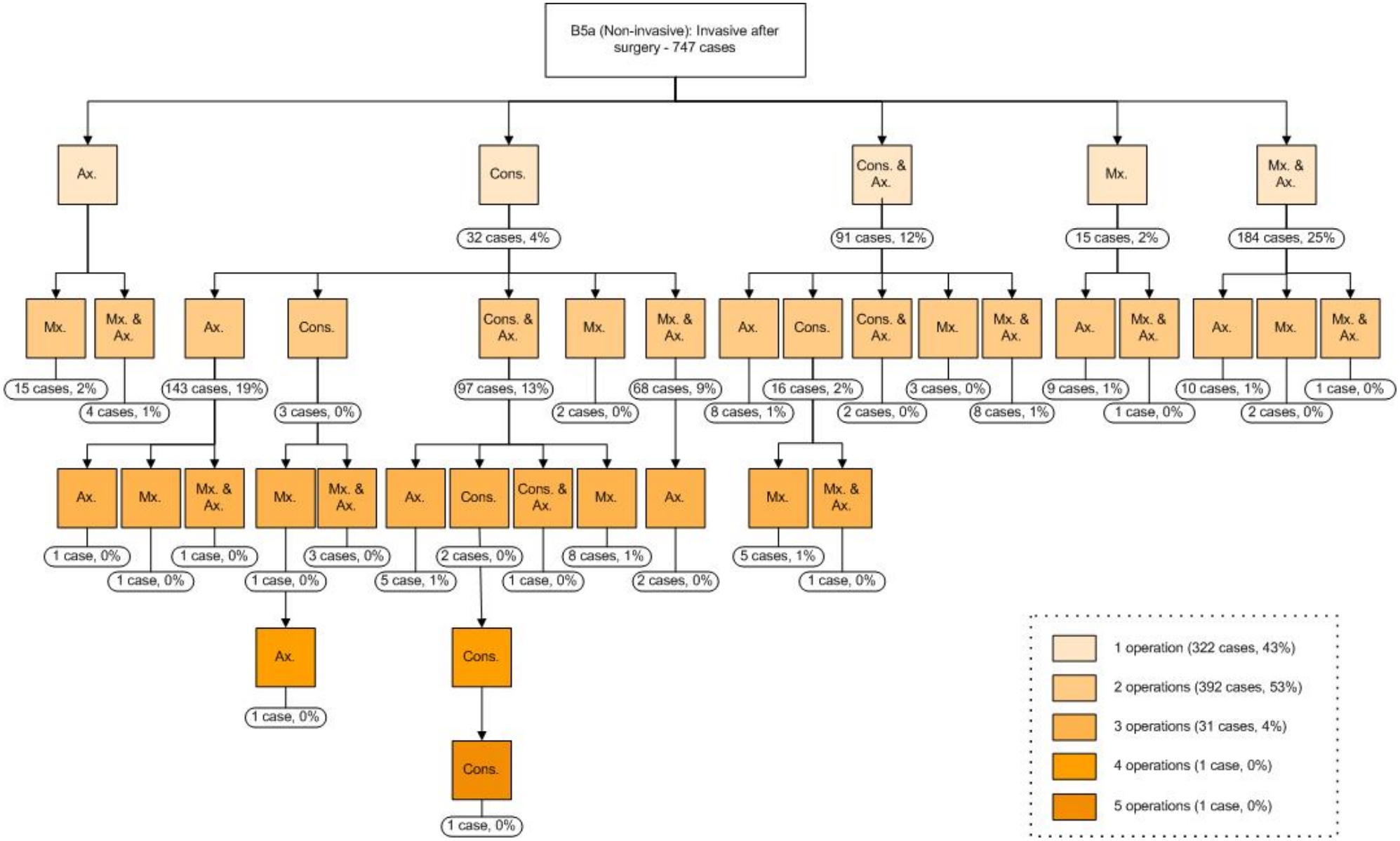

Figure 50: Sequence of operations for cancers with B5a (Non-invasive) core biopsy determined to be invasive after surgery

REPEAT THERAPEUTIC OPERATION RATES

	Invasive cancers						Non-invasive or micro-invasive cancers	
	B5b (Table 79)		C5 only, no B5 (Table 80)		B5a (Table 81)		B5a (Table 82)	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	345	21	14	24	60	62	97	25
East Midlands	161	17	0	0	36	53	61	26
East of England	249	21	3	33	45	64	69	24
London	216	21	9	36	40	62	66	27
South East Coast	152	18	10	12	33	46	64	27
South Central	140	17	1	6	22	52	55	28
South West	200	20	12	40	45	54	73	28
West Midlands	215	20	5	14	42	61	58	27
North West	238	20	30	18	49	56	68	23
Wales	155	22	0	-	18	69	54	26
Northern Ireland	28	17	22	21	4	50	17	30
Scotland	198	18	1	100	31	52	43	18
United Kingdom	**2297**	**20**	**107**	**20**	**425**	**57**	**725**	**25**

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

The summary table shows that invasive cancers with a B5b (Invasive) core biopsy or a C5 cytology only had the lowest proportion of repeat operations (20%). For invasive cancers with a B5b core biopsy, this varied from 17% in East Midlands, South Central and Northern Ireland to 22% in Wales. Of the 107 invasive cancers with a C5 cytology only and repeat operations, 30 (28%) were in North West and 22 (21%) in Northern Ireland. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 25%. This varied from 18% in Scotland to 30% in Northern Ireland. As expected, invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (57%). This varied from 46% in South East Coast to 69% in Wales. These repeat operation rates are generally 2-3% higher than in 2007/08.

7.3 Repeat Breast Conservation Surgery to Clear Margins

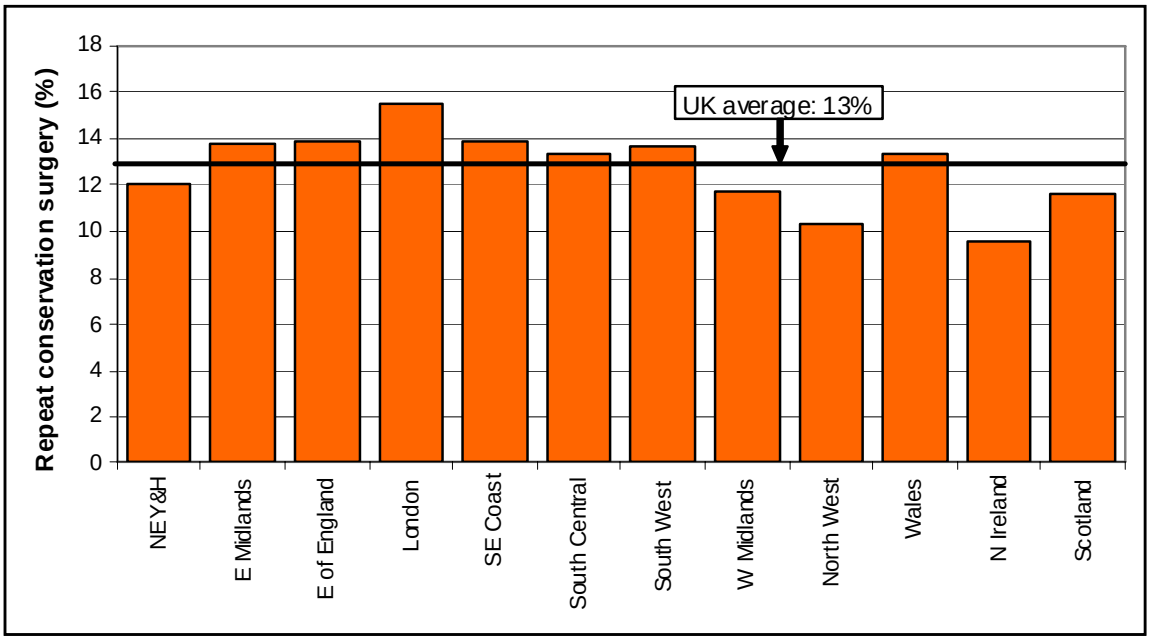

Figure 51: Proportion of cancers which were initially treated with conservation surgery and had repeat conservation operation(s) to clear margins

In the UK as a whole, 21% of all cancers with a non-operative diagnosis, which were initially treated

with breast conservation surgery, had repeat therapeutic operations (breast conservation surgery or mastectomy) to clear margins. This varied from 17% in Scotland to 23% in London. Figure 51 shows that in the UK as a whole, 13% of all cancers with a non-operative diagnosis, which were initially treated with breast conservation surgery, had repeat breast conservation operations to clear margins. This varied between 10% in North West and Northern Ireland and 15% in London.

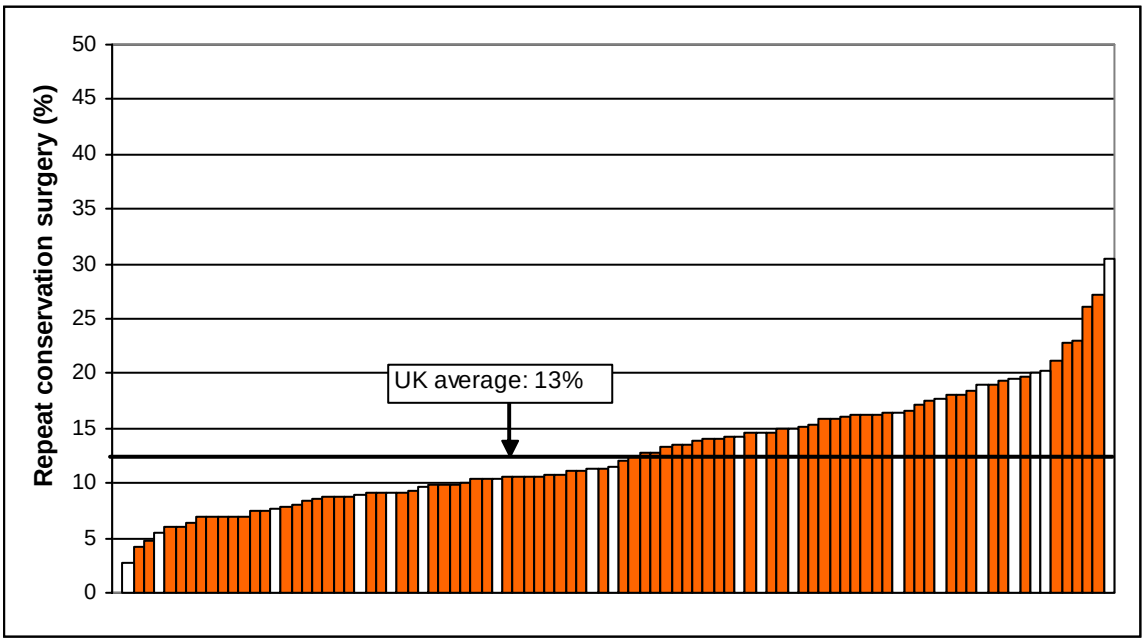

Figure 52: Proportion of cancers which were initially treated with breast conservation surgery and had repeat breast conservation operation(s) to clear margins by screening unit (19 of the smallest units are highlighted in white, one small unit had no repeat operations)

Figure 52 shows the wide variation between screening units in the proportion of cancers initially treated with breast conservation surgery that had repeat breast conservation surgery to clear margins. 7 units (2 of which were small) had repeat rates in excess of 20% and for 4 units (2 of which were small) the rate was below 5%.

REPEAT BREAST CONSERVATION OPERATIONS TO CLEAR MARGINS

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b		***C5 only, no B5***		***B5a***		***B5a***	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*135*	*11*	*4*	*10*	*15*	*23*	*42*	*15*
East Midlands	*82*	*11*	*0*	*0*	*8*	*19*	*39*	*23*
East of England	*115*	*12*	*2*	*25*	*14*	*33*	*38*	*18*
London	*106*	*13*	*4*	*17*	*19*	*38*	*38*	*20*
South East Coast	*74*	*10*	*6*	*8*	*13*	*28*	*48*	*26*
South Central	*73*	*11*	*1*	*10*	*7*	*25*	*33*	*21*
South West	*90*	*11*	*5*	*17*	*13*	*20*	*46*	*22*
West Midlands	*83*	*10*	*3*	*9*	*16*	*33*	*31*	*17*
North West	*87*	*10*	*8*	*6*	*8*	*14*	*30*	*14*
Wales	*67*	*12*	*0*	*-*	*7*	*37*	*27*	*17*
Northern Ireland	*8*	*7*	*8*	*9*	*2*	*40*	*7*	*15*
Scotland	*92*	*10*	*0*	*0*	*5*	*13*	*30*	*18*
United Kingdom	***1012***	***11***	***41***	***9***	***127***	***25***	***409***	***19***

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

The preceding summary table shows for cancers with various non-operative diagnoses, the regional variation in the proportion of cancers initially treated with breast conservation surgery that had repeat

breast conservation surgery to clear margins. In the UK as a whole, 11% of invasive cancers with a B5b (Invasive) non-operative diagnosis, which were initially treated with a breast conservation operation, had repeat breast conservation surgery to clear margins. This varied from 7% in Northern Ireland to 13% in London. 9% of invasive cancers with a C5 cytology only non-operative diagnosis, which were initially treated with a breast conservation operation, had repeat breast conservation operations to clear margins. This varied from 0% in Scotland and East Midlands to 25% (2 cases) in East of England.

19% of non-invasive and micro-invasive cancers with a B5a (Non-invasive) non-operative diagnosis initially treated with a breast conservation operation had repeat operations to clear margins. This varied from 14% in North West to 26% in South East Coast. Invasive cancers with a B5a (Non-invasive) non-operative diagnosis, which were initially treated with a breast conservation operation, had the highest repeat breast conservation operation rate to clear margins (25%). This varied from 13% in Scotland to 40% in Northern Ireland.

7.4 Conservation Operations Converted to Mastectomies

In the UK as a whole, 19% of invasive cancers with a non-operative diagnosis had an initial therapeutic mastectomy at the first operation and 6% had initial therapeutic conservation surgery converted to a mastectomy at a subsequent repeat operation. The proportion of invasive cancers having an initial therapeutic mastectomy varied from 25% in East Midlands to 15% in North West (Figure 53). The proportion of invasive cancers having initial therapeutic conservation surgery converted to a mastectomy at a subsequent operation varied from 9% in Northern Ireland to 4% in South East Coast and Scotland.

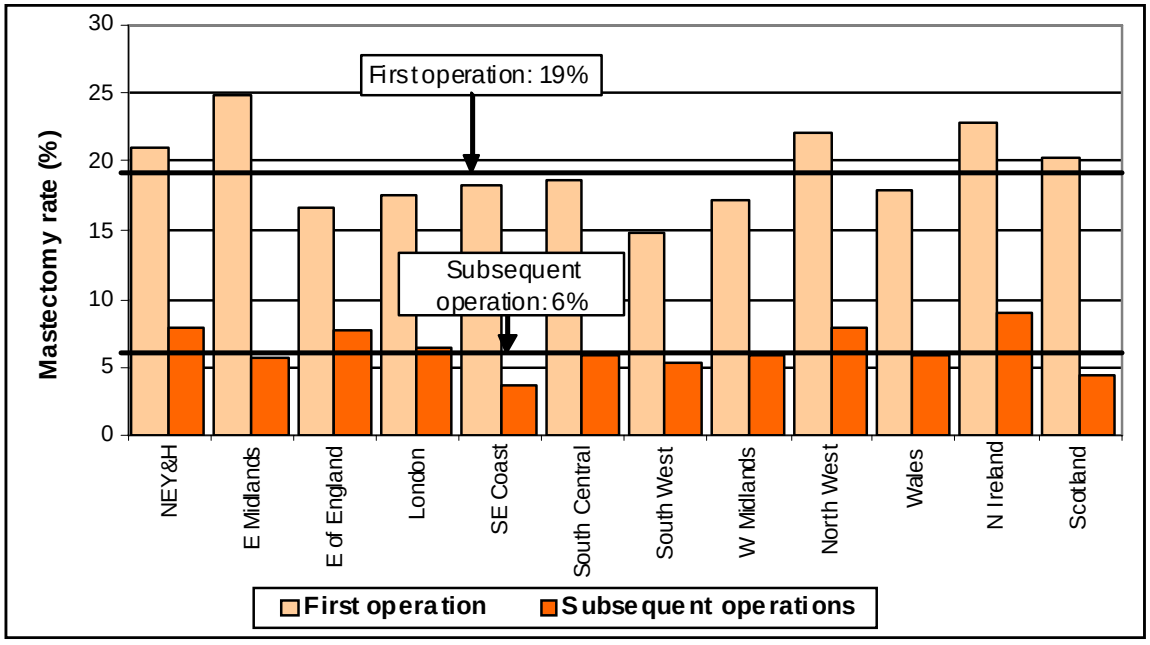

Figure 53: Proportions of invasive cancers undergoing mastectomy at first operation and subsequent operations

The following table summarises the regional variation in the proportion of cancers in each diagnostic category that had a mastectomy as their first therapeutic operation. In the UK as a whole, invasive cancers with a B5b (Invasive) core biopsy had an initial mastectomy rate of 19%. This varied from 15% in South West to 25% in East Midlands and Northern Ireland. 77 (14%) of the 533 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. 20 (26%) of these cancers were in North West and 19 (25%) in Northern Ireland. Regional QA reference centres and regional surgical QA co-ordinators should audit these 77 cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial therapeutic operation. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 23%. This varied from 14% in West Midlands to 29% in Scotland. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (30%). This varied from 22% in London to 38% in East Midlands and Northern Ireland.

MASTECTOMY AS FIRST THERAPEUTIC OPERATION

	Invasive cancers						Non-invasive or micro-invasive cancers	
	B5b		C5 only, no B5		B5a		B5a	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	339	21	16	28	28	29	103	26
East Midlands	245	25	1	17	26	38	59	25
East of England	196	16	0	0	22	31	63	22
London	189	18	2	8	14	22	54	21
South East Coast	155	18	12	14	25	35	53	22
South Central	158	19	6	38	11	26	45	22
South West	151	15	0	0	19	23	54	20
West Midlands	185	17	1	3	19	28	30	14
North West	278	23	20	12	28	32	72	24
Wales	131	18	0	-	6	23	43	21
Northern Ireland	42	25	19	18	3	38	9	16
Scotland	228	20	0	0	21	35	68	29
United Kingdom	**2297**	**19**	**77**	**14**	**222**	**30**	**653**	**23**

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

Figure 54 shows that in the UK as a whole, 8% of all cancers with a non-operative diagnosis, which were initially treated with therapeutic breast conservation surgery, were eventually converted to a mastectomy. This varied between 5% in South East Coast and 13% in Northern Ireland.

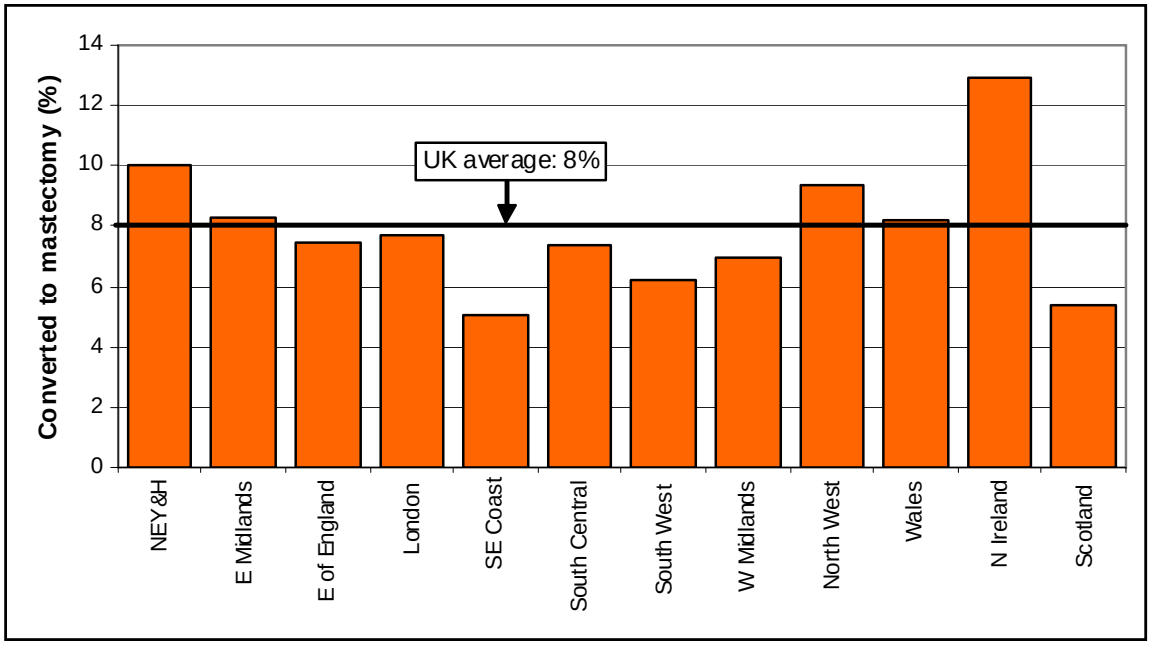

Figure 54: Proportion of cancers which were initially treated with breast conservation surgery and which were eventually converted to a mastectomy

Figure 55 shows the variation between screening units in the proportion of all cancers with a non-operative diagnosis, which were initially treated with therapeutic breast conservation surgery, which were eventually converted to a mastectomy. In 3 units, the conversion rate to mastectomy was in excess of 15%. Two of these were small units with small numbers of cases. In the unit with the highest rate, 8 cases were converted to mastectomies after receiving initial therapeutic breast conservation surgery.

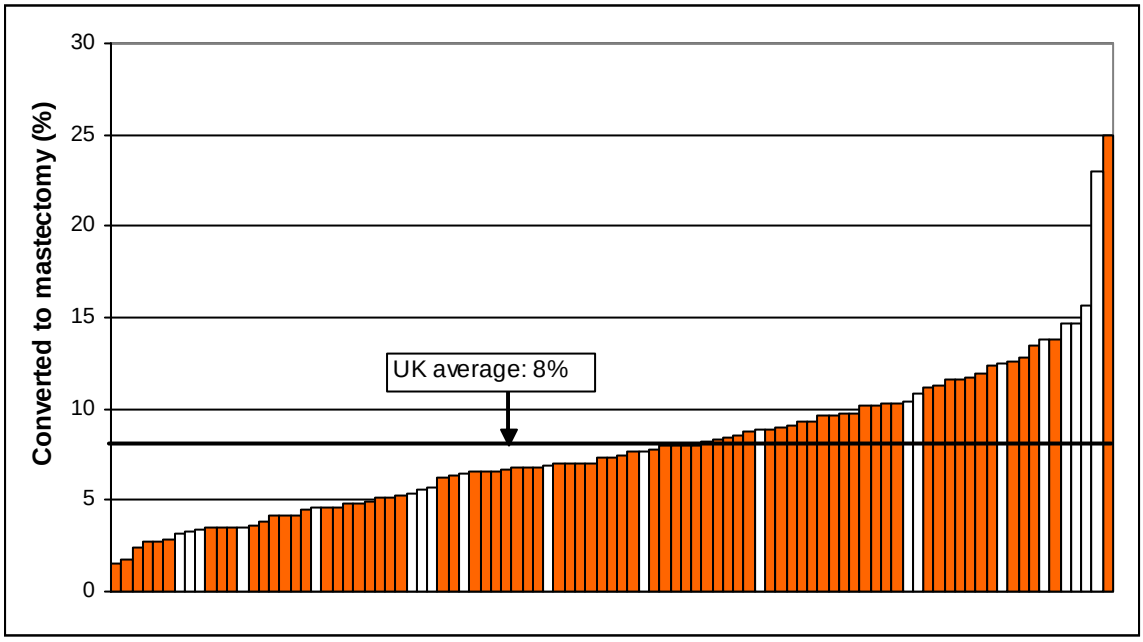

Figure 55: Proportion of cancers which were initially treated with breast conservation surgery and which were eventually converted to a mastectomy by screening unit (The 20 smallest units are highlighted in white)

The following summary table shows the regional variation in the proportion of cancers initially treated with breast conservation surgery that eventually went on to have a mastectomy. In the UK as a whole, 6% of invasive cancers with a B5b (Invasive) non-operative diagnosis, initially treated with breast conservation surgery, went on to have a mastectomy. 30 (7%) of the 455 surgically treated invasive cancers diagnosed by C5 cytology only, which were initially treated with breast conservation surgery, went on to have a mastectomy. 12% of micro-invasive and non-invasive cancers with a B5a (Non-invasive) non-operative diagnosis, initially treated with breast conservation surgery, went on to have a mastectomy. This varied from 7% in Scotland to 21% in Northern Ireland. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest conversion of breast conservation surgery to mastectomy (21%). This varied from 0% in Northern Ireland to 32% in North West.

INITIALLY TREATED WITH BREAST CONSERVATION SURGERY BUT WENT ON TO HAVE A MASTECTOMY

	Invasive cancers						***Non-invasive or micro-invasive cancers***	
	B5b		***C5 only, no B5***		***B5a***		***B5a***	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*91*	*7*	*7*	*17*	*19*	*29*	*46*	*17*
East Midlands	*47*	*7*	*0*	*0*	*10*	*24*	*21*	*12*
East of England	*60*	*6*	*1*	*13*	*11*	*26*	*18*	*9*
London	*51*	*6*	*0*	*0*	*11*	*22*	*21*	*11*
South East Coast	*28*	*4*	*1*	*1*	*7*	*15*	*15*	*8*
South Central	*38*	*6*	*0*	*0*	*6*	*21*	*19*	*12*
South West	*39*	*5*	*2*	*7*	*6*	*9*	*23*	*11*
West Midlands	*49*	*6*	*1*	*3*	*9*	*19*	*20*	*11*
North West	*68*	*8*	*11*	*8*	*18*	*32*	*24*	*12*
Wales	*37*	*6*	*0*	*-*	*3*	*16*	*22*	*14*
Northern Ireland	*17*	*14*	*7*	*8*	*0*	*0*	*10*	*21*
Scotland	*44*	*5*	*0*	*0*	*4*	*11*	*11*	*7*
United Kingdom	***569***	***6***	***30***	***7***	***104***	***21***	***250***	***12***

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

7.5 Repeat Operation Rates Involving the Axilla

PERCENTAGE OF CANCERS WITH AXILLARY SURGERY AT FIRST AND LATER OPERATIONS

	Invasive cancers (Table 83)									Non-invasive or micro-invasive cancers		
	B5b			C5 only, no B5			B5a			B5a		
Region	Total	1st Op	Later Op	Total	1st Op	Later Op	Total	1st Op	Later Op	Total	1st Op	Later Op
N East, Yorks & Humber	99	99	0	100	100	0	96	46	49	39	31	9
East Midlands	99	99	0	83	83	0	93	46	47	39	31	8
East of England	99	99	0	100	89	11	96	56	40	39	36	3
London	98	97	0	100	88	12	85	34	51	40	32	9
South East Coast	98	98	0	96	96	0	90	50	40	31	27	4
South Central	99	98	0	100	100	0	90	57	33	32	26	7
South West	99	99	0	100	100	0	92	45	47	28	22	6
West Midlands	100	99	0	100	100	0	97	46	51	34	29	5
North West	99	98	1	99	99	0	94	47	47	35	29	6
Wales	99	99	0	-	-	-	88	35	54	34	26	8
Northern Ireland	99	99	0	100	98	2	100	63	38	39	30	9
Scotland	99	99	1	100	0	100	95	48	47	32	29	3
United Kingdom	**99**	**99**	**0**	**99**	**98**	**1**	**93**	**47**	**46**	**35**	**29**	**6**

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

One reason for undertaking repeat operations for invasive cancers is to ascertain the nodal status where axillary surgery has not been performed at the first therapeutic operation. The preceding table summarises how the proportions of invasive cancers with axillary surgery undertaken in each region at first and repeat operations varied with the non-operative diagnostic result.

In the UK as a whole, axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy. The axillary surgery was carried out at the first operation for almost all cases and only 31 cancers had their axillary surgery at a repeat operation. A similar picture was apparent for invasive cancers diagnosed by C5 cytology only, with 99% having axillary surgery at the first operation. Only 1% of these cases had their axillary surgery at a repeat operation.

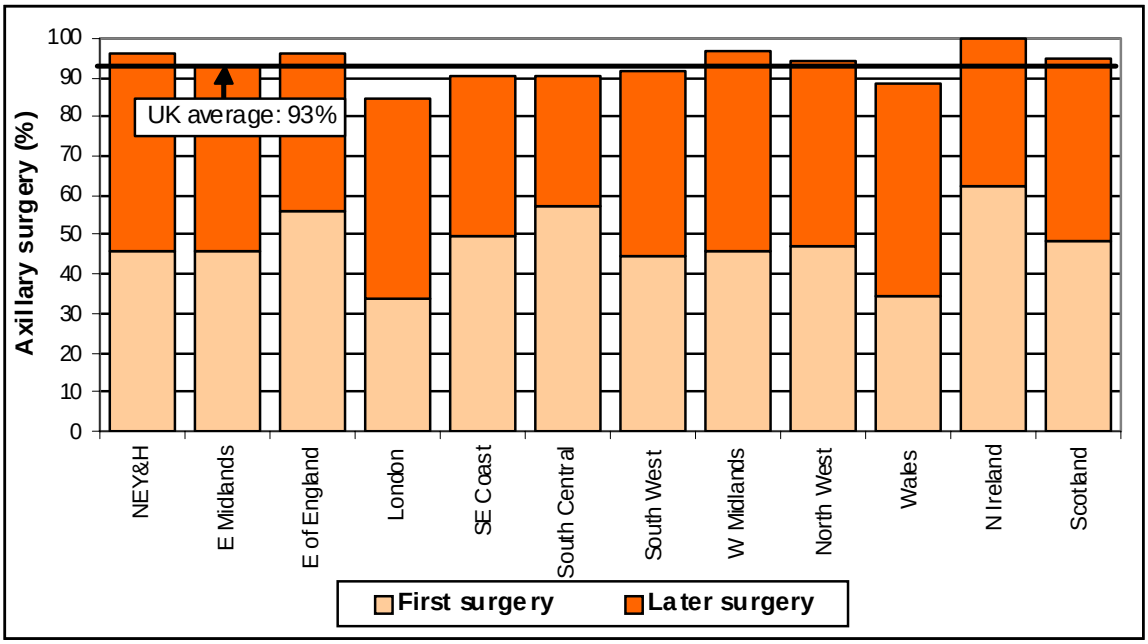

Figure 56 (Table 83): Variation in proportion of invasive cancers with a B5a (Non-invasive) non-operative diagnosis having axillary surgery at first and repeat operations

In the UK as a whole, 93% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had axillary surgery. This varied from 85% in London (65 cancers) to 100% in Northern Ireland. Overall, 47% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had their axillary surgery at the first operation, with repeat operations providing nodal data for 46%. In 2007/08, 50% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had their axillary surgery at the first operation, with repeat operations providing nodal data for 43%.

Figure 56 shows how the proportion of invasive cancers with a B5a (Non-invasive) non-operative diagnosis having axillary surgery at the first and repeat operations varied in different regions. The proportion of these cancers having their axillary surgery at the first operation was highest in Northern Ireland (63%) and lowest in London (34%). In London, 15% of B5a (Non-invasive) cancers that were found to be invasive at surgery had no axillary operation recorded.

Figure 57 shows how the proportion of invasive cancers with a B5a (Non-invasive) non-operative diagnosis having axillary surgery at the first and repeat operations varied across screening units. The proportion of cancers with a B5a (Non-invasive) non-operative diagnosis that had axillary surgery varied from 100% in 59 units to less than 70% in 3 units, only one of which is a small unit. In three small units, all invasive cancers with a B5a (Non-invasive) non-operative diagnosis had axillary surgery at the first operation and in 10 units (2 of which were small) all of these cancers had axillary surgery at a repeat operation. There was therefore, considerable variation in practice across screening units in the proportion of cancers with a B5a (Non-invasive) non-operative diagnosis that had axillary surgery at either a first or repeat operation or not at all.

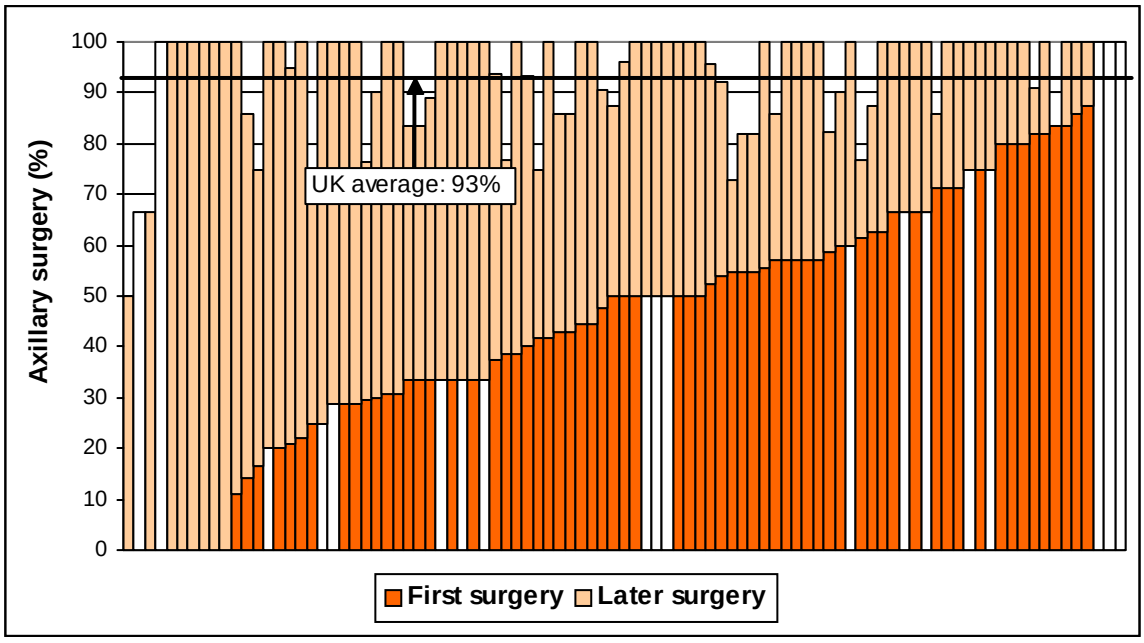

Figure 57: Variation in proportion of invasive cancers with a B5a (Non-invasive) non-operative diagnosis having axillary surgery at first and repeat operations by screening unit
(The 20 smallest units are highlighted in white)
(2 units were excluded from the graph as they had no B5a to invasive cancers)

The following summary table shows for each type of non-operative diagnosis, the proportion of invasive cancers in each region with no axillary surgery recorded. 123 invasive cancers (1%) with a B5b (Invasive) non-operative diagnosis had no axillary procedure recorded. 24 of these cancers were in London and 16 in South East Coast. Five invasive cancers (1%) diagnosed by C5 cytology only did not have an axillary procedure recorded. 53 invasive cancers (7%) with a B5a (Non-invasive) non-operative diagnosis had no surgery to the axilla recorded. In addition to these 181 cancer cases, 28 invasive cancers without a non-operative diagnosis had no surgery to the axilla.

INVASIVE CANCERS WITH NO AXILLARY OPERATION						
	B5b		C5 only, no B5		B5a	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	12	1	0	0	4	4
East Midlands	8	1	1	17	5	7
East of England	11	1	0	0	3	4
London	24	2	0	0	10	15
South East Coast	16	2	3	4	7	10
South Central	11	1	0	0	4	10
South West	13	1	0	0	7	8
West Midlands	4	0	0	0	2	3
North West	9	1	1	1	5	6
Wales	7	1	0	-	3	12
Northern Ireland	2	1	0	0	0	0
Scotland	6	1	0	0	3	5
United Kingdom	**123**	**1**	**5**	**1**	**53**	**7**

Shaded if 5% or more above the value for the UK as a whole and more than one cancer is included

The following summary table shows how the number and proportion of invasive cancers with a B5a (Non-invasive) core biopsy which had no axillary operation recorded has varied in each region over the last 3 audit periods. Northern Ireland was a consistent outlier until the most recent audit period. All regional QA reference centres and regional surgical QA co-ordinators should audit all their invasive cancers with no surgery to the axilla recorded to ascertain whether the data for these cases are recorded correctly and, if so, why the nodal status was not determined.

INVASIVE CANCERS WITH A B5A NON-OPERATIVE DIAGNOSIS WITH NO AXILLARY OPERATION						
	2006/07		2007/08		2008/09	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	11	11	4	4	4	4
East Midlands	1	2	6	10	5	7
East of England	7	11	6	8	3	4
London	6	11	7	10	10	15
South East Coast	11	18	9	11	7	10
South Central	8	15	3	7	4	10
South West	8	12	3	4	7	8
West Midlands	3	5	2	3	2	3
North West	13	15	6	7	5	6
Wales	2	4	3	5	3	12
Northern Ireland	6	50	9	43	0	0
Scotland	1	2	2	3	3	5
United Kingdom	**77**	**11**	**60**	**8**	**53**	**7**

Shaded if 5% or more above the value for the UK as a whole

Another reason for performing repeat operations to the axilla is if the positive nodal status has been determined on the basis of a sentinel lymph node biopsy. If this is case, the NHSBSP surgical guidelines state that further axillary treatment should be offered to patients. Figure 58 shows how the proportion of repeat operations to the axilla varied between regions for invasive cancers with positive nodal status. In the UK as a whole, 35% of these cancers had a repeat operation to the axilla. This varied from 20% in Northern Ireland to 49% in Wales. 27% of invasive cancers with positive nodal status had a repeat operation to the axilla following a SLNB and 8% after an axillary operation which did not involve a SLNB. Overall in the UK, 78% of repeat operations on the axilla were carried out on invasive cancers with positive nodal status determined on the basis of SLNB (Table 84). This varied between 45% in Scotland and 90% in London and Wales.

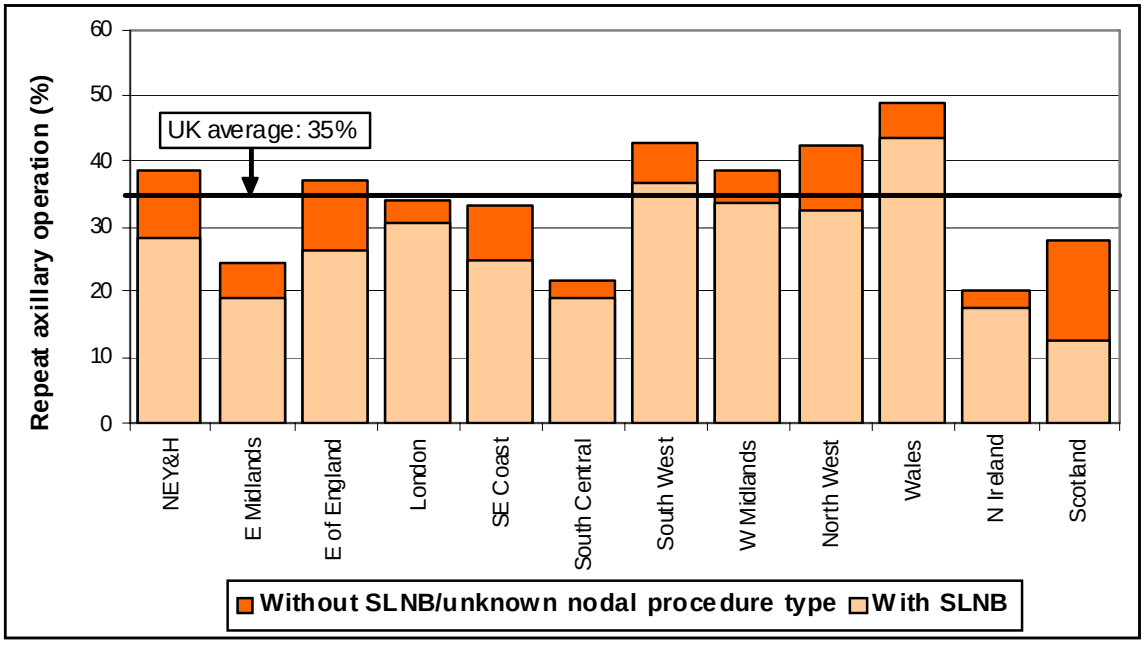

Figure 58 (Table 84): Repeat axillary operations for invasive cancers with positive nodal status

Figure 59 shows how the proportion of repeat operations to the axilla varied between screening units for invasive cancers with positive nodal status. The proportion of repeat operations varied widely from 0% in 5 units to over 60% in 10 units (only 3 of which are small). It is also clear from this figure that, in most screening units, the majority of repeat operations were carried out on invasive cancers with positive nodal status determined on the basis of a SLNB. There were a small number of units with repeat operation rates above the UK average where the majority of the invasive cancers had their positive nodal status determined without a SLNB or where the nodal procedure was not known. Regional QA reference centres and regional surgical QA co-ordinators should audit these invasive cancers to ensure that the nodal operation data for these cases are recorded correctly and to ascertain why the nodal procedure type was not known.

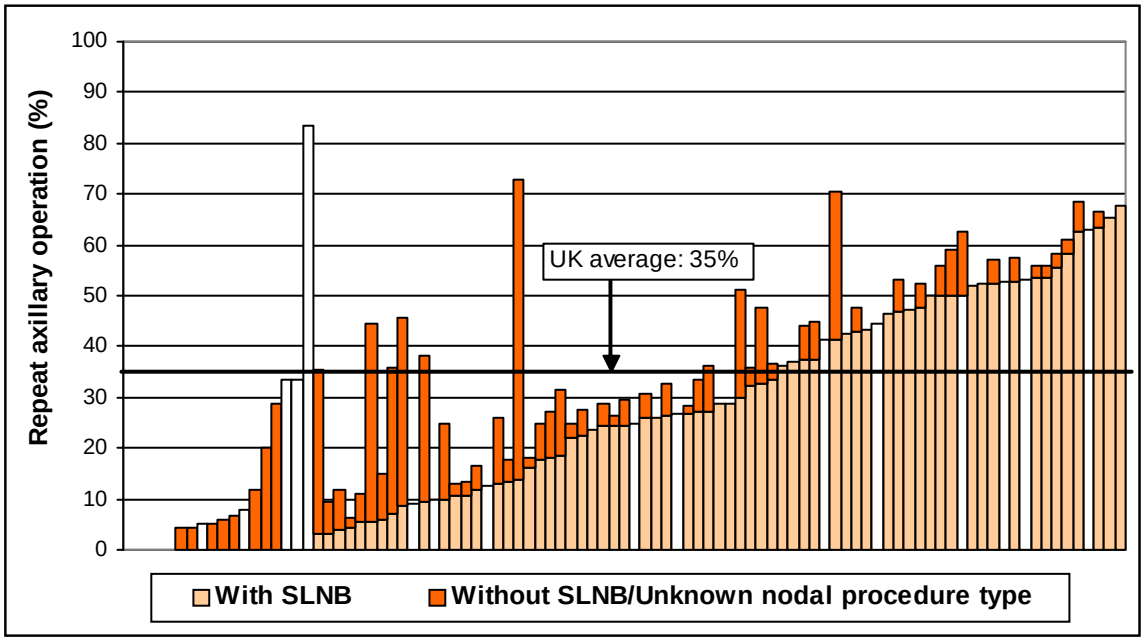

Figure 59: Repeat axillary operations for invasive cancers with positive nodal status by screening unit (16 of the smallest units are highlighted in white)

COMMENTS:

- In the UK as a whole in 2008/09, 4,040 surgically treated patients underwent more than one operation. 23% of the invasive cancers and 28% of non-invasive cancers underwent more than one operation.
- The repeat operation rate for the 802 surgically treated cancers without a non-operative diagnosis was 56%. For 44% of surgically treated cancers without a non-operative diagnosis, the initial diagnostic operation was deemed to have removed the whole tumour and a second, therapeutic operation was therefore not required. The repeat operation rate for surgically treated cancers with a non-operative diagnosis was 23%.
- 22% of invasive cancers and 22% of non-invasive cancers with a non-operative diagnosis had more than one therapeutic operation.
- 25% of the invasive cancers and 31% of the non-invasive cancers, which had a non-operative diagnosis and were initially treated by therapeutic breast conservation surgery, had repeat therapeutic operations. 13 invasive cases and 4 non-invasive cases had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit these 17 cases to ascertain the reason for this unusual practice.
- Of the 257 surgeons who had more than 20 cases with breast conserving surgery as the first therapeutic operation, 25 had unusually high repeat operation rates. Regional QA reference centres and regional surgical QA co-ordinators should audit the work of these surgeons to ascertain the reasons for this unusual practice.
- Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (20%). Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 25%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (57%).
- In the UK as a whole, 21% of cancers with a non-operative diagnosis, which were initially treated with therapeutic breast conservation surgery, had repeat operations (breast conservation surgery or mastectomy) to clear involved margins and 13% underwent repeat breast conservation operations to clear margins. 7 screening units had repeat breast conservation surgery rates in excess of 20%.
- 25% of invasive cancers with a B5a (Non-invasive) core biopsy had a repeat therapeutic breast conservation operation to clear margins. This varied from 13% in Scotland to 40% in Northern Ireland.
- In the UK as a whole, 19% of invasive cancers with B5b (Invasive) core biopsy had an initial therapeutic mastectomy at the first operation and 6% had initial therapeutic conservation surgery converted to a mastectomy at a subsequent repeat operation.
- Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial therapeutic mastectomy rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (30%).
- 77 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. 20 were in North West and 19 in Northern Ireland. Regional QA reference centres and regional surgical QA co-ordinators should audit these cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation.
- 8% of cancers had repeat operations which converted initial therapeutic breast conservation operations to a mastectomy. In 3 screening units the conversion rate to mastectomy was in excess of 15%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest conversion of therapeutic breast conservation surgery to mastectomy (21%). This varied from 0% in Northern Ireland to 32% in North West.
- Axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy and 99% of invasive cancers diagnosed by C5 cytology only. For 99% and 98% of these cancers respectively, the nodal status was determined at the first operation.
- 93% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 47% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 46%. The proportion of these cancers having their axillary surgery at the first operation was highest in Northern Ireland (63%) and lowest in London (34%).
- 123 invasive cancers with a B5b (Invasive) core biopsy, 5 invasive cancers with C5 cytology and 53 invasive cancers with a B5a (Non-invasive) core biopsy had no axillary procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit the invasive cancers with no surgery to the axilla recorded to ascertain whether the data for these cases are recorded correctly and, if so, why the nodal status was not determined.

COMMENTS:

- 35% of invasive cancers with a positive nodal status had a repeat operation to the axilla. This varied from 20% in Northern Ireland to 49% in Wales and from 0% in 5 screening units to over 60% in 10 units.
- 27% of invasive cancers with positive nodal status had a repeat operation to the axilla following a SLNB and 8% after an axillary operation which did not involve a SLNB. Overall in the UK, 78% of repeat operations on the axilla were carried out on invasive cancers with positive nodal status determined on the basis of SLNB. This varied between 45% in Scotland and 90% in London and Wales.
- There were a small number of units with repeat operation rates above the UK average where the majority of the invasive cancers had their positive nodal status determined without a SLNB or where the nodal procedure was not known. Regional QA reference centres and regional surgical QA co-ordinators should audit these invasive cancers to ensure that the nodal operation data for these cases are recorded correctly and to ascertain why the nodal procedure type was not known.

7.6 Neo-adjuvant Therapy

In 2008/09 data on neo-adjuvant chemotherapy, neo-adjuvant Herceptin and neo-adjuvant hormone therapy were collected for the first time in the NHSBSP audit. Radiological size and core biopsy grade were recorded for cases with neo-adjuvant therapies. 5% of all cancer cases did not have a complete record of the 3 types of neo-adjuvant therapy. These cases were all in South Central, North West and Scotland. In South Central, two units which did not submit any neo-adjuvant treatment data accounted for over 90% of the unknown information. In North West, the unknown information was from one unit (11% of cases in North West) and in Scotland one unit did not submit any neo-adjuvant treatment which accounted for 98% of their missing information.

A total of 583 cancer patients received neo-adjuvant therapy in 2008/09 (Table 85). This included 567 (4%) of the 13,532 invasive cancer patients and 14 non-invasive cancer patients. 131 (23%) of the invasive cancer patients had no surgery recorded. This may be because surgery was not planned until the course of neo-adjuvant therapy was completed and as a result had taken place after the audit cut off date, or the neo-adjuvant therapy was the only treatment received by the patient.

The table below shows how the use of neo-adjuvant therapy varied with age. As with adjuvant chemotherapy, the use of neo-adjuvant chemotherapy was higher in younger patients. The use of neo-adjuvant hormone therapy was higher for the oldest patients aged at least 71 years; nearly half (49%) of whom had no surgery recorded, compared to 20% of the patients aged less than 50.

USE OF NEO-ADJUVANT THERAPIES

Age	*Chemotherapy*	*Herceptin*	*Hormone therapy*
<50	5.0%	0.0%	2.5%
50 – 64	2.5%	0.2%	2.0%
65 – 70	1.2%	0.1%	2.9%
71+	1.0%	0.2%	4.7%

7.6.1 Neo-adjuvant Chemotherapy

283 cancers (2% of all cancers diagnosed in 2008/09) had neo-adjuvant chemotherapy recorded (Table 86). 282 cancers were invasive and for 1 cancer the invasive status was not known. The proportion of cancers having neo-adjuvant chemotherapy varied between regions from 0% (3 cases) in Wales to 4% (48 cases) in London. Of those with known tumour size, the 148 (52%) invasive cancers with neo-adjuvant chemotherapy recorded had a tumour size larger than 20mm on mammography. 49 cases had a tumour size less than 20mm on mammography. 92% of the 282 invasive cancers were

Grade II or III, and 19 cases were Grade I. 57 cases had an abnormal axillary ultrasound result. Overall, 8 invasive cancers with neo-adjuvant chemotherapy recorded were small, Grade I and were not proven to have abnormal lymph nodes. QA reference centres should ascertain if the data for these cancers were recorded correctly.

7.6.2 Neo-adjuvant Herceptin

In the UK as a whole, 19 cases were recorded as having received neo-adjuvant Herceptin, all of which were invasive cancers (Table 87). 16 cases were HER-2 positive, 1 case was HER-2 negative and 2 cases had an unknown HER-2 status. 6 cases were in London and 5 in South East Coast.

7.6.3 Neo-adjuvant Hormone Therapy

337 cancers (2%) had neo-adjuvant hormone therapy recorded, 322 were invasive cancers, 1 was micro-invasive and 14 were non-invasive (Table 88). The proportion of cases receiving neo-adjuvant hormone therapy varied between regions from 0% (1 case) in Northern Ireland to 7% (92 cases) in South East Coast. Of the 337 cases, 97 (29%) had no surgery recorded. 298 cancers (88%) with neo-adjuvant hormone therapy recorded were ER and/or PgR positive, 9% (29 cases) had unknown ER and PgR status and the remaining 10 cases were ER negative. It was not known whether the hormone receptor status was determined from the core biopsy or from resection specimens. The invasive cancers with neo-adjuvant hormone therapy recorded were generally small (24% <15mm) and Grade I or II (66%).

COMMENTS:

- 5% of all cancer cases did not have a complete record of the three types of neo-adjuvant therapy. These cases were all in South Central, North West and Scotland.
- A total of 583 cancer patients received neo-adjuvant therapy in 2008/09. 567 patients had invasive cancer and 14 patients had non-invasive cancer.
- As with adjuvant chemotherapy, the use of neo-adjuvant chemotherapy was higher in younger patients. The use of neo-adjuvant hormone therapy was higher for the oldest patients aged at least 71 years; nearly half (49%) of whom had no surgery recorded, compared to 20% of the patients aged less than 50.
- 19 cancers were recorded as having received neo-adjuvant Herceptin; all were invasive cancers. 337 cancers (2%) had neo-adjuvant hormone therapy recorded, 322 were invasive cancers, 1 was micro-invasive and 14 were non-invasive. 298 cancers (88%) with neo-adjuvant hormone therapy recorded were ER and/or PgR positive, 9% (29 cases) had unknown ER and PgR status and the remaining 10 cases were ER negative.

CHAPTER 8
ADJUVANT THERAPY

Surgeons were asked to supply radiotherapy, chemotherapy and hormonal therapy information for cancers detected through screening between 1 April 2007 and 31 March 2008, the period covered by the previous screening audit. Oestrogen receptor (ER), progesterone receptor (PgR) and Human Epidermal Growth Factor Receptor 2 (HER-2) status were also requested. The cut off point for adjuvant therapy was 31 March 2009, allowing a minimum of 12 months follow up for each case. The final invasive status was derived by taking into account the core biopsy result and the surgical histology.

Note: Some of these analyses should be treated with caution because it is probably easier to verify that a woman did not receive a given therapy than to provide a complete start date.

8.1 Data Completeness for the Adjuvant Therapy Audit

The 2007/08 NHSBSP audit reported tumour characteristics and primary treatment data for 16,792 screen-detected breast cancers. When data for these cases were requested for inclusion in this year's adjuvant therapy audit, 15 additional cases which were not included in the 2007/08 main audit were identified. A further 2 cases were excluded from the adjuvant therapy audit because they were found not to be breast cancers. Thus, 16,805 cases were eligible for inclusion in the adjuvant therapy audit. Of these, 398 (2%) had no adjuvant therapy data supplied. 1,253 cases (7%) were excluded from the audit due to incomplete surgery data or because the woman had had a previous cancer. Following these exclusions, 15,154 cases (90%) were included in the adjuvant therapy audit. Figure 60 shows the variation in data completeness between regions. Scotland and Wales had the highest proportion of eligible cases (100% and 99% respectively). South East Coast had the lowest proportion because 370 of their cases were excluded (Table 89).

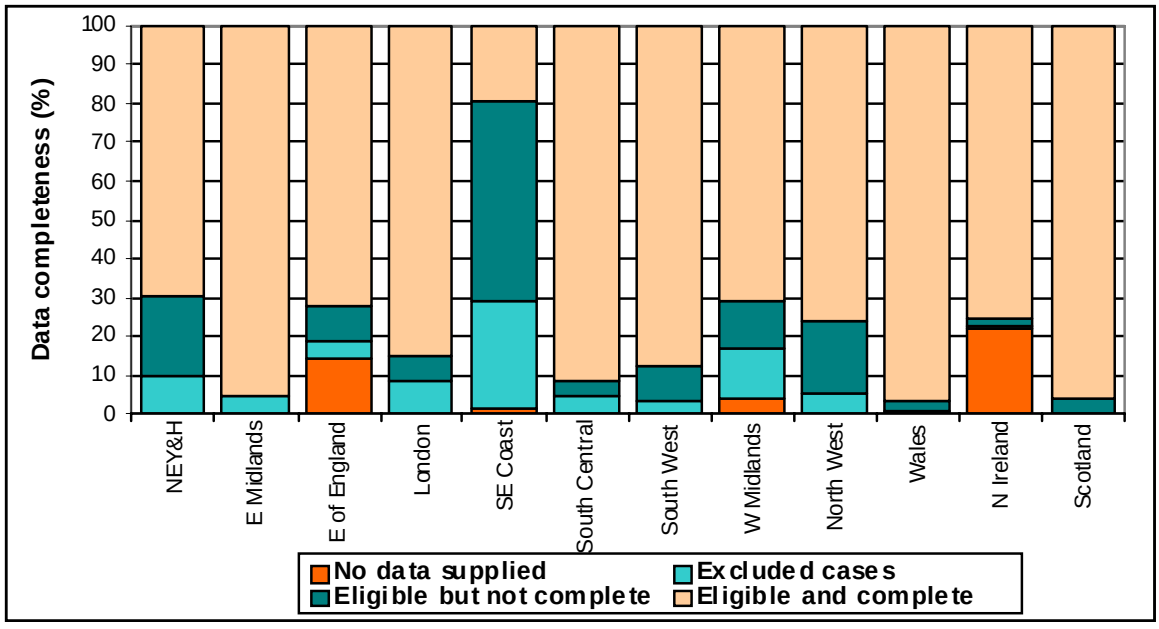

Figure 60 (Table 89): Data completeness of adjuvant audit data

In the UK as a whole, data completeness for radiotherapy, chemotherapy and hormone therapy was 91%, 96% and 95% respectively for the 15,154 eligible cases included in the audit for which adjuvant therapy data were supplied. 12,941 (85%) of these cases had radiotherapy, chemotherapy and hormone therapy data available (Table 90). This varied from 27% in South East Coast to 100% in East Midlands.

8.2 ER, PgR and HER-2 Status

Quality Objective **To ensure that all patients have access to appropriate adjuvant treatments**

Outcome Measure **The ER and HER-2 status should be determined in every case of invasive breast cancer, with the results available for the 'post-operative results' multidisciplinary team (MDT) meeting**

(Quality Assurance Guidelines for Surgeons in Breast Cancer Screening, NHSBSP Publication No 20, 4th Edition, March 2009)

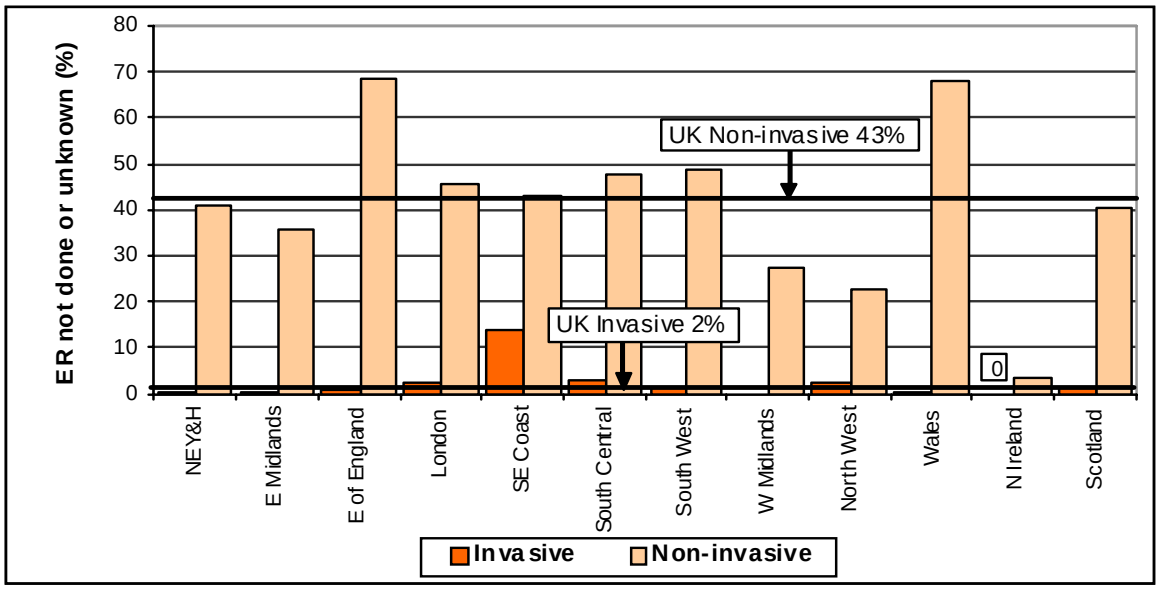

Figure 61 (Table 91): Variation in the proportion of invasive and non-invasive cancers with ER status information unknown or not provided

In the UK as a whole, ER status was unknown for 239 (2%) invasive cancers and for 1,258 (43%) non-invasive cancers (Figure 61). In South East Coast, 14% of the invasive cancers did not have ER status recorded. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at the post-operative MDT meeting. The proportion of non-invasive cancers with unknown ER status varied from 4% in Northern Ireland to 68% in East of England and Wales. Of the 11,841 invasive cancers with known ER status, 10,686 (90%) were ER positive. 75% of the 1,659 non-invasive cancers with known ER status were ER positive.

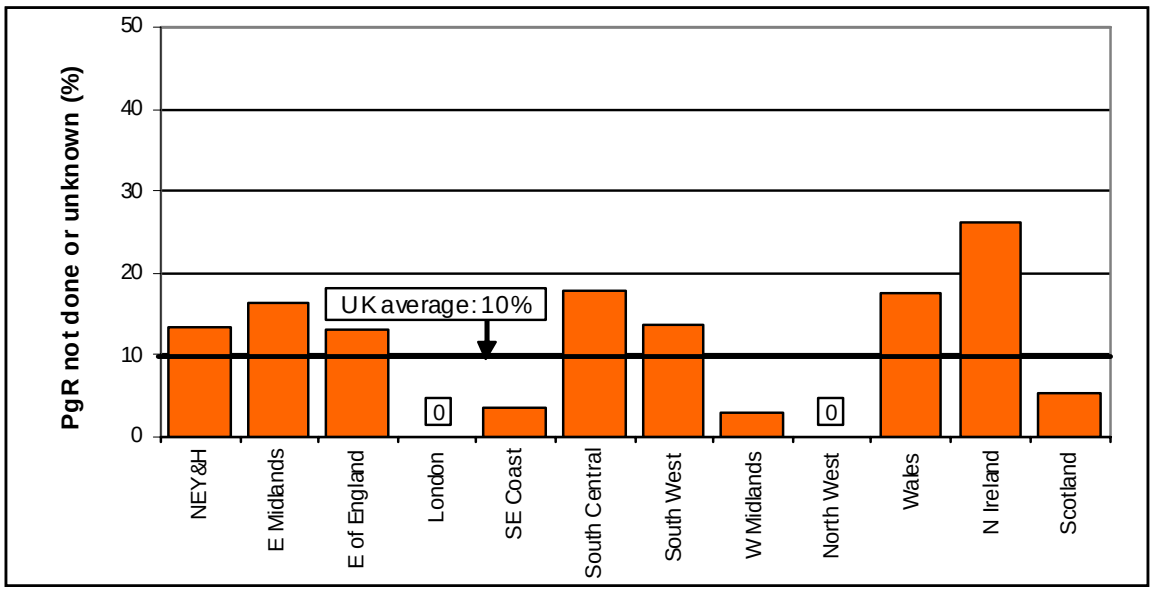

Figure 62 (Table 93): Variation in the proportion of ER negative invasive cases with unknown PgR status

PgR status data were available for 75% of invasive cancers and 40% of non-invasive cancers. PgR data completeness for invasive cancers varied from 47% in Wales to 97% in London and North West (Table 92). PgR status was known for 90% of the 1,155 ER negative invasive cancers (Table 93), suggesting that PgR status was preferentially requested for invasive cancers when the ER status was negative. Figure 62 shows that the proportion of ER negative invasive cancers with unknown PgR status varied from 0% in London and North West to 26% in Northern Ireland.

HER-2 status data were available for 87% of the 12,080 invasive cancers included in the audit. This has improved from 78% in 2006/07. The proportion of cases with known HER-2 status varied from 55% in South East Coast to 98% in Scotland (Figure 63). Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions. Of the 10,507 invasive cancers with known HER-2 status, 12% were positive, 87% were negative and 0.1% were borderline. The proportion of HER-2 positive invasive cancers varied from 9% in Wales to 16% in Northern Ireland. In Scotland, where the HER-2 status data were the most complete, 14% of the invasive cancers were HER-2 positive.

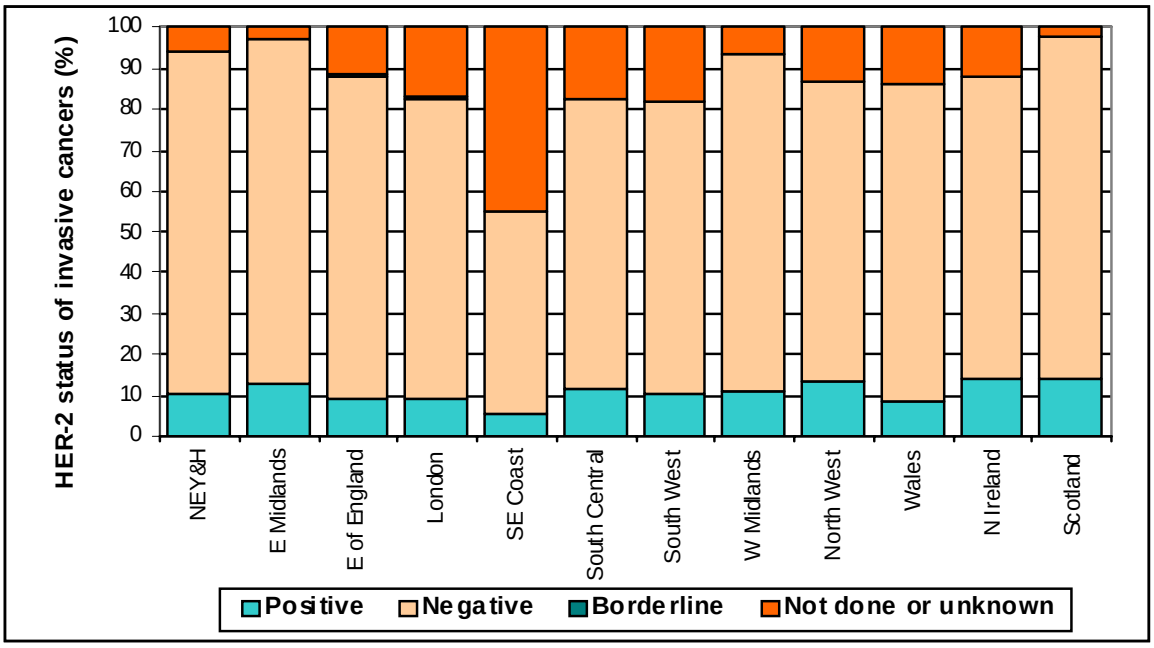

Figure 63 (Table 94): Variation in HER-2 status for invasive cancers

COMMENTS:

- 15,154 cases (90% of all cases) were included in the adjuvant therapy audit. Scotland and Wales had the highest proportion of eligible cases (100% and 99% respectively). South East Coast had the lowest proportion of eligible cases with 29% of cases excluded.
- In the UK as a whole, ER status was not known for 239 (2%) invasive cancers and for 1,258 (43%) non-invasive cancers. In South East Coast, 14% of the invasive cancers did not have ER status recorded. Regional QA reference centres should ensure that the ER status is recorded for all invasive cancers and that the results are available for discussion at the post-operative MDT meeting.
- Of the 11,841 invasive cancers with known ER status, 90% were ER positive.
- PgR status data were available for 75% of invasive cancers and 40% of non-invasive cancers. PgR status was known for 90% of the ER negative invasive cancers, suggesting that PgR status was preferentially requested for invasive cancers when the ER status was negative.
- HER-2 status data were available for 87% of invasive cancers compared with 78% in 2006/07. The proportion of cases with known HER-2 status varied from 55% in South East Coast to 98% in Scotland. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reasons why HER-2 status was not available for all the invasive cancers diagnosed in their regions.
- Of the 10,507 invasive cancers with known HER-2 status, 12% were positive, 87% were negative and 0.1% were borderline.

8.3 Adjuvant Therapy

In general, invasive cancers received more adjuvant therapy than non-invasive cancers. Of all cancers with known radiotherapy treatment, 9,676 (70%) had radiotherapy recorded by the audit cut off date. 77% of invasive cancers and 41% of non-invasive cancers had radiotherapy recorded (Table 95). 2,935 (25%) of invasive cancers and 14 patients with non-invasive cancer had chemotherapy recorded (Table 96). Regional QA reference centres should audit these 14 cases to ascertain if this is a data recording issue. 86% of invasive cancers and 22% of non-invasive cancers received hormone therapy (Table 97). This difference reflects the relatively low proportion of ER positive non-invasive cancers (43% compared with 88% for invasive cancers), and differing opinions regarding the benefit of offering hormone therapy to women with non-invasive breast cancer. As NICE Clinical Guideline 80 E*arly and locally advanced breast cancer: Diagnosis and treatment* (2009) states that Tamoxifen should not be offered to these women, it will be interesting to see if the proportion of women with non-invasive breast cancer who do receive hormone therapy decreases in future audits.

RADIOTHERAPY TREATMENT			
	Invasive *(Table 99)*	***Non-invasive*** *(Table 100)*	***Overall*** *(Table 98)*
No surgery	*22%*	*12%*	*20%*
1 operation	*73%*	*38%*	*66%*
>1 operation	*65%*	*37%*	*59%*

The preceding summary table shows that for both invasive and non-invasive cancers, a higher proportion of cancers (8% and 1% respectively) which had only one operation had radiotherapy recorded compared with cancers which had more than one operation. It is possible that some of these cancers may have had involved margins at the first operation, and that the women received radiotherapy to the breast instead of further surgery. 20% of the 173 cancers which did not receive surgery did have radiotherapy recorded (Table 98). For invasive cancers, 22% of the 9,474 cancers which had one operation and 33% of the 2,471 cancers which had more than one operation had chemotherapy recorded (Table 101). 39 invasive cancers which did not have surgery also had chemotherapy recorded. Regional QA reference centres should audit these cases to ascertain whether this is a data recording issue.

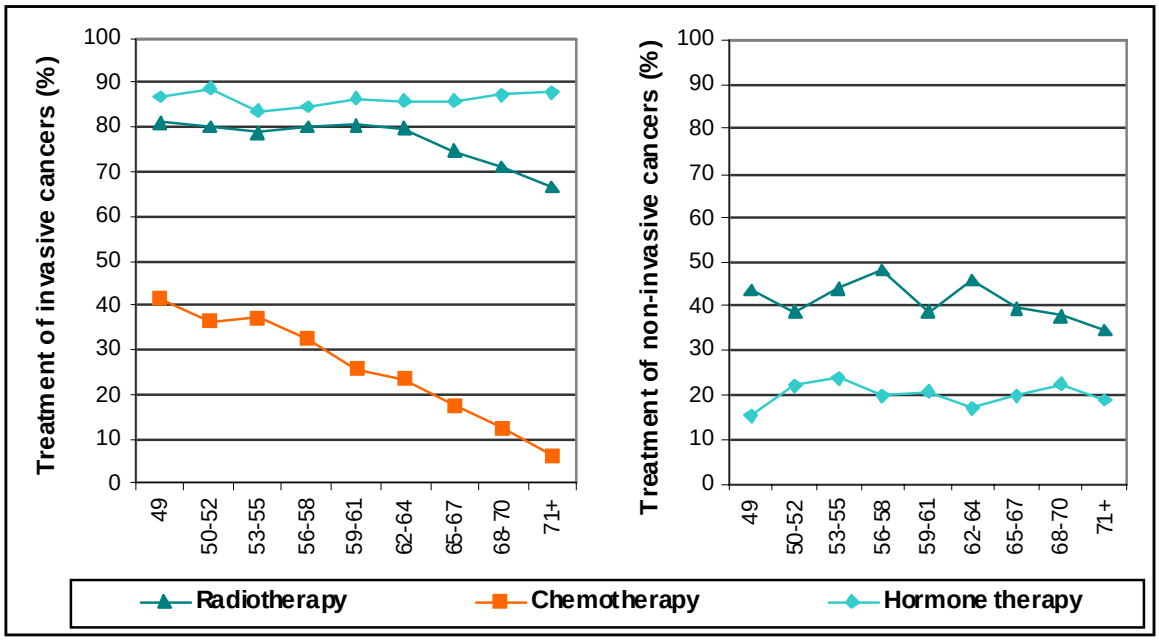

Figure 64 (Table 102 & 103): Percentage of women in each age group who had radiotherapy, chemotherapy and hormonal therapy recorded, for cases with complete adjuvant data

Figure 64 shows how the level of adjuvant therapy recorded for invasive and non-invasive cancers varies with age. Chemotherapy recorded for non-invasive cancers has been excluded because the numbers are small (14 cases) and the accuracy of the data is questionable. Hormone therapy was the main adjuvant therapy for invasive cancers at all ages, followed by radiotherapy. Overall, 86% of women with invasive cancer and 22% of women with non-invasive cancer had hormone therapy recorded and 77% and 41% respectively had radiotherapy recorded. The use of radiotherapy decreased gradually with age for both invasive and non-invasive cancers.

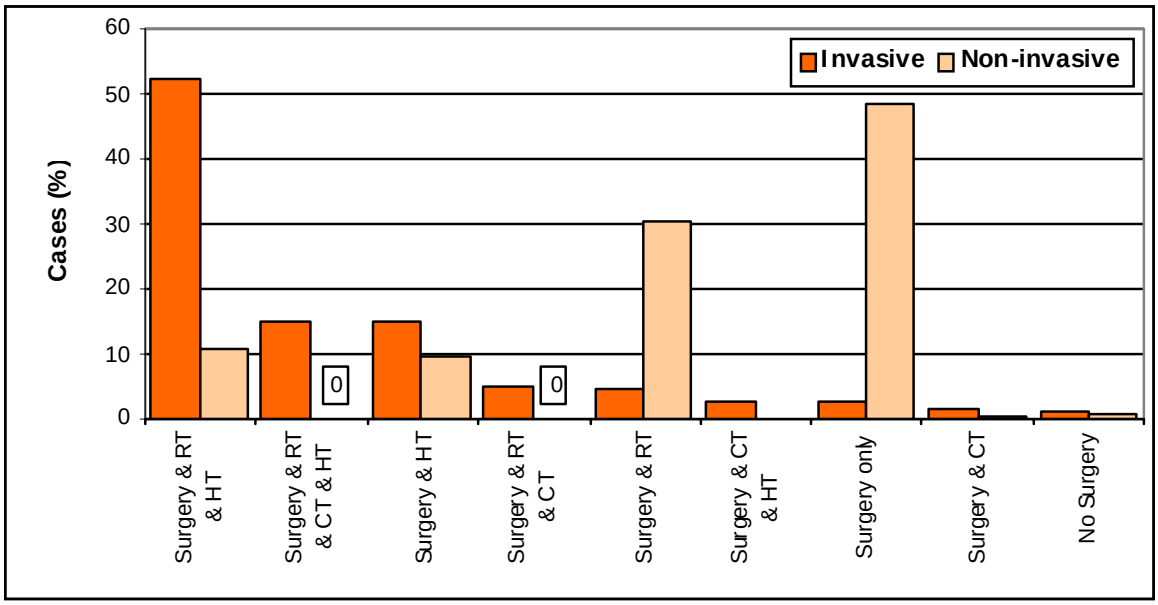

Figure 65 (Tables 104 and 105): Combinations of treatment, expressed as a percentage of cases with complete adjuvant therapy data

Chemotherapy was the least used adjuvant therapy; being recorded for only 25% of women with invasive cancers. This is mainly a reflection of the high proportion of relatively early stage cancers detected by screening. However, there was also a clear decrease in chemotherapy with age; with only 15% of women aged 65-70 having chemotherapy recorded compared with 37% of women aged 49-55. This may be because a higher proportion of younger women have aggressive, fast growing cancers, but may also indicate a reluctance to prescribe chemotherapy to older women where the risk/benefit balance is less clear.

Surgery, radiotherapy and hormone therapy as a combination of treatment was the most common treatment pattern for invasive cancers, with 52% (5,434 cases) receiving this treatment combination (Figure 65). For non-invasive cancers, 48% had surgery alone without any adjuvant therapy. Surgery and radiotherapy, the second most commonly used treatment combination, was received by 30% of the women with non-invasive cancer.

8.4 Waiting Time for Radiotherapy

Tables 106 to 113 show the regional variation in the cumulative percentages of cases recorded as having various therapies within 14, 30, 60, 90, 120 and 200 days. Surgically treated cancers which were recorded as having received chemotherapy before or after surgery have been excluded.

In Figure 66, the cumulative percentage curves for the UK as a whole are drawn as solid lines and dashed lines represent the regions with the maximum and minimum cumulative percentages at each point. The left hand graph shows the time taken from final surgery to radiotherapy, excluding surgically treated cases recorded as having received chemotherapy. In the UK as a whole, 54% of women with invasive or non-invasive breast cancer received radiotherapy within 60 days of their final surgery and 90% within 90 days. 59 women (1%) had not received radiotherapy 200 days after their final surgery. Waiting times for radiotherapy have improved since 2002/03 when only 36% of women received their radiotherapy within 60 days of their final surgery.

The right hand graph in Figure 66 shows that 47% of women with invasive cancers and 36% of women with non-invasive cancers with radiotherapy recorded had started their radiotherapy within 90 days of their first assessment visit and that 3% and 2% respectively had not started radiotherapy even after 200 days. Regional QA reference centres should review all the cases (invasive and non-invasive) where radiotherapy was not started within 200 days of final surgery.

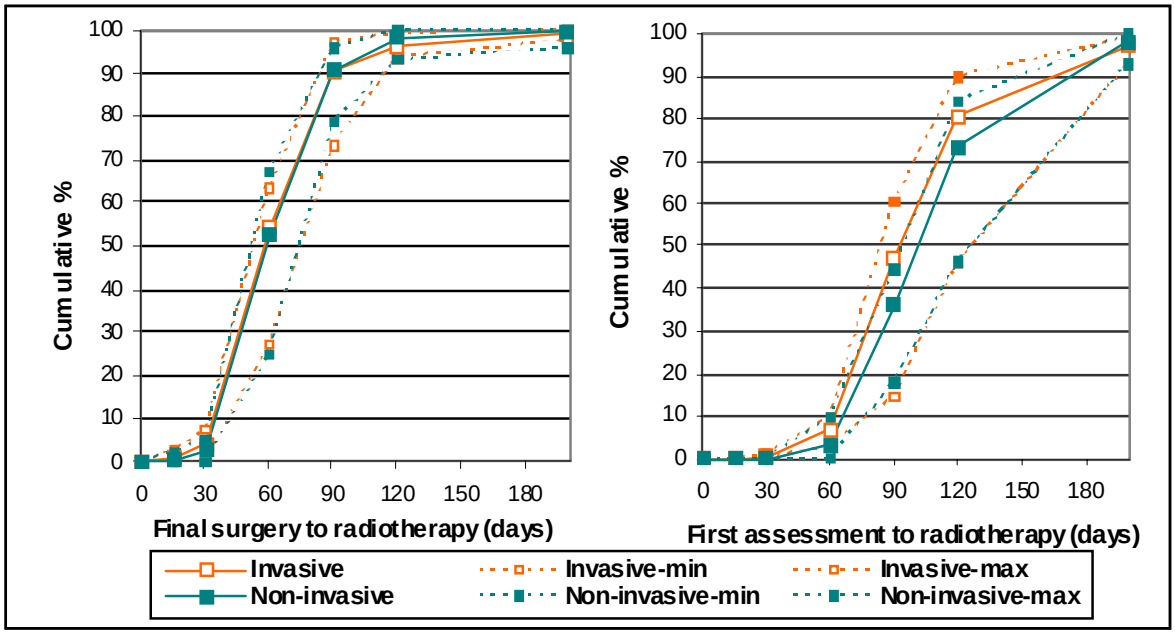

Figure 66 (Tables 110, 111, 112 and 113) : The cumulative percentage of cases with surgery and adjuvant radiotherapy, that had radiotherapy recorded up to 200 days after final surgery (left) and first assessment (right)

The following summary tables show the median number of days from assessment to diagnostic and therapeutic surgery, from assessment to radiotherapy and from final surgery to radiotherapy in each region for invasive and non-invasive cancers. In general, the waiting times for radiotherapy are slightly longer for non-invasive cancers compared to invasive cancers. For invasive cancers which did not have chemotherapy, the median time between final surgery and radiotherapy was similar for patients undergoing one or more surgical operations (58 or 57 days respectively) but varied somewhat between regions. The longest waiting times were seen in South East Coast and Northern Ireland. The shortest time was in East Midlands.

MEDIAN DAYS BETWEEN THERAPIES – INVASIVE

	Assessment to …				*Final surgery to …*	
Region	***Diagnostic surgery*** *(Table 106)*	***Therapeutic surgery*** *(Table 108)*	***RT (1 op)****	***RT (>1op)****	***RT (1 op)****	***RT (>1 op)****
N East, Yorks & Humber	*33*	*28*	*87*	*120*	*57*	*57*
East Midlands	*40*	*27*	*81*	*113*	*55*	*52*
East of England	*35*	*28*	*86*	*120*	*56*	*56*
London	*40*	*35*	*97*	*132*	*59*	*62*
South East Coast	*44*	*38*	*120*	*140*	*76*	*61*
South Central	*26*	*29*	*90*	*130*	*58*	*62*
South West	*35*	*32*	*97*	*117*	*63*	*59*
West Midlands	*32*	*26*	*85*	*119*	*59*	*62*
North West	*33*	*29*	*86*	*118*	*55*	*54*
Wales	*28*	*24*	*90*	*111*	*63*	*56*
Northern Ireland	*33*	*23*	*97*	*119*	*71*	*70*
Scotland	*28*	*29*	*84*	*115*	*56*	*56*
United Kingdom	***34***	***29***	***89***	***120***	***58***	***57***

*Excludes cases with chemotherapy

MEDIAN DAYS BETWEEN THERAPIES – NON-INVASIVE

Region	Assessment to …				Final surgery to …	
	Diagnostic surgery (Table 107)	Therapeutic surgery (Table 109)	RT (1 op)*	RT (>1op)*	RT (1 op)*	RT (>1 op)*
N East, Yorks & Humber	43	34	92	121	58	54
East Midlands	34	33	84	115	50	55
East of England	33	29	87	127	58	60
London	37	37	97	140	58	65
South East Coast	47	43	107	137	69	67
South Central	37	30	91	137	62	66
South West	45	39	111	129	68	59
West Midlands	35	30	92	112	58	50
North West	36	31	87	117	57	48
Wales	22	28	91	127	67	66
Northern Ireland	23	24	104	118	75	66
Scotland	30	36	93	111	59	53
United Kingdom	**37**	**34**	**92**	**125**	**59**	**57**

*Excludes 5 cases with chemotherapy

In the Cancer Reform Strategy published in December 2007, a new radiotherapy waiting times standard was introduced which specifies that the time between the date when a person is determined to be 'fit to treat' after surgery and the start of radiotherapy should be no more than 31 days. If this standard is to be achieved, considerable reductions in the time between final surgery and radiotherapy will be required in all regions.

COMMENTS:

- 77% of invasive cancers and 41% of non-invasive cancers had radiotherapy recorded. 25% of the invasive cancers and 14 patients with non-invasive cancer had chemotherapy recorded. Regional QA reference centres should audit these 14 cases to ascertain if this is a data recording issue.
- 86% of invasive cancers and 22% of non-invasive cancers had hormone therapy recorded. There are differing opinions regarding the benefit of offering hormone therapy to women with non-invasive breast cancer. As NICE Clinical Guideline 80 E*arly and locally advanced breast cancer: Diagnosis and treatment* (2009) states that Tamoxifen should not be offered to these women, it will be interesting to see if the proportion of women with non-invasive breast cancer who do receive hormone therapy decreases in future audits.
- Hormone therapy was the main treatment recorded for invasive cancers at all ages, followed by radiotherapy. The use of radiotherapy decreased gradually with age for both invasive and non-invasive cancers.
- Chemotherapy was the least used adjuvant therapy as would be expected for the high proportion of relatively early stage cancers detected by screening. 39 invasive cancers which did not have surgery had chemotherapy recorded. Regional QA reference centres should audit these cases to ascertain whether this is a data recording issue.
- There was a clear decrease in chemotherapy treatment with age; with only 15% of women aged 65-70 receiving chemotherapy compared with 37% of women aged 49-55. This may be because a higher proportion of younger women have aggressive, fast growing cancers, but may also indicate a reluctance to prescribe chemotherapy to older women where the risk/benefit balance is less clear.
- Overall, 54% of women received radiotherapy within 60 days of their final surgery and 90% within 90 days. 59 women (1%) had not received radiotherapy 200 days after their final surgery. Only 47% of women with invasive breast cancer had started their radiotherapy within 90 days of their first assessment visit and 3% had not started radiotherapy after 200 days. Regional QA reference centres should review all of the cases (invasive and non-invasive) where radiotherapy was not started within 200 days of final surgery.

8.5 Combinations of Adjuvant Therapy According to Tumour Characteristics

This section examines the combinations of adjuvant therapy given to tumours with various prognostic characteristics. It is clear that different screening units followed different protocols. It is hoped that by presenting analyses for five specific propositions, informative discussions to agree best practice can take place.

8.5.1 Conservation Surgery and Radiotherapy

PROPOSITION 1

Women with breast cancer treated with conservation surgery should normally receive radiotherapy

Of the 13,835 cases with radiotherapy data recorded, 80% were invasive and 19% were non-invasive (Table 114). 7,994 (73%) of the invasive cancers were treated with breast conservation surgery (Table 115). Of these, 548 (7%) did not have adjuvant radiotherapy recorded (Table 116). Figure 67 shows the variation in the proportion of conservatively treated invasive and non-invasive cancers that did not have adjuvant radiotherapy recorded. For invasive cancers, the proportions without radiotherapy recorded varied from 1% in Wales to 16% in South East Coast. Of the 1,909 non-invasive cancers treated with conservation surgery, 842 (44%) did not have adjuvant radiotherapy recorded (Table 119). This varied from 27% in Scotland to 64% in South Central.

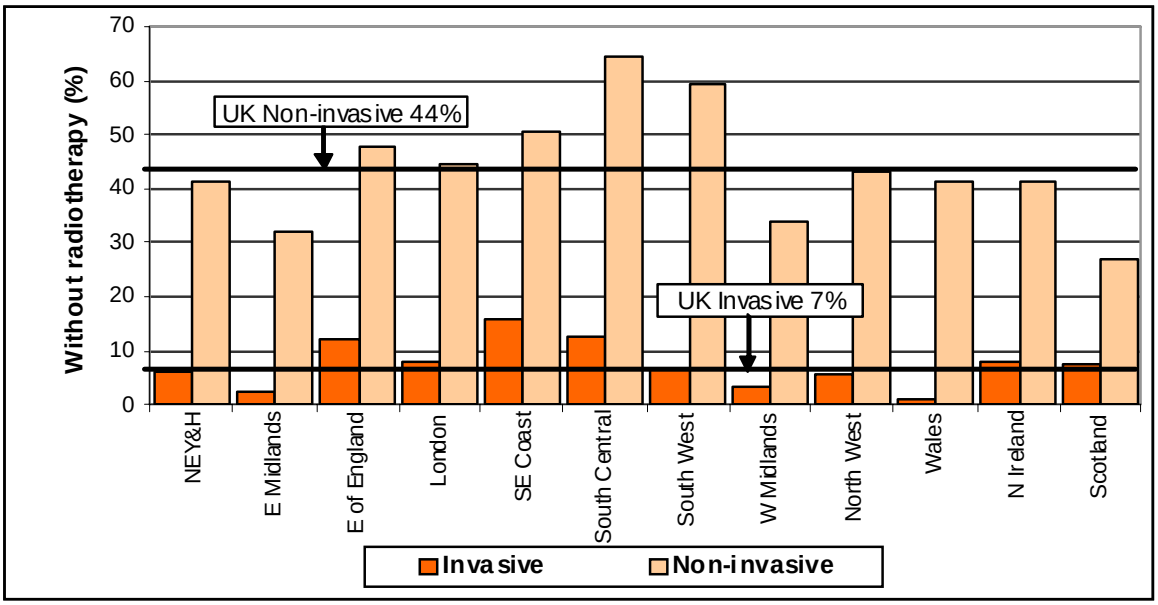

Figure 67 (Tables 116 & 119): The proportion of conservatively treated invasive cancers and non-invasive cancers that did not have radiotherapy recorded

Figure 68 shows the variation between individual screening units in the proportion of conservatively treated invasive breast cancers which did not have radiotherapy recorded. This varied from 0 cancers in 13 units to more than 20% of invasive cancers in 7 screening units.

In the UK as a whole, the majority (64%) of conservatively treated invasive cancers without radiotherapy recorded were small (<15mm invasive size diameter) tumours (Table 117). However, 13% of conservatively treated invasive cancers were larger than 20mm in diameter, 12% were Grade III and 11% were node positive (Table 118).

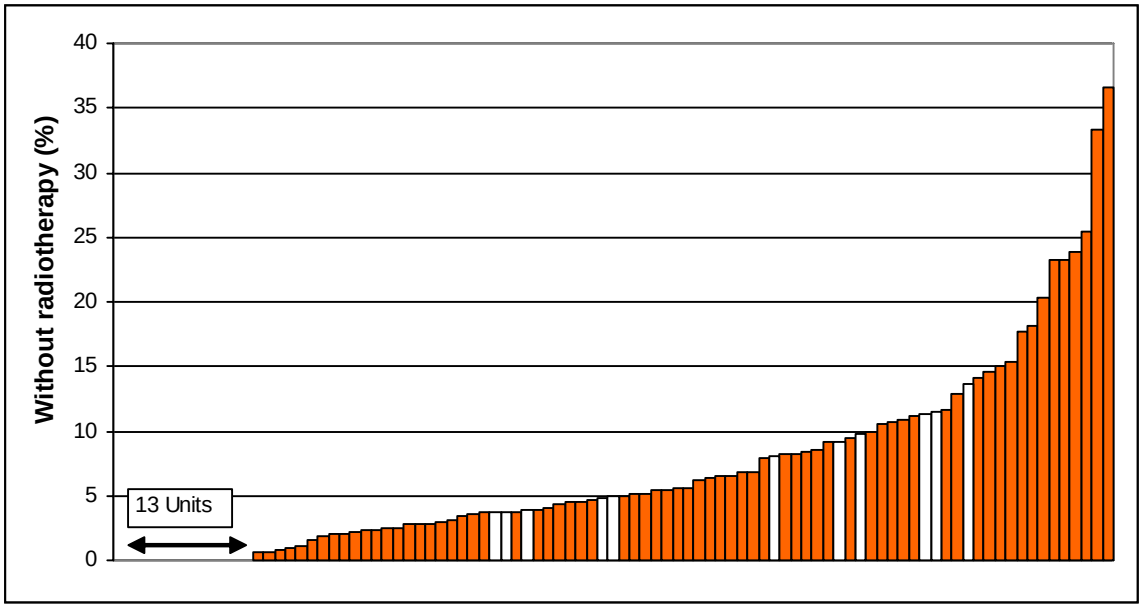

Figure 68: Variation between screening units in the proportion of conservatively treated invasive cancers that did not have radiotherapy recorded (11 of the 20 smallest units are highlighted in white)

Of the 1,909 non-invasive cancers treated with breast conservation surgery, 842 (44%) did not have adjuvant radiotherapy recorded (Table 119). Figure 69 shows the proportion of conservatively treated high cytonuclear grade non-invasive cancers and the proportion of conservatively treated non-invasive cancers with size greater than 40mm that did not have radiotherapy recorded. 24% (202) of non-invasive cancers without radiotherapy recorded were high cytonuclear grade (Table 120), and 16 cancers were more than 40mm in diameter (Table 121). Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive radiotherapy. It is, however, possible that these cancers received less than optimal therapy.

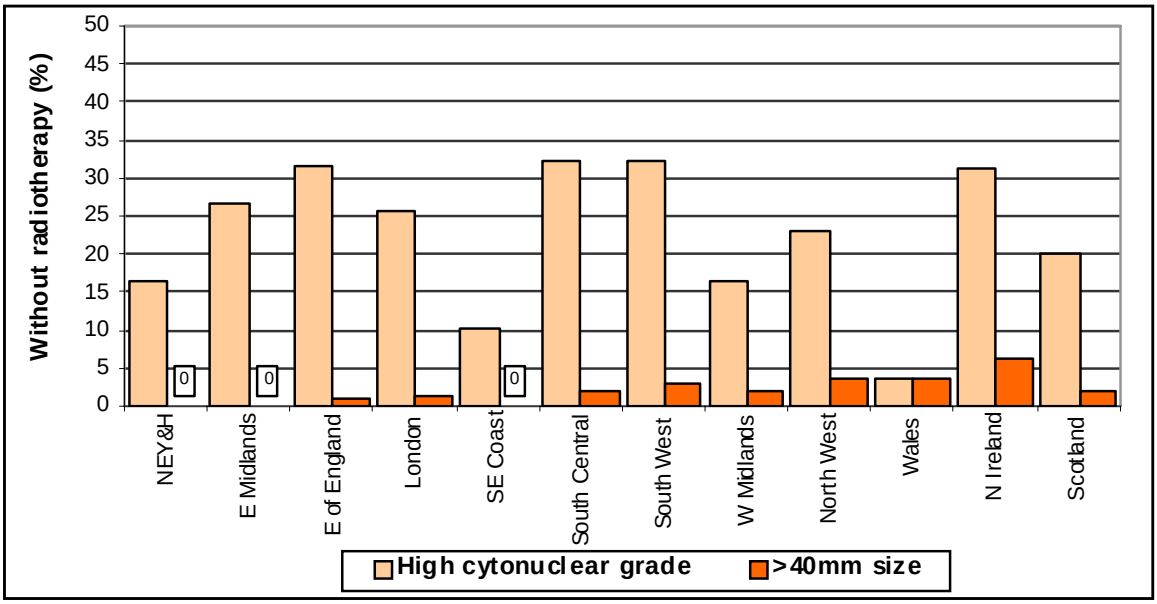

Figure 69 (Tables 120 & 121): The proportion of conservatively treated non-invasive cancers with high cytonuclear grade or size greater than 40mm which did not have radiotherapy recorded

The following summary table shows how the number and proportion of conservatively treated invasive and non-invasive cancers without radiotherapy recorded has varied in each region over the 3 year period from 2005/06 to 2007/08. Regions where the proportion of cancers without radiotherapy recorded is 5% or more in excess of the UK average are shaded. Throughout the 3 year period, in South East Coast, South Central and South West, more than 50% of conservatively treated non-invasive cancers do not appear to have received radiotherapy. Given the benefits demonstrated in clinical trials from the provision of radiotherapy to patients treated with breast conservation surgery, regional QA reference centres should audit all conservatively treated invasive

breast cancers which did not have radiotherapy recorded to ascertain if this is a true reflection of clinical practice or a data recording issue. Regional QA reference centres should also ascertain each screening unit's policy regarding the provision of radiotherapy to conservatively treated non-invasive breast cancers since there is evidence from clinical trials that this can reduce recurrence rates as well as reducing the time to recurrence.

CONSERVATIVELY TREATED CANCERS WITHOUT RADIOTHERAPY RECORDED

	Invasive						Non-invasive					
	2005/06		2006/07		2007/08		2005/06		2006/07		2007/08	
Region	**No.**	%	**No.**	%	**No.**	%	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	108	14	50	6	57	6	104	53	87	40	115	42
East Midlands	13	2	16	3	14	2	57	41	44	34	49	32
East of England	44	6	45	7	92	12	57	32	71	41	95	48
London	60	9	73	10	58	8	75	42	92	45	82	45
South East Coast	26	9	30	8	26	16	53	69	74	60	29	51
South Central	79	12	78	12	83	13	79	55	89	64	90	64
South West	69	8	62	7	56	6	138	57	120	53	136	59
West Midlands	18	3	23	4	25	3	45	35	42	34	49	34
North West	66	8	118	12	56	6	99	55	93	45	83	43
Wales	15	4	14	3	7	1	42	42	46	41	53	41
Northern Ireland	8	7	7	9	12	8	8	40	7	32	16	41
Scotland	75	15	78	10	62	8	57	41	43	26	45	27
United Kingdom	**581**	**8**	**594**	**8**	**548**	**7**	**814**	**47**	**808**	**44**	**842**	**44**

Shaded if 5% or more above the value for the UK as a whole

CONCLUSIONS 1

- 93% of women with invasive cancer treated with breast conservation surgery had radiotherapy recorded, compared to only 56% of women with conservatively treated non-invasive cancers.
- 13% of conservatively treated invasive cancers without radiotherapy recorded were larger than 20mm in diameter, 12% were Grade III and 11% were node positive. Given the benefits demonstrated in clinical trials from the provision of radiotherapy to patients treated with breast conservation surgery, regional QA reference centres should audit all conservatively treated invasive breast cancers which did not have radiotherapy recorded to ascertain if this is a true reflection of clinical practice or a data recording issue.
- 202 non-invasive cancers without radiotherapy recorded were high cytonuclear grade and 16 were more than 40mm in diameter. In the 3 year period 2005/06-2008/09, in South East Coast, South Central and South West, more than 50% of conservatively treated non-invasive cancers do not appear to have received radiotherapy. Provided that the tumour margins were adequate, it may be acceptable for conservatively treated non-invasive cancers to not receive adjuvant radiotherapy. However, regional QA reference centres should ascertain each screening unit's policy regarding the provision of radiotherapy to conservatively treated non-invasive breast cancers since there is evidence from clinical trials that this can reduce recurrence rates as well as reducing the time to recurrence.

8.5.2 Node Positive Invasive Cancers and Chemotherapy

PROPOSITION 2

Women with node positive invasive cancers should normally receive chemotherapy

Of the 14,544 cancers with known chemotherapy data, 2,548 (18%) were recorded as node positive invasive cancers (Table 122), of these, 897 (35%) did not have chemotherapy recorded (Figure 70). This varied from 27% in Northern Ireland to 47% in East of England. Of the 897 cases which had no chemotherapy recorded, 139 (16%) were Grade III, 54 (6%) were HER-2 positive, 459 were aged

less than 65 and 438 were aged 65 or above. The 459 cases aged less than 65 without chemotherapy recorded accounted for only 26% of all node positive invasive cancers with known chemotherapy data in this age group. In contrast, in the older patients, the 438 cases without chemotherapy recorded constituted 56% of all the node positive invasive cancers. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit Grade III and/or HER-2 positive, node positive invasive cancers with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

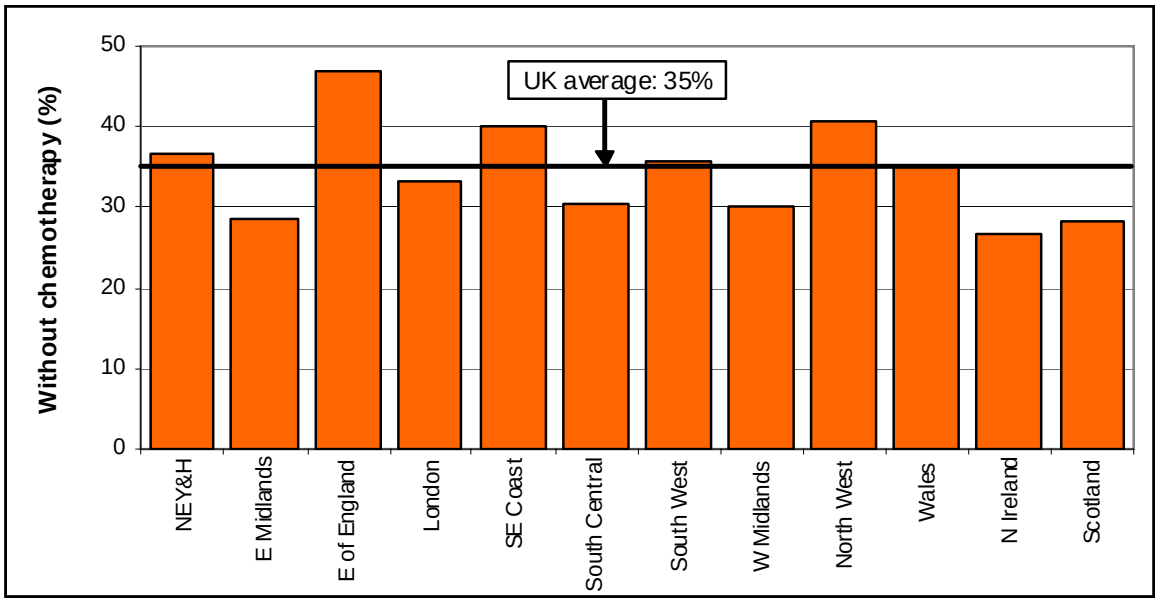

Figure 70 (Table 122): The proportion of node positive invasive cancers that did not have chemotherapy recorded

The following table shows how the number and proportion of node positive invasive cancers with no chemotherapy treatment recorded has varied in each region for the three year period from 2005/06 to 2007/08. Regions where the proportion of cancers not receiving chemotherapy is 5% or more in excess of the UK average are shaded. The majority of regions show decreases in the proportion of node positive invasive cancers with no chemotherapy treatment recorded with time.

NODE POSITIVE INVASIVE CANCERS WITHOUT CHEMOTHERAPY

	2005/06		2006/07		2007/08	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	*112*	*40*	*131*	*45*	*125*	*37*
East Midlands	*81*	*40*	*56*	*29*	*51*	*28*
East of England	*116*	*52*	*92*	*46*	*113*	*47*
London	*65*	*31*	*75*	*34*	*86*	*33*
South East Coast	*34*	*35*	*77*	*55*	*63*	*40*
South Central	*66*	*35*	*59*	*32*	*60*	*30*
South West	*96*	*42*	*86*	*35*	*87*	*36*
West Midlands	*64*	*31*	*62*	*29*	*63*	*30*
North West	*104*	*42*	*112*	*36*	*118*	*41*
Wales	*41*	*30*	*47*	*36*	*54*	*35*
Northern Ireland	*9*	*36*	*6*	*20*	*8*	*27*
Scotland	*104*	*41*	*72*	*27*	*69*	*28*
United Kingdom	***892***	***39***	***875***	***36***	***897***	***35***

Shaded if 5% or more above the value for the UK as a whole

CONCLUSIONS 2

- 35% of women with node positive invasive cancer did not have chemotherapy recorded. Older women with node positive invasive cancers were less likely to have chemotherapy recorded than younger women.
- 16% of the 897 node positive invasive cancers which had no chemotherapy were Grade III and 6% were HER-2 positive. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit Grade III and/or HER-2 positive, node positive invasive cancers with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

8.5.3 ER Status and Hormone Therapy

PROPOSITION 3

Hormonal therapy (e.g. Tamoxifen) is only beneficial to women with ER positive invasive cancers and to women with ER negative, PgR positive invasive cancers

Of the 14,429 cancers with complete hormone therapy data included in the adjuvant therapy analysis, 11,512 (80%) were ER positive, 1,532 (11%) ER negative and for 1,385 (10%) either the ER status were not tested or the ER status was unknown (Table 123). 90% of the ER positive cancers with known hormone therapy data were invasive and 10% non-invasive (Table 124).

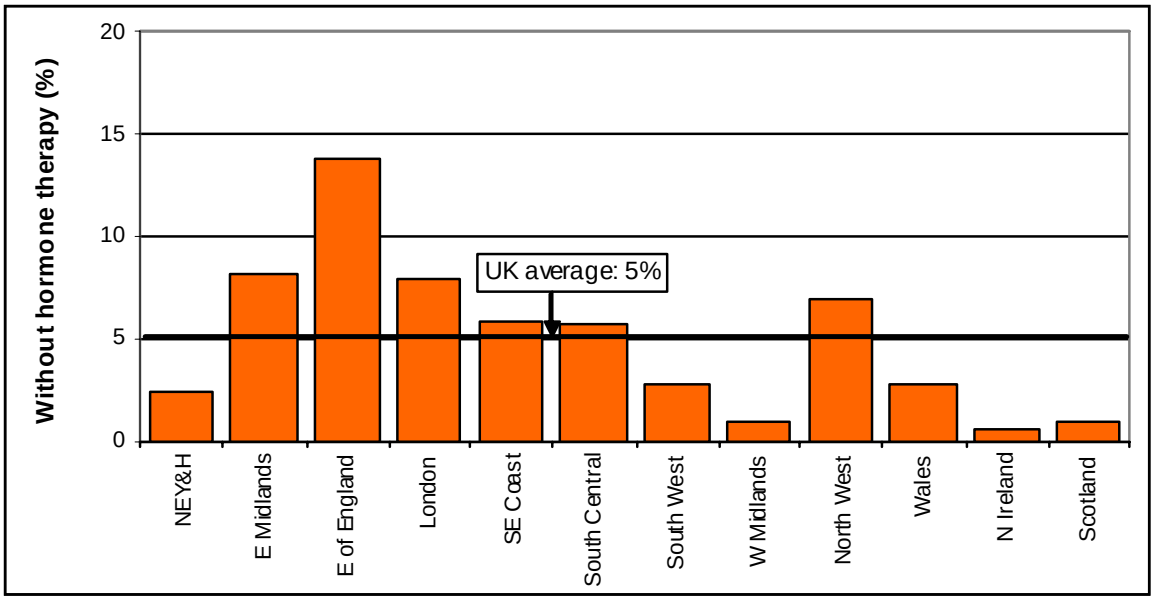

Figure 71 (Table 125): Variation in proportion of ER positive, invasive cancers that did not have hormone therapy recorded

In the UK as a whole, 528 (5%) ER positive invasive cancers had no hormone therapy recorded (Figure 71). The proportion of ER positive invasive cancers that did not have hormone therapy recorded varied from 1% in West Midlands (8 cases), Northern Ireland (1 case) and Scotland (9 cases) to 14% in East of England (128 cancers). In Wales, the figure has dropped from 13% in 2006/07 to 3% in 2007/08 because of the introduction of new guidelines in 2008 which recommend hormone therapy for all ER positive patients. 82% of the ER positive invasive cancers that did not have hormone therapy recorded were Grade I or II, 77% were node negative and 60% were <15mm in diameter (Table 126). Figure 72 shows how the proportion of ER positive cancers in the Excellent Prognostic Group (EPG) treated with hormone therapy varied between screening units from 4% (1 case) in one screening unit in East Midlands to 100% in 35 screening units.

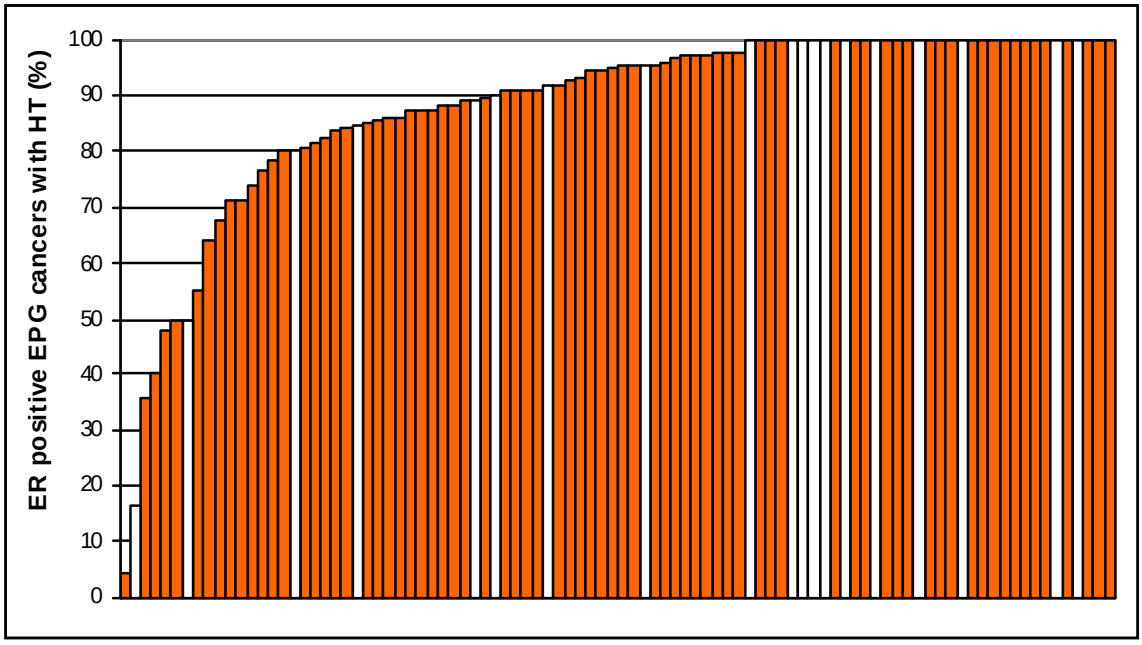

Figure 72: Variation between screening units in the proportion of ER positive, EPG cancers that had hormone therapy recorded (excludes 2 units that had no ER positive EPG cancers)
(19 of the 20 smallest units are highlighted in white)

The following summary table shows that in the 3 year period 2005/06-2007/08, the proportion of ER positive invasive cancers without hormone therapy recorded in Wales has decreased, while the proportion in East of England has increased. Regional QA reference centres and regional surgical QA co-ordinators where the proportion of ER positive invasive cancers without hormone therapy recorded is 5% or more in excess of the UK average should audit their cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue.

ER POSITIVE INVASIVE CANCERS WITHOUT HORMONE THERAPY RECORDED

	2005/06		2006/07		2007/08	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	53	5	35	3	32	2
East Midlands	90	10	98	12	66	8
East of England	71	8	80	10	128	14
London	42	5	30	4	73	8
South East Coast	7	2	8	2	33	6
South Central	13	2	28	4	45	6
South West	34	4	34	3	29	3
West Midlands	14	2	20	3	8	1
North West	59	6	129	11	85	7
Wales	77	14	77	13	19	3
Northern Ireland	2	2	0	0	1	1
Scotland	7	1	11	1	9	1
United Kingdom	**469**	**5**	**550**	**6**	**528**	**5**

Shaded if 5% or more above the value of the UK as a whole

In the UK as a whole, 25 (48%) ER negative, PgR positive invasive cancers did not have hormone therapy recorded (Table 127) and 115 ER negative cancers (8%) did have hormone therapy recorded (Table 128). 25 of the latter were PgR positive invasive cancers (Table 127). Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why hormone therapy was not given to ER negative cancers which were PgR positive and why hormone therapy does appear to have been given to ER negative cancers.

The proportion of non-invasive cancers with hormone therapy recorded varied markedly between regions from 8% in East of England to 81% in Northern Ireland (Figure 73 & Table 129). Of the 524 non-invasive cancers with known ER status with hormone therapy recorded, 516 were ER positive

and 8 were ER negative. A further 56 non-invasive cancers with unknown ER status also had hormone therapy recorded. In East Midlands, 8% of the non-invasive cancers with hormone therapy recorded had unknown ER status. 631 ER positive, non-invasive cancers did not have hormone therapy recorded (Table 130). Given the potential side effects of hormone treatment, regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why hormone therapy appears to have been given to non-invasive cancers with unknown or negative ER status.

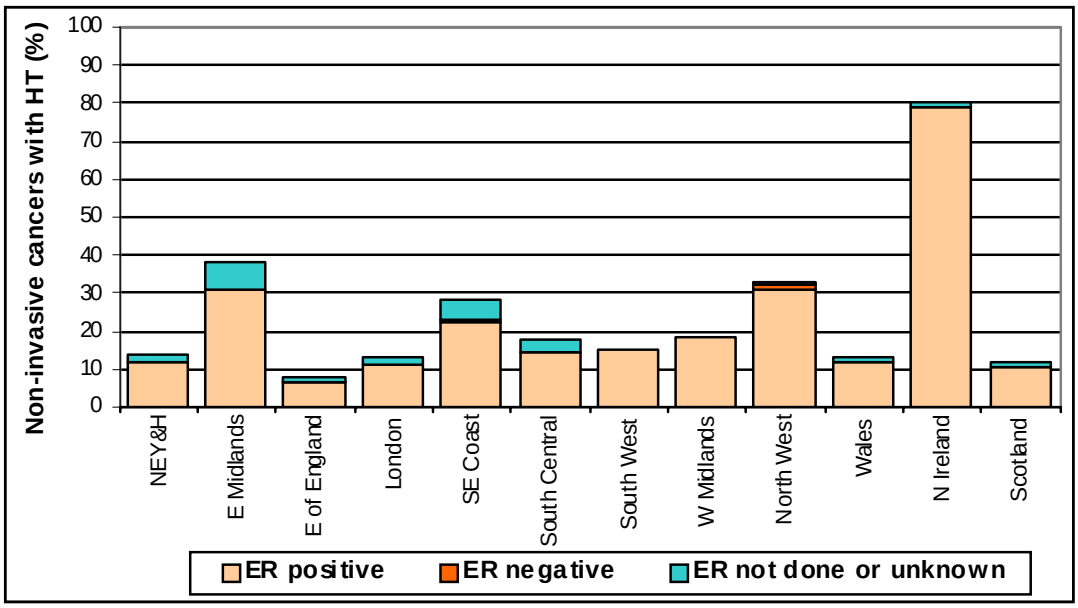

Figure 73 (Table 129): Variation in the proportion of non-invasive cancers that had hormone therapy recorded

CONCLUSIONS 3

- The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 528 ER positive, invasive cancers and 25 ER negative, PgR positive invasive cancers did not have hormone therapy recorded.
- 82% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 77% were node negative and 60% were <15mm in diameter. Regional QA reference centres and regional surgical QA co-ordinators should audit ER and PgR positive invasive cancers to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue.
- The proportion of non-invasive cancers with hormone therapy recorded varied markedly between regions from 8% in East of England to 81% in Northern Ireland. 8% of ER negative non-invasive cancers had hormone therapy recorded.
- Given the potential side effects of hormone treatment, regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why hormone therapy appears to have been given to invasive and non-invasive cancers with unknown or negative ER and PgR status.

8.5.4 ER Negative Invasive Cancers and Chemotherapy

PROPOSITION 4

Chemotherapy should be considered as a treatment for ER negative invasive cancers

Chemotherapy should be considered for ER negative invasive breast cancers but its use represents a balance between toxicity and benefit. Of the 14,544 cancers with known chemotherapy data, 273 (2%) were recorded as ER negative, node positive invasive cancers and 827 (6%) were recorded as ER negative, node negative invasive cancers (Table 131). Of the 273 ER negative, node positive invasive cancers, 33 (12%) did not receive chemotherapy (Figure 74). This varied from 0% in London to 25% (1 case) in Northern Ireland.

Of the 33 ER negative, node positive invasive cancers which had no chemotherapy recorded, 23 (70%) were Grade III, 11 (33%) were HER-2 positive, 13 were aged less than 65 and 20 were aged 65 or above. Although these numbers are similar, the 13 cases aged less than 65 were only 7% of the ER negative, node positive invasive cancers in this age group; while the 20 cases were 22% of the ER negative, node positive invasive cancers in the older patients.

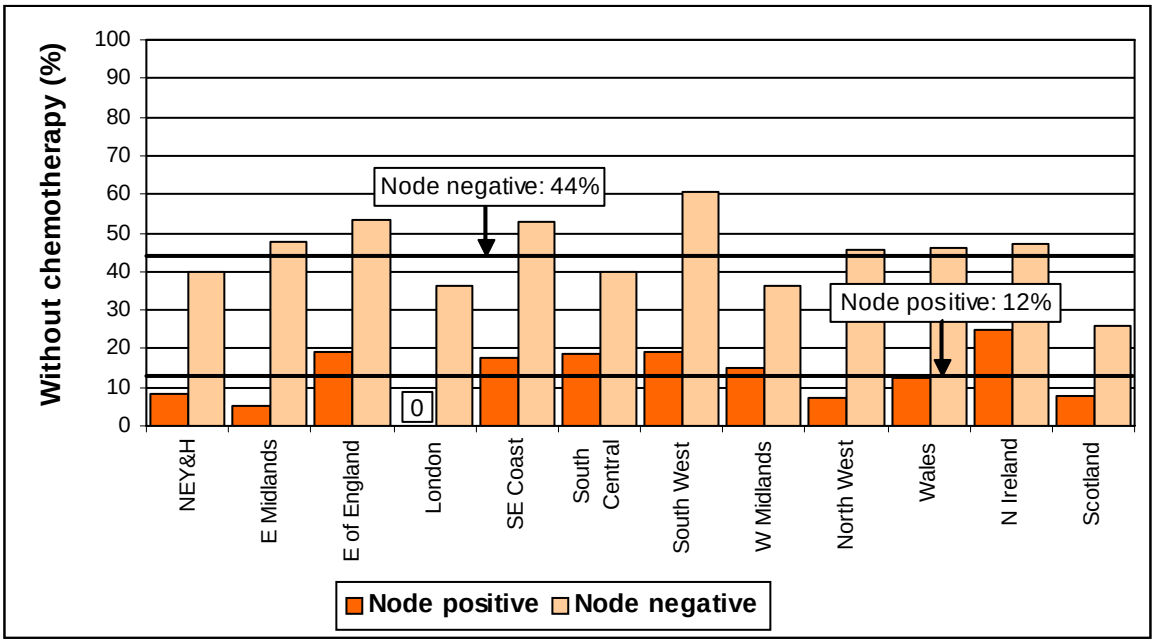

Figure 74 (Table 133): The proportion of ER negative, node positive and negative invasive cancers that did not have chemotherapy recorded

Of the 827 ER negative, node negative invasive cancers, 363 (44%) did not have chemotherapy recorded (Table 133). This varied from 26% in Scotland to 61% in South West (Figure 74). Thus, in most regions, nodal status was taken into account when deciding whether ER negative cancers received chemotherapy. Nodal status made the least difference in Scotland where the highest proportion of ER negative, node negative cancers had chemotherapy recorded. In the UK as a whole, 81% of the 464 ER negative, node negative invasive cancers given chemotherapy were Grade III (Table 134), 155 (33%) cases were HER-2 positive, 374 (81%) were aged less than 65 and 90 (19%) were aged 65 or above.

ER NEGATIVE NODE POSITIVE INVASIVE CANCERS WITHOUT CHEMOTHERAPY RECORDED

	2005/06		2006/07		2007/08	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	*9*	*23*	*8*	*20*	*3*	*8*
East Midlands	*3*	*14*	*2*	*7*	*1*	*5*
East of England	*4*	*17*	*7*	*33*	*4*	*19*
London	*4*	*14*	*1*	*5*	*0*	*0*
South East Coast	*3*	*21*	*4*	*31*	*3*	*18*
South Central	*3*	*16*	*0*	*0*	*3*	*19*
South West	*4*	*17*	*5*	*19*	*5*	*19*
West Midlands	*2*	*10*	*7*	*27*	*6*	*15*
North West	*5*	*13*	*2*	*5*	*2*	*7*
Wales	*0*	*0*	*3*	*25*	*3*	*13*
Northern Ireland	*0*	*0*	*0*	*0*	*1*	*25*
Scotland	*4*	*15*	*5*	*16*	*2*	*8*
United Kingdom	***41***	***15***	***44***	***16***	***33***	***12***

Shaded if 5% or more above the value for the UK as a whole

The preceding summary table shows how the number and proportion of ER negative, node positive invasive cancers with no chemotherapy recorded has varied in each region for the three year period

from 2005/06 to 2007/08. Regions where the proportion of cancers without chemotherapy recorded is 5% or more in excess of the UK average are shaded. North East, Yorkshire and Humber, East Midlands and London show marked decreases in the proportion of ER negative, node positive invasive cancers with no chemotherapy treatment recorded with time. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit these cases to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

CONCLUSIONS 4

- 12% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 44% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy.
- 81% of the 464 ER negative, node negative invasive cancers with chemotherapy recorded were Grade III and 33% were HER-2 positive.
- Older women with ER negative, node positive or node negative invasive cancers were less likely to have chemotherapy recorded than younger women. Given the relatively small numbers of cancers involved, all regional QA reference centres and regional surgical QA co-ordinators should audit the ER negative, node positive invasive cancers with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

8.5.5 HER-2 Status and Chemotherapy

PROPOSITION 5

Chemotherapy should be considered as a treatment for HER-2 positive invasive cancers

NICE Clinical Guideline 80 on the *Early and locally advanced breast cancer: Diagnosis and treatment* (2009) states that, given the poor prognosis associated with HER-2 positivity, patients with HER-2 positive tumours who have satisfactory cardiac function should be offered Trastuzumab after their surgery, chemotherapy and radiotherapy treatment has been completed. This proposition is therefore designed to examine the proportion of patients who may not be eligible to have Trastuzumab because they have not had chemotherapy as a first line adjuvant therapy.

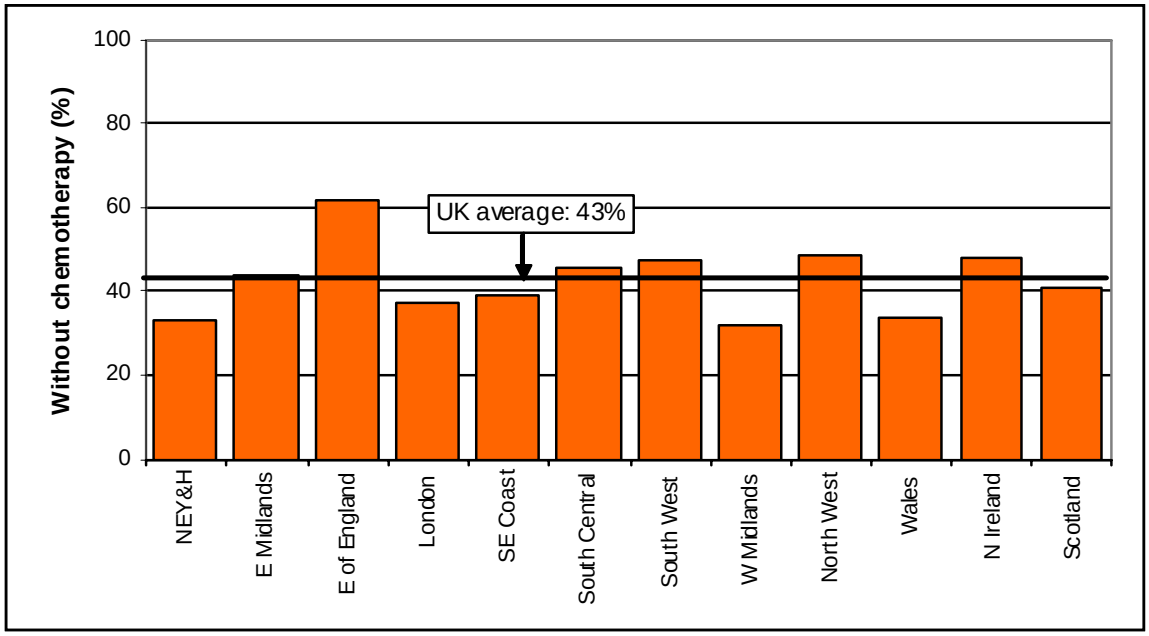

Figure 75 (Table 135): Proportion of HER-2 positive invasive cancers that did not receive chemotherapy

In the UK as a whole, HER-2 status was known for 10,507 (87%) of invasive cancers (Table 94). Of these, 1,263 were HER-2 positive and had chemotherapy data available. For 539 (43%) of these cases, no chemotherapy treatment was recorded (Table 135). This varied between 32% in West Midlands and 61% in East of England (Figure 75). In the UK as a whole, 14% of the HER-2 positive cases with no chemotherapy recorded were greater than 20mm in diameter, 31% were Grade III, 10% were node positive and 40% were in the MPG1, MPG2 or PPG groups (Tables 136 and 137). Older patients were less likely to receive chemotherapy. 61% of the patients aged less than 65 with HER-2 positive invasive cancers received chemotherapy, compared to 38% of patients aged 65 and over.

Figure 76 shows how the proportion of HER-2 positive invasive cancers that did not have chemotherapy recorded varied between individual screening units. In 5 units, all HER-2 positive invasive cancers had chemotherapy recorded, whilst in 11 screening units more than 70% of these cancers had no chemotherapy recorded. Given that Trastuzumab is only usually prescribed for HER-2 positive patients who have already received chemotherapy, regional QA reference centres and regional surgical QA co-ordinators should audit HER-2 positive cases with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

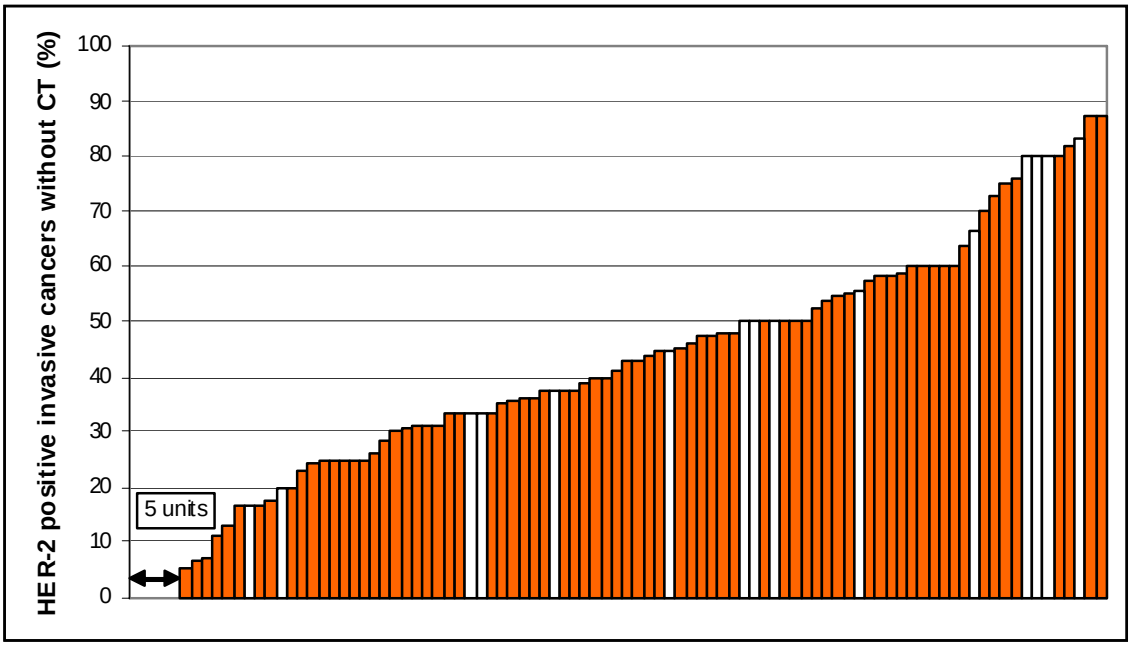

Figure 76: Variation between screening units in the proportion of HER-2 positive invasive cancers that did not have chemotherapy recorded (15 of the 20 smallest units are highlighted in white)

CONCLUSIONS 5

- 539 (43%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 14% of these cases were greater than 20mm in diameter, 31% were Grade III, 10% were node positive and 40% were in the MPG1, MPG2 or PPG groups.
- In 5 screening units, all HER-2 positive invasive cancers had chemotherapy recorded, whilst in 11 units more than 70% of these cancers had no chemotherapy recorded.
- Given that Trastuzumab is only usually prescribed for HER-2 positive patients who have already received chemotherapy, regional QA reference centres and regional surgical QA co-ordinators should audit HER-2 positive cases with no chemotherapy recorded to determine whether the absence of chemotherapy treatment data is a true reflection of clinical practice or a data recording issue.

8.5.6 Summary

The following table provides a summary of the proportion of cancers in each region which did not appear to receive treatment consistent with propositions 1 to 5 presented in this section. Regions where the proportion of cancers which appear to have been treated in a manner inconsistent with each proposition was 5% or more in excess of the UK average are shaded. Regional QA reference centres and regional surgical QA co-ordinators should determine firstly whether these inconsistencies are apparent for all or a small number of their screening units, and secondly whether the results are a true reflection of clinical practice or whether they are due to data recording issues. If the latter is the case, more robust data collection and validation processes should be implemented by the affected screening units and improved data checking procedures implemented by the regional QA reference centre. If the inconsistencies are due to clinical practice which is not consistent with national guidance, the reasons that surgeons and their multi-disciplinary teams are not following the guidance should be investigated and changes in practice implemented where necessary.

SUMMARY OF PROPOSITIONS 1, 2, 3, 4 and 5

	Proposition 1		***Proposition 2***	***Proposition 3***			***Proposition 4***	***Proposition 5***
	Invasive conservation surgery no RT *(Table 116)*	***Non-invasive conservation surgery no RT*** *(Table 119)*	***Node positive invasive no CT*** *(Table 122)*	***ER positive invasive no HT*** *(Table 125)*	***ER negative PgR positive invasive no HT*** *(Table 127)*	***ER negative with HT*** *(Table 128)*	***ER negative invasive no CT*** *(Table 132)*	***HER-2 positive invasive cancers no CT*** *(Table 135)*
Region	***%***	***%***	***%***	***%***	***%***	***%***	***%***	***%***
NEY&H	*6*	*42*	*37*	*2*	*0*	*9*	*34*	*33*
East Midlands	*2*	*32*	*28*	*8*	*67*	*1*	*38*	*44*
E of England	*12*	*48*	*47*	*14*	*60*	*11*	*46*	*61*
London	*8*	*45*	*33*	*8*	*0*	*8*	*30*	*37*
SE Coast	*16*	*51*	*40*	*6*	*0*	*11*	*43*	*39*
South Central	*13*	*64*	*30*	*6*	*67*	*15*	*36*	*46*
South West	*6*	*59*	*36*	*3*	*73*	*5*	*52*	*47*
West Midlands	*3*	*34*	*30*	*1*	*0*	*2*	*28*	*32*
North West	*6*	*43*	*41*	*7*	*45*	*12*	*38*	*49*
Wales	*1*	*41*	*35*	*3*	*50*	*10*	*34*	*34*
N Ireland	*8*	*41*	*27*	*1*	*-*	*3*	*43*	*48*
Scotland	*8*	*27*	*28*	*1*	*75*	*1*	*22*	*41*
UK	***7***	***44***	***35***	***5***	***48***	***8***	***36***	***43***

Shaded if 5% or more above the value for the UK as a whole

CHAPTER 9
SURVIVAL ANALYSIS

UK NHS Breast Screening Programme data for women with breast cancers detected by screening between 1 April 2002 and 31 March 2003 were combined with data recorded by regional cancer registries to analyse breast cancer survival. All cases were followed up to the study end date of 31 December 2009, enabling survival for a period of up to 6 years post diagnosis to be calculated. 5-year relative survival has been calculated for this report. By liaising with the cancer registries serving their population, 11 of the 12 regional QA reference centres were able to provide complete data for this analysis. ISD Scotland was unable to participate in the audit because of other commitments.

Age at diagnosis, invasive grade, invasive tumour size and nodal status were requested from the screening services for cases detected in 2002/03. Date of death and underlying cause of death were obtained from cancer registries, the National Strategic Tracing Service (NSTS) and the Office for National Statistics (ONS). Tumour characteristics and death information for earlier years were collected in previous audits.

9.1 Survival Analysis Methods

Relative survival is defined as the observed survival in the patient group divided by the expected survival of the general population, matched by age and sex. The cumulative relative survival is interpreted as the proportion surviving a given interval after diagnosis in the hypothetical situation that breast cancer is the only possible cause of death. A population without breast cancer would have a relative survival rate of 100%. Relative survival was calculated, using the statistical package Surv2 (*"Surv2: Relative Survival Analysis Program", Esko T Voutilainene, Paul W. Dickman, Timo Hakulinen. Finnish Cancer Registry (Helsinki) and Dept of Medical Epidemiology, Karolinska Institutet (Stockholm)*).

Expected survival probabilities for women in the general UK population were calculated using the Hakulinen method with probability of life tables supplied by the Government's Actuary Department. For each relative survival rate, 95% confidence intervals were approximated as twice the standard error. Relative survival curves were tested for statistically significant differences using likelihood ratio tests for inequality. Full details can be found in the Surv2 software manual.

9.2 Eligibility and Data Completeness of Cases Included in the Survival Analysis

Details of 10,680 breast cancers detected by screening between 1 April 2002 and 31 March 2003 were submitted to the survival audit. Of the 10,680 cancers submitted, 428 cancers (4%) were excluded for one of the following reasons:

- Unknown invasive status (39 cases)
- Case not registered at the regional cancer registry or registered with an unknown diagnosis date (208 cases)
- Screen-detected cancer not confirmed to be the first primary breast tumour (181 cases)

The diagnosis date recorded at the cancer registry was taken for the survival analysis, unless it was incomplete or later than the screening surgery date, in which case the screening surgery date was used. This can occur where the cancer registry has incomplete data for the cancer, for example a registration based only on a death certificate.

The following summary table shows that the proportion of cases that were eligible for analysis varied between 94% in East Midlands and South West and 99% in Wales and Northern Ireland. The highest numbers of unregistered cases were in East Midlands (53 cases), South West (36 cases) and North West (35 cases) which together account for 60% of the 208 unregistered cases. The proportion of cases with unknown invasive size, grade and/or nodal status (5%) is relatively high in 2002/03 compared with the 2% recorded for the 1999/00 and 2000/01 survival analyses. The highest numbers of cases with unknown invasive size, grade and/or nodal status were in North West (116 cases) and London (90 cases) which together account for 41% of the 502 cases with missing tumour characteristics.

DATA COMPLETENESS FOR THE 2002/03 SURVIVAL AUDIT

	Not registered		***Cases not confirmed to be primary breast cancers****		***Incomplete size, grade or nodal status for invasive cancers***		***Eligible cases***		***Total number of cases***
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***	***No.***	***%***	
N East, Yorks & Humber	*18*	*1*	*34*	*2*	*39*	*3*	*1370*	*96*	*1429*
East Midlands	*53*	*6*	*1*	*0*	*28*	*3*	*879*	*94*	*933*
East of England	*3*	*0*	*12*	*1*	*79*	*6*	*1222*	*98*	*1244*
London	*31*	*3*	*26*	*2*	*90*	*8*	*1082*	*95*	*1140*
South East Coast	*12*	*1*	*19*	*2*	*38*	*4*	*823*	*96*	*857*
South Central	*20*	*3*	*14*	*2*	*26*	*3*	*707*	*95*	*743*
South West	*36*	*3*	*23*	*2*	*47*	*4*	*990*	*94*	*1051*
West Midlands	*0*	*0*	*26*	*3*	*12*	*1*	*988*	*97*	*1022*
North West	*35*	*3*	*17*	*1*	*116*	*8*	*1327*	*96*	*1387*
Wales	*0*	*0*	*8*	*1*	*14*	*2*	*654*	*99*	*662*
Northern Ireland	*0*	*0*	*1*	*0*	*13*	*6*	*210*	*99*	*212*
Scotland	*No data supplied*								
United Kingdom	***208***	***2***	***181***	***2***	***502***	***5***	***10252***	***96***	***10680***

**confirmed to be a recurrence or where the cancer diagnosis date at the cancer registry is outside the audit period

9.3 Cause of Death

The main advantage of calculating relative rather than cause-specific survival is that knowledge of the cause of death is not required. However, the underlying cause of death was requested from the ONS for all the cases confirmed by cancer registries and the NSTS as having died.

Overall, 56% of the 744 deaths among the 8,131 women with invasive breast cancer were recorded as being due to breast cancer, 16% were due to another type of cancer and 26% were due to non-cancer related causes. Death cause was unknown for 11 women (1%). There were variations in the proportions of women with invasive cancer recorded as dying from each cause of death in each region (Table 138). The proportion of breast cancer deaths varied from 62% in Northern Ireland (13 cases) to 51% in East Midlands, East of England and West Midlands. In Wales, 23% of deaths were due to another cancer and only 16% were due to non-cancer related causes.

Table 139 shows that there were 4 deaths (4%) recorded amongst the 109 women with micro-invasive breast cancer detected by screening in 2002/03. 2 were from the breast cancer, 1 from another cancer and 1 was a non-cancer death. Of the 67 deaths (3%) in the 2,012 women with non-invasive breast cancer, 10 (15%) were recorded as being due to breast cancer, 30 (45%) were from a cancer other than breast cancer and 27 (40%) were non-cancer deaths (Table 140). The breast cancers deaths in the women with non-invasive breast cancer were due to invasive recurrences of the non-invasive breast cancers included in the 2002/03 cohort.

9.4 5-Year Relative Survival Rates for Cancers Diagnosed in 2002/03

Figure 77 shows that the overall 5-year relative survival of women with invasive cancers diagnosed in England, Wales and Northern Ireland in 2002/03 was 97.1%. 5-year relative survival rates varied from 92.5% in Northern Ireland to 98.5% in South East Coast. There is no significant difference between the 5-year relative survival rates in each region.

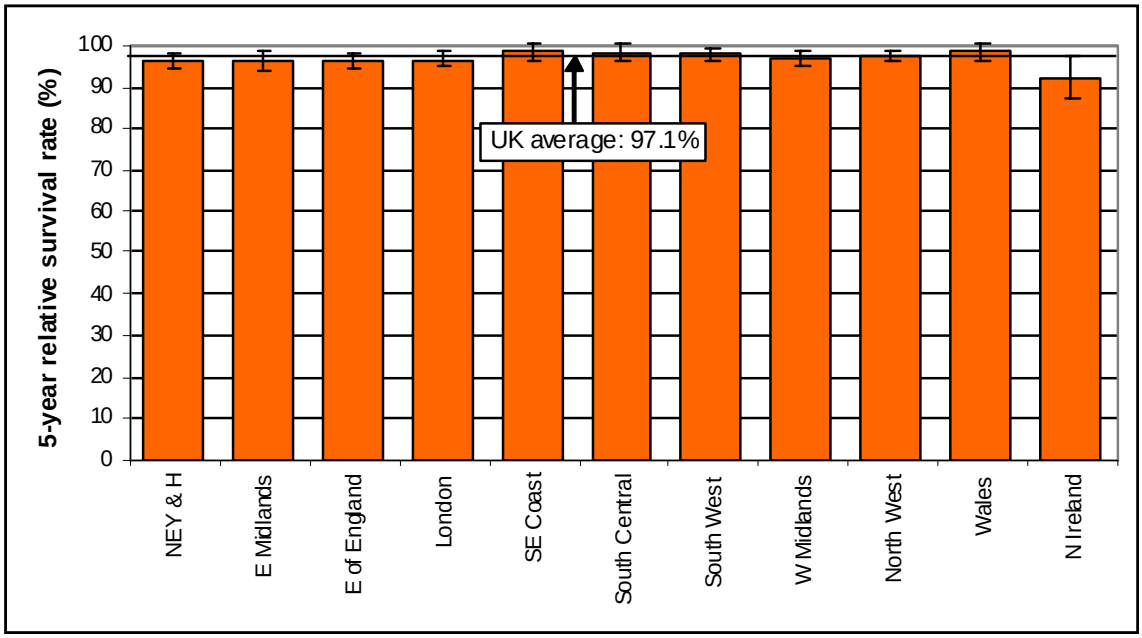

Figure 77 (Table 141): 5-year relative survival for women with screen-detected invasive breast cancer diagnosed in 2002/03

The following summary table shows the 5-year relative survival rates from past audit reports. 5-year relative survival for women with screen-detected invasive breast cancer has improved significantly from 95.4% in 1996/97 to 97.1% in 2002/03. The number of eligible cases increased each year until 2002/03 when it fell slightly from 8,943 to 8,131.

7 YEAR SUMMARY OF 5-YEAR RELATIVE SURVIVAL RATES INVASIVE BREAST CANCER

Audit year	*Number of cases*	*5-year relative survival rate*
Mar 1996 – Apr 1997	*5,445*	*95.4 (94.6,96.2)*
Mar 1997 – Apr 1998	*5,313*	*95.7 (94.9,96.5)*
Mar 1998 – Apr 1999	*6,898*	*95.8 (95.1,96.5)*
Mar 1999 – Apr 2000	*6,761*	*96.5 (95.8,97.2)*
Mar 2000 – Apr 2001	*7,007*	*96.4 (95.8,97.1)*
Mar 2001 – Apr 2002	*8,943*	*97.2 (96.6,97.8)*
Mar 2002 – Apr 2003	*8,131*	*97.1 (96.5,97.7)*

9.5 Variation in 5-Year Relative Survival with Tumour Characteristics

10,252 cancers were included in the 2002/03 survival audit. The following table shows the characteristics of the 8,131 invasive cancers included in the audit. 80% of the invasive cancers were diagnosed in women aged 50-64 years, 79% were less than or equal to 20mm in diameter, 81% were Grade I or Grade II, 72% were node negative, 58% were in the excellent (EPG) and good (GPG) prognostic groups and only 5% in the poor prognostic group (PPG).

Parameter		Cancers included in each analysis group 2002/03 Number	%
Invasive status	Invasive	8131	79
	Non-invasive	2012	20
	Micro-invasive	109	1
Age group (invasive cancers only)	<50	111	1
	50-52	1229	15
	53-55	1243	15
	56-58	1338	16
	59-61	1377	17
	62-64	1322	16
	65+	1511	19
	Total	8131	100
Invasive cancer size	<15mm	4421	54
	15-≤20mm	2000	25
	>20-≤35mm	1272	16
	>35-≤50mm	221	3
	>50mm	118	1
	Unknown	99	1
	Total	8131	100
Invasive grade	Grade I	2712	33
	Grade II	3898	48
	Grade III	1333	16
	Not assessable	41	1
	Unknown	147	2
	Total	8131	100
Nodal status (invasive cancers only)	Negative	5882	72
	Positive	1913	24
	Unknown	336	4
	Total	8131	100
NPI group (invasive cancers only)	EPG	2000	25
	GPG	2712	33
	MPG1	1778	22
	MPG2	752	9
	PPG	440	5
	Unknown	449	6
	Total	8131	100

9.5.1 Variation in 5-Year Relative Survival with Invasive Status

The following table shows that in the last three survival audits, 5-year relative survival for women with non-invasive breast cancer has exceeded 100%. Moreover, the lower limits of the 95% confidence intervals for the 5-year relative survival of women with non-invasive breast cancer are over 100%. This indicates that their chance of survival is no worse than that of the UK female population as a whole.

EFFECT OF INVASIVE CANCER STATUS ON 5-YEAR RELATIVE SURVIVAL			
	2000/01	2001/02	2002/03
Invasive	96.4 (95.7,97.0)	97.2 (96.6,97.8)	97.1 (96.5,97.7)
Micro-invasive	99.5 (95.6,103.5)	96.5 (90.5,102.4)	101.1 (97.8,104.3)
Non-invasive	100.5 (99.7,101.4)	101.3 (100.5,102.1)	101.5 (100.8,102.2)

9.5.2 Variation in 5-Year Relative Survival of Invasive Cancers with Age Group

Table 142 and Figure 78 show the variation with age at diagnosis in the 5-year relative survival rates for women diagnosed with primary invasive breast cancer. There is no statistically significant difference in the relative survival rates for women in the different age bands.

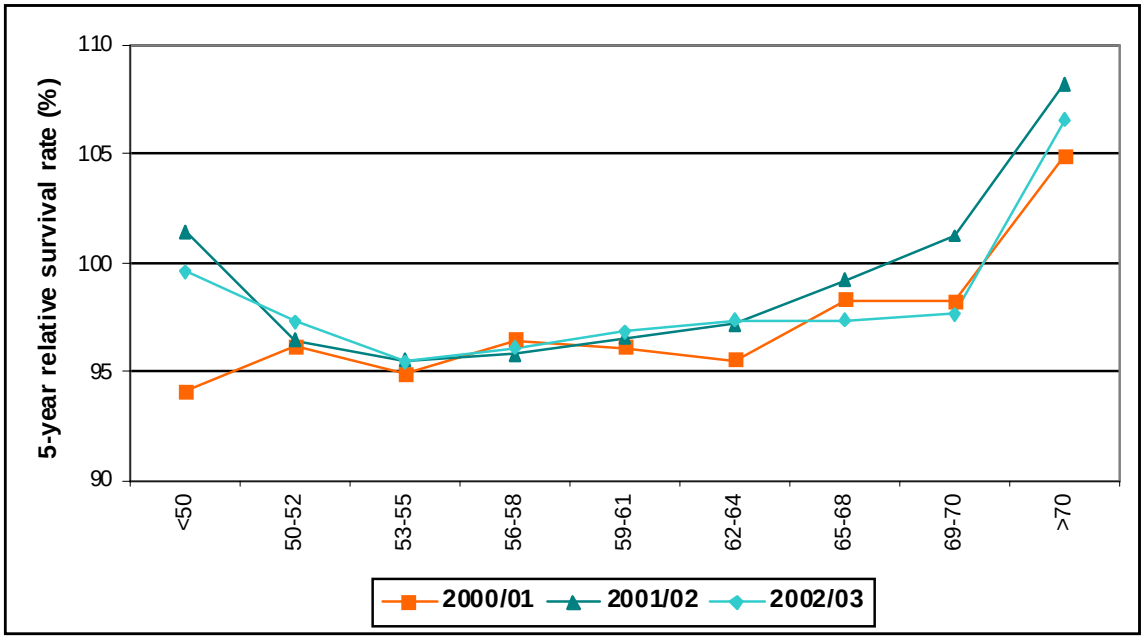

Figure 78 (Table 142): Variation in 5-year relative survival with age for women with screen-detected invasive breast cancer

The comparatively high 5-year relative survival of women aged 65 and over, is similar to that seen in previous audits for invasive cancers diagnosed via screening and may be due to a number of factors. Firstly, it is possible that routine follow-up appointments result in the earlier identification of other health problems in women diagnosed with early stage breast cancer than in women of the same age in the general population. Secondly, women over 65 years of age who self-refer for breast screening may be from a more affluent socio-economic group and therefore have better overall health than the general population as a whole. There is some evidence to support this hypothesis from screening history data available in the West Midlands which show that 56% of women aged 65 and over diagnosed with screen-detected breast cancer are in the two most affluent Townsend bands. These explanations could be tested using socio-economic status adjusted life tables and this will form part of an independent research project.

9.5.3 Variation in 5-Year Relative Survival of Invasive Cancers with Tumour Size, Grade and Nodal Status

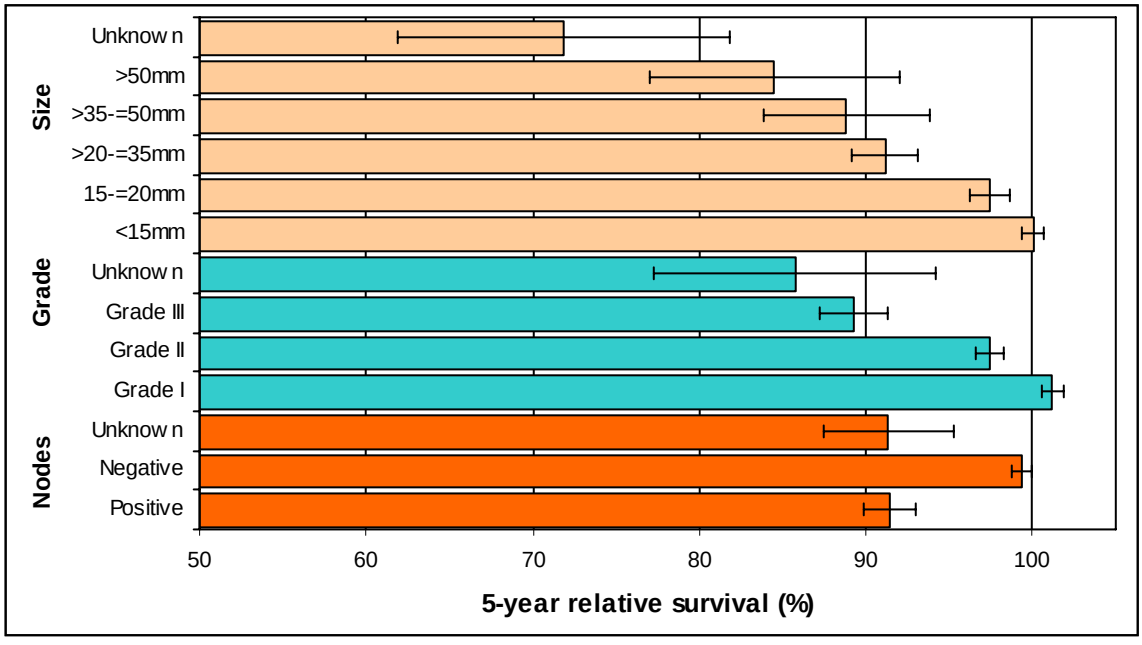

Figure 79 (Tables 143, 144 & 145): Variation in 5-year relative survival with nodal status, grade and size for women with screen-detected invasive breast cancer

Figure 79 shows how 5-year relative survival rates for women diagnosed with invasive breast cancers in 2002/03 varied with tumour size, grade and nodal status. The 5-year relative survival of women with less than 15mm diameter cancers was 100% (95% CI 99.4%-100.7%) compared with a 5-year relative survival rate of 84.5% (95% CI 77.1%-92.0%) for women with tumours with a diameter greater than 50mm. At 101.2% (95% CI 100.5%-101.9%), the 5-year relative survival rate was also significantly higher for women with Grade I cancers (33% of the cohort) compared with women with Grade III cancers (16% of the cohort) whose 5-year relative survival was 89.3% (95% CI 87.2%-91.3%). Finally, at 99.3% (95% CI 98.7%-99.9%), the 5-year relative survival for women with node negative cancers (72% of the cohort) was higher than for the women with node positive cancers (24% of the cohort) whose 5-year relative survival was 91.5% (95% CI 89.9%-93.0%).

9.5.4 Variation in 5-Year Relative Survival of Invasive Cancers with NPI Group

The Nottingham Prognostic Index (NPI) is a combined score derived from the invasive size, grade and nodal status of an invasive cancer. Figure 80 shows how 5-year relative survival rates for women diagnosed with invasive breast cancers in 2002/03 varied with NPI score at diagnosis. The 5-year relative survival rates for women with cancers in the excellent prognostic group (EPG) and good prognostic group (GPG) were 101.8% (95% CI 101.1%-102.5%) and 100% (95% CI 99.2%-100.9%) respectively. There has been no significant change in the 5-year relative survival rate in these two prognostic groups in the 3-year period from 2000/01 to 2002/03.

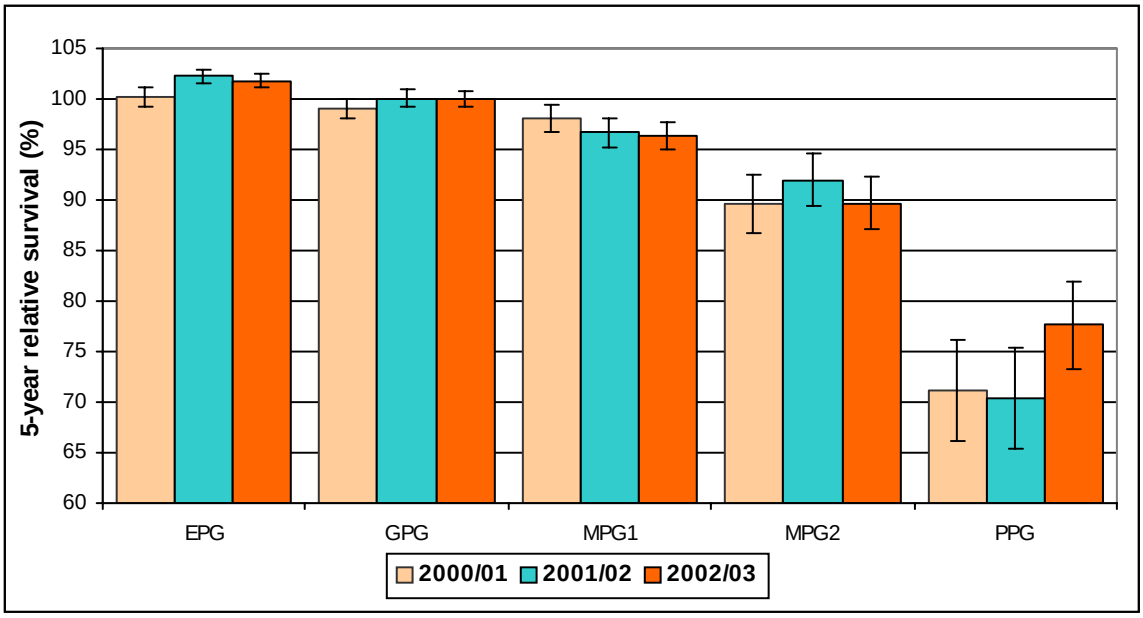

Figure 80 (Table 146): Variation in 5-year relative survival with NPI group for women with screen-detected invasive breast cancer in 2000/01, 2001/02 and 2002/03

At 96.4% (95% CI 95.1%-97.7%), the 5-year relative survival rate for the 22% of women with cancers in the moderate prognostic group 1 (MPG1) was significantly worse than that of women with cancers in the EPG and GPG groups. The 5-year relative survival rates for women with the 9% of cancers in the moderate prognostic group 2 (MPG2) and the 5% of women with cancers in the poor prognostic group (PPG) were even lower at 89.7% (95% CI 87.0%-92.3%) and 77.7% (95% CI 73.3%-82.0%) respectively.

COMMENTS:

- Of the 10,680 cancers submitted to the survival analysis for the period 1 April 2002 to 31 March 2003, 208 (2%) were excluded because they were not registered at the cancer registries. A further 181 cancers (2%) were excluded because they were not confirmed to be primary tumours and 39 because their invasive status was not known.
- 5-year relative survival for women with invasive cancers diagnosed in 2002/03 was 97.1% (95% CI 96.5%-97.7%). This varied from 92.5% in Northern Ireland to 98.5% in South East Coast. However, there is no significant difference between the 5-year relative survival rates in each region.

COMMENTS:

- 5-year relative survival for women with screen-detected invasive breast cancer has improved significantly from 95.4% in 1996/97 to 97.1% in 2002/03.
- The 5-year relative survival of women with less than 15mm diameter cancers was 100% (95% CI 99.4%-100.7%) compared with a 5-year relative survival rate of 84.5% (95% CI 77.1%-92.0%) for women with tumours with a diameter greater than 50mm.
- At 101.2% (95% CI 100.5%-101.9%), the 5-year relative survival rate was significantly higher for women with Grade I cancers (33% of the cohort) compared with women with Grade III cancers (16% of the cohort) whose 5-year relative survival was 89.3% (95% CI 87.2%-91.3%).
- At 99.3% (95% CI 98.7%-99.9%), the 5-year relative survival for women with node negative cancers (72% of the cohort) was higher than for the women with node positive cancers (24% of the cohort) whose 5-year relative survival was 91.5% (95% CI 89.9%-93.0%).
- The 5-year relative survival rates in 2002/03 for women with cancers in the excellent prognostic group (EPG) and good prognostic group (GPG) were 101.8% (95% CI 101.1%-102.5%) and 100% (95% CI 99.2%-100.9%) respectively.
- At 96.4% (95% CI 95.1%-97.7%), the 5-year relative survival rate for the 22% of women with cancers in the moderate prognostic group 1 (MPG1) was significantly worse than that of women with cancers in the EPG and GPG groups.
- The 5-year relative survival rates for women with the 9% of cancers in the moderate prognostic group 2 (MPG2) and the 5% of women with cancers in the poor prognostic group (PPG) were even lower at 89.7% (95% CI 87.0%-92.3%) and 77.7% (95% CI 73.3%-82.0%) respectively.

APPENDIX A: TIMETABLE OF EVENTS

ABS AT BASO AUDIT OF SCREEN-DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING 1ST APRIL 2008 - 31ST MARCH 2009

AUDIT TIMETABLE	
Date	**Event**
18th Mar 09	Audit group meet to plan the 2008/09 audit.
31st July 09	Draft timetable emailed to Audit Group, QA Reference Centres (QARCs) and Cancer Registries for comments. Email QA Reference Centres regarding the plan to run adjuvant and survival crystal reports.
3rd – 7th July	QA Co-ordinators discuss draft timetable with their QA Surgeon, QA Director and QA Data Managers. Return comments to the West Midlands Cancer Intelligence Unit (WMCIU) by 10th August.
17th August 09	Audit documents sent to QA Surgeons, QA Directors and QA Co-ordinators. QA Co-ordinators liaise with lead surgeons, data managers and screening office managers on methods used to collect data. Survival and adjuvant audit data collection can begin immediately. Main audit data can be collected as soon as the screening office computer system is ready to provide a KC62 return for 2008/09.
1st Sept 09	Suggested deadline for QARCs to request survival audit data from Cancer Registries.
18th Sept 09	Suggested deadline for Cancer Registries to provide data to the QARCs for the survival audit.
16th Oct 09	**Deadline for receipt of survival data from QARCs at the WMCIU.**
19th – 23rd Oct 09	All QARCs to ensure that an appropriate member of staff is available to respond to any queries from the WMCIU regarding the survival audit.
13th Nov 09	Suggested deadline for main and adjuvant audit data to be provided to QARCs with the signature of the lead breast surgeon to confirm that the data are correct. *An earlier deadline may be set by the QARC due to local issues, eg. QA Team requirements.*
5th Nov 09	QA director meeting in London (to provide follow up report from 2007/08)
16th Nov 09– 6th Jan 10	QARCs validate audit data and collate into the main and adjuvant spreadsheets provided. QARCs ensure that all cases are coded correctly, that all internal data checks are resolved and that there are no anomalies in the data.
6th Jan 2010	**Deadline for receipt of main and adjuvant audit data from QARCs at the WMCIU.**
7th – 15th Jan 10	All QARCs to ensure that an appropriate member of staff is available to respond to queries from the WMCIU. The WMCIU liaises with QARCs to ensure data are complete, correct and surgically confirmed. It will not be possible to incorporate new or late data after this stage.
24th Feb 10	Audit booklet tables (first draft) emailed QA Reference Centres for information. *All draft data should be marked "Not for circulation" to avoid unpublished data getting into the public domain.*
12th Mar 10	Second draft audit booklet emailed to Audit group for comments
9th April 10	Deadline for receipt of the audit booklet at the printers.
19th May 10	**Audit booklet distributed**
19th – 20th May 10	2010 ABS at BASO conference (York Racecourse)
20th May 10	Wash-up meeting (York Racecourse)

APPENDIX B: BREAST AUDIT QUESTIONNAIRE WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO AUDIT OF WOMEN WITH SCREEN-DETECTED BREAST CANCERS DETECTED FOLLOWING INVITATION BETWEEN 1 APRIL 2008 AND 31 MARCH 2009

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN-DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1 APRIL 2008 - 31 MARCH 2009 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT AT 1 APRIL 2009

This document accompanies the MS Excel spreadsheet designed to record NHSBSP & ABS at BASO breast screening audit main surgical data and screening surgical caseload data which has been prepared by the West Midlands Cancer Intelligence Unit (WMCIU).

It is the responsibility of the QA co-ordinator to organise data collection at unit level, on paper and/or using copies of the spreadsheet. Regional data should be sent to WMCIU in electric format using the spreadsheet containing the check programme. Although there is an explanation column for special cases that contain errors in this spreadsheet, it is only for regional recording use and the WMCIU does not need to know details of individual cases. However, we would ask for an indication that those cases were being checked. **All data sent to WMCIU should be password protected and sent via nhs.net email accounts.**

Named breast screening unit data will be available in Excel format on the NBSS website. The 20 smallest screening units according to the number of women screened will be highlighted.

Each surgeon should be identified by their GMC code in order to audit screening caseload accurately. The unique identifying number known as the "Sx" number is required for data validation and matching purposes.

The deadline for submission of regional data by the regional QA co-ordinator to the WMCIU is 6 January 2010

****

UNIT:

REGION:

****

SURGICAL CONFIRMATION

I confirm that these data are an accurate record for the above unit

Signed (Lead Surgeon):

Print name:

Date:

DEFINITIONS AND GUIDANCE NOTES

Bilateral and multiple cancers*:* The KC62 report only counts one cancer per woman. Cancers included in the NHSBSP & ABS at BASO breast audit should be counted in the same way so that the total number of cancers in the breast screening audit equals the total number of cancers counted on the KC62 report for 2008/09. If bilateral or multiple cancers have been detected, the KC62 software selects the worst prognosis cancer. The same rules should be applied for the audit. All data for bilateral cases should be taken from the cancer included in the KC62.

Diagnosis on radiological and/or clinical grounds only: Cancers diagnosed with neither C5 nor B5 nor malignant diagnostic open biopsy should not be included in the audit. Enter the total number of such cancers in the preliminary data table.

Non-operative diagnosis for cancers: NHSBSP policy defines non-operative diagnosis as diagnosis by C5 cytology and/or B5 core biopsy only. These cancers appear in KC62 C18 L24.

Malignant diagnostic open biopsies: Cancers diagnosed by neither C5 nor B5 will have had a diagnostic open biopsy with an outcome of cancer. These cancers appear in KC62 C24 L24, which includes some cancers with operations which were both diagnostic and therapeutic. If the diagnostic open biopsy was treatment, and was the only operation, then the total number of therapeutic operations is zero.

Cytology and Core biopsy: Codes used on the NHSBSP pathology reporting forms.
If cytology was carried out please indicate the highest (worst) cytology result in the "worst cytology". If no cytology was carried out enter NONE. If core biopsy was carried out please indicate the highest (worst) core biopsy result in the "worst core biopsy" column. If no core biopsy was carried out enter NONE. If a B5 result was obtained but the malignancy type (B5a or B5b) is unknown or not assessable enter B5c in the "worst core biopsy" column. The number of visits to an assessment clinic (excluding results clinics) in order to undergo core biopsy or cytology procedures should be recorded.

Invasive status:
Invasive status of the surgical specimen*:* the worst invasive status diagnosed at surgery/surgeries.
Final invasive status*:* this takes into account the non-operative diagnosis and the final decision of the MDT (in some cases).

For example:
A case with B5b (Invasive) non-operative diagnosis but with a non-invasive surgical specimen diagnosis will have 'N' in the invasive status of the surgical specimen column and 'I' in the final invasive status column.

A case with the invasive component taken out at mammotome and with a benign surgical specimen diagnosis will have 'B' in the invasive status of the surgical specimen column and 'I' (if MDT agree) in the final invasive status column.

Note that a cancer with no surgery has the final invasive status taken from the core biopsy (B5a non-invasive, B5b invasive) and the invasive status of the surgical specimen would be 'U'.

Invasive status coding rules:

B5b diagnosis but non-invasive at surgery

Final invasive status:	invasive
Invasive size:	unknown
Whole size:	non-invasive size at surgery
Invasive grade:	core biopsy invasive grade

B5b diagnosis but micro-invasive at surgery
Final invasive status: invasive
Invasive size: unknown
Whole size: non-invasive and micro-invasive size at surgery
Inv grade: core biopsy invasive grade

B5 (a or b or c) diagnosis but benign surgery
If the case is proven to be a cancer case (i.e. not false positive)
Final invasive status: according to the core biopsy result.
All sizes: unknown
Grade: core biopsy grade

No surgery or unknown surgery
All sizes: unknown
Grade: unknown
(because we do not need the info for this audit)

Lobular in situ neoplasia (LISN): All women with non-invasive cancer, including those with LISN, should be included in Part C of the audit. It is accepted that for LISN the grade and size are not assessable.

Micro-invasive cancer: Non-invasive cancer with possible micro-invasion should be included in Part A and Part C of the audit. Cancers which are definitely micro-invasive should only appear in Part A.

Screening surgical caseload: To each cancer in Part A assign the GMC code of the consultant surgeon. Women with no GMC code assigned (e.g. because the woman refused treatment) should be recorded as having no surgical referral in the surgical caseload audit. If the woman was under the care of more than one consultant surgeon for her diagnostic and therapeutic surgery, enter GMC codes for each of the surgeons in Part A (separated by semicolons) and count the woman in the caseload for each surgeon in the surgical caseload audit. By assigning a GMC code to each cancer in Part A each consultant surgeon can be credited with their total UK NHSBSP screening caseload.

Reasons for low caseload: An explanation is required for surgeons who have screening caseload <10 in 2008/09. Explanations given at unit level may become redundant when caseloads are collated at regional and then at national level.

First surgery date: The first surgery date given should be the first overall, whether this surgery was diagnostic or therapeutic.

Reconstruction surgery: Surgery which is only for the purpose of reconstruction should be excluded when calculating the date of final surgery. For women undergoing mastectomy, the surgeon should indicate whether there was immediate reconstruction.

Surgery for benign conditions: Surgery for benign conditions should be excluded when calculating the total number of therapeutic operations.

Type of operation/treatment: An operation is a visit to theatre, at which one or more procedures are intended to be carried out. For this audit, code each diagnostic or therapeutic operation to the primary tumour (up to a maximum of 5) according to whether conservation surgery or mastectomy was carried out, with or without an axillary procedure. Exclude reconstruction alone. Conservation surgery can be wide local excision, repeat excision, localisation biopsy etc. If a case had only 2 operations, code the 3rd, 4th and 5th operation as no surgery (NS).

Diagnostic and therapeutic operations: The number of operations will be calculated by the WMCIU. A woman with screen-detected breast cancer who did not have a non-operative diagnosis (C5 or B5) must have had a diagnostic open biopsy to be included in this audit. All other operations (including axillary procedures), are considered to be therapeutic for this audit. If the diagnostic open biopsy was treatment, and was the only operation, then the total number of therapeutic operations is zero.

Nodal Status: Nodal status refers to **axillary lymph nodes only.** The number of nodes obtained at each operation (visit to theatre) and the number of nodes which are found to be positive is requested. The number of nodes obtained will be 0 in many cases. In instances where an axillary procedure has been undertaken but no nodes obtained, the number of nodes obtained should be recorded as zero. It is recommended that these cases are reviewed by the QARC and the classification confirmed with the responsible surgeon. Incidental nodes may be obtained at operations where no axillary procedure is recorded. These should be recorded in the nodal columns but all such anomalies should be checked before submission. If a case had only 2 operations, code the nodal columns for the 3rd, 4th and 5th operation as no surgery (NS).

Sentinel Lymph nodes:
You are required to input the specific type of sentinel node biopsy procedure for each case. This information is included in the main crystal report. You should only record the type of procedure for the first axillary operation.

Example 1: A patient had C at the 1st operation, then C+AX at the 2nd operation. Her first axillary operation is a sentinel biopsy with blue dye only. For this case, the sentinel procedure type should be 'SD'

Example 2: A patient had C+AX at the 1st operation, then M+AX at the 2nd operation. Her first axillary operation is a sentinel biopsy with isotope only and 2nd axillary is a level 1 clearance. For this case, the Sentinel procedure type should be 'SI'.

Sentinel procedure type *(SD,SI,SX,SB,AY,O,NL,U):*
SD=Sentinel biopsy with blue dye
SI=Sentinel biopsy with radioisotope
SX=Sentinel biopsy with blue dye and isotope
SB=Unknown type of sentinel biopsy
AY=4 node sampling with blue dye,
O=Other axillary procedures
NL= No axillary treatment
U=No info about axillary assessment

Margins: Excision distance field is the closest margin in mm. If the margin is reached and no distance is given on the pathology report, input 0 in the margin distance field.

For cases where the margin is not clear in the final operation the cases should be checked by examining the pathology report. If the closest margin is not the radial margin, the data on NBSS should be updated to ‘not involved’. If the closest margin is the radial margin and it is involved, an explanation for why a further operation to clear margins was not undertaken should be provided in the comments column. This process may result in the identification of additional operations that have been undertaken to clear involved radial margins. In which case, the additional operation should be added to the table in Part A.

Axillary Ultrasound: To determine if ultrasound was used to assess the axilla. The data should be inputted in the spreadsheet as N=Normal, A=Abnormal, NP=Not performed and U=Unknown.

Pre-operative lymph node biopsy: To determine if a biopsy was performed on suspicious nodes at assessment. The worst lymph node biopsy result at assessment should be recorded as

C1,C2,C3,C4,C5,B1,B2,B3,B4.B5A,B5B,B5U, NP=not performed, U=unknown. For cases with a C5 and B5 result, the core biopsy result should be recorded because it is the most accurate result.

Neo-adjuvant Treatment: Neo-adjuvant chemotherapy, neo-adjuvant herceptin and neo-adjuvant hormone therapy should be recorded as yes, no or unknown. If neo-adjuvant treatment is regularly recorded on NBSS then assume all cases with no neo-adjuvant information recorded is no.

Hormone receptor status: ER, PgR and HER2 status is now recorded in the main audit. ER and PgR status should be recorded as P=positive, N=negative and U=unknown. Her2 status should be recorded as P=positive, N=negative, B=Borderline and U=Unknown. These data should come from surgery specimen information. If the patient has no surgery or the results are not recorded under surgery then the WBN results may be used. For patients with bilateral cancers then the result from the worst prognosis cancer is used.

DATA CHECKS

The Regional QA co-ordinator should work with screening office managers on data quality issues. A number of data checks have been incorporated into the spreadsheet. Please consult the user guide for the data check programme. References to the KC62 Table T column and line numbers are given for information.

Case Check The total number of cancers should equal KC62 C25 L36 and be equal to the number of invasive cancers (KC62 C35 L36) plus the number of micro-invasive cancers (KC62 C28 L36) plus the number of non-invasive cancers (KC62 C27 L36) plus the number of cancers with invasive status unknown (KC62 C26 L36).

Caseload Check In the screening surgical caseload audit, the total number of cancers should equal the total caseload plus the total number of women with no surgical referral minus the total number of women treated by two surgeons. This formula is different if any woman is treated by more than 2 surgeons.

The regional QA co-ordinator must ensure that all records are cleared of errors, except special cases with explanations.

Queries
Any queries about the NHSBSP and ABS at BASO breast screening audit should be directed to:

Ms Shan Cheung
Breast Screening QA Senior Information Analyst
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham
B15 2TT

Tel: 0121 415 8189
Fax: 0121 414 7714

shan.cheung@wmciu.nhs.uk
shan.cheung@nhs.net

NHSBSP & ABS AT BASO BREAST SCREENING AUDIT 2008/09

PRELIMINARY DATA SHEET

Unit Name	Number of women screened (KC62 C3 L12)	Number of women with radiological/clinical diagnosis only (KC62 C13 L24)	Number benign diagnostic open biopsies (KC62 C22 L24 + KC62 C23 L24)	Unit participating in any sentinel procedure trial? (Y/N)	Number of cytology false positive cases (CQA report)	Number of core biopsy false positive cases (BQA report)

PART A1: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

Col. G - GMC Code (enter GMC code of the consultant surgeon or NoRef=No consultant surgeon). If the woman was treated by more than one consultant surgeon enter all GMC codes, separated by **semicolons**. Cases with no surgery (NS) still usually are assigned to a consultant surgeon.
Dates - Enter dates in dd/mm/yyyy format. EC=Early Recall. U=Unknown
Col. O - Number of visit refers to FNA Date and Core Date in the crystal report. If biopsy/cyt performed on the same date, count as 1 visit.
Col. Q – Worst lymph node biopsy result takes into account the cytology and core biopsy results. If a patient has a C5 and B5 the record the core biopsy result.

{C} **Sx Number**	*{G}* **Consultant surgeon GMC Code** *(No shared cases) (Code, NoRef)*	*{H}* **Date of birth** *(dd/mm /yyyy)*	*{I}* **Date of first offered appt** *(dd/mm/yyyy)*	*{J}* **Screen date** *(dd/mm/yyyy, EC,U)*	*{K}* **First assessment date** *(dd/mm/yyyy, U)*	*{L}* **Side (left or right)** *(L,R)*	*{M}* **Worst cytology**	*{N}* **Worst core biopsy**	*{O}* **Number of visits for cytology/ core biopsy** *(exclude results clinic) (U,0,1,2,.)*	*{P}* **Axillary Ultra-sound** *(N,A, NP,U)*	*{Q}* **Worst lymph node biopsy result at assessment** *(C1,C2,C3,C4,C5 B1,B2,B3,B4, B5a,B5b,B5c, NP,U) (see above)*	*{R}* **Neo-adjuvant chemo therapy** *(Y,N,U)*	*{S}* **Neo-adjuvant herceptin** *(Y,N,U)*	*{T}* **Neo-adjuvant hormone therapy** *(Y,N,U)*

Col. U - Type of treatment refer to the final concluded treatment type of all treatment involved (C=Conservation surgery, M=Mastectomy, NS=No surgery, U=Unknown)
Col. V - Immediate Reconstruction - to be completed by the surgeon for mastectomies only. Enter X if type of treatment not M.
Col. W - Invasive status of the surgical specimen refers to the worst invasive status at surgery/surgeries. I = invasive, M = micro-invasive, N = non-invasive, B = benign histology, U = unknown/no information/no surgery.
Col. X - Invasive status of the cancer; taking into account the non-operative diagnosis, surgery and MDT decisions.

{U} **Type of surgical Treatment** *(C,M,NS,U)*	*{V}* **Immediate reconstruction** *(only for M =Mastectomy) (Y,N,U,X)*	*-Invasive status- {W}* **Invasive status of the surgical specimen** *(I,M,N,B,U)*	*{X}* **Final Invasive status** *(I,M,N,U)*	*{Y}* **ER status** *(P,N,U)*	*{Z}* **PgR status** *(P,N,U)*	*{AA}* **HER2 status** *(P,N,U)*

PART A2: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

For each operation (visit to theatre) – intended surgery, ignoring reconstruction, enter the most appropriate from the following list (C=Conservation surgery, M=Mastectomy, AX=Axillary procedure, C+AX, M+AX, NS=No surgery, U=Unknown)
Conservation surgery can be wide local excision (WLE), repeat excision, localisation biopsy etc
(e.g. a diagnostic open biopsy on one day followed at a later date by a mastectomy where axillary surgery was done. It should be coded 1st=C, 2nd=M+AX, 3rd=NS, 4th=NS, 5th=NS)

{C} **Sx Number**	*{AB}* **First surgery date** *(diag or therapeutic)* *(dd/mm/yyyy,NS,U)*	*{AC}* **Final surgery date** *(excl reconstruction only)* *(dd/mm/yyyy,NS,U)*	*{AD}* **First operation type** *(diag or therapeutic)* *(C,M,AX, C+AX,M+AX, NS,U)*	*{AE}* **Second operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*{AF}* **Third operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*{AG}* **Fourth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*{AH}* **Fifth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*

PART A3: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

Coding: NS, U, 0,1,2,…The number of nodes obtained at each operation (visit to theatre) is requested. This will be 0 in many cases, even if an axillary procedure is recorded as part of the operation type. Incidental nodes may be obtained at operations where no axillary procedure is recorded. These should be recorded in the nodal columns but all such anomalies should be checked and flagged before the spreadsheet is submitted.
If a case had only 2 operations, code the nodal columns for the 3rd, 4th and 5th operation as no surgery (NS).

Sentinel procedure type *(SD,SI,SX,SB,AY,O,NL,U): SD=Sentinel biopsy with blue dye, SI=Sentinel biopsy with radioisotope, SX=Sentinel biopsy with blue dye and isotope, SB=Unknown type of sentinel biopsy, AY=4 node sampling with blue dye, O=Other axillary procedures, NL= No axillary treatment, U=No info about axillary assessment*

	1st operation (diagnostic or therapeutic)		**2nd operation**		**3rd operation**		**4th operation**		**5th operation**		*{AS}*
{C} **Sx Number**	*{AI}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*{AJ}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AK}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*{AL}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AM}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*{AN}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AO}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*{AP}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AQ}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*{AR}* **Number nodes positive** *(NS,U, 0,1,2,..)*	**Sentinel Procedure Type** *(SD,SI,SX,SB, AY,O,NL,U)*

PART A4: TO BE COMPLETED FOR ALL CANCERS (KC62 C25 L36)

Excision margins (N=Not to margin, R=Reaches radial margin, U=Uncertain/Not Specified, NS = No surgery)
Excision distance (enter distance to excision margin in millimeters, U=Unknown, NS = No surgery)

	1st operation (diagnostic or therapeutic)		**2nd operation**		**3rd operation**		**4th operation**		**5th operation**	
{C} **Sx Number**	*{AT}* **Excision margins** *(N,R,U,NS)*	*{AU}* **Excision distance** *(distance in mm, U,NS)*	*{AV}* **Excision margins** *(N,R,U,NS)*	*{AW}* **Excision distance** *(distance in mm, U,NS)*	*{AX}* **Excision margins** *(N,R,U,NS)*	*{AY}* **Excision distance** *(distance in mm, U,NS)*	*{AZ}* **Excision margins** *(N,R,U,NS)*	*{BA}* **Excision distance** *(distance in mm, U,NS)*	*{BB}* **Excision margins** *(N,R,U,NS)*	*{BC}* **Excision distance** *(distance in mm, U,NS)*

PART B: TO BE COMPLETED FOR <u>INVASIVE CANCERS ONLY</u> (KC62 C35 L36)

Col. BF - Invasive size of tumour (enter size in millimetres, U = Unknown)
Col. BG - Whole size of tumour (enter size in millimetres, U = Unknown). Whole tumour size includes any surrounding DCIS
Col. BH - Invasive grade – Bloom & Richardson (I, II, III, NA=Not assessable or U=Unknown. Enter X if not invasive)

{C} **Sx Number**	*{BF}* **Invasive size of tumour**	*{BG}* **Whole size of tumour** *(including surrounding DCIS)*	*{BH}* **Invasive grade** *(I,II,III, NA,U)*

PART C: TO BE COMPLETED FOR <u>NON-INVASIVE CANCERS ONLY</u> (KC62 C27 L36)

Col. BK – Cytonuclear Grade (H = High grade, I = Intermediate grade, L = Low grade, NA = Not assessable, U = Unknown)
Col. BL - Pathological size (enter size in millimetres, NA = Not assessable, U = Unknown)

{C} **Sx Number**	*-Non Invasive-* *{BK}* **Cytonuclear Grade** *(H,I,L,NA,U)*	*{BL}* **Pathological size** *(size (mm), NA,U)*

SCREENING SURGICAL CASELOAD AUDIT

Please fill in Part A first.

Screening surgical caseload should be calculated by summing the number of times each GMC code appears in Part A.
In rare cases where there is no surgeon, the GMC code for the case should be coded as “NoRef” in Part A, and counted on the top line.
Cases treated by more than one surgeon should be counted in each surgeon’s Shared Cases field. For example if Surgeon A & B shared 1 case, input ‘1’ in both fields of Surgeon A and B.

GMC Code	Screening caseload (from Part A)	Shared Cases	If caseload <10 was this because: (write Y in the first applicable reason)							
			Other breast caseload > 30 per year	Joined NHSBSP 2008/09	Left NHSBSP 2008/09	Surgeon is a plastic surgeon	Surgeon operated in private practice	Surgeon from other region	No information available for surgeon	Other reason (text)
NoRef										

APPENDIX C: ADJUVANT THERAPY AUDIT DATA FORM WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO ADJUVANT AUDIT FOR WOMEN WITH SCREEN-DETECTED BREAST CANCERS DETECTED BETWEEN 1 APRIL 2007 AND 31 MARCH 2008

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN-DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1 APRIL 2007 TO 31 MARCH 2008 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1 APRIL 2009

This document accompanies the MS Excel spreadsheet designed to record NHSBSP & ABS at BASO breast audit adjuvant therapy data which has been prepared by the West Midlands Cancer Intelligence Unit (WMCIU). The spreadsheet contains data validation checks.

The ABS at BASO Screening Audit Group expects each consultant surgeon to collect adjuvant therapy data for the list of cases supplied by the screening office or regional QA reference centre. The QA Co-ordinator will organise collation of these data. A box is provided for the signature of the surgeons to verify that these data are correct.

Data will be presented by region and breast screening unit. The unique identifying number known as the "Sx" number is required for data validation and matching purposes. **Names and other identifiable data should not be sent by the QA Co-ordinator to the WMCIU**.

The deadline for submission of regional data by the regional QA Co-ordinator to the WMCIU is 6 January 2010

DEFINITIONS AND GUIDANCE NOTES

Audit cut-off date: If a woman has not received radiotherapy or chemotherapy or hormonal therapy before 31st March 2009 then it should be assumed for the purposes of this audit that she has not had this treatment. This cut off date allows at least 1 year follow up for all cases.

Bilateral and multiple cancers*:* The KC62 report only counts one cancer per woman. Cancers included in the NHSBSP & ABS at BASO breast screening audit should be counted in the same way so that the number of cancers in the audit equals the number counted on the KC62 report. If bilateral or multiple cancers have been detected, the KC62 selects the worst prognosis cancer. If a non-invasive and an invasive tumour have been detected, the KC62 report counts the invasive tumour only. The same rules should be applied for the audit.

Diagnosis on radiological and/or clinical grounds only: Cancers diagnosed with neither C5 nor B5 nor malignant diagnostic open biopsy should not be included in the audit.

First surgery date: The first surgery date given should be for the first operation, whether this surgery was diagnostic or therapeutic.

Reconstruction surgery: Surgery which is only for the purpose of reconstruction should be excluded when calculating the date of final surgery.

Surgery for benign conditions: Surgery for benign conditions should be excluded when calculating the dates of first and final surgery.

MATCHING TO TUMOUR DATA

The 2007/08 screen-detected cancers in each region need to be downloaded using the adjuvant audit crystal reports. The downloaded data should be matched with the main data submitted to the WMCIU last year to check for any extra cases. If there are any extra cases, the main data for these cases should be provided so that the WMCIU can conduct a complete analysis on all the adjuvant cases provided.

Your spreadsheet should include all cases for which the date of first offered appointment is from 1 April 2007 to 31 March 2008. Cases with no data supplied should have 'NDS' on any column of the cases.

The WMCIU should be advised of any changes in the region or unit code assigned to each screening unit's cases.

DATA CHECKS

The following checks are included in the Excel spreadsheet

Checks 1-3 (Assessment to surgery)	If the number of days from assessment to first surgery, assessment to final surgery or first to final surgery cannot be calculated, #VALUE! will appear. For cases with only one surgery, first to final surgery (so first surgery equals final surgery) should display 0. All cases where the number of days is negative should be checked.
Check 4 (Assessment to radiotherapy)	If the number of days from assessment to radiotherapy cannot be calculated, #VALUE! will appear. If the number of days is negative, the date of radiotherapy has been entered as before the date of assessment. All such cases should be checked to confirm that the patient received radiotherapy for a previous cancer.
Data check summary	Minimum, maximum, averages and quartiles of the number of days in each data check are provided in the spreadsheet.

Queries

Any queries about the adjuvant audit should be directed to:

Ms Shan Cheung
Breast Screening QA Senior Information Analyst
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham
B15 2TT

Tel: 0121 415 8189
Fax: 0121 414 7714

shan.cheung@wmciu.nhs.uk
shan.cheung@nhs.net

NHSBSP & ABS at BASO ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1 APRIL 2007 TO 31 MARCH 2008 INCLUSIVE

UNIT:

Enter dates in dd/mm/yyyy format (e.g. 28/04/2007)

{D} **Sx Number**	*{E}* **Date of First Offered Appointment** (dd/mm/yyyy)	*{F}* **First Assessment Date** (dd/mm/yyyy,U)	*{G}* **First Surgery Date** *(diagnostic or therapeutic)* (dd/mm/yyyy,NS,U)	*{H}* **Final Surgery Date** *(excl reconstruction only)* (dd/mm/yyyy,NS,U)	*{I}* **Date of Birth** (dd/mm/yyyy)	*{J}* **Consultant Surgeon**

ADJUVANT THERAPY AUDIT - TO BE COMPLETED FOR ALL CANCERS WITH DATE OF FIRST OFFERED APPOINTMENT FROM 1 APRIL 2007 TO 31 MARCH 2008 INCLUSIVE

Enter dates in dd/mm/yyyy format (e.g. 01/04/2007) or U=Unknown, NS=No surgery, NRT=No radiotherapy,
Chemotherapy. Hormonal therapy: Y = therapy given before 31/03/09, N = No therapy given before 31/03/09, U=Unknown
ER Status, PgR Status, Cerb-B2/HER-2 (P = Positive, N = Negative, U = Unknown) to be completed according to local definitions.
(Cerb-B2/Her-2+ if immunohistochemistry 3+ or FISH +)
Previous cancer? : Y if the patient has a previous cancer affecting adjuvant treatment decisions (eg. already on CT for another cancer)

	To aid data collection by the consultant surgeon. Do not send to WMCIU			*See above for coding – to be completed according to local definitions*						
{D} **Sx Number**	*{K}* **Name**	*{L}* **NHS Number**	*{M}* **Hospital Number**	*{N}* **RT Start Date** (dd/mm/yyyy, NRT,U)	*{O}* **CT** (Y,N,U)	*{P}* **HT (eg. Tamoxifen)** (Y,N,U)	*{Q}* **ER Status** *(P,N,U)*	*{R}* **PgR Status** *(P,N,U)*	*{S}* **Cerb-B2/ HER-2** *(P,N,U)*	*{T}* **Previous Cancer?** *(Y)*

I confirm the data above are correct and as complete as possible

Signature (Surgeon):
Print Name:
Date:

APPENDIX D: SURVIVAL AUDIT DATA COLLECTION SHEET WITH GUIDANCE NOTES

NHSBSP & ABS AT BASO SURVIVAL AUDIT FOR WOMEN WITH SCREEN-DETECTED BREAST CANCERS DETECTED BETWEEN 1 APRIL 2002 AND 31 MARCH 2003

The completed spreadsheets should be submitted by the Breast Screening QA Reference Centre to the WMCIU by 16 October 2009.

Aim:

To combine NHS Breast Screening Programme (NHSBSP) data for women with breast cancers detected by screening between 1 April 2002 and 31 March 2003 with data recorded by regional cancer registries to enable analysis of breast cancer survival for a period of up to 5 years post-diagnosis. Where tumour size, grade and nodal status are available the survival profiles according to prognostic characteristics will be examined. The audit will continue to demonstrate effective information exchange between the NHSBSP and regional cancer registries.

Study population:

All women with breast cancers screened by the NHSBSP between 1 April 2002 and 31 March 2003 should be included in the audit.

Core patient and tumour data should be extracted from screening service computer systems and matched with records held by regional cancer registries. Cancer registries should indicate if the cancers are not recorded in the cancer registry database (see additional guidance attached). Cancer registries should also identify deaths in these women and confirm that death data are complete to 31 December 2008. If the latter is not the case, an alternative date to which survival can be calculated should be provided.

Data collection:

A MS Excel spreadsheet to record survival audit data has been designed by the West Midlands Cancer Intelligence Unit and provided to each breast screening quality assurance reference centre. QA reference centres should liaise with cancer registries to complete the audit spreadsheets:

A paper representation of the format used in the spreadsheets is provided and may be used as the basis for a data collection form. Crystal reports designed by Mrs Margot Wheaton may be used to collect data from screening offices that use the NBSS computer system.

Overall responsibility for regional data collection remains with the QA Co-ordinator.

DATA TO BE COLLECTED FROM SCREENING SERVICES AND COLLATED BY BREAST SCREENING QUALITY ASSURANCE REFERENCE CENTRES

For cancers detected by screening between 1 April 2002 and 31 March 2003, the following data should be extracted from breast screening computer systems:

• Forename	for use within region only
• Surname	for use within region only
• Address	for use within region only
• Postcode	for use within region only
• NHS number	New NHS number
• Date of birth	(dd/mm/yyyy) necessary for age calculations
• Sx No. (Screening Office Number)	for checking data and matching queries
• Date of first surgery	(dd/mm/yyyy, NS, U) a proxy for date of diagnosis, to help match cases at the cancer registry and to identify possible recurrences and/or multiple primary breast cancers
• Invasive status	Invasive/Micro-invasive/Non-invasive/Unknown
For invasive cancers only (enter X if the case is not invasive):	
• Tumour size	invasive size in mm, 'U' for unknown
• Tumour grade	Bloom & Richardson I, II, III, NA or 'U' for unknown
• Total number of lymph nodes	total number, 0 if no nodes obtained, 'U' if unknown
• Number of positive lymph nodes	total number, 0 if node negative, 'U' if unknown

DO NOT send these details to WMCIU

The region, breast screening unit and cancer registry should be added to each case.

DATA TO BE COLLECTED FROM REGIONAL CANCER REGISTRIES

Regional cancer registries will be asked by the QA reference centers to match breast cancers detected following screening between 1 April 2002 and 31 March 2003 with data held on the cancer registration systems using name, NHS number, address, postcode, date of birth, and date of first surgery (as a proxy for date of diagnosis).

Cancer registries have been asked to supply the earliest date of diagnosis for any invasive breast cancer diagnosed for the screening patient in the date of diagnosis column. If the screening case is non-invasive or micro-invasive and no other invasive cancer has been diagnosed before 2002, then the date of diagnosis of this non-invasive/micro-invasive screening case will be recorded.

All cases thought to be 'alive' should be submitted by cancer registries to the National Strategic Tracing Service (NSTS) (or the new Demographics Batch Service (DBS) as appropriate) to obtain any date of death not recorded at the cancer registry.

The following data items are required from the cancer registry for all breast cancers detected following screening between 1 April 2002 and 31 March 2003.

• Registration number	the unique registration number for the breast cancer should be added.
• Not registered	For tumours not registered indicate NR in the appropriate column. Please note that this field refers to tumours, not patients
• Date of diagnosis	dd/mm/yyyy of the specific tumour (U if unknown)
• Date of death	dd/mm/yyyy of the patient (leave blank if no death)

The census date for the survival audit has been set at **31 December 2008**. The cancer registry should confirm to the QA reference centre that death data are complete to **31 December 2008**, or provide an alternative date to which survival time can be calculated.

DATA VALIDATION

A number of data checks have been incorporated into the spreadsheet.

Check 1 (Age at Diagnosis)	If the age at diagnosis cannot be calculated, #VALUE! will appear. If the age at diagnosis is negative, the date of diagnosis has been entered as before the date of birth. All such cases should be checked.
Check 2 (Dates)	All the date columns (Date of Birth, Date of first surgery, Date of diagnosis and Date of death, as the order of flags) should be input in a date format, which is dd/mm/yyyy. In some QA reference centres and cancer registries, dates are downloaded from other databases and the dates are in a text format, although it looks like a date format. This check reveals this format difference which human eye cannot see. If the input is wrong or in a wrong format, the check result will show 'Check'.
Check 3 (Nodes)	If the total number of nodes and/or the number of positive nodes are wrong or not in numerical format, the check will flag up as 'Wrong data type'. This also checks if the total number of nodes is less than the number of positive nodes.
Check 4 (Invasive size)	If the invasive size is wrong or not in numerical format, the check will flag up as 'Size-Wrong data type'
Check 5 (Invasive Status)	If invasive status is blank or wrong codes are used, this check will flag up as 'Enter invasive status'

QUERIES

Any queries about the survival audit should be directed to:

Ms Shan Cheung
Breast Screening QA Senior Information Analyst
West Midlands Cancer Intelligence Unit
Public Health Building
The University of Birmingham
Birmingham
B15 2TT

Tel: 0121 415 8189
Fax: 0121 414 7714
shan.cheung@wmciu.nhs.uk

SURVIVAL AUDIT: SCREENING OFFICE DATA FOR CASES DETECTED IN 2002/03

Region:
Screening Unit:
Cancer Registry:

Date of first surgery (dd/mm/yyyy, NS = No surgery, U = Unknown)
Invasive status (I = Invasive, M = Micro-invasive, N = Non-invasive, U = Unknown)
Invasive Size (size in mm, U = unknown. Enter X if not invasive)
Tumour grade – Bloom & Richardson (I, II, III, NA = Not assessable or U = Unknown. Enter X if not invasive)
Total number of axillary nodes obtained (total number, zero if no nodes obtained, U = Unknown. Enter X if not invasive)
Number of positive axillary nodes (number positive, zero if node negative, U = Unknown. Enter X if not invasive)

Invasive Cancers Only

DO NOT SEND DATA IN SHADED COLUMNS TO THE WMCIU

{C} **Sx No.**	*{D}* **Fore-name**	*{E}* **Sur-name**	*{F}* **Address Line1**	*{G}* **Address Line2**	*{H}* **Address Line3**	*{I}* **Address Line4**	*{J}* **Post Code**	*{K}* **NHS Number**	*{L}* **Date of Birth** dd/mm/yyyy	*{M}* **Date of First Surgery** (dd/mm/yyyy, NS, U)	{O} **Invasive Status** (I,M,N,U)	{P} **Invasive Size** (size (mm), U,X)	{Q} **Tumour Grade** (I,II,III, NA,U,X)	{R} **Total Nodes Obtained** (0, 1, 2, .., U,X)	{S} **Number Positive Nodes** (0, 1, 2, .., U,X)

SURVIVAL AUDIT: CANCER REGISTRY DATA FOR CASES DETECTED IN 2002/03

Region:
Screening Unit:
Cancer Registry: **Data complete to: 31/12/2008**

{C} **Sx No. (Screening Office Number)**	[T] **Cancer Registry**	{U} **Cancer Registration Number**	{V} **Not Registered** (NR)	{W} **Date of Diagnosis** (dd/mm/yyyy)	{X} **Date of Death** (dd/mm/yyyy)

ADDITIONAL GUIDANCE

Non-registered cases

A case should be recorded as a non-registered case (NR) if

1. the patient is not registered on the cancer registry database
2. the patient is registered, but the screen-detected breast cancer is not registered.

Date of diagnosis

Cancer registries have been asked to fill in the date of diagnosis column with the earliest date of diagnosis for any invasive breast cancer diagnosed for the screening patient. If the screening case is non-invasive or micro-invasive and no other invasive cancer has been diagnosed before 2002, then the date of diagnosis of the screening case will be recorded.

Example 1:
The patient (with an invasive breast cancer diagnosed in the audit period) in the survival spreadsheet is recorded in the cancer registry database. The earliest invasive breast cancer for that patient was diagnosed in 1997, and there was also an invasive breast cancer diagnosed in 2002/03 which matches the characteristics of the cancer on the spreadsheet.
For this case:
Not registered (NR) column: is blank
Date of diagnosis: the invasive cancer diagnosed in 1997.

Example 2:
The patient (with an invasive breast cancer diagnosed in the audit period) in the survival spreadsheet is recorded in the cancer registry database. The earliest breast cancer for that patient was diagnosed in 1995, and this was a non-invasive breast cancer. The patient also had an invasive breast cancer diagnosed in 2002/03 which matches the characteristics of the one on the spreadsheet.
For this case:
Not registered (NR) column: is blank
Date of diagnosis: the invasive cancer diagnosed in 2002/03.

Example 3:
The patient (with a non-invasive breast cancer diagnosed in the audit period) in the survival spreadsheet is recorded in the cancer registry database. In the CR database, she had a non-invasive breast cancer diagnosed in 2002/03 and there have been no other previous breast cancers recorded for this patient.
For this case:
Not registered (NR) column: is blank
Date of diagnosis: the non-invasive breast cancer in 2002/03.

Example 4:
The patient (with a non-invasive breast cancer diagnosed in the audit period) in the survival spreadsheet is recorded in the cancer registry database, but this specific cancer is not found in the cancer registry records. From the records, this patient had an invasive breast cancer in 1997.
For this case:
Not registered (NR) column: Not registered

Date of diagnosis: the invasive cancer diagnosed in 1997.

APPENDIX E: MAIN AUDIT DATA TABLES (1 - 88)

DATA FROM THE 2008/09 AUDIT OF SCREEN-DETECTED BREAST CANCERS IN WOMEN ALL AGES FOR THE PERIOD 1 APRIL 2008 – 31 MARCH 2009

Table 1 : Number and invasive status of screen-detected breast cancers and total women screened

Region	Invasive		Micro-invasive		Non-invasive		Status unknown		Total		Total women screened	Micro/ Non-invasive cancer rate	Invasive cancer rate	Invasive <15mm rate
	No.	%	No.	%	No.	%	No.	%	No.	%				
N East, Yorks & Humber	1839	80	15	1	433	19	3	0	2290	100	291159	1.5	6.3	3.4
East Midlands	1092	80	13	1	261	19	0	0	1366	100	166736	1.6	6.5	3.8
East of England	1322	77	19	1	360	21	6	0	1707	100	203356	1.9	6.5	3.5
London	1177	79	13	1	299	20	2	0	1491	100	187895	1.7	6.3	3.0
South East Coast	1059	77	11	1	293	21	5	0	1368	100	155908	1.9	6.8	3.7
South Central	931	79	11	1	232	20	1	0	1175	100	151401	1.6	6.1	3.1
South West	1145	78	12	1	311	21	0	0	1468	100	195303	1.7	5.9	3.2
West Midlands	1208	82	15	1	253	17	2	0	1478	100	186075	1.4	6.5	3.4
North West	1477	80	22	1	335	18	1	0	1835	100	243646	1.5	6.1	3.0
Wales	765	77	3	0	224	23	0	0	992	100	106867	2.1	7.2	3.8
Northern Ireland	281	78	1	0	74	21	2	1	358	100	46810	1.6	6.0	2.7
Scotland	1236	81	5	0	276	18	0	0	1517	100	181432	1.5	6.8	3.3
United Kingdom	**13532**	**79**	**140**	**1**	**3351**	**20**	**22**	**0**	**17045**	**100**	**2116588**	**1.6**	**6.4**	**3.3**
Isle of Man	26	90	0	0	3	10	0	0	29	100	4011	0.7	6.5	5.0

Table 2 : Age at first offered appointment

Region	<50		50-64		65-70		71-75		76+		Total	>65	
	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%
N East, Yorks & Humber	39	2	1564	68	577	25	76	3	34	1	2290	687	30
East Midlands	24	2	906	66	339	25	71	5	26	2	1366	437	32
East of England	12	1	1121	66	439	26	84	5	51	3	1707	574	34
London	40	3	987	66	376	25	55	4	33	2	1491	464	31
South East Coast	29	2	886	65	365	27	56	4	32	2	1368	453	33
South Central	26	2	769	65	289	25	61	5	30	3	1175	380	32
South West	22	1	967	66	386	26	58	4	35	2	1468	479	33
West Midlands	29	2	968	65	402	27	59	4	20	1	1478	481	33
North West	49	3	1221	67	487	27	46	3	32	2	1835	565	31
Wales	13	1	656	66	254	26	49	5	20	2	992	323	33
Northern Ireland	1	0	320	89	31	9	3	1	3	1	358	37	10
Scotland	0	0	986	65	413	27	77	5	41	3	1517	531	35
United Kingdom	**284**	**2**	**11351**	**67**	**4358**	**25**	**695**	**4**	**357**	**2**	**17045**	**5411**	**31**
Isle of Man	0	0	23	79	6	21	0	0	0	0	29	6	21

Table 3 : Cancers diagnosed on radiological/clinical grounds only

Region	Total cancers including radiological/clinical cancers	Cancers diagnosed on radiological/clinical grounds only	
		No.	%
N East, Yorks & Humber	2290	1	0.04
East Midlands	1366	2	0.15
East of England	1707	1	0.06
London	1491	1	0.07
South East Coast	1368	0	0.00
South Central	1175	0	0.00
South West	1468	0	0.00
West Midlands	1478	0	0.00
North West	1835	0	0.00
Wales	992	0	0.00
Northern Ireland	358	0	0.00
Scotland	1517	0	0.00
United Kingdom	**17045**	**5**	**0.03**

Table 4 : Non-operative diagnosis rate											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2290	62	3	260	11	1897	83	2219	97	71	3
East Midlands	1366	6	0	18	1	1283	94	1307	96	59	4
East of England	1707	13	1	17	1	1559	91	1589	93	118	7
London	1491	27	2	52	3	1330	89	1409	95	82	5
South East Coast	1368	89	7	43	3	1162	85	1294	95	74	5
South Central	1175	18	2	56	5	1039	88	1113	95	62	5
South West	1468	31	2	26	2	1329	91	1386	94	82	6
West Midlands	1478	38	3	16	1	1358	92	1412	96	66	4
North West	1835	168	9	69	4	1510	82	1747	95	88	5
Wales	992	0	0	14	1	947	95	961	97	31	3
Northern Ireland	358	112	31	78	22	154	43	344	96	14	4
Scotland	1517	4	0	213	14	1245	82	1462	96	55	4
United Kingdom	**17045**	**568**	**3**	**862**	**5**	**14813**	**87**	**16243**	**95**	**802**	**5**

Table 5 : Non-operative diagnosis rate (invasive cancers)											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1839	58	3	235	13	1518	83	1811	98	28	2
East Midlands	1092	6	1	16	1	1050	96	1072	98	20	2
East of England	1322	9	1	16	1	1261	95	1286	97	36	3
London	1177	25	2	51	4	1076	91	1152	98	25	2
South East Coast	1059	83	8	39	4	920	87	1042	98	17	2
South Central	931	16	2	55	6	835	90	906	97	25	3
South West	1145	30	3	24	2	1063	93	1117	98	28	2
West Midlands	1208	36	3	16	1	1132	94	1184	98	24	2
North West	1477	163	11	69	5	1213	82	1445	98	32	2
Wales	765	0	0	13	2	741	97	754	99	11	1
Northern Ireland	281	106	38	74	26	100	36	280	100	1	0
Scotland	1236	1	0	198	16	1019	82	1218	99	18	1
United Kingdom	**13532**	**533**	**4**	**806**	**6**	**11928**	**88**	**13267**	**98**	**265**	**2**

Table 6 : Non-operative diagnosis rate (non-invasive cancers)											
	Total cancers	C5 only		C5 & B5		B5 only		Non-operative diagnosis		No non-operative diagnosis	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	433	2	0	24	6	365	84	391	90	42	10
East Midlands	261	0	0	1	0	221	85	222	85	39	15
East of England	360	1	0	1	0	282	78	284	79	76	21
London	299	0	0	1	0	243	81	244	82	55	18
South East Coast	293	1	0	3	1	232	79	236	81	57	19
South Central	232	1	0	1	0	193	83	195	84	37	16
South West	311	1	0	2	1	254	82	257	83	54	17
West Midlands	253	1	0	0	0	211	83	212	84	41	16
North West	335	2	1	0	0	279	83	281	84	54	16
Wales	224	0	0	1	0	203	91	204	91	20	9
Northern Ireland	74	3	4	4	5	54	73	61	82	13	18
Scotland	276	3	1	15	5	221	80	239	87	37	13
United Kingdom	**3351**	**15**	**0**	**53**	**2**	**2758**	**82**	**2826**	**84**	**525**	**16**

Table 7 : Invasive status of the diagnostic core biopsy							
Region	Total Cancers with B5	B5a (Non-invasive)		B5b (Invasive)		B5c (Not Assessable or Unknown)	
		No.	%	No.	%	No.	%
N East, Yorks & Humber	2157	486	23	1644	76	27	1
East Midlands	1301	303	23	993	76	5	0
East of England	1576	359	23	1198	76	19	1
London	1382	318	23	1061	77	3	0
South East Coast	1205	317	26	880	73	8	1
South Central	1095	245	22	845	77	5	0
South West	1355	348	26	1006	74	1	0
West Midlands	1374	290	21	1075	78	9	1
North West	1579	381	24	1192	75	6	0
Wales	961	232	24	727	76	2	0
Northern Ireland	232	65	28	166	72	1	0
Scotland	1458	295	20	1151	79	12	1
United Kingdom	**15675**	**3639**	**23**	**11938**	**76**	**98**	**1**

Table 8 : B5a (Non-invasive) core biopsy: histological status after surgery												
Region	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	97	20	12	3	361	75	8	2	1	0	479	100
East Midlands	68	23	13	4	208	69	11	4	0	0	300	100
East of England	70	20	14	4	265	74	8	2	0	0	357	100
London	65	21	11	4	222	71	14	4	0	0	312	100
South East Coast	72	23	10	3	223	72	5	2	0	0	310	100
South Central	42	17	11	5	187	77	2	1	0	0	242	100
South West	84	24	10	3	246	71	5	1	0	0	345	100
West Midlands	69	24	14	5	198	69	3	1	1	0	285	100
North West	87	23	19	5	265	70	3	1	3	1	377	100
Wales	26	11	3	1	201	87	1	0	0	0	231	100
Northern Ireland	8	12	0	0	56	86	1	2	0	0	65	100
Scotland	60	20	2	1	233	79	0	0	0	0	295	100
United Kingdom	**748**	**21**	**119**	**3**	**2665**	**74**	**61**	**2**	**5**	**0**	**3598**	**100**

Benign cases have non-invasive disease reported in the non-operative core biopsy but no malignant disease found in the surgical specimen

Table 9 : B5b (Invasive) core biopsy: histological status after surgery												
Region	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1601	99	0	0	7	0	1	0	2	0	1611	100
East Midlands	956	99	4	0	3	0	3	0	0	0	966	100
East of England	1160	99	1	0	10	1	1	0	3	0	1175	100
London	1014	99	1	0	4	0	6	1	3	0	1028	100
South East Coast	861	99	1	0	4	0	0	0	0	0	866	100
South Central	825	99	1	0	5	1	1	0	0	0	832	100
South West	968	98	1	0	12	1	4	0	1	0	986	100
West Midlands	1045	99	4	0	4	0	4	0	0	0	1057	100
North West	1149	98	3	0	13	1	1	0	7	1	1173	100
Wales	710	99	0	0	3	0	2	0	0	0	715	100
Northern Ireland	164	99	0	0	0	0	1	1	0	0	165	100
Scotland	1118	99	2	0	3	0	2	0	3	0	1128	100
United Kingdom	**11571**	**99**	**18**	**0**	**68**	**1**	**26**	**0**	**19**	**0**	**11702**	**100**

Benign cases have non-invasive disease reported in the non-operative core biopsy but no malignant disease found in the surgical specimen

Table 10 : C5 cytology only: histological status after surgery												
	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	58	97	0	0	2	3	0	0	0	0	60	100
East Midlands	6	100	0	0	0	0	0	0	0	0	6	100
East of England	9	69	1	8	1	8	0	0	2	15	13	100
London	25	100	0	0	0	0	0	0	0	0	25	100
South East Coast	83	99	0	0	1	1	0	0	0	0	84	100
South Central	16	94	0	0	1	6	0	0	0	0	17	100
South West	30	97	0	0	1	3	0	0	0	0	31	100
West Midlands	36	95	0	0	1	3	0	0	1	3	38	100
North West	163	97	2	1	2	1	1	1	0	0	168	100
Wales	0	-	0	-	0	-	0	-	0	-	0	-
Northern Ireland	106	96	1	1	3	3	0	0	0	0	110	100
Scotland	1	25	0	0	3	75	0	0	0	0	4	100
United Kingdom	**533**	**96**	**4**	**1**	**15**	**3**	**1**	**0**	**3**	**1**	**556**	**100**

Benign cases have non-invasive disease reported in the non-operative core biopsy but no malignant disease found in the surgical specimen

Table 11 : Number of visits for cytology/core biopsy for all cancers														
	0		1		2		3+		Unknown		Total		Repeat (2+) visit for core/cyt	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	0	2101	92	177	8	7	0	0	0	2290	100	184	8
East Midlands	0	0	1221	89	139	10	6	0	0	0	1366	100	145	11
East of England	1	0	1587	93	117	7	2	0	0	0	1707	100	119	7
London	4	0	1338	90	139	9	10	1	0	0	1491	100	149	10
South East Coast	2	0	1237	90	125	9	4	0	0	0	1368	100	129	9
South Central	3	0	1047	89	119	10	6	1	0	0	1175	100	125	11
South West	3	0	1288	88	169	12	8	1	0	0	1468	100	177	12
West Midlands	1	0	1275	86	188	13	14	1	0	0	1478	100	202	14
North West	0	0	1508	82	303	17	24	1	0	0	1835	100	327	18
Wales	1	0	901	91	86	9	4	0	0	0	992	100	90	9
Northern Ireland	0	0	342	96	16	4	0	0	0	0	358	100	16	4
Scotland	0	0	1418	93	98	6	1	0	0	0	1517	100	99	7
United Kingdom	**20**	**0**	**15263**	**90**	**1676**	**10**	**86**	**1**	**0**	**0**	**17045**	**100**	**1762**	**10**

Table 12 : C5 and/or B5 at first visit versus overall non-operative rate (invasive cancers)					
	1 C5/B5		Non-operative diagnosis rate		% increase between 1 visit and repeat visits
Region	No.	%	No.	%	
N East, Yorks & Humber	1709	93	1811	98	6
East Midlands	989	91	1072	98	8
East of England	1224	93	1286	97	5
London	1060	90	1152	98	8
South East Coast	948	90	1042	98	9
South Central	832	89	906	97	8
South West	1000	87	1117	98	10
West Midlands	1061	88	1184	98	10
North West	1225	83	1445	98	15
Wales	704	92	754	99	7
Northern Ireland	269	96	280	100	4
Scotland	1161	94	1218	99	5
United Kingdom	**12182**	**90**	**13267**	**98**	**8**

Table 13 : C5 and/or B5 at first visit versus overall non-operative rate (non/micro invasive cancers)					
	1 C5/B5		Non-operative diagnosis rate		% increase between 1 visit and repeat visits
Region	No.	%	No.	%	
N East, Yorks & Humber	340	76	405	90	15
East Midlands	193	70	235	86	15
East of England	263	69	300	79	10
London	220	71	255	82	11
South East Coast	223	73	247	81	8
South Central	175	72	206	85	13
South West	216	67	269	83	16
West Midlands	177	66	227	85	19
North West	227	64	301	84	21
Wales	178	78	207	91	13
Northern Ireland	58	77	62	83	5
Scotland	217	77	244	87	10
United Kingdom	**2487**	**71**	**2958**	**85**	**13**

Table 14 : Status of diagnostic open biopsies									
	Benign		Malignant		Total		Total women screened	Benign biopsy rate	Malignant biopsy rate
Region	No.	%	No.	%	No.	%			
N East, Yorks & Humber	203	74	71	26	274	100	291159	0.70	0.24
East Midlands	89	60	59	40	148	100	166736	0.53	0.35
East of England	175	60	118	40	293	100	203356	0.86	0.58
London	193	70	82	30	275	100	187895	1.03	0.44
South East Coast	182	71	74	29	256	100	155908	1.17	0.47
South Central	120	66	62	34	182	100	151401	0.79	0.41
South West	190	70	82	30	272	100	195303	0.97	0.42
West Midlands	135	67	66	33	201	100	186075	0.73	0.35
North West	207	70	88	30	295	100	243646	0.85	0.36
Wales	86	74	31	26	117	100	106867	0.80	0.29
Northern Ireland	38	73	14	27	52	100	46810	0.81	0.30
Scotland	147	73	55	27	202	100	181432	0.81	0.30
United Kingdom	**1765**	**69**	**802**	**31**	**2567**	**100**	**2116588**	**0.83**	**0.38**

Table 15 : Number of clients with proven false positive C5 or B5 non-operative diagnosis				
	False positive C5 (CQA Report)		False positive B5 (BQA Report)	
Region	No.	Per 100,000 screened	No.	Per 100,000 screened
N East, Yorks & Humber	0	0.00	1	0.34
East Midlands	0	0.00	0	0.00
East of England	0	0.00	0	0.00
London	0	0.00	1	0.53
South East Coast	0	0.00	0	0.00
South Central	0	0.00	0	0.00
South West	0	0.00	0	0.00
West Midlands	0	0.00	0	0.00
North West	1	0.41	4	1.64
Wales	0	0.00	0	0.00
Northern Ireland	0	0.00	2	4.27
Scotland	3	1.65	0	0.00
United Kingdom	**4**	**0.19**	**8**	**0.38**

Table 16 : Invasive status of malignant diagnostic open biopsies									
Region	Total malignant open biopsies	Invasive		Micro-invasive		Non-invasive		Status unknown	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	71	28	39	1	1	42	59	0	0
East Midlands	59	20	34	0	0	39	66	0	0
East of England	118	36	31	3	3	76	64	3	3
London	82	25	30	2	2	55	67	0	0
South East Coast	74	17	23	0	0	57	77	0	0
South Central	62	25	40	0	0	37	60	0	0
South West	82	28	34	0	0	54	66	0	0
West Midlands	66	24	36	0	0	41	62	1	2
North West	88	32	36	2	2	54	61	0	0
Wales	31	11	35	0	0	20	65	0	0
Northern Ireland	14	1	7	0	0	13	93	0	0
Scotland	55	18	33	0	0	37	67	0	0
United Kingdom	**802**	**265**	**33**	**8**	**1**	**525**	**65**	**4**	**0**

Table 17 : Non-operative history for invasive cancers with malignant open biopsy									
Region	Total malignant open biopsies	No non-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	28	3	11	1	4	23	82	1	4
East Midlands	20	0	0	1	5	17	85	2	10
East of England	36	1	3	6	17	26	72	3	8
London	25	4	16	2	8	16	64	3	12
South East Coast	17	0	0	0	0	16	94	1	6
South Central	25	2	8	0	0	21	84	2	8
South West	28	4	14	3	11	19	68	2	7
West Midlands	24	0	0	0	0	23	96	1	4
North West	32	0	0	2	6	26	81	4	13
Wales	11	1	9	0	0	10	91	0	0
Northern Ireland	1	0	0	0	0	1	100	0	0
Scotland	18	0	0	0	0	15	83	3	17
United Kingdom	**265**	**15**	**6**	**15**	**6**	**213**	**80**	**22**	**8**

Table 18 : Non-operative history for non-invasive cancers with malignant open biopsy									
Region	Total malignant open biopsies	No non-operative procedures		Cytology only		Core biopsy only		Both cytology and core biopsy	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	42	2	5	0	0	27	64	13	31
East Midlands	39	0	0	0	0	39	100	0	0
East of England	76	1	1	2	3	70	92	3	4
London	55	0	0	1	2	48	87	6	11
South East Coast	57	2	4	0	0	55	96	0	0
South Central	37	1	3	0	0	34	92	2	5
South West	54	1	2	0	0	51	94	2	4
West Midlands	41	2	5	0	0	39	95	0	0
North West	54	1	2	3	6	47	87	3	6
Wales	20	0	0	0	0	20	100	0	0
Northern Ireland	13	0	0	0	0	12	92	1	8
Scotland	37	0	0	0	0	36	97	1	3
United Kingdom	**525**	**10**	**2**	**6**	**1**	**478**	**91**	**31**	**6**

Table 19 : Highest cytology and core biopsy result prior to malignant diagnostic open biopsies (invasive cancers)											
Region	Total malignant open biopsies	No non-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	28	3	11	8	29	14	50	0	0	3	11
East Midlands	20	0	0	9	45	9	45	0	0	2	10
East of England	36	1	3	15	42	12	33	1	3	7	19
London	25	4	16	4	16	16	64	0	0	1	4
South East Coast	17	0	0	7	41	7	41	3	18	0	0
South Central	25	2	8	11	44	10	40	2	8	0	0
South West	28	4	14	9	32	9	32	4	14	2	7
West Midlands	24	0	0	11	46	10	42	1	4	2	8
North West	32	0	0	19	59	12	38	0	0	1	3
Wales	11	1	9	2	18	5	45	1	9	2	18
Northern Ireland	1	0	0	1	100	0	0	0	0	0	0
Scotland	18	0	0	7	39	8	44	2	11	1	6
United Kingdom	**265**	**15**	**6**	**103**	**39**	**112**	**42**	**14**	**5**	**21**	**8**

Table 20 : Highest cytology and core biopsy result prior to malignant diagnostic open biopsies (non-invasive cancers)											
Region	Total malignant open biopsies	No non-operative procedures		C4, B4 or both		C3, B3 or both		C2, B2 or both		C1, B1 or both	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	42	2	5	10	24	26	62	2	5	2	5
East Midlands	39	0	0	10	26	27	69	1	3	1	3
East of England	76	1	1	23	30	49	64	2	3	1	1
London	55	0	0	11	20	42	76	1	2	1	2
South East Coast	57	2	4	24	42	29	51	1	2	1	2
South Central	37	1	3	12	32	21	57	1	3	2	5
South West	54	1	2	27	50	25	46	1	2	0	0
West Midlands	41	2	5	21	51	18	44	0	0	0	0
North West	54	1	2	19	35	25	46	6	11	3	6
Wales	20	0	0	7	35	11	55	0	0	2	10
Northern Ireland	13	0	0	5	38	8	62	0	0	0	0
Scotland	37	0	0	10	27	26	70	1	3	0	0
United Kingdom	**525**	**10**	**2**	**179**	**34**	**307**	**58**	**16**	**3**	**13**	**2**

Table 21 : Axillary ultrasound record for invasive cancers							
Region	Had axillary ultrasound		Did not have axillary ultrasound		Unknown		Total
	No.	%	No.	%	No.	%	
N East, Yorks & Humber	875	48	958	52	6	0	1839
East Midlands	549	50	484	44	59	5	1092
East of England	833	63	487	37	2	0	1322
London	619	53	545	46	13	1	1177
South East Coast	464	44	459	43	136	13	1059
South Central	418	45	511	55	2	0	931
South West	539	47	595	52	11	1	1145
West Midlands	643	53	449	37	116	10	1208
North West	670	45	795	54	12	1	1477
Wales	6	1	289	38	470	61	765
Northern Ireland	35	12	245	87	1	0	281
Scotland*	0	0	0	0	1236	100	1236
United Kingdom	**5651**	**42**	**5817**	**43**	**2064**	**15**	**13532**

*Scotland did not supply any axillary ultrasound information

Table 22 : Axillary ultrasound result for invasive cancers					
	Normal		Abnormal		Total
Region	No.	%	No.	%	
N East, Yorks & Humber	788	90	87	10	875
East Midlands	461	84	88	16	549
East of England	691	83	142	17	833
London	511	83	108	17	619
South East Coast	426	92	38	8	464
South Central	373	89	45	11	418
South West	471	87	68	13	539
West Midlands	577	90	66	10	643
North West	595	89	75	11	670
Wales*	-	-	-	-	-
Northern Ireland	24	69	11	31	35
Scotland*	-	-	-	-	-
United Kingdom	**4917**	**87**	**728**	**13**	**5645**

*Excluded cases from Wales and Scotland

Table 23 : Axillary biopsy for invasive cancers							
	Had axillary biopsy		Did not have axillary biopsy		Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	72	4	1767	96	0	0	1839
East Midlands	85	8	948	87	59	5	1092
East of England	128	10	1194	90	0	0	1322
London	106	9	1071	91	0	0	1177
South East Coast	55	5	1004	95	0	0	1059
South Central	39	4	892	96	0	0	931
South West	33	3	1112	97	0	0	1145
West Midlands	64	5	1143	95	1	0	1208
North West	71	5	1406	95	0	0	1477
Wales*	-	-	-	-	-	-	-
Northern Ireland	9	3	271	96	1	0	281
Scotland*	-	-	-	-	-	-	-
United Kingdom	**662**	**6**	**10808**	**94**	**61**	**1**	**11531**

*Excluded cases from Wales and Scotland

Table 24 : Worst axillary biopsy result for invasive cancer cases with an axillary ultrasound examination											
	C1/B1		C2/B2		C3/B3		C4/B4		C5/B5		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	11	16	26	38	1	1	1	1	30	43	69
East Midlands	6	7	30	35	2	2	2	2	45	53	85
East of England	17	13	60	47	0	0	1	1	50	39	128
London	9	9	42	43	0	0	5	5	41	42	97
South East Coast	3	8	9	24	1	3	3	8	22	58	38
South Central	8	21	7	18	0	0	1	3	23	59	39
South West	5	16	8	25	0	0	2	6	17	53	32
West Midlands	18	30	11	18	0	0	2	3	30	49	61
North West	10	14	30	42	1	1	1	1	29	41	71
Wales*	-	-	-	-	-	-	-	-	-	-	-
Northern Ireland	0	0	4	44	0	0	2	22	3	33	9
Scotland*	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	**87**	**14**	**227**	**36**	**5**	**1**	**20**	**3**	**290**	**46**	**629**

*Excluded cases from Wales and Scotland

Table 25: Positive predictive value of the axillary biopsy results for invasive cancers										
	C1/B1		C2/B2		C3/B3		C4/B4		C5/B5	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	11	64	26	19	1	0	1	0	30	87
East Midlands	6	17	30	17	2	50	2	100	45	82
East of England	17	18	60	23	0	-	1	100	50	88
London	9	33	42	21	0	-	5	60	41	73
South East Coast	3	0	9	56	1	0	3	100	22	91
South Central	8	50	7	71	0	-	1	0	23	87
South West	5	0	8	0	0	-	2	100	17	88
West Midlands	18	56	11	36	0	-	2	100	30	90
North West	10	50	30	20	1	0	1	0	29	90
Wales*	-	-	-	-	-	-	-	-	-	-
Northern Ireland	0	-	4	25	0	-	2	0	3	100
Scotland*	-	-	-	-	-	-	-	-	-	-
United Kingdom	**87**	**38**	**227**	**24**	**5**	**20**	**20**	**65**	**290**	**86**

*Excluded cases from Wales and Scotland

Table 26 : Treatment for non-invasive breast cancers										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	263	61	163	38	7	2	0	0	433	100
East Midlands	168	64	90	34	3	1	0	0	261	100
East of England	255	71	103	29	2	1	0	0	360	100
London	206	69	87	29	4	1	2	1	299	100
South East Coast	214	73	72	25	7	2	0	0	293	100
South Central	166	72	63	27	3	1	0	0	232	100
South West	228	73	80	26	3	1	0	0	311	100
West Midlands	193	76	55	22	5	2	0	0	253	100
North West	217	65	114	34	4	1	0	0	335	100
Wales	148	66	75	33	1	0	0	0	224	100
Northern Ireland	53	72	21	28	0	0	0	0	74	100
Scotland	194	70	82	30	0	0	0	0	276	100
United Kingdom	**2305**	**69**	**1005**	**30**	**39**	**1**	**2**	**0**	**3351**	**100**

Table 27 : Treatment for micro-invasive breast cancers										
	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	10	67	5	33	0	0	0	0	15	100
East Midlands	10	77	3	23	0	0	0	0	13	100
East of England	12	63	7	37	0	0	0	0	19	100
London	8	62	5	38	0	0	0	0	13	100
South East Coast	7	64	4	36	0	0	0	0	11	100
South Central	5	45	6	55	0	0	0	0	11	100
South West	6	50	6	50	0	0	0	0	12	100
West Midlands	10	67	5	33	0	0	0	0	15	100
North West	12	55	10	45	0	0	0	0	22	100
Wales	2	67	1	33	0	0	0	0	3	100
Northern Ireland	0	0	1	100	0	0	0	0	1	100
Scotland	4	80	1	20	0	0	0	0	5	100
United Kingdom	**86**	**61**	**54**	**39**	**0**	**0**	**0**	**0**	**140**	**100**

Table 28 : Size of non-invasive cancers												
	<15mm		15-≤40mm		>40 mm		Size not assessable		Size unknown		Total non-invasive with surgery	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	165	39	177	42	55	13	0	0	29	7	426	100
East Midlands	90	35	114	44	36	14	3	1	15	6	258	100
East of England	134	37	149	42	29	8	12	3	34	9	358	100
London	100	34	113	38	44	15	12	4	26	9	295	100
South East Coast	111	39	116	41	35	12	0	0	24	8	286	100
South Central	80	35	115	50	22	10	3	1	9	4	229	100
South West	125	41	117	38	44	14	7	2	15	5	308	100
West Midlands	92	37	114	46	24	10	3	1	15	6	248	100
North West	123	37	144	44	37	11	0	0	27	8	331	100
Wales	88	39	89	40	31	14	6	3	9	4	223	100
Northern Ireland	34	46	31	42	7	9	0	0	2	3	74	100
Scotland	94	34	120	43	51	18	4	1	7	3	276	100
United Kingdom	**1236**	**37**	**1399**	**42**	**415**	**13**	**50**	**2**	**212**	**6**	**3312**	**100**

Table 29 : Treatment for non-invasive breast cancers size >40mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	9	16	46	84	0	0	55	100
East Midlands	3	8	33	92	0	0	36	100
East of England	1	3	28	97	0	0	29	100
London	10	23	34	77	0	0	44	100
South East Coast	10	29	25	71	0	0	35	100
South Central	2	9	20	91	0	0	22	100
South West	10	23	34	77	0	0	44	100
West Midlands	10	42	14	58	0	0	24	100
North West	4	11	33	89	0	0	37	100
Wales	3	10	28	90	0	0	31	100
Northern Ireland	0	0	7	100	0	0	7	100
Scotland	10	20	41	80	0	0	51	100
United Kingdom	**72**	**17**	**343**	**83**	**0**	**0**	**415**	**100**

Table 30 : Cytonuclear grade of surgically treated non-invasive cancers												
	High		Intermediate		Low		Not assessable		Unknown		Total non-invasive with surgery	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	248	58	114	27	49	12	0	0	15	4	426	100
East Midlands	149	58	86	33	20	8	3	1	0	0	258	100
East of England	194	54	98	27	36	10	12	3	18	5	358	100
London	162	55	72	24	44	15	15	5	2	1	295	100
South East Coast	169	59	78	27	17	6	0	0	22	8	286	100
South Central	133	58	60	26	25	11	4	2	7	3	229	100
South West	176	57	77	25	37	12	9	3	9	3	308	100
West Midlands	152	61	60	24	21	8	4	2	11	4	248	100
North West	189	57	93	28	36	11	0	0	13	4	331	100
Wales	129	58	64	29	22	10	6	3	2	1	223	100
Northern Ireland	44	59	18	24	10	14	0	0	2	3	74	100
Scotland	179	65	68	25	14	5	9	3	6	2	276	100
United Kingdom	**1924**	**58**	**888**	**27**	**331**	**10**	**62**	**2**	**107**	**3**	**3312**	**100**

Table 31: Data completeness for non-invasive cancers (cases with surgery only)							
	Unknown cytonuclear grade		Unknown size		Unknown cytonuclear grade and/or size		Total with surgery
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**
N East, Yorks & Humber	15	4	29	7	29	7	426
East Midlands	0	0	15	6	15	6	258
East of England	18	5	34	9	34	9	358
London	2	1	26	9	27	9	295
South East Coast	22	8	24	8	25	9	286
South Central	7	3	9	4	13	6	229
South West	9	3	15	5	18	6	308
West Midlands	11	4	15	6	18	7	248
North West	13	4	27	8	30	9	331
Wales	2	1	9	4	11	5	223
Northern Ireland	2	3	2	3	2	3	74
Scotland	6	2	7	3	10	4	276
United Kingdom	**107**	**3**	**212**	**6**	**232**	**7**	**3312**

Table 32 : Treatment of non-invasive cancers with unknown cytonuclear grade and unknown size (benign surgery cases excluded)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	10	91	1	9	0	0	11	100
East Midlands	0	-	0	-	0	-	0	-
East of England	15	88	2	12	0	0	17	100
London	0	-	0	-	0	-	0	-
South East Coast	16	89	2	11	0	0	18	100
South Central	2	67	1	33	0	0	3	100
South West	4	100	0	0	0	0	4	100
West Midlands	7	100	0	0	0	0	7	100
North West	9	100	0	0	0	0	9	100
Wales	0	-	0	-	0	-	0	-
Northern Ireland	1	100	0	0	0	0	1	100
Scotland	3	100	0	0	0	0	3	100
United Kingdom	**67**	**92**	**6**	**8**	**0**	**0**	**73**	**100**

Benign cases have non-invasive disease reported in the non-operative core biopsy but no malignant disease found in the surgical specimen

Table 33 : Treatment of high cytonuclear grade non-invasive cancers (>40mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	8	19	35	81	0	0	43	100
East Midlands	2	7	25	93	0	0	27	100
East of England	0	0	21	100	0	0	21	100
London	8	24	26	76	0	0	34	100
South East Coast	7	28	18	72	0	0	25	100
South Central	1	6	16	94	0	0	17	100
South West	8	24	26	76	0	0	34	100
West Midlands	8	40	12	60	0	0	20	100
North West	3	14	19	86	0	0	22	100
Wales	3	12	22	88	0	0	25	100
Northern Ireland	0	0	6	100	0	0	6	100
Scotland	8	18	36	82	0	0	44	100
United Kingdom	**56**	**18**	**262**	**82**	**0**	**0**	**318**	**100**

Table 34 : Treatment for invasive breast cancers										
	Conservation surgery		Mastectomy		No Surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1272	69	534	29	33	2	0	0	1839	100
East Midlands	730	67	335	31	27	2	0	0	1092	100
East of England	976	74	323	24	23	2	0	0	1322	100
London	861	73	283	24	32	3	1	0	1177	100
South East Coast	813	77	232	22	14	1	0	0	1059	100
South Central	688	74	230	25	13	1	0	0	931	100
South West	894	78	231	20	20	2	0	0	1145	100
West Midlands	912	75	278	23	18	1	0	0	1208	100
North West	1015	69	443	30	19	1	0	0	1477	100
Wales	571	75	182	24	12	2	0	0	765	100
Northern Ireland	191	68	89	32	1	0	0	0	281	100
Scotland	908	73	305	25	23	2	0	0	1236	100
United Kingdom	**9831**	**73**	**3465**	**26**	**235**	**2**	**1**	**0**	**13532**	**100**

Table 35 : Invasive size of surgically treated invasive breast cancers																
	<10mm		10-<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	493	27	497	28	437	24	263	15	64	4	36	2	16	1	1806	100
East Midlands	313	29	315	30	219	21	166	16	29	3	10	1	13	1	1065	100
East of England	343	26	365	28	285	22	216	17	52	4	23	2	15	1	1299	100
London	281	25	280	24	272	24	220	19	50	4	26	2	16	1	1145	100
South East Coast	285	27	288	28	237	23	171	16	46	4	12	1	6	1	1045	100
South Central	233	25	233	25	219	24	178	19	26	3	14	2	15	2	918	100
South West	314	28	302	27	250	22	184	16	39	3	17	2	19	2	1125	100
West Midlands	308	26	324	27	298	25	194	16	34	3	22	2	10	1	1190	100
North West	362	25	358	25	353	24	257	18	68	5	38	3	22	2	1458	100
Wales	200	27	206	27	184	24	125	17	18	2	12	2	8	1	753	100
Northern Ireland	55	20	73	26	60	21	70	25	13	5	5	2	4	1	280	100
Scotland	292	24	302	25	326	27	219	18	37	3	21	2	16	1	1213	100
United Kingdom	**3479**	**26**	**3543**	**27**	**3140**	**24**	**2263**	**17**	**476**	**4**	**236**	**2**	**160**	**1**	**13297**	**100**

Table 36 : Mastectomy rate with invasive tumour size										
	<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	206	21	109	25	124	47	53	83	34	94
East Midlands	137	22	75	34	84	51	25	86	10	100
East of England	114	16	55	19	82	38	45	87	23	100
London	97	17	60	22	72	33	30	60	21	81
South East Coast	74	13	53	22	64	37	31	67	10	83
South Central	84	18	48	22	64	36	18	69	13	93
South West	91	15	42	17	59	32	21	54	17	100
West Midlands	96	15	55	18	80	41	24	71	22	100
North West	140	19	97	27	113	44	52	76	32	84
Wales	60	15	45	24	49	39	14	78	11	92
Northern Ireland	22	17	17	28	33	47	8	62	5	100
Scotland	92	15	74	23	86	39	28	76	21	100
United Kingdom	**1213**	**17**	**730**	**23**	**910**	**40**	**349**	**73**	**219**	**93**

Table 37 : Whole size of invasive breast cancers																
	<10mm		10-<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	274	15	422	23	472	26	375	21	136	8	88	5	39	2	1806	100
East Midlands	189	18	269	25	252	24	257	24	66	6	28	3	4	0	1065	100
East of England	212	16	328	25	310	24	303	23	86	7	43	3	17	1	1299	100
London	147	13	253	22	281	25	266	23	73	6	67	6	58	5	1145	100
South East Coast	154	15	276	26	240	23	238	23	86	8	39	4	12	1	1045	100
South Central	134	15	195	21	215	23	259	28	45	5	29	3	41	4	918	100
South West	187	17	255	23	275	24	270	24	74	7	37	3	27	2	1125	100
West Midlands	184	15	287	24	306	26	269	23	79	7	53	4	12	1	1190	100
North West	239	16	329	23	364	25	341	23	94	6	64	4	27	2	1458	100
Wales	139	18	168	22	182	24	151	20	47	6	31	4	35	5	753	100
Northern Ireland	33	12	61	22	73	26	72	26	24	9	13	5	4	1	280	100
Scotland	198	16	263	22	331	27	271	22	83	7	52	4	15	1	1213	100
United Kingdom	**2090**	**16**	**3106**	**23**	**3301**	**25**	**3072**	**23**	**893**	**7**	**544**	**4**	**291**	**2**	**13297**	**100**

Table 38 : Whole size of invasive cancers with invasive size <15mm														
	Whole size <15mm		Whole size 15-≤20mm		Whole size >20-≤35mm		Whole size >35-≤50mm		Whole size >50mm		Whole size unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	694	70	134	14	85	9	42	4	24	2	11	1	990	100
East Midlands	455	72	79	13	60	10	22	4	12	2	0	0	628	100
East of England	540	76	76	11	68	10	11	2	9	1	4	1	708	100
London	400	71	62	11	41	7	17	3	22	4	19	3	561	100
South East Coast	430	75	56	10	49	9	18	3	17	3	3	1	573	100
South Central	329	71	50	11	55	12	11	2	8	2	13	3	466	100
South West	440	71	76	12	65	11	19	3	10	2	6	1	616	100
West Midlands	467	74	65	10	59	9	21	3	15	2	5	1	632	100
North West	568	79	60	8	67	9	13	2	8	1	4	1	720	100
Wales	305	75	34	8	30	7	14	3	5	1	18	4	406	100
Northern Ireland	94	73	22	17	9	7	1	1	2	2	0	0	128	100
Scotland	460	77	56	9	43	7	18	3	17	3	0	0	594	100
United Kingdom	**5182**	**74**	**770**	**11**	**631**	**9**	**207**	**3**	**149**	**2**	**83**	**1**	**7022**	**100**

Table 39 : Mastectomy rate for <15mm invasive cancers by whole tumour size										
	Whole Size <15mm		Whole size 15-≤20mm		Whole size >20-≤35mm		Whole size >35-≤50mm		Whole size >50mm	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	81	12	35	26	36	42	27	64	24	100
East Midlands	61	13	22	28	26	43	17	77	11	92
East of England	49	9	19	25	26	38	9	82	9	100
London	37	9	12	19	14	34	9	53	19	86
South East Coast	30	7	8	14	14	29	10	56	12	71
South Central	40	12	8	16	18	33	6	55	8	100
South West	42	10	4	5	23	35	8	42	10	100
West Midlands	42	9	9	14	11	19	14	67	15	100
North West	78	14	17	28	27	40	9	69	7	88
Wales	32	10	6	18	8	27	4	29	5	100
Northern Ireland	13	14	5	23	1	11	1	100	2	100
Scotland	46	10	9	16	12	28	13	72	12	71
United Kingdom	**551**	**11**	**154**	**20**	**216**	**34**	**127**	**61**	**134**	**90**

Table 40 : Immediate reconstruction with mastectomy (all cancers)								
	Immediate reconstruction		No immediate reconstruction		Unknown		Total mastectomies	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	85	12	570	81	47	7	702	100
East Midlands	80	19	238	56	110	26	428	100
East of England	104	24	259	60	71	16	434	100
London	87	23	261	70	27	7	375	100
South East Coast	66	21	227	74	15	5	308	100
South Central	71	24	227	76	1	0	299	100
South West	84	26	227	72	6	2	317	100
West Midlands	68	20	246	73	24	7	338	100
North West	83	15	476	84	8	1	567	100
Wales	35	14	223	86	0	0	258	100
Northern Ireland	19	17	92	83	0	0	111	100
Scotland	51	13	337	87	0	0	388	100
United Kingdom	**833**	**18**	**3383**	**75**	**309**	**7**	**4525**	**100**

Table 41 : Invasive status of cancers which had immediate reconstruction with mastectomy										
	Invasive		Micro-invasive		Non-invasive		Unknown		Immediate Reconstruction	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	48	56	1	1	36	42	0	0	85	100
East Midlands	40	50	0	0	40	50	0	0	80	100
East of England	58	56	3	3	43	41	0	0	104	100
London	59	68	0	0	28	32	0	0	87	100
South East Coast	42	64	0	0	24	36	0	0	66	100
South Central	43	61	6	8	22	31	0	0	71	100
South West	39	46	6	7	39	46	0	0	84	100
West Midlands	42	62	1	1	25	37	0	0	68	100
North West	54	65	3	4	26	31	0	0	83	100
Wales	21	60	1	3	13	37	0	0	35	100
Northern Ireland	13	68	1	5	5	26	0	0	19	100
Scotland	34	67	0	0	17	33	0	0	51	100
United Kingdom	**493**	**59**	**22**	**3**	**318**	**38**	**0**	**0**	**833**	**100**

Table 42 : Waiting time - assessment to first therapeutic surgery (excluding cases with neo-adjuvant therapy)												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	2120	113	5	1208	57	1844	87	2036	96	2107	99	29
East Midlands	1242	117	9	738	59	1077	87	1194	96	1229	99	28
East of England	1519	119	8	910	60	1330	88	1456	96	1500	99	28
London	1309	55	4	555	42	1033	79	1223	93	1289	98	34
South East Coast	1155	22	2	282	24	757	66	1029	89	1133	98	40
South Central	1065	66	6	539	51	903	85	1021	96	1054	99	31
South West	1338	53	4	644	48	1115	83	1262	94	1316	98	32
West Midlands	1373	106	8	863	63	1217	89	1328	97	1361	99	28
North West	1695	108	6	1040	61	1521	90	1654	98	1684	99	29
Wales	938	121	13	640	68	870	93	920	98	936	100	26
Northern Ireland	336	80	24	271	81	320	95	332	99	335	100	22
Scotland	1420	164	12	875	62	1221	86	1357	96	1403	99	28
United Kingdom	**15510**	**1124**	**7**	**8565**	**55**	**13208**	**85**	**14812**	**95**	**15347**	**99**	**29**

Table 43 : Waiting time - assessment to first diagnostic surgery (excluding cases with neo-adjuvant therapy)												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	71	5	7	31	44	53	75	67	94	71	100	33
East Midlands	59	4	7	26	44	46	78	57	97	58	98	34
East of England	118	3	3	56	47	92	78	107	91	114	97	32
London	82	5	6	24	29	48	59	64	78	78	95	41.5
South East Coast	73	0	0	12	16	36	49	57	78	67	92	46
South Central	62	1	2	27	44	45	73	52	84	56	90	34
South West	81	2	2	34	42	57	70	71	88	79	98	34
West Midlands	66	7	11	30	45	45	68	55	83	60	91	36.5
North West	87	1	1	47	54	74	85	82	94	83	95	31
Wales	31	1	3	16	52	21	68	26	84	31	100	31
Northern Ireland	14	2	14	9	64	12	86	14	100	14	100	23.5
Scotland	55	2	4	23	42	37	67	49	89	53	96	34
United Kingdom	**799**	**33**	**4**	**335**	**42**	**566**	**71**	**701**	**88**	**764**	**96**	**35**

Table 44 : 31-day wait: ≤31 days from first assessment to first therapeutic surgery						
	1 visit			>1 visit		
Region	Total	No	%	Total	No	%
N East, Yorks & Humber	1964	1177	60	156	31	20
East Midlands	1122	705	63	120	33	28
East of England	1425	887	62	94	23	24
London	1195	537	45	114	18	16
South East Coast	1063	273	26	92	9	10
South Central	962	508	53	103	31	30
South West	1175	582	50	163	62	38
West Midlands	1209	824	68	164	39	24
North West	1409	908	64	286	132	46
Wales	861	600	70	77	40	52
Northern Ireland	321	263	82	15	8	53
Scotland	1339	843	63	81	32	40
United Kingdom	**14045**	**8107**	**58**	**1465**	**458**	**31**

Table 45 : 31-day wait: ≤31 days from first assessment to first diagnostic surgery						
	1 visit			>1 visit		
Region	Total	No	%	Total	No	%
N East, Yorks & Humber	49	27	55	17	2	12
East Midlands	39	21	54	20	5	25
East of England	97	50	52	20	5	25
London	56	21	38	22	2	9
South East Coast	60	12	20	11	0	0
South Central	39	21	54	20	4	20
South West	71	32	45	7	2	29
West Midlands	36	22	61	29	7	24
North West	55	33	60	32	14	44
Wales	19	12	63	11	3	27
Northern Ireland	13	9	69	1	0	0
Scotland	40	17	43	15	6	40
United Kingdom	**574**	**277**	**48**	**205**	**50**	**24**

Table 46 : Waiting time – assessment to first surgery (all cancers) (excluding cases with neo-adjuvant therapy)												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	2191	118	5	1239	57	1897	87	2103	96	2178	99	29
East Midlands	1301	121	9	764	59	1123	86	1251	96	1287	99	28
East of England	1637	122	7	966	59	1422	87	1563	95	1614	99	28
London	1391	60	4	579	42	1081	78	1287	93	1367	98	34
South East Coast	1228	22	2	294	24	793	65	1086	88	1200	98	41
South Central	1127	67	6	566	50	948	84	1073	95	1110	98	31
South West	1419	55	4	678	48	1172	83	1333	94	1395	98	32
West Midlands	1439	113	8	893	62	1262	88	1383	96	1421	99	28
North West	1782	109	6	1087	61	1595	90	1736	97	1767	99	29
Wales	969	122	13	656	68	891	92	946	98	967	100	26
Northern Ireland	350	82	23	280	80	332	95	346	99	349	100	22
Scotland	1475	166	11	898	61	1258	85	1406	95	1456	99	28
United Kingdom	**16309**	**1157**	**7**	**8900**	**55**	**13774**	**84**	**15513**	**95**	**16111**	**99**	**30**

Table 47 : Waiting time - screen to first surgery (all cancers) (excluding cases with neo-adjuvant therapy)												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	2187	0	0	148	7	853	39	1641	75	2092	96	50
East Midlands	1298	1	0	135	10	660	51	1104	85	1267	98	45
East of England	1631	1	0	166	10	727	45	1324	81	1568	96	48
London	1388	1	0	76	5	434	31	1013	73	1302	94	52
South East Coast	1220	0	0	38	3	236	19	739	61	1120	92	58
South Central	1123	1	0	121	11	482	43	936	83	1085	97	48
South West	1414	0	0	106	7	569	40	1108	78	1347	95	49
West Midlands	1434	0	0	123	9	670	47	1173	82	1375	96	47
North West	1778	5	0	173	10	751	42	1355	76	1710	96	49
Wales	969	0	0	125	13	401	41	722	75	932	96	49
Northern Ireland	349	1	0	90	26	230	66	323	93	346	99	39
Scotland	1473	1	0	97	7	378	26	947	64	1384	94	56
United Kingdom	**16264**	**11**	**0**	**1398**	**9**	**6391**	**39**	**12385**	**76**	**15528**	**95**	**49**

Table 48 : ER status							
	Positive		Negative		Not done or Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	1838	80	266	12	186	8	2290
East Midlands	1092	80	121	9	153	11	1366
East of England	1271	74	156	9	280	16	1707
London	1122	75	159	11	210	14	1491
South East Coast	985	72	122	9	261	19	1368
South Central	943	80	96	8	136	12	1175
South West	1166	79	164	11	138	9	1468
West Midlands	1218	82	168	11	92	6	1478
North West	1498	82	199	11	138	8	1835
Wales	737	74	82	8	173	17	992
Northern Ireland	289	81	54	15	15	4	358
Scotland	1238	82	136	9	143	9	1517
United Kingdom	**13397**	**79**	**1723**	**10**	**1925**	**11**	**17045**

Table 49 : ER status (invasive cancers)							
	Positive		Negative		Not done or Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	1621	88	204	11	14	1	1839
East Midlands	985	90	99	9	8	1	1092
East of England	1182	89	128	10	12	1	1322
London	1009	86	126	11	42	4	1177
South East Coast	857	81	88	8	114	11	1059
South Central	846	91	81	9	4	0	931
South West	999	87	123	11	23	2	1145
West Midlands	1078	89	123	10	7	1	1208
North West	1302	88	154	10	21	1	1477
Wales	688	90	72	9	5	1	765
Northern Ireland	239	85	38	14	4	1	281
Scotland	1107	90	107	9	22	2	1236
United Kingdom	**11913**	**88**	**1343**	**10**	**276**	**2**	**13532**

Table 50 : ER status (non-invasive cancers)							
	Positive		Negative		Not done or Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	211	49	54	12	168	39	433
East Midlands	104	40	21	8	136	52	261
East of England	76	21	24	7	260	72	360
London	106	35	30	10	163	55	299
South East Coast	124	42	31	11	138	47	293
South Central	94	41	13	6	125	54	232
South West	160	51	37	12	114	37	311
West Midlands	133	53	39	15	81	32	253
North West	182	54	41	12	112	33	335
Wales	49	22	10	4	165	74	224
Northern Ireland	49	66	16	22	9	12	74
Scotland	126	46	29	11	121	44	276
United Kingdom	**1414**	**42**	**345**	**10**	**1592**	**48**	**3351**

Table 51 : PgR status							
	Positive		Negative		Not done or Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	999	44	401	18	890	39	2290
East Midlands	469	34	174	13	723	53	1366
East of England	488	29	230	13	989	58	1707
London	963	65	285	19	243	16	1491
South East Coast	732	54	214	16	422	31	1368
South Central	613	52	163	14	399	34	1175
South West	705	48	257	18	506	34	1468
West Midlands	752	51	294	20	432	29	1478
North West	1313	72	365	20	157	9	1835
Wales	292	29	105	11	595	60	992
Northern Ireland	202	56	95	27	61	17	358
Scotland	790	52	213	14	514	34	1517
United Kingdom	**8318**	**49**	**2796**	**16**	**5931**	**35**	**17045**

Table 52 : HER-2 status for invasive cancers									
	Positive		Negative		Borderline		Not done or Unknown		Total
Region	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	202	11	1521	83	9	0	107	6	1839
East Midlands	90	8	936	86	22	2	44	4	1092
East of England	146	11	1106	84	34	3	36	3	1322
London	97	8	855	73	34	3	191	16	1177
South East Coast	84	8	659	62	11	1	305	29	1059
South Central	90	10	694	75	51	5	96	10	931
South West	188	16	838	73	12	1	107	9	1145
West Midlands	124	10	893	74	21	2	170	14	1208
North West	165	11	1122	76	106	7	84	6	1477
Wales	71	9	656	86	0	0	38	5	765
Northern Ireland	20	7	200	71	9	3	52	19	281
Scotland	145	12	1041	84	0	0	50	4	1236
United Kingdom	**1422**	**11**	**10521**	**78**	**309**	**2**	**1280**	**9**	**13532**

Table 53 : Availability of lymph node status for invasive cancers									
	Total invasive cancers with surgery	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1806	1783	99	0	0	21	1	2	0
East Midlands	1065	1048	98	0	0	17	2	0	0
East of England	1299	1279	98	0	0	20	2	0	0
London	1145	1106	97	0	0	36	3	3	0
South East Coast	1045	1017	97	0	0	28	3	0	0
South Central	918	898	98	0	0	20	2	0	0
South West	1125	1100	98	0	0	24	2	1	0
West Midlands	1190	1180	99	0	0	10	1	0	0
North West	1458	1441	99	0	0	17	1	0	0
Wales	753	741	98	0	0	12	2	0	0
Northern Ireland	280	278	99	0	0	2	1	0	0
Scotland	1213	1203	99	0	0	9	1	1	0
United Kingdom	**13297**	**13074**	**98**	**0**	**0**	**216**	**2**	**7**	**0.1**

Table 54 : Sentinel lymph node procedure for invasive cancers with axillary surgery								
Region	With SLNB		Without SLNB		Unknown nodal procedure type		Total	
	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	988	55	790	44	7	0	1785	100
East Midlands	536	51	514	49	0	0	1050	100
East of England	716	56	563	44	1	0	1280	100
London	750	68	355	32	3	0	1108	100
South East Coast	534	53	481	47	2	0	1017	100
South Central	583	65	308	34	7	1	898	100
South West	665	60	427	39	10	1	1102	100
West Midlands	705	60	474	40	0	0	1179	100
North West	886	61	546	38	9	1	1441	100
Wales	563	76	178	24	0	0	741	100
Northern Ireland	130	47	148	53	0	0	278	100
Scotland	477	40	726	60	1	0	1204	100
United Kingdom	**7533**	**58**	**5510**	**42**	**40**	**0**	**13083**	**100**

Table 55 : Number of nodes taken for invasive cases without SLNB/ with unknown nodal procedure type									
Region	Total with axillary surgery	0 node obtained		1,2,3 nodes obtained		≥4nodes obtained		Unknown	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	797	0	0	24	3	773	97	0	0
East Midlands	514	2	0	36	7	476	93	0	0
East of England	564	1	0	27	5	536	95	0	0
London	358	0	0	21	6	337	94	0	0
South East Coast	483	0	0	67	14	416	86	0	0
South Central	315	0	0	31	10	284	90	0	0
South West	437	0	0	26	6	411	94	0	0
West Midlands	475	0	0	21	4	454	96	0	0
North West	555	0	0	35	6	520	94	0	0
Wales	178	0	0	30	17	148	83	0	0
Northern Ireland	148	0	0	1	1	147	99	0	0
Scotland	727	0	0	11	2	715	98	1	0
United Kingdom	**5551**	**3**	**0**	**330**	**6**	**5217**	**94**	**1**	**0**

Table 56 : Nodal status of invasive cancers with known status					
Region	Total known nodal status	Positive		Negative	
		No.	%	No.	%
N East, Yorks & Humber	1783	400	22	1383	78
East Midlands	1048	199	19	849	81
East of England	1279	275	22	1004	78
London	1106	258	23	848	77
South East Coast	1017	236	23	781	77
South Central	898	196	22	702	78
South West	1100	228	21	872	79
West Midlands	1180	269	23	911	77
North West	1441	310	22	1131	78
Wales	741	142	19	599	81
Northern Ireland	278	74	27	204	73
Scotland	1203	275	23	928	77
United Kingdom	**13074**	**2862**	**22**	**10212**	**78**

Table 57 : Nodal status of invasive cancers with/without SLNB								
	With SLNB				Without SLNB			
	Positive		Negative		Positive		Negative	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	180	18	806	82	218	28	572	72
East Midlands	70	13	466	87	129	25	383	75
East of England	128	18	588	82	147	26	415	74
London	124	17	624	83	134	38	221	62
South East Coast	87	16	447	84	147	31	334	69
South Central	88	15	495	85	105	34	203	66
South West	103	15	560	84	122	29	305	71
West Midlands	120	17	585	83	149	31	326	69
North West	138	16	748	84	169	31	377	69
Wales	84	15	479	85	58	33	120	67
Northern Ireland	21	16	109	84	53	36	95	64
Scotland	83	17	394	83	192	26	534	74
United Kingdom	**1226**	**16**	**6301**	**84**	**1623**	**29**	**3885**	**71**

Table 58 : Number of nodes obtained for invasive cancers with positive nodal status determined from SLNB										
	1-<4 nodes obtained					4+ nodes obtained				
	1 axillary op		2+ axillary op			1 axillary op		2+ axillary op		
Region	No.	%	No.	%	Total	No.	%	No.	%	Total
N East, Yorks & Humber	19	95	1	5	20	48	30	112	70	160
East Midlands	13	100	0	0	13	19	33	38	67	57
East of England	8	100	0	0	8	48	40	72	60	120
London	16	100	0	0	16	29	27	79	73	108
South East Coast	6	100	0	0	6	22	27	59	73	81
South Central	6	86	1	14	7	45	56	36	44	81
South West	3	100	0	0	3	16	16	84	84	100
West Midlands	13	100	0	0	13	17	16	90	84	107
North West	15	100	0	0	15	23	19	100	81	123
Wales	8	100	0	0	8	14	18	62	82	76
Northern Ireland	2	100	0	0	2	6	32	13	68	19
Scotland	15	83	3	17	18	33	51	32	49	65
United Kingdom	**124**	**96**	**5**	**4**	**129**	**320**	**29**	**777**	**71**	**1097**

Table 59 : Status of invasive cases with <4 nodes obtained													
	Total with nodal status known	Nodal status determined on basis of <4 nodes		Positive Sentinel procedure(s)		Positive (Other)		Negative Sentinel procedure(s)		Negative (Other)		Unknown status	
Region		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1783	574	32.2	20	1.1	4	0.2	530	29.7	20	1.1	0	0
East Midlands	1048	358	34.2	13	1.2	2	0.2	309	29.5	34	3.2	0	0
East of England	1279	388	30.3	8	0.6	2	0.2	353	27.6	25	2.0	0	0
London	1106	439	39.7	16	1.4	1	0.1	402	36.3	20	1.8	0	0
South East Coast	1017	401	39.4	6	0.6	8	0.8	328	32.3	59	5.8	0	0
South Central	898	411	45.8	7	0.8	2	0.2	373	41.5	29	3.2	0	0
South West	1100	421	38.3	3	0.3	0	0.0	392	35.6	26	2.4	0	0
West Midlands	1180	478	40.5	13	1.1	2	0.2	444	37.6	19	1.6	0	0
North West	1441	525	36.4	15	1.0	2	0.1	475	33.0	33	2.3	0	0
Wales	741	386	52.1	8	1.1	1	0.1	348	47.0	29	3.9	0	0
Northern Ireland	278	91	32.7	2	0.7	1	0.4	88	31.7	0	0.0	0	0
Scotland	1203	222	18.5	18	1.5	0	0.0	193	16.0	11	0.9	0	0
United Kingdom	**13074**	**4694**	**35.9**	**129**	**1.0**	**25**	**0.2**	**4235**	**32.4**	**305**	**2.3**	**0**	**0**

Table 60 : Availability of lymph node status for non-invasive cancers									
	Total non-invasive cancers	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	426	157	37	0	0	269	63	0	0
East Midlands	258	97	38	0	0	161	62	0	0
East of England	358	113	32	0	0	245	68	0	0
London	295	104	35	0	0	188	64	3	1
South East Coast	286	75	26	0	0	211	74	0	0
South Central	229	60	26	0	0	169	74	0	0
South West	308	74	24	0	0	234	76	0	0
West Midlands	248	69	28	0	0	179	72	0	0
North West	331	104	31	0	0	227	69	0	0
Wales	223	80	36	0	0	143	64	0	0
Northern Ireland	74	25	34	0	0	49	66	0	0
Scotland	276	74	27	0	0	201	73	1	0
United Kingdom	**3312**	**1032**	**31**	**0**	**0**	**2276**	**69**	**4**	**0**

Table 61 : Treatment for non-invasive cancers with known nodal status						
	With known nodal status		Total Conservation	With known nodal status		Total mastectomy
Region	No.	%		No.	%	
N East, Yorks & Humber	26	10	263	131	80	163
East Midlands	17	10	168	80	89	90
East of England	34	13	255	79	77	103
London	25	12	206	79	91	87
South East Coast	17	8	214	58	81	72
South Central	13	8	166	47	75	63
South West	19	8	228	55	69	80
West Midlands	28	15	193	41	75	55
North West	18	8	217	86	75	114
Wales	19	13	148	61	81	75
Northern Ireland	7	13	53	18	86	21
Scotland	2	1	194	72	88	82
United Kingdom	**225**	**10**	**2305**	**807**	**80**	**1005**

Table 62 : Nodal status of non-invasive cancers					
	Total known nodal status	Positive		Negative	
Region		No.	%	No.	%
N East, Yorks & Humber	157	0	0	157	100
East Midlands	97	0	0	97	100
East of England	113	0	0	113	100
London	104	1	1	103	99
South East Coast	75	0	0	75	100
South Central	60	3	5	57	95
South West	74	0	0	74	100
West Midlands	69	0	0	69	100
North West	104	1	1	103	99
Wales	80	0	0	80	100
Northern Ireland	25	0	0	25	100
Scotland	74	0	0	74	100
United Kingdom	**1032**	**5**	**0**	**1027**	**100**

Table 63 : Average number of nodes obtained (non-invasive cancers)							
	Total with nodal status known	Conservation			Mastectomy		
Region		Mean	Median	Maximum	Mean	Median	Maximum
N East, Yorks & Humber	157	3	3	10	4	4	21
East Midlands	97	4	4	12	5	4	13
East of England	113	3	2	8	4	3	25
London	104	2	2	7	4	3	14
South East Coast	75	2	1	9	4	3	14
South Central	60	3	3	7	5	4	35
South West	74	4	3	10	4	4	12
West Midlands	69	2	2	7	3	2	11
North West	104	4	3	12	4	4	20
Wales	80	3	2	7	3	2	8
Northern Ireland	25	2	1	3	5	4	14
Scotland	74	3	3	4	4	4	11
United Kingdom	**1032**	**3**	**2**	**12**	**4**	**4**	**35**

Table 64 : Sentinel lymph node procedure for non-invasive cancers with a mastectomy and known nodal status									
	With SLNB		Without SLNB		Unknown SLNB		Total non-invasive cancers with surgery	Total with known nodal status	% determined on basis of SLNB
Region	No.	%	No.	%	No.	%			
N East, Yorks & Humber	54	33	75	46	2	1.2	163	131	41
East Midlands	29	32	51	57	0	0.0	90	80	36
East of England	47	46	32	31	0	0.0	103	79	59
London	55	63	23	26	1	1.1	87	79	70
South East Coast	25	35	33	46	0	0.0	72	58	43
South Central	24	38	22	35	1	1.6	63	47	51
South West	17	21	38	48	0	0.0	80	55	31
West Midlands	29	53	12	22	0	0.0	55	41	71
North West	58	51	27	24	1	0.9	114	86	67
Wales	46	61	15	20	0	0.0	75	61	75
Northern Ireland	8	38	10	48	0	0.0	21	18	44
Scotland	27	33	45	55	0	0.0	82	72	38
United Kingdom	**419**	**42**	**383**	**38**	**5**	**0.5**	**1005**	**807**	**52**

Table 65 : Sentinel lymph node procedure for non-invasive cancers with conservation surgery and known nodal status									
	With SLNB		Without SLNB		Unknown SLNB		Total non-invasive cancers with surgery	Total with known nodal status	% determined on basis of SLNB
Region	No.	%	No.	%	No.	%			
N East, Yorks & Humber	19	7	6	2	1	0.4	263	26	73
East Midlands	5	3	12	7	0	0.0	168	17	29
East of England	24	9	10	4	0	0.0	255	34	71
London	21	10	4	2	0	0.0	206	25	84
South East Coast	12	6	5	2	0	0.0	214	17	71
South Central	11	7	2	1	0	0.0	166	13	85
South West	13	6	5	2	1	0.4	228	19	68
West Midlands	0	14	1	1	0	0.0	193	28	96
North West	12	6	6	3	0	0.0	217	18	67
Wales	14	9	5	3	0	0.0	148	19	74
Northern Ireland	7	13	0	0	0	0.0	53	7	100
Scotland	2	1	0	0	0	0.0	194	2	100
United Kingdom	**167**	**7**	**56**	**2**	**2**	**0.1**	**2305**	**225**	**74**

Table 66 : Grade of invasive cancers												
	Grade I		Grade II		Grade III		Not assessable		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	459	25	985	55	350	19	4	0	8	0	1806	100
East Midlands	291	27	580	54	185	17	3	0	6	1	1065	100
East of England	300	23	714	55	280	22	3	0	2	0	1299	100
London	308	27	594	52	227	20	8	1	8	1	1145	100
South East Coast	258	25	567	54	210	20	6	1	4	0	1045	100
South Central	223	24	493	54	190	21	5	1	7	1	918	100
South West	333	30	562	50	219	19	4	0	7	1	1125	100
West Midlands	310	26	611	51	261	22	4	0	4	0	1190	100
North West	397	27	756	52	293	20	4	0	8	1	1458	100
Wales	206	27	403	54	137	18	0	0	7	1	753	100
Northern Ireland	63	23	135	48	79	28	0	0	3	1	280	100
Scotland	265	22	654	54	281	23	1	0	12	1	1213	100
United Kingdom	**3413**	**26**	**7054**	**53**	**2712**	**20**	**42**	**0**	**76**	**1**	**13297**	**100**

Table 67 : Data completeness for invasive cancers (with surgery)									
	Unknown invasive size		Unknown nodal status		Unknown grade		Unknown NPI*		Total invasive
Region	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	16	0.9	23	1.3	8	0.4	41	2.3	1806
East Midlands	13	1.2	17	1.6	6	0.6	33	3.1	1065
East of England	15	1.2	20	1.5	2	0.2	37	2.8	1299
London	16	1.4	39	3.4	8	0.7	60	5.2	1145
South East Coast	6	0.6	28	2.7	4	0.4	39	3.7	1045
South Central	15	1.6	20	2.2	7	0.8	37	4.0	918
South West	19	1.7	25	2.2	7	0.6	50	4.4	1125
West Midlands	10	0.8	10	0.8	4	0.3	24	2.0	1190
North West	22	1.5	17	1.2	8	0.5	45	3.1	1458
Wales	8	1.1	12	1.6	7	0.9	25	3.3	753
Northern Ireland	4	1.4	2	0.7	3	1.1	7	2.5	280
Scotland	16	1.3	10	0.8	12	1.0	27	2.2	1213
United Kingdom	**160**	**1.2**	**223**	**1.7**	**76**	**0.6**	**425**	**3.2**	**13297**

* NPI is unknown if size, grade or nodal status are unknown or grade if not assessible

Table 68 : NPI Group of invasive cancers												
	EPG		GPG		MPG1		MPG2		PPG		Total with known NPI	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	366	21	711	40	398	23	171	10	119	7	1765	100
East Midlands	252	24	396	38	233	23	103	10	48	5	1032	100
East of England	237	19	478	38	327	26	143	11	77	6	1262	100
London	222	20	376	35	293	27	133	12	61	6	1085	100
South East Coast	197	20	376	37	272	27	104	10	57	6	1006	100
South Central	191	22	304	35	224	25	105	12	57	6	881	100
South West	274	25	377	35	240	22	120	11	64	6	1075	100
West Midlands	253	22	416	36	292	25	114	10	91	8	1166	100
North West	323	23	500	35	325	23	164	12	101	7	1413	100
Wales	177	24	271	37	173	24	72	10	35	5	728	100
Northern Ireland	48	18	87	32	69	25	38	14	31	11	273	100
Scotland	218	18	445	38	288	24	167	14	68	6	1186	100
United Kingdom	**2758**	**21**	**4737**	**37**	**3134**	**24**	**1434**	**11**	**809**	**6**	**12872**	**100**

Table 69 : Proportion of women referred to consultant surgeons according to annual caseload of surgeon												
	Total (referred)	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
Region		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2287	88	4	114	5	221	10	1634	71	230	10
East Midlands	1366	29	2	70	5	79	6	1253	88	0	0
East of England	1697	47	3	96	6	79	5	1510	87	0	0
London	1468	87	6	223	15	191	13	880	59	105	7
South East Coast	1367	38	3	157	11	29	2	1038	76	105	8
South Central	1166	44	4	26	2	28	2	1001	83	101	8
South West	1462	48	3	93	6	189	13	1132	77	0	0
West Midlands	1472	39	3	65	4	283	19	1085	74	0	0
North West	1818	52	3	133	7	265	14	1297	70	107	6
Wales	992	14	1	0	0	24	2	851	86	103	10
Northern Ireland	356	21	6	33	9	149	41	162	44	0	0
Scotland	1517	63	4	125	8	68	4	1040	69	221	15
United Kingdom	**16968**	**466**	**3**	**1026**	**6**	**1681**	**10**	**13019**	**76**	**973**	**6**

Table 70 : Annual screening surgical caseload per surgeon (2006/07 – 2008/09)											
Region	Total surgeons	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	103	51	50	9	9	14	14	27	26	2	2
East Midlands	53	24	45	5	9	3	6	21	40	0	0
East of England	92	50	54	8	9	4	4	30	33	0	0
London	119	75	63	15	13	14	12	15	13	0	0
South East Coast	77	47	61	4	5	6	8	20	26	0	0
South Central	64	36	56	5	8	3	5	19	30	1	2
South West	66	30	45	8	12	6	9	21	32	1	2
West Midlands	74	32	43	9	12	9	12	24	32	0	0
North West	87	38	44	10	11	12	14	27	31	0	0
Wales	25	9	36	0	0	1	4	14	56	1	4
Northern Ireland	18	7	39	4	22	4	22	3	17	0	0
United Kingdom	**630**	**257**	**41**	**72**	**11**	**76**	**12**	**220**	**35**	**5**	**1**

Scotland has not been included as caseload data has only been available for the last 2 years

Table 71 : Explanations for surgeons treating less than 10 screening cases (2006/07 – 2008/09)									
Region	Number surgeons with caseload <10	Other caseload >30 year	Joined NHSBSP	Left NHSBSP	Plastic surgeon	Private practice	Surgeon from other region	No information	Other
N East, Yorks & Humber	51	16	5	9	2	1	12	4	2
East Midlands	24	5	0	0	3	1	14	1	0
East of England	50	4	0	3	6	8	21	3	5
London	75	19	1	3	4	17	18	11	2
South East Coast	47	12	6	4	1	0	20	3	1
South Central	36	4	2	0	5	7	16	2	0
South West	30	4	2	1	1	0	12	9	1
West Midlands	32	10	3	3	3	3	4	3	3
North West	38	20	1	1	1	4	4	4	3
Wales	9	5	0	0	1	0	2	1	0
Northern Ireland	7	2	1	0	0	0	1	2	1
United Kingdom	**257**	**76**	**18**	**18**	**25**	**24**	**37**	**42**	**17**

Scotland has not been included as caseload data has only been available for the last 2 years

Table 72 : Annual screening surgical caseload per surgeon											
Region	Total surgeons	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	73	24	33	8	11	9	12	30	41	2	3
East Midlands	45	14	31	6	13	3	7	22	49	0	0
East of England	62	22	35	7	11	3	5	30	48	0	0
London	79	35	44	16	20	8	10	19	24	1	1
South East Coast	54	21	39	10	19	1	2	21	39	1	2
South Central	41	18	44	2	5	1	2	19	46	1	2
South West	47	12	26	6	13	8	17	21	45	0	0
West Midlands	55	15	27	4	7	12	22	24	44	0	0
North West	66	19	29	8	12	11	17	27	41	1	2
Wales	21	5	24	0	0	1	5	14	67	1	5
Northern Ireland	16	4	25	2	13	6	38	4	25	0	0
Scotland	54	21	39	10	19	3	6	19	35	1	2
United Kingdom	**549**	**149**	**27**	**72**	**13**	**69**	**13**	**251**	**46**	**8**	**1**

The surgeons in each region are credited with their total UK screening caseload.

Surgeons working in more than one region appear in each of these regions' figures.

Table 73 : Screening cases per surgeon					
Region	**Total surgeons**	**Mean**	**Minimum**	**Median**	**Maximum**
N East, Yorks & Humber	73	31	1	24	130
East Midlands	45	32	1	28	83
East of England	62	28	1	27	92
London	79	19	1	12	105
South East Coast	54	25	1	18	105
South Central	41	29	1	28	101
South West	47	31	1	25	85
West Midlands	55	27	1	26	73
North West	66	28	1	24	107
Wales	21	47	1	55	103
Northern Ireland	16	23	1	25	50
Scotland	54	28	1	13	221
United Kingdom	**549**	**31**	**1**	**27**	**221**

Table 74 : Number of surgeons treating each woman									
	Total cancers	**Number of women treated by…**							
		No referral		**1 surgeon**		**2 surgeons**		**3+ surgeons**	
Region		**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	2290	3	0	2287	100	0	0	0	0
East Midlands	1366	0	0	1301	95	65	5	0	0
East of England	1707	10	1	1663	97	33	2	1	0
London	1491	23	2	1450	97	18	1	0	0
South East Coast	1368	1	0	1367	100	0	0	0	0
South Central	1175	9	1	1133	96	32	3	1	0
South West	1468	6	0	1462	100	0	0	0	0
West Midlands	1478	6	0	1472	100	0	0	0	0
North West	1835	17	1	1783	97	34	2	1	0
Wales	992	0	0	992	100	0	0	0	0
Northern Ireland	358	2	1	347	97	9	3	0	0
Scotland	1517	0	0	1517	100	0	0	0	0
United Kingdom	**17045**	**77**	**0**	**16774**	**98**	**191**	**1**	**3**	**0**

Table 75 : Explanations for surgeons treating less than 10 screening cases in 2008/09									
Region	**Number surgeons with caseload <10**	**Other caseload >30 year**	**Joined NHSBSP**	**Left NHSBSP**	**Plastic surgeon**	**Private practice**	**Surgeon from other region**	**No information**	**Other**
N East, Yorks & Humber	24	8	5	3	0	1	5	0	2
East Midlands	14	0	0	0	3	0	11	0	0
East of England	22	3	1	0	4	2	7	2	3
London	35	10	1	2	2	12	7	1	0
South East Coast	21	2	0	1	1	0	17	0	0
South Central	18	1	1	0	4	2	10	0	0
South West	12	3	1	0	1	0	7	0	0
West Midlands	15	5	3	2	2	0	1	0	2
North West	19	12	1	0	1	0	2	0	3
Wales	5	3	0	0	1	0	1	0	0
Northern Ireland	4	1	1	0	0	0	1	0	1
Scotland	21	14	2	1	0	0	2	1	1
United Kingdom	**149**	**55**	**14**	**6**	**17**	**14**	**27**	**4**	**12**

Table 76 : Repeat operations of surgically treated invasive and non-invasive cancers						
	Invasive			Non-invasive		
Region	Total	Re-op	%	Total	Re-op	%
N East, Yorks & Humber	1806	444	25	426	117	27
East Midlands	1065	218	20	258	81	31
East of England	1299	327	25	358	99	28
London	1144	284	25	293	85	29
South East Coast	1045	213	20	286	85	30
South Central	918	183	20	229	62	27
South West	1125	278	25	308	90	29
West Midlands	1190	283	24	248	71	29
North West	1458	346	24	331	90	27
Wales	753	183	24	223	69	31
Northern Ireland	280	55	20	74	25	34
Scotland	1213	245	20	276	51	18
United Kingdom	**13296**	**3059**	**23**	**3310**	**925**	**28**

Table 77 : Number of therapeutic operations (invasive cancers) with initial BCS and a non-operative diagnosis														
	1		2		3		4+		Unknown		Total cancers		Repeat 2+ ops	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
N East, Yorks & Humber	997	73	338	25	30	2	2	0	0	0	1367	100	370	27
East Midlands	588	76	171	22	11	1	1	0	0	0	771	100	183	24
East of England	755	75	238	23	18	2	2	0	0	0	1013	100	258	25
London	659	74	207	23	22	2	4	0	0	0	892	100	233	26
South East Coast	646	78	174	21	9	1	2	0	0	0	831	100	185	22
South Central	554	79	132	19	18	3	0	0	0	0	704	100	150	21
South West	684	75	218	24	16	2	0	0	0	0	918	100	234	25
West Midlands	717	75	226	24	12	1	0	0	0	0	955	100	238	25
North West	809	74	258	24	21	2	1	0	0	0	1089	100	280	26
Wales	447	74	144	24	9	1	1	0	0	0	601	100	154	26
Northern Ireland	165	77	47	22	3	1	0	0	0	0	215	100	50	23
Scotland	723	77	202	22	9	1	0	0	1	0	935	100	211	23
United Kingdom	**7744**	**75**	**2355**	**23**	**178**	**2**	**13**	**0**	**1**	**0**	**10291**	100	**2546**	**25**

Table 78 : Number of therapeutic operations (non-invasive cancers) with initial BCS and a non-operative diagnosis														
	1		2		3		4+		Unknown		Total cancers		Repeat 2+ ops	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
N East, Yorks & Humber	186	68	75	27	12	4	0	0	0	0	273	100	87	32
East Midlands	105	66	48	30	7	4	0	0	0	0	160	100	55	34
East of England	150	72	47	23	10	5	0	0	0	0	207	100	57	28
London	124	69	44	24	12	7	0	0	1	1	181	100	56	31
South East Coast	116	65	55	31	7	4	1	1	0	0	179	99	63	35
South Central	100	67	45	30	4	3	0	0	0	0	149	100	49	33
South West	136	67	55	27	10	5	1	0	0	0	202	100	66	33
West Midlands	125	73	42	24	5	3	0	0	0	0	172	100	47	27
North West	146	73	49	25	3	2	1	1	0	0	199	99	53	27
Wales	106	68	39	25	10	6	1	1	0	0	156	99	50	32
Northern Ireland	33	63	18	35	1	2	0	0	0	0	52	100	19	37
Scotland	128	76	35	21	6	4	0	0	0	0	169	100	41	24
United Kingdom	**1455**	**69**	**552**	**26**	**87**	**4**	**4**	**0**	**1**	**0**	**2099**	100	**643**	**31**

Table 79 : Number of therapeutic operations for invasive cancers with B5b (invasive) core biopsy result												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	1266	79	323	20	22	1	0	0	1611	100	345	21
East Midlands	805	83	153	16	8	1	0	0	966	100	161	17
East of England	925	79	237	20	12	1	0	0	1174	100	249	21
London	812	79	185	18	31	3	1	0	1029	100	216	21
South East Coast	714	82	141	16	11	1	0	0	866	100	152	18
South Central	692	83	125	15	15	2	0	0	832	100	140	17
South West	784	80	181	18	19	2	0	0	984	100	200	20
West Midlands	840	80	203	19	12	1	0	0	1055	100	215	20
North West	935	80	228	19	10	1	0	0	1173	100	238	20
Wales	560	78	146	20	9	1	0	0	715	100	155	22
Northern Ireland	137	83	26	16	2	1	0	0	165	100	28	17
Scotland	927	82	189	17	9	1	1	0	1126	100	198	18
United Kingdom	**9397**	**80**	**2137**	**18**	**160**	**1**	**2**	**0**	**11696**	**100**	**2297**	**20**

Table 80 : Number of therapeutic operations for invasive cancers with C5 (no B5) cytology result												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	44	76	11	19	3	5	0	0	58	100	14	24
East Midlands	6	100	0	0	0	0	0	0	6	100	0	0
East of England	6	67	2	22	1	11	0	0	9	100	3	33
London	16	64	9	36	0	0	0	0	25	100	9	36
South East Coast	73	88	10	12	0	0	0	0	83	100	10	12
South Central	15	94	1	6	0	0	0	0	16	100	1	6
South West	18	60	12	40	0	0	0	0	30	100	12	40
West Midlands	31	86	5	14	0	0	0	0	36	100	5	14
North West	133	82	27	17	3	2	0	0	163	100	30	18
Wales	0	-	0	-	0	-	0	-	0	-	0	-
Northern Ireland	84	79	21	20	1	1	0	0	106	100	22	21
Scotland	0	0	1	100	0	0	0	0	1	100	1	100
United Kingdom	**426**	**80**	**99**	**19**	**8**	**2**	**0**	**0**	**533**	**100**	**107**	**20**

Table 81 : Number of therapeutic operations for invasive cancers with B5a (non-invasive) core biopsy result												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	37	38	54	56	6	6	0	0	97	100	60	62
East Midlands	32	47	32	47	4	6	0	0	68	100	36	53
East of England	25	36	38	54	7	10	0	0	70	100	45	64
London	25	38	40	62	0	0	0	0	65	100	40	62
South East Coast	39	54	32	44	1	1	0	0	72	100	33	46
South Central	20	48	18	43	4	10	0	0	42	100	22	52
South West	38	46	45	54	0	0	0	0	83	100	45	54
West Midlands	27	39	41	59	1	1	0	0	69	100	42	61
North West	38	44	40	46	9	10	0	0	87	100	49	56
Wales	8	31	17	65	1	4	0	0	26	100	18	69
Northern Ireland	4	50	4	50	0	0	0	0	8	100	4	50
Scotland	29	48	31	52	0	0	0	0	60	100	31	52
United Kingdom	**322**	**43**	**392**	**52**	**33**	**4**	**0**	**0**	**747**	**100**	**425**	**57**

Table 82 : Number of therapeutic operations for non-invasive or micro-invasive cancers with B5a (non-invasive) core biopsy result												
	1		2		3+		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	285	75	85	22	12	3	0	0	382	100	97	25
East Midlands	171	74	54	23	7	3	0	0	232	100	61	26
East of England	218	76	59	21	10	3	0	0	287	100	69	24
London	180	72	54	22	12	5	3	1	249	100	66	27
South East Coast	174	73	56	24	8	3	0	0	238	100	64	27
South Central	145	73	50	25	5	3	0	0	200	100	55	28
South West	189	72	62	24	11	4	0	0	262	100	73	28
West Midlands	158	73	53	25	5	2	0	0	216	100	58	27
North West	222	77	62	21	6	2	0	0	290	100	68	23
Wales	151	74	43	21	11	5	0	0	205	100	54	26
Northern Ireland	40	70	16	28	1	2	0	0	57	100	17	30
Scotland	192	82	37	16	6	3	0	0	235	100	43	18
United Kingdom	**2125**	**74**	**631**	**22**	**94**	**3**	**3**	**0**	**2853**	**100**	**725**	**25**

Table 83 : Proportion of invasive cancers with axillary surgery at the first and later operation																		
	B5b						C5 only						B5a					
	Total Ax		1st op		Later op		Total Ax		1st op		Later op		Total Ax		1st op		Later op	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1611	99	1597	99	2	0	58	100	58	100	0	0	97	96	45	46	48	49
East Midlands	966	99	958	99	0	0	6	83	5	83	0	0	68	93	31	46	32	47
East of England	1174	99	1163	99	0	0	9	100	8	89	1	11	70	96	39	56	28	40
London	1028	98	999	97	5	0	25	100	22	88	3	12	65	85	22	34	33	51
South East Coast	866	98	846	98	4	0	83	96	80	96	0	0	72	90	36	50	29	40
South Central	832	99	819	98	2	0	16	100	16	100	0	0	42	90	24	57	14	33
South West	984	99	971	99	0	0	30	100	30	100	0	0	83	92	37	45	39	47
West Midlands	1055	100	1049	99	2	0	36	100	36	100	0	0	69	97	32	46	35	51
North West	1173	99	1154	98	10	1	163	99	162	99	0	0	87	94	41	47	41	47
Wales	715	99	708	99	0	0	0	-	0	-	0	-	26	88	9	35	14	54
Northern Ireland	165	99	163	99	0	0	106	100	104	98	2	2	8	100	5	63	3	38
Scotland	1126	99	1114	99	6	1	1	100	0	0	1	100	60	95	29	48	28	47
United Kingdom	**11695**	**99**	**11541**	**99**	**31**	**0**	**533**	**99**	**521**	**98**	**7**	**1**	**747**	**93**	**350**	**47**	**344**	**46**

Table 84 : Repeat axillary operations for invasive cancers with positive nodal status							
	Re ax op & with SLNB		Re ax op & without/unknown SLNB		Total invasive with positive nodal status	Total with repeat axillary operation	% repeat operation after SLNB
Region	No	%	No	%			
N East, Yorks & Humber	113	28	41	10	400	154	73
East Midlands	38	19	10	5	199	48	79
East of England	72	26	29	11	275	101	71
London	79	31	9	3	258	88	90
South East Coast	59	25	19	8	236	78	76
South Central	37	19	5	3	196	42	88
South West	84	37	14	6	228	98	86
West Midlands	90	33	13	5	269	103	87
North West	100	32	31	10	310	131	76
Wales	62	44	7	5	142	69	90
Northern Ireland	13	18	2	3	74	15	87
Scotland	35	13	42	15	275	77	45
United Kingdom	**782**	**27**	**222**	**8**	**2862**	**1004**	**78**

Table 85 : Any neo-adjuvant therapy (2008/09)							
	Had treatment		Did not have treatment		Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	71	1	2219	99	0	0	2290
East Midlands	45	3	1321	97	0	0	1366
East of England	38	2	1669	98	0	0	1707
London	39	3	1452	97	0	0	1491
South East Coast	48	4	1320	96	0	0	1368
South Central	28	2	1033	88	114	10	1175
South West	11	1	1457	99	0	0	1468
West Midlands	9	1	1452	99	0	0	1478
North West	15	1	1598	89	196	11	1835
Wales	20	0	972	100	0	0	992
Northern Ireland	6	1	352	99	0	0	358
Scotland	28	1	978	64	526	35	1517
United Kingdom	**583**	**2**	**15926**	**93**	**836**	**5**	**17045**

Table 86 : Neo-adjuvant chemotherapy (2008/09)							
	Had treatment		Did not have treatment		Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	29	1	2261	99	0	0	2290
East Midlands	45	3	1321	97	0	0	1366
East of England	38	2	1669	98	0	0	1707
London	39	3	1452	97	0	0	1491
South East Coast	48	4	1320	96	0	0	1368
South Central	28	2	1033	88	114	10	1175
South West	11	1	1457	99	0	0	1468
West Midlands	9	1	1469	99	0	0	1478
North West	15	1	1624	89	196	11	1835
Wales	3	0	989	100	0	0	992
Northern Ireland	5	1	353	99	0	0	358
Scotland	13	1	978	64	526	35	1517
United Kingdom	**283**	**2**	**15926**	**93**	**836**	**5**	**17045**

Table 87 : Neo-adjuvant herceptin (2008/09)							
	Had treatment		Did not have treatment		Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	1	0	2289	100	0	0	2290
East Midlands	0	0	1366	100	0	0	1366
East of England	1	0	1706	100	0	0	1707
London	6	0	1485	100	0	0	1491
South East Coast	5	0	1363	100	0	0	1368
South Central	2	0	1095	93	78	7	1175
South West	0	0	1468	100	0	0	1468
West Midlands	0	0	1478	100	0	0	1478
North West	2	0	1636	89	197	11	1835
Wales	0	0	992	100	0	0	992
Northern Ireland	0	0	358	100	0	0	358
Scotland	2	0	988	65	527	35	1517
United Kingdom	**19**	**0**	**16224**	**95**	**802**	**5**	**17045**

Table 88 : Neo-adjuvant hormone therapy (2008/09)							
	Had treatment		Did not have treatment		Unknown		Total
Region	No.	%	No.	%	No.	%	
N East, Yorks & Humber	47	2	2243	98	0	0	2290
East Midlands	6	0	1360	100	0	0	1366
East of England	23	1	1684	99	0	0	1707
London	52	3	1439	97	0	0	1491
South East Coast	92	7	1276	93	0	0	1368
South Central	7	1	1095	93	73	6	1175
South West	28	2	1440	98	0	0	1468
West Midlands	18	1	1460	99	0	0	1478
North West	29	2	1612	88	194	11	1835
Wales	17	2	975	98	0	0	992
Northern Ireland	1	0	357	100	0	0	358
Scotland	17	1	973	64	527	35	1517
United Kingdom	**337**	**2**	**15914**	**93**	**794**	**5**	**17045**

APPENDIX F: ADJUVANT THERAPY DATA TABLES (89 – 137)

ADJUVANT THERAPY AUDIT FOR 1 APRIL 2007 – 31 MARCH 2008 WITH TUMOUR DATA FROM THE 2006/07 AUDIT OF SCREEN-DETECTED BREAST CANCERS

Table 89 : 2007/08 cases supplied to the NHSBSP adjuvant audit

Region	Total Cancers	No data supplied		Excluded cases		Total Eligible		Complete data*	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2295	4	0	218	9	2073	90	1598	70
East Midlands	1229	0	0	55	4	1174	96	1174	96
East of England	1699	241	14	82	5	1376	81	1227	72
London	1482	0	0	133	9	1349	91	1263	85
South East Coast	1332	18	1	370	28	944	71	257	19
South Central	1137	0	0	52	5	1085	95	1042	92
South West	1567	0	0	53	3	1514	97	1373	88
West Midlands	1448	62	4	182	13	1204	83	1024	71
North West	1931	0	0	100	5	1831	95	1473	76
Wales	963	0	0	5	1	958	99	928	96
Northern Ireland	327	73	22	1	0	253	77	246	75
Scotland	1395	0	0	2	0	1393	100	1336	96
United Kingdom	**16805**	**398**	**2**	**1253**	**7**	**15154**	**90**	**12941**	**77**

* cases which are eligible and with complete RT, CT and HT data

Table 90 : Data completeness for adjuvant therapy

Region	Total Eligible	Complete RT		Complete CT		Complete HT		Complete RT,CT & HT	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2073	1777	86	2003	97	1907	92	1598	77
East Midlands	1174	1174	100	1174	100	1174	100	1174	100
East of England	1376	1313	95	1313	95	1291	94	1227	89
London	1349	1306	97	1307	97	1317	98	1263	94
South East Coast	944	282	30	924	98	918	97	257	27
South Central	1085	1074	99	1059	98	1054	97	1042	96
South West	1514	1449	96	1487	98	1447	96	1373	91
West Midlands	1204	1153	96	1088	90	1092	91	1024	85
North West	1831	1713	94	1621	89	1685	92	1473	80
Wales	958	957	100	956	100	929	97	928	97
Northern Ireland	253	251	99	253	100	248	98	246	97
Scotland	1393	1386	99	1359	98	1367	98	1336	96
United Kingdom	**15154**	**13835**	**91**	**14544**	**96**	**14429**	**95**	**12941**	**85**

Table 91 : ER status of included cases

Region	Invasive						Total Invasive	Non-invasive						Total Non-inv
	ER Positive		ER Negative		Not done or Unknown			ER positive		ER Negative		Not done or Unknown		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
N East, Yorks & Humber	1438	89	171	11	5	0	1614	199	46	60	14	178	41	437
East Midlands	814	89	91	10	5	1	910	100	42	54	23	86	36	240
East of England	971	90	100	9	8	1	1079	67	24	23	8	194	68	284
London	936	90	80	8	27	3	1043	113	40	42	15	130	46	285
South East Coast	586	79	56	8	101	14	743	89	46	22	11	83	43	194
South Central	791	89	73	8	25	3	889	74	40	23	12	89	48	186
South West	1062	89	118	10	15	1	1195	126	41	30	10	149	49	305
West Midlands	893	89	104	10	1	0	998	100	50	44	22	55	28	199
North West	1318	88	150	10	36	2	1504	166	55	67	22	68	23	301
Wales	685	89	79	10	3	0	767	47	25	13	7	126	68	186
Northern Ireland	170	88	23	12	0	0	193	48	84	7	12	2	4	57
Scotland	1022	89	110	10	13	1	1145	119	49	26	11	98	40	243
United Kingdom	**10686**	**88**	**1155**	**10**	**239**	**2**	**12080**	**1248**	**43**	**411**	**14**	**1258**	**43**	**2917**

Table 92 : PgR status of invasive and non-invasive cancers														
	Invasive						Total Invasive	Non-invasive						Total Non-inv
	PgR Positive		PgR Negative		Not done or Unknown			PgR positive		PgR Negative		Not done or Unknown		
Region	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
N East, Yorks & Humber	886	55	289	18	439	27	1614	99	23	70	16	268	61	437
East Midlands	358	39	156	17	396	44	910	20	8	51	21	169	70	240
East of England	410	38	172	16	497	46	1079	35	12	25	9	224	79	284
London	823	79	191	18	29	3	1043	94	33	50	18	141	49	285
South East Coast	413	56	139	19	191	26	743	73	38	34	18	87	45	194
South Central	556	63	151	17	182	20	889	35	19	27	15	124	67	186
South West	636	53	239	20	320	27	1195	63	21	41	13	201	66	305
West Midlands	667	67	177	18	154	15	998	65	33	39	20	95	48	199
North West	1149	76	306	20	49	3	1504	144	48	89	30	68	23	301
Wales	247	32	112	15	408	53	767	9	5	10	5	167	90	186
Northern Ireland	100	52	26	13	67	35	193	28	49	10	18	19	33	57
Scotland	698	61	210	18	237	21	1145	39	16	22	9	182	75	243
United Kingdom	**6943**	**57**	**2168**	**18**	**2969**	**25**	**12080**	**704**	**24**	**468**	**16**	**1745**	**60**	**2917**

Table 93 : PgR status of ER negative invasive cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	3	143	84	23	13	171	100
East Midlands	3	3	73	80	15	16	91	100
East of England	5	5	82	82	13	13	100	100
London	2	3	78	98	0	0	80	100
South East Coast	3	5	51	91	2	4	56	100
South Central	3	4	57	78	13	18	73	100
South West	13	11	89	75	16	14	118	100
West Midlands	1	1	100	96	3	3	104	100
North West	11	7	139	93	0	0	150	100
Wales	4	5	61	77	14	18	79	100
Northern Ireland	0	0	17	74	6	26	23	100
Scotland	4	4	100	91	6	5	110	100
United Kingdom	**54**	**5**	**990**	**86**	**111**	**10**	**1155**	**100**

Table 94 : HER-2 status of invasive cancers										
	Positive		Negative		Borderline		Not done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	164	10	1350	84	0	0	100	6	1614	100
East Midlands	117	13	766	84	0	0	27	3	910	100
East of England	100	9	846	78	6	1	127	12	1079	100
London	97	9	762	73	6	1	178	17	1043	100
South East Coast	41	6	369	50	0	0	333	45	743	100
South Central	106	12	626	70	0	0	157	18	889	100
South West	125	10	855	72	0	0	215	18	1195	100
West Midlands	107	11	823	82	0	0	68	7	998	100
North West	198	13	1097	73	1	0	208	14	1504	100
Wales	62	8	597	78	0	0	108	14	767	100
Northern Ireland	27	14	142	74	0	0	24	12	193	100
Scotland	161	14	956	83	0	0	28	2	1145	100
United Kingdom	**1305**	**11**	**9189**	**76**	**13**	**0**	**1573**	**13**	**12080**	**100**

Table 95 : Radiotherapy															
	Invasive					Non-invasive					Overall				
	RT		No RT		Invasive total	RT		No RT		Non-invasive total	RT		No RT		Overall total
Region	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
NEYH	1022	75	343	25	1365	171	44	220	56	391	1202	68	575	32	1777
East Midlands	702	77	208	23	910	104	43	136	57	240	817	70	357	30	1174
East of England	757	74	268	26	1025	105	38	170	62	275	868	66	445	34	1313
London	769	76	247	24	1016	104	39	166	61	270	883	68	423	32	1306
South East Coast	155	73	57	27	212	28	42	39	58	67	185	66	97	34	282
South Central	671	76	210	24	881	51	28	133	72	184	728	68	346	32	1074
South West	909	80	228	20	1137	95	32	204	68	299	1009	70	440	30	1449
West Midlands	837	87	120	13	957	97	51	93	49	190	936	81	217	19	1153
North West	1080	76	344	24	1424	113	42	153	58	266	1203	70	510	30	1713
Wales	609	80	157	20	766	78	42	108	58	186	690	72	267	28	957
Northern Ireland	155	81	37	19	192	24	43	32	57	56	182	73	69	27	251
Scotland	850	75	288	25	1138	121	50	122	50	243	973	70	413	30	1386
United Kingdom	**8516**	**77**	**2507**	**23**	**11023**	**1091**	**41**	**1576**	**59**	**2667**	**9676**	**70**	**4159**	**30**	**13835**

Table 96 : Chemotherapy															
	Invasive					Non-invasive					Overall				
	CT		No CT		Invasive total	CT		No CT		Non-invasive total	CT		No CT		Overall total
Region	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
NEYH	419	27	1150	73	1569	3	1	409	99	412	422	21	1581	79	2003
East Midlands	244	27	666	73	910	0	0	240	100	240	247	21	927	79	1174
East of England	207	20	826	80	1033	1	0	267	100	268	208	16	1105	84	1313
London	288	28	724	72	1012	2	1	272	99	274	290	22	1017	78	1307
South East Coast	150	21	576	79	726	0	0	191	100	191	150	16	774	84	924
South Central	226	26	643	74	869	2	1	178	99	180	228	22	831	78	1059
South West	268	23	903	77	1171	0	0	303	100	303	268	18	1219	82	1487
West Midlands	255	28	649	72	904	1	1	176	99	177	256	24	832	76	1088
North West	322	24	1011	76	1333	1	0	263	100	264	323	20	1298	80	1621
Wales	181	24	584	76	765	2	1	184	99	186	183	19	773	81	956
Northern Ireland	43	22	150	78	193	0	0	57	100	57	43	17	210	83	253
Scotland	332	30	783	70	1115	2	1	238	99	240	334	25	1025	75	1359
United Kingdom	**2935**	**25**	**8665**	**75**	**11600**	**14**	**1**	**2778**	**99**	**2792**	**2952**	**20**	**11592**	**80**	**14544**

Table 97 : Hormone therapy															
	Invasive					Non-invasive					Overall				
	HT		No HT		Invasive total	HT		No HT		Non-invasive total	HT		No HT		Overall total
Region	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
NEYH	1337	89	173	11	1510	59	16	316	84	375	1399	73	508	27	1907
East Midlands	753	83	157	17	910	92	38	148	62	240	851	72	323	28	1174
East of England	815	79	214	21	1029	23	9	228	91	251	841	65	450	35	1291
London	862	85	157	15	1019	38	14	239	86	277	903	69	414	31	1317
South East Coast	629	87	93	13	722	55	29	134	71	189	686	75	232	25	918
South Central	762	88	105	12	867	33	19	145	81	178	799	76	255	24	1054
South West	1030	88	138	12	1168	47	18	219	82	266	1082	75	365	25	1447
West Midlands	805	89	100	11	905	37	21	143	79	180	844	77	248	23	1092
North West	1171	85	213	15	1384	98	36	178	64	276	1278	76	407	24	1685
Wales	672	88	90	12	762	24	15	138	85	162	697	75	232	25	929
Northern Ireland	167	88	23	12	190	46	84	9	16	55	215	87	33	13	248
Scotland	1014	90	112	10	1126	28	12	209	88	237	1043	76	324	24	1367
United Kingdom	**10017**	**86**	**1575**	**14**	**11592**	**580**	**22**	**2106**	**78**	**2686**	**10638**	**74**	**3791**	**26**	**14429**

Table 98 : Radiotherapy by number of operations									
Region	Had RT		Total No Surgery	1 operation		Total 1 op	> 1 operation		Total Re-op
	No.	%		No.	%		No.	%	
N East, Yorks & Humber	6	19	32	963	61	1583	233	51	458
East Midlands	8	36	22	660	71	924	149	65	228
East of England	2	18	11	692	66	1052	174	56	313
London	8	32	25	656	66	989	219	65	335
South East Coast	3	38	8	147	20	733	35	17	203
South Central	1	17	6	571	69	825	156	61	254
South West	1	10	10	767	69	1111	241	61	393
West Midlands	0	0	8	754	79	949	182	74	247
North West	2	11	19	988	69	1440	213	57	372
Wales	0	0	9	557	75	741	133	64	208
Northern Ireland	0	-	0	153	74	206	29	62	47
Scotland	3	13	23	812	71	1148	158	71	222
United Kingdom	**34**	**20**	**173**	**7720**	**66**	**11701**	**1922**	**59**	**3280**

Table 99 : Radiotherapy by number of operations for invasive cancers									
Region	Had RT		Total No Surgery	1 operation		Total 1 op	> 1 operation		Total Re-op
	No.	%		No.	%		No.	%	
N East, Yorks & Humber	6	23	26	831	67	1243	185	54	345
East Midlands	7	54	13	578	79	736	117	73	161
East of England	2	20	10	612	72	846	143	64	223
London	7	35	20	582	75	772	180	72	251
South East Coast	3	38	8	127	21	592	25	17	143
South Central	0	0	5	529	77	687	142	72	197
South West	1	13	8	694	78	888	214	72	299
West Midlands	0	0	5	689	86	804	148	78	189
North West	1	8	13	894	75	1200	185	64	291
Wales	0	0	7	495	82	603	114	73	157
Northern Ireland	0	-	0	129	81	159	26	76	34
Scotland	3	15	20	710	75	944	137	76	181
United Kingdom	**30**	**22**	**135**	**6870**	**73**	**9474**	**1616**	**65**	**2471**

Table 100 : Radiotherapy by number of operations for non-invasive cancers									
Region	Had RT		Total No Surgery	1 operation		Total 1 op	> 1 operation		Total Re-op
	No.	%		No.	%		No.	%	
N East, Yorks & Humber	0	0	5	126	39	324	45	42	108
East Midlands	0	0	2	78	44	178	26	43	60
East of England	0	0	1	74	38	195	31	35	88
London	1	50	2	67	33	205	36	46	78
South East Coast	0	-	0	18	13	137	10	18	57
South Central	1	100	1	39	29	133	11	21	52
South West	0	0	2	70	32	216	25	29	87
West Midlands	0	0	3	63	45	141	34	62	55
North West	1	25	4	86	39	222	26	35	75
Wales	0	0	2	61	45	135	17	35	49
Northern Ireland	0	-	0	22	49	45	2	17	12
Scotland	0	0	3	100	50	200	21	53	40
United Kingdom	**3**	**12**	**25**	**804**	**38**	**2131**	**284**	**37**	**761**

Table 101 : Chemotherapy by number of operations for invasive cancers									
Region	Had CT		Total No Surgery	1 operation		Total 1 op	> 1 operation		Total Re-op
	No.	%		No.	%		No.	%	
N East, Yorks & Humber	10	38	26	286	23	1243	123	36	345
East Midlands	8	62	13	182	25	736	54	34	161
East of England	3	30	10	144	17	846	60	27	223
London	8	40	20	186	24	772	94	37	251
South East Coast	4	50	8	113	19	592	33	23	143
South Central	0	0	5	150	22	687	76	39	197
South West	0	0	8	170	19	888	98	33	299
West Midlands	0	0	5	196	24	804	59	31	189
North West	4	31	13	229	19	1200	89	31	291
Wales	0	0	7	133	22	603	48	31	157
Northern Ireland	0	-	0	33	21	159	10	29	34
Scotland	2	10	20	264	28	944	66	36	181
United Kingdom	**39**	**29**	**135**	**2086**	**22**	**9474**	**810**	**33**	**2471**

Table 102 : Invasive cancers with adjuvant therapy by age							
Age group	Radiotherapy		Chemotherapy		Hormone Therapy		Total
	No.	%	No.	%	No.	%	
<=48	0	-	0	-	0	-	0
49	112	81	57	41	120	87	138
50-52	1024	80	467	37	1135	89	1279
53-55	790	79	374	37	839	84	1001
56-58	1030	80	419	33	1087	85	1285
59-61	1395	81	447	26	1494	86	1731
62-64	1173	80	343	23	1267	86	1473
65-67	1084	75	252	17	1246	86	1448
68-70	1014	71	182	13	1243	87	1425
71+	405	67	39	6	536	88	609
Total	**8027**	**77**	**2580**	**25**	**8967**	**86**	**10389**

* with completed data only

Table 103 : Non-invasive cancers with adjuvant therapy by age					
Age group	Radiotherapy		Hormone Therapy		Total non-invasive
	No.	%	No.	%	
<=48	0	-	0	-	0
49	20	43	7	15	46
50-52	163	39	94	22	423
53-55	112	44	61	24	255
56-58	145	48	60	20	301
59-61	139	39	74	21	357
62-64	136	46	51	17	295
65-67	134	40	67	20	339
68-70	107	38	64	23	282
71+	40	35	22	19	115
Total	**996**	**41**	**500**	**21**	**2413**

Table 104 : Combinations of adjuvant therapy for invasive cancers with complete data																			
	No surgery		Surgery only		Surgery & RT		Surgery & CT		Surgery & HT		Surgery & RT & CT		Surgery & RT & HT		Surgery & CT & HT		Surgery & RT & CT & HT		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
NEYH	13	1	21	2	41	3	17	1	223	18	68	5	627	50	42	3	195	16	1247
East Midlands	13	1	27	3	67	7	16	2	134	15	42	5	433	48	25	3	153	17	910
East of England	10	1	60	6	82	8	17	2	124	13	44	5	512	53	19	2	105	11	973
London	19	2	30	3	47	5	14	1	141	14	49	5	476	48	43	4	165	17	984
South East Coast	4	2	1	1	5	3	4	2	44	23	11	6	102	53	3	2	18	9	192
South Central	4	0	18	2	29	3	10	1	150	18	44	5	432	50	23	3	147	17	857
South West	7	1	22	2	52	5	9	1	146	13	47	4	620	56	34	3	164	15	1101
West Midlands	3	0	7	1	27	3	5	1	90	11	60	7	500	59	10	1	147	17	849
North West	6	0	44	4	66	5	22	2	215	17	52	4	635	52	34	3	156	13	1230
Wales	7	1	9	1	35	5	10	1	104	14	36	5	425	56	24	3	111	15	761
Northern Ireland	0	0	4	2	5	3	5	3	25	13	8	4	114	60	3	2	25	13	189
Scotland	17	2	13	1	19	2	28	3	173	16	50	5	558	51	43	4	195	18	1096
United Kingdom	**103**	**1**	**256**	**2**	**475**	**5**	**157**	**2**	**1569**	**15**	**511**	**5**	**5434**	**52**	**303**	**3**	**1581**	**15**	**10389**

Table 105 : Combinations of adjuvant therapy for non-invasive cancers with complete data																			
	No surgery		Surgery only		Surgery & RT		Surgery & CT		Surgery & HT		Surgery & RT & CT		Surgery & RT & HT		Surgery & CT & HT		Surgery & RT & CT & HT		Total
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
NEYH	1	0	159	48	125	38	0	0	18	5	0	0	25	8	0	0	2	1	330
East Midlands	2	1	92	38	55	23	0	0	42	18	0	0	49	20	0	0	0	0	240
East of England	1	0	134	55	85	35	0	0	6	2	1	0	16	7	0	0	0	0	243
London	1	0	145	56	80	31	2	1	13	5	0	0	18	7	0	0	0	0	259
South East Coast	0	0	27	44	17	27	0	0	9	15	0	0	9	15	0	0	0	0	62
South Central	0	0	99	56	42	24	2	1	26	15	0	0	7	4	0	0	0	0	176
South West	0	0	158	61	57	22	0	0	24	9	0	0	21	8	0	0	0	0	260
West Midlands	3	2	82	49	53	31	1	1	5	3	0	0	25	15	0	0	0	0	169
North West	3	1	89	40	43	19	1	0	38	17	0	0	48	22	0	0	0	0	222
Wales	2	1	74	46	63	39	0	0	12	7	0	0	9	6	1	1	1	1	162
Northern Ireland	0	0	4	7	5	9	0	0	26	48	0	0	19	35	0	0	0	0	54
Scotland	2	1	103	44	103	44	0	0	10	4	0	0	17	7	1	0	0	0	236
United Kingdom	**15**	**1**	**1166**	**48**	**728**	**30**	**6**	**0.2**	**229**	**9**	**1**	**0.0**	**263**	**11**	**2**	**0.1**	**3**	**0.1**	**2413**

Table 106 : Time from assessment to first diagnostic surgery (invasive cancers with no non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	0	0	7	44	13	81	16	100	16	100	16	100	33
East Midlands	0	0	2	22	7	78	9	100	9	100	9	100	40
East of England	0	0	8	44	16	89	17	94	18	100	18	100	35
London	2	9	6	26	21	91	23	100	23	100	23	100	40
South East Coast	0	0	4	24	12	71	15	88	16	94	17	100	44
South Central	2	12	10	59	15	88	16	94	17	100	17	100	26
South West	2	10	8	40	17	85	20	100	20	100	20	100	34.5
West Midlands	4	19	9	43	17	81	21	100	21	100	21	100	32
North West	2	7	11	39	27	96	27	96	27	96	27	96	32.5
Wales	0	0	8	57	13	93	13	93	13	93	14	100	28
Northern Ireland	1	17	3	50	5	83	6	100	6	100	6	100	32.5
Scotland	2	12	9	53	14	82	16	94	17	100	17	100	28
United Kingdom	**15**	**7**	**85**	**41**	**177**	**86**	**199**	**97**	**203**	**99**	**205**	**100**	**34**

Table 107 : Time from assessment to first diagnostic surgery (non-invasive cancers with no non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	0	0	10	18	45	82	53	96	55	100	55	100	43
East Midlands	2	6	15	44	28	82	32	94	32	94	34	100	34
East of England	3	5	25	44	51	89	55	96	56	98	57	100	33
London	3	7	16	35	41	89	44	96	46	100	46	100	37
South East Coast	0	0	4	12	27	79	33	97	33	97	33	97	46.5
South Central	2	4	16	35	35	76	44	96	44	96	45	98	36.5
South West	0	0	15	22	48	71	62	91	67	99	67	99	45
West Midlands	3	9	11	31	25	71	34	97	35	100	35	100	35
North West	0	0	16	36	36	82	41	93	44	100	44	100	35.5
Wales	5	25	13	65	18	90	20	100	20	100	20	100	21.5
Northern Ireland	0	0	9	69	12	92	12	92	13	100	13	100	23
Scotland	2	6	18	53	27	79	33	97	33	97	34	100	30
United Kingdom	**20**	**4**	**168**	**35**	**393**	**81**	**463**	**95**	**478**	**98**	**483**	**99**	**37**

Table 108 : Time from assessment to first therapeutic surgery (invasive cancers with non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	123	8	900	57	1514	96	1546	98	1551	99	1563	99	28
East Midlands	100	11	554	62	836	94	853	96	855	96	875	99	27
East of England	88	8	599	57	974	93	1011	96	1021	97	1036	99	28
London	43	4	382	38	890	89	953	95	965	97	986	99	35
South East Coast	30	4	209	29	640	89	696	97	707	98	717	100	38
South Central	83	10	483	56	824	95	850	98	854	99	863	100	29
South West	77	7	553	47	1090	93	1137	97	1144	98	1154	99	32
West Midlands	94	10	691	71	950	98	961	99	967	99	971	100	26
North West	92	6	808	55	1403	96	1444	99	1452	99	1458	100	29
Wales	80	11	542	73	730	98	737	99	738	99	745	100	24
Northern Ireland	20	11	145	78	186	99	187	100	187	100	187	100	23
Scotland	114	10	636	57	1017	92	1071	97	1078	97	1101	99	29
United Kingdom	**944**	**8**	**6502**	**55**	**11054**	**94**	**11446**	**98**	**11519**	**98**	**11656**	**99**	**29**

Table 109 : Time from assessment to first therapeutic surgery (non-invasive cancers with non-operative diagnosis)													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	22	6	163	43	347	92	372	99	375	99	377	100	34
East Midlands	13	6	92	45	184	90	197	97	201	99	203	100	33
East of England	14	6	121	54	205	91	222	98	226	100	226	100	29
London	8	3	72	30	199	84	224	95	232	98	236	100	37
South East Coast	3	2	33	21	129	81	153	96	160	100	160	100	43
South Central	9	6	70	50	131	94	139	100	139	100	139	100	30
South West	3	1	69	29	203	86	230	98	232	99	235	100	39
West Midlands	3	2	84	52	145	90	159	99	160	99	161	100	30
North West	5	2	120	47	237	94	247	98	251	99	253	100	31
Wales	10	6	98	60	156	95	162	99	163	99	163	99	28
Northern Ireland	1	2	34	77	44	100	44	100	44	100	44	100	24
Scotland	13	6	76	37	181	88	202	98	205	100	206	100	36
United Kingdom	**104**	**4**	**1032**	**43**	**2161**	**90**	**2351**	**98**	**2388**	**99**	**2403**	**100**	**34**

Table 110 : Time from final surgery to radiotherapy (excluding neo-adjuvant therapy cases and cases with chemotherapy) - invasive													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	5	1	33	4	423	58	675	92	701	95	726	99	57
East Midlands	0	0	20	4	317	64	486	97	494	99	497	100	55
East of England	1	0	17	3	367	61	568	94	593	99	601	100	56
London	6	1	40	7	282	52	467	86	517	95	537	99	59
South East Coast	2	2	5	4	39	33	88	73	112	93	117	98	74
South Central	2	0	17	4	245	51	422	88	462	96	474	99	59
South West	18	3	42	6	325	47	603	87	664	96	690	100	62
West Midlands	0	0	7	1	323	53	567	93	585	96	607	100	59.5
North West	9	1	51	6	510	61	737	88	797	96	819	98	55
Wales	1	0	6	1	212	46	416	90	453	98	462	100	62
Northern Ireland	0	0	0	0	33	28	100	83	116	97	119	99	71
Scotland	8	1	13	2	353	60	535	91	571	97	583	99	56
United Kingdom	**52**	**1**	**251**	**4**	**3429**	**55**	**5664**	**90**	**6065**	**96**	**6232**	**99**	**58**

Table 111 : Time from final surgery to radiotherapy (excluding neo-adjuvant therapy cases and cases with chemotherapy) – non-invasive													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	2	1	7	4	97	58	159	95	165	98	168	100	56
East Midlands	0	0	4	4	70	67	98	94	103	99	104	100	50.5
East of England	0	0	0	0	54	52	94	90	102	98	103	99	60
London	0	0	3	3	50	49	87	84	100	97	103	100	63
South East Coast	0	0	1	4	10	36	22	79	26	93	28	100	67.5
South Central	0	0	0	0	24	48	44	88	49	98	50	100	62.5
South West	2	2	5	5	37	39	80	84	93	98	95	100	66
West Midlands	1	1	3	3	58	60	92	95	97	100	97	100	56
North West	1	1	5	5	69	62	102	92	109	98	110	99	55
Wales	0	0	1	1	30	39	70	91	76	99	77	100	66
Northern Ireland	0	0	0	0	6	25	19	79	23	96	23	96	74.5
Scotland	0	0	0	0	65	54	115	96	120	100	120	100	59
United Kingdom	**6**	**1**	**29**	**3**	**570**	**53**	**982**	**91**	**1063**	**98**	**1078**	**100**	**58**

Table 112 : Time from assessment to radiotherapy (excluding cases with chemotherapy) - invasive													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
N East, Yorks & Humber	1	0	1	0	57	8	365	50	615	83	711	96	91
East Midlands	0	0	0	0	35	7	303	60	451	90	495	99	84
East of England	0	0	0	0	41	7	322	53	506	84	587	98	89.5
London	0	0	2	0	37	7	198	36	372	68	525	96	104
South East Coast	0	0	1	1	6	5	18	15	57	46	114	93	123
South Central	0	0	3	1	39	8	214	45	371	77	464	97	92
South West	0	0	2	0	50	7	248	36	521	75	672	97	100
West Midlands	0	0	0	0	27	4	312	51	523	85	595	97	90
North West	0	0	5	1	80	10	424	51	685	82	811	97	90
Wales	0	0	0	0	15	3	220	48	393	85	458	99	92
Northern Ireland	0	0	0	0	5	4	43	36	97	81	118	98	100
Scotland	0	0	3	1	27	5	310	52	497	83	575	96	89
United Kingdom	**1**	**0**	**17**	**0**	**419**	**7**	**2977**	**47**	**5088**	**81**	**6125**	**97**	**92**

Table 113 : Time from assessment to radiotherapy (excluding cases with chemotherapy) – non-invasive													
	≤ 14 days		≤ 30 days		≤ 60 days		≤ 90 days		≤ 120 days		≤ 200 days		Median
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
N East, Yorks & Humber	0	0	0	0	8	5	63	38	123	73	164	98	99.5
East Midlands	0	0	0	0	4	4	46	44	87	84	103	99	95.5
East of England	0	0	0	0	4	4	46	44	77	74	100	96	93.5
London	0	0	0	0	3	3	30	29	64	62	103	99	109
South East Coast	0	0	0	0	0	0	5	18	13	46	26	93	127.5
South Central	0	0	0	0	5	10	20	39	35	69	50	98	98
South West	0	0	0	0	3	3	19	20	53	56	94	99	113
West Midlands	0	0	0	0	3	3	30	31	77	79	97	100	103
North West	0	0	0	0	5	4	50	44	91	81	109	96	93
Wales	0	0	0	0	2	3	30	39	57	74	76	99	101
Northern Ireland	0	0	0	0	1	4	6	25	19	79	23	96	104
Scotland	0	0	0	0	1	1	46	38	102	84	121	100	96
United Kingdom	**0**	**0**	**0**	**0**	**39**	**4**	**391**	**36**	**798**	**73**	**1066**	**98**	**100**

Table 114 : Invasive status of cancers with known radiotherapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1365	77	21	1	391	22	0	0	1777	100
East Midlands	910	78	16	1	240	20	8	1	1174	100
East of England	1025	78	12	1	275	21	1	0	1313	100
London	1016	78	17	1	270	21	3	0	1306	100
South East Coast	212	75	3	1	67	24	0	0	282	100
South Central	881	82	8	1	184	17	1	0	1074	100
South West	1137	78	13	1	299	21	0	0	1449	100
West Midlands	957	83	6	1	190	16	0	0	1153	100
North West	1424	83	20	1	266	16	3	0	1713	100
Wales	766	80	5	1	186	19	0	0	957	100
Northern Ireland	192	76	3	1	56	22	0	0	251	100
Scotland	1138	82	5	0	243	18	0	0	1386	100
United Kingdom	**11023**	**80**	**129**	**1**	**2667**	**19**	**16**	**0**	**13835**	**100**

Table 115 : Treatment of invasive cancers with known radiotherapy data										
	Conservation surgery		Mastectomy		No Surgery		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	935	68	408	30	22	2	0	0	1365	100
East Midlands	614	67	283	31	13	1	0	0	910	100
East of England	751	73	262	26	12	1	0	0	1025	100
London	734	72	257	25	22	2	3	0	1016	100
South East Coast	162	76	45	21	5	2	0	0	212	100
South Central	660	75	217	25	4	0	0	0	881	100
South West	864	76	266	23	7	1	0	0	1137	100
West Midlands	755	79	198	21	4	0	0	0	957	100
North West	1007	71	407	29	10	1	0	0	1424	100
Wales	541	71	211	28	14	2	0	0	766	100
Northern Ireland	152	79	40	21	0	0	0	0	192	100
Scotland	819	72	299	26	20	2	0	0	1138	100
United Kingdom	**7994**	**73**	**2893**	**26**	**133**	**1**	**3**	**0**	**11023**	**100**

Table 116 : Radiotherapy for invasive cancers treated by breast conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	878	94	57	6	935	100
East Midlands	600	98	14	2	614	100
East of England	659	88	92	12	751	100
London	676	92	58	8	734	100
South East Coast	136	84	26	16	162	100
South Central	577	87	83	13	660	100
South West	808	94	56	6	864	100
West Midlands	730	97	25	3	755	100
North West	951	94	56	6	1007	100
Wales	534	99	7	1	541	100
Northern Ireland	140	92	12	8	152	100
Scotland	757	92	62	8	819	100
United Kingdom	**7446**	**93**	**548**	**7**	**7994**	**100**

Table 117 : Invasive size of invasive cancers treated by breast conservation surgery without radiotherapy																
	<10mm		10-<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
NEYH	21	37	21	37	9	16	4	7	0	0	1	2	1	2	57	100
East Midlands	5	36	4	29	1	7	2	14	0	0	0	0	2	14	14	100
East of England	22	24	32	35	19	21	16	17	1	1	0	0	2	2	92	100
London	16	28	14	24	19	33	6	10	1	2	1	2	1	2	58	100
South East Coast	12	46	4	15	5	19	3	12	1	4	0	0	1	4	26	100
South Central	41	49	21	25	16	19	5	6	0	0	0	0	0	0	83	100
South West	19	34	21	38	9	16	5	9	1	2	0	0	1	2	56	100
West Midlands	10	40	6	24	5	20	3	12	0	0	0	0	1	4	25	100
North West	21	38	12	21	17	30	5	9	0	0	0	0	1	2	56	100
Wales	2	29	1	14	2	29	2	29	0	0	0	0	0	0	7	100
Northern Ireland	7	58	1	8	2	17	2	17	0	0	0	0	0	0	12	100
Scotland	15	24	20	32	13	21	12	19	1	2	0	0	1	2	62	100
United Kingdom	**191**	**35**	**157**	**29**	**117**	**21**	**65**	**12**	**5**	**1**	**2**	**0**	**11**	**2**	**548**	**100**

Table 118 : Invasive cancers treated by breast conservation surgery without radiotherapy							
		>20mm		Grade III		Nodal status positive	
Region	Total	No	%	No	%	No	%
North, Yorks & Humber	57	5	9	5	9	3	5
East Midlands	14	2	14	2	14	2	14
East of England	92	17	18	18	20	17	18
London	58	8	14	6	10	8	14
South East Coast	26	4	15	1	4	0	0
South Central	83	5	6	4	5	6	7
South West	56	6	11	4	7	5	9
West Midlands	25	3	12	1	4	3	12
North West	56	5	9	9	16	7	13
Wales	7	2	29	1	14	3	43
Northern Ireland	12	2	17	2	17	1	8
Scotland	62	13	21	12	19	7	11
United Kingdom	**548**	**72**	**13**	**65**	**12**	**62**	**11**

Table 119 : Radiotherapy for non-invasive cancers treated by breast conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	161	58	115	42	276	100
East Midlands	103	68	49	32	152	100
East of England	104	52	95	48	199	100
London	102	55	82	45	184	100
South East Coast	28	49	29	51	57	100
South Central	50	36	90	64	140	100
South West	93	41	136	59	229	100
West Midlands	96	66	49	34	145	100
North West	111	57	83	43	194	100
Wales	75	59	53	41	128	100
Northern Ireland	23	59	16	41	39	100
Scotland	121	73	45	27	166	100
United Kingdom	**1067**	**56**	**842**	**44**	**1909**	**100**

Table 120 : Cytonuclear grade of non-invasive cancers treated by breast conservation surgery without radiotherapy												
	High		Intermediate		Low		Not assessable		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	19	17	51	44	29	25	6	5	10	9	115	100
East Midlands	13	27	18	37	12	24	0	0	6	12	49	100
East of England	30	32	26	27	24	25	7	7	8	8	95	100
London	21	26	29	35	21	26	0	0	11	13	82	100
South East Coast	3	10	16	55	9	31	1	3	0	0	29	100
South Central	29	32	35	39	19	21	6	7	1	1	90	100
South West	44	32	52	38	23	17	1	1	16	12	136	100
West Midlands	8	16	15	31	19	39	5	10	2	4	49	100
North West	19	23	33	40	16	19	0	0	15	18	83	100
Wales	2	4	25	47	22	42	3	6	1	2	53	100
Northern Ireland	5	31	6	38	4	25	0	0	1	6	16	100
Scotland	9	20	21	47	7	16	4	9	4	9	45	100
United Kingdom	**202**	**24**	**327**	**39**	**205**	**24**	**33**	**4**	**75**	**9**	**842**	**100**

Table 121 : Size of non-invasive cancers treated by conservation surgery without radiotherapy												
	<15mm		15-≤40mm		>40mm		Not assessable		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	76	66	22	19	0	0	3	3	14	12	115	100
East Midlands	32	65	11	22	0	0	0	0	6	12	49	100
East of England	55	58	19	20	1	1	7	7	13	14	95	100
London	53	65	11	13	1	1	0	0	17	21	82	100
South East Coast	21	72	7	24	0	0	1	3	0	0	29	100
South Central	54	60	23	26	2	2	4	4	7	8	90	100
South West	70	51	41	30	4	3	2	1	19	14	136	100
West Midlands	31	63	9	18	1	2	2	4	6	12	49	100
North West	46	55	15	18	3	4	0	0	19	23	83	100
Wales	33	62	13	25	2	4	3	6	2	4	53	100
Northern Ireland	9	56	3	19	1	6	0	0	3	19	16	100
Scotland	31	69	11	24	1	2	1	2	1	2	45	100
United Kingdom	**511**	**61**	**185**	**22**	**16**	**2**	**23**	**3**	**107**	**13**	**842**	**100**

Table 122 : Chemotherapy for node positive invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	217	63	125	37	342	100
East Midlands	128	72	51	28	179	100
East of England	128	53	113	47	241	100
London	173	67	86	33	259	100
South East Coast	94	60	63	40	157	100
South Central	137	70	60	30	197	100
South West	156	64	87	36	243	100
West Midlands	147	70	63	30	210	100
North West	172	59	118	41	290	100
Wales	100	65	54	35	154	100
Northern Ireland	22	73	8	27	30	100
Scotland	177	72	69	28	246	100
United Kingdom	**1651**	**65**	**897**	**35**	**2548**	**100**

Table 123 : ER status of all cases with complete hormone therapy data								
	ER Positive		ER Negative		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1531	80	213	11	163	9	1907	100
East Midlands	916	78	150	13	108	9	1174	100
East of England	999	77	117	9	175	14	1291	100
London	1029	78	129	10	159	12	1317	100
South East Coast	662	72	76	8	180	20	918	100
South Central	864	82	96	9	94	9	1054	100
South West	1156	80	147	10	144	10	1447	100
West Midlands	897	82	142	13	53	5	1092	100
North West	1386	82	209	12	90	5	1685	100
Wales	721	78	92	10	116	12	929	100
Northern Ireland	215	87	31	13	2	1	248	100
Scotland	1136	83	130	10	101	7	1367	100
United Kingdom	**11512**	**80**	**1532**	**11**	**1385**	**10**	**14429**	**100**

Table 124 : Invasive status of ER positive cases with known hormone therapy data										
	Invasive		Micro-invasive		Non-invasive		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1348	88	13	1	170	11	0	0	1531	100
East Midlands	814	89	1	0	100	11	1	0	916	100
East of England	929	93	4	0	66	7	0	0	999	100
London	914	89	5	0	110	11	0	0	1029	100
South East Coast	573	87	2	0	87	13	0	0	662	100
South Central	785	91	5	1	73	8	1	0	864	100
South West	1046	90	7	1	103	9	0	0	1156	100
West Midlands	810	90	2	0	85	9	0	0	897	100
North West	1223	88	12	1	150	11	1	0	1386	100
Wales	681	94	2	0	38	5	0	0	721	100
Northern Ireland	167	78	2	1	46	21	0	0	215	100
Scotland	1015	89	2	0	119	10	0	0	1136	100
United Kingdom	**10305**	**90**	**57**	**0**	**1147**	**10**	**3**	**0**	**11512**	**100**

Table 125 : Hormone therapy for ER positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	1316	98	32	2	1348	100
East Midlands	748	92	66	8	814	100
East of England	801	86	128	14	929	100
London	841	92	73	8	914	100
South East Coast	540	94	33	6	573	100
South Central	740	94	45	6	785	100
South West	1017	97	29	3	1046	100
West Midlands	802	99	8	1	810	100
North West	1138	93	85	7	1223	100
Wales	662	97	19	3	681	100
Northern Ireland	166	99	1	1	167	100
Scotland	1006	99	9	1	1015	100
United Kingdom	**9777**	**95**	**528**	**5**	**10305**	**100**

Table 126 : ER positive invasive cancers without hormone therapy							
	Total	<15mm		Grade I or II		Node negative	
Region	cases	No.	%	No.	%	No.	%
N East, Yorks & Humber	32	20	63	27	84	24	75
East Midlands	66	61	92	60	91	60	91
East of England	128	78	61	106	83	96	75
London	73	34	47	52	71	47	64
South East Coast	33	15	45	24	73	27	82
South Central	45	19	42	37	82	29	64
South West	29	17	59	27	93	24	83
West Midlands	8	4	50	8	100	7	88
North West	85	47	55	68	80	66	78
Wales	19	17	89	18	95	18	95
Northern Ireland	1	1	100	1	100	1	100
Scotland	9	6	67	7	78	8	89
United Kingdom	**528**	**319**	**60**	**435**	**82**	**407**	**77**

Table 127 : Hormone therapy for ER negative, PgR positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	100	0	0	5	100
East Midlands	1	33	2	67	3	100
East of England	2	40	3	60	5	100
London	2	100	0	0	2	100
South East Coast	3	100	0	0	3	100
South Central	1	33	2	67	3	100
South West	3	27	8	73	11	100
West Midlands	1	100	0	0	1	100
North West	6	55	5	45	11	100
Wales	2	50	2	50	4	100
Northern Ireland	0	-	0	-	0	-
Scotland	1	25	3	75	4	100
United Kingdom	**27**	**52**	**25**	**48**	**52**	**100**

Table 128 : Hormone therapy for all ER negative cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	20	9	193	91	213	100
East Midlands	2	1	148	99	150	100
East of England	13	11	104	89	117	100
London	10	8	119	92	129	100
South East Coast	8	11	68	89	76	100
South Central	14	15	82	85	96	100
South West	8	5	139	95	147	100
West Midlands	3	2	139	98	142	100
North West	26	12	183	88	209	100
Wales	9	10	83	90	92	100
Northern Ireland	1	3	30	97	31	100
Scotland	1	1	129	99	130	100
United Kingdom	**115**	**8**	**1417**	**92**	**1532**	**100**

Table 129 : ER status for non-invasive cancers with hormone therapy								
	ER positive		ER negative		ER Not done or Unknown		Total*	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	52	12	1	0	6	1	59	14
East Midlands	74	31	0	0	18	8	92	38
East of England	18	6	1	0	4	1	23	8
London	31	11	1	0	6	2	38	13
South East Coast	44	23	1	1	10	5	55	28
South Central	27	15	0	0	6	3	33	18
South West	46	15	0	0	1	0	47	15
West Midlands	37	19	0	0	0	0	37	19
North West	93	31	4	1	1	0	98	33
Wales	23	12	0	0	1	1	24	13
Northern Ireland	45	79	0	0	1	2	46	81
Scotland	26	11	0	0	2	1	28	12
United Kingdom	**516**	**18**	**8**	**0**	**56**	**2**	**580**	**20**

*Number of non-invasive cancers with hormone therapy as a percentage of the number of non-invasive cancers

Table 130 : Hormone therapy for ER positive non-invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	52	31	118	69	170	100
East Midlands	74	74	26	26	100	100
East of England	18	27	48	73	66	100
London	31	28	79	72	110	100
South East Coast	44	51	43	49	87	100
South Central	27	37	46	63	73	100
South West	46	45	57	55	103	100
West Midlands	37	44	48	56	85	100
North West	93	62	57	38	150	100
Wales	23	61	15	39	38	100
Northern Ireland	45	98	1	2	46	100
Scotland	26	22	93	78	119	100
United Kingdom	**516**	**45**	**631**	**55**	**1147**	**100**

Table 131 : Invasive status, nodal status and ER status of cancers with known chemotherapy data														
	Invasive						Micro-invasive		Non-invasive		Invasive status unknown		Total	
	ER negative Node negative		ER negative Node positive		Other									
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	128	6	37	2	1404	70	22	1	412	21	0	0	2003	100
East Midlands	69	6	20	2	821	70	16	1	240	20	8	1	1174	100
East of England	69	5	21	2	943	72	12	1	268	20	0	0	1313	100
London	58	4	15	1	939	72	18	1	274	21	3	0	1307	100
South East Coast	34	4	17	2	675	73	7	1	191	21	0	0	924	100
South Central	55	5	16	2	798	75	9	1	180	17	1	0	1059	100
South West	89	6	26	2	1056	71	13	1	303	20	0	0	1487	100
West Midlands	61	6	40	4	803	74	7	1	177	16	0	0	1088	100
North West	112	7	28	2	1193	74	21	1	264	16	3	0	1621	100
Wales	52	5	24	3	689	72	5	1	186	19	0	0	956	100
Northern Ireland	19	8	4	2	170	67	3	1	57	23	0	0	253	100
Scotland	81	6	25	2	1009	74	4	0	240	18	0	0	1359	100
United Kingdom	**827**	**6**	**273**	**2**	**10500**	**72**	**137**	**1**	**2792**	**19**	**15**	**0**	**14544**	**100**

Table 132 : Chemotherapy for ER negative invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	112	66	57	34	169	100
East Midlands	56	62	35	38	91	100
East of England	51	54	43	46	94	100
London	54	70	23	30	77	100
South East Coast	32	57	24	43	56	100
South Central	46	64	26	36	72	100
South West	56	48	60	52	116	100
West Midlands	73	72	28	28	101	100
North West	89	62	55	38	144	100
Wales	52	66	27	34	79	100
Northern Ireland	13	57	10	43	23	100
Scotland	84	78	24	22	108	100
United Kingdom	**718**	**64**	**412**	**36**	**1130**	**100**

Table 133 : Chemotherapy for ER negative node positive and negative invasive cancers										
	Node positive					Node negative				
	Chemotherapy		No chemotherapy		Total	Chemotherapy		No chemotherapy		Total
Region	No.	%	No.	%		No.	%	No.	%	
N East, Yorks & Humber	34	92	3	8	37	77	60	51	40	128
East Midlands	19	95	1	5	20	36	52	33	48	69
East of England	17	81	4	19	21	32	46	37	54	69
London	15	100	0	0	15	37	64	21	36	58
South East Coast	14	82	3	18	17	16	47	18	53	34
South Central	13	81	3	19	16	33	60	22	40	55
South West	21	81	5	19	26	35	39	54	61	89
West Midlands	34	85	6	15	40	39	64	22	36	61
North West	26	93	2	7	28	61	54	51	46	112
Wales	21	88	3	13	24	28	54	24	46	52
Northern Ireland	3	75	1	25	4	10	53	9	47	19
Scotland	23	92	2	8	25	60	74	21	26	81
United Kingdom	**240**	**88**	**33**	**12**	**273**	**464**	**56**	**363**	**44**	**827**

Table 134 : Grade of ER negative node negative invasive cancers given chemotherapy										
	Grade I		Grade II		Grade III		Unknown or Not assessable		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	0	0	15	19	61	79	1	1	77	100
East Midlands	0	0	2	6	32	89	2	6	36	100
East of England	0	0	5	16	27	84	0	0	32	100
London	0	0	10	27	27	73	0	0	37	100
South East Coast	0	0	1	6	15	94	0	0	16	100
South Central	0	0	4	12	29	88	0	0	33	100
South West	1	3	4	11	30	86	0	0	35	100
West Midlands	1	3	4	10	33	85	1	3	39	100
North West	1	2	14	23	46	75	0	0	61	100
Wales	0	0	3	11	25	89	0	0	28	100
Northern Ireland	0	0	3	30	7	70	0	0	10	100
Scotland	0	0	11	18	45	75	4	7	60	100
United Kingdom	**3**	**1**	**76**	**16**	**377**	**81**	**8**	**2**	**464**	**100**

Table 135 : Chemotherapy for HER-2 positive invasive cancers						
	Chemotherapy		No Chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	107	67	53	33	160	100
East Midlands	66	56	51	44	117	100
East of England	37	39	59	61	96	100
London	58	63	34	37	92	100
South East Coast	25	61	16	39	41	100
South Central	57	54	48	46	105	100
South West	66	53	59	47	125	100
West Midlands	64	68	30	32	94	100
North West	96	51	91	49	187	100
Wales	41	66	21	34	62	100
Northern Ireland	14	52	13	48	27	100
Scotland	93	59	64	41	157	100
United Kingdom	**724**	**57**	**539**	**43**	**1263**	**100**

Table 136 : HER-2 positive invasive cancers without chemotherapy							
		>20mm		Grade III		Nodal status positive	
Region	Total cases	No.	%	No.	%	No.	%
North, Yorks & Humber	53	13	25	19	36	5	9
East Midlands	51	4	8	7	14	6	12
East of England	59	10	17	24	41	9	15
London	34	1	3	10	29	2	6
South East Coast	16	1	6	3	19	1	6
South Central	48	6	13	14	29	5	10
South West	59	4	7	17	29	3	5
West Midlands	30	6	20	9	30	3	10
North West	91	20	22	34	37	7	8
Wales	21	1	5	6	29	0	0
Northern Ireland	13	1	8	2	15	2	15
Scotland	64	10	16	20	31	11	17
United Kingdom	**539**	**77**	**14**	**165**	**31**	**54**	**10**

Table 137 : NPI groups of HER-2 positive invasive cancers without chemotherapy											
		EPG		GPG		MPG1		MPG2		PPG	
Region	**Total**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
North, Yorks & Humber	53	3	6	23	43	16	30	5	9	3	6
East Midlands	51	6	12	27	53	13	25	0	0	1	2
East of England	59	2	3	23	39	24	41	6	10	2	3
London	34	2	6	16	47	10	29	1	3	0	0
South East Coast	16	2	13	8	50	4	25	0	0	0	0
South Central	48	5	10	22	46	16	33	2	4	1	2
South West	59	5	8	29	49	19	32	2	3	0	0
West Midlands	30	6	20	10	33	9	30	0	0	3	10
North West	91	12	13	33	36	30	33	8	9	5	5
Wales	21	2	10	9	43	7	33	0	0	0	0
Northern Ireland	13	1	8	9	69	0	0	1	8	1	8
Scotland	64	6	9	28	44	15	23	7	11	4	6
United Kingdom	**539**	**52**	**10**	**237**	**44**	**163**	**30**	**32**	**6**	**20**	**4**

APPENDIX G: SURVIVAL ANALYSIS DATA TABLES (138-146)

DATA OBTAINED FROM THE SURVIVAL AUDIT OF SCREEN-DETECTED BREAST CANCERS FOR CANCERS DIAGNOSED BETWEEN 1 APRIL 2002 AND 31 MARCH 2003

Table 138 : Cause of death of eligible invasive cancers with death before 31/03/2009

	Breast cancer		Other cancer		Non-cancer		Unknown		Total deaths		
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	66	61	20	19	22	20	0	0	108	10	1085
East Midlands	35	51	14	20	19	28	1	1	69	10	679
East of England	50	51	18	18	30	30	1	1	99	11	938
London	48	60	9	11	22	28	1	1	80	10	831
South East Coast	29	58	6	12	14	28	1	2	50	8	634
South Central	24	52	8	17	14	30	0	0	46	8	574
South West	40	58	10	14	18	26	1	1	69	8	816
West Midlands	34	51	13	19	19	28	1	1	67	9	777
North West	51	55	13	14	26	28	2	2	92	8	1113
Wales	25	58	10	23	7	16	1	2	43	8	525
Northern Ireland	13	62	1	5	5	24	2	10	21	13	159
United Kingdom	**415**	**56**	**122**	**16**	**196**	**26**	**11**	**1**	**744**	**9**	**8131**

Table 139 : Cause of death of eligible micro-invasive cancers with death before 31/03/2009

	Breast cancer		Other cancer		Non-cancer		Unknown		Total deaths		
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	0	-	0	-	0	-	0	-	0	0	16
East Midlands	0	0	0	0	1	100	0	0	1	7	15
East of England	0	-	0	-	0	-	0	-	0	0	3
London	0	0	1	100	0	0	0	0	1	8	13
South East Coast	0	-	0	-	0	-	0	-	0	0	15
South Central	1	100	0	0	0	0	0	0	1	33	3
South West	0	-	0	-	0	-	0	-	0	0	2
West Midlands	1	100	0	0	0	0	0	0	1	8	13
North West	0	-	0	-	0	-	0	-	0	0	17
Wales	0	-	0	-	0	-	0	-	0	0	8
Northern Ireland	0	-	0	-	0	-	0	-	0	0	4
United Kingdom	**2**	**50**	**1**	**25**	**1**	**25**	**0**	**0**	**4**	**4**	**109**

Table 140 : Cause of death of eligible non-invasive cancers with death before 31/03/2009

	Breast cancer		Other cancer		Non-cancer		Unknown		Total deaths		
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	2	29	1	14	4	57	0	0	7	3	269
East Midlands	0	0	1	25	3	75	0	0	4	2	185
East of England	3	21	8	57	3	21	0	0	14	5	281
London	2	33	1	17	3	50	0	0	6	3	238
South East Coast	1	20	2	40	2	40	0	0	5	3	174
South Central	0	0	3	50	3	50	0	0	6	5	130
South West	1	33	1	33	1	33	0	0	3	2	172
West Midlands	0	0	5	71	2	29	0	0	7	4	198
North West	0	0	3	38	5	63	0	0	8	4	197
Wales	1	17	4	67	1	17	0	0	6	5	121
Northern Ireland	0	0	1	100	0	0	0	0	1	2	47
United Kingdom	**10**	**15**	**30**	**45**	**27**	**40**	**0**	**0**	**67**	**3**	**2012**

Table 141 : 5 year relative survival by region – primary invasive cancers only			
Region	**2000/01**	**2001/02**	**2002/03**
N East, Yorks & Humber	96.4 (94.7,98.1)	95.9 (94.0,97.7)	96.3 (94.6,98.0)
East Midlands	95.8 (93.4,98.1)	98.8 (96.8,100.7)	96.2 (94.1,98.4)
East of England	97.1 (95.0,99.2)	98.3 (96.5,100.1)	96.3 (94.5,98.2)
London	98.1 (96.2,100.0)	97.8 (95.7,99.8)	96.8 (95.0,98.7)
South East Coast	97.0 (94.8,99.2)	96.9 (94.7,99.0)	98.5 (96.6,100.4)
South Central	96.4 (94.0,98.8)	98.0 (95.8,100.2)	98.3 (96.3,100.3)
South West	95.9 (93.7,98.1)	96.5 (94.4,98.7)	97.9 (96.1,99.7)
West Midlands	95.6 (93.3,97.8)	95.2 (93.0,97.5)	97.1 (95.2,99.0)
North West	95.6 (93.7,97.6)	96.5 (94.8,98.2)	97.6 (96.1,99.2)
Wales	95.9 (93.0,98.7)	99.3 (97.1,101.4)	98.4 (96.1,100.6)
Northern Ireland	96.6 (92.9,100.4)	98.9 (95.3,102.6)	92.5 (87.4,97.6)
United Kingdom	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Table 142 : 5 year relative survival by age for primary invasive cancers			
Age	**2000/01**	**2001/02**	**2002/03**
<50	94.0 (89.5,98.5)	101.4 (101.4,101.4)	98.7 (95.5,101.8)
50-52	96.2 (94.9,97.4)	96.4 (95.1,97.7)	97.4 (96.2,98.5)
53-55	94.9 (93.3,96.5)	95.5 (94.0,97.0)	94.9 (93.5,96.4)
56-58	96.4 (94.9,98.0)	95.8 (94.3,97.3)	95.7 (94.2,97.1)
59-61	96.1 (94.4,97.8)	96.5 (94.9,98.1)	97.3 (96.0,98.7)
62-64	95.5 (93.6,97.3)	97.1 (95.5,98.8)	97.4 (95.9,98.9)
65-68	98.3 (95.7,100.9)	99.2 (96.8,101.7)	97.3 (95.1,99.5)
69-70	98.2 (92.8,103.6)	101.2 (96.7,105.7)	98.7 (94.8,102.5)
>70	105.0 (100.2,109.7)	108.3 (104.2,112.4)	106.3 (102.5,110.1)
All invasive cancers	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Table 143 : 5 year relative survival by invasive tumour size for primary invasive cancers			
Size	**2000/01**	**2001/02**	**2002/03**
<15mm	99.3 (98.6,100.1)	100.2 (99.5,100.8)	100.0 (99.4,100.7)
15-≤20mm	96.3 (95.0,97.6)	97.6 (96.3,99.0)	97.4 (96.3,98.6)
>20-≤35mm	91.2 (89.1,93.3)	92.4 (90.7,94.1)	91.1 (89.2,93.1)
>35-≤50mm	85.6 (79.9,91.4)	88.8 (82.2,95.3)	88.8 (83.8,93.8)
>50mm	78.4 (65.9,91.0)	77.1 (69.0,85.2)	84.5 (77.1,92.0)
Unknown	99.4 (98.5,100.4)	100.4 (99.5,101.3)	71.9 (61.9,81.9)
All invasive cancers	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Table 144 : 5 year relative survival by grade for primary invasive cancers			
Grade	**2000/01**	**2001/02**	**2002/03**
I	99.7 (98.8,100.6)	101.8 (101.1,102.4)	101.2 (100.5,101.9)
II	97.7 (96.8,98.6)	97.7 (96.8,98.6)	97.4 (96.6,98.3)
III	86.7 (84.4,89.0)	87.5 (85.3,89.7)	89.3 (87.2,91.3)
Unknown	100.4 (96.4,104.4)	97.7 (89.1,106.4)	96.6 (88.1,105.1)
All invasive cancers	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Table 145 : 5 year relative survival by nodal status for primary invasive cancers			
Nodal status	**2000/01**	**2001/02**	**2002/03**
Positive	89.2 (87.4,91.0)	88.9 (87.1,90.7)	91.5 (89.9,93.0)
Negative	99.0 (98.3,99.6)	100.0 (99.4,100.6)	99.3 (98.7,99.9)
Unknown	95.0 (92.3,97.8)	96.8 (93.8,99.7)	91.3 (87.4,95.3)
All invasive cancers	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Table 146 : 5 year relative survival by NPI prognostic group for primary invasive cancers			
NPI group	**2000/01**	**2001/02**	**2002/03**
EPG	100.2 (99.2,101.2)	102.2 (101.5,102.9)	101.8 (101.1,102.5)
GPG	99.1 (98.1,100.1)	100.1 (99.2,100.9)	100.0 (99.2,100.9)
MPG1	98.1 (96.8,99.4)	96.7 (95.2,98.1)	96.4 (95.1,97.7)
MPG2	89.6 (86.7,92.4)	92.0 (89.4,94.6)	89.7 (87.0,92.3)
PPG	71.2 (66.2,76.2)	70.4 (65.4,75.3)	77.7 (73.3,82.0)
Unknown	96.0 (93.8,98.1)	100.1 (99.2,100.9)	93.4 (90.3,96.5)
All invasive cancers	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**	**97.1 (96.5,97.7)**

Produced by the West Midlands NHS Breast and Cervical Screening Quality Assurance Reference Centre