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&

ASSOCIATION OF BREAST SURGERY AT BASO

AN AUDIT OF SCREEN DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING APRIL 2007 TO MARCH 2008

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West Midlands
Cancer Intelligence Unit

Cancer Screening Programmes

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FOREWORDS

I am delighted to provide the foreword to this report on the NHSBSP & ABS at BASO Audit. As ever, there is a mine of useful information here both about the programme as a whole and about how it performs in different parts of the country. There are also important messages for local surgeons and screening teams to enable them to improve their practice across the country in order to reach the standards achieved by the best. However, there is a difference with this year's report. This is the first one produced under the guidance of Neil Rothnie. Neil has a hard act to follow in Hugh Bishop who originated the NHSBSP & ABS at BASO Audit and who has developed it to the strong audit it is today. I have no doubts that Neil will take things forward as the screening programme continues to develop and as, with the addition of new groups of women, new challenges are presented.

One further development that has happened over the last year is the launch of the National Cancer Intelligence Network. The NCIN will bring together the cancer registries and various national cancer audits and cancer datasets to provide the NHS and the population of this country with a great deal more information on which to base decisions. These will be decisions at a local or personal level and on a national basis. The NHSBSP & ABS at BASO Audit is an example to other cancer sites about what can be achieved and I look forward to the ABS at BASO and the breast cancer community playing a full part in the NCIN. Gill Lawrence and her team at the West Midlands Cancer Intelligence Unit will be taking the lead role in breast cancer in the NCIN and so this will help us all move forward together into an exciting future.

Thanks as ever are due to all the surgical and screening teams who contributed to these data, to the West Midlands Breast Screening QA Reference Centre and to Neil and his team on the audit group. This publication will not gather dust as we all read every page and every table in great detail.

Professor Julietta Patnick CBE
Director for the NHS Cancer Screening Programmes

The headline data for the 2007/08 ABS at BASO Screening Audit have already been presented by Gill Lawrence at the ABS Conference held at York Racecourse on 17 and 18 March 2009. This publication, in its eco-friendly colour, fleshes out the bones of those presentations and provides a wealth of information relating to the performance of the NHSBSP. Data quality continues to improve; however, simple observation of practice is not sufficient. We must complete the audit cycle by using the information contained within this booklet to implement changes in practice with the ultimate aim of improving outcomes for women diagnosed and treated under the NHSBSP.

The latest ABS at BASO guidelines have set new higher standards of care for diagnosis and treatment. The audit should be used to inform regional QA reference centres, breast screening units and individual surgeons about their performance against these published standards and it should enable them to see where they rank in comparison with national norms. The hard work of data collection has been done, now we can all use our audit to see areas of our own practice where improvements are possible for the benefit of our patients. The booklet should not be left to gather dust on the shelf.

Over the years a great deal effort has gone into the audit and we now have a wealth of information available. With this in mind I am delighted that the ABS has agreed to fund a research fellow to work on the audit. Linked to the West Midlands Cancer Intelligence Unit, the aim will be to analyse the audit data in more detail with a view to wider publication.

A big thank you, as always, goes to Gill Lawrence and her team at the WMCIU for all their sterling work in the organisation of the audit, the analysis of the data and the publication of the results.

Finally, a special vote of thanks should go to Hugh Bishop, outgoing chair of the audit group. His foresight and inimitable drive were instrumental in the establishment of this unique audit. As a result of his vision breast surgeons are well ahead of colleagues in other specialities in having quality audit data and evidence for revalidation. He will be a hard act to follow.

Neil Rothnie
Chair of the ABS at BASO Screening Audit Group

ACKNOWLEDGEMENTS

The 2007/08 audit of screen-detected breast cancers was designed and directed by the Breast Screening Audit Steering Group of the Association of Breast Surgery at BASO.

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

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INTRODUCTION

AIMS AND OBJECTIVES

The 2007/08 NHS Breast Screening Programme (NHSBSP) and Association of Breast Surgery at BASO (ABS at BASO) audit of screen-detected breast cancer was undertaken to examine NHSBSP clinical activity in the period 1 April 2007 to 31 March 2008. The audit was 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 guidelines intended for symptomatic breast cancer and the National Mastectomy and Reconstruction Audit:

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

National Mastectomy and Reconstruction Audit: A national audit of provision and outcomes of mastectomy and breast reconstruction surgery for women in England and Wales.
The NHS Information Centre, 2008

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
- surgical treatment and tumour size
- waiting times
- lymph node status, invasive grade and NPI score
- surgical caseload
- repeat therapeutic operations
- 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 at BASO 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 at BASO 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 at BASO breast main audit questionnaire was designed to enable collection of data describing breast screening activity in the 2007/08 screening year. The cohort of women included in this period was selected to be identical to that included in the statistical KC62 reports for 2007/08, 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 2006 to 31 March 2007 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 2006/07 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 2001 and 31 March 2002 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 2008.

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 2007/08 NHSBASP & ABS at BASO 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 2007/08 varied from 4,822 to 12,441.

Responsibility for Data Collection

NHSBSP & ABS at BASO breast audit information packs were sent to NHSBSP representatives in 9 QA reference centres in England and to Wales, Scotland and Northern Ireland. Data for the 9 QA reference centres in English and data for Wales, Northern Ireland and Scotland are presented in this document.

In each region, the surgical QA co-ordinator, QA director and QA co-ordinator and 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. 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 that 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 at BASO Breast Screening Audit Steering 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 at BASO Breast Screening Audit Steering Group.

Publication of Audit Data

The NHSBSP & ABS at BASO 2007/08 audit of screen-detected breast cancers is published as a booklet with financial assistance from NHSBSP National Office. The booklet will be distributed on **11 June 2009.**

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

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USING THE AUDIT DATA TO IMPROVE PERFORMANCE

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

At National Level

The NHSBSP and ABS at BASO 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 at BASO 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 at BASO 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 at BASO 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 2007/08 audit, about this document or about the development of future NHSBSP and ABS at BASO breast screening audits please put them in writing to:

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PROVISION OF DATA FOR THE 2007/08 AUDIT

The map below shows the ten English Strategic Health Authorities (SHA), Wales, Scotland and Northern Ireland for the boundaries revised on 1 April 2007. Data form the North East and Yorkshire and Humber SHA are collated in one QA reference centre, called North East, Yorkshire & Humber.

KEY FINDINGS AND RECOMMENDATIONS

CANCERS DETECTED BY SCREENING

2,042,497 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2007 and 31 March 2008. 16,792 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.2 cancers per 1,000 women screened. 66% 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. 27% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75.

NON-OPERATIVE DIAGNOSIS

In 2007/08, 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 4% in 2007/08. Northern Ireland had the highest proportion (25%) of cancers diagnosed by C5 cytology only in 2007/08. 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 was used to diagnose such a high proportion of cancers in these units.

The increased difficulty in diagnosing non-invasive breast cancers non-operatively, has been recognised in the most recent NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening published in March 2009, in which separate minimum standards and targets have been set for non-invasive and invasive breast cancers. The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 83% respectively. The proportion of non-invasive cancers without a non-operative diagnosis varied from 11% in Wales to 26% in South Central. 48 units failed to meet the new 85% minimum standard for the non-operative diagnosis of non-invasive breast cancers. Regional QA reference centres should investigate the screening units in their regions which failed to meet the minimum standard.

For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. This varied from 17% in North East, Yorkshire & Humber to 26% in Northern Ireland. For 2 screening units in the West Midlands and the South West, the proportion of cancers with B5a (Non-invasive) diagnosis later found to have invasive component was significantly higher than the average rate of 22%. Regional QA reference centres should carry out audits with these 2 screening units to ascertain the reason for these unusual results. In North East, Yorkshire & Humber, 40 cases were recorded as B5c (Not assessable/unknown). The regional QA reference centre should investigate why a definitive non-operative diagnosis result was not available for these cases.

80 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. For 15 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 733 cancers diagnosed by C5 cytology alone were found to be invasive after surgery. Regional QA reference centres should audit the 24 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or benign at surgery.

91% of women had all attempts at core biopsy and/or cytology performed at one assessment clinic visit. 6 units failed to achieve a non-operative diagnosis rate of 80% (the previous minimum standard for all cancers) at the first visit. The regional QA reference centres should carry out audits with these screening units.

DIAGNOSTIC OPEN BIOPSIES

In the UK as a whole, 2,616 diagnostic open biopsies were performed in 2007/08. Of these 69% were benign and 31% were malignant. The UK malignant open biopsy rate has fallen from 2.04 per 1,000 women screened in 1996/97 to 0.40 per 1,000 women screened in 2007/08 as the non-operative diagnosis rate has increased from 63% to 95%. The UK benign open biopsy rate was 0.87 per 1,000 women screened in 2007/08. The regional QA reference centres in East of England, London and South West should investigate the reasons for their relatively high benign open biopsy rates.

In the UK as a whole, there were 17 false positive core biopsies and 1 false positive cytology recorded in 2007/08. In previous audits, the majority of the "false positive" core biopsies were found to be very small cancers which were removed in the core biopsy specimen. However, 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. 15 cancers which were diagnosed by open surgical biopsy had a mastectomy as the first surgical operation. Regional QA reference centres and regional surgical QA co-ordinator should review these cases to ascertain the reason that mastectomies were performed as the first surgical operation.

8 invasive cancers and 14 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 22 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. 35% of invasive cancers and 35% 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 West Midlands and South East Coast should audit their invasive cases and in South West and East of England their non-invasive cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result.

SURGICAL TREATMENT

Overall, 71% of non-invasive cancers were treated with conservation surgery. Mastectomy rates for non-invasive cancers varied from 23% in South East Coast, South Central and South West to 36% in East Midlands. In 2007/08, 58% of the surgically-treated non-invasive cancers had high cytonuclear grade. For 8% of non-invasive cancers (272 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 have not been 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). 182 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 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 6% and 62%. 201 invasive cancers, 37 non-invasive cancers and 1 micro-invasive cancer had no surgery recorded and for 9 invasive cancers, 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. 94% of >50mm invasive cancers were treated with mastectomy compared with 18% 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 477 (4%) invasive cancers. 111 (23%) of these cancers were in London, 79 (17%) were in North East, Yorkshire & Humber and 49 (10%) were in the North West. In Northern Ireland, only 5% of the invasive cancers did not have whole tumour size provided. 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 12% of cancers with whole tumour size <15mm were treated with mastectomy compared with 18% of cancers with invasive tumour size of <15mm. In all but 6 screening units, the mastectomy rate for cancers with whole tumour size <15mm was lower than that for cancers with invasive tumour size <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.

The National Mastectomy and Breast Reconstruction Audit used Hospital Episode Statistics (HES) data to show that in 2005/06 the immediate reconstruction rate in England for all breast cancers (screen-detected and symptomatic) treated with mastectomy was 11%. 15% of screen-detected cancers treated with mastectomy were recorded as having immediate reconstruction in 2007/08. The highest recorded immediate reconstruction rates were in East of England (23%) and London (20%) and the lowest in East Midlands (10%). Only 11% of invasive cancers treated with mastectomy were recorded as having immediate reconstruction compared with 27% of non-invasive cancers treated with mastectomy. For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 6% in Northern Ireland to 19% in East of England. For non-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 15% in East Midlands and North West to 38% in East of England.

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 36% 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 37 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.

84% of women with and 66% of women without a non-operative diagnosis had their first surgery within 45 days of their first assessment appointment. This suggests that neither the UK as a whole or any individual region would have met the new 31 day cancer waiting times standard. In the UK as a whole, 94% of women had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit and 71% 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 possible exception of Northern Ireland, no region in the UK would have met the new 62 day cancer waiting times target.

LYMPH NODES AND INVASIVE GRADE

In the UK as a whole, 98% of surgically treated invasive cancers had known nodal status. This varied between 94% in Northern Ireland and 99% in North East, Yorkshire & Humber, East of England, South West, Wales and Scotland. In 23 screening units, nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres and regional surgical QA co-ordinators with screening units with more than 5% of cases with unknown nodal status should audit their cases to determine the reasons for the absence of these important data.

For cases recorded as having a sentinel lymph node biopsy (SNLB), 58% of cases had a full SLNB procedure using isotope and blue dye. This varied from 25% in South Central to 100% in Wales. In 2007/08 when a SLNB procedure was recorded for 5,843 invasive cancers, the proportion of cases with fewer than 4 nodes examined increased to 27%. 24% of these cases involved a SLNB procedure, leaving an underlying rate of 3% with fewer than 4 nodes examined when a SLNB procedure was not

used. 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 2007/08, the proportion of cases with positive nodal status (22%) was slightly lower than in previous years; with the proportion of positive nodes ranging from 7% to 34% in individual screening units. The proportion of cases with positive nodal status (17%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (26%). 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. 14% of the 1,015 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 40 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 usually indicated for non-invasive cancers, 27% of non-invasive cancers had known nodal status. This varied from 16% in Northern Ireland to 33% in East Midlands and North West. Of the 893 non-invasive cancers with known nodal status, 5 (1%) had positive nodal status recorded. 76% of non-invasive cancers treated with mastectomy had known nodal status, compared with 8% of those treated with conservation surgery. Cases treated with mastectomy also had a higher median and maximum number of nodes taken. 26% of non-invasive cancers treated with mastectomy had their nodal status determined on the basis of a SLNB, compared with 5% of those treated with conservation surgery.

Overall, 26% of invasive cancers were Grade I, 52% were Grade II and 20% were Grade III. Grade was not assessable for 57 cases (0.4%) and unknown for 113 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. Data were available to calculate a Nottingham Prognostic Index (NPI) score for 96% of surgically treated invasive cancers. Regional QA reference centres and regional QA pathology QA co-ordinators should investigate why the proportion of cancers with unknown NPI was particulaly high in some units and the reasons for the significant variations in the proportion of EPG, GPG and PPG cancers apparent for some screening units in the NPI control charts.

SURGICAL CASELOAD

There were 526 consultant breast surgeons working in the UK NHSBSP in 2007/08. 92% of women were treated by a surgeon with a screening caseload of at least 20 cases. Of the 142 surgeons with screening caseload of less than 10 cases, 39% treated more than 30 symptomatic breast cancers during 2007/08. Information was unavailable to explain the low caseload of 6 surgeons treating a total of 24 women. Two of these surgeons were in the East of England, 2 were in London and 2 were in West Midlands. Regional QA reference centres and regional surgical QA co-ordinators should investigate why screening cases were treated by these low caseload surgeons.

NUMBER AND SEQUENCE OF OPERATIONS

In the UK as a whole, 20% of cancers with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation. This varied from 14% in Northern Ireland to 24% in South West. 19% of invasive cancers and 19% of non-invasive cancers had more than one therapeutic operation. The former varied from 13% in Northern Ireland to 23% South West and the latter from 14% in Northern Ireland and Scotland to 22% in Wales.

22% of the invasive cancers and 23% of the non-invasive cancers initially treated by conservation surgery had repeat therapeutic operations. 15 invasive cases and 6 non-invasive cases had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit

the 21 cases which had more than three operations to ascertain the reason for this unusual practice. Of the 259 surgeons who had more than 20 cases with breast conserving surgery as the first operation, 31 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.

In the UK as a whole, 22% of cancers with a B5a (Non-invasive) core biopsy result were confirmed following surgery to be invasive; this varied from 0% to 47% in individual screening units. Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (17% and 20% respectively). Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (54%). This varied from 33% in Northern Ireland to 66% in South West. In the UK as a whole, 12% of cancers underwent repeat conservation operations to clear involved margins. 27% of invasive cancers with a B5a (Non-invasive) core biopsy had a repeat conservation operation to clear margins. This varied from 13% in South Central to 42% in East of England.

Invasive cancers with B5b (Invasive) core biopsy had an initial mastectomy rate of 20% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (32%). 97 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. 32 of these cancers were in North West and 28 in North East, Yorkshire & Humber. 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 conservative operations to a mastectomy. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat conversion of conservation surgery to mastectomy (21%). This varied from 12% in West Midlands to 33% in Northern Ireland and 36% in North East Yorkshire & Humber.

Axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy and 97% of invasive cancers diagnosed by C5 cytology only. For 99% and 96% of these cancers respectively, the nodal status was determined at the first operation. 92% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 50% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 43%. 124 invasive cancers with a B5b (Invasive) core biopsy, 18 invasive cancers with C5 cytology and 60 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. 26% of these cancers had a repeat operation to the axilla. This varied from 17% in Scotland to 32% in London and South West.

ADJUVANT THERAPY

14,005 cases (88% of all cases) were eligible to be included in the adjuvant therapy audit. Scotland and Wales had the highest proportion of eligible cases (98%). Northern Ireland had the lowest proportion of eligible cases; with no adjuvant data supplied for 36% of their cancers.

In the UK as a whole, ER status was not known for 352 (3%) of invasive cancers and for 1,230 (45%) non-invasive cancers. In South East Coast, 23% 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 10,791 invasive cancers with known ER status, 89% were ER positive. PgR status data were available for 74% of invasive cancers and 41% of non-invasive cancers. PgR status was known for 91% of the 1,038 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 78% of invasive cancers compared with only 53% in 2005/06. The proportion of cases with known HER-2 status varied from 58% in South Central to 97% 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 8,686 invasive cancers with HER-2 status, 14% were positive and 86% were negative.

76% of invasive cancers and 41% of non-invasive cancers had radiotherapy. 25% of the invasive cancers and 14 of the non-invasive cancers had chemotherapy. 85% of invasive cancers and 21% of non-invasive

cancers received hormone therapy. This difference probably reflects the relatively high proportion of non-invasive cancers for which the ER status was not known (45% compared with 3% for invasive cancers). Hormone therapy was the main treatment 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. This is mainly a reflection of the high proportion of relatively early stage cancers detected by screening. There was a clear decrease in chemotherapy treatment with age; with only 15% of women aged 65-70 receiving chemotherapy compared with 36% 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.

Patients without chemotherapy are included in the Waiting Time for Radiotherapy section in Chapter 8. Overall, 48% of women received radiotherapy within 60 days of their final surgery and 86% within 90 days. 123 women (2%) had not received radiotherapy 200 days after their final surgery. Only 42% of women with invasive breast cancer had started their radiotherapy within 90 days of their first assessment visit and 4% had not started radiotherapy 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 assessment and/or 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.

92% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 56% of women with conservatively treated non-invasive cancers. 12% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 15% were node positive. Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why larger (20mm+ diameter), high grade and/ or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy. 27% of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade and 12 cancers were more than 40mm in diameter. 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 and regional surgical QA co-ordinators should audit the treatment provided to larger (40mm+ diameter) and/or high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy. Throughout the three year period studied, 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. The regional QA reference centres and regional surgical QA co-ordinators should ascertain if these results are due to data collection problems or whether they are a true reflection of clinical practice.

16% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 53% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy. 82% of the 373 ER negative, node negative invasive cancers given chemotherapy were Grade III and 33% were HER-2 positive. Older women with ER negative, node positive invasive cancers were less likely to receive chemotherapy than younger women. 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.

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 6% of ER positive, invasive cancers and 41% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded. 86% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 83% were node negative and 71% were <15mm in diameter. Nevertheless, regional QA reference centres and regional surgical QA co-ordinators should audit ER and PgR positive cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue. The reasons for not giving hormone therapy to ER positive, non-invasive cancers should also be determined. 10% of ER negative cancers did have

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.

43% of ER and PgR negative invasive cancers did not have chemotherapy recorded. 50% of these cancers were Grade III, 9% were node positive and 20% were HER-2 positive. Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why chemotherapy therapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

598 (51%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 15% of these cases were greater than 20mm in diameter, 25% were Grade III, 11% were node positive and 37% were in the MPG1, MPG2 or PPG groups. 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 9,296 cancers submitted to the survival analysis for the period 1 April 2001 to 31 March 2002, 198 (2%) were excluded because they were not registered at the cancer registries. A further 113 cancers (1%) were excluded because they were not confirmed to be primary tumours and 42 because their invasive status was not known.

5 year relative survival for women with invasive cancers diagnosed in 2001/02 was 97.2% (95% CI 96.6%-97.8%). This varied from 95.2% in West Midlands to 99.3% in Wales. However, there is no significant difference between the 5 year relative survival rates in each region. 5 year relative survival has improved significantly from 93.6% in 1990 and 1991 to 97.2% in 2001/02 and the number of eligible cases has increased each year.

The 5 year relative survival of women with less than 15mm diameter cancers was 100.2% compared with a 5 year relative survival rate of only 77.1% for women with tumours with a diameter greater than 50mm. At 101.8%, 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 (17% of the cohort) whose 5 year relative survival was only 87.5%. At 100%, the 5 year relative survival for women with node negative cancers (71% of the cohort) was higher than for the women with node positive cancers (23% of the cohort) whose 5 year relative survival was only 88.9%.

The 5 year relative survival rate in 2001/02 for women with cancers in the excellent prognostic group (EPG) was 102.2%. For women with cancers in the good prognostic group (GPG) and moderate prognostic group 1 (MPG1) the 5 year relative survival rate was 100.1% and 96.7% respectively. At 96.7%, the 5 year relative survival rate for the 20% 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 rate of the 10% of women with cancers in the moderate prognostic group 2 (MPG2) and the 6% of women with cancers in the poor prognostic group (PPG) were even lower at 92.0% and 70.4% 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.17
Low non-operative diagnosis rate for non-invasive cancers	All regions	Ch2 P.19
High proportion of B5c (Not assessable/unknown) cases	NEYH (40 cases)	Ch2 P.21
B5a cancers which become invasive after surgery	SW, WM (2 screening units)	Ch2 P.21
C5 only diagnosis found to be not invasive at surgery	All (24 cases)	Ch2 P.23
Low proportion of cases diagnosed in 1 visit	6 screening units	Ch2 P.23
High benign open biopsy rates	EoE, London, SW	Ch2 P.25
False positive cytology and core biopsy cases	All (18 cases)	Ch2 P.26
Mastectomy as diagnostic open biopsy	All (15 cases)	Ch2 P.26
No non-operative diagnosis attempted	All (22 cases)	Ch2 P.26
High proportion of C4 and/or B4 cytology/core biopsy diagnosis prior to open biopsy	SEC, WM, SW, EM	Ch2 P.27
Large non-invasive cancers with conservation surgery	All (69 cases)	Ch3 P.29
Unknown size/grade for non-invasive cancers	All (272 cases)	Ch3 P.30
Large and high/unknown grade non-invasive cancers treated with conservation surgery	All (182 cases)	Ch3 P.31
No surgery or unknown treatment for invasive cancers	All (210 cases)	Ch3 P.32
Unknown invasive whole size information	All	Ch3 P.33
Mastectomy rate for small invasive cancers	17 screening units	Ch3 P.34
Nodal status data unknown for invasive cancers	9 screening units	Ch5 P.40
High proportion of cases where it was unknown whether or not SLNB was performed	NEYH, Scotland	Ch5 P.41
Unknown SLNB technique	SC, London, SEC	Ch5 P.41
Less than 4 nodes obtained without/unknown SNLB	24 screening units	Ch5 P.42
Positive nodal status determined by less than 4 nodes and no sentinel lymph node procedure	All (40 cases)	Ch5 P.44
Insufficient nodal information (includes invasive cancers with no lymph nodes taken in surgery)	All (632 cases)	Ch5 P.44 & Ch7 P.65
Interpretation of invasive grade definition	All	Ch5 P.47
Significant variance in proportion of cancers in NPI groups	All	Ch5 P.48
Explanations for low screening caseload	EoE, London, WM	Ch6 P.53
More than 3 therapeutic operations	21 cases	Ch7 P.54
High/low repeat operation for conservation surgery or mastectomy	37 surgeons	Ch7 P.55
Mastectomy carried out on C5 invasive cancers	All (97 cases)	Ch7 P.62
Availability of ER status for all invasive cancers	All regions	Ch8 P.69
Availability of HER-2 data for invasive cancers	All regions	Ch8 P.70
Radiotherapy waiting time (over 200 days after final surgery)	All (123 cases)	Ch8 P.72
No radiotherapy for large high grade and/or node positive invasive cancers treated with conservation surgery	All (167 cases)	Ch8 P.76
No radiotherapy for large high grade non-invasive cancers treated with conservation surgery	All (230 cases) & SEC, SC, SW	Ch8 P.76
No chemotherapy for ER negative node positive invasive cancers	All (44 cases)	Ch8 P.78
No hormone therapy for ER positive cancers	EM NW, Wales	Ch8 P.80
No hormone therapy for ER negative, PgR positive invasive cancers	All (24 cases)	Ch8 P.80
Hormone therapy given to cancers with ER and PgR negative or unknown	All (232 cases)	Ch8 P.81
ER and PgR negative PPG invasive cancers without chemotherapy	All (12 cases)	Ch8 P.82
HER-2 positive invasive cases without chemotherapy	All (598 cases)	Ch8 P.83

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 2007/08 NHSBSP and ABS at BASO audit examines surgical activity undertaken for the 2,042,497 women screened in England, Wales, Northern Ireland and Scotland between 1 April 2007 and 31 March 2008. 16,792 cancers were detected in women of all ages which equates to a cancer detection rate of 8.2 cancers per 1,000 women screened. This varied from 7.4 per 1,000 screened in Northern Ireland to 9.3 per 1,000 screened in Wales. Figure 1 shows the invasive status of these 16,792 cancers. Overall, 13,305 (79%) were invasive, 3,311 (20%) non-invasive and 155 (1%) micro-invasive. The invasive status of 21 cancers was unknown.

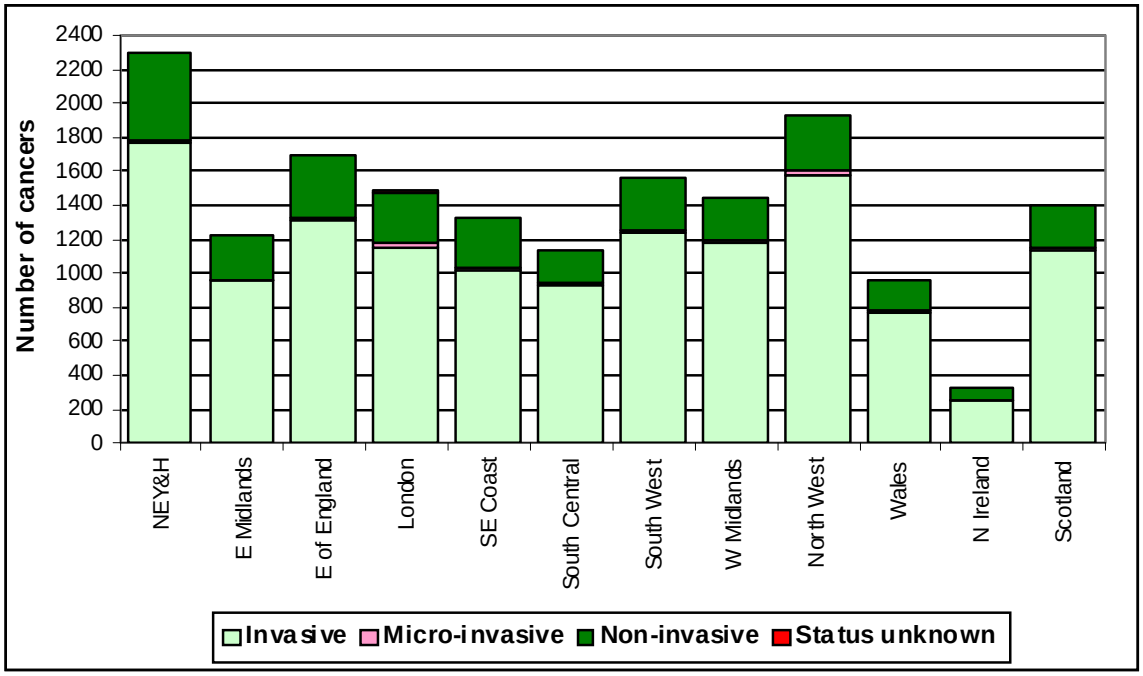

Figure 1 (Table 1): Variation in the number and invasive status of screen-detected breast cancers in each region and country contributing to the 2007/08 NHSBSP and ABS at BASO audit

In 2007/08, the UK invasive cancer detection rate was 6.5 per 1,000 women screened; varying between 5.7 per 1,000 screened in Northern Ireland and 7.5 per 1,000 screened in Wales. The UK cancer detection rate for non-invasive and micro-invasive cancers was 1.7 per 1,000 screened. This rate varied from 1.4 per 1,000 screened in North West and Scotland, to 2.0 per 1,000 screened in South East Coast. For small invasive cancers, <15mm, the UK detection rate was 3.4; varying between 3.1 per 1,000 screened in London and Northern Ireland, and 4.4 per 1,000 screened in Wales.

The following summary table shows that the number of women screened each year has risen by more than 460,000 since 2002/03 when the NHSBSP started to expand the screening programme to invite women up to 70 years of age. The expansion and the introduction of two-view mammography has had a marked effect on the number of cancers detected; with 5,199 more cancers diagnosed in 2007/08 compared with 2002/03. The increase in cancer detection peaked in 2005/06. It has been stable for the last couple of years because most screening units have completed one full round of the age extension.

12 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

* Data from Scotland are absent in 1998/99

95 screening units in the UK are included in the 2007/08 audit. The number of women screened varied from 4,822 women in a screening unit in South Central (where 40 cancers were detected) to 62,561 women in a screening unit in Scotland (where 489 cancers were detected).

Figure 2 shows how the cancer detection rates in each screening unit vary according to invasive status. The Invasive (Other) bars include invasive cancers with size larger than or equal to 15mm and with size unknown. The overall cancer detection rate varies from 5.3 per 1,000 women screened in a unit screening 7,428 women to 10.3 per 1,000 women screened in a unit screening 13,086 women annually.

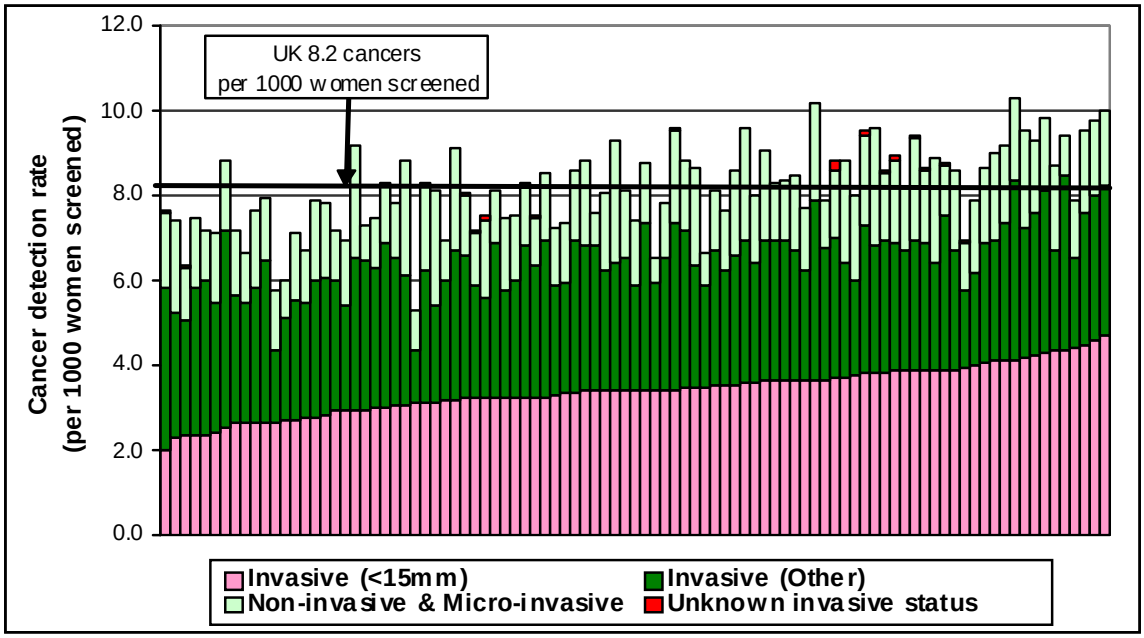

Figure 2: Variation with screening unit in the overall cancer detection rate expressed as the number of cancers detected per 1,000 women screened

1.2 Age Profile of Women with Screen-Detected Breast Cancer

The following summary table shows the effect of age expansion in the past 6 years. In 2002/03, prior to the roll out of the age expansion, only 13% of cancers were diagnosed in women aged 65-70. In the most recent 3 years when the majority of screening units had completed their first full three year expanded screening round, 27% of cancers were diagnosed in women aged 65-70.

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

At the start of the current 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 ranges from 7% in Northern Ireland where the expansion was not implemented during the audit period, to 30% in South East Coast.

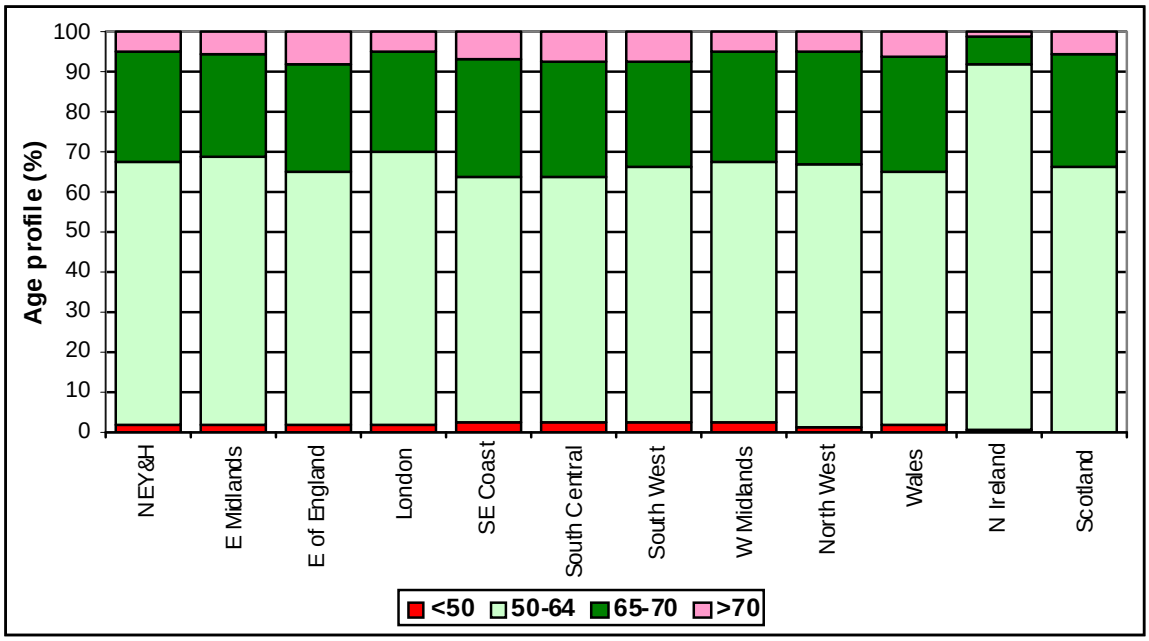

Figure 3 (Table 2): Age at screening appointment

COMMENTS:

- 2,042,497 women were screened by the UK NHSBSP in England, Wales, Northern Ireland and Scotland between 1 April 2007 and 31 March 2008.
- 16,792 cancers were detected in women of all ages. This equates to a cancer detection rate of 8.2 cancers per 1,000 women screened.
- 66% 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.
- 27% of screen-detected breast cancers were diagnosed in women aged 65-70. 4% of cancers were detected in women aged 71-75.

CHAPTER 2
DIAGNOSIS OF CANCERS

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. They are only included in Table 3 of this audit, which shows there were 8 such cancers in 2007/08.

In 2007/08, 95% of cancers detected in the UK NHSBSP were diagnosed non-operatively. Figure 4 shows the non-operative diagnosis rate by C5 cytology, by both C5 cytology and B5 core biopsy and by B5 core biopsy alone. Northern Ireland has the highest proportion (25%) of cancers diagnosed by C5 cytology only. In one unit in Northern Ireland, 64% of cancers were diagnosed by C5 cytology only and in two units in North West, 60% and 47% of cancers were diagnosed by C5 cytology only. Regional QA reference centres should investigate why C5 cytology alone was used to diagnose such a high proportion of cancers in these units. In Northern Ireland and Scotland, relatively high proportions of cancers were diagnosed by C5 cytology and B5 core biopsy (18% and 15% respectively). In Scotland, final needle aspiration (FNA) cytology was also carried out on suspicious lymph nodes (data not included in this analysis). In one Scottish unit, the protocol indicates that cases might receive both cytology and core biopsy and that the results of the FNA are given immediately to women before they leave the assessment clinic.

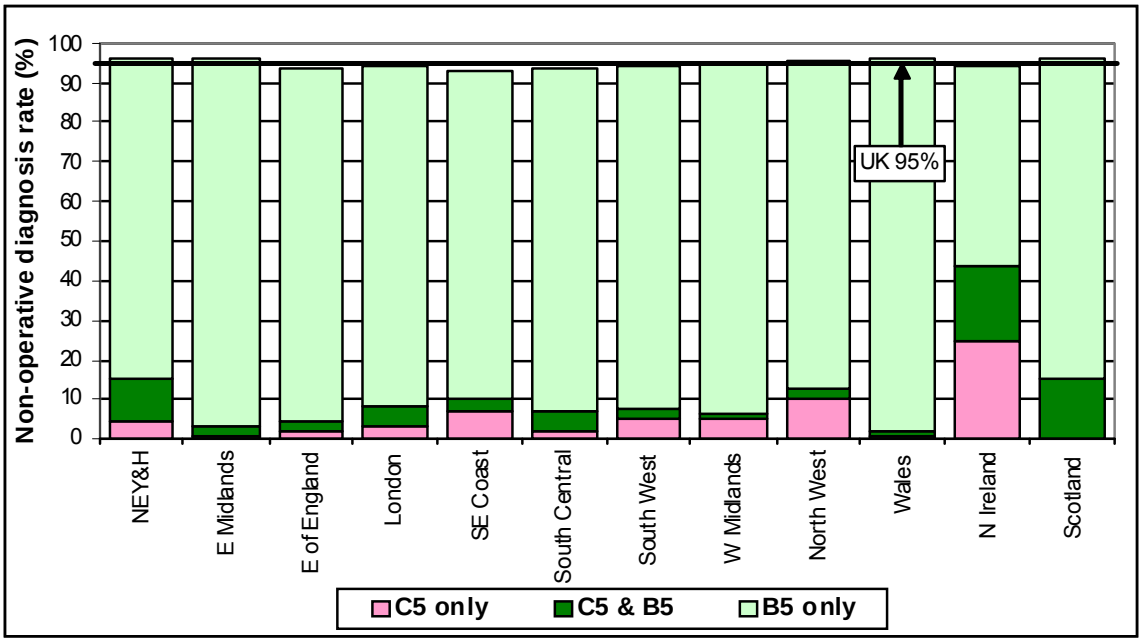

Figure 4 (Table 4): Variation in non-operative diagnosis rate and the proportion of cancers detected by cytology alone, core biopsy alone or cytology and core biopsy as a percentage of cancers detected

The following summary table shows that over the last 12 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 86% in the proportion of cancers diagnosed by B5 core biopsy alone.

12 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

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

Over the last 12 years, data from the NHSBSP and ABS at BASO audits have consistently demonstrated higher non-operative diagnosis rates for invasive breast cancers than for non-invasive breast cancers. The increased difficulty in diagnosing non-invasive breast cancers non-operatively, has been recognised in the most recent NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening published in March 2009, in which separate minimum standards and targets have been set for non-invasive and invasive breast cancers.

2.1.1 Non-operative Diagnosis Rate 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 242 invasive cancers did not have a non-operative diagnosis.

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. 21 units achieved a 100% non-operative diagnosis rate for invasive cancers. Only five screening units failed to meet the 95% non-operative diagnosis target. Two units were in North West, one in North East, Yorkshire & Humber, one in South Central, and the lowest proportion of invasive cancers with a non-operative diagnosis (92%) was recorded in a screening unit in Northern Ireland.

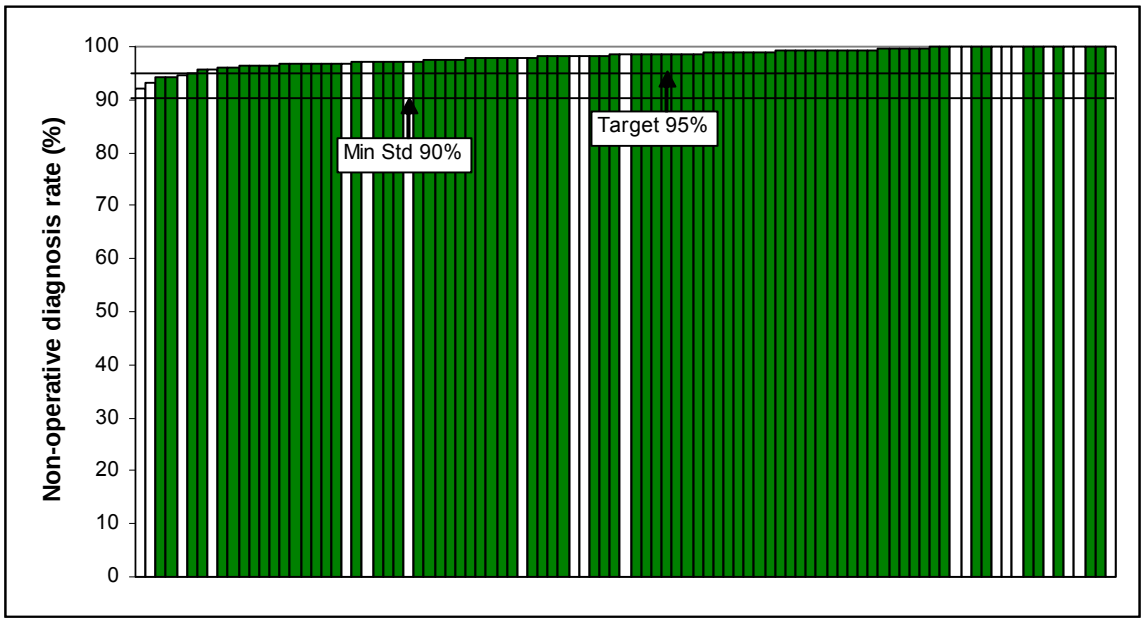

Figure 5 (Table 5): Variation in the proportion of invasive cancers with a non-operative diagnosis (Smaller units are highlighted in white)

2.1.2 Non-operative Diagnosis Rate 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)

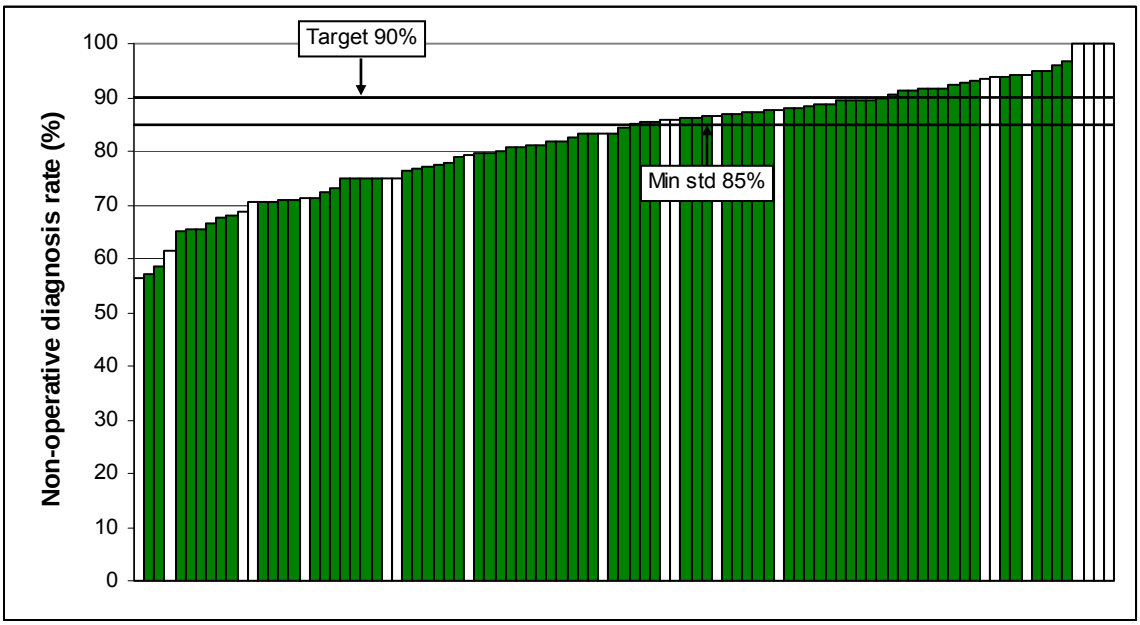

Figure 6 (Table 6): Variation in the proportion of non-invasive cancers with a non-operative diagnosis (Smaller units are highlighted in white)

In 2007/08, the non-operative diagnosis rate for non-invasive cancers was 83%. 561 non-invasive cancers did not have a non-operative diagnosis. The proportion of non-invasive cancers without a non-operative diagnosis varied from 11% in Wales to 26% in South Central. Figure 6 shows the variation between screening units in the proportion of non-invasive cancers with a non-operative diagnosis.

Only 22 screening units achieved the 90% non-operative diagnosis target for non-invasive cancers. Four units achieved a 100% non-operative diagnosis rate for non-invasive cancers. They had 5, 6, 7 and 16 non-invasive cancers in the audit period. 48 units failed to meet the 85% minimum standard for the non-operative diagnosis of non-invasive breast cancers. The lowest proportion of non-invasive cancers with a non-operative diagnosis (56%) was recorded in a screening unit in East of England. Interestingly, the 3 units with a non-operative diagnosis rate for non-invasive cancers below 60% all achieved non-operative diagnosis rates of 90% or above for invasive cancers. 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. North East, Yorkshire & Humber and North West have seen 7% and 9% increases in the non-operative diagnosis rate for non-invasive cancers while South West and Northern Ireland show 5% and 6% decreases. 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 most notable change seen in Northern Ireland where the rate decreased from 8% to 1%. In the three units where a high proportion of cancers were diagnosed by C5 cytology only (one in Northern Ireland and two in the North West), the non-operative diagnosis rate for non-invasive cancers was only 75-77%.

3 YEAR SUMMARY: NON-OPERATIVE DIAGNOSIS RATES

	Non-operative diagnosis rate (%)				*Cancer diagnosed by C5 only (%)*			
Region	***2005/06***	***2006/07***	***2007/08***	***3 Year 2005-08***	***2005/06***	***2006/07***	***2007/08***	***3 Year 2005-08***
N East, Yorks & Humber	*81*	*88*	*88*	*86*	*1*	*1*	*1*	*1*
East Midlands	*84*	*85*	*86*	*85*	*0*	*0*	*0*	*0*
East of England	*79*	*79*	*79*	*79*	*0*	*0*	*0*	*0*
London	*79*	*79*	*83*	*80*	*2*	*1*	*0*	*1*
South East Coast	*83*	*80*	*81*	*82*	*1*	*0*	*1*	*1*
South Central	*75*	*75*	*74*	*75*	*0*	*0*	*0*	*0*
South West	*83*	*79*	*78*	*80*	*1*	*1*	*1*	*1*
West Midlands	*82*	*85*	*82*	*83*	*0*	*0*	*0*	*0*
North West	*76*	*78*	*85*	*80*	*1*	*1*	*1*	*1*
Wales	*88*	*90*	*89*	*89*	*0*	*0*	*0*	*0*
Northern Ireland	*88*	*78*	*82*	*82*	*8*	*0*	*1*	*3*
Scotland	*84*	*80*	*86*	*83*	*2*	*1*	*1*	*2*
United Kingdom	***81***	***81***	***83***	***82***	***1***	***1***	***1***	***1***

COMMENTS:

- In 2007/08, 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 4% in 2007/08. Northern Ireland had the highest proportion (25%) of cancers diagnosed by C5 cytology only in 2007/08. 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 was used to diagnose such a high proportion of cancers in these units.
- The increased difficulty in diagnosing non-invasive breast cancers non-operatively, has been recognised in the most recent NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening published in March 2009, in which separate minimum standards and targets have been set for non-invasive and invasive breast cancers.
- The UK non-operative diagnosis rates for invasive and non-invasive cancers were 98% and 83% respectively.
- The proportion of non-invasive cancers without a non-operative diagnosis varied from 11% in Wales to 26% in South Central. 48 units failed to meet the new 85% minimum standard for the non-operative diagnosis of non-invasive breast cancers. 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 15,244 cancers with a B5 diagnosis, 3,625 (24%) were B5a (Non-invasive), 11,522 (76%) were B5b (Invasive) and 97 cancers (1%) had invasive status B5c (Not Assessable or Unknown) at core biopsy. Of the latter cancers, 40 were in North East, Yorkshire & Humber. The regional QA reference centre should review these cases and ascertain the reason for the relatively high numbers of B5c cases.

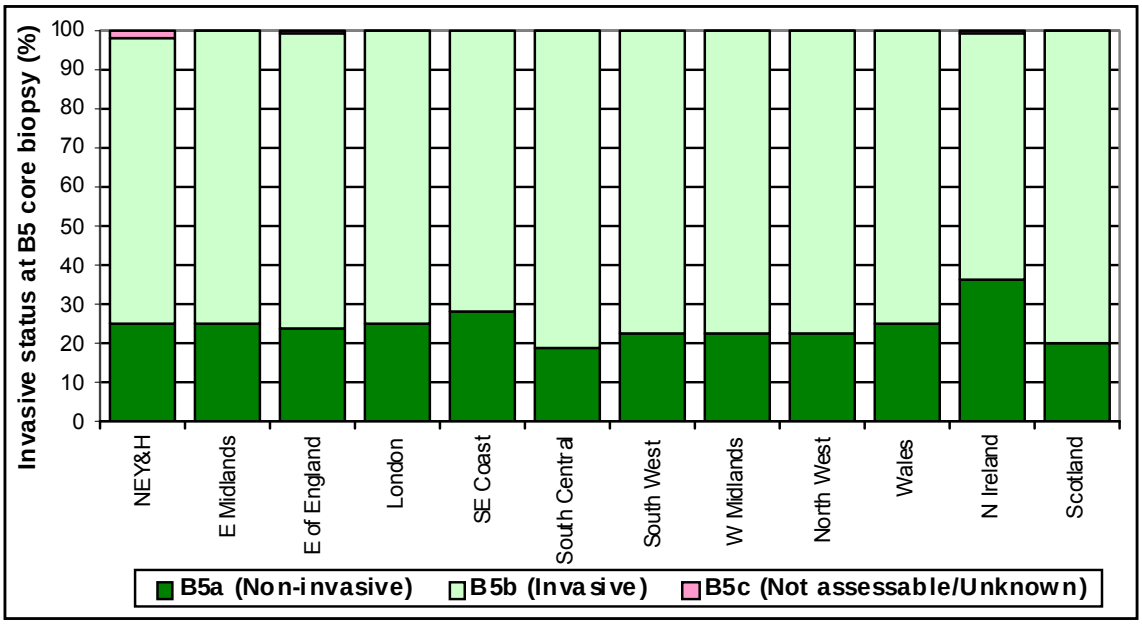

Figure 7 (Table 7): Variation in the proportion of cancers with B5a (Non-invasive), B5b (Invasive) and B5c (Not Assessable or Unknown) core biopsy, expressed as a percentage of cancers diagnosed by core biopsy

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

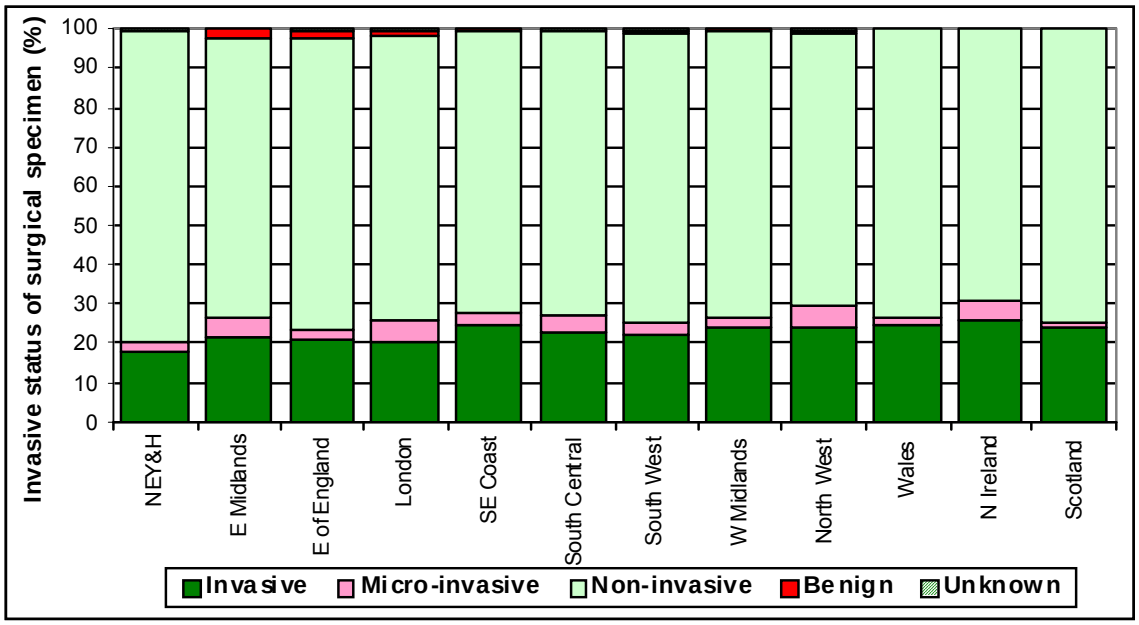

Figure 8 (Table 8): Variation in the invasive status at surgery of cases with a B5a (Non-invasive) non-operative diagnosis, expressed as a percentage of cancers diagnosed as B5a (Non-invasive)

The majority of cancers diagnosed by core biopsy go on to have surgery, at which a definitive invasive status is determined. 35 of the 3,625 cancers with a B5a (Non-invasive) non-operative diagnosis had no surgery, so the non-operative diagnosis of non-invasive cancer was retained. Of the remaining 3,590 cases, 2,623 (73%) had surgical confirmation of non-invasive cancer, 128 (4%) had a diagnosis of micro-invasive cancer at surgery. For 799 (22%) cancers, invasive disease was found at surgery. This varied from 17% in North East, Yorkshire & Humber to 26% in Northern Ireland. For 29 (1%)

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 "Benign" in Figure 8.

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 (64%) 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). The 2 screening units (open red diamonds) which are outside the upper control limit have rates significantly higher than the average rate of 22%. Regional QA reference centres should carry out audits with these two screening units to ascertain why the proportion of B5a (Non-invasive) cancers found to be invasive at surgery is unusually high.

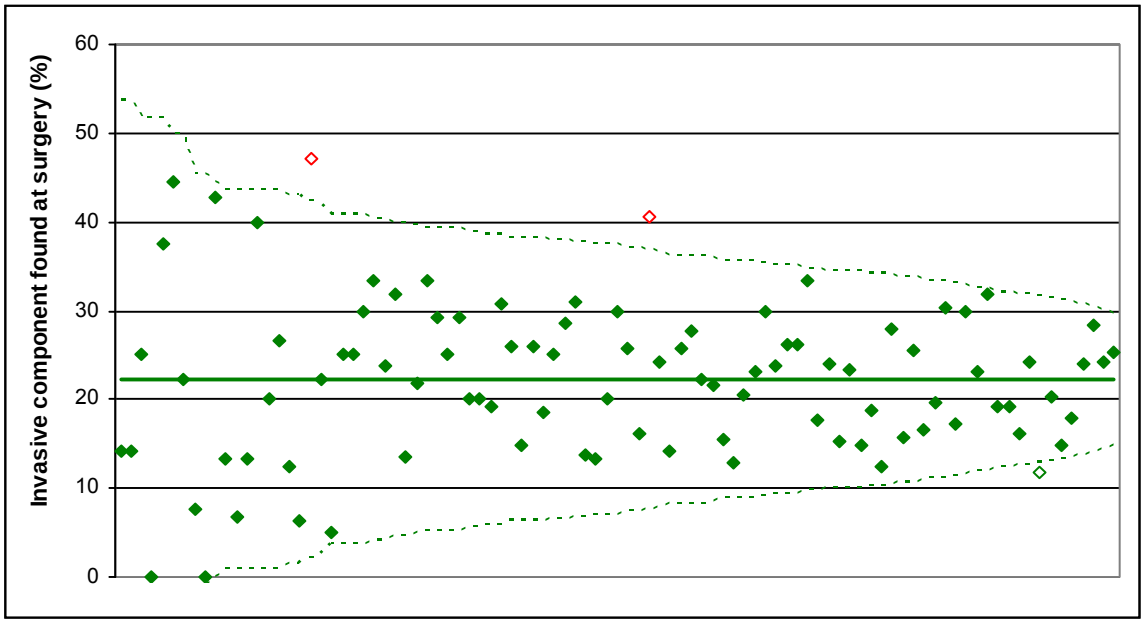

Figure 9: Variation with screening unit in the proportion of cancers with a B5a (Non-invasive) non-operative diagnosis found to be invasive at surgery (open diamonds represent units which lie outside the control limits)

Of the 11,522 cases with a B5b (Invasive) non-operative diagnosis, 201 had no surgery and 9 had unknown surgical treatment. In the UK as a whole, 99% (11,207 cases) of the remaining 11,312 cases had surgical confirmation of invasive cancer. These data are shown for each region in Table 9. 80 cases with a B5b (Invasive) non-operative diagnosis were found to have non-invasive or micro-invasive cancer with no associated invasive disease in the surgical specimen. For 15 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.

8 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*

*Not non-invasive includes invasive, micro-invasive, "benign" histology and unknown invasive status
Not invasive at surgery includes non-invasive, micro-invasive, "benign" histology 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 "benign", micro-invasive or invasive after surgery has fallen by 2% in the past 8 years (from 29% to 27%). The proportions in the last two years are slightly higher, as cases found to be "benign" at surgery (42 cases in 2006/07 and 29 cases in 2007/08) were not included in earlier years. 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 8 years.

2.1.5 Invasive Status of Cancers Diagnosed by C5 Cytology Only

733 cancers were diagnosed by C5 cytology alone. 6 of these cancers had no surgery. 97% of the 727 cancers diagnosed by C5 cytology alone which received surgical treatment were invasive. This varied between 0 cases in Scotland and 100% in Wales (4 cases), South Central (20 cases) and London (44 cases) (Table 10). 19 cancers (3%) diagnosed by C5 cytology alone were non-invasive and 3 were micro-invasive. 2 cases were found to be "benign" at surgery. Regional QA reference centres should audit the 24 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or "benign" at surgery.

COMMENTS:

- For 22% of cancers with a B5a (Non-invasive) non-operative diagnosis, invasive disease was found at surgery. This varied from 17% in North East, Yorkshire & Humber to 26% in Northern Ireland.
- For 2 screening units in 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 22%. Regional QA reference centres should carry out audits with these 2 screening units to ascertain the reason for these unusual results.
- In North East, Yorkshire & Humber, 40 cases were recorded as B5c (Not assessable/unknown). The regional QA reference centre should investigate why a definitive non-operative diagnosis result was not available for these cases.
- 80 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.
- For 15 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 733 cancers diagnosed by C5 cytology alone were found to be invasive after surgery. Regional QA reference centres should audit the 24 cases diagnosed by C5 cytology alone that were found to be non-invasive, micro-invasive or benign 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 (91%) 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 increase of non-operative diagnosis rates in each region achieved by repeat visits to an assessment clinic. In the UK as a whole, a non-operative diagnosis rate of all cancer has increased by 8% after more than one assessment clinic visit. This varied between 2% in Northern Ireland and 13% in South West.

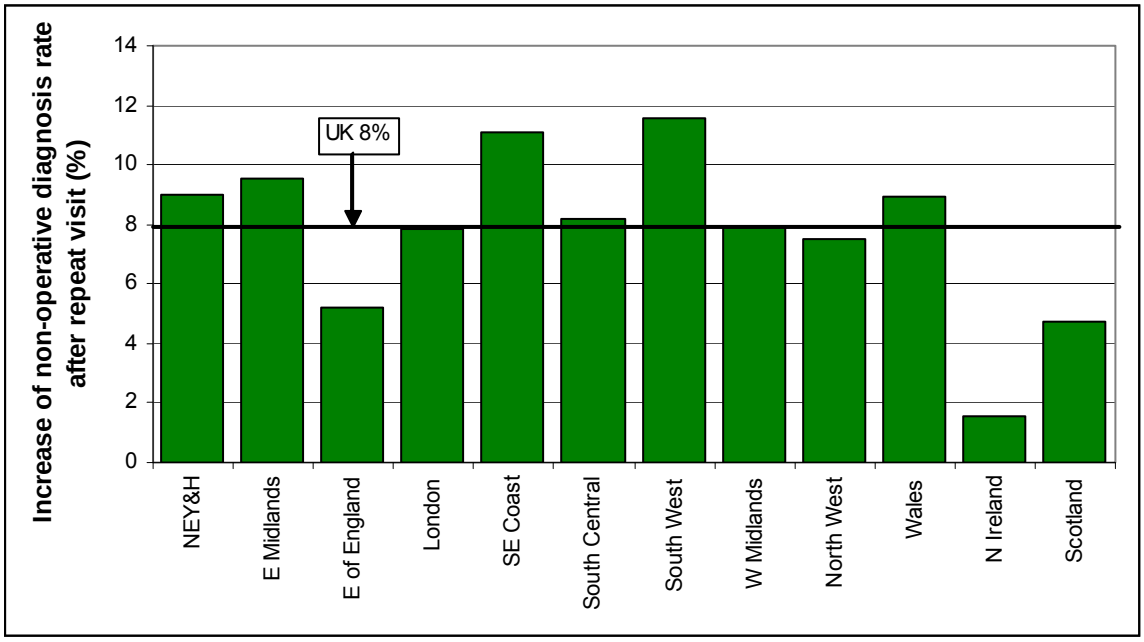

Figure 10 (Table 12): Increase of non-operative diagnosis rate after repeat assessment visit

Figure 11 illustrates the ability of individual screening units to achieve a definitive non-operative diagnosis at one assessment visit. 6 units failed to achieve a non-operative diagnosis rate of 80% (the pervious minimum standard for all cancers) at the first visit. The regional QA reference centres should carry out audits with these screening units.

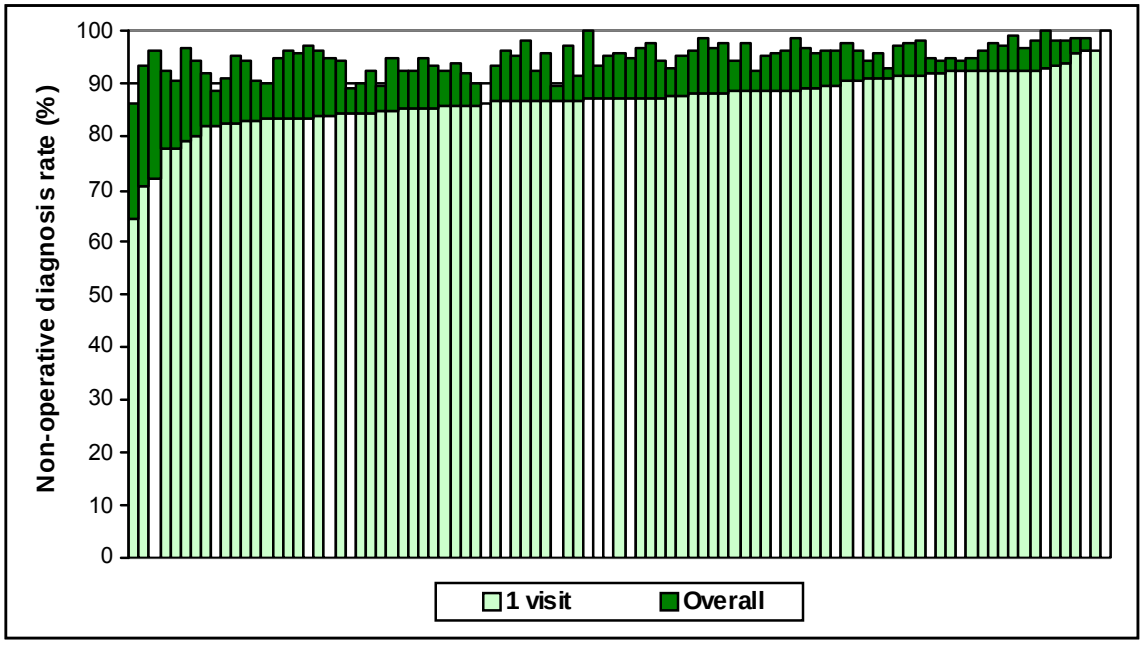

Figure 11: Variation in overall non-operative diagnosis rate and the non-operative diagnosis rate achieved after only 1 visit, presented as a proportion of all screen-detected cancers in each screening unit (Smaller units are highlighted in white)

COMMENTS:

- 91% of women had all attempts at core biopsy and/or cytology performed at one assessment clinic visit.
- 6 units failed to achieve a non-operative diagnosis rate of 80% (the previous minimum standard for all cancers) at the first visit. The regional QA reference centres 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)

Figure 12 shows the regional variation in benign and malignant diagnostic open biopsy rates. In the UK as a whole, 2,616 diagnostic open biopsies were performed. Of these, 1,801 (69%) were benign and 815 (31%) were malignant.

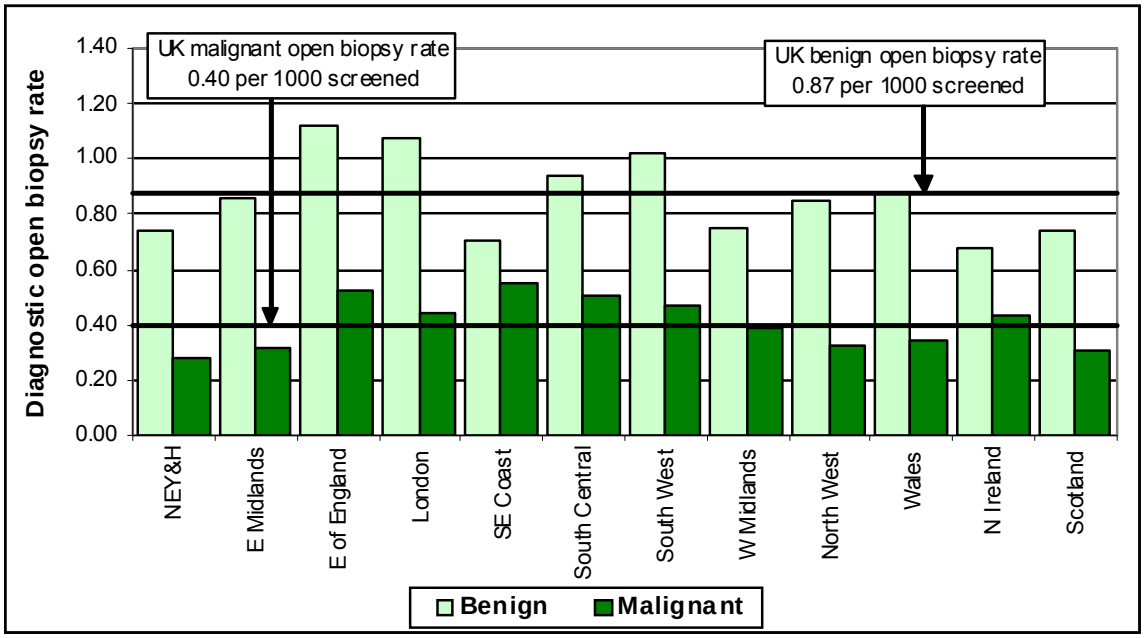

Figure 12 (Table 13): Variation in benign and malignant diagnostic open biopsy rates expressed as the number of diagnostic open biopsies undertaken per 1,000 women screened

The benign open biopsy rate was 0.87 per 1,000 women screened, varying from 0.68 per 1,000 screened in Northern Ireland to 1.12 per 1,000 screened in East of England. The UK benign open biopsy rate is lower than the maximum standards for prevalent (first) and incident (subsequent) screens, but higher than the 0.75 per 1,000 women screened target for incident screens which make up more than 80% of the total. East of England, London and South West have a relatively high benign open biopsy rates and they exceed 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 0.40 per 1,000 women screened, varying from 0.28 per 1,000 screened in North East, Yorkshire & Humber to 0.55 per 1,000 screened in South East Coast.

The following summary table shows that the UK benign open biopsy rate has fallen over 12 years from 1.50 per 1,000 women screened in 1996/97 to 0.87 per 1,000 screened in 2007/08. Over the same period, the UK malignant open biopsy rate has fallen from 2.04 per 1,000 women screened to 0.40 per 1,000 screened as the non-operative diagnosis rate has increased from 63% to 95%.

12 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*
1996/97	*1,340,175*	*2,015*	*2,734*	*1.50*	*2.04*
1997/98	*1,419,287*	*2,251*	*2,349*	*1.59*	*1.66*
*1998/99**	*1,308,751*	*1,830*	*1,553*	*1.40*	*1.19*
*1999/00**	*1,429,905*	*1,838*	*1,316*	*1.29*	*0.92*
2000/01	*1,535,019*	*2,042*	*1,304*	*1.33*	*0.85*
2001/02	*1,507,987*	*2,018*	*1,148*	*1.34*	*0.76*
2002/03	*1,582,269*	*1,901*	*1,018*	*1.20*	*0.64*
2003/04	*1,685,661*	*1,825*	*952*	*1.08*	*0.56*
*2004/05**	*1,717,170*	*1,795*	*927*	*1.05*	*0.54*
2005/06	*1,942,449*	*1,847*	*944*	*0.95*	*0.49*
2006/07	*1,955,825*	*1,811*	*888*	*0.93*	*0.45*
2007/08	*2,042,497*	*1,801*	*815*	*0.87*	*0.40*

*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 14 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 17 false positive core biopsy cases and 1 false positive cytology case recorded. In previous audits, the majority of the "false positive" core biopsies were found to be very small cancers which were removed in the diagnosing process. However, 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.

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

The number of cancers diagnosed by open biopsy has decreased from 888 in 2006/07 to 815 in 2007/08. Of the latter, 242 (30%) were invasive, 9 (1%) micro-invasive and 561 (69%) non-invasive (Table 15). 387 (47%) of the 815 cases did not have further surgical treatment after their diagnostic open biopsy. 15 cancers diagnosed by open biopsy were treated by mastectomy or mastectomy with axillary surgery as the first treatment. Regional QA reference centres and regional surgical QA co-ordinators should ascertain the reason that mastectomies were performed as the first surgical operation for these women. Presumably, this is because radiological and clinical opinion was strongly supportive of the presence of malignant disease.

Tables 16 and 17 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 75% of invasive cancers diagnosed by open biopsy there had been unsuccessful attempts to obtain a non-operative diagnosis using core biopsy alone (Table 16). For non-invasive cancers the proportion of cases where non-operative diagnosis had been attempted with core biopsy alone was higher at 90% (Table 17). Table 16 also shows that, of the 242 invasive cancers diagnosed by open biopsy, 8 (3%) had no non-operative procedure recorded and that, of the 561 non-invasive cancers diagnosed by open biopsy, 14 (2%) had no non-operative procedure recorded. Regional QA reference centres and regional surgical QA co-ordinators should audit these 22 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 8 year summary table shows that, in line with the increased use of core biopsy since 2000/01, the proportion of invasive and non-invasive cancers undergoing cytology as the only procedure prior to a diagnostic open biopsy has decreased from 31% to 9%, while the proportion undergoing core biopsy alone has risen from 36% to 75%. For non-invasive cancers the proportion undergoing cytology as the only procedure prior to a diagnostic open biopsy has decreased from 11% to 2%, while the proportion undergoing core biopsy alone has risen from 65% to 90%.

8 YEAR COMPARISON : PERCENTAGE OF CANCERS HAD MAGLINANT 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

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

Of the 242 invasive cancers diagnosed by open biopsy, 10% had an inadequate (C1) cytology sample or a normal (B1) core biopsy sample (Table 18). This varied from 0% in East of England, North West and Northern Ireland to 36% in Wales (5 cases). 14% had a benign result (C2/B2, 34 cases), 39% were suspicious of benign disease (C3/B3, 94 cases) and 34% were suspicious of malignant disease (C4/B4, 83 cases). In West Midlands and South East Coast, 50% (13 cases) and 48% (13 cases) respectively of the 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.

8 YEAR COMPARISON : PERCENTAGE OF CANCERS HAD MAGLINANT OPEN BIOPSY BY 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

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

The preceding summary table shows that in 6 years of the 8 year period studied, the highest proportion (34% - 46%) of invasive cancers diagnosed by malignant open biopsy were those with a C4 cytology or B4 core biopsy result. In the most recent 2 years, the proportion of invasive cancers with a C3 cytology or B3 core biopsy result has increased and it becomes higher than those with a C4/B4 diagnosis. The proportion with a C1 cytology or B1 core biopsy result has fallen from 22% to 10% since 2000/01.

For the non-invasive cancers which had malignant open biopsy, 34% had a C4 and/or B4 cytology or biopsy result and 56% had a C3 and/B3 non-operative result (Table 19). In South West and East of England 46% (31 cases) and 37% (29 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.

The preceding 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 8

year period studied, from 27% in 2000/01 to 56% in 2007/08, while the proportion with a C1 cytology or B1 core biopsy and C2 cytology or B2 core biopsy results have fallen sharply. The proportion of cases with a C4 cytology or B4 core biopsy result has decreased slightly in the recent 4 years.

COMMENTS:

- In the UK as a whole, 2,616 diagnostic open biopsies were performed in 2007/08. Of these 69% were benign and 31% were malignant.
- The UK benign open biopsy rate was 0.87 per 1,000 women screened in 2007/08. The regional QA reference centres in East of England, London and South West 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 0.40 per 1,000 women screened in 2007/08 as the non-operative diagnosis rate has increased from 63% to 95%.
- In the UK as a whole, there were 17 false positive core biopsies and 1 false positive cytology recorded in 2007/08. In previous audits, the majority of the "false positive" core biopsies were found to be very small cancers which were removed in the core biopsy specimen. However, 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.
- 15 cancers which were diagnosed by open surgical biopsy had a mastectomy 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 surgical operation.
- 8 invasive cancers and 14 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 22 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.
- 35% of invasive cancers and 35% 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 West Midlands and South East Coast should audit their invasive cases and in South West and East of England their non-invasive cases to ascertain why they have particularly high proportions of open biopsies with a C4 and/or B4 non-operative result.

CHAPTER 3
SURGICAL TREATMENT

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

In the UK as a whole in 2007/08, 71% of the 3,311 non-invasive cancers were treated by breast conserving surgery, 28% were treated by mastectomy and 37 cancers (1%) apparently received no surgery (Table 20). The mastectomy rate varied from 23% in South East Coast, South Central and South West to 36% in East Midlands. Of the 155 micro-invasive cancers included in this audit period, 60% had conservation surgery and 39% had mastectomy (Table 21). Only 1 micro-invasive cancer had no surgical treatment.

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 2007/08, 41% of the 3,274 non-invasive cases with surgery were less than 15mm in diameter and 11% were larger than 40mm (Table 22). The size of 41 cases (1%) was not assessable. Of the 355 non-invasive cancers larger than 40mm, 69 (19%) had conservation surgery. Regional QA reference centres should audit these cases to ensure that they have not been under-treated.

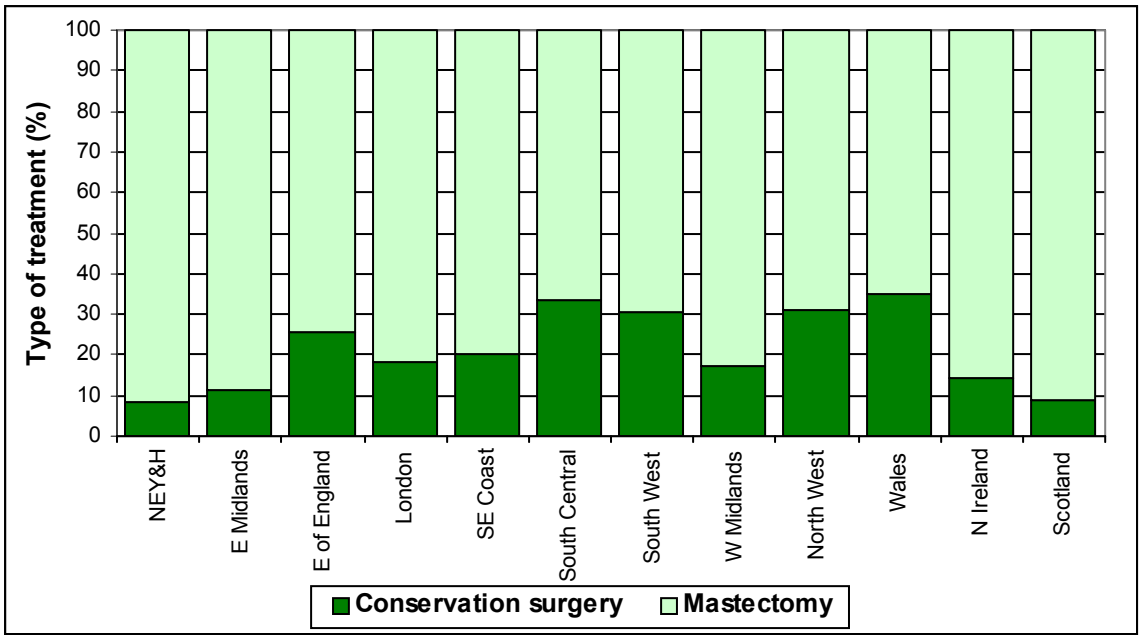

Figure 13 (Table 23): Variation in treatment of non-invasive cancers size larger than 40mm

3.2 Cytonuclear Grade and Size for Non-invasive Breast Cancers

In the UK as a whole, 1,901 (58%) of the 3,274 surgically treated non-invasive cancers had high cytonuclear grade, 855 (26%) had intermediate cytonuclear grade, 339 (10%) had low cytonuclear grade and for 43 (1%) the cytonuclear grade was not assessable (Table 24). Of the 136 non-invasive cancers with unknown cytonuclear grade, 30 (22%) were in North West. The variation in the cytonuclear grade of non-invasive cancers in each screening unit is shown in Figure 14. The unit with

the greatest proportion of non-invasive cancers with unknown cytonuclear grade treated 18 cases in the audit period.

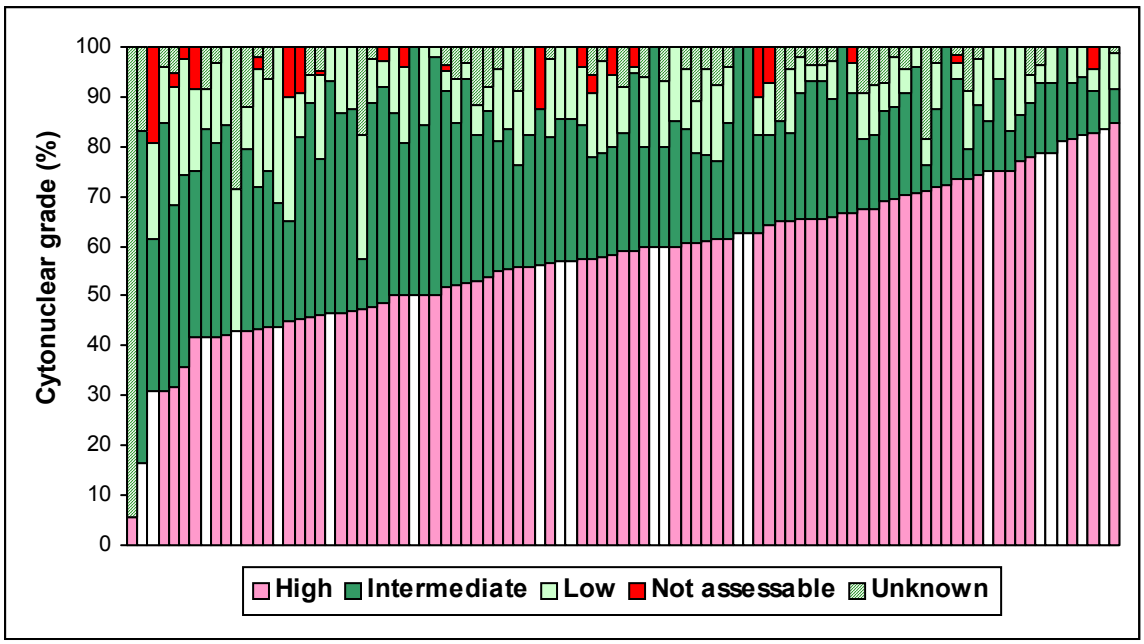

Figure 14: Variation in the cytonuclear grade of non-invasive cancers in each screening unit. (Smaller units are highlighted in white) (Cases with no surgery are excluded)

The following summary table shows that in the UK as a whole, data completeness for non-invasive cancers has improved markedly since 2000/01.

8 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*

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

Figure 15 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 2007/08. Although 44 units were able to supply the cytonuclear grade for all their cases, only 24 units had complete cytonuclear grade and size. Overall, data were incomplete (unknown cytonuclear grade and/or size) for 272 (8%) of all surgically treated non-invasive cancers. Data incompleteness varied from 3% in West Midlands and Scotland to 18% in North West (Table 25). 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 have not been 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* (February 2009) and in the 4th edition of NHSBSP Publication 20, *QA Guidelines for surgeons in breast cancer screening* (March 2009).

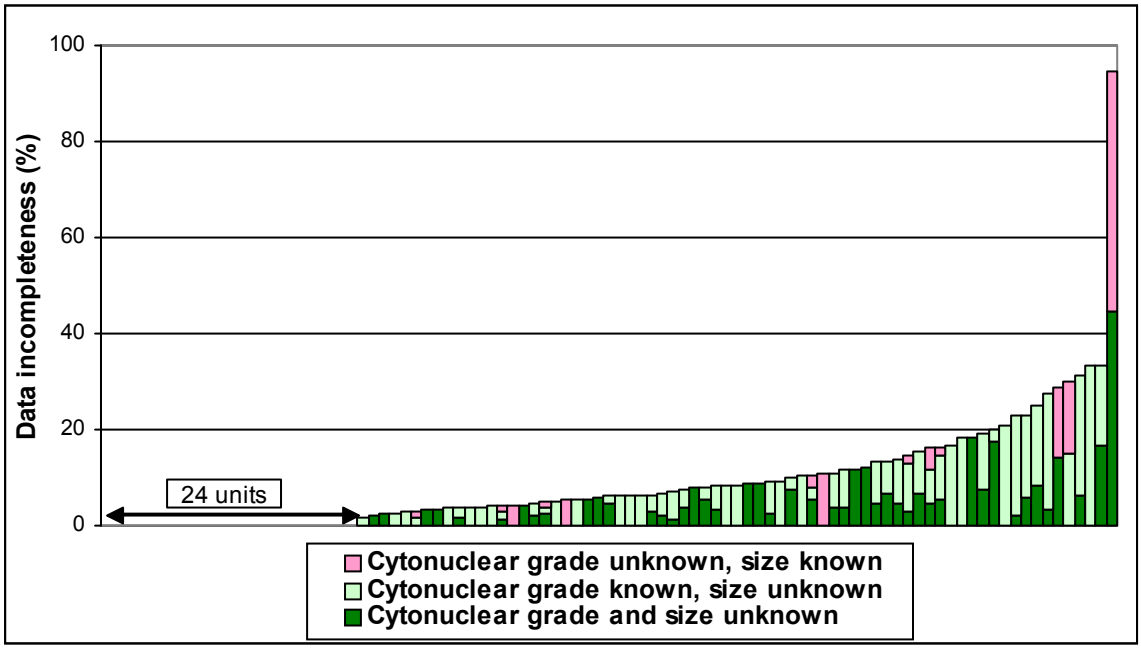

Figure 15: Variation in the data incompleteness of cytonuclear grade and size for non-invasive cancers in each screening unit (Cases with no surgery are excluded)

The following summary table shows that, in total, 182 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 28)	**Unknown cytonuclear grade**	**High cytonuclear grade** (Table 26)	**Unknown cytonuclear grade** (Table 27)	**Total***
N East, Yorks & Humber	*5*	*0*	*8*	*12*	25
East Midlands	*3*	*0*	*0*	*2*	5
East of England	*7*	*1*	*1*	*11*	20
London	*5*	*0*	*7*	*10*	22
South East Coast	*4*	*0*	*3*	*10*	17
South Central	*4*	*0*	*3*	*3*	10
South West	*5*	*0*	*3*	*16*	24
West Midlands	*3*	*0*	*1*	*3*	7
North West	*7*	*0*	*9*	*17*	33
Wales	*6*	*0*	*6*	*1*	13
Northern Ireland	*1*	*0*	*0*	*3*	4
Scotland	*2*	*0*	*0*	*0*	2
United Kingdom	***52***	***1***	***41***	***88***	***182***

*Each non-invasive cancer is counted once only; cases with benign histology at surgery are excluded

COMMENTS:

- Overall, 71% of non-invasive cancers were treated with conservation surgery. Mastectomy rates for non-invasive cancers varied from 23% in South East Coast, South Central and South West to 36% in East Midlands.
- In 2007/08, 58% of the surgically-treated non-invasive cancers had high cytonuclear grade.

COMMENTS:

- For 8% of non-invasive cancers (272 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 have not been 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).
- 182 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 Cancers

Of the 13,305 invasive breast cancers detected by the UK NHSBSP in 2007/08, 9,571 (72%) underwent conservation surgery, 3,524 (26%) had a mastectomy and 201 cases (2%) had no surgery. Treatment information was unavailable for 9 cases, of which 7 were in London. Regional QA reference centres and regional surgical QA co-ordinators should audit these 210 cases to ascertain why surgical treatment was not given or why the surgical treatment that was given was not recorded. Figure 16 shows the regional variation in invasive cancer mastectomy rates which ranged from 21% in South East Coast and Northern Ireland to 32% in East Midlands. Mastectomy rates in individual screening units varied between 6% and 62%.

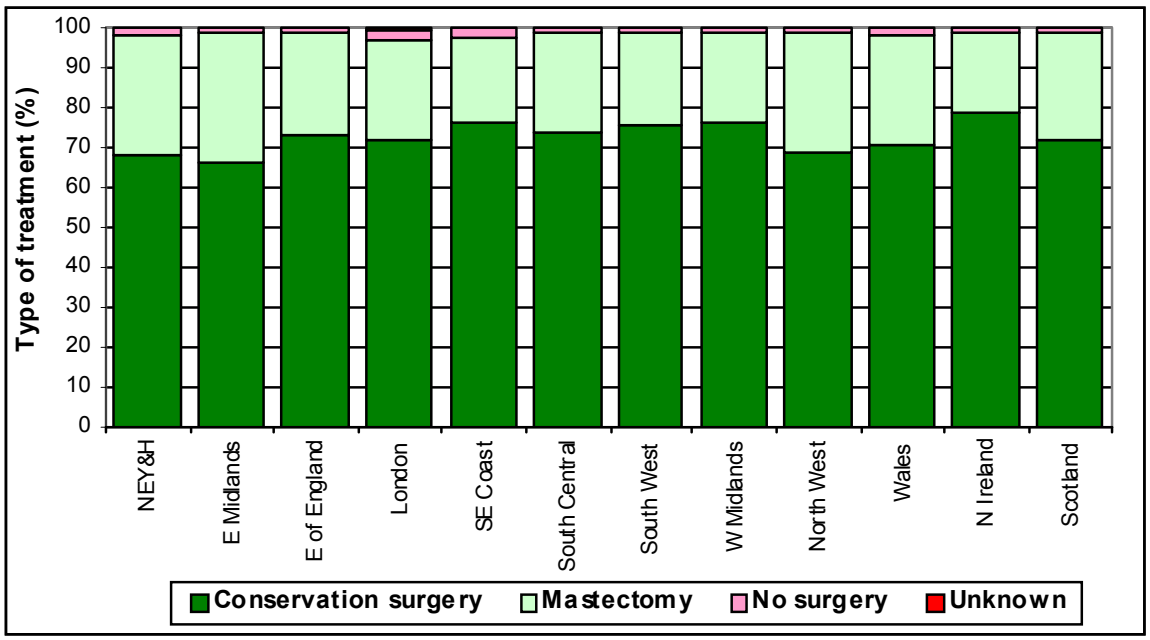

Figure 16 (Table 29): Variation in the type of treatment for invasive cancers (all sizes)

3.3.1 Treatment of Invasive Cancers According to Invasive Size

Of the 13,305 invasive cancers, 3,250 (24%) were less than 10mm in diameter, 3,752 (28%) were 10-<15mm in diameter, 3,072 (23%) were 15-≤20mm in diameter, 2,217 (17%) were >20-≤35mm in diameter and 410 (3%) were >35-≤50mm in diameter. Only 232 cases (2%) were greater than 50mm in diameter (Table 30). For the 372 invasive cases with unknown size, 201 (54%) had no surgery and 89 (24%) had non-invasive, micro-invasive or "benign" histology at surgery.

In most regions there was a clear variation in mastectomy rate with tumour size. In West Midlands, 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 Central and Wales, the difference was about 40%.

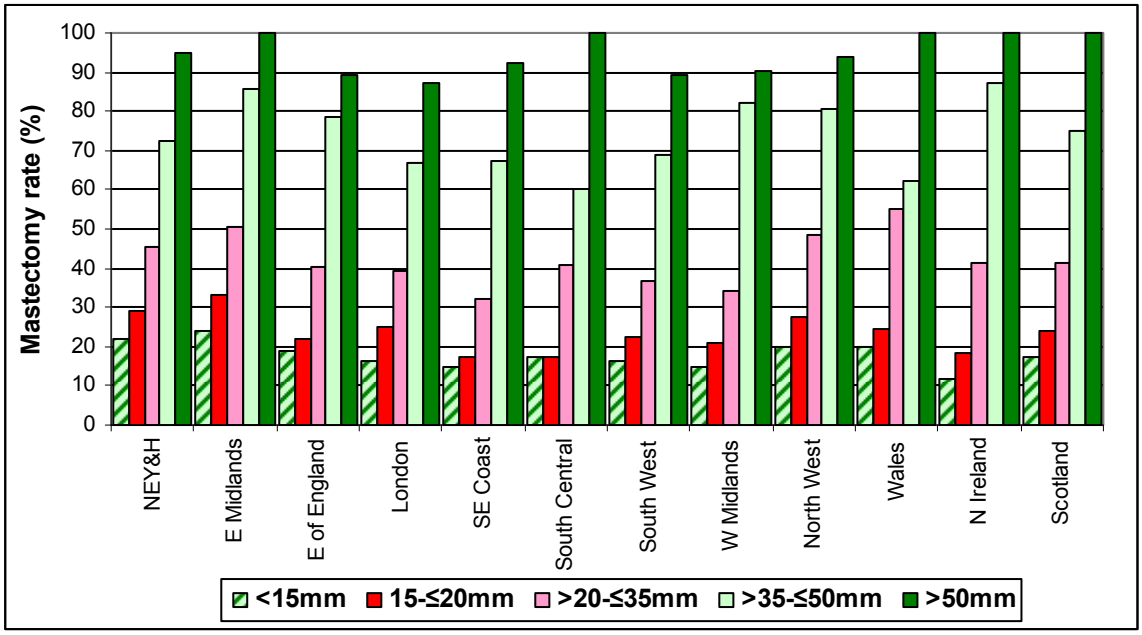

Figure 17 (Table 31): Variation in mastectomy rates with invasive tumour size

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 has remained fairly stable since 1996/97, varying between 18% and 21%. Table 31 shows that the highest mastectomy rates for small (<15mm) invasive cancers were recorded in East Midlands (24%) and the lowest rates (12%) in Northern Ireland.

12 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*

*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. The whole tumour size was not provided for 477 (4%) of the 13,305 invasive cancers (Table 32). 111 (23%) of the cancers without a whole tumour size were in London, 79 (17%) were in North East, Yorkshire & Humber and 49 (10%) were in the North West. In Northern Ireland, 5% of the invasive cancers did not have whole tumour size provided. Regional QA reference centres should ascertain why these important data were not available from their screening units.

The following summary table shows how mastectomy rates in 2007/08 varied with the size of the invasive cancer and with whole tumour size. As expected, mastectomy rates increase with invasive tumour size from 18% for small (<15mm) tumours to 94% for very large (>50mm) tumours. However,

for small (<15mm) invasive cancers, mastectomy rates also increase as the whole tumour size increases. Thus, while only 12% of small (<15mm) cancers with whole tumour size <15mm have mastectomies, 89% of small (<15mm) tumours with whole size >50mm have mastectomies. This indicates that the presence of *in situ* disease accounts for a proportion of the mastectomies performed on small (<15mm) invasive cancers.

INVASIVE CANCER TREATMENT - NUMBER AND MASTECTOMY RATE				
Size	***Invasive size*** *(Table 31)*		***Whole tumour size for cancers with invasive component <15mm*** *(Table 34)*	
	No.	***Mastectomy Rate (%)***	***No.***	***Mastectomy Rate (%)***
<15mm	*1,282*	*18*	*629*	*12*
15-≤20mm	*743*	*24*	*161*	*21*
>20-≤35mm	*928*	*42*	*201*	*35*
>35-≤50mm	*299*	*73*	*138*	*67*
>50mm	*218*	*94*	*132*	*89*

Tables 31 and 34 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 London (16% compared to 6%) and North East, Yorkshire & Humber (22% compared to 13%), and least in Northern Ireland (12% compared to 9%) and Wales (20% compared to 17%).

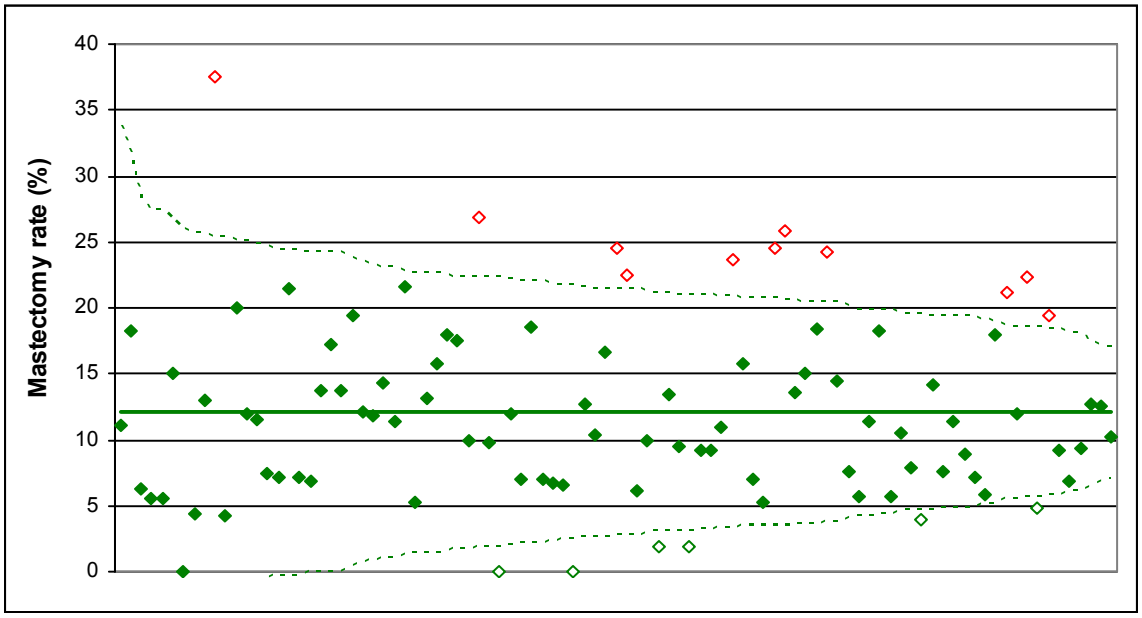

Figure 19: Variation in the mastectomy rates for invasive cancers with a whole tumour size <15mm in each screening unit (open diamonds represent units which lie outside the control limits)

Figure 19 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% confident intervals of the average mastectomy rate (solid line). The mastectomy rates which are outside the control limits are significantly higher (11 units) or lower (6 units) than the average rate of 12%. 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 to ascertain the reasons for this non-random variation in clinical practice.

3.4 Immediate Reconstruction Following Mastectomy

Overall, of the 16,792 cancers detected in 2007/08, 4,512 (27%) were treated with mastectomy. Of these, only 662 (15%) were recorded as having immediate reconstruction. 3,353 (74%) cases had no immediate reconstruction recorded and for 497 (11%) 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 used Hospital Episode Statistics (HES) data to show that in 2005/06 the overall immediate reconstruction rate in England for all breast cancers (screen-detected and symptomatic) treated with mastectomy was 11%.

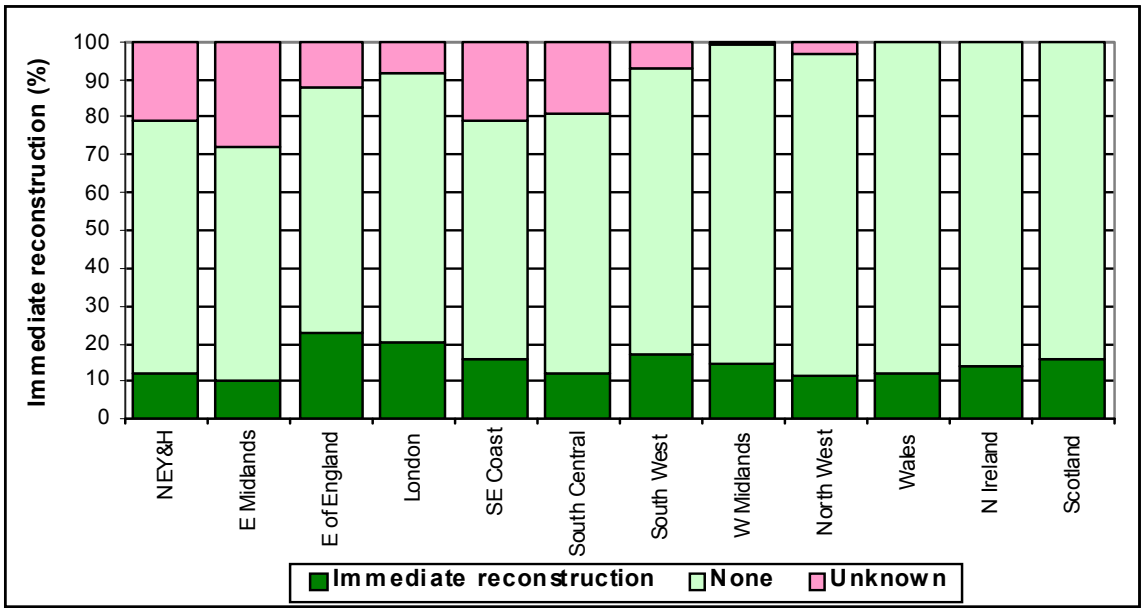

Figure 20 (Table 35): Proportion of cancers having immediate reconstruction

Figure 20 shows how recorded immediate reconstruction rates for all screen-detected cancers treated with mastectomy varied with region in 2007/08. The highest recorded immediate reconstruction rates were in East of England (23%) and London (20%) and the lowest in East Midlands (10%). However in the latter region, it was not known whether or not immediate reconstruction was performed in 28% of cases.

Table 36 shows that, of the 662 cases known to have had immediate reconstruction following mastectomy, 391 (59%) were invasive, 18 (3%) were micro-invasive and 253 (38%) were non-invasive. Thus, only 11% of the 3,524 invasive cancers treated with mastectomy (Table 29) had immediate reconstruction recorded compared with 27% of the 926 non-invasive cancers treated with mastectomy (Table 20). For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 6% in Northern Ireland to 19% in East of England. For non-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 15% in East Midlands and North West to 38% in East of England.

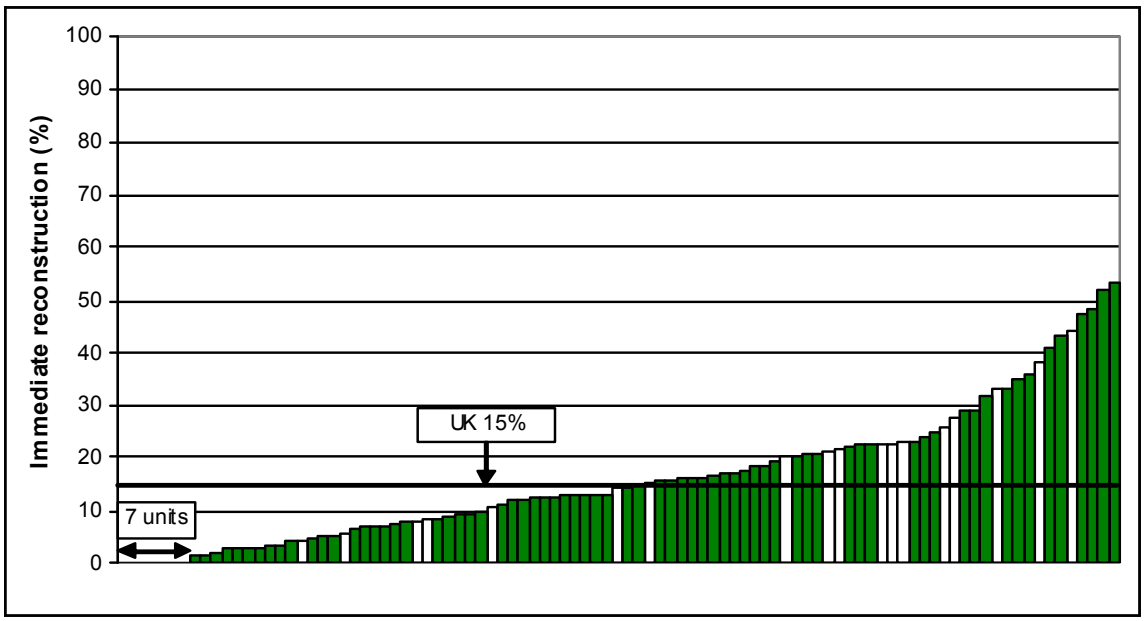

Figure 21: Variation in the proportion of immediate reconstruction in each screening unit. (Smaller units are highlighted in white)

Figure 21 shows that recorded immediate reconstruction rates in 2007/08 varied widely (from 1% to 53%) in individual screening units. No immediate reconstruction was recorded in 7 screening units.

COMMENTS:

- In the UK as a whole, the mastectomy rate for invasive cancers was 26%. Mastectomy rates in individual screening units varied between 6% and 62%.
- 201 invasive cancers, 37 non-invasive cancers and 1 micro-invasive cancer had no surgery recorded and for 9 invasive cancers, 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.
- 94% of >50mm invasive cancers were treated with mastectomy compared with 18% 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 477 (4%) invasive cancers. 111 (23%) of these cancers without a whole tumour size were in London, 79 (17%) were in North East, Yorkshire & Humber and 49 (10%) were in the North West. In Northern Ireland, only 5% of the invasive cancers did not have whole tumour size provided. 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 12% of cancers with whole tumour size <15mm were treated with mastectomy compared with 18% of cancers with invasive tumour size of <15mm. In all but 6 screening units, the mastectomy rate for cancers with whole tumour size <15mm was lower than that for cancers with invasive tumour size <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.
- The National Mastectomy and Breast Reconstruction Audit used Hospital Episode Statistics (HES) data to show that in 2005/06 the overall immediate reconstruction rate in England for all breast cancers (screen-detected and symptomatic) treated with mastectomy was 11%.
- 15% of screen-detected cancers treated with mastectomy were recorded as having immediate reconstruction in 2007/08. The highest recorded immediate reconstruction rates were in East of England (23%) and London (20%) and the lowest in East Midlands (10%).
- Only 11% of invasive cancers in this audit, treated with mastectomy were recorded as having immediate reconstruction compared with 27% of non-invasive cancers treated with mastectomy. For invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 6% in Northern Ireland to 19% in East of England. For non-invasive cancers treated with mastectomy, recorded immediate reconstruction rates varied from 15% in East Midlands and North West to 38% in East of England.

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 will be included in the new Going Forward on Cancer Waits (GFoCW) cancer waiting times performance monitoring system. In order to monitor performance against the 62 day target, the 'date of the last read' of the screening mammogram recorded on the National Breast Screening Computer System (NBSS) will be taken as the 'date of referral'. In GFoCW, cancer waiting times will no longer be adjusted to take into account patient cancellations and patients who did not attend, admission deferrals, medical and social suspensions and patient choice. Thus, instead of a 100% target 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 62 day target of 97% is anticipated for all breast cancer patients. This is 3% lower than the 100% 62 day target included in the new NHSBSP Surgical QA Guidelines.

The 'date of last read' and 'decision to treat date' were not collected for screen-detected cases included in the 2007/08 audit. It is therefore not possible to accurately assess performance against the new surgical QA and GFoCW 31 and 62 day targets. 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 not unreasonable 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 would have met the new 31 day and 62 day targets can therefore be obtained.

Data showing the length of time between assessment and first therapeutic surgery for cases which had a non-operative diagnosis (95% of the 16,792 cases included in the audit) and have the date of the first therapeutic operation recorded are provided in Tables 37-39. Table 37 provides data for all cases, Table 38 for cases which had only one assessment visit and Table 39 for cases where more than one assessment visit was required to obtain the non-operative diagnosis. Equivalent data for the 814 cases which did not have a non-operative diagnosis are presented separately in Tables 40-42. These cases have the date of first diagnostic surgery recorded. 262 cases with unknown screening, assessment or surgery dates are excluded.

In Figure 22 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 22 show that in the UK as a whole, 55% of women had their first therapeutic treatment within 31 days of their first assessment visit. The median waiting time was 29 days (Table 37). The proportion of women having their first therapeutic surgery within 31 days of assessment varied from 31% in South East Coast to 82% in Northern Ireland Only 36% 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 37 days (Table 40). The proportion of women having their first diagnostic surgery within 31 days of assessment varied from 16% in South East Coast to 63% in Northern Ireland. The longer waiting times seen for the latter 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 38, 39, 41 and 42 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 25% of cases where more than one assessment visit was required to obtain the non-operative diagnosis. For cases without a non-operative diagnosis, 42% of those having only one assessment visit (74% of the total) had their diagnostic surgery within 31 days compared with only 18% of those having more than one assessment visit.

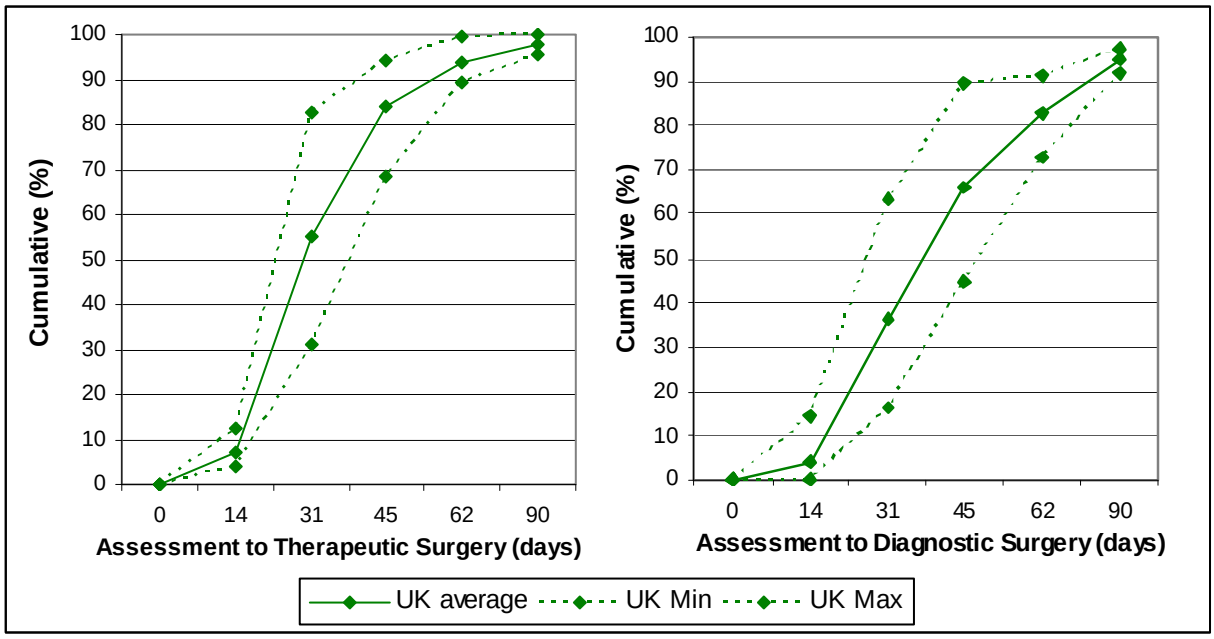

Figure 22 (Tables 37 and 40): Time from assessment to first therapeutic or diagnostic surgery

In order to compare these data with the new 31 day target set in the NHSBSP Quality Assurance Guidelines for Surgeons in Breast Cancer Screening published in March 2009, 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, 84% of women with a non-operative diagnosis had their first therapeutic surgery within 45 days of their first assessment appointment (Table 37) and 66% of women without a non-operative diagnosis had

their first diagnostic operation within 45 days (Table 40). These data suggest that, neither the UK as a whole, nor any of the individual regions is likely to meet the new 31 day target.

In the UK as a whole, 94% of women had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit (Table 44) and 71% had their first surgical treatment (therapeutic or diagnostic) within 62 days of their screening visit (Table 43). Figure 23 shows the proportion of women in each region 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 59% of women received their first surgical treatment within 62 days of their screening visit. In Northern Ireland this figure was 89%. 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 2007/08, with the possible exception of Northern Ireland, no region in the UK would have met the new 62 day 97% target.

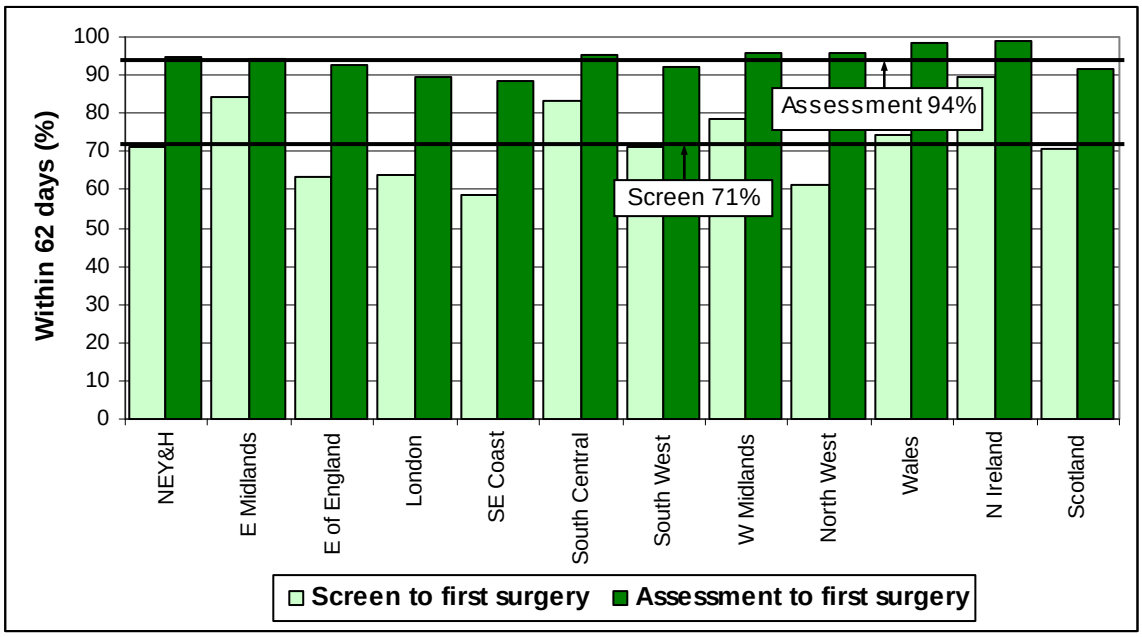

Figure 23 (Tables 43 & 44): Percentage of women who had their surgery (therapeutic or diagnostic) within 62 days of their screening or assessment visit

COMMENTS:

- In the UK as a whole, 55% of women had their first therapeutic treatment within 31 days of their first assessment visit and the median waiting time was 29 days.
- Only 36% 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 37 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.
- 84% of women with and 66% of women without a non-operative diagnosis had their first surgery within 45 days of their first assessment appointment. This suggests that neither the UK as a whole or any individual region would have met the new 31 day cancer waiting times standard.
- In the UK as a whole, 94% of women had their first surgical treatment (therapeutic or diagnostic) within 62 days of their first assessment visit and 71% 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 possible exception of Northern Ireland, no region in the UK would have met the new 62 day cancer waiting times 97% target.

CHAPTER 5
LYMPH NODE STATUS, INVASIVE GRADE AND NPI

201 invasive cancers and 37 non-invasive cancers which did not have surgery have been excluded from this chapter as no information was available concerning their lymph node status and grade.

5.1 Lymph Node Status for Invasive Cancers

Screening guidelines recommended that invasive cancers should have axillary node assessment. Axillary node assessment is not usually indicated for non-invasive cancers.

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)

5.1.1 Availability of Nodal Status for Invasive Cancers

In 2007/08, nodal status was known for 98% of surgically treated invasive cancers, varying from 94% in Northern Ireland to 99% in North East, Yorkshire & Humber, East of England, South West, Wales, and Scotland (Table 45). In Northern Ireland, 15 (6%) invasive cancers were recorded as having no nodes obtained. In London, 10 invasive cancers did not have a record of whether or not nodes were obtained.

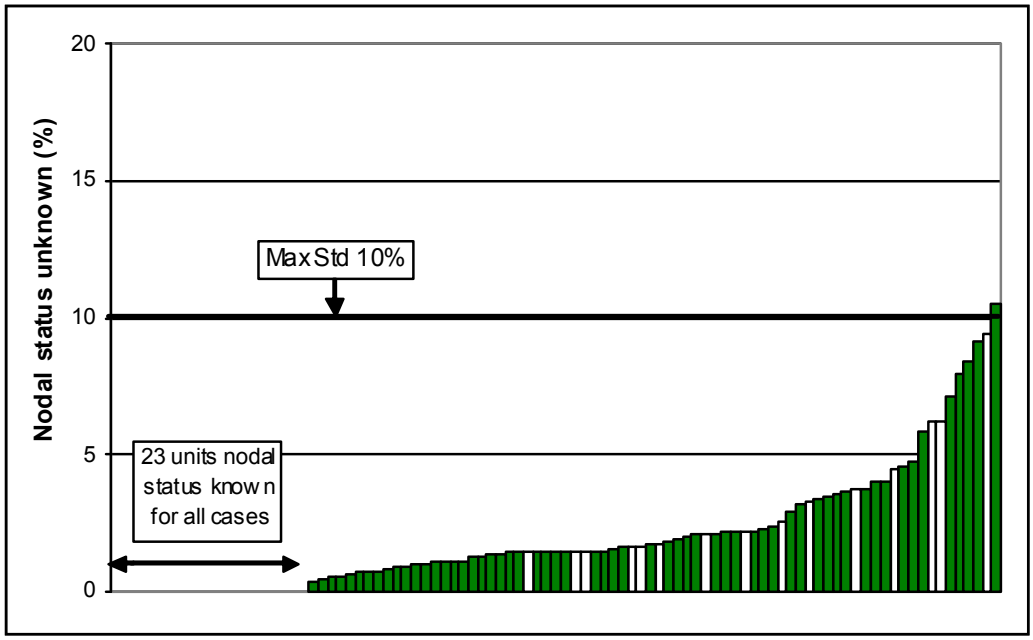

Figure 24: The non-availability of lymph node status for invasive breast cancers in each screening unit (Smaller units are highlighted in white)

The availability of nodal status for invasive cancers is shown for individual screening units in Figure 24. 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. One screening unit in North West did not meet the minimum standard of 90%. Regional QA reference centres and regional surgical QA co-ordinators should audit the cases in 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.

5.1.2 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 12,864 invasive cancers with axillary surgery, 5,843 (45%) had a sentinel lymph node biopsy (SLNB) and 6,672 (52%) did not (Table 46). There were 349 cases where the axillary lymph node procedure was not specified. 195 (56%) of these were in Scotland and 68 (19%) in North East, Yorkshire & Humber. Regional QA reference centres and regional surgical QA co-ordinators should investigate why, for such a relatively high proportion of cases, it was not known whether or not a SLNB was performed.

The following table shows the technique used in the invasive cancers with a SNLB. Of the 5,843 invasive cases with a SLNB, 58% had the full SLNB using isotope and blue dye. Wales was the only region to achieve the SLNB standard of 100% of cases using the isotope and blue dye technique. In Scotland, 94% of cases received the recommended SLNB technique, but in South Central, South East Coast and East of England in only 25%, 32% and 36% of cases respectively was the recommended technique used. For 32% of cases in the UK, the SLNB technique used was not specified; with the highest percentage seen in South Central (72%), London (51%) and South East Coast (50%). Regional QA reference centres and regional surgical QA co-ordinators should investigate why the SLNB technique was not known for their cases.

SENTINEL LYMPH NODE BIOPSY TECHNIQUE USED (%)

Region	*Isotope and blue dye*	*Blue dye only*	*Isotope only*	*SLNB unknown type*
N East, Yorks & Humber	*80*	*4*	*1*	*15*
East Midlands	*87*	*13*	*0*	*0*
East of England	*36*	*17*	*1*	*46*
London	*44*	*5*	*0*	*51*
South East Coast	*32*	*18*	*0*	*50*
South Central	*25*	*3*	*0*	*72*
South West	*58*	*16*	*0*	*26*
West Midlands	*57*	*8*	*4*	*31*
North West	*47*	*6*	*0*	*46*
Wales	*100*	*0*	*0*	*0*
Northern Ireland	*39*	*29*	*0*	*32*
Scotland	*94*	*4*	*0*	*2*
United Kingdom	***58***	***9***	***1***	***32***

5.1.3 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)

The following 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 4 years, this figure has started to rise again because of the increased use of SLNB procedures. When cases with a SLNB are excluded, there is a continuous decrease in the proportion of cases with nodal status based on the examination of fewer than 4 nodes until 2007/08 when there is a slight increase to 3.3% compared with 3.1% in 2006/07.

12 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*

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

In the UK, 94% of the 7,023 invasive cancers, which either did not have a SLNB procedure or where it was not known whether a SLNB procedure was performed, had 4 or more nodes taken (Table 49). This ranged from 90% in North West to 97% in South East Coast.

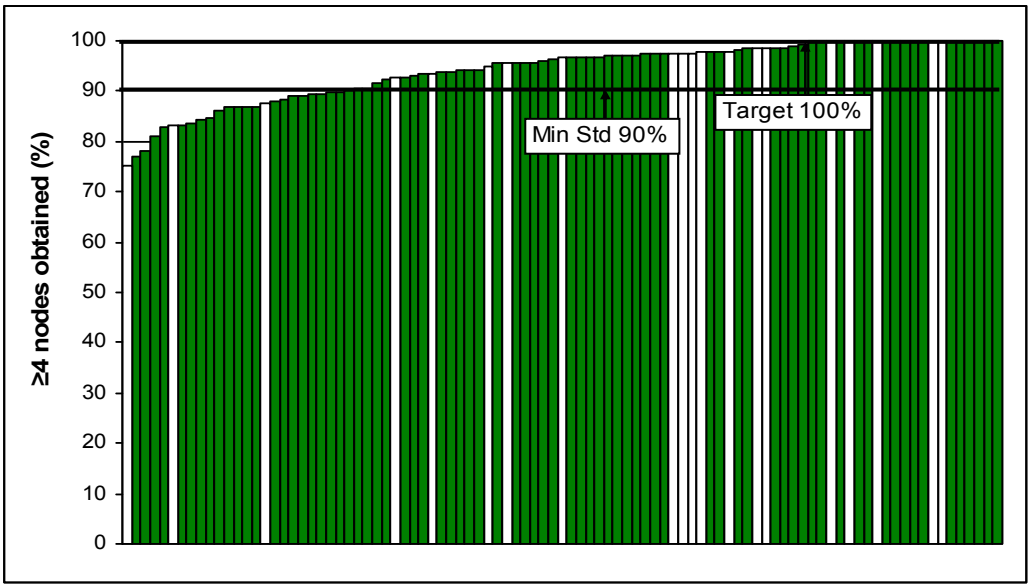

Figure 25: Invasive cancers with at least 4 nodes obtained presented as a proportion of invasive cancers recorded as without/unknown sentinel procedure (Smaller units are highlighted in white)

Figure 25 shows that in 2007/08, 21 screening units achieved the 100% target that all their invasive cancers without a SLNB or with unknown SLNB had at least 4 nodes obtained. 24 screening units did not achieve the 90% minimum standard. The small screening unit, in which only 75% of the invasive cancers without a SLNB or with unknown SLNB had at least 4 nodes obtained, had only 4 cancers included in the data. Regional QA reference centres and regional surgical QA co-ordinators should audit all the invasive cancers without a SLNB or with unknown SLNB which have fewer than 4 nodes reported to ensure that the axilla has not been under-treated.

5.1.4 Lymph Node Status

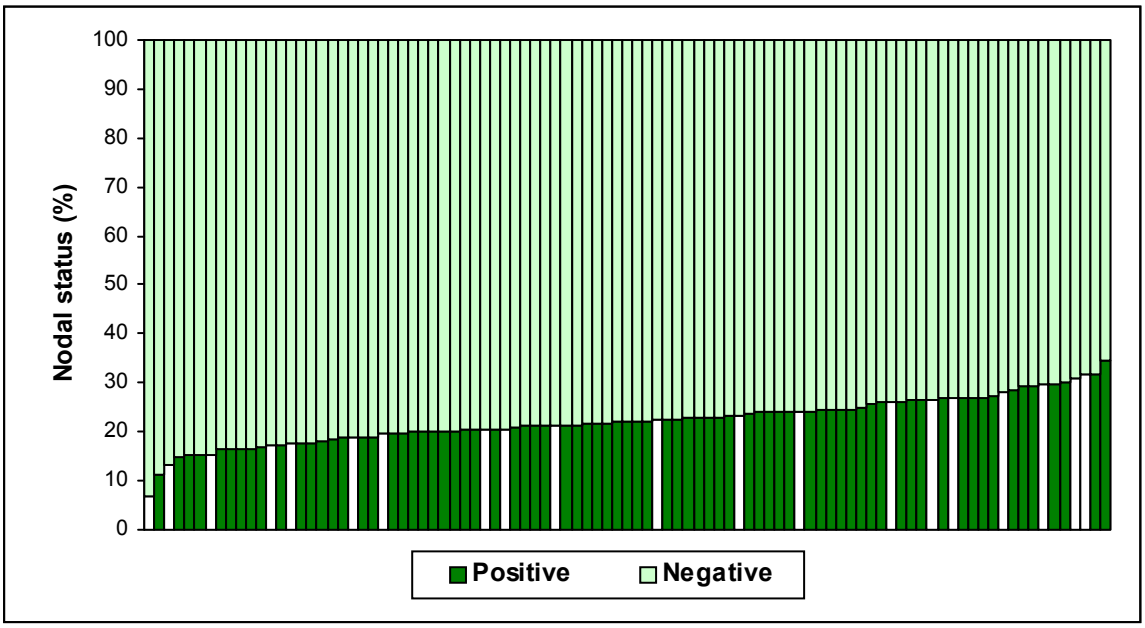

Figure 26: Variation in the lymph node status of invasive breast cancers in each screening unit (Smaller units are highlighted in white)

Of the 12,850 invasive cancers with known nodal status, 2,867 (22%) had positive nodes (Table 47), which is slightly lower than 24% in 2006/07. There was some regional variation in lymph node status; with the proportion of node positive cancers varying from 17% in Northern Ireland to 26% in London (Table 47). A wider variation in nodal status was apparent in individual screening units as illustrated in Figure 26 where the proportion of positive nodes varied from 7% (29 cancers) to 34% (93 cancers).

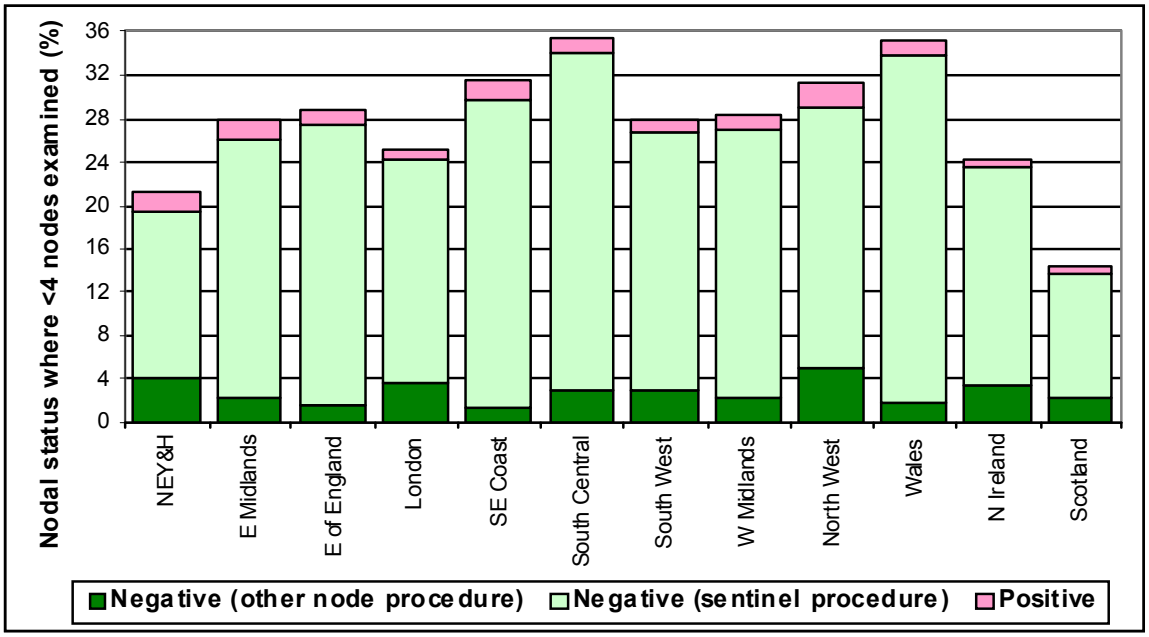

Figure 27 (Table 48): Nodal status for invasive cancers where nodal status was determined on the basis of <4 nodes, expressed as the percentage of invasive cancers with known nodal status

Overall, 378 (2.9%) 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 27 shows that this varied from 1.5% (14 cancers) in South East Coast to 5.1% (78 cancers) in North West. A further 2,936 cancers (22%) had their negative nodal status determined by a SLNB procedure. This varied from 11% (127 cancers) in Scotland to 32% (239 cancers) in Wales.

Table 50 shows that the proportion of cases with positive nodal status (17%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (26%). 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 have positive nodes on non-operative ultrasound guided cytology or core biopsy. Of the 1,015 cases which had their positive nodal status determined from a SLNB procedure, only 534 (53%) had a subsequent axillary procedure (Table 51). For 337 cases (33%), 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 probably reflects the relatively large number of surgeons who were doing the audit phase of the New Start Programme in 2007/08. These surgeons may be carrying out a SLNB procedure and their routine axillary surgery in the same operation.

For 144 cases (14%), the positive nodal status was determined on the basis of fewer than 4 nodes as no subsequent axillary procedures were recorded. A further 40 invasive cancers (0.3%) 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 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.

INVASIVE CANCERS WITH INSUFFICIENT NODAL INFORMATION

	Total invasive cancers with surgery	***Unknown nodal status*** *(Table 45)*	***Negative <4 nodes*** *(Not SLNB - Table 48)*	***Insufficient nodal information***	
Region	***No.***	***No.***	***No.***	***No.***	***%***
N East, Yorks & Humber	*1,732*	*23*	*71*	*94*	*5*
East Midlands	*940*	*17*	*20*	*37*	*4*
East of England	*1,298*	*18*	*21*	*39*	*3*
London	*1,128*	*44*	*39*	*83*	*7*
South East Coast	*999*	*39*	*14*	*53*	*5*
South Central	*921*	*22*	*27*	*49*	*5*
South West	*1,225*	*11*	*36*	*47*	*4*
West Midlands	*1,166*	*18*	*25*	*43*	*4*
North West	*1,566*	*31*	*78*	*109*	*7*
Wales	*754*	*9*	*13*	*22*	*3*
Northern Ireland	*248*	*15*	*8*	*23*	*9*
Scotland	*1,127*	*7*	*26*	*33*	*3*
United Kingdom	***13,104***	***254***	***378***	***632***	***5***

The table above shows that of the 13,104 surgically treated invasive cancers, 254 (2%) had unknown nodal status and that 378 (3%) had their negative nodal status determined on the basis of 1, 2 or 3 nodes with no known SLNB procedure. Thus, 632 (5%) of the 13,104 invasive cancers detected appear to have insufficient nodal information to provide a satisfactory diagnostic work-up. This proportion varied from 3% in East of England, Wales and Scotland to 9% in Northern Ireland.

Figure 28 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 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 20%. 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.

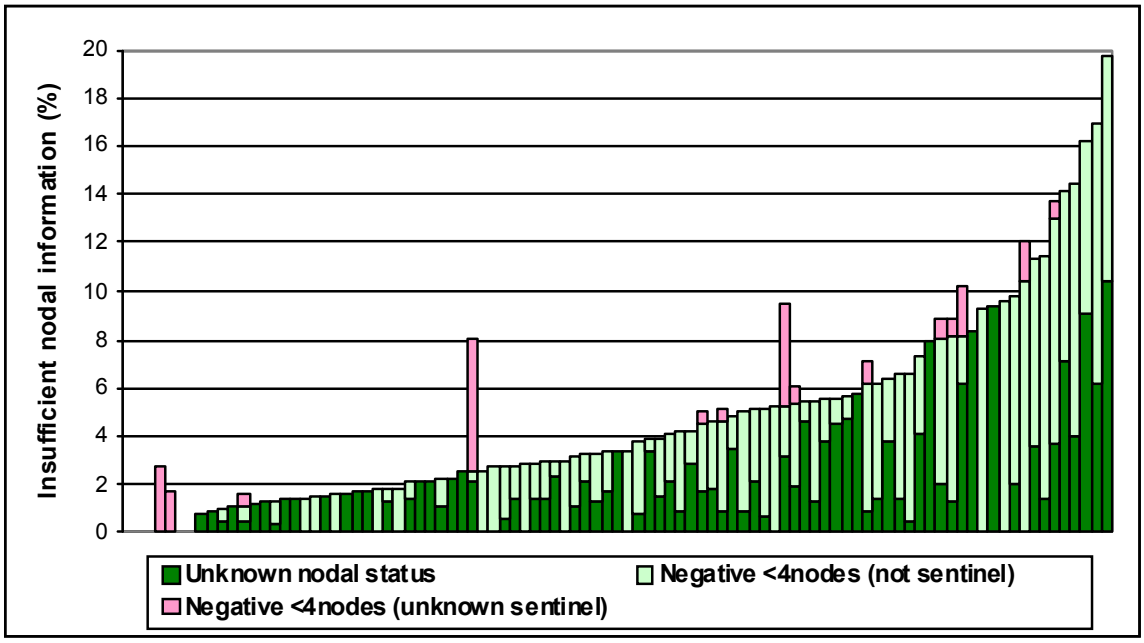

Figure 28: Proportion of invasive cancers with insufficient nodal information in each screening unit

COMMENTS:

- In the UK as a whole, 98% of surgically treated invasive cancers had known nodal status. This varied between 94% in Northern Ireland and 99% in North East, Yorkshire & Humber, East of England, South West, Wales and Scotland.
- In 23 screening units, nodal status was ascertained for 100% of surgically treated invasive cancers. Regional QA reference centres and regional surgical QA co-ordinators with screening units with more than 5% of cases with unknown nodal status should audit their cases to determine the reasons for the absence of these important data.
- For cases recorded as having a sentinel lymph node biopsy (SNLB), 58% of cases had a full SLNB procedure using isotope and blue dye. This varied from 25% in South Central to 100% in Wales.
- In 2007/08 when a SLNB procedure was recorded for 5,843 invasive cancers, the proportion of cases with fewer than 4 nodes examined increased to 27%. 24% of these cases involved a SLNB procedure, leaving an underlying rate of 3% with fewer than 4 nodes examined when a SLNB procedure was not used.
- 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 2007/08, the proportion of cases with positive nodal status (22%) was slightly lower than in previous years; with the proportion of positive nodes ranging from 7% to 34% in individual screening units.
- The proportion of cases with positive nodal status (17%) was lower for cases which underwent a SLNB procedure compared with cases which did not have a SLNB procedure (26%). 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.
- 14% of the 1,015 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 40 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.

5.2 Lymph Node Status of Non-invasive Cancers

Although nodal assessment is not usually indicated for non-invasive cancers, nodes are often obtained when a mastectomy is performed, especially if the assessment process provides suspicion of invasive disease. Of the 3,274 surgically treated non-invasive cancers, 27% had known nodal status. This varied from 16% in Northern Ireland to 33% in East Midlands and North West (Table 52 and Figure 29). For one case in North East, Yorkshire & Humber and one case in South Central it was not known whether or not nodes were taken. 76% of the non-invasive cancers treated by mastectomy had known nodal status, varying from 43% in Northern Ireland to 93% in Scotland (Table 54). In contrast, only 8% of non-invasive cancers treated with conservation surgery had known nodal status. Of the 893 non-invasive cancers with known nodal status, 5 (1%) had positive nodal status recorded (Table 53). This is consistent with previous studies suggesting that 2% of non-invasive breast cancers have non-identified invasive disease removed during the diagnostic process.

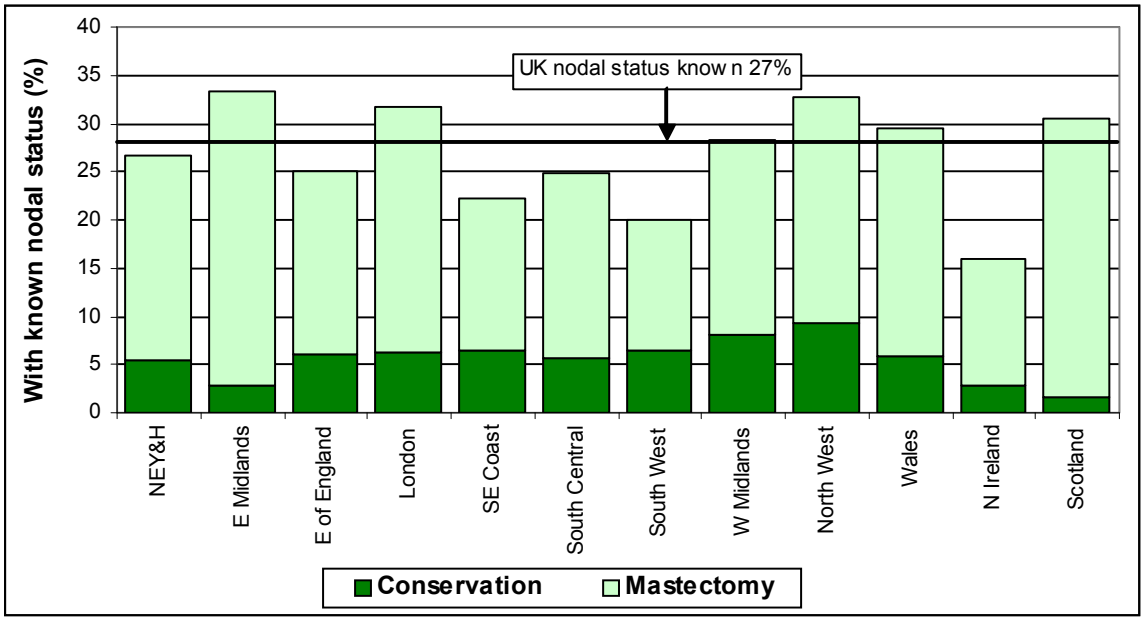

Figure 29 (Table 54): The proportion of non-invasive cancers treated with conservation surgery or mastectomy with known nodal status

In the UK as a whole the median numbers of nodes taken for non-invasive cancers undergoing conservative surgery and mastectomy were 3 and 4 respectively (Table 55). The maximum numbers of nodes taken for cases treated with conservative surgery and mastectomy were 13 and 25 respectively. The maximum number of nodes taken for mastectomy cases varied from 10 in West Midlands to 21 in London and 25 in North West.

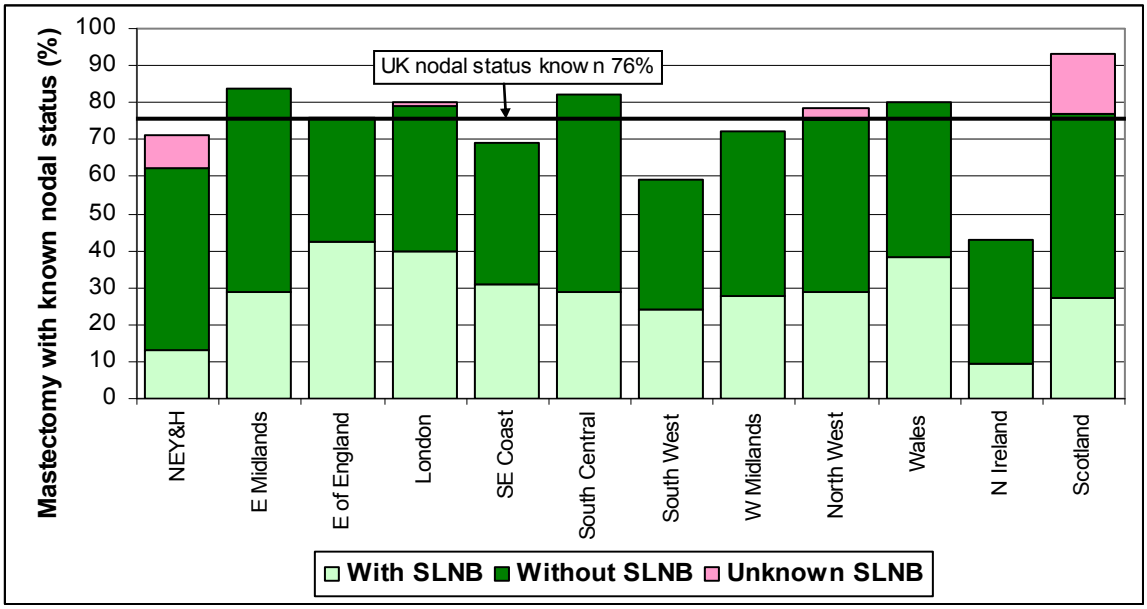

Figure 30 (Table 56): Use of sentinel lymph node biopsy for non-invasive cancers with known nodal status treated by a mastectomy

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 30 shows that of the 76% of non-invasive breast cancers treated with mastectomy that had known nodal status, 28% had their nodal status determined on the basis of a SLNB. This varied from 10% in Northern Ireland to 42% in East of England. Figure 31 shows that of the 8% of non-invasive breast cancers treated with conservation surgery that had known nodal status, 5% had their nodal status determined on the basis of a SLNB. This varied from 1% in Scotland to 7% in West Midlands and North West. 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.

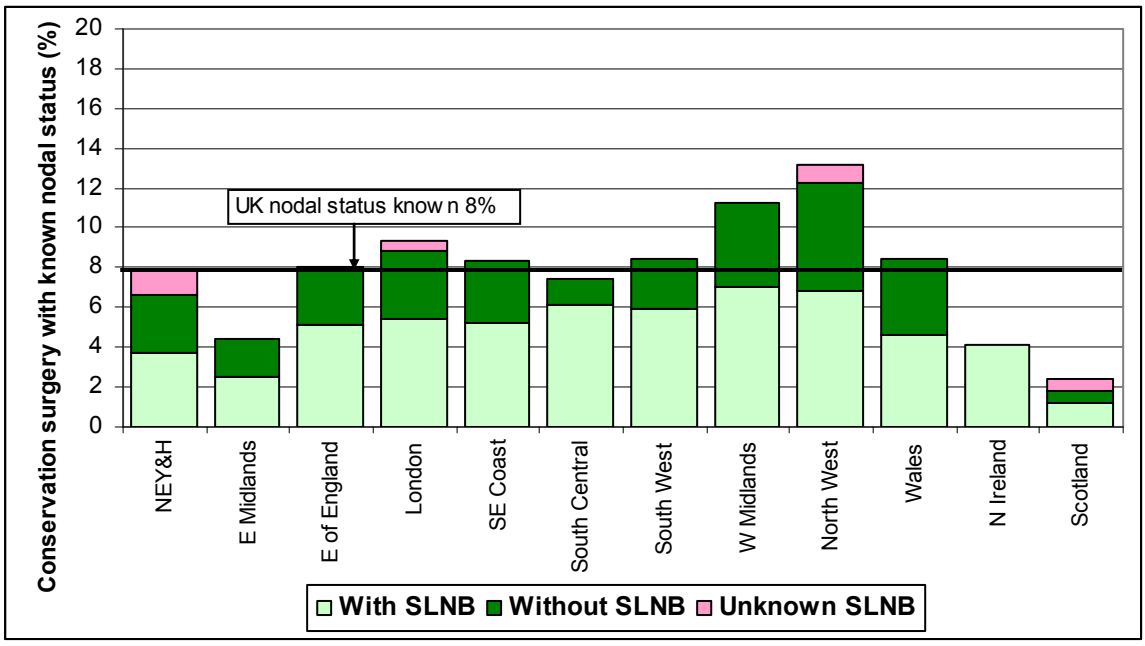

Figure 31 (Table 57): Use of sentinel lymph node biopsy on non-invasive cancers with known nodal status treated with conservation surgery

COMMENTS:

- Although nodal assessment is not usually indicated for non-invasive cancers, 27% of non-invasive cancers had known nodal status. This varied from 16% in Northern Ireland to 33% in East Midlands and North West.
- Of the 893 non-invasive cancers with known nodal status, 5 (1%) had positive nodal status recorded.
- 76% of non-invasive cancers treated with mastectomy had known nodal status, compared with 8% of those treated with conservation surgery. Cases treated with mastectomy also had a higher median and maximum number of nodes taken.
- 26% of non-invasive cancers treated with mastectomy had their nodal status determined on the basis of a SLNB, compared with 5% of those treated with conservation surgery.

5.3 Grade of Invasive Cancers

Of the 13,104 invasive cancers which had surgery, 3,462 (26%) were Grade I, 6,815 (52%) were Grade II and 2,657 (20%) were Grade III (Table 58). Grade was not assessable for 57 cases (0.4%) and grade was unknown for 113 cases (1%).

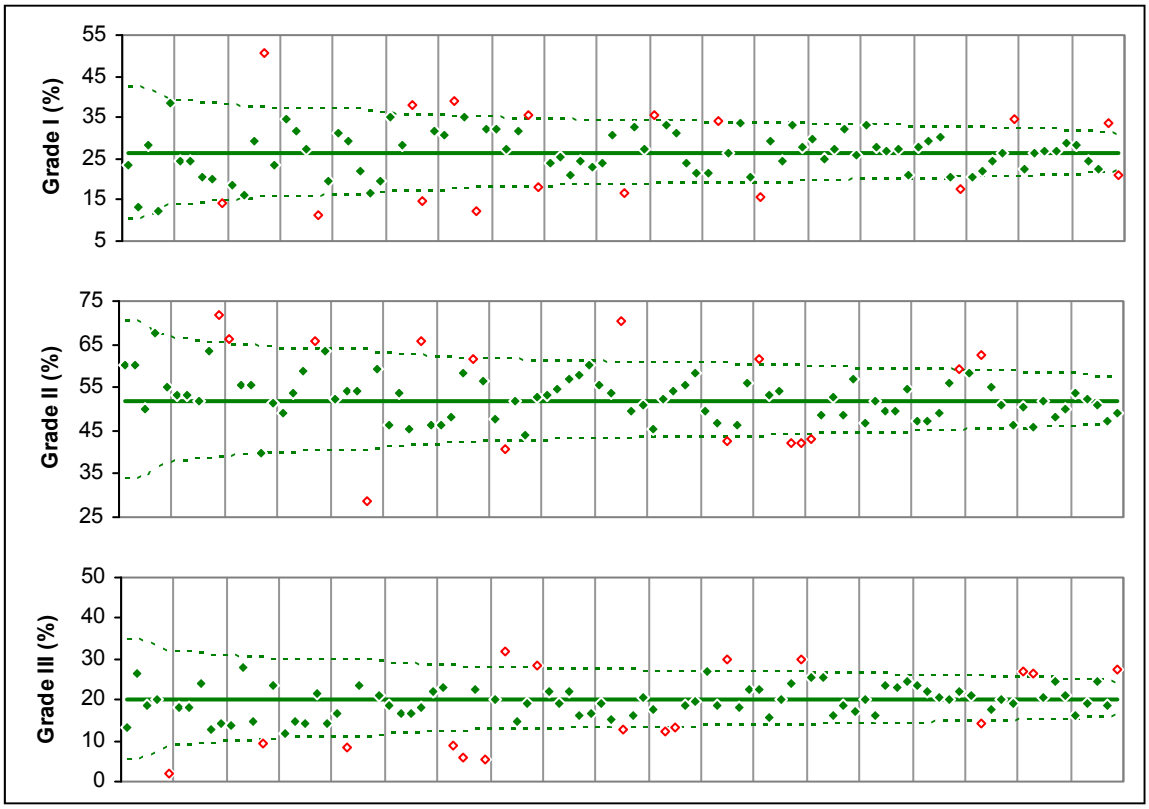

Figure 32: Variation in the grade of surgically treated invasive cancers in each screening unit (open diamonds represent units which lie outside the control limits)

The control charts in Figure 32 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. The 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 their regional pathology QA co-ordinators. For example, 3 of the 4 Welsh units are the outliers in the Grade I control chart, 4 of the 11 units in East of England are the outliers in the Grade II control chart and 3 of the 6 units in Scotland are the outliers in the Grade III control chart.

5.4 NPI of Invasive Cancers

NPI Group = 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 32 will have affected the NPI groupings.

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 4% (461 cases) of the 13,104 invasive cancers which had surgery. Figure 33 shows that the proportion of cancers with unknown NPI is the lowest in South West and Scotland (2%) and highest in Northern Ireland (8%). The high proportion of cancers with an unknown NPI score in Northern Ireland was due to unknown nodal status, unknown size and unknown grade.

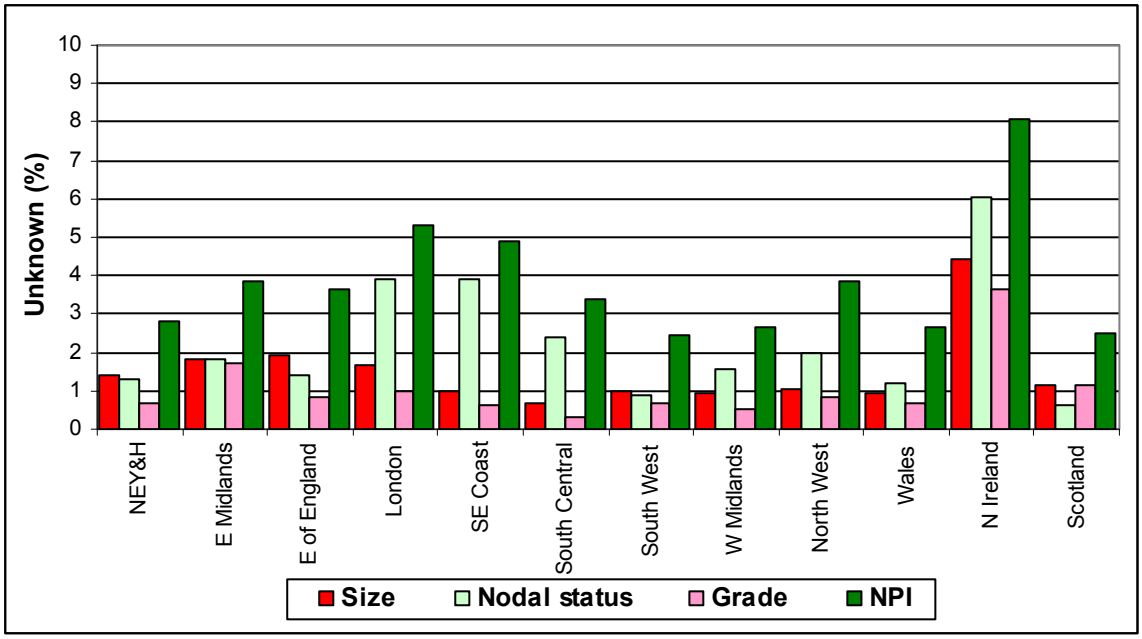

Figure 33 (Table 59): Data completeness of tumour characteristics of surgically treated invasive cancers

Of the 12,643 surgically treated invasive cancers with known NPI score, the highest proportion fell into the Good Prognostic Group (37%), with only 6% (784 cases) in the Poor Prognostic Group (Table 60). As expected with cancers detected by screening, the majority (59%) 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 56% in London and Scotland to 64% in Northern Ireland.

In Figure 34, the proportion of invasive cancers for individual screening units in each NPI prognostic group is plotted in the control charts. As in Figure 32, 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 34 shows that 11 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 4 units have a significantly higher proportion of PPG cancers. 9 units have a significantly higher proportion than the average with unknown NPI score (fourth control chart). Regional QA reference centres and their regional pathology QA co-ordinators and surgical QA co-ordinators should investigate the reason for these unusual variations.

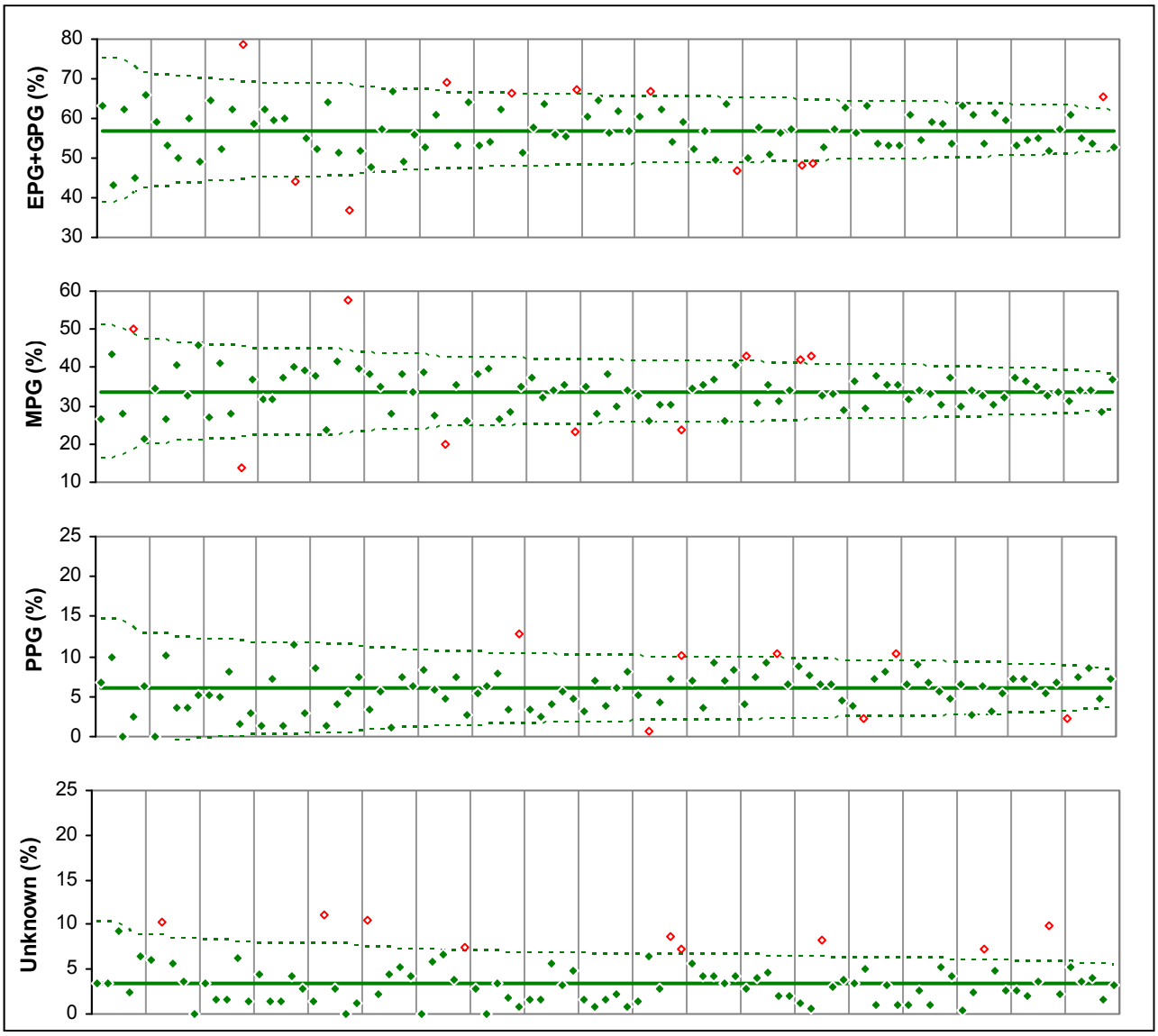

Figure 34: NPI Groups for surgically treated invasive cancers in each screening unit (open diamonds represent units which lie outside the control limits)

COMMENTS:

- Overall, 26% of invasive cancers were Grade I, 52% were Grade II and 20% were Grade III. Grade was not assessable for 57 cases (0.4%) and unknown for 113 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.
- Data were available to calculate a Nottingham Prognostic Index (NPI) score for 96% 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.
- Regional QA reference centres and their regional pathology QA co-ordinators and surgical QA co-ordinators should investigate the reasons for the significant variations in the proportion of EPG, GPG and PPG cancers apparent for some screening units in the NPI control charts.

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 526 consultant breast surgeons working in the UK NHSBSP in 2007/08. This UK figure counts only once the 43 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. 460 of the 526 consultant surgeons were identified by their unique GMC registration code. A code other than the GMC code was provided for a further 53 surgeons from Scotland. Data for the remaining 13 unidentified surgeons have been assumed to be for 13 individual surgeons.

8 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*

*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 level off at 91% to 93% between 2004/05 and 2007/08. In 2007/08, 84% women were treated by surgeons with an annual caseload of more than 30 screen-detected cancers.

The screening surgical caseload is shown for each region in Figure 35. The 43 surgeons working in more than one region appear in each region's figures. 255 surgeons (48%) treated 30-99 cases and 8 surgeons (2%) treated more than 100 cases. 59 surgeons (11%) treated 20-29 screening cases and 62 (12%) treated 10-19 screening cases. 142 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 (47%) and Scotland (45%). Surgical specialisation was most advanced in Wales where only 11% of surgeons (2 in total) treated fewer than 10 screening cases. Table 62 shows that the highest median surgical caseload was in Wales (56 cases) and the lowest in Scotland (11 cases). The

highest caseload for a single surgeon was in Scotland, where one surgeon was clinically responsible for 199 cases. Seven other surgeons had a screening caseload of more than 100 cases in 2007/08.

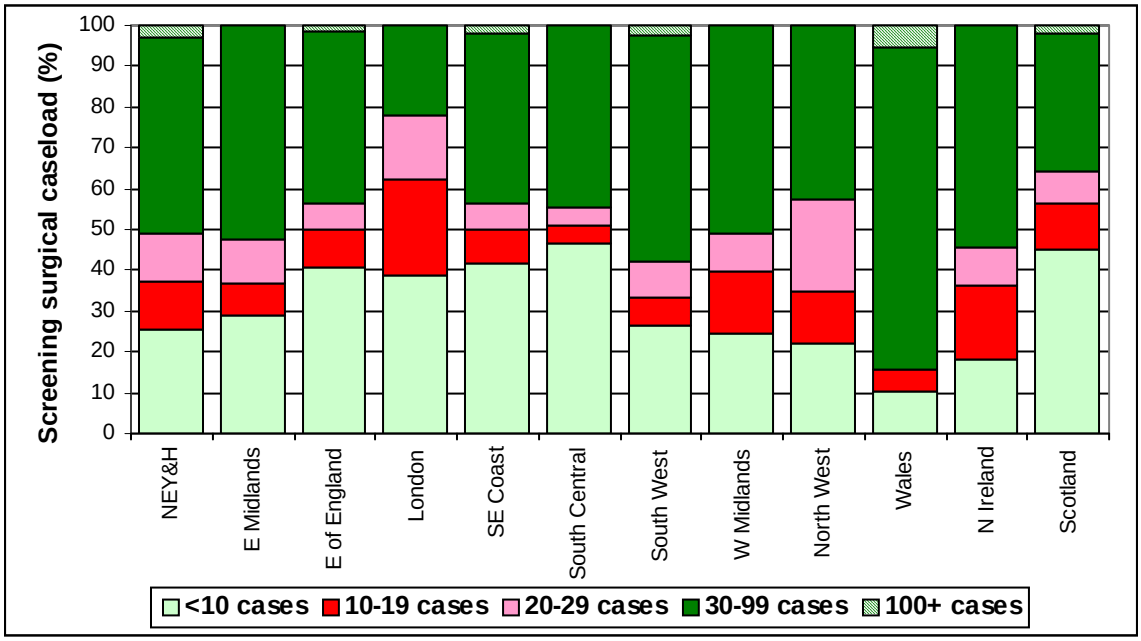

Figure 35 (Table 61): Variation in screening surgical caseload expressed as number of cases per surgeon

Table 63 shows the number of women treated by 1, 2, 3 or more surgeons and those with no referral to a consultant surgeon. Of the 16,792 screen-detected cases included in the audit, the majority (98%) were recorded under 1 consultant surgeon, 147 (1%) were recorded under 2 surgeons and 106 had no consultant surgeon recorded.

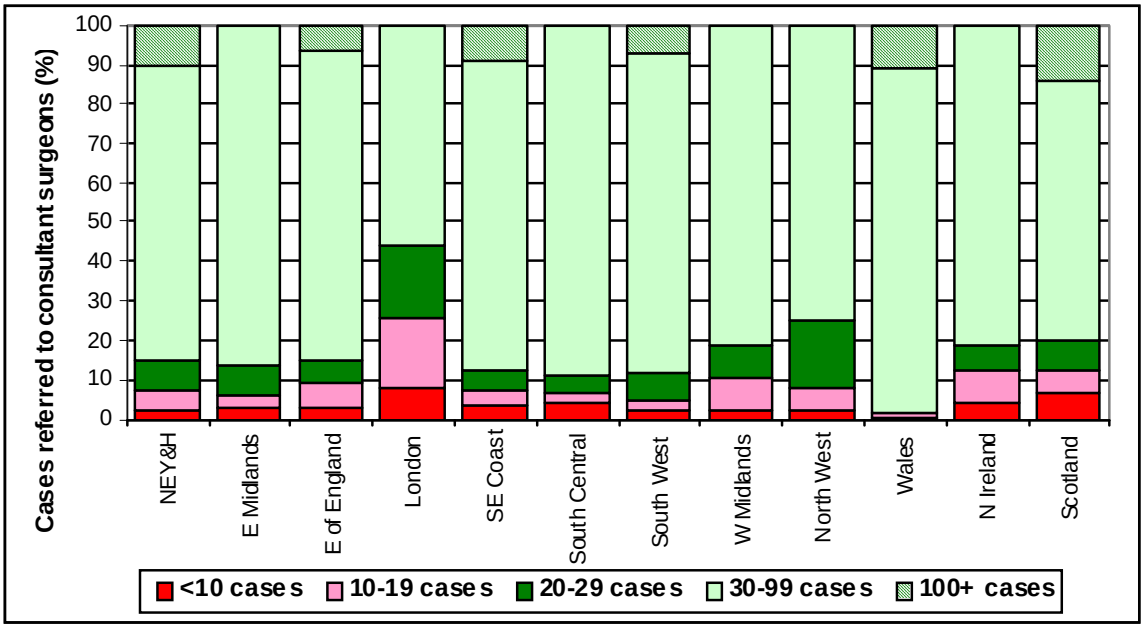

Figure 36 (Table 64): Variation in the proportion of women treated by surgeons with differing screening caseloads

Figure 36 shows the variation in the proportion of women treated by surgeons with differing screening caseloads. Of the 16,686 women who were under the care of a consultant surgeon, 13,057 (78%) were treated by a surgeon with a screening caseload of 30-99 cases. A further 957 women (6%) were treated by 8 surgeons with a screening caseload of 100 cases or more. For 1,415 women (8%) the treating surgeon had a screening caseload of 20-29 cases, and for 920 women (5%) the treating surgeon had a screening caseload of 10-19 cases. In the UK as a whole, 484 women (3%) were treated by a surgeon with a screening caseload of less than 10 cases. 123 (25%) of these women were in London.

Each region was asked to provide reasons to explain why surgeons had a screening caseload of less than 10 cases. A list of 7 satisfactory reasons for low screening caseload was provided (see Appendix B). If multiple reasons were given, only one was included. The reasons given to explain why surgeons had a UK screening caseload of fewer than 10 cases are shown in Figure 37.

Of the 142 surgeons in the UK with a screening caseload of less than 10 cases, 56 (39%) treated more than 30 symptomatic breast cancers during 2007/08. 30 (21%) either joined or left the NHSBSP during 2007/08. One of the other satisfactory reasons (plastic surgeon, private practice, not screening in area in 2007/08) was given for 43 surgeons (30%). For 7 surgeons a reason other than one of the 7 listed was provided. They treated a total of 30 women and the reasons provided were: patient choice, general surgeon, shared cases not recorded, surgeon from outside the UK and surgeon working outside the UK as a military surgeon. No information was available to explain the low screening caseload recorded for 6 surgeons who treated a total of 24 women. Two of these surgeons were in the East of England, 2 in London and 2 in West Midlands. Regional QA reference centres and regional surgical QA co-ordinators should investigate why screening cases were treated by these low caseload surgeons.

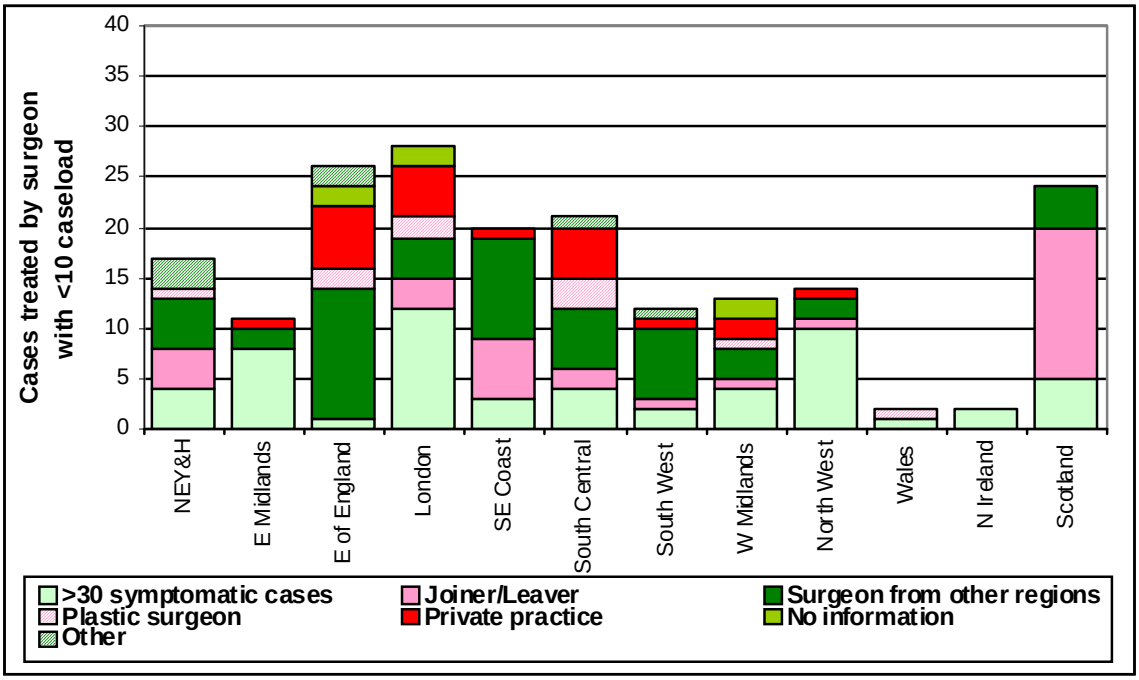

Figure 37 (Table 65): Explanations provided for surgeons treating less than 10 screening cases a year

COMMENTS:

- There were 526 consultant breast surgeons working in the UK NHSBSP in 2007/08.
- 92% of women were treated by a surgeon with a screening caseload of at least 20 cases.
- Of the 142 surgeons with screening caseload of less than 10 cases, 39% treated more than 30 symptomatic breast cancers during 2007/08.
- Information was unavailable to explain the low caseload of 6 surgeons treating a total of 24 women. Two of these surgeons were in the East of England, 2 were in London and 2 were in West Midlands. Regional QA reference centres and regional surgical QA co-ordinators should investigate why screening cases were treated by these low caseload surgeons.

CHAPTER 7
NUMBER AND SEQUENCE OF THERAPEUTIC OPERATIONS

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 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 conservation surgery. For any case 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, so that the number of therapeutic operations is one fewer than 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 conservation surgery procedure.

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.

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)

Overall, 2,520 invasive cancers (19%) and 635 non-invasive cancers (19%) underwent more than one therapeutic operation (Tables 68 and 69). For invasive cancers the proportion having more than one operation varied from 13% in Northern Ireland (33 cancers) to 23% (285 cancers) in South West. For non-invasive cancers, the proportion having more than one operation varied from 14% in Northern Ireland (10 cancers) and Scotland (33 cancers) to 22% in Wales (41 cancers).

In the UK as a whole, 3,153 cancers (20%) with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation (Table 66). This varied from 14% in Northern Ireland to 24% in South West. For the 815 cancers without a non-operative diagnosis, 47% had only a diagnostic operation (Table 67). 47% had a second operation, which is also their first therapeutic operation. For 49 cases, 2 or more therapeutic operations were performed.

10,309 of the 13,305 invasive cancers were initially treated by conservation surgery. Of these, 22% had repeat therapeutic operations (Figure 38). 153 cases had three operations and 15 cases had more than three operations. Five cases with more than three operations were in South East Coast and 4 cases were in West Midlands. Of the 2,618 non-invasive cancers initially treated by conservation surgery, 23% had repeat therapeutic operations. 62 had three operations and 6 had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit the 21 cases which had more than three operations to ascertain the reason for this unusual practice.

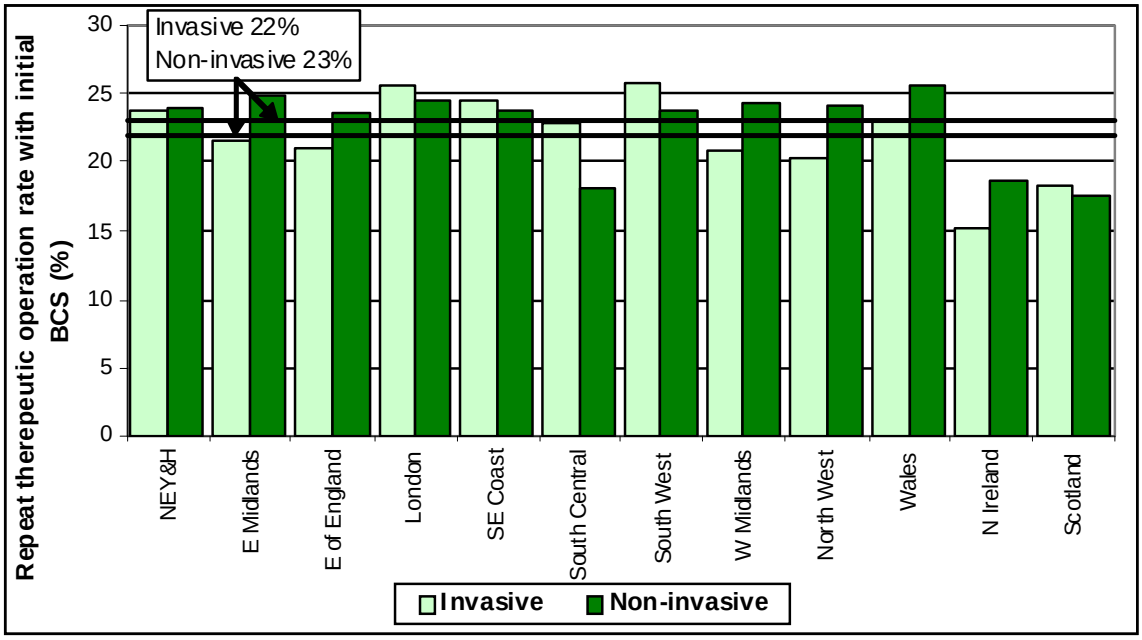

Figure 38 (Tables 70 & 71): Proportions of invasive and non-invasive cancers undergoing two or more therapeutic operations after initial breast conservation surgery (BCS)

Figure 39 shows how the proportion of cases undergoing repeat breast conservation surgery or mastectomy after an initial breast conservation surgery varies between surgeons. Surgeons who initially treated fewer than 20 cases with conservation are shaded. Overall, 18% of cases with initial breast conservation surgery had one or more repeat operations (breast conservation surgery or a mastectomy). Of the 259 surgeons who had more than 20 cases with initial breast conserving surgery, 31 had a repeat operation rate above the 95% upper control limit and 6 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.

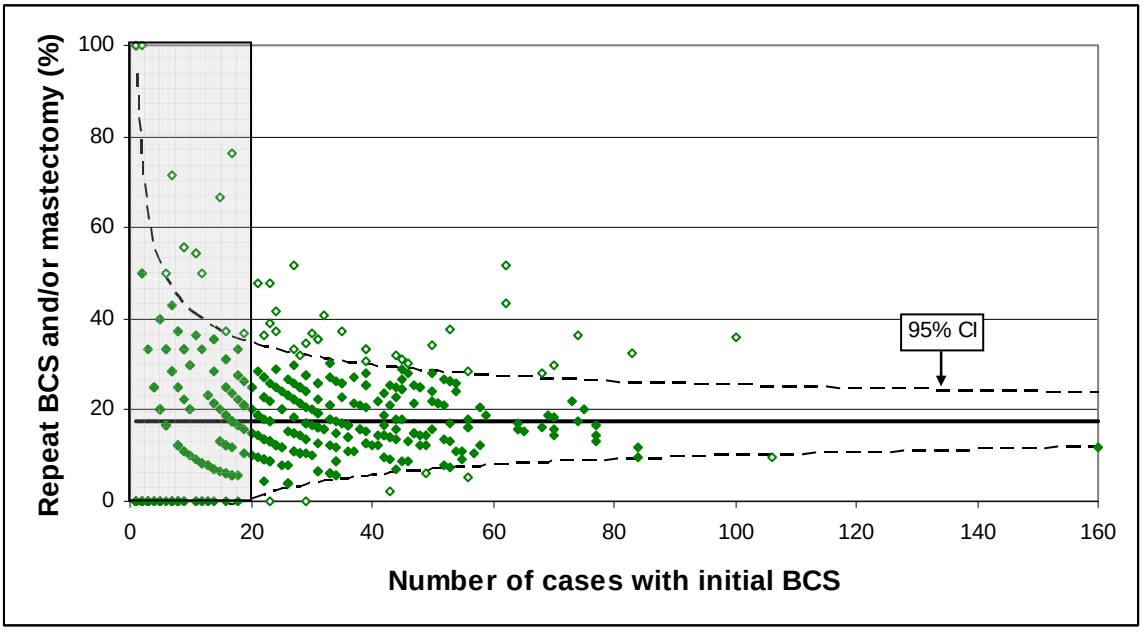

Figure 39: Variation between surgeons in the proportion of cases initially treated with breast conservation surgery (BCS) that underwent repeat operations (only patients treated by 1 surgeon included)

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 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 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

The types and sequences of therapeutic operations undertaken in the UK as a whole are shown in Figure 40 for cancers with a B5b (Invasive) core biopsy, in Figure 41 for cancers with C5 cytology only, in Figure 42 for non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy and in Figure 43 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 surgery (Table 9). The therapeutic surgical operation can thus be planned in advance and these cases are least likely to require a repeat operation. 97% 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 predicted microscopically, radiological or clinical features are of increased importance when planning the therapeutic surgical 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 22% 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 47%.

The summary table on page 61 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 108 cancers with a B5b (Invasive) core biopsy for which the invasive status was not confirmed after surgery (see Figure 40) and the 40 cancers with a B5a (Non-invasive) core biopsy that were found to be benign or had unknown invasive status at surgery (see Figure 42).

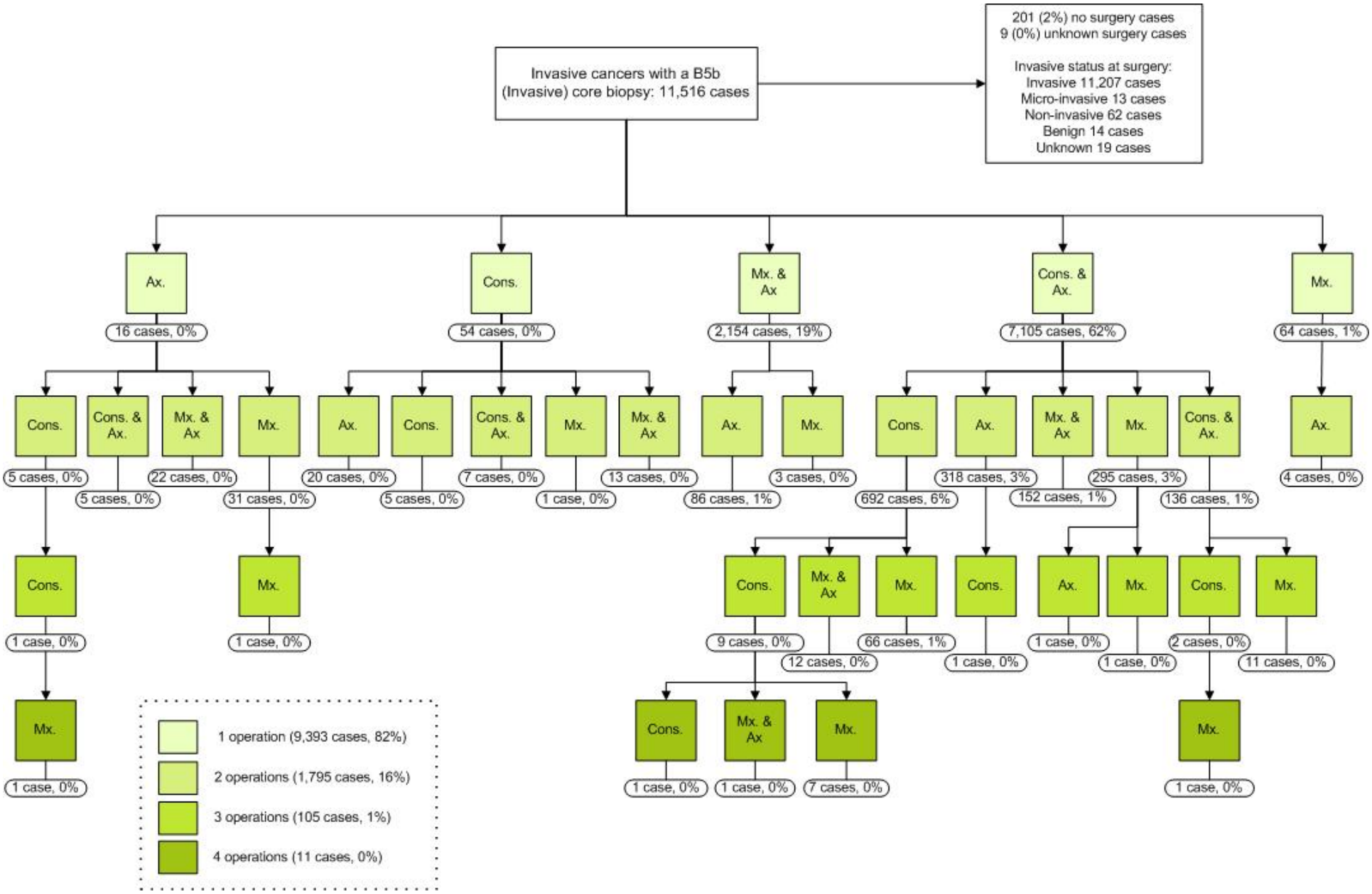

Figure 40: Sequence of operations for Invasive cancers with a B5b (Invasive) core biopsy

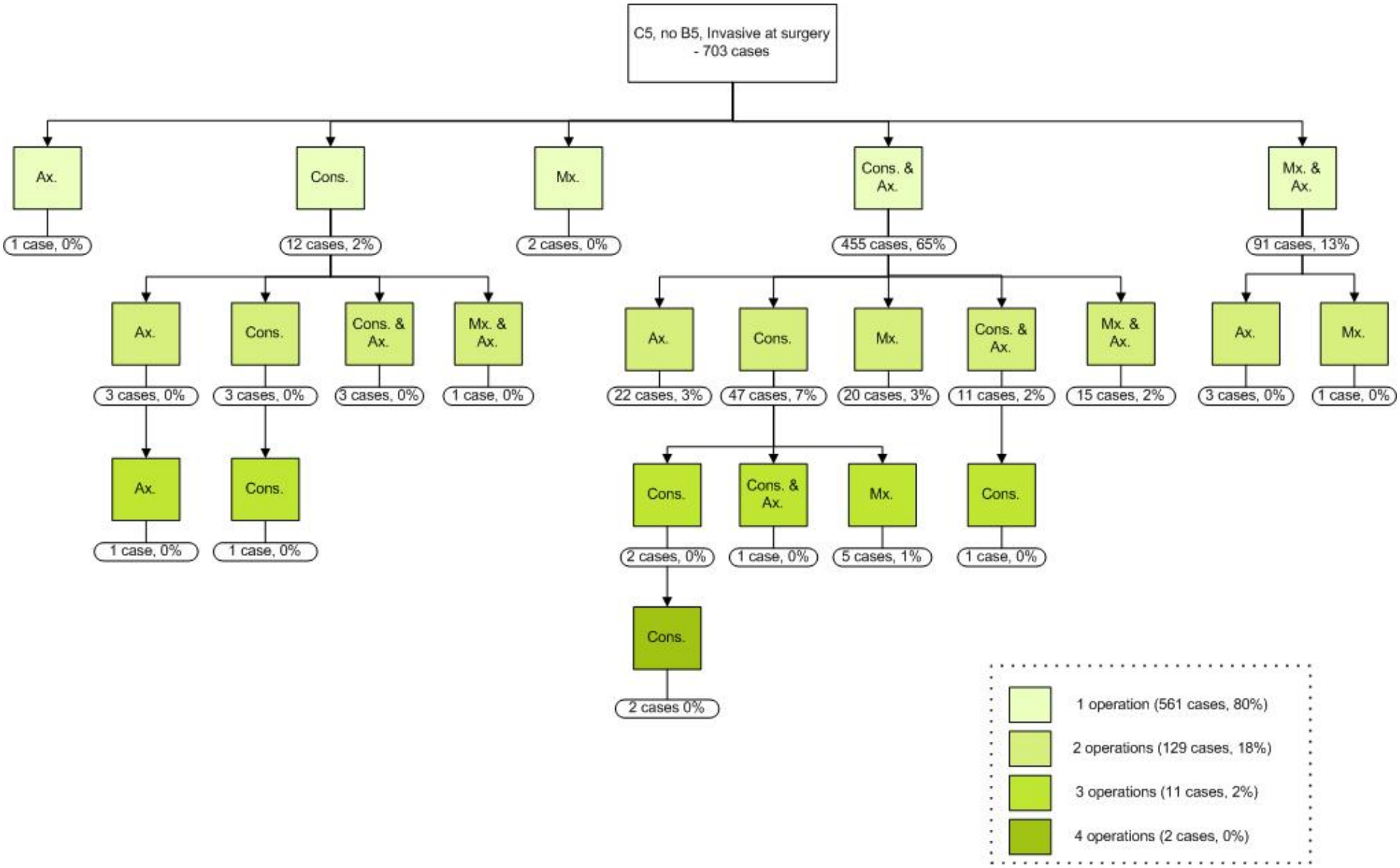

Figure 41: Sequence of operations for invasive cancers with C5 Cytology only, no B5 core biopsy

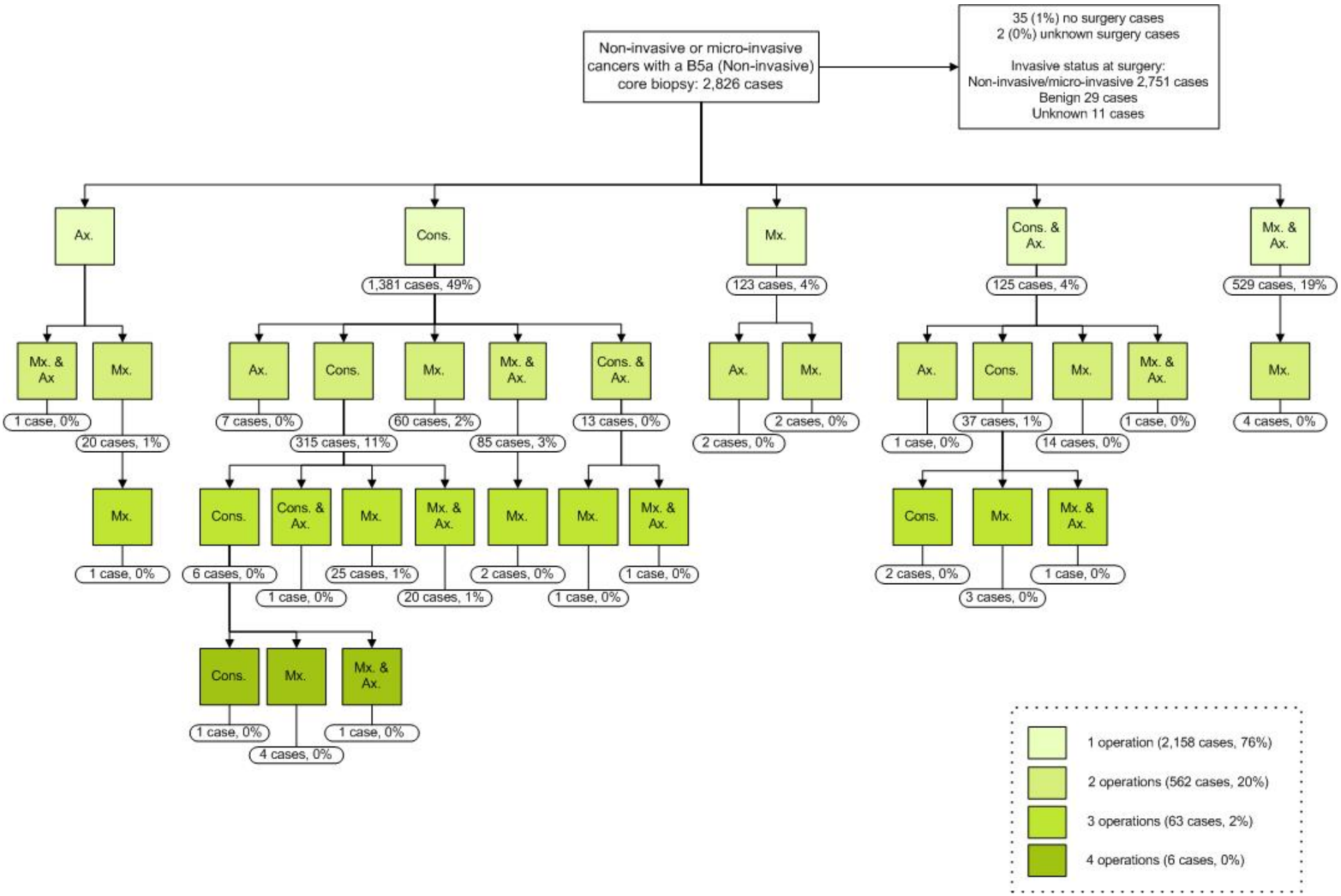

Figure 42: Sequence of operations for non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy

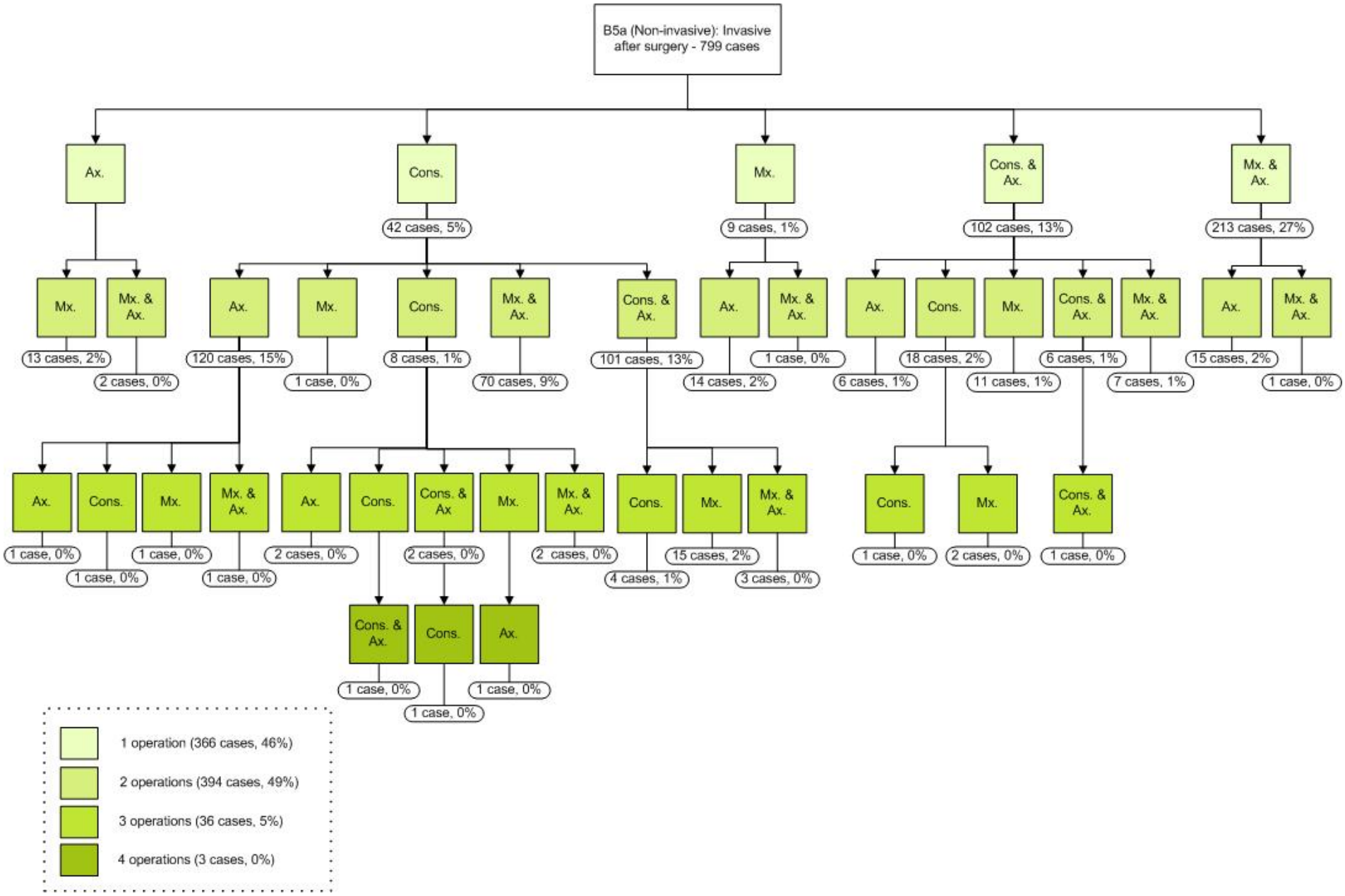

Figure 43: Sequence of operations for cancers with B5a (Non-invasive) core biopsy determined to be invasive after surgery

REPEAT THERAPEUTIC OPERATION RATES

	Invasive cancers						Non-invasive or micro-invasive cancers	
	B5b (Table 72)		C5 only, no B5 (Table 73)		B5a (Table 75)		B5a (Table 74)	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	265	18	19	18	56	61	92	21
East Midlands	124	14	0	0	32	51	45	20
East of England	205	18	5	15	44	56	78	27
London	198	20	13	30	32	46	59	22
South East Coast	145	18	23	28	40	49	60	24
South Central	153	18	2	10	25	57	34	23
South West	212	20	25	34	46	66	65	26
West Midlands	159	16	11	16	39	57	54	25
North West	194	15	34	18	41	46	67	24
Wales	108	16	0	0	35	64	38	22
Northern Ireland	16	11	10	13	7	33	10	17
Scotland	132	13	0	-	36	55	29	14
United Kingdom	**1911**	**17**	**142**	**20**	**433**	**54**	**631**	**23**

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 had the lowest proportion of repeat operations (17%). This varied from 11% in Northern Ireland to 20% in London and South West. 142 (20%) of the 703 surgically treated invasive cancers diagnosed by C5 cytology only underwent a repeat operation. 34 (24%) of these cancers were in North West, 25 (18%) in South West, 23 (16%) in South East Coast and 19 (13%) in North East, Yorkshire & Humber. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 23%. This varied from 14% in Scotland to 27% in East of England. As expected, invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (54%). This varied from 33% in Northern Ireland to 66% in South West.

7.3 Repeat Conservation Operations to Clear Margins

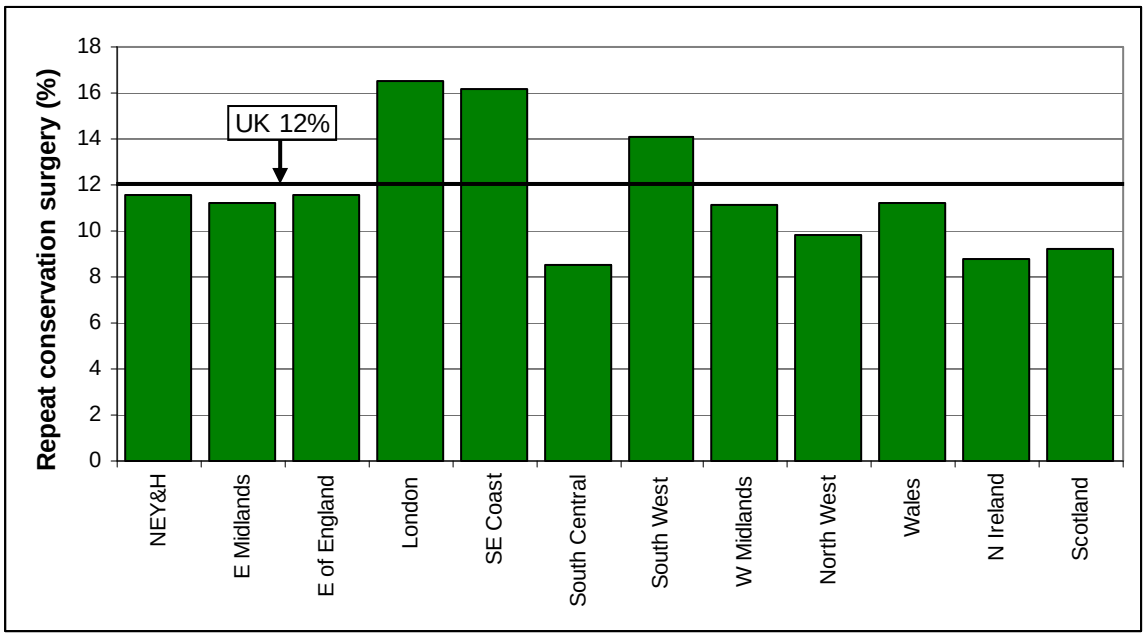

Figure 44: Proportion of cancers which were initially treated with conservation surgery and had repeat conservation operation(s) to clear margins (Based on data in the following summary table)

In the UK as a whole, 20% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, had repeat therapeutic operations (conservation surgery or mastectomy) to clear margins. This varied from 14% in Scotland to 23% in London. Figure 44 shows that in the UK as a whole, 12% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, had repeat conservation operations to clear margins. This varied between 8.6% in South Central and 16.5% in London.

REPEAT THERAPEUTIC 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	*113*	*10*	*8*	*11*	*15*	*25*	*52*	*16*
East Midlands	*57*	*9*	*0*	*0*	*13*	*33*	*24*	*15*
East of England	*75*	*8*	*2*	*6*	*21*	*42*	*43*	*19*
London	*115*	*15*	*5*	*12*	*11*	*25*	*41*	*22*
South East Coast	*81*	*12*	*16*	*20*	*18*	*35*	*46*	*24*
South Central	*51*	*8*	*1*	*6*	*4*	*13*	*16*	*13*
South West	*97*	*11*	*13*	*18*	*17*	*34*	*40*	*20*
West Midlands	*70*	*9*	*4*	*6*	*18*	*35*	*31*	*18*
North West	*78*	*8*	*14*	*9*	*8*	*14*	*35*	*16*
Wales	*47*	*9*	*0*	*0*	*9*	*21*	*23*	*18*
Northern Ireland	*8*	*6*	*8*	*12*	*2*	*17*	*4*	*9*
Scotland	*61*	*8*	*0*	*-*	*10*	*26*	*20*	*14*
United Kingdom	***853***	***10***	***71***	***12***	***146***	***27***	***375***	***18***

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 conservation surgery that had repeat therapeutic conservation operations to clear margins. In the UK as a whole, 10% of invasive cancers with a B5b (Invasive) non-operative diagnosis, which were initially treated with a conservation operation, had repeat conservation operations to clear margins. This varied from 6% in Northern Ireland to 15% in London. 12% of invasive cancers with a C5 cytology only non-operative diagnosis, which were initially treated with a conservation operation, had repeat operations to clear margins. This varied from 6% in East of England, South Central and West Midlands to 20% in South East Coast.

18% of non-invasive and micro-invasive cancers with a B5a (Non-invasive) non-operative diagnosis initially treated with a conservation operation had repeat operations to clear margins. This varied from 9% in Northern Ireland to 24% in South East Coast. Invasive cancers with a B5a (Non-invasive) non-operative diagnosis, which were initially treated with a conservation operation, had the highest repeat operation rate to clear margins (27%). This varied from 13% in South Central to 42% in East of England.

7.4 Conservation Operations Converted to Mastectomies

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 20%. This varied from 11% in Northern Ireland to 25% in East Midlands. 97 (14%) of the 703 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. 32 (33%) of these cancers were in North West and 28 (29%) in North East, Yorkshire & Humber. Regional QA reference centres and regional surgical QA co-ordinators should audit these 97 cases to determine why cancers with unconfirmed invasive status had a mastectomy as an initial operation. Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 23%. This varied from 16% in South Central to 31% in East Midlands. Invasive cancers with a B5a (Non-

invasive) core biopsy had the highest initial mastectomy rate (32%). This varied from 20% in Wales to 43% in Northern Ireland.

MASTECTOMY AS FIRST 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	330	21	28	27	33	36	106	24
East Midlands	223	25	2	33	23	37	71	31
East of England	221	19	3	9	26	33	55	19
London	201	20	2	5	25	36	77	29
South East Coast	134	16	2	2	28	34	56	23
South Central	153	18	4	20	11	25	25	16
South West	186	17	2	3	18	26	46	18
West Midlands	172	17	8	11	16	23	48	22
North West	302	24	32	17	29	32	63	22
Wales	145	21	3	75	11	20	37	21
Northern Ireland	16	11	11	14	9	43	14	23
Scotland	230	22	0	-	24	37	62	30
United Kingdom	**2,313**	**20**	**97**	**14**	**253**	**32**	**660**	**23**

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

Figure 45 shows that in the UK as a whole, 8% of all cancers with a non-operative diagnosis, which were initially treated with conservation surgery, were eventually converted to mastectomy. This varied between 5% in Scotland and 9.5% in North East, Yorkshire & Humber.

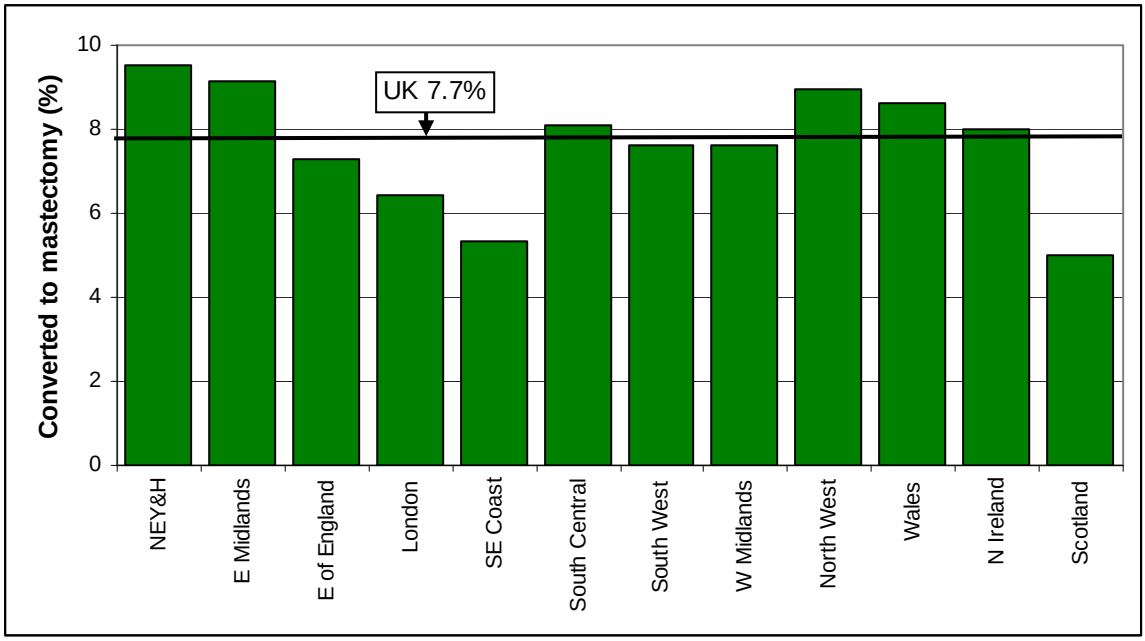

Figure 45: Proportion of cancers which were initially treated with conservation surgery and which were eventually converted to mastectomy (Based on data in the following table)

The following summary table shows the regional variation in the proportion of cancers initially treated with 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 conservation surgery, went on to have a mastectomy. 41 (7%) of the 605 surgically treated invasive cancers diagnosed by C5 cytology only, which were initially treated with conservation surgery, went on to have a mastectomy. 13 (32%) of these cancers were in North West. 10% of non-invasive cancers with a B5a (Non-invasive) non-operative diagnosis, initially treated with conservation surgery, went on to have

a mastectomy. This varied from 5% in Scotland to 13% in East Midlands, East of England, North West and Northern Ireland. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest conversion of conservation surgery to mastectomy (21%). This varied from 12% in West Midlands to 33% in Northern Ireland and 36% in North East, Yorkshire & Humber.

INITIALLY TREATED WITH 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	*92*	*8*	*7*	*9*	*21*	*36*	*34*	*10*
East Midlands	*47*	*7*	*0*	*0*	*9*	*23*	*21*	*13*
East of England	*52*	*6*	*1*	*3*	*7*	*14*	*29*	*13*
London	*39*	*5*	*1*	*2*	*11*	*25*	*16*	*9*
South East Coast	*32*	*5*	*2*	*3*	*8*	*15*	*11*	*6*
South Central	*45*	*7*	*1*	*6*	*7*	*22*	*15*	*12*
South West	*54*	*6*	*7*	*10*	*9*	*18*	*20*	*10*
West Midlands	*51*	*6*	*7*	*11*	*6*	*12*	*20*	*12*
North West	*66*	*7*	*13*	*8*	*16*	*27*	*28*	*13*
Wales	*39*	*7*	*0*	*0*	*10*	*23*	*12*	*9*
Northern Ireland	*8*	*6*	*2*	*3*	*4*	*33*	*6*	*13*
Scotland	*36*	*4*	*0*	*-*	*6*	*15*	*7*	*5*
United Kingdom	***561***	***6***	***41***	***7***	***114***	***21***	***219***	***10***

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

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 operation. The following table summarises how the proportions of invasive cancers with axillary surgery undertaken in each region at first and repeat operations varies with the non-operative diagnostic result.

PERCENTAGE OF CANCERS WITH AXILLARY SURGERY AT 1ST AND LATER OPERATIONS

	Invasive cancers *(Table 76)*									***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*	*98*	*97*	*1*	*96*	*42*	*53*	*29*	*24*	*5*
East Midlands	*99*	*99*	*0*	*100*	*100*	*0*	*90*	*49*	*41*	*40*	*35*	*5*
East of England	*99*	*99*	*0*	*94*	*91*	*3*	*92*	*53*	*39*	*29*	*24*	*5*
London	*98*	*97*	*0*	*98*	*93*	*5*	*90*	*59*	*30*	*37*	*32*	*5*
South East Coast	*98*	*97*	*1*	*95*	*92*	*4*	*89*	*49*	*40*	*27*	*23*	*3*
South Central	*98*	*98*	*0*	*95*	*95*	*0*	*93*	*43*	*50*	*31*	*23*	*9*
South West	*99*	*98*	*1*	*100*	*100*	*0*	*96*	*39*	*57*	*24*	*21*	*3*
West Midlands	*99*	*99*	*0*	*99*	*97*	*1*	*97*	*54*	*43*	*33*	*28*	*5*
North West	*99*	*99*	*0*	*97*	*97*	*0*	*93*	*63*	*30*	*38*	*31*	*6*
Wales	*99*	*99*	*0*	*100*	*100*	*0*	*95*	*42*	*53*	*28*	*24*	*4*
Northern Ireland	*96*	*96*	*1*	*99*	*99*	*0*	*57*	*38*	*19*	*17*	*12*	*5*
Scotland	*100*	*99*	*0*	*-*	*-*	*-*	*97*	*52*	*45*	*33*	*30*	*2*
United Kingdom	***99***	***99***	***0***	***97***	***96***	***1***	***92***	***50***	***43***	***31***	***26***	***5***

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

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 44 cancers had their axillary surgery in a repeat operation. A similar picture was apparent for invasive cancers diagnosed by C5 cytology only, with 97% having axillary surgery. Only 1% of these cases had their axillary surgery in a repeat operation.

In the UK as a whole, 92% of invasive cancers with a B5a (Non-invasive) non-operative diagnosis had axillary surgery. This varied from 57% in Northern Ireland (12 cancers) to 97% in West Midlands and Scotland. Overall, 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%.

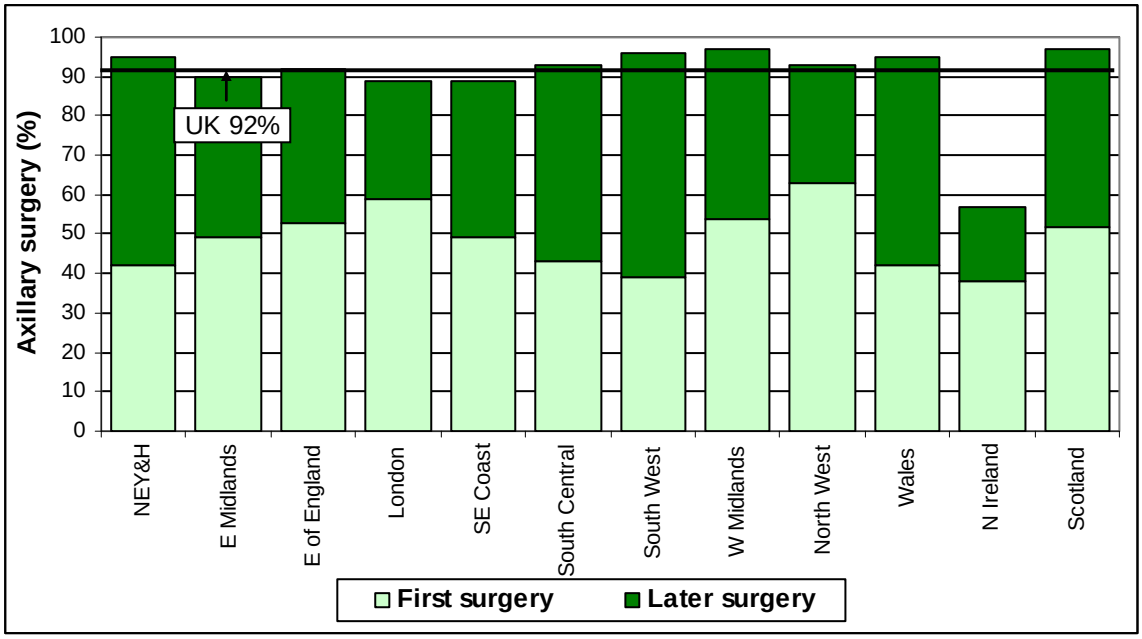

Figure 46 (Table 76): Variation in proportion of invasive cancers with a B5a (Non-invasive) non-operative diagnosis having axillary surgery at first and repeat operations

Figure 46 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 North West (63%) and lowest in Northern Ireland (38%). However, in Northern Ireland, 43% of B5a (Non-invasive) cancers that were found to be invasive at surgery had no axillary operation recorded.

INVASIVE CANCERS WITH NO AXILLARY OPERATION

	B5b		C5 only, no B5		B5a	
Region	***No.***	***%***	***No.***	***%***	***No.***	***%***
N East, Yorks & Humber	*11*	*1*	*2*	*2*	*4*	*4*
East Midlands	*9*	*1*	*0*	*0*	*6*	*10*
East of England	*7*	*1*	*2*	*6*	*6*	*8*
London	*22*	*2*	*1*	*2*	*7*	*10*
South East Coast	*17*	*2*	*4*	*5*	*9*	*11*
South Central	*13*	*2*	*1*	*5*	*3*	*7*
South West	*7*	*1*	*0*	*0*	*3*	*4*
West Midlands	*10*	*1*	*1*	*1*	*2*	*3*
North West	*14*	*1*	*6*	*3*	*6*	*7*
Wales	*5*	*1*	*0*	*0*	*3*	*5*
Northern Ireland	*5*	*4*	*1*	*1*	*9*	*43*
Scotland	*4*	*0*	*0*	*-*	*2*	*3*
United Kingdom	***124***	***1***	***18***	***3***	***60***	***8***

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

The summary table above shows for each type of non-operative diagnosis, the proportion of invasive cancers in each region with no axillary surgery recorded. Overall, 202 invasive cancers had no surgery

to the axilla recorded. 124 invasive cancers (1%) with a B5b (Invasive) non-operative diagnosis had no axillary procedure recorded. 22 of these cancers were in London and 17 in South East Coast. 18 invasive cancers (3%) diagnosed by C5 cytology only did not have an axillary procedure recorded. 60 invasive cancers (8%) with a B5a (Non-invasive) non-operative diagnosis had no surgery to the axilla recorded.

The following 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 is a consistent outlier in all three audit periods. All 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.

INVASIVE CANCERS WITH A B5A NON-OPERATIVE DIAGNOSIS WITH NO AXILLARY OPERATION

	2005/06		2006/07		2007/08	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	*2*	*2*	*11*	*11*	*4*	*4*
East Midlands	*4*	*7*	*1*	*2*	*6*	*10*
East of England	*7*	*16*	*7*	*11*	*6*	*8*
London	*16*	*21*	*6*	*11*	*7*	*10*
South East Coast	*9*	*11*	*11*	*18*	*9*	*11*
South Central	*4*	*8*	*8*	*15*	*3*	*7*
South West	*7*	*8*	*8*	*12*	*3*	*4*
West Midlands	*9*	*14*	*3*	*5*	*2*	*3*
North West	*2*	*6*	*13*	*15*	*6*	*7*
Wales	*3*	*6*	*2*	*4*	*3*	*5*
Northern Ireland	*3*	*30*	*6*	*50*	*9*	*43*
Scotland	*2*	*4*	*1*	*2*	*2*	*3*
United Kingdom	***68***	***10***	***77***	***11***	***60***	***8***

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. In this case, the NICE Guidelines state that a further axillary treatment should be offered to patients. Figure 47 shows how the proportion of repeat operations to the axilla varies between regions for invasive cancers with positive nodal status. In the UK as a whole, 26% of these cancers had a repeat operation to the axilla. This varied from 17% in Scotland to 32% in London and South West.

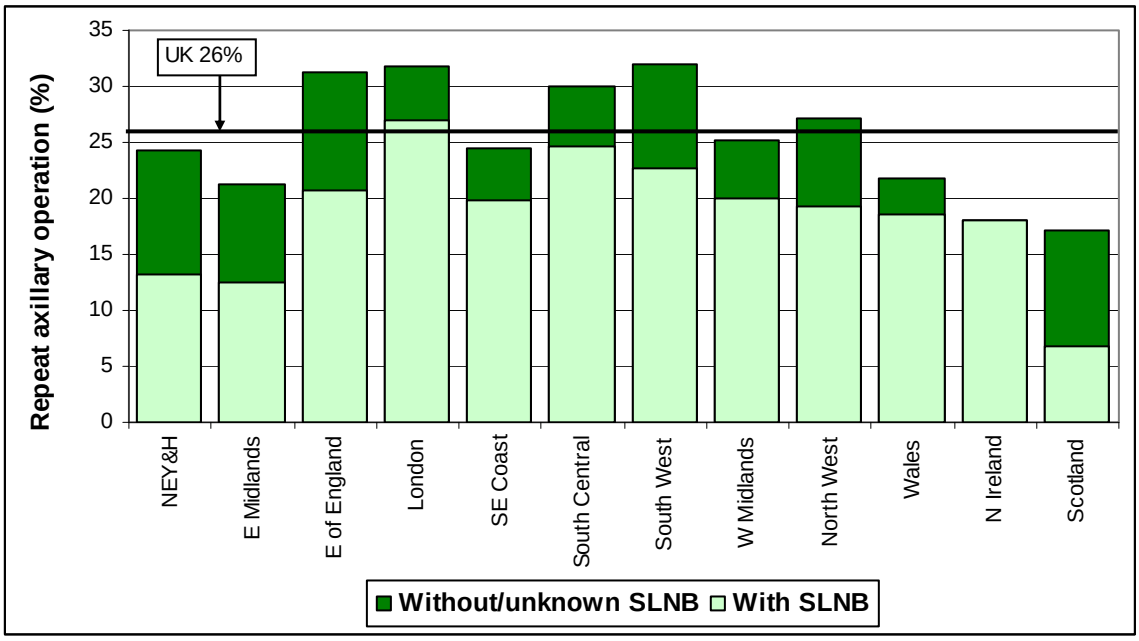

Figure 47 (Table 77): Repeat axillary operations for invasive cancers with positive nodal status

COMMENTS:

- In the UK as a whole, 20% of cancers with a proven non-operative diagnosis by C5 cytology and/or B5 core biopsy underwent more than one therapeutic operation. This varied from 14% in Northern Ireland to 24% in South West.
- 19% of invasive cancers and 19% of non-invasive cancers had more than one therapeutic operation. The former varied from 13% in Northern Ireland to 23% South West and the latter from 14% in Northern Ireland and Scotland to 22% in Wales.
- 22% of the invasive cancers initially treated by conservation surgery had repeat therapeutic operations. 23% of the non-invasive cancers initially treated by conservation surgery had repeat therapeutic operations. 15 invasive cases and 6 non-invasive cases had more than three operations. Regional QA reference centres and regional surgical QA co-ordinators should audit the 21 cases which had more than three operations to ascertain the reason for this unusual practice.
- Of the 259 surgeons who had more than 20 cases with breast conserving surgery as the first operation, 31 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.
- In the UK as a whole, 22% of cancers with a B5a (Non-invasive) core biopsy result were confirmed following surgery to be invasive; this varied from 0% to 47% in individual screening units.
- Invasive cancers with B5b (Invasive) core biopsy and those diagnosed on the basis of C5 cytology alone had fewest repeat operations (17% and 20% respectively). Non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had a repeat operation rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat operation rate (54%). This varied from 33% in Northern Ireland to 66% in South West.
- In the UK as a whole, 12% of cancers underwent repeat conservation operations to clear involved margins. 27% of invasive cancers with a B5a (Non-invasive) core biopsy had a repeat conservation operation to clear margins. This varied from 13% in South Central to 42% in East of England.
- Invasive cancers with B5b (Invasive) core biopsy had an initial mastectomy rate of 20% and non-invasive or micro-invasive cancers with a B5a (Non-invasive) core biopsy had an initial mastectomy rate of 23%. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest initial mastectomy rate (32%).
- 97 surgically treated invasive cancers diagnosed by C5 cytology only had a mastectomy as their first therapeutic operation. 32 of these cancers were in North West and 28 in North East, Yorkshire & Humber. 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 conservative operations to a mastectomy. Invasive cancers with a B5a (Non-invasive) core biopsy had the highest repeat conversion of conservation surgery to mastectomy (21%). This varied from 12% in West Midlands to 33% in Northern Ireland and 36% in North East Yorkshire & Humber.
- Axillary surgery was performed for 99% of invasive cancers with a B5b (Invasive) core biopsy and 97% of invasive cancers diagnosed by C5 cytology only. For 99% and 96% of these cancers respectively, the nodal status was determined at the first operation.
- 92% of invasive cancers with a B5a (Non-invasive) diagnosis had axillary surgery. 50% of these cancers had their axillary surgery at the first operation, with repeat operations providing nodal data for the additional 43%.
- 124 invasive cancers with a B5b (Invasive) core biopsy, 18 invasive cancers with C5 cytology and 60 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.
- 26% of these cancers had a repeat operation to the axilla. This varied from 17% in Scotland to 32% in London and South West.

CHAPTER 8
ADJUVANT THERAPY

Surgeons were asked to supply radiotherapy, chemotherapy and hormonal therapy information for cancers detected through screening between 1 April 2006 and 31 March 2007, the period covered by the previous screening audit. Oestrogen receptor (ER), progesterone receptor (PgR) and HER-2 status were also requested. The cut off point for adjuvant treatment was 31 March 2008, 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 2006/07 NHSBSP & ABS at BASO audit reported tumour characteristics and primary treatment data for 15,856 screen-detected breast cancers. When data for these cases were requested for inclusion in this year's adjuvant audit, 59 additional cases which were not included in the 2006/07 main audit were identified. A further 10 cases were excluded from the adjuvant audit because they were found not to be breast cancers. Thus, 15,905 cases were eligible for inclusion in the adjuvant therapy audit. Of these, 782 (5%) had no adjuvant data supplied. 1,118 cases (7%) were excluded from the audit due to incomplete surgery data or because the woman had had a previous cancer. Following these exclusions, 14,005 cases (88%) were included in the adjuvant therapy audit. Figure 48 shows the variation in data completeness between regions. Scotland and Wales had the highest proportion of eligible cases (98%). Northern Ireland had the lowest proportion of eligible cases because no adjuvant data were supplied for 36% of their cancers (Table 78).

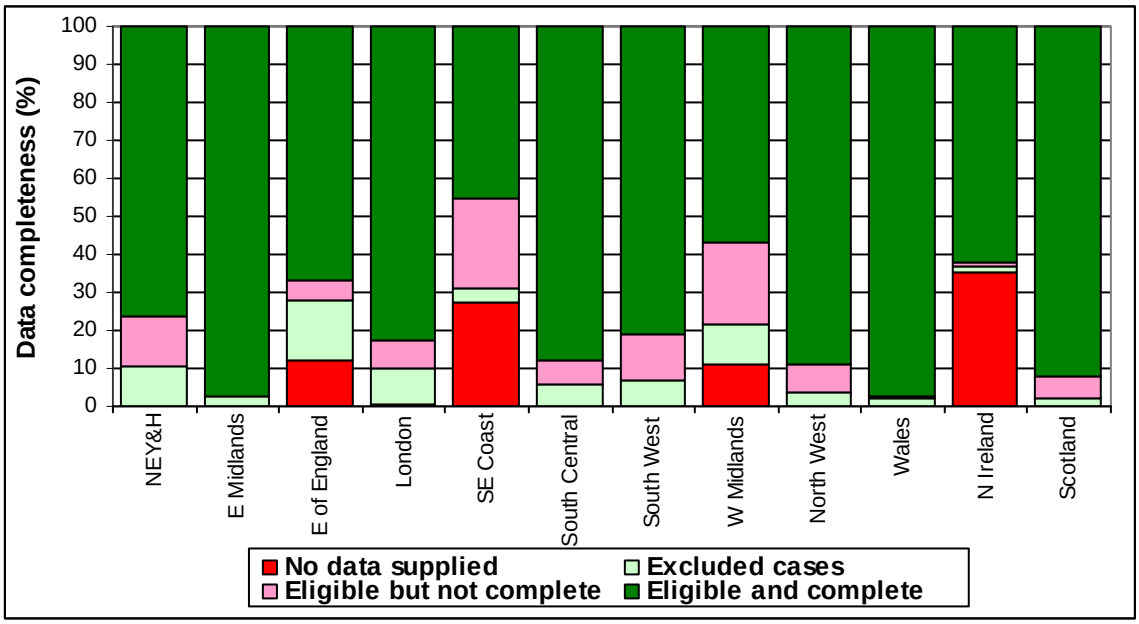

Figure 48 (Table 78): Data completeness of adjuvant audit data

In the UK as a whole, data completeness for radiotherapy, chemotherapy and hormone therapy was 95%, 96% and 95% respectively for the 14,005 eligible cases included in the audit for which adjuvant therapy data were supplied. 12,476 (89%) of these cases had radiotherapy, chemotherapy and hormone therapy data available (Table 79). This varied from 65% 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)

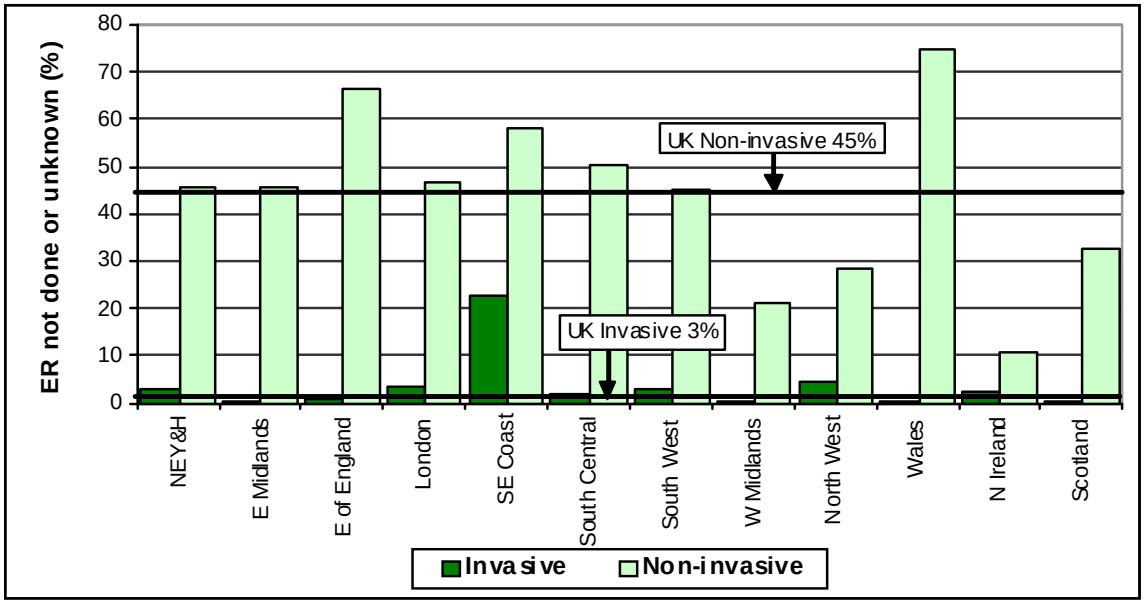

Figure 49 (Table 80): Variation in the proportion of invasive and non-invasive cancers with ER status information unknown or not provided

In the UK as a whole, ER status was unknown for 352 (3%) of invasive cancers and for 1,230 (45%) of non-invasive cancers (Figure 49). In South East Coast, 23% 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 11% in Northern Ireland to 75% in Wales. Of the 10,791 invasive cancers with known ER status, 9,651 (89%) were ER positive. Only 77% of the 1,478 non-invasive cancers with known ER status were ER positive.

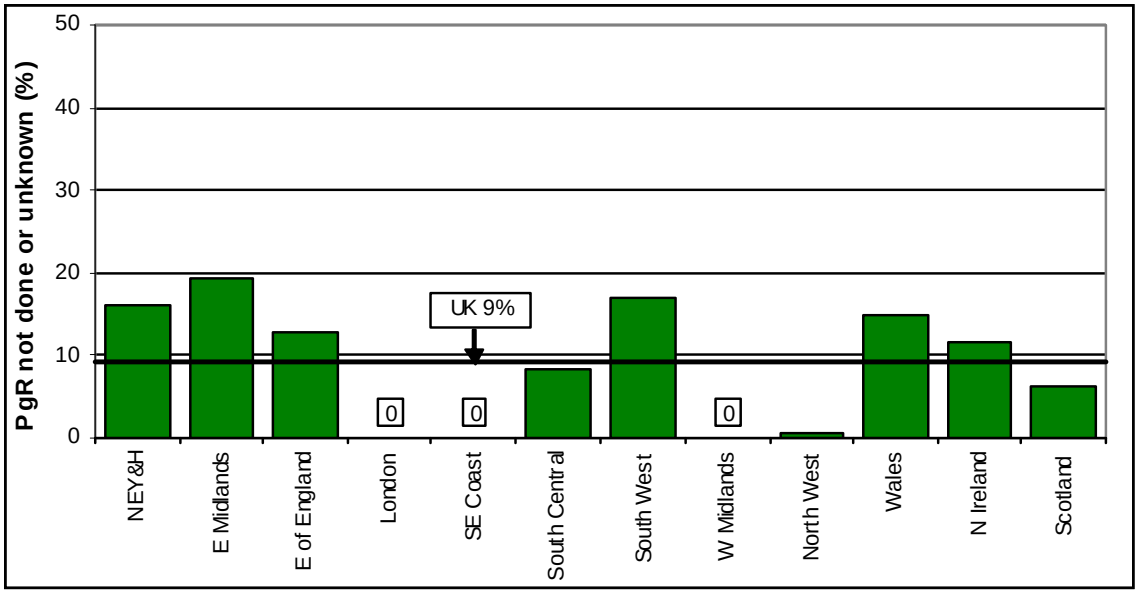

Figure 50 (Table 82): Variation in the proportion of ER negative invasive cases with unknown PgR status

PgR status data were available for 74% of invasive cancers and 41% of non-invasive cancers. PgR data completeness for invasive cancers varied from 39% in Wales to 96% in London (Table 81). PgR status was known for 91% of the 1,140 ER negative invasive cancers (Table 82), suggesting that PgR status was preferentially requested for invasive cancers when the ER status was negative. Figure 50 shows that the proportion of ER negative invasive cancers with unknown PgR status varied from 0% in London, South East Coast and West Midlands to 19% in East Midlands.

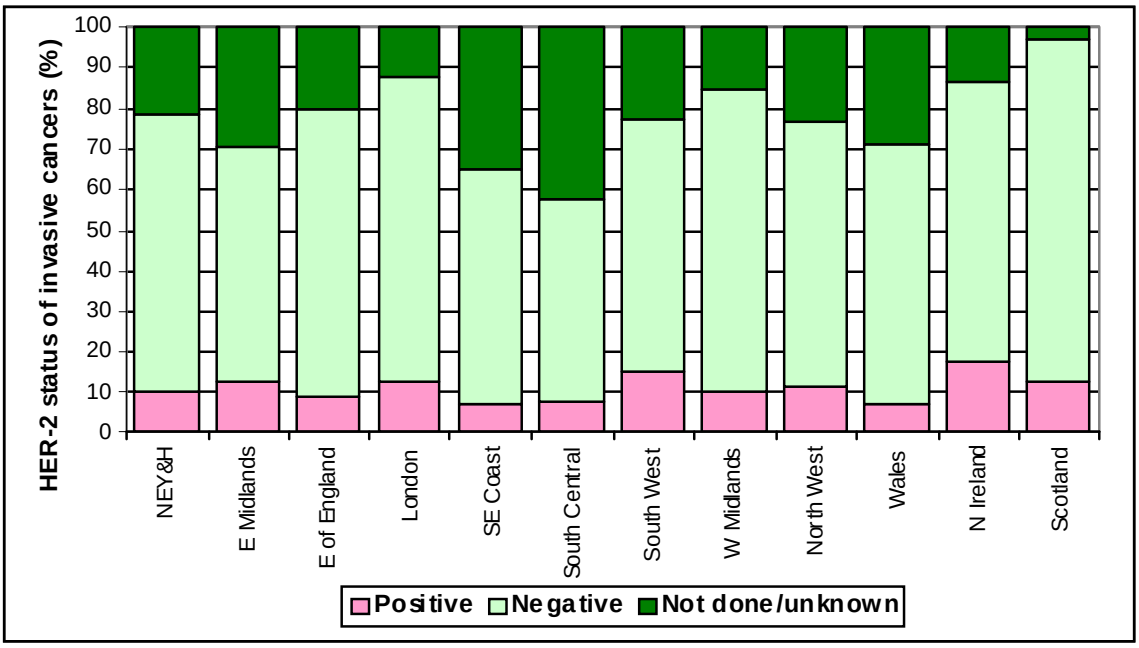

Figure 51 (Table 83): Variation in HER-2 status for invasive cancers

HER-2 status data were available for 78% of the 11,143 invasive cancers included in the audit. This is a considerable increase compared with cases diagnosed in 2005/06 when the HER-2 status was known for only 53% of invasive cancers. The proportion of cases with known HER-2 status varied from 58% in South Central to 97% in Scotland (Figure 51). 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 8,686 invasive cancers with known HER-2 status, 14% were positive and 86% were negative. The proportion of HER-2 positive invasive cancers varied from 18% in Northern Ireland to 7% in South East Coast and Wales. In Scotland, where the HER-2 status data were the most complete, 13% of the invasive cancers were HER-2 positive.

8.3 Adjuvant Treatment

In general, invasive cancers received more adjuvant treatment than non-invasive cancers. Of all cancers (invasive and non-invasive) with known radiotherapy treatment, 9,149 (69%) had radiotherapy recorded by the audit cut off date. 76% of invasive cancers and 41% of non-invasive cancers had radiotherapy (Table 84). 25% of invasive cancers and 1% (14 patients) of non-invasive cancers had chemotherapy recorded (Table 85). 85% of invasive cancers and 21% of non-invasive cancers received hormone therapy (Table 86). This difference probably reflects the relatively low proportion of ER positive non-invasive cancers (42% compared with 87% for invasive cancers), and the relatively high proportion of non-invasive cancers for which the ER status was not known (45% compared with 3% for invasive cancers).

RADIOTHERAPY TREATMENT			
	Invasive	***Non-invasive***	***Overall***
No surgery	*19%*	*19%*	*19%*
1 operation	*74%*	*40%*	*67%*
>1 operation	*66%*	*37%*	*59%*

The preceding summary table shows that for both invasive and non-invasive cancers, a higher proportion of cases (8% and 3% respectively) which had only one operation received radiotherapy compared with cases 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. 19% of the 142 cases which did not receive surgery did have radiotherapy (Table 87). For invasive cancers, 32% of the 120 cases which did not have surgery, 22% of the 9,075 cases which had one operation and 29% of the 1,948 cases which had more than one operation received chemotherapy (Table 90).

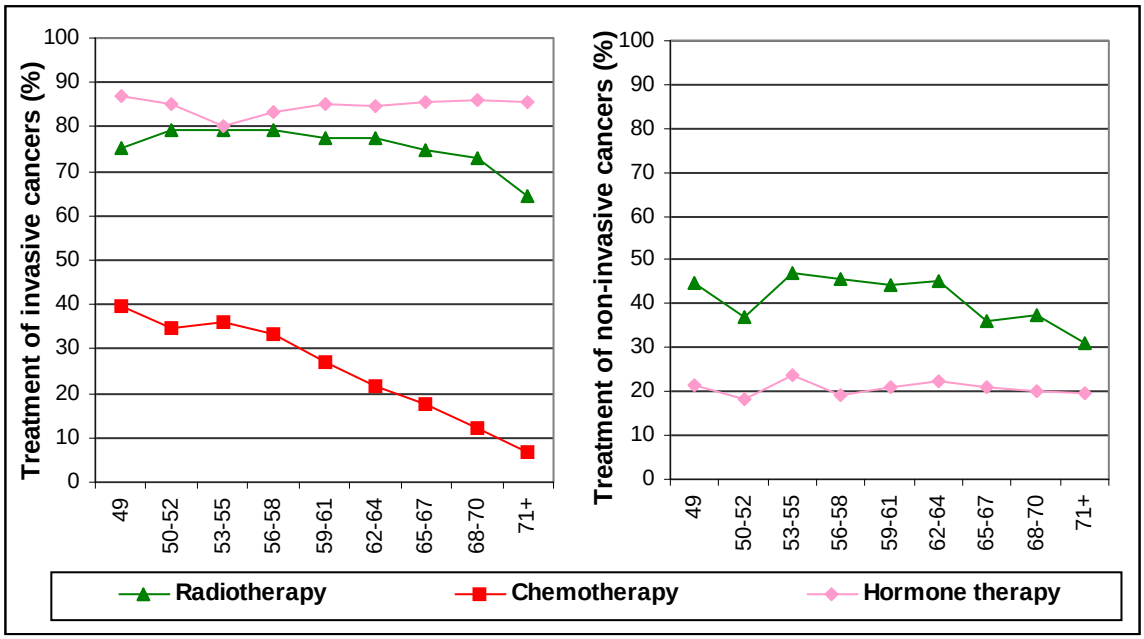

Figure 52 (Table 91 & 92): Percentage of women in each age group who had radiotherapy, chemotherapy and hormonal therapy, for cases with complete adjuvant data

Figure 52 shows how the level of adjuvant treatment given to invasive and non-invasive cancers varies with age. Chemotherapy for non-invasive cancers has been excluded because the numbers are too small. Hormone therapy was the main treatment for invasive cancers at all ages, followed by radiotherapy. Overall, 85% of women with invasive cancer received hormone therapy and 76% received radiotherapy. 21% of women with non-invasive cancer received hormone therapy and 41% received radiotherapy. The use of radiotherapy decreased gradually with age for both invasive and non-invasive cancers.

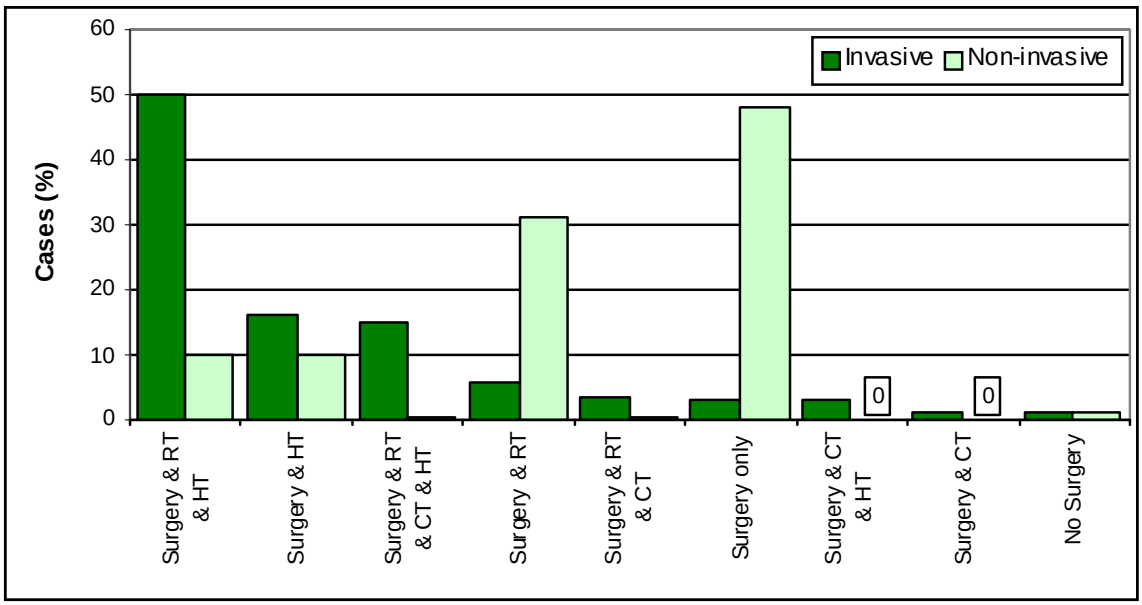

Figure 53 (Tables 93 and 94): Combinations of treatment, expressed as a percentage of cases with complete adjuvant therapy data

Chemotherapy was the least used adjuvant therapy; being recorded for only 24% 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 treatment with age; with only 15% of women aged 65-70 receiving chemotherapy compared with 36% 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 50% (4,977 cases) receiving this treatment combination (Figure 53). For non-invasive cancers, 48% had surgery only without any adjuvant treatment. Surgery and radiotherapy, the second most commonly used treatment combination, was received by 31% of the women with non-invasive cancers.

8.4 Waiting Time for Radiotherapy

Tables 99 to 102 show the regional variation in the cumulative percentages of cases having various therapies within 14, 30, 60, 90, 120 and 200 days. Surgically treated cases which received chemotherapy before or after surgery have been excluded.

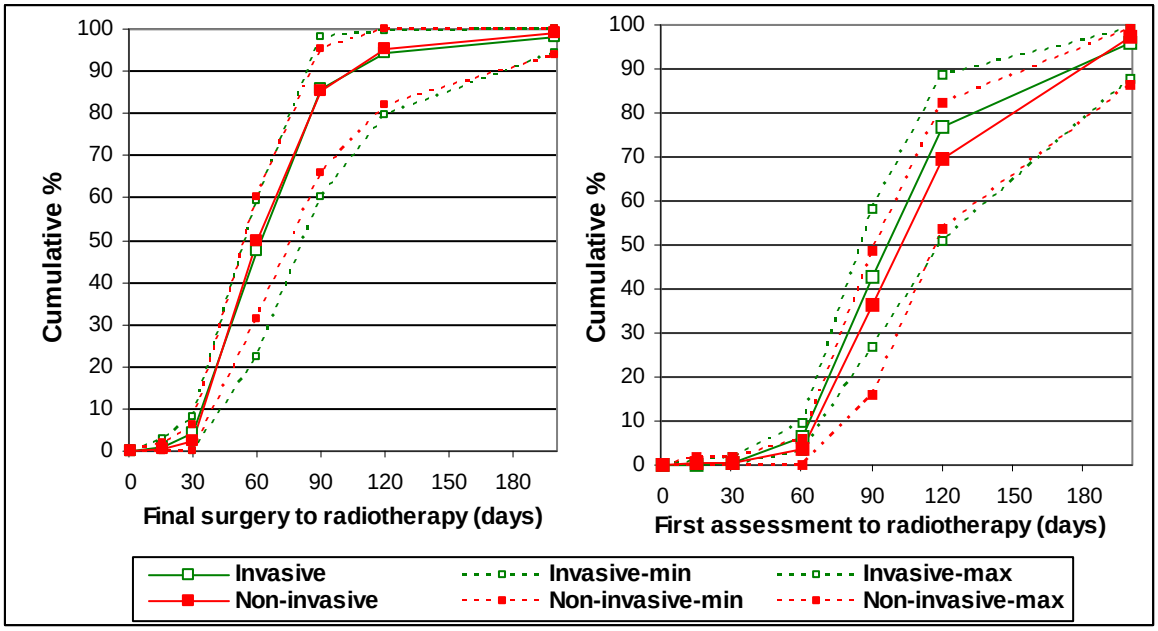

Figure 54 (Tables 99, 100, 101 and 102) : The cumulative percentage of cases with surgery and adjuvant radiotherapy, that had radiotherapy up to 200 days after final surgery (left) and first assessment (right)

In Figure 54 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 which received chemotherapy. In the UK as a whole, 48% of women with invasive or non-invasive breast cancer received radiotherapy within 60 days of their final surgery and 86% within 90 days. 123 women (2%) 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 54 shows that 43% of the invasive cases and 36% of the non-invasive cases with radiotherapy recorded had started their radiotherapy within 90 days of their first assessment visit and that 4% and 3% 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.

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. In the UK as a whole for invasive cases which did not have chemotherapy, the median time between final surgery and radiotherapy was similar for patients undergoing one or more surgical operations (62 or 58 days respectively) but varied somewhat between regions. The longest time was in South East Coast (68 days), but it is an improvement from the 98 days recorded in 2005/06. The shortest time was in North East, Yorkshire & Humber (52 days). 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.

MEDIAN DAYS BETWEEN THERAPIES – INVASIVE

	Assessment to …				*Final surgery to …*	
Region	***Diagnostic surgery*** *(Table 95)*	***Therapeutic surgery*** *(Table 97)*	***RT (1 op)****	***RT (>1op)****	***RT (1 op)****	***RT (>1 op)****
N East, Yorks & Humber	*37*	*28*	*93*	*112*	*64*	*52*
East Midlands	*28*	*27*	*83*	*117*	*57*	*57*
East of England	*35*	*28*	*85*	*118*	*56*	*56*
London	*39*	*35*	*94*	*137*	*58*	*62*
South East Coast	*36*	*34*	*115*	*142*	*79*	*68*
South Central	*28*	*27*	*97*	*131*	*66*	*63*
South West	*36*	*32*	*99*	*122*	*65*	*63*
West Midlands	*76*	*28*	*95*	*138*	*63*	*58*
North West	*32*	*29*	*89*	*119*	*60*	*56*
Wales	*22*	*23*	*90*	*112*	*65*	*56*
Northern Ireland	*45*	*24*	*98*	*139*	*69*	*65*
Scotland	*43*	*28*	*89*	*114*	*59*	*54*
United Kingdom	***35***	***29***	***92***	***123***	***62***	***58***

*Excludes cases with chemotherapy

MEDIAN DAYS BETWEEN THERAPIES – NON-INVASIVE

	Assessment to …				*Final surgery to …*	
Region	***Diagnostic surgery*** *(Table 96)*	***Therapeutic surgery*** *(Table 98)*	***RT (1 op)****	***RT (>1op)****	***RT (1 op)****	***RT (>1 op)****
N East, Yorks & Humber	*36*	*34*	*90*	*135*	*59*	*59*
East Midlands	*34*	*28*	*89*	*112*	*58*	*52*
East of England	*32*	*30*	*89*	*127*	*55*	*70*
London	*35*	*40*	*102*	*137*	*64*	*66*
South East Coast	*47*	*42*	*103*	*155*	*65*	*88*
South Central	*36*	*29*	*101*	*153*	*69*	*85*
South West	*47*	*42*	*106*	*138*	*69*	*63*
West Midlands	*43*	*35*	*101*	*142*	*62*	*67*
North West	*34*	*31*	*87*	*128*	*57*	*57*
Wales	*29*	*29*	*99*	*120*	*69*	*61*
Northern Ireland	*43*	*28*	*109*	*160*	*71*	*82*
Scotland	*43*	*31*	*91*	*117*	*58*	*50*
United Kingdom	***37***	***34***	***96***	***128***	***61***	***61***

*Excludes 8 cases with chemotherapy

COMMENTS:

- 14,005 cases (88% of all cases) were eligible to be included in the adjuvant therapy audit. Scotland and Wales had the highest proportion of eligible cases (98%). Northern Ireland had the lowest proportion of eligible cases with no adjuvant data supplied for 36% of their cancers.
- In the UK as a whole, ER status was not known for 352 (3%) invasive cancers and for 1,230 (45%) non-invasive cancers. In South East Coast, 23% 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 10,791 invasive cancers with known ER status, 89% were ER positive.
- PgR status data were available for 74% of invasive cancers and 41% of non-invasive cancers.
- PgR status was known for 91% of the 1,140 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 78% of invasive cancers compared with only 53% in 2005/06. The proportion of cases with known HER-2 status varied from 58% in South Central to 97% 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 8,686 invasive cancers with known HER-2 status, 14% were positive and 86% were negative.
- 76% of invasive cancers and 41% of non-invasive cancers had radiotherapy. 25% of the invasive cancers and 14 of the non-invasive cancers had chemotherapy. 85% of invasive cancers and 21% of non-invasive cancers received hormone therapy. This difference probably reflects the relatively high proportion of non-invasive cancers for which the ER status was not known (45% compared with 3% for invasive cancers).
- Hormone therapy was the main treatment 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. This is mainly a reflection of the high proportion of relatively early stage cancers detected by screening.
- There was a clear decrease in chemotherapy treatment with age; with only 15% of women aged 65-70 receiving chemotherapy compared with 36% 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, 48% of women received radiotherapy within 60 days of their final surgery and 86% within 90 days. 123 women (2%) had not received radiotherapy 200 days after their final surgery. Only 42% of women with invasive breast cancer had started their radiotherapy within 90 days of their first assessment visit and 4% 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.

8.5 Combinations of Treatment According to Tumour Characteristics

This section examines the combinations of treatment 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

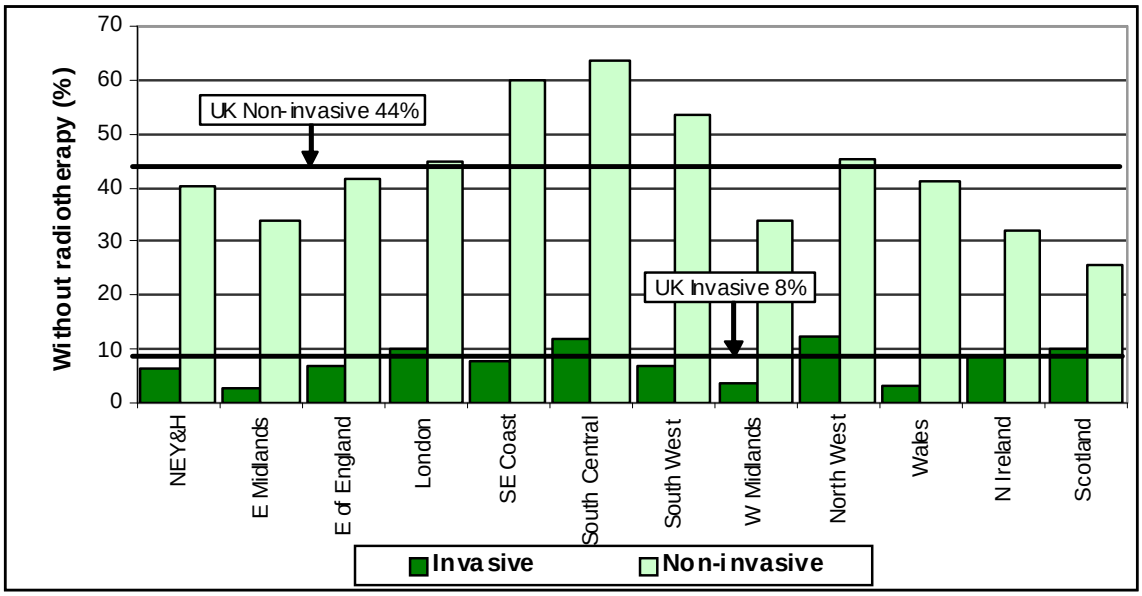

Figure 55 (Tables 105 & 108): The proportion of conservatively treated invasive cancers and non-invasive cancers that did not receive radiotherapy

Of the 13,242 cases with radiotherapy data available, 79% were invasive and 19% were non-invasive (Table 103). 7,734 (74%) of the invasive cancers were treated with conservation surgery (Table 104). Of these, 594 (8%) did not have adjuvant radiotherapy recorded (Table 105). Figure 55 shows the variation in the proportion of conservatively treated invasive and non-invasive cancers that did not receive adjuvant radiotherapy. For invasive cancers, the proportions without radiotherapy recorded varied from 3% in East Midlands and Wales to 12% in South Central and North West. Of the 1,844 non-invasive cancers treated with conservation surgery, 808 (44%) did not have adjuvant radiotherapy recorded (Table108). This varied from 26% in Scotland to 64% in South Central. Figure 56 shows the variation between individual screening units in the proportion of conservatively treated invasive breast cancers which did not receive radiotherapy. This varied from 0 cancers in 13 units to more than 20% of cancers in 8 screening units.

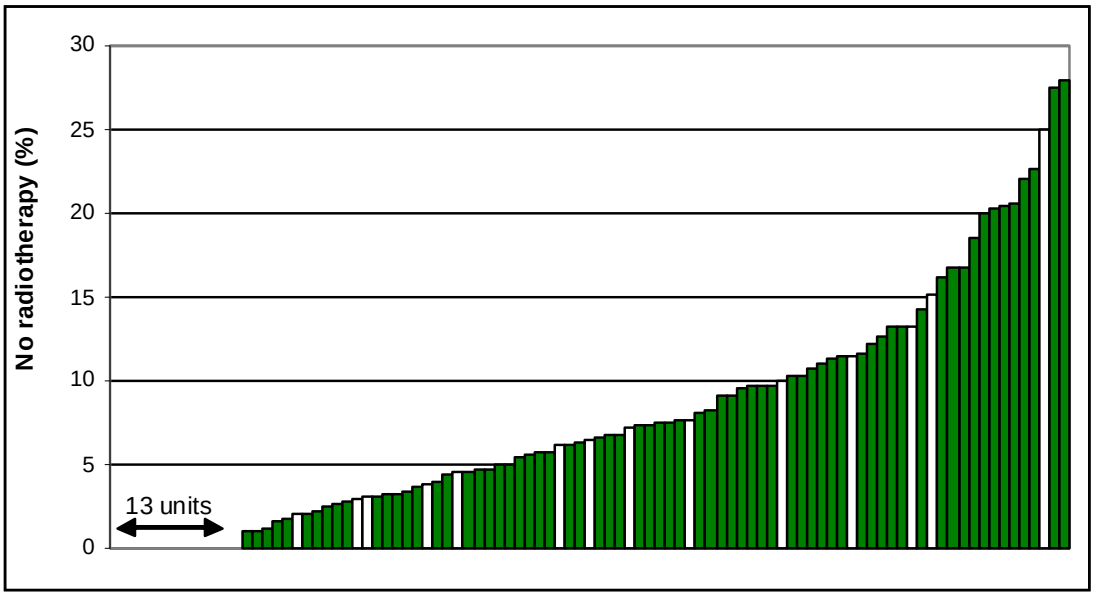

Figure 56: Variation between screening units in the proportion of conservatively treated invasive cancers that did not receive radiotherapy (Smaller units are highlighted in white)

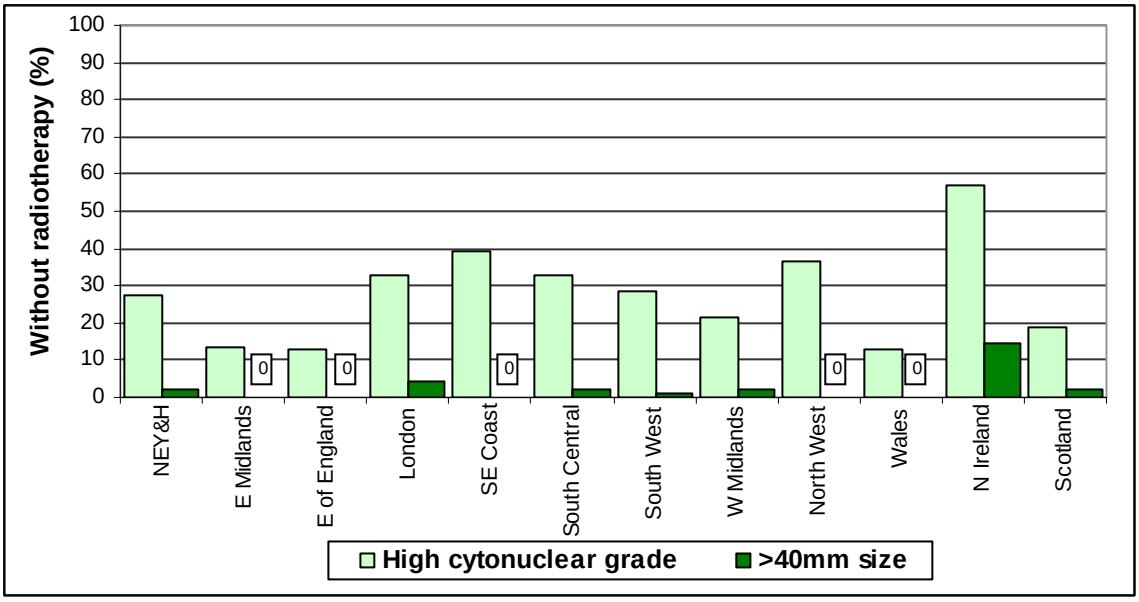

Figure 57 (Tables 109 & 110): The proportion of conservatively treated non-invasive cancers with high cytonuclear grade or size greater than 40mm which did not receive radiotherapy

In the UK as a whole, the majority (63%) of conservatively treated invasive cancers not given adjuvant radiotherapy were small (<15mm invasive size diameter) tumours (Table 106). However, 12% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 15% were node positive (Table 107). Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why larger (20mm+ diameter), high grade and/or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy.

Figure 57 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 receive radiotherapy. 27% (222) of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade (Table 109), and 12 cancers were more then 40mm in diameter (Table 110). 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 and regional surgical QA co-ordinators should audit the treatment provided to larger (40mm+ diameter) and/ or high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy.

CONSERVATIVELY TREATED CANCERS WITHOUT RADIOTHERAPY

	Invasive						***Non-invasive***					
	2004/05		***2005/06***		***2006/07***		***2004/05***		***2005/06***		***2006/07***	
Region	***No.***	%	***No.***	%	***No.***	%	***No.***	%	***No.***	%	***No.***	%
N East, Yorks & Humber	*68*	*9*	*108*	*14*	*50*	*6*	*97*	*46*	*104*	*53*	*87*	*40*
East Midlands	*24*	*5*	*13*	*2*	*16*	*3*	*63*	*49*	*57*	*41*	*44*	*34*
East of England	*24*	*5*	*44*	*6*	*45*	*7*	*64*	*46*	*57*	*32*	*71*	*41*
London	*46*	*7*	*60*	*9*	*73*	*10*	*57*	*45*	*75*	*42*	*92*	*45*
South East Coast	*99*	*23*	*26*	*9*	*30*	*8*	*97*	*66*	*53*	*69*	*74*	*60*
South Central	*48*	*9*	*79*	*12*	*78*	*12*	*77*	*62*	*79*	*55*	*89*	*64*
South West	*45*	*6*	*69*	*8*	*62*	*7*	*110*	*58*	*138*	*57*	*120*	*53*
West Midlands	*56*	*8*	*18*	*3*	*23*	*4*	*64*	*42*	*45*	*35*	*42*	*34*
North West	*113*	*15*	*66*	*8*	*118*	*12*	*114*	*59*	*99*	*55*	*93*	*45*
Wales	*7*	*2*	*15*	*4*	*14*	*3*	*26*	*41*	*42*	*42*	*46*	*41*
Northern Ireland	*3*	*3*	*8*	*7*	*7*	*9*	*4*	*17*	*8*	*40*	*7*	*32*
Scotland	*35*	*8*	*75*	*15*	*78*	*10*	*35*	*36*	*57*	*41*	*43*	*26*
United Kingdom	***568***	***9***	***581***	***8***	***594***	***8***	***808***	***51***	***814***	***47***	***808***	***44***

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 conservatively treated invasive and non-invasive cancers with no radiotherapy treatment recorded has varied in each region over the treatment year period from 2004/05 to 2006/07. Regions where the proportion of cancers not receiving radiotherapy is 5% or more in excess of the UK average are shaded. Throughout the three year period studied, 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. The regional QA reference centres and regional surgical QA co-ordinators should ascertain if these results are due to data collection problems or whether they are a true reflection of clinical practice.

CONCLUSION 1

92% of women with invasive cancer treated with conservation surgery received adjuvant radiotherapy, compared to only 56% of women with conservatively treated non-invasive cancers.

12% of conservatively treated invasive cancers not given adjuvant radiotherapy were larger than 20mm in diameter, 13% were Grade III and 15% were node positive. Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why larger (20mm+ diameter), high grade and/or node positive conservatively treated invasive cancers do not appear to have received adjuvant radiotherapy.

27% of non-invasive cancers not given adjuvant radiotherapy were high cytonuclear grade and 12 cancers were more than 40mm in diameter. 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 and regional surgical QA co-ordinators should audit the treatment provided to larger (40mm+ diameter) and/or high cytonuclear grade non-invasive cancers to ensure that these cancers did not receive less than optimal therapy.

Throughout the three year period studied, 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. The regional QA reference centres and regional surgical QA co-ordinators should ascertain if these results are due to data collection problems or whether they are a true reflection of clinical practice.

8.5.2 ER Negative, Node Positive Invasive Cancers and Chemotherapy

PROPOSITION 2

Women with ER negative, node positive invasive cancers should normally receive chemotherapy

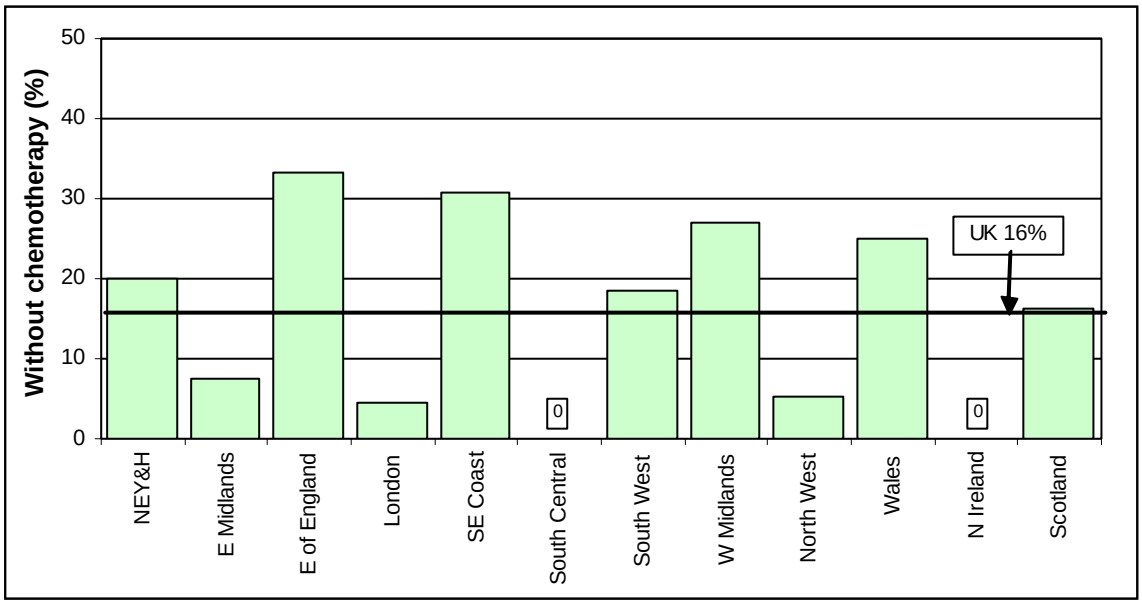

Figure 58 (Table 112): The proportion of ER negative, node positive invasive cancers that did not receive chemotherapy

Of the 13,409 cancers with known chemotherapy data, 282 (2%) were recorded as ER negative, node positive invasive cancers and 790 (6%) were recorded as ER negative, node negative invasive cancers (Table 111). Of the 282 ER negative, node positive invasive cancers, 44 (16%) did not receive chemotherapy (Figure 58). This varied from 0% in South Central and Northern Ireland to 31% in South East Coast and 33% in East of England. Of the 44 cases which did not receive chemotherapy, 20 were aged less than 65 and 24 were aged 65 or above. Although these numbers are similar, the 20 cases aged less than 65 were only 10% of the ER negative, node positive invasive cancers in this age group; while the 24 cases were 27% of the ER negative, node positive invasive cancers in the older patients.

ER NEGATIVE NODE POSITIVE INVASIVE CANCERS WITHOUT CHEMOTHERAPY

	2004/05		2005/06		2006/07	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	*5*	*16*	*9*	*23*	*8*	*20*
East Midlands	*0*	*0*	*3*	*14*	*2*	*7*
East of England	*1*	*13*	*4*	*17*	*7*	*33*
London	*3*	*19*	*4*	*14*	*1*	*5*
South East Coast	*2*	*13*	*3*	*21*	*4*	*31*
South Central	*6*	*23*	*3*	*16*	*0*	*0*
South West	*3*	*13*	*4*	*17*	*5*	*19*
West Midlands	*2*	*9*	*2*	*10*	*7*	*27*
North West	*6*	*21*	*5*	*13*	*2*	*5*
Wales	*0*	*0*	*0*	*0*	*3*	*25*
Northern Ireland	*1*	*10*	*0*	*0*	*0*	*0*
Scotland	*0*	*0*	*4*	*15*	*5*	*16*
United Kingdom	***29***	***13***	***41***	***15***	***44***	***16***

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

The preceding table shows how the number and proportion of ER negative, node positive invasive cancers with no chemotherapy treatment recorded has varied in each region for the three year period from 2004/05 to 2006/07. Regions where the proportion of cancers not receiving chemotherapy is 5% or more in excess of the UK average are shaded. London, South Central and North West 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.

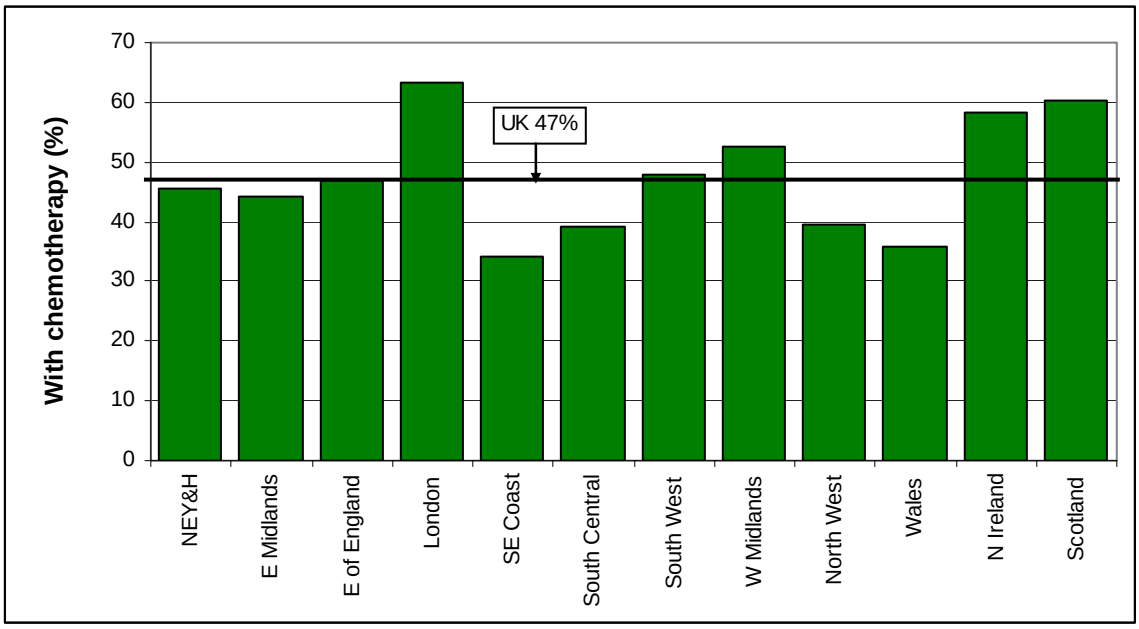

Figure 59 (Table 113): The proportion of ER negative, node negative invasive cancers that received chemotherapy

Of the 790 ER negative, node negative invasive cancers, 417 (53%) did not receive chemotherapy (Table 113). This varied from 37% in London to 66% in South East Coast (Figure 59). 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 London where the highest proportion of ER negative node negative cancers received chemotherapy. In the UK as a whole, 82% of the 373 ER negative, node negative invasive cancers given chemotherapy were Grade III (Table 114) and 122 (33%) cases were HER-2 positive.

CONCLUSION 2

16% of women with ER negative, node positive invasive cancers did not have chemotherapy recorded compared to 53% of ER negative, node negative invasive cancers. This suggests that nodal status was taken into account when deciding whether women would benefit from chemotherapy.

82% of the 373 ER negative, node negative invasive cancers given chemotherapy were Grade III and 33% were HER-2 positive.

Older women with ER negative, node positive invasive cancers were less likely to receive chemotherapy 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.

8.5.3 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 13,317 cancers with complete hormone therapy data included in the adjuvant therapy analysis, 10,560 (79%) were ER positive, 1,464 (11%) ER negative and for 1,293 (10%) either the ER status were not tested or the ER status was unknown (Table 115). 89% of the ER positive cancers with known hormone therapy data were invasive and 10% non-invasive (Table 116).

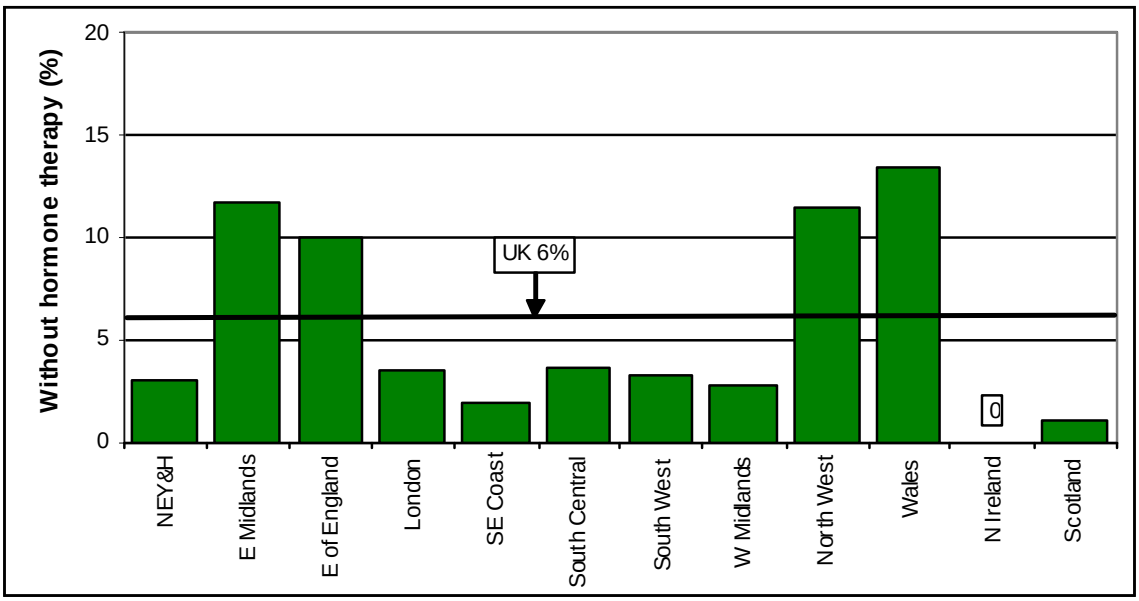

Figure 60 (Table 117): Variation in proportion of ER positive, invasive cancers that did not receive hormone therapy

In the UK as a whole, 550 (6%) ER positive, invasive cancers had no hormone therapy recorded (Figure 60). The proportion of ER positive, invasive cancers that did not receive hormone therapy varied from 0 cases in Northern Ireland to 13% in Wales (77 cancers) (Figure 60). 86% of the ER positive, invasive cancers that did not receive hormone therapy were Grade I or II, 83% were node

negative and 71% were <15mm in diameter (Table 118). Figure 61 shows how the proportion of ER positive cancers in the Excellent Prognostic Group (EPG) treated with hormone therapy varies between screening units. In one screening unit in East Midlands, none of these cancers received hormone therapy and in 30 screening units they all did.

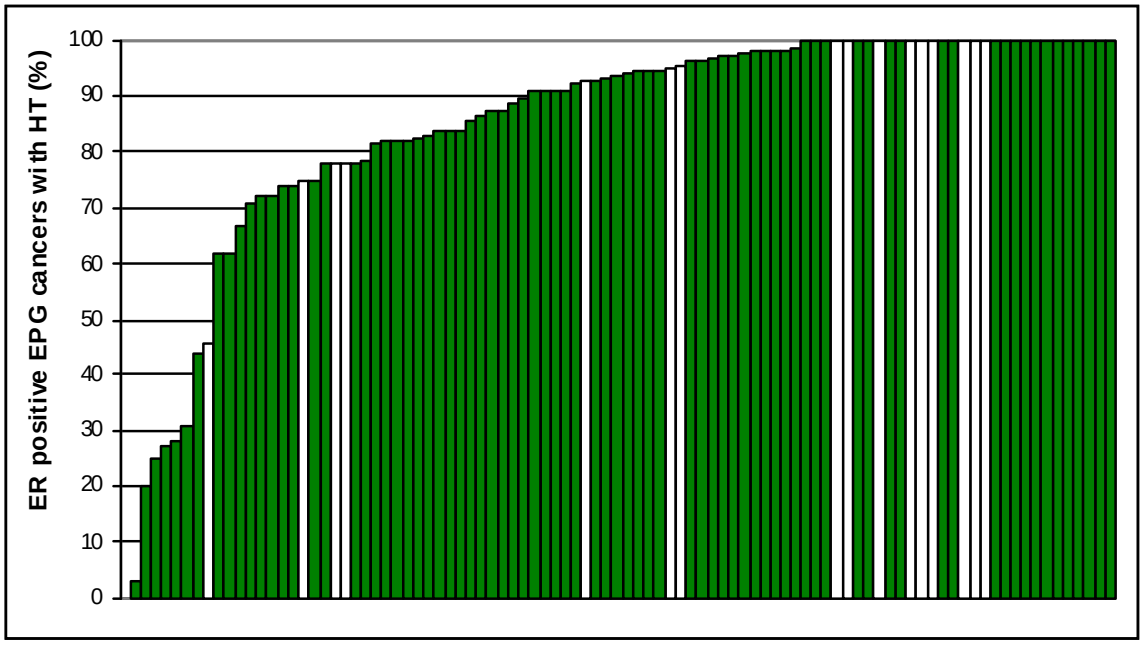

Figure 61: Variation between screening units in the proportion of ER positive, EPG cancers that received hormone therapy (excludes 2 units that had no ER positive EPG cancers)
(Smaller units are highlighted in white)

ER POSITIVE INVASIVE CANCERS WITHOUT HORMONE THERAPY

	2004/05		2005/06		2006/07	
Region	**No.**	%	**No.**	%	**No.**	%
N East, Yorks & Humber	*12*	*1*	*53*	*5*	*35*	*3*
East Midlands	*90*	*13*	*90*	*10*	*98*	*12*
East of England	*53*	*9*	*71*	*8*	*80*	*10*
London	*39*	*5*	*42*	*5*	*30*	*4*
South East Coast	*28*	*5*	*7*	*2*	*8*	*2*
South Central	*98*	*16*	*13*	*2*	*28*	*4*
South West	*13*	*2*	*34*	*4*	*34*	*3*
West Midlands	*5*	*1*	*14*	*2*	*20*	*3*
North West	*106*	*11*	*59*	*6*	*129*	*11*
Wales	*55*	*12*	*77*	*14*	*77*	*13*
Northern Ireland	*1*	*1*	*2*	*2*	*0*	*0*
Scotland	*13*	*2*	*7*	*1*	*11*	*1*
United Kingdom	***513***	***7***	***469***	***5***	***550***	***6***

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

The preceding table shows how the number and proportion of ER positive invasive cancers with no hormone therapy treatment recorded has varied in each region over the three year period from 2004/05 to 2006/07. Regions where the proportion of cancers not receiving hormone therapy is 5% or more in excess of the UK average are shaded. Throughout the three year period studied, East Midlands and Wales have consistently high proportions of ER positive invasive cancers that do not appear to have received hormone therapy. Regional QA reference centres and regional surgical QA co-ordinators where the proportion of cancers not receiving hormone therapy 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.

In the UK as a whole, 41% (24 cases) of ER negative, PgR positive invasive cancers did not receive hormone therapy (Table 119) and 151 ER negative cancers (10%) received hormone therapy (Table

120). 34 of the latter were PgR positive invasive cancers (Table 119). 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 was given to ER negative cancers.

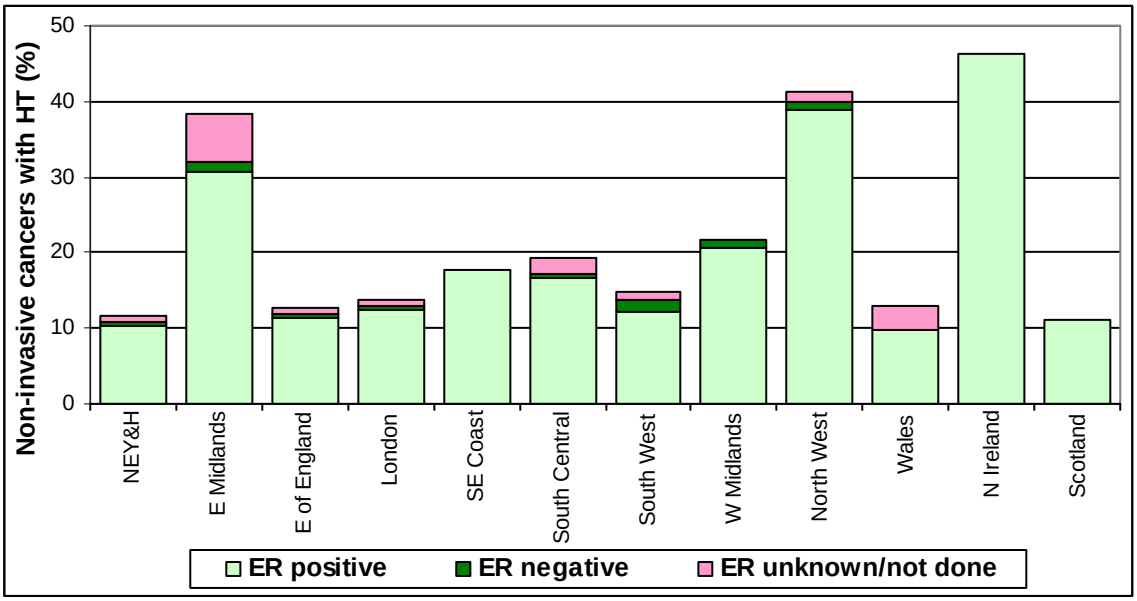

Figure 62 (Table 121): Variation in the proportion of non-invasive cancers that received hormone therapy

The proportion of non-invasive cancers treated with hormone therapy varied markedly between regions from 11% in Scotland to 46% in Northern Ireland (Figure 62 & Table 121). Of the 495 non-invasive cancers with known ER status treated with hormone therapy, 476 were ER positive and 19 were ER negative. A further 36 non-invasive cancers with unknown ER status were also treated with hormone therapy. In East Midlands 6% of the non-invasive cancers with unknown ER status were treated with hormone therapy. 593 ER positive, non-invasive cancers did not receive hormone therapy (Table 122). 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 was given to non-invasive cancers with unknown or negative ER status. The reasons for not giving hormone therapy to ER positive, non-invasive cancers should also be determined.

CONCLUSIONS 3

The decision to give hormone therapy did appear to depend to a large extent on ER and PgR status. However, 6% of ER positive, invasive cancers and 41% of ER negative, PgR positive invasive cancers did not have hormone therapy recorded. 86% of the ER positive invasive cancers not treated with hormone therapy were Grade I or II, 83% were node negative and 71% were <15mm in diameter. Nevertheless, regional QA reference centres and regional surgical QA co-ordinators should audit ER and PgR positive cases to determine whether the absence of hormone therapy data is a true reflection of clinical practice or a data recording issue. The reasons for not giving hormone therapy to ER positive, non-invasive cancers should also be determined.

10% of ER negative cancers did have 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, PgR Negative Invasive Cancers and Chemotherapy

PROPOSITION 4

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

In the UK as a whole, 411 (43%) invasive cancers with ER and PgR negative status did not have received chemotherapy recorded (Figure 63). This varied between 26% (26 out of 100 cancers) in London and 58% (31 out of 53 cancers) in Wales. In the UK as a whole, 50% of the ER and PgR negative cancers which did not receive chemotherapy were Grade III, 9% were node positive and 20% were HER-2 positive (Table 124). Regional QA reference centres and regional surgical QA co-ordinators should determine the reasons why chemotherapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

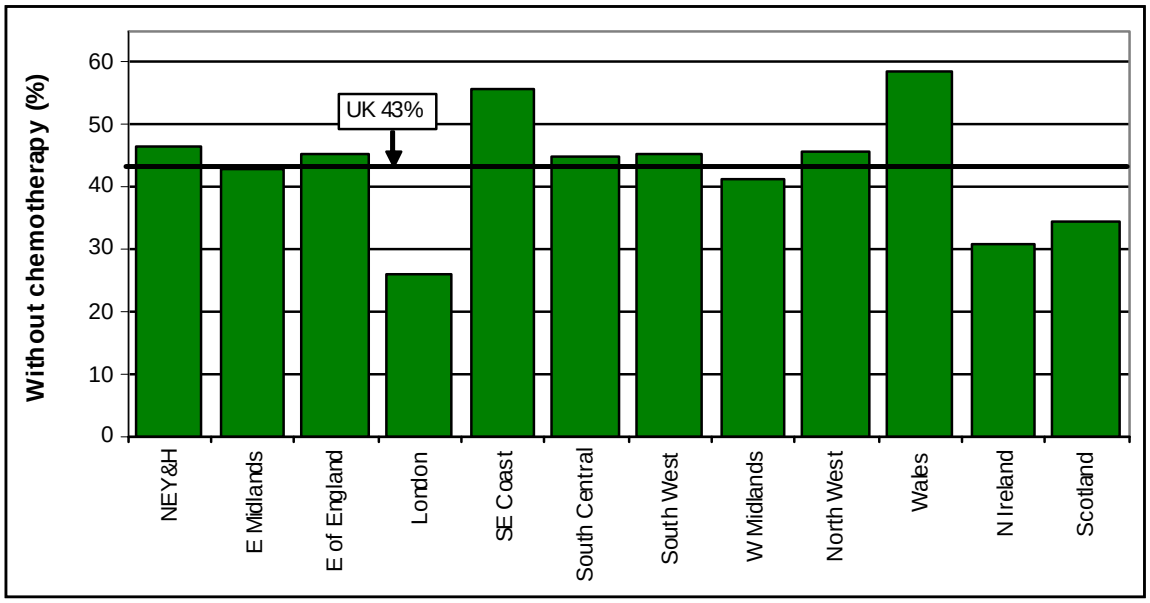

Figure 63 (Table 123): Proportion of ER negative, PgR negative invasive cancers that did not receive chemotherapy

The following table shows that older women who had ER and PgR negative invasive cancers were less likely to receive chemotherapy than younger women.

ER and PGR NEGATIVE INVASIVE CANCERS			
		Without Chemotherapy	
Age	*Total*	*No.*	*%*
49	*8*	*1*	*13*
50-52	*94*	*29*	*31*
53-55	*118*	*40*	*34*
56-58	*133*	*40*	*30*
59-61	*147*	*62*	*42*
62-64	*160*	*71*	*44*
65-67	*128*	*52*	*41*
68-70	*114*	*72*	*63*
71+	*57*	*44*	*77*

CONCLUSIONS 4

43% of ER and PgR negative invasive cancers did not have chemotherapy recorded. 50% of these cancers were Grade III, 9% were node positive and 20% were HER-2 positive. Regional QA reference centres and regional surgical QA coordinators should determine the reasons why chemotherapy therapy does not appear to have been given to ER and PgR negative invasive cancers in poor prognostic groups.

8.5.5 HER-2 Status and Chemotherapy

PROPOSITION 5

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

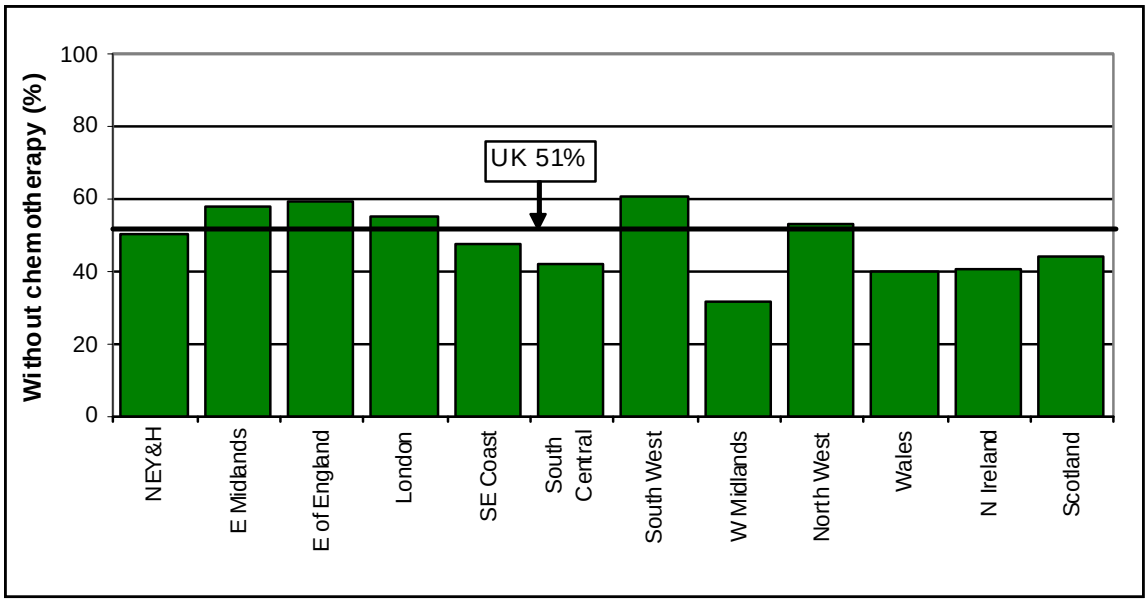

Figure 64 (Table 125): Proportion of HER-2 positive invasive cancers that did not receive chemotherapy

In the UK as a whole, HER-2 status was known for 8,686 (78%) of invasive cancers (Table 83). Of these, 1,173 were HER-2 positive and had chemotherapy data available. For 598 (51%) of these cases, no chemotherapy treatment was recorded (Table 125). This varied between 31% in West Midlands and 61% in South West (Figure 64). In the UK as a whole, 15% of the HER-2 positive cases with no chemotherapy recorded were greater than 20mm in diameter, 25% were Grade III, 11% were node positive and 37% were in the MPG1, MPG2 or PPG groups (Tables 126 and 127). Older patients were less likely to receive chemotherapy. 56% of the patients aged less than 65 with HER-2 positive invasive cancers received chemotherapy, compared to 44% of patients aged 65 and over.

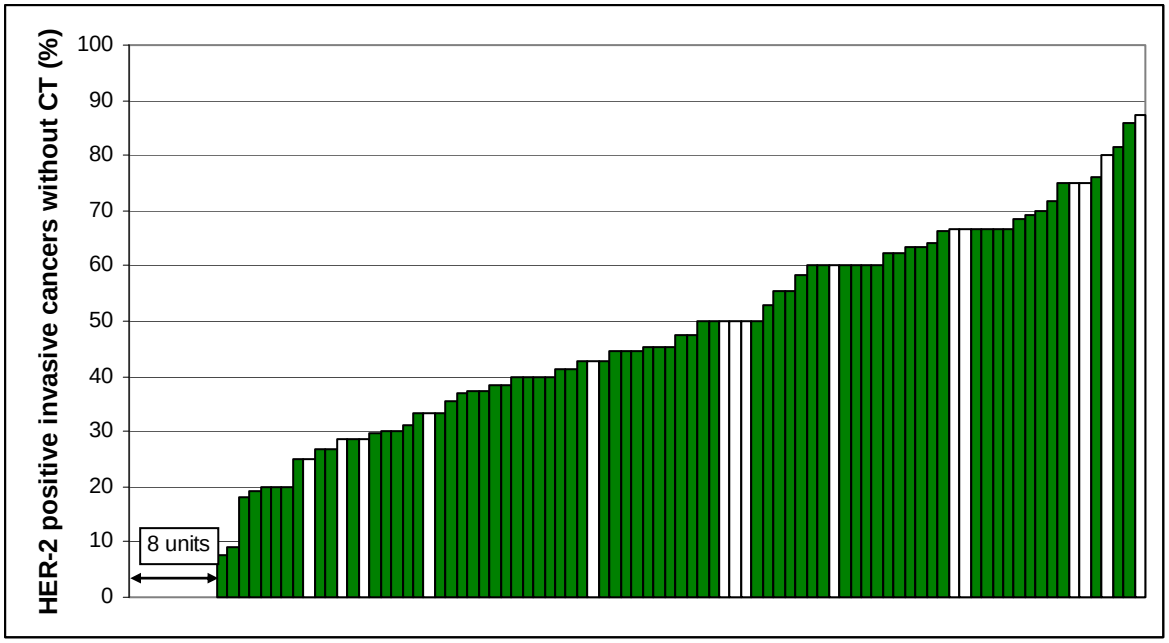

Figure 65: Variation between screening units in the proportion of HER-2 positive invasive cancers that did not receive chemotherapy (Smaller units are highlighted in white)

Figure 65 shows how the proportion of HER-2 positive invasive cancers that did not receive chemotherapy varied between individual screening units. In 8 units, all HER-2 positive invasive

cancers received chemotherapy, whilst in 9 screening units more than 70% of these cancers had no chemotherapy recorded. NICE Clinical Guideline 80 published in February 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. 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.

CONCLUSIONS 5

598 (51%) HER-2 positive cases did not have chemotherapy recorded. In the UK as a whole, 15% of these cases were greater than 20mm in diameter, 25% were Grade III, 11% were node positive and 37% were in the MPG1, MPG2 or PPG groups.

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 receive treatment consistent with propositions 1 to 5 presented in this section. Regions where the proportion of cancers 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 the surgeons 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 91)*	***Non-invasive conservation surgery no RT*** *(Table 94)*	***ER negative node positive invasive no CT*** *(Table 98)*	***ER positive invasive no HT*** *(Table 103)*	***ER negative PgR positive invasive no HT*** *(Table 105)*	***ER negative with HT*** *(Table 106)*	***ER negative PgR negative invasive no CT*** *(Table 109)*	***HER-2 Positive invasive cancers no CT*** *(Table 111)*
Region	***%***	***%***	***%***	***%***	***%***	***%***	***%***	***%***
NEY&H	*6*	*40*	*20*	*3*	*33*	*6*	*47*	*50*
East Midlands	*3*	*34*	*7*	*12*	*43*	*7*	*43*	*58*
E of England	*7*	*41*	*33*	*10*	*43*	*7*	*45*	*59*
London	*10*	*45*	*5*	*4*	*50*	*9*	*26*	*55*
SE Coast	*8*	*60*	*31*	*2*	*40*	*7*	*56*	*48*
South Central	*12*	*64*	*0*	*4*	*40*	*16*	*45*	*42*
South West	*7*	*53*	*19*	*3*	*40*	*15*	*45*	*61*
West Midlands	*4*	*34*	*27*	*3*	*67*	*15*	*41*	*31*
North West	*12*	*45*	*5*	*11*	*33*	*12*	*46*	*53*
Wales	*3*	*41*	*25*	*13*	*60*	*2*	*58*	*40*
N Ireland	*9*	*32*	*0*	*0*	*0*	*8*	*31*	*41*
Scotland	*10*	*26*	*16*	*1*	*25*	*15*	*35*	*44*
UK	***8***	***44***	***16***	***6***	***41***	***10***	***43***	***51***

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 2001 and 31 March 2002 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 2008, enabling survival for a period of up to 6 years post diagnosis to be calculated. 5 year relative survival has been performed 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 2001/02. 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 9,296 breast cancers detected by screening between 1 April 2001 and 31 March 2002 were submitted to the survival audit. Of the 9,296 cancers submitted, 353 cancers (4%) were excluded if one of the following reasons applied:

- Unknown invasive status (42 cases)
- Case not registered at the regional cancer registry or registered with an unknown diagnosis date (198 cases)
- Screen-detected cancer not confirmed to be the first primary breast tumour (113 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 93% in Wales and 100% in Northern Ireland. The highest numbers of unregistered cases

were in South West (44 cases), North West (40 cases) and Wales (36 cases) which together account for 61% of the 198 unregistered cases. The proportion of cases with unknown invasive size, grade and/or nodal status (6%) is relatively high in 2001/02 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 (121 cases) and London (109 cases) which together account for 44% of the 596 cases with missing tumour characteristics.

DATA COMPLETENESS FOR THE 2001/02 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	*26*	*2*	*25*	*2*	*70*	*6*	*1,209*	*95*	***1,267***
East Midlands	*21*	*3*	*3*	*0*	*18*	*2*	*752*	*97*	***777***
East of England	*6*	*1*	*15*	*1*	*76*	*7*	*1,027*	*97*	***1,060***
London	*23*	*3*	*8*	*1*	*109*	*12*	*848*	*96*	***882***
South East Coast	*2*	*0*	*9*	*1*	*31*	*4*	*794*	*99*	***805***
South Central	*0*	*0*	*17*	*2*	*41*	*6*	*672*	*97*	***692***
South West	*44*	*5*	*0*	*0*	*53*	*6*	*892*	*95*	***942***
West Midlands	*0*	*0*	*15*	*2*	*13*	*2*	*818*	*97*	***839***
North West	*40*	*3*	*14*	*1*	*151*	*12*	*1,173*	*95*	***1,230***
Wales	*36*	*6*	*7*	*1*	*25*	*4*	*564*	*93*	***608***
Northern Ireland	*0*	*0*	*0*	*0*	*9*	*5*	*194*	*100*	***194***
Scotland	*No data supplied*								
United Kingdom	***198***	***2***	***113***	***1***	***596***	***6***	***8,943***	***96***	***9,296***

**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, 57% of the 640 deaths among the 7,051 women with invasive breast cancer were recorded as being due to breast cancer, 20% were due to another type of cancer and 23% were due to non-cancer related causes. Death cause was unknown for 7 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 128). For example, in London only 45% of the deaths were attributed to breast cancer compared with 64% in South East Coast; in North East, Yorkshire & Humber 26% of deaths were attributed to other types of cancer compared with only 7% in South Central and 0% in Northern Ireland; and in South Central 28% were non-cancer deaths compared with 14% in East Midlands and 13% in Northern Ireland.

Table 129 shows that there were a total of 8 deaths (10%) recorded amongst the 82 women with micro-invasive cancer detected by screening in 2001/02. 4 were from the breast cancer, 1 from another cancer and 3 were non-cancer deaths. Of the 72 deaths (4%) in the 1,810 women with non-invasive cancer, 19 (26%) were recorded as being due to breast cancer, 36 (50%) were from a cancer other than breast cancer and 16 (22%) were non-cancer deaths. For 1 case the cause of death was not collected (Table 130).

9.4 5 Year Relative Survival Rates for Cancers Diagnosed in 2001/02

Figure 66 shows that the overall 5 year relative survival of women with invasive cancers diagnosed in England, Wales and Northern Ireland in 2001/02 was 97.2%, compared to 96.4% in 2000/01. 5 year

relative survival rates varied from 95.2% in West Midlands to 99.3% in Wales. There is no significant difference between the 5 year relative survival rates in each region.

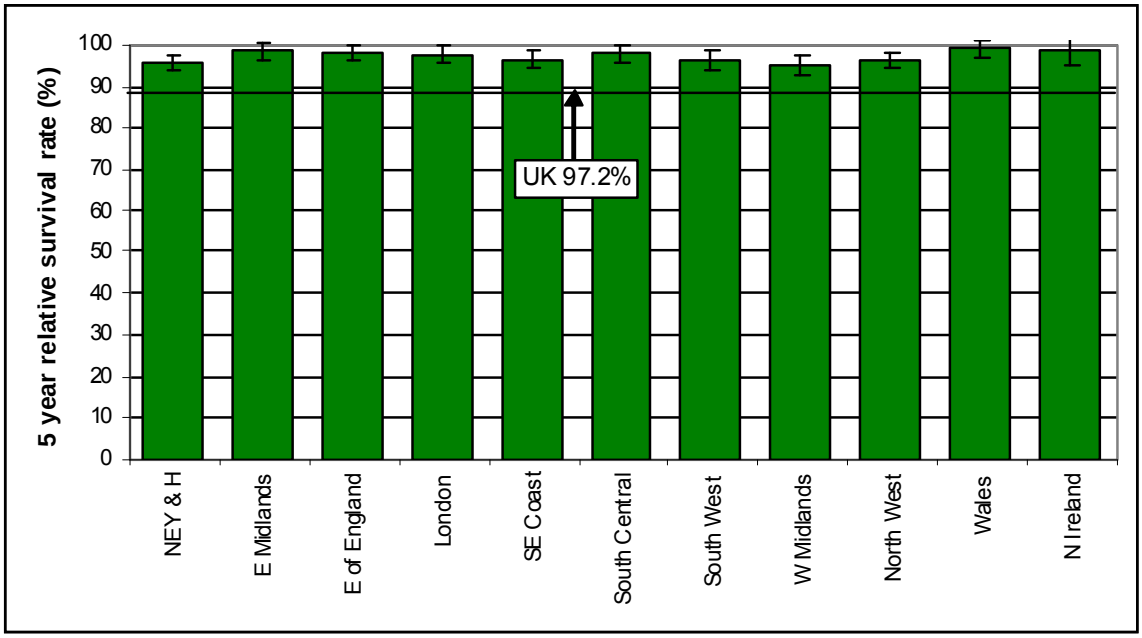

Figure 66 (Table 131): 5 year relative survival for women with screen-detected invasive breast cancer diagnosed in 2001/02

The following summary table shows the 5 year relative survival rates from past audit reports. 5 year relative survival has improved significantly from 93.6% in 1990/91 to 97.2% in 2001/02 and the number of eligible cases has increased each year.

12 YEAR SUMMARY OF 5 YEAR RELATIVE SURVIVAL RATES		
Audit year	***Number of invasive cases***	***5 year survival rate***
Jan 1990 – Dec 1991	*7,108 (2 years)*	*93.6 (92.9,94.4)*
Mar 1991 – Apr 1992	*No information*	
Mar 1992 – Apr 1993	*4,864*	*92.5 (91.8,93.3)*
Mar 1993 – Apr 1994	*3,705*	*93.9 (93.2,94.7)*
Mar 1994 – Apr 1995	*4,554*	*93.1 (92.4,93.9)*
Mar 1995 – Apr 1996	*No information*	
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)*

9.5 5 Year Relative Survival with Tumour Characteristics

The following table shows the characteristics of the 7,051 invasive cancers included in the 2001/02 survival audit. 83% of the invasive cancers were diagnosed in women aged 50-64 years. 80% of the cancers were less than or equal to 20mm in diameter, 80% were Grade I or Grade II and 71% were node negative. 57% of the cancers were in the excellent (EPG) and good (GPG) prognostic groups and only 6% in the poor prognostic group (PPG).

Parameter		Cancers included in each analysis group 2001/02	
		No.	%
Invasive status	Invasive	7,051	79
	Micro-invasive	1,810	20
	Non-invasive	82	1
Age group (invasive cancers only)	<50	130	2
	50-52	1,208	18
	53-55	1,140	16
	56-58	1,219	17
	59-61	1,130	16
	62-64	1,143	16
	65+	1,081	15
	Total	7,051	100
Invasive cancer size	<15mm	3,800	54
	15-≤20mm	1,829	26
	>20-≤35mm	1,071	15
	>35-≤50mm	197	3
	>50mm	90	1
	Unknown	64	1
	Total	7,051	100
Invasive grade	Grade I	2,327	33
	Grade II	3,308	47
	Grade III	1,216	17
	Not assessable	30	0
	Unknown	170	2
	Total	7,051	100
Nodal status (invasive cancers only)	Negative	5,009	71
	Positive	1,653	23
	Unknown	389	6
	Total	7,051	100
NPI group (invasive cancers only)	EPG	1,691	24
	GPG	2,321	33
	MPG1	1,410	20
	MPG2	691	10
	PPG	391	6
	Unknown	547	8
	Total	7,051	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 cancers is higher than 100%. Moreover, the lower limits of the 95% confidence intervals for the 5 year relative survival of women with non-invasive cancers 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			
	1999/00	2000/01	2001/02
Invasive	96.5 (95.8,97.2)	96.4 (95.7,97.0)	97.2 (96.6,97.8)
Micro-invasive	97.5 (93.0,102.1)	99.5 (95.6,103.5)	96.5 (90.5,102.4)
Non-invasive	101.1 (100.3,101.9)	100.5 (99.7,101.4)	101.3 (100.5,102.1)

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

Table 132 and Figure 67 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.

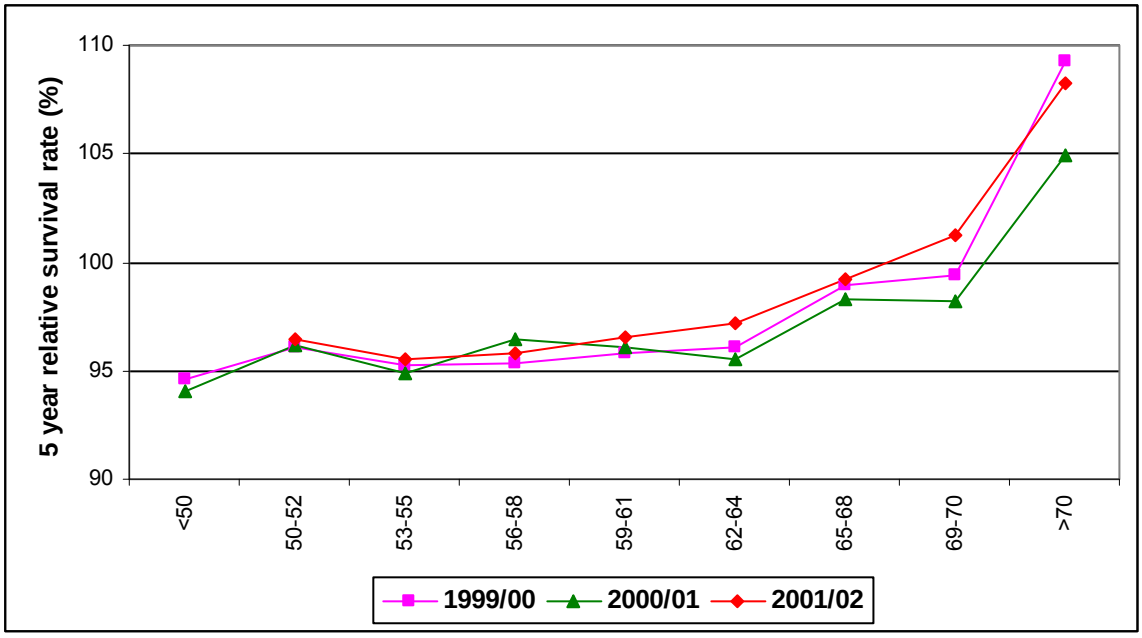

Figure 67 (Table 132): Variation in 5 year relative survival with age for women with screen-detected invasive breast cancer

The comparatively high relative survival of women aged 65 and over, is similar to that which has been 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

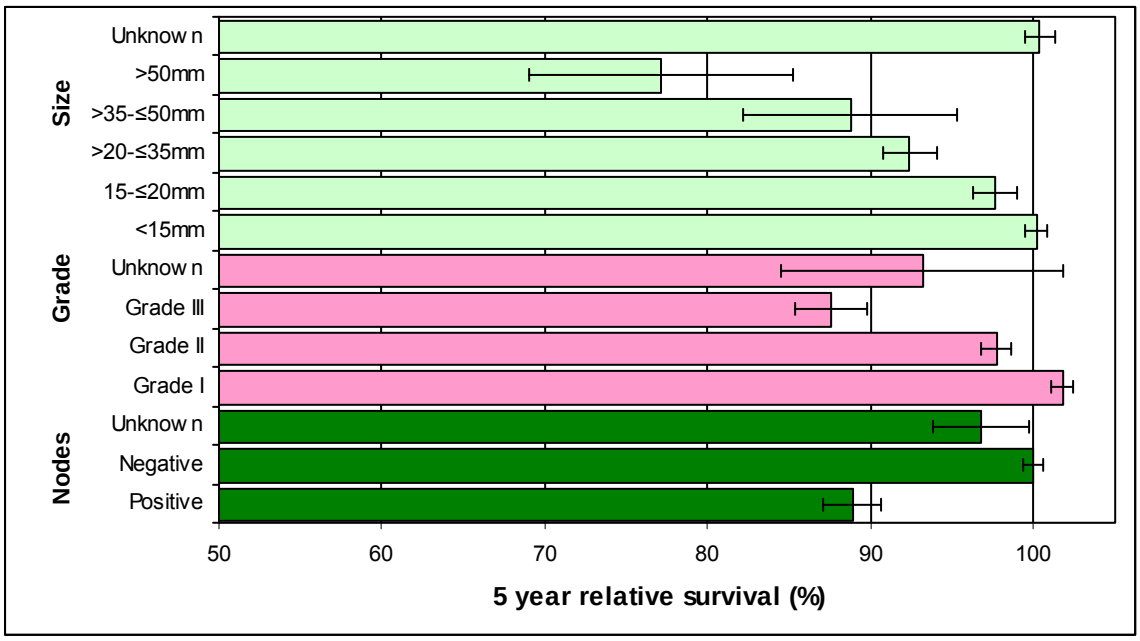

Figure 68 (Tables 133, 134 & 135): Variation in 5 year relative survival with nodal status, grade and size for women with screen-detected invasive breast cancer

Figure 68 shows how 5 year relative survival rates vary with tumour size, grade and nodal status. The 5 year relative survival of women with less than 15mm diameter cancers was 100.2% (95% CI 99.5%-100.8%) compared with a 5 year relative survival rate of only 77.1% (95% CI 69.0%-85.2%) for women with tumours with a diameter greater than 50mm. At 101.8% (95% CI 101.1%-102.4%), 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 (17% of the cohort) whose 5 year relative survival was only 87.5% (95% CI 85.3%-89.7%). Finally, at 100% (95% CI 99.4%-100.6%), the 5 year relative survival for women with node negative cancers (71% of the cohort) was higher than for the women with node positive cancers (23% of the cohort) whose 5 year relative survival was only 88.9% (95% CI 87.1%-90.7%).

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 69 shows how 5 year relative survival rates varied with NPI score at diagnosis. The 5 year relative survival rate in 2001/02 for women with cancers in the excellent prognostic group (EPG) was 102.2% (95% CI 101.5%-102.9%), and for women with cancers in the good prognostic group (GPG) and moderate prognostic group 1 (MPG1) the 5 year relative survival rate was 100.1% (95% CI 99.2%-100.9%) and 96.7% (95% CI 95.2%-98.1%) respectively. There has been no significant change in the 5 year relative survival rate in these three prognostic groups in the 3 year period from 1999/00 to 2001/02.

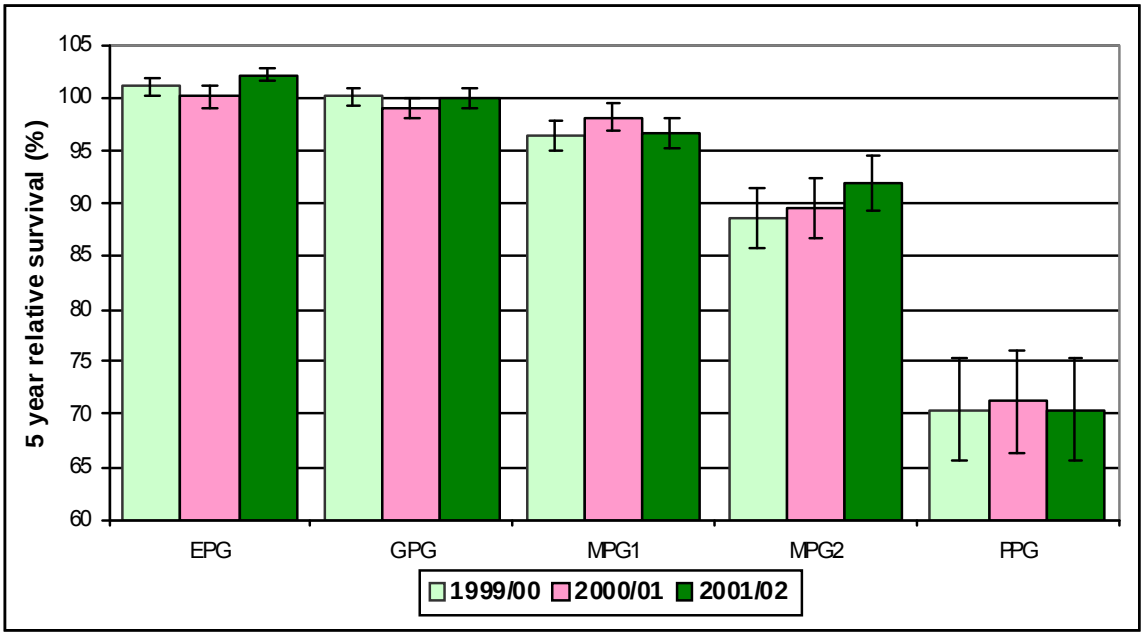

Figure 69 (Table 136): Variation in 5 year relative survival with NPI group for women with screen-detected invasive breast cancer in 1999/00, 2000/01 and 2001/02

At 96.7% (95% CI 95.2%-98.1%), the 5 year relative survival rate for the 20% 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 10% of cancers in the moderate prognostic group 2 (MPG2) and the 6% of women with cancers in the poor prognostic group (PPG) were even lower at 92.0% (95% CI 89.4%-94.6%) and 70.4% (95% CI 65.4%-75.3%) respectively.

COMMENTS:

- Of the 9,296 cancers submitted to the survival analysis for the period 1 April 2001 to 31 March 2002, 198 (2%) were excluded because they were not registered at the cancer registries. A further 113 cancers (1%) were excluded because they were not confirmed to be primary tumours and 42 because their invasive status was not known.
- 5 year relative survival for women with invasive cancers diagnosed in 2001/02 was 97.2%. This varied from 95.2% in West Midlands to 99.3% in Wales. However, there is no significant difference between the 5 year relative survival rates in each region.

COMMENTS:

- 5 year relative survival has improved significantly from 93.6% in 1990 and 1991 to 97.2% in 2001/02 and the number of eligible cases has increased each year.
- The 5 year relative survival of women with less than 15mm diameter cancers was 100.2% (95% CI 99.5%-100.8%) compared with a 5 year relative survival rate of only 77.1% (95% CI 69.0%-85.2%) for women with tumours with a diameter greater than 50mm.
- At 101.8%, 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 (17% of the cohort) whose 5 year relative survival was only 87.5%.
- At 100%, the 5 year relative survival for women with node negative cancers (71% of the cohort) was higher than for the women with node positive cancers (23% of the cohort) whose 5 year relative survival was only 88.9%.
- The 5 year relative survival rate in 2001/02 for women with cancers in the excellent prognostic group (EPG) was 102.2% (95% CI 101.5%-102.9%).
- For women with cancers in the good prognostic group (GPG) and moderate prognostic group 1 (MPG1) the 5 year relative survival rate was 100.1% (95% CI 99.2%-100.9%) and 96.7% (95% CI 95.2%-98.1%) respectively.
- At 96.7%, the 5 year relative survival rate for the 20% 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 rate of the 10% of women with cancers in the moderate prognostic group 2 (MPG2) and the 6% of women with cancers in the poor prognostic group (PPG) were even lower at 92.0% (95% CI 89.4%-94.6%) and 70.4% (95% CI 65.4%-75.3%) respectively.

APPENDIX A: TIMETABLE OF EVENTS

ABS AT BASO AUDIT OF SCREEN-DETECTED BREAST CANCERS FOR THE YEAR OF SCREENING 1ST APRIL 2007 - 31ST MARCH 2008

AUDIT TIMETABLE	
Date	**Event**
12th June 08	Audit group meet to plan the 2007/08 audit.
1st July 08	Draft timetable and changes in the audit 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.
2nd – 8th July	QA Co-ordinators discuss draft timetable and changes with their QA Surgeon, QA Director and QA Data Managers. Return comments to the West Midlands Cancer Intelligence Unit (WMCIU) by 10th July.
24th July 08	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 2007/08.
26th Aug 08	Suggested deadline for QARCs to request survival audit data from Cancer Registries.
26th Sept 08	Suggested deadline for Cancer Registries to provide data to the QARCs for the survival audit.
7th Oct 08	**All QARCs to ensure that an appropriate member of staff attends a data quality day at the NBSS Training Centre, Coventry to validate the completed audit spreadsheets.**
10th Oct 08	**Deadline for receipt of survival data from QARCs at the WMCIU.**
16th – 22nd Oct 08	All QARCs to ensure that an appropriate member of staff is available to respond to any queries from the WMCIU regarding the survival audit.
14th Nov 08	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.*
26th Nov 08	QA director meeting in London (to include feedback on outliers from 2006/07)
17th Nov 08 – 6th Jan 09	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.
7th Jan 09	**Deadline for receipt of main and adjuvant audit data from QARCs at the WMCIU.**
8th – 16th Jan 09	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.
17th Feb 09	First draft audit booklet emailed to Audit group for comments
27th Feb 09	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.*
9th March 09	Speakers and commentator pre-conference meeting
17th – 18th March 09	2009 ABS at BASO conference
18th March 09	Wash-up meeting
22nd Apr 09	Audit booklet final draft sent to the Audit Group to act as scrutinisers/editors.
8th May 09	Deadline for receipt of the audit booklet at the printers.
11th June 09	**Audit booklet distributed**

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 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 - 31 MARCH 2008 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT AT 1 APRIL 2008

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. **<u>All data sent to WMCIU should be password protected and sent via nhs.net email accounts.</u>**

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 7 January 2009

****

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 2007/08. 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 2007/08. 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. This is the same as the one recorded in NBSS.

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
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West Midlands Cancer Intelligence Unit
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Birmingham
B15 2TT

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Fax: 0121 414 7714

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shan.cheung@nhs.net

NHSBSP & ABS AT BASO BREAST SCREENING AUDIT 2007/08

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. P - 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. Q - Immediate Reconstruction - to be completed by the surgeon for mastectomies only. Enter X if type of treatment not M.
Col. R - 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. S- Invasive status of the cancer; taking into account the non-operative diagnosis, surgery and MDT decisions.

-Sx Number- *{C}* **Sx Number**	*-Surgeon-* *{G}* **Consultant GMC Code**	*-DOB-* *{H}* **Date of birth** *(dd/mm/yyyy)*	*-DOFOA-* *{I}* **Date of first offered appt** *(dd/mm/yyyy)*	*-Screen Date-* *{J}* **Screen date** *(dd/mm/yyyy, EC,U)*	*-Ass Date-* *{K}* **First assessment date** *(dd/mm/yyyy, U)*	*{L}* **Side (left or right)** *(L,R)*	*-WBN Opinon-* *{M}* **Worst cytology** *(see above)*	*-WBN Opinion + Type-* *{N}* **Worst core biopsy** *(see above)*	*{O}* **Number of visits for cytology/ core biopsy** *(exclude results clinic)* *(U,0,1,2,.)*	*{P}* **Type of treat-ment** *(C,M,NS,U)*	*-treatment-* *{Q}* **Immediate recon-struction** *(only for M =Mastectomy)* *(Y,N,U,X)*	*{R}* **Invasive status of the surgical specimen** *(I,M,N,B,U)*	*{S}* **Final Invasive status** *(I,M,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**	*-Biopsy Date- {T}* **First surgery date** *(diag or therapeutic)* *(dd/mm/yyyy,NS,U)*	*-Biopsy Date- {U}* **Final surgery date** *(excl reconstruction only)* *(dd/mm/yyyy,NS,U)*	*-Treatment + No des- {V}* **First operation type** *(diag or therapeutic)* *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {W}* **Second operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {X}* **Third operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {Y}* **Fourth operation type** *(C,M,AX, C+AX,M+AX, NS,U)*	*-Treatment + No des- {Z}* **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**		
{C} **Sx Number**	*-Total Node- {AA}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AB}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AC}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AD}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AE}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AF}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AG}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AH}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*-Total Node- {AI}* **Total nodes obtained** *(NS,U, 0,1,2,..)*	*-Pos Nod- {AJ}* **Number nodes positive** *(NS,U, 0,1,2,..)*	*{AK}* **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 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**	*{AL}* **Excision margins** *(N,R,U,NS)*	*{AM}* **Excision distance** *(distance in mm, U,NS)*	*{AN}* **Excision margins** *(N,R,U,NS)*	*{AO}* **Excision distance** *(distance in mm, U,NS)*	*{AP}* **Excision margins** *(N,R,U,NS)*	*{AQ}* **Excision distance** *(distance in mm, U,NS)*	*{AR}* **Excision margins** *(N,R,U,NS)*	*{AS}* **Excision distance** *(distance in mm, U,NS)*	*{AT}* **Excision margins** *(N,R,U,NS)*	*{AU}* **Excision distance** *(distance in mm, U,NS)*

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

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

{C} **Sx Number**	*-Max Dia-* *{AX}* **Invasive size of tumour**	*-Whole Size-* *{AY}* **Whole size of tumour** *(including surrounding DCIS)*	*-Grade-* *{AZ}* **Invasive grade** *(I,II,III, NA,U)*

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

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

{C} **Sx Number**	*-Non Invasive-* *{BC}* **Grade** *(H,I,L,NA,U)*	*-Whole Size-* *{BD}* **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 2007/08**	**Left NHSBSP 2007/08**	**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 2006 AND 31 MARCH 2007

PLEASE SUPPLY DATA FOR WOMEN OF ALL AGES WITH SCREEN-DETECTED BREAST CANCERS WITH FIRST OFFERED APPOINTMENT FROM 1 APRIL 2006 TO 31 MARCH 2007 INCLUSIVE ACCORDING TO THE REGIONAL BOUNDARIES EXTANT FROM 1 APRIL 2008

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 NHSBSP & 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 7 January 2009

DEFINITIONS AND GUIDANCE NOTES

Audit cut-off date: If a woman has not received radiotherapy or chemotherapy or hormonal therapy before 31st March 2008 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 2006/07 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 2006 to 31 March 2007. 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:

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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 2006 TO 31 MARCH 2007 INCLUSIVE

UNIT:

Enter dates in dd/mm/yyyy format (e.g. 28/04/2006)

{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 2006 TO 31 MARCH 2007 INCLUSIVE

Enter dates in dd/mm/yyyy format (e.g. 01/04/2002) or U=Unknown, NS=No surgery, NRT=No radiotherapy,
Chemotherapy. Hormonal therapy: Y = therapy given before 31/03/08, N = No therapy given before 31/03/08, 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 2001 AND 31 MARCH 2002

The completed spreadsheets should be submitted by the Breast Screening QA Reference Centre to the WMCIU by 10 October 2008.

Aim:

To combine NHS Breast Screening Programme (NHSBSP) data for women with breast cancers detected by screening between 1 April 2001 and 31 March 2002 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 2001 and 31 March 2002 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. Screen-detected cancers matched to women with other breast cancers (recurrences or multiple primary tumours) at the cancer registry should be included in the audit, but flagged by the cancer registry so that they can be excluded from the survival analysis.

Cancer registries should identify deaths in these women and confirm that death data are complete to 31 December 2007, or provide an alternative date to which survival can be calculated.

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.

What's new?

1. There is no recurrence, ICDM code or Cause of Death fields this year.
2. The earliest date of diagnosis for any invasive breast cancer diagnosed for the screening patient should be recorded in the date of diagnosis column. If the screening case is non-invasive and no other invasive cancer has been diagnosed before 2001, then the date of diagnosis of the screening case diagnosed in 2001 will be recorded.
3. Cancer Registries should check all the downloaded NBSS cases to see whether there are any dates of deaths registered for the women. Cases which do not have a date of death registered should be checked with NSTS.
4. Cause of Death code will be filled in by the WMCIU. QARCs are required to submit new NHS number for patient who died to WMCIU, so we can obtain the underlying cause of death from ONS.
5. The data check at the right of the spreadsheet will flag up formatting and data errors.

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

For cases screen-detected in 2001/02 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 primaries
• 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 by screening in 2001/02 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 2001, then the date of diagnosis of this non-invasive/micro-invasive screening case will be recorded.

All the 'alive' cases should be submitted by cancer registries to NSTS to obtain any date of death not being recorded in the cancer registry.

The following data items are required from the cancer registry for all breast cancers screen-detected between 1 April 2001 and 31 March 2002.

• 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 censor date for the Survival audit has been set at **31 December 2007**. The cancer registry should confirm to the QA reference centre that death data are complete to **31 December 2007**, 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 would flag up as '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 Information Officer
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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 2001/02

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)

DO NOT SEND DATA IN SHADED COLUMNS TO THE WMCIU

												Invasive Cancers Only			
{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 for Patient who Died**	*{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 2001/02

Region:
Screening Unit:
Cancer Registry: **Data complete to: 31/12/2007 (amend if necessary)**

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

SURVIVAL AUDIT
(ADDITIONAL GUIDANCE)

Non-registered cases
A cases should be recorded as a non-registered case (NR) if
1. the patient is not registered in 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 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 2001, then the date of diagnosis of the screening case will be recorded.

Example 1:
The patient (with an invasive breast cancer) in the survival spreadsheet is recorded in the cancer registry database. The earliest invasive breast cancer for that patient was diagnosed in 1997, and this was also an invasive breast cancer diagnosed in 2001/02 which matches the characteristic of the one on the spreadsheet.

For this case:
NR column: is blank
Date of diagnosis: the invasive cancer diagnosed in 1997.

Example 2:
The patient (with an invasive breast cancer) 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. She also had an invasive breast cancer diagnosed in 2001/02 which matches the characteristic of the one on the spreadsheet.

For this case:
NR column: is blank
Date of diagnosis: the invasive cancer diagnosed in 2001/02.

Example 3:
The patient (with a non-invasive breast cancer) in the survival spreadsheet is recorded in the cancer registry database. In the CR database, she had a non-invasive breast cancer diagnosed in 2001/02 and there have been no other previous breast cancers recorded for this patient.

For this case:
NR column: is blank
Date of diagnosis: the non-invasive breast cancer in 2001/02.

Example 4:
The patient (with a non-invasive breast cancer) 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 record, this patient had an invasive breast cancer in 1997.

For this case:
NR column: NR
Date of diagnosis: the invasive cancer diagnosed in 1997.

APPENDIX E: MAIN AUDIT DATA TABLES (1 - 77)

DATA FROM THE 2007/08 AUDIT OF SCREEN-DETECTED BREAST CANCERS IN WOMEN ALL AGES FOR THE PERIOD 1 APRIL 2007 – 31 MARCH 2008

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	1769	77	25	1	500	22	0	0	2294	100	277093	1.9	6.4	3.4
East Midlands	954	78	16	1	251	20	8	1	1229	100	144332	1.8	6.6	3.8
East of England	1315	77	12	1	369	22	1	0	1697	100	200472	1.9	6.6	3.6
London	1155	78	18	1	303	20	3	0	1479	100	181606	1.8	6.4	3.1
South East Coast	1023	77	13	1	296	22	0	0	1332	100	155171	2.0	6.6	3.5
South Central	928	82	9	1	196	17	1	0	1134	100	138496	1.5	6.7	3.3
South West	1237	79	14	1	313	20	0	0	1564	100	194168	1.7	6.4	3.5
West Midlands	1177	81	10	1	261	18	0	0	1448	100	183968	1.5	6.4	3.2
North West	1581	82	24	1	319	17	6	0	1930	100	246798	1.4	6.4	3.2
Wales	769	80	5	1	189	20	0	0	963	100	103038	1.9	7.5	4.4
Northern Ireland	250	76	4	1	71	22	2	1	327	100	44208	1.7	5.7	3.1
Scotland	1147	82	5	0	243	17	0	0	1395	100	173147	1.4	6.6	3.5
United Kingdom	**13305**	**79**	**155**	**1**	**3311**	**20**	**21**	**0**	**16792**	**100**	**2042497**	**1.7**	**6.5**	**3.4**

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	36	2	1517	66	638	28	74	3	29	1	2294	741	32
East Midlands	21	2	828	67	312	25	48	4	20	2	1229	380	31
East of England	24	1	1084	64	453	27	89	5	47	3	1697	589	35
London	25	2	1005	68	374	25	45	3	30	2	1479	449	30
South East Coast	30	2	820	62	396	30	52	4	34	3	1332	482	36
South Central	20	2	703	62	334	29	50	4	27	2	1134	411	36
South West	30	2	1006	64	421	27	63	4	44	3	1564	528	34
West Midlands	26	2	954	66	397	27	43	3	28	2	1448	468	32
North West	24	1	1262	65	560	29	55	3	29	2	1930	644	33
Wales	16	2	609	63	280	29	33	3	25	3	963	338	35
Northern Ireland	1	0	300	92	23	7	1	0	2	1	327	26	8
Scotland	0	0	922	66	393	28	61	4	19	1	1395	473	34
United Kingdom	**253**	**2**	**11010**	**66**	**4581**	**27**	**614**	**4**	**334**	**2**	**16792**	**5529**	**33**

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	2294	3	0.13
East Midlands	1229	1	0.08
East of England	1697	0	0.00
London	1479	3	0.20
South East Coast	1332	0	0.00
South Central	1134	0	0.00
South West	1564	0	0.00
West Midlands	1448	1	0.07
North West	1930	0	0.00
Wales	963	0	0.00
Northern Ireland	327	0	0.00
Scotland	1395	0	0.00
United Kingdom	**16792**	**8**	**0.05**

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	2294	107	5	239	10	1870	82	2216	97	78	3
East Midlands	1229	7	1	32	3	1144	93	1183	96	46	4
East of England	1697	35	2	42	2	1514	89	1591	94	106	6
London	1479	47	3	76	5	1276	86	1399	95	80	5
South East Coast	1332	85	6	51	4	1111	83	1247	94	85	6
South Central	1134	20	2	52	5	992	87	1064	94	70	6
South West	1564	77	5	39	2	1357	87	1473	94	91	6
West Midlands	1448	71	5	16	1	1289	89	1376	95	72	5
North West	1930	195	10	46	2	1608	83	1849	96	81	4
Wales	963	4	0	17	2	907	94	928	96	35	4
Northern Ireland	327	82	25	60	18	166	51	308	94	19	6
Scotland	1395	3	0	208	15	1132	81	1343	96	52	4
United Kingdom	**16792**	**733**	**4**	**878**	**5**	**14366**	**86**	**15977**	**95**	**815**	**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	1769	103	6	217	12	1430	81	1750	99	19	1
East Midlands	954	6	1	32	3	907	95	945	99	9	1
East of England	1315	34	3	40	3	1214	92	1288	98	27	2
London	1155	44	4	74	6	1010	87	1128	98	27	2
South East Coast	1023	83	8	51	5	862	84	996	97	27	3
South Central	928	20	2	52	6	837	90	909	98	19	2
South West	1237	73	6	38	3	1105	89	1216	98	21	2
West Midlands	1177	70	6	16	1	1065	90	1151	98	26	2
North West	1581	186	12	46	3	1319	83	1551	98	30	2
Wales	769	4	1	17	2	734	95	755	98	14	2
Northern Ireland	250	80	32	56	22	108	43	244	98	6	2
Scotland	1147	0	0	196	17	934	81	1130	99	17	1
United Kingdom	**13305**	**703**	**5**	**835**	**6**	**11525**	**87**	**13063**	**98**	**242**	**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	500	4	1	19	4	418	84	441	88	59	12
East Midlands	251	1	0	0	0	215	86	216	86	35	14
East of England	369	1	0	2	1	287	78	290	79	79	21
London	303	0	0	2	1	249	82	251	83	52	17
South East Coast	296	2	1	0	0	239	81	241	81	55	19
South Central	196	0	0	0	0	146	74	146	74	50	26
South West	313	4	1	1	0	240	77	245	78	68	22
West Midlands	261	1	0	0	0	214	82	215	82	46	18
North West	319	2	1	0	0	268	84	270	85	49	15
Wales	189	0	0	0	0	168	89	168	89	21	11
Northern Ireland	71	1	1	4	6	53	75	58	82	13	18
Scotland	243	3	1	10	4	196	81	209	86	34	14
United Kingdom	**3311**	**19**	**1**	**38**	**1**	**2693**	**81**	**2750**	**83**	**561**	**17**

Table 7 : Invasive status of the diagnostic core biopsy							
	Total Cancers with B5	B5a (Non-invasive)		B5b (Invasive)		B5c (Not Assessable or Unknown)	
Region		No.	%	No.	%	No.	%
N East, Yorks & Humber	2109	531	25	1538	73	40	2
East Midlands	1176	293	25	876	74	7	1
East of England	1556	372	24	1167	75	17	1
London	1352	335	25	1012	75	5	0
South East Coast	1162	330	28	831	72	1	0
South Central	1044	197	19	841	81	6	1
South West	1396	321	23	1073	77	2	0
West Midlands	1305	291	22	1008	77	6	0
North West	1654	375	23	1273	77	6	0
Wales	924	228	25	696	75	0	0
Northern Ireland	226	82	36	142	63	2	1
Scotland	1340	270	20	1065	79	5	0
United Kingdom	**15244**	**3625**	**24**	**11522**	**76**	**97**	**1**

Table 8 : B5a (Non-invasive) core biopsy: 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	92	17	18	3	413	79	1	0	2	0	526	100
East Midlands	63	22	15	5	206	71	7	2	0	0	291	100
East of England	79	21	9	2	272	74	7	2	2	1	369	100
London	69	21	17	5	240	72	5	2	1	0	332	100
South East Coast	82	25	10	3	236	72	2	1	0	0	330	100
South Central	44	23	9	5	139	72	0	0	2	1	194	100
South West	70	22	11	3	232	73	2	1	2	1	317	100
West Midlands	69	24	8	3	209	73	2	1	0	0	288	100
North West	90	24	19	5	257	69	3	1	2	1	371	100
Wales	55	24	5	2	165	73	0	0	0	0	225	100
Northern Ireland	21	26	4	5	55	69	0	0	0	0	80	100
Scotland	65	24	3	1	199	75	0	0	0	0	267	100
United Kingdom	**799**	**22**	**128**	**4**	**2623**	**73**	**29**	**1**	**11**	**0**	**3590**	**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												
	Invasive		Micro-invasive		Non-invasive		Benign		Unknown		Total with surgery	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1479	99	2	0	12	1	1	0	6	0	1500	100
East Midlands	849	98	1	0	8	1	4	0	0	0	862	100
East of England	1137	99	2	0	10	1	1	0	0	0	1150	100
London	970	99	0	0	6	1	2	0	0	0	978	100
South East Coast	802	99	2	0	2	0	1	0	0	0	807	100
South Central	831	100	0	0	3	0	0	0	0	0	834	100
South West	1052	99	4	0	4	0	0	0	1	0	1061	100
West Midlands	987	99	0	0	4	0	5	1	1	0	997	100
North West	1248	99	2	0	4	0	1	0	2	0	1257	100
Wales	676	99	0	0	5	1	0	0	0	0	681	100
Northern Ireland	138	99	0	0	2	1	0	0	0	0	140	100
Scotland	1038	99	2	0	5	0	0	0	0	0	1045	100
United Kingdom	**11207**	**99**	**15**	**0**	**65**	**1**	**15**	**0**	**10**	**0**	**11312**	**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	103	96	0	0	4	4	0	0	0	0	107	100
East Midlands	6	86	0	0	1	14	0	0	0	0	7	100
East of England	34	97	0	0	1	3	0	0	0	0	35	100
London	44	100	0	0	0	0	0	0	0	0	44	100
South East Coast	83	98	0	0	2	2	0	0	0	0	85	100
South Central	20	100	0	0	0	0	0	0	0	0	20	100
South West	73	95	0	0	4	5	0	0	0	0	77	100
West Midlands	70	99	0	0	1	1	0	0	0	0	71	100
North West	186	96	3	2	2	1	2	1	0	0	193	100
Wales	4	100	0	0	0	0	0	0	0	0	4	100
Northern Ireland	80	99	0	0	1	1	0	0	0	0	81	100
Scotland	0	0	0	0	3	100	0	0	0	0	3	100
United Kingdom	**703**	**97**	**3**	**0**	**19**	**3**	**2**	**0**	**0**	**0**	**727**	**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	0	0	2064	90	217	9	13	1	0	0	2294	100	230	10
East Midlands	0	0	1092	89	126	10	11	1	0	0	1229	100	137	11
East of England	6	0	1589	94	100	6	2	0	0	0	1697	100	102	6
London	2	0	1351	91	122	8	4	0	0	0	1479	100	126	9
South East Coast	1	0	1171	88	156	12	4	0	0	0	1332	100	160	12
South Central	1	0	1026	90	99	9	8	1	0	0	1134	100	107	9
South West	3	0	1350	86	199	13	12	1	0	0	1564	100	211	13
West Midlands	3	0	1305	90	130	9	10	1	0	0	1448	100	140	10
North West	2	0	1765	91	155	8	8	0	0	0	1930	100	163	8
Wales	1	0	867	90	89	9	6	1	0	0	963	100	95	10
Northern Ireland	1	0	319	98	7	2	0	0	0	0	327	100	7	2
Scotland	1	0	1316	94	74	5	4	0	0	0	1395	100	78	6
United Kingdom	**21**	**0**	**15215**	**91**	**1474**	**9**	**82**	**0**	**0**	**0**	**16792**	**100**	**1556**	**9**

Table 12 : All cancers versus C5 and/or B5 at first visit						
	1 C5/B5		Non-operative diagnosis rate		All cancers	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	2010	88	2216	97	2294	100
East Midlands	1066	87	1183	96	1229	100
East of England	1503	89	1591	94	1697	100
London	1283	87	1399	95	1479	100
South East Coast	1099	83	1247	94	1332	100
South Central	971	86	1064	94	1134	100
South West	1292	83	1473	94	1564	100
West Midlands	1261	87	1376	95	1448	100
North West	1704	88	1849	96	1930	100
Wales	842	87	928	96	963	100
Northern Ireland	303	93	308	94	327	100
Scotland	1277	92	1343	96	1395	100
United Kingdom	**14611**	**87**	**15977**	**95**	**16792**	**100**

Table 13 : 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	206	73	78	27	284	100	277093	0.74	0.28
East Midlands	124	73	46	27	170	100	144332	0.86	0.32
East of England	224	68	106	32	330	100	200472	1.12	0.53
London	214	73	80	27	294	100	181606	1.07	0.44
South East Coast	110	56	85	44	195	100	155171	0.71	0.55
South Central	130	65	70	35	200	100	138496	0.94	0.51
South West	197	68	91	32	288	100	194168	1.01	0.47
West Midlands	138	66	72	34	210	100	183968	0.75	0.39
North West	210	72	81	28	291	100	246798	0.85	0.33
Wales	90	72	35	28	125	100	103038	0.87	0.34
Northern Ireland	30	61	19	39	49	100	44208	0.68	0.43
Scotland	128	71	52	29	180	100	173147	0.74	0.30
United Kingdom	**1801**	**69**	**815**	**31**	**2616**	**100**	**2042497**	**0.87**	**0.40**

Table 14 : 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	2	0.72
East Midlands	0	0.00	0	0.00
East of England	0	0.00	3	1.50
London	0	0.00	0	0.00
South East Coast	0	0.00	8	5.16
South Central	0	0.00	0	0.00
South West	1	0.52	0	0.00
West Midlands	0	0.00	0	0.00
North West	0	0.00	2	0.81
Wales	0	0.00	0	0.00
Northern Ireland	0	0.00	2	4.52
Scotland	0	0.00	0	0.00
United Kingdom	**1**	**0.05**	**17**	**0.83**

Table 15 : Invasive status of malignant diagnostic open biopsies									
	Total malignant open biopsies	Invasive		Micro-invasive		Non-invasive		Status unknown	
Region		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	78	19	24	0	0	59	76	0	0
East Midlands	46	9	20	1	2	35	76	1	2
East of England	106	27	25	0	0	79	75	0	0
London	80	27	34	1	1	52	65	0	0
South East Coast	85	27	32	3	4	55	65	0	0
South Central	70	19	27	0	0	50	71	1	1
South West	91	21	23	2	2	68	75	0	0
West Midlands	72	26	36	0	0	46	64	0	0
North West	81	30	37	1	1	49	60	1	1
Wales	35	14	40	0	0	21	60	0	0
Northern Ireland	19	6	32	0	0	13	68	0	0
Scotland	52	17	33	1	2	34	65	0	0
United Kingdom	**815**	**242**	**30**	**9**	**1**	**561**	**69**	**3**	**0**

Table 16 : 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	19	0	0	0	0	14	74	5	26
East Midlands	9	0	0	0	0	6	67	3	33
East of England	27	2	7	1	4	21	78	3	11
London	27	2	7	1	4	21	78	3	11
South East Coast	27	0	0	7	26	19	70	1	4
South Central	19	1	5	0	0	17	89	1	5
South West	21	0	0	1	5	16	76	4	19
West Midlands	26	1	4	5	19	20	77	0	0
North West	30	0	0	7	23	18	60	5	17
Wales	14	0	0	0	0	12	86	2	14
Northern Ireland	6	1	17	0	0	3	50	2	33
Scotland	17	1	6	0	0	15	88	1	6
United Kingdom	**242**	**8**	**3**	**22**	**9**	**182**	**75**	**30**	**12**

Table 17 : 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	59	0	0	0	0	47	80	12	20
East Midlands	35	0	0	0	0	34	97	1	3
East of England	79	4	5	1	1	73	92	1	1
London	52	1	2	0	0	48	92	3	6
South East Coast	55	1	2	4	7	48	87	2	4
South Central	50	0	0	0	0	49	98	1	2
South West	68	3	4	0	0	61	90	4	6
West Midlands	46	2	4	0	0	43	93	1	2
North West	49	2	4	2	4	43	88	2	4
Wales	21	1	5	0	0	20	95	0	0
Northern Ireland	13	0	0	2	15	10	77	1	8
Scotland	34	0	0	0	0	28	82	6	18
United Kingdom	**561**	**14**	**2**	**9**	**2**	**504**	**90**	**34**	**6**

Table 18 : Highest cytology and core biopsy result prior to malignant diagnostic open biopsies (invasive cancers)											
Region	Total malignant open biopsies	No non-operative procedures		C1, B1 or both		C2, B2 or both		C3, B3 or both		C4, B4 or both	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	19	0	0	4	21	2	11	7	37	6	32
East Midlands	9	0	0	1	11	3	33	2	22	3	33
East of England	27	2	7	0	0	7	26	8	30	10	37
London	27	2	7	1	4	2	7	18	67	4	15
South East Coast	27	0	0	2	7	3	11	9	33	13	48
South Central	19	1	5	3	16	1	5	10	53	4	21
South West	21	0	0	4	19	6	29	3	14	8	38
West Midlands	26	1	4	2	8	1	4	9	35	13	50
North West	30	0	0	0	0	4	13	14	47	12	40
Wales	14	0	0	5	36	1	7	3	21	5	36
Northern Ireland	6	1	17	0	0	0	0	3	50	2	33
Scotland	17	1	6	1	6	4	24	8	47	3	18
United Kingdom	**242**	**8**	**3**	**23**	**10**	**34**	**14**	**94**	**39**	**83**	**34**

Table 19 : Highest cytology and core biopsy result prior to malignant diagnostic open biopsies (non-invasive)											
Region	Total malignant open biopsies	No non-operative procedures		C1, B1 or both		C2, B2 or both		C3, B3 or both		C4, B4 or both	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	59	0	0	1	2	3	5	36	61	19	32
East Midlands	35	0	0	0	0	1	3	17	49	17	49
East of England	79	4	5	3	4	2	3	41	52	29	37
London	52	1	2	1	2	3	6	36	69	11	21
South East Coast	55	1	2	1	2	0	0	35	64	18	33
South Central	50	0	0	1	2	4	8	30	60	15	30
South West	68	3	4	3	4	2	3	29	43	31	46
West Midlands	46	2	4	1	2	2	4	25	54	16	35
North West	49	2	4	0	0	4	8	30	61	13	27
Wales	21	1	5	2	10	3	14	7	33	8	38
Northern Ireland	13	0	0	0	0	1	8	10	77	2	15
Scotland	34	0	0	1	3	2	6	19	56	12	35
United Kingdom	**561**	**14**	**2**	**14**	**2**	**27**	**5**	**315**	**56**	**191**	**34**

Table 20 : Treatment for non-invasive breast cancers										
Region	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	346	69	148	30	6	1	0	0	500	100
East Midlands	158	63	91	36	2	1	0	0	251	100
East of England	274	74	92	25	3	1	0	0	369	100
London	204	67	95	31	4	1	0	0	303	100
South East Coast	228	77	68	23	0	0	0	0	296	100
South Central	148	76	45	23	3	2	0	0	196	100
South West	238	76	71	23	4	1	0	0	313	100
West Midlands	186	71	72	28	3	1	0	0	261	100
North West	221	69	94	29	4	1	0	0	319	100
Wales	131	69	55	29	3	2	0	0	189	100
Northern Ireland	48	68	21	30	2	3	0	0	71	100
Scotland	166	68	74	30	3	1	0	0	243	100
United Kingdom	**2348**	**71**	**926**	**28**	**37**	**1**	**0**	**0**	**3311**	**100**

Table 21 : Treatment for micro-invasive breast cancers										
Region	Conservation surgery		Mastectomy		No surgery		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	15	60	9	36	1	4	0	0	25	100
East Midlands	12	75	4	25	0	0	0	0	16	100
East of England	6	50	6	50	0	0	0	0	12	100
London	13	72	5	28	0	0	0	0	18	100
South East Coast	6	46	7	54	0	0	0	0	13	100
South Central	6	67	3	33	0	0	0	0	9	100
South West	7	50	7	50	0	0	0	0	14	100
West Midlands	5	50	5	50	0	0	0	0	10	100
North West	14	58	10	42	0	0	0	0	24	100
Wales	3	60	2	40	0	0	0	0	5	100
Northern Ireland	4	100	0	0	0	0	0	0	4	100
Scotland	2	40	3	60	0	0	0	0	5	100
United Kingdom	**93**	**60**	**61**	**39**	**1**	**1**	**0**	**0**	**155**	**100**

Table 22 : 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	199	40	197	40	60	12	4	1	34	7	494	100
East Midlands	99	40	104	42	35	14	0	0	11	4	249	100
East of England	165	45	127	35	35	10	11	3	28	8	366	100
London	113	38	120	40	33	11	3	1	30	10	299	100
South East Coast	140	47	103	35	30	10	5	2	18	6	296	100
South Central	75	39	77	40	21	11	5	3	15	8	193	100
South West	142	46	114	37	23	7	3	1	27	9	309	100
West Midlands	93	36	123	48	29	11	4	2	9	3	258	100
North West	127	40	112	36	29	9	0	0	47	15	315	100
Wales	72	39	72	39	20	11	5	3	17	9	186	100
Northern Ireland	27	39	28	41	7	10	0	0	7	10	69	100
Scotland	92	38	112	47	33	14	1	0	2	1	240	100
United Kingdom	**1344**	**41**	**1289**	**39**	**355**	**11**	**41**	**1**	**245**	**7**	**3274**	**100**

Table 23 : Treatment for non-invasive breast cancers size >40mm								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	8	55	92	0	0	60	100
East Midlands	4	11	31	89	0	0	35	100
East of England	9	26	26	74	0	0	35	100
London	6	18	27	82	0	0	33	100
South East Coast	6	20	24	80	0	0	30	100
South Central	7	33	14	67	0	0	21	100
South West	7	30	16	70	0	0	23	100
West Midlands	5	17	24	83	0	0	29	100
North West	9	31	20	69	0	0	29	100
Wales	7	35	13	65	0	0	20	100
Northern Ireland	1	14	6	86	0	0	7	100
Scotland	3	9	30	91	0	0	33	100
United Kingdom	**69**	**19**	**286**	**81**	**0**	**0**	**355**	**100**

Table 24 : 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	306	62	118	24	48	10	7	1	15	3	494	100
East Midlands	164	66	50	20	26	10	0	0	9	4	249	100
East of England	196	54	105	29	40	11	8	2	17	5	366	100
London	177	59	70	23	34	11	1	0	17	6	299	100
South East Coast	174	59	77	26	26	9	5	2	14	5	296	100
South Central	108	56	52	27	23	12	6	3	4	2	193	100
South West	168	54	97	31	26	8	1	0	17	6	309	100
West Midlands	159	62	54	21	37	14	5	2	3	1	258	100
North West	174	55	86	27	25	8	0	0	30	10	315	100
Wales	100	54	50	27	29	16	5	3	2	1	186	100
Northern Ireland	29	42	25	36	11	16	0	0	4	6	69	100
Scotland	146	61	71	30	14	6	5	2	4	2	240	100
United Kingdom	**1901**	**58**	**855**	**26**	**339**	**10**	**43**	**1**	**136**	**4**	**3274**	**100**

Table 25: 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	3	34	7	37	7	494
East Midlands	9	4	11	4	11	4	249
East of England	17	5	28	8	30	8	366
London	17	6	30	10	36	12	299
South East Coast	14	5	18	6	20	7	296
South Central	4	2	15	8	15	8	193
South West	17	6	27	9	27	9	309
West Midlands	3	1	9	3	9	3	258
North West	30	10	47	15	56	18	315
Wales	2	1	17	9	17	9	186
Northern Ireland	4	6	7	10	8	12	69
Scotland	4	2	2	1	6	3	240
United Kingdom	**136**	**4**	**245**	**7**	**272**	**8**	**3274**

Table 26 : Treatment of non-invasive cases with high cytonuclear grade and unknown size (benign surgery cases excluded)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	8	50	8	50	0	0	16	100
East Midlands	0	0	2	100	0	0	2	100
East of England	1	33	2	67	0	0	3	100
London	7	78	2	22	0	0	9	100
South East Coast	3	75	1	25	0	0	4	100
South Central	3	60	2	40	0	0	5	100
South West	3	60	2	40	0	0	5	100
West Midlands	1	50	1	50	0	0	2	100
North West	9	53	8	47	0	0	17	100
Wales	6	75	2	25	0	0	8	100
Northern Ireland	0	-	0	-	0	-	0	-
Scotland	0	-	0	-	0	-	0	-
United Kingdom	**41**	**58**	**30**	**42**	**0**	**0**	**71**	**100**

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

Table 27 : 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	12	100	0	0	0	0	12	100
East Midlands	2	100	0	0	0	0	2	100
East of England	11	92	1	8	0	0	12	100
London	10	91	1	9	0	0	11	100
South East Coast	10	91	1	9	0	0	11	100
South Central	3	75	1	25	0	0	4	100
South West	16	94	1	6	0	0	17	100
West Midlands	3	100	0	0	0	0	3	100
North West	17	85	3	15	0	0	20	100
Wales	1	50	1	50	0	0	2	100
Northern Ireland	3	100	0	0	0	0	3	100
Scotland	0	-	0	-	0	-	0	-
United Kingdom	**88**	**91**	**9**	**9**	**0**	**0**	**97**	**100**

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

Table 28 : Treatment of high cytonuclear grade non-invasive cancers (>40mm)								
	Conservation surgery		Mastectomy		Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	5	10	44	90	0	0	49	100
East Midlands	3	11	24	89	0	0	27	100
East of England	7	25	21	75	0	0	28	100
London	5	19	22	81	0	0	27	100
South East Coast	4	19	17	81	0	0	21	100
South Central	4	25	12	75	0	0	16	100
South West	5	29	12	71	0	0	17	100
West Midlands	3	14	18	86	0	0	21	100
North West	7	35	13	65	0	0	20	100
Wales	6	40	9	60	0	0	15	100
Northern Ireland	1	20	4	80	0	0	5	100
Scotland	2	8	24	92	0	0	26	100
United Kingdom	**52**	**19**	**220**	**81**	**0**	**0**	**272**	**100**

Table 29 : Treatment for invasive breast cancers										
	Conservation surgery		Mastectomy		Unknown		No Surgery		Total	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1202	68	529	30	1	0	37	2	1769	100
East Midlands	633	66	307	32	0	0	14	1	954	100
East of England	962	73	336	26	0	0	17	1	1315	100
London	830	72	291	25	7	1	27	2	1155	100
South East Coast	783	77	216	21	0	0	24	2	1023	100
South Central	687	74	234	25	0	0	7	1	928	100
South West	933	75	292	24	0	0	12	1	1237	100
West Midlands	892	76	274	23	0	0	11	1	1177	100
North West	1088	69	477	30	1	0	15	1	1581	100
Wales	541	70	213	28	0	0	15	2	769	100
Northern Ireland	196	78	52	21	0	0	2	1	250	100
Scotland	824	72	303	26	0	0	20	2	1147	100
United Kingdom	**9571**	**72**	**3524**	**26**	**9**	**0**	**201**	**2**	**13305**	**100**

Table 30 : Invasive 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	441	25	489	28	398	22	288	16	54	3	38	2	61	3	1769	100
East Midlands	276	29	266	28	210	22	142	15	21	2	8	1	31	3	954	100
East of England	335	25	379	29	296	23	211	16	33	3	19	1	42	3	1315	100
London	264	23	302	26	272	24	208	18	39	3	24	2	46	4	1155	100
South East Coast	270	26	272	27	212	21	185	18	37	4	13	1	34	3	1023	100
South Central	204	22	254	27	239	26	155	17	40	4	23	2	13	1	928	100
South West	319	26	370	30	267	22	193	16	45	4	19	2	24	2	1237	100
West Midlands	253	21	332	28	304	26	206	18	39	3	21	2	22	2	1177	100
North West	351	22	429	27	421	27	269	17	46	3	34	2	31	2	1581	100
Wales	214	28	243	32	152	20	111	14	16	2	11	1	22	3	769	100
Northern Ireland	59	24	80	32	54	22	34	14	8	3	2	1	13	5	250	100
Scotland	264	23	336	29	247	22	215	19	32	3	20	2	33	3	1147	100
United Kingdom	**3250**	**24**	**3752**	**28**	**3072**	**23**	**2217**	**17**	**410**	**3**	**232**	**2**	**372**	**3**	**13305**	**100**

Table 31 : Mastectomy rate with invasive tumour size										
	<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	202	22	115	29	131	45	39	72	36	95
East Midlands	130	24	70	33	72	51	18	86	8	100
East of England	134	19	65	22	85	40	26	79	17	89
London	92	16	68	25	82	39	26	67	21	88
South East Coast	81	15	37	17	59	32	25	68	12	92
South Central	79	17	42	18	63	41	24	60	23	100
South West	111	16	60	22	71	37	31	69	17	89
West Midlands	87	15	63	21	70	34	32	82	19	90
North West	154	20	117	28	131	49	37	80	32	94
Wales	91	20	37	24	61	55	10	63	11	100
Northern Ireland	16	12	10	19	14	41	7	88	2	100
Scotland	105	18	59	24	89	41	24	75	20	100
United Kingdom	**1282**	**18**	**743**	**24**	**928**	**42**	**299**	**73**	**218**	**94**

Table 32 : 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	260	15	400	23	416	24	401	23	116	7	97	5	79	4	1769	100
East Midlands	165	17	232	24	215	23	230	24	61	6	30	3	21	2	954	100
East of England	214	16	330	25	315	24	307	23	63	5	46	3	40	3	1315	100
London	148	13	234	20	274	24	265	23	73	6	50	4	111	10	1155	100
South East Coast	155	15	240	23	243	24	236	23	77	8	38	4	34	3	1023	100
South Central	124	13	214	23	239	26	218	23	62	7	41	4	30	3	928	100
South West	188	15	325	26	302	24	268	22	92	7	37	3	25	2	1237	100
West Midlands	138	12	296	25	319	27	275	23	69	6	57	5	23	2	1177	100
North West	228	14	381	24	425	27	357	23	85	5	56	4	49	3	1581	100
Wales	142	18	228	30	174	23	140	18	38	5	25	3	22	3	769	100
Northern Ireland	33	13	79	32	56	22	53	21	9	4	7	3	13	5	250	100
Scotland	148	13	310	27	277	24	282	25	59	5	41	4	30	3	1147	100
United Kingdom	**1943**	**15**	**3269**	**25**	**3255**	**24**	**3032**	**23**	**804**	**6**	**525**	**4**	**477**	**4**	**13305**	**100**

Table 33 : 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	655	70	110	12	83	9	36	4	30	3	16	2	930	100
East Midlands	395	73	53	10	60	11	21	4	13	2	0	0	542	100
East of England	540	76	79	11	60	8	20	3	11	2	4	1	714	100
London	382	67	68	12	54	10	17	3	15	3	30	5	566	100
South East Coast	395	73	76	14	45	8	13	2	13	2	0	0	542	100
South Central	338	74	49	11	40	9	9	2	10	2	12	3	458	100
South West	512	74	84	12	51	7	30	4	9	1	3	0	689	100
West Midlands	432	74	78	13	45	8	12	2	15	3	3	1	585	100
North West	609	78	67	9	63	8	17	2	9	1	15	2	780	100
Wales	370	81	41	9	25	5	14	3	7	2	0	0	457	100
Northern Ireland	112	81	11	8	12	9	1	1	3	2	0	0	139	100
Scotland	458	76	69	12	42	7	17	3	13	2	1	0	600	100
United Kingdom	**5198**	**74**	**785**	**11**	**580**	**8**	**207**	**3**	**148**	**2**	**84**	**1**	**7002**	**100**

Table 34 : Mastectomy rate for <15mm invasive cancers by whole tumour size										
	<15mm		15-≤20mm		>20-≤35mm		>35-≤50mm		>50mm	
Region	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	86	13	21	19	35	42	24	67	28	93
East Midlands	68	17	12	23	22	37	17	81	11	85
East of England	66	12	18	23	23	38	16	80	10	91
London	24	6	14	21	26	48	9	53	14	93
South East Coast	38	10	13	17	12	27	6	46	12	92
South Central	40	12	12	24	11	28	5	56	9	90
South West	48	9	19	23	14	27	23	77	7	78
West Midlands	39	9	19	24	11	24	6	50	12	80
North West	89	15	13	19	27	43	12	71	9	100
Wales	64	17	10	24	4	16	7	50	6	86
Northern Ireland	10	9	0	0	3	25	1	100	2	67
Scotland	57	12	10	14	13	31	12	71	12	92
United Kingdom	**629**	**12**	**161**	**21**	**201**	**35**	**138**	**67**	**132**	**89**

Table 35 : Immediate reconstruction with mastectomy (all cancers)								
	Immediate reconstruction		No immediate reconstruction		Unknown		Total mastectomies	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	82	12	461	67	143	21	686	100
East Midlands	40	10	250	62	112	28	402	100
East of England	100	23	281	65	53	12	434	100
London	79	20	280	72	32	8	391	100
South East Coast	46	16	184	63	61	21	291	100
South Central	33	12	196	70	53	19	282	100
South West	64	17	282	76	24	6	370	100
West Midlands	52	15	298	85	1	0	351	100
North West	64	11	500	86	18	3	582	100
Wales	32	12	238	88	0	0	270	100
Northern Ireland	10	14	63	86	0	0	73	100
Scotland	60	16	320	84	0	0	380	100
United Kingdom	**662**	**15**	**3353**	**74**	**497**	**11**	**4512**	**100**

Table 36 : 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	36	44	3	4	43	52	0	0	82	100
East Midlands	26	65	0	0	14	35	0	0	40	100
East of England	64	64	1	1	35	35	0	0	100	100
London	52	66	1	1	26	33	0	0	79	100
South East Coast	24	52	4	9	18	39	0	0	46	100
South Central	20	61	1	3	12	36	0	0	33	100
South West	41	64	1	2	22	34	0	0	64	100
West Midlands	27	52	2	4	23	44	0	0	52	100
North West	46	72	4	6	14	22	0	0	64	100
Wales	18	56	0	0	14	44	0	0	32	100
Northern Ireland	3	30	0	0	7	70	0	0	10	100
Scotland	34	57	1	2	25	42	0	0	60	100
United Kingdom	**391**	**59**	**18**	**3**	**253**	**38**	**0**	**0**	**662**	**100**

Table 37 : Waiting time - assessment to first therapeutic surgery												
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	2171	153	7	1227	57	1870	86	2064	95	2130	98	29
East Midlands	1160	121	10	716	62	1015	88	1095	94	1117	96	27
East of England	1571	116	7	874	56	1304	83	1461	93	1518	97	29
London	1360	57	4	530	39	1032	76	1215	89	1302	96	35
South East Coast	1223	47	4	380	31	835	68	1097	90	1190	97	39
South Central	1054	101	10	612	58	911	86	1012	96	1035	98	29
South West	1457	84	6	668	46	1216	83	1356	93	1420	97	33
West Midlands	1362	108	8	920	68	1217	89	1319	97	1343	99	27
North West	1826	103	6	1061	58	1618	89	1750	96	1798	98	29
Wales	910	91	10	658	72	840	92	900	99	907	100	25
Northern Ireland	302	37	12	249	82	285	94	300	99	302	100	23
Scotland	1320	127	10	738	56	1081	82	1217	92	1278	97	29
United Kingdom	**15716**	**1145**	**7**	**8633**	**55**	**13224**	**84**	**14786**	**94**	**15340**	**98**	**29**

Table 38 : Waiting time - assessment to first therapeutic surgery – 1 visit												
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	1967	150	8	1194	61	1759	89	1909	97	1938	99	28
East Midlands	1044	121	12	685	66	938	90	998	96	1007	96	27
East of England	1485	116	8	853	57	1257	85	1397	94	1439	97	29
London	1246	56	4	512	41	984	79	1138	91	1202	96	34
South East Coast	1079	44	4	355	33	765	71	985	91	1054	98	37
South Central	962	100	10	581	60	846	88	933	97	947	98	28
South West	1278	79	6	615	48	1103	86	1213	95	1253	98	32
West Midlands	1250	107	9	886	71	1146	92	1221	98	1237	99	26
North West	1686	103	6	1021	61	1514	90	1622	96	1662	99	29
Wales	825	86	10	623	76	779	94	818	99	824	100	24
Northern Ireland	297	37	12	245	82	280	94	295	99	297	100	23
Scotland	1256	126	10	722	57	1046	83	1166	93	1215	97	29
United Kingdom	**14375**	**1125**	**8**	**8292**	**58**	**12417**	**86**	**13695**	**95**	**14075**	**98**	**29**

Table 39 : Waiting time - assessment to first therapeutic surgery - >1 visit												
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	204	3	1	33	16	111	54	155	76	192	94	44
East Midlands	116	0	0	31	27	77	66	97	84	110	95	40
East of England	86	0	0	21	24	47	55	64	74	79	92	43
London	114	1	1	18	16	48	42	77	68	100	88	49
South East Coast	144	3	2	25	17	70	49	112	78	136	94	46
South Central	92	1	1	31	34	65	71	79	86	88	96	39
South West	179	5	3	53	30	113	63	143	80	167	93	41
West Midlands	112	1	1	34	30	71	63	98	88	106	95	40.5
North West	140	0	0	40	29	104	74	128	91	136	97	38
Wales	84	5	6	35	42	61	73	82	98	83	99	34
Northern Ireland	5	0	0	4	80	5	100	5	100	5	100	30
Scotland	64	1	2	16	25	35	55	51	80	63	98	43
United Kingdom	**1341**	**20**	**1**	**341**	**25**	**807**	**60**	**1091**	**81**	**1265**	**94**	**42**

Table 40 : Waiting time - assessment to first diagnostic surgery												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	78	0	0	19	24	44	56	66	85	76	97	41.5
East Midlands	46	2	4	19	41	31	67	40	87	44	96	34
East of England	106	3	3	39	37	79	75	95	90	102	96	37
London*	79	5	6	25	32	52	66	71	90	77	97	37
South East Coast	85	0	0	14	16	38	45	62	73	78	92	50
South Central	70	4	6	32	46	51	73	58	83	67	96	33.5
South West	91	3	3	26	29	51	56	69	76	85	93	43
West Midlands	72	7	10	26	36	44	61	54	75	67	93	39.5
North West	81	2	2	35	43	64	79	73	90	77	95	34
Wales	35	5	14	21	60	30	86	32	91	34	97	27
Northern Ireland	19	1	5	12	63	17	89	17	89	18	95	29
Scotland	52	4	8	27	52	34	65	42	81	50	96	30
United Kingdom	**814**	**36**	**4**	**295**	**36**	**535**	**66**	**679**	**83**	**775**	**95**	**37**

Table 41 : Waiting time - assessment to first diagnostic surgery – 1 visit												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	54	0	0	16	30	38	70	51	94	54	100	38
East Midlands	26	2	8	14	54	19	73	25	96	26	100	28.5
East of England	86	3	3	34	40	69	80	81	94	84	98	36
London*	68	5	7	23	34	48	71	62	91	66	97	36
South East Coast	72	0	0	13	18	35	49	55	76	67	93	46.5
South Central	55	4	7	27	49	42	76	48	87	54	98	32
South West	58	2	3	17	29	35	60	47	81	56	97	43
West Midlands	44	6	14	25	57	34	77	37	84	40	91	30
North West	61	2	3	32	52	51	84	58	95	59	97	30
Wales	25	4	16	18	72	23	92	24	96	25	100	27
Northern Ireland	16	1	6	12	75	15	94	15	94	15	94	23
Scotland	39	3	8	21	54	26	67	31	79	37	95	30
United Kingdom	**604**	**32**	**5**	**252**	**42**	**435**	**72**	**534**	**88**	**583**	**97**	**35**

Table 42 : Waiting time - assessment to first diagnostic surgery - >1 visit												
	Total	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median
Region	cancers	No	%	No	%	No	%	No	%	No	%	days
N East, Yorks & Humber	24	0	0	3	13	6	25	15	63	22	92	55
East Midlands	20	0	0	5	25	12	60	15	75	18	90	40.5
East of England	14	0	0	1	7	5	36	9	64	12	86	48.5
London*	10	0	0	2	20	3	30	7	70	9	90	57
South East Coast	12	0	0	1	8	2	17	6	50	10	83	61.5
South Central	14	0	0	4	29	8	57	9	64	12	86	41
South West	30	1	3	8	27	15	50	19	63	26	87	50
West Midlands	25	0	0	0	0	9	36	16	64	24	96	54
North West	18	0	0	3	17	11	61	13	72	16	89	43.5
Wales	9	0	0	2	22	6	67	7	78	8	89	39
Northern Ireland	2	0	0	0	0	1	50	1	50	2	100	52.5
Scotland	12	0	0	5	42	7	58	10	83	12	100	35
United Kingdom	**190**	**1**	**1**	**34**	**18**	**85**	**45**	**127**	**67**	**171**	**90**	**49.5**

Table 43 : Waiting time - screen to first surgery (all cancers)												
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	2240	1	0	140	6	748	33	1590	71	2119	95	52
East Midlands	1203	0	0	131	11	614	51	1013	84	1139	95	45
East of England	1670	3	0	84	5	510	31	1061	64	1518	91	55
London	1435	0	0	56	4	352	25	916	64	1294	90	56
South East Coast	1302	2	0	52	4	283	22	764	59	1175	90	58
South Central	1121	3	0	171	15	562	50	935	83	1080	96	45
South West	1543	1	0	104	7	515	33	1098	71	1430	93	52
West Midlands	1428	3	0	156	11	691	48	1125	79	1361	95	46
North West	1899	1	0	115	6	472	25	1162	61	1768	93	56
Wales	945	0	0	103	11	369	39	702	74	918	97	50
Northern Ireland	319	1	0	61	19	190	60	285	89	316	99	42
Scotland	1372	2	0	99	7	452	33	967	70	1270	93	52
United Kingdom	**16477**	**17**	**0**	**1272**	**8**	**5758**	**35**	**11618**	**71**	**15388**	**93**	**51**

Table 44 : Waiting time – assessment to first surgery (all cancers)												
Region	Total cancers	≤14 days		≤31 days		≤45 days		≤62 days		≤90 days		Median days
		No	%	No	%	No	%	No	%	No	%	
N East, Yorks & Humber	2249	153	7	1246	55	1914	85	2130	95	2206	98	29
East Midlands	1206	123	10	735	61	1046	87	1135	94	1161	96	28
East of England	1677	119	7	913	54	1383	82	1556	93	1620	97	29
London	1439	62	4	555	39	1084	75	1286	89	1379	96	35
South East Coast	1308	47	4	394	30	873	67	1159	89	1268	97	39
South Central	1124	105	9	644	57	962	86	1070	95	1102	98	29
South West	1548	87	6	694	45	1267	82	1425	92	1505	97	33
West Midlands	1434	115	8	946	66	1261	88	1373	96	1410	98	27
North West	1907	105	6	1096	57	1682	88	1823	96	1875	98	29
Wales	945	96	10	679	72	870	92	932	99	941	100	25
Northern Ireland	321	38	12	261	81	302	94	317	99	320	100	23
Scotland	1372	131	10	765	56	1115	81	1259	92	1328	97	29
United Kingdom	**16530**	**1181**	**7**	**8928**	**54**	**13759**	**83**	**15465**	**94**	**16115**	**97**	**30**

Table 45 : Availability of lymph node status for invasive cancers									
Region	Total invasive cancers with surgery	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1732	1709	99	0	0	20	1	3	0
East Midlands	940	923	98	0	0	17	2	0	0
East of England	1298	1280	99	0	0	18	1	0	0
London	1128	1084	96	1	0	33	3	10	1
South East Coast	999	960	96	0	0	39	4	0	0
South Central	921	899	98	0	0	22	2	0	0
South West	1225	1214	99	0	0	11	1	0	0
West Midlands	1166	1148	98	0	0	18	2	0	0
North West	1566	1535	98	0	0	30	2	1	0
Wales	754	745	99	0	0	9	1	0	0
Northern Ireland	248	233	94	0	0	15	6	0	0
Scotland	1127	1120	99	0	0	7	1	0	0
United Kingdom	**13104**	**12850**	**98**	**1**	**0**	**239**	**2**	**14**	**0.1**

Table 46 : Sentinel lymph node procedure for invasive cancers with axillary surgery								
Region	**With SLNB**		**Without SLNB**		**Unknown SLNB**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	571	33	1072	63	68	4	1711	100
East Midlands	411	45	512	55	0	0	923	100
East of England	634	49	649	51	0	0	1283	100
London	531	49	555	51	3	0	1089	100
South East Coast	484	50	476	50	0	0	960	100
South Central	453	50	444	49	2	0	899	100
South West	598	49	600	49	17	1	1215	100
West Midlands	517	45	633	55	0	0	1150	100
North West	700	46	794	52	41	3	1535	100
Wales	537	72	209	28	0	0	746	100
Northern Ireland	72	31	138	59	23	10	233	100
Scotland	335	30	590	53	195	17	1120	100
United Kingdom	**5843**	**45**	**6672**	**52**	**349**	**3**	**12864**	**100**

Table 47 : Nodal status of invasive cancers with known status					
Region	**Total known nodal status**	**Positive**		**Negative**	
		No.	**%**	**No.**	**%**
N East, Yorks & Humber	1709	383	22	1326	78
East Midlands	923	184	20	739	80
East of England	1280	302	24	978	76
London	1084	278	26	806	74
South East Coast	960	213	22	747	78
South Central	899	207	23	692	77
South West	1214	262	22	952	78
West Midlands	1148	274	24	874	76
North West	1535	320	21	1215	79
Wales	745	154	21	591	79
Northern Ireland	233	40	17	193	83
Scotland	1120	250	22	870	78
United Kingdom	**12850**	**2867**	**22**	**9983**	**78**

Table 48 : Status of invasive cases with <4 nodes obtained													
Region	**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**	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	1709	362	21.2	21	1.2	11	0.6	259	15.2	71	4.2	0	0
East Midlands	923	257	27.8	14	1.5	2	0.2	221	23.9	20	2.2	0	0
East of England	1280	367	28.7	14	1.1	3	0.2	329	25.7	21	1.6	0	0
London	1084	272	25.1	9	0.8	1	0.1	223	20.6	39	3.6	0	0
South East Coast	960	301	31.4	14	1.5	2	0.2	271	28.2	14	1.5	0	0
South Central	899	319	35.5	10	1.1	4	0.4	278	30.9	27	3.0	0	0
South West	1214	338	27.8	8	0.7	5	0.4	289	23.8	36	3.0	0	0
West Midlands	1148	325	28.3	14	1.2	1	0.1	285	24.8	25	2.2	0	0
North West	1535	481	31.3	27	1.8	8	0.5	368	24.0	78	5.1	0	0
Wales	745	263	35.3	10	1.3	1	0.1	239	32.1	13	1.7	0	0
Northern Ireland	233	56	24.0	1	0.4	0	0.0	47	20.2	8	3.4	0	0
Scotland	1120	161	14.4	6	0.5	2	0.2	127	11.3	26	2.3	0	0
United Kingdom	**12850**	**3502**	**27.3**	**148**	**1.2**	**40**	**0.3**	**2936**	**22.8**	**378**	**2.9**	**0**	**0**

Table 49 : Number of nodes taken for invasive cases without/unknown SLNB									
Region	Total with axillary surgery	0 node obtained		1,2,3 nodes obtained		4+nodes obtained		Unknown	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1140	0	0	82	7	1058	93	0	0
East Midlands	512	0	0	22	4	490	96	0	0
East of England	649	1	0	24	4	624	96	0	0
London	558	1	0	40	7	516	92	1	0
South East Coast	476	0	0	16	3	460	97	0	0
South Central	446	0	0	31	7	415	93	0	0
South West	617	1	0	41	7	575	93	0	0
West Midlands	633	2	0	26	4	605	96	0	0
North West	835	0	0	86	10	749	90	0	0
Wales	209	1	0	14	7	194	93	0	0
Northern Ireland	161	0	0	8	5	153	95	0	0
Scotland	787	2	0	28	4	757	96	0	0
United Kingdom	**7023**	**8**	**0**	**418**	**6**	**6596**	**94**	**1**	**0**

Table 50 : 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	109	19	460	81	263	25	809	75
East Midlands	65	16	346	84	119	23	393	77
East of England	117	18	515	81	185	29	463	71
London	114	21	415	78	163	29	389	70
South East Coast	73	15	411	85	140	29	336	71
South Central	85	19	368	81	121	27	323	73
South West	98	16	500	84	160	27	439	73
West Midlands	93	18	424	82	181	29	450	71
North West	115	16	585	84	197	25	597	75
Wales	86	16	451	84	68	33	140	67
Northern Ireland	12	17	60	83	24	17	114	83
Scotland	48	14	287	86	138	23	452	77
United Kingdom	**1015**	**17**	**4822**	**83**	**1759**	**26**	**4905**	**74**

Table 51 : 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	20	95	1	5	21	38	43	50	57	88
East Midlands	14	100	0	0	14	28	55	23	45	51
East of England	14	100	0	0	14	41	40	62	60	103
London	9	100	0	0	9	31	30	74	70	105
South East Coast	14	100	0	0	14	17	29	42	71	59
South Central	10	100	0	0	10	23	31	52	69	75
South West	7	88	1	13	8	31	34	59	66	90
West Midlands	14	100	0	0	14	24	30	55	70	79
North West	27	100	0	0	27	27	31	61	69	88
Wales	8	80	2	20	10	48	63	28	37	76
Northern Ireland	1	100	0	0	1	4	36	7	64	11
Scotland	6	100	0	0	6	25	60	17	40	42
United Kingdom	**144**	**97**	**4**	**3**	**148**	**337**	**39**	**530**	**61**	**867**

Table 52 : Availability of lymph node status for non-invasive cancers									
Region	Total non-invasive cancers	Nodal status known		Nodes obtained but status unknown		No nodes obtained		Unknown if nodes obtained	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	494	132	27	0	0	361	73	1	0
East Midlands	249	83	33	0	0	166	67	0	0
East of England	366	92	25	0	0	274	75	0	0
London	299	95	32	0	0	204	68	0	0
South East Coast	296	66	22	0	0	230	78	0	0
South Central	193	48	25	0	0	144	75	1	1
South West	309	62	20	0	0	247	80	0	0
West Midlands	258	73	28	0	0	185	72	0	0
North West	315	103	33	0	0	212	67	0	0
Wales	186	55	30	0	0	131	70	0	0
Northern Ireland	69	11	16	0	0	58	84	0	0
Scotland	240	73	30	0	0	167	70	0	0
United Kingdom	**3274**	**893**	**27**	**0**	**0**	**2379**	**73**	**2**	**0**

Table 53 : Nodal status of non-invasive cancers					
Region	Total known nodal status	Positive		Negative	
		No.	%	No.	%
N East, Yorks & Humber	132	1	1	131	99
East Midlands	83	0	0	83	100
East of England	92	0	0	92	100
London	95	0	0	95	100
South East Coast	66	2	3	64	97
South Central	48	0	0	48	100
South West	62	0	0	62	100
West Midlands	73	0	0	73	100
North West	103	0	0	103	100
Wales	55	1	2	54	98
Northern Ireland	11	0	0	11	100
Scotland	73	1	1	72	99
United Kingdom	**893**	**5**	**1**	**888**	**99**

Table 54 : Treatment for non-invasive cancers with known nodal status						
Region	With known nodal status		Total Conservation	With known nodal status		Total mastectomy
	No.	%		No.	%	
N East, Yorks & Humber	27	8	346	105	71	148
East Midlands	7	4	158	76	84	91
East of England	22	8	274	70	76	92
London	19	9	204	76	80	95
South East Coast	19	8	228	47	69	68
South Central	11	7	148	37	82	45
South West	20	8	238	42	59	71
West Midlands	21	11	186	52	72	72
North West	29	13	221	74	79	94
Wales	11	8	131	44	80	55
Northern Ireland	2	4	48	9	43	21
Scotland	4	2	166	69	93	74
United Kingdom	**192**	**8**	**2348**	**701**	**76**	**926**

Table 55 : 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	132	3	3	8	5	4	18
East Midlands	83	4	3	9	5	5	14
East of England	92	3	3	6	4	4	13
London	95	3	2	13	5	4	21
South East Coast	66	4	4	12	5	4	18
South Central	48	2	1	5	5	4	14
South West	62	4	4	12	5	4.5	12
West Midlands	73	3	3	7	4	4	10
North West	103	4	4	11	5	4	25
Wales	55	4	5	9	4	3.5	12
Northern Ireland	11	4	4	7	5	5	11
Scotland	73	5	5.5	7	5	4	18
United Kingdom	**893**	**4**	**3**	**13**	**5**	**4**	**25**

Table 56 : Sentinel lymph node procedure for non-invasive cancers with a mastectomy and axillary surgery and known nodal status							
	With SLNB		Without SLNB		Unknown SLNB		Total non-invasive cancers with surgery
Region	No.	%	No.	%	No.	%	No.
N East, Yorks & Humber	19	12.8	73	49.3	13	8.8	148
East Midlands	26	28.6	50	54.9	0	0.0	91
East of England	39	42.4	31	33.7	0	0.0	92
London	38	40.0	37	38.9	1	1.1	95
South East Coast	21	30.9	26	38.2	0	0.0	68
South Central	13	28.9	24	53.3	0	0.0	45
South West	17	23.9	25	35.2	0	0.0	71
West Midlands	20	27.8	32	44.4	0	0.0	72
North West	27	28.7	44	46.8	3	3.2	94
Wales	21	38.2	23	41.8	0	0.0	55
Northern Ireland	2	9.5	7	33.3	0	0.0	21
Scotland	20	27.0	37	50.0	12	16.2	74
United Kingdom	**263**	**28.4**	**409**	**44.2**	**29**	**3.1**	**926**

Table 57 : Sentinel lymph node procedure for non-invasive cancers with conservation and axillary surgery and known nodal status							
	With SLNB		Without SLNB		Unknown SLNB		Total non-invasive cancers with surgery
Region	No.	%	No.	%	No.	%	No.
N East, Yorks & Humber	13	3.8	10	2.9	4	1.2	346
East Midlands	4	2.5	3	1.9	0	0.0	158
East of England	14	5.1	8	2.9	0	0.0	274
London	11	5.4	7	3.4	1	0.5	204
South East Coast	12	5.3	7	3.1	0	0.0	228
South Central	9	6.1	2	1.4	0	0.0	148
South West	14	5.9	6	2.5	0	0.0	238
West Midlands	13	7.0	8	4.3	0	0.0	186
North West	15	6.8	12	5.4	2	0.9	221
Wales	6	4.6	5	3.8	0	0.0	131
Northern Ireland	2	4.2	0	0.0	0	0.0	48
Scotland	2	1.2	1	0.6	1	0.6	166
United Kingdom	**115**	**4.9**	**69**	**2.9**	**8**	**0.3**	**2348**

Table 58 : 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	434	25	918	53	365	21	3	0	12	1	1732	100
East Midlands	254	27	471	50	196	21	3	0	16	2	940	100
East of England	307	24	702	54	271	21	7	1	11	1	1298	100
London	304	27	571	51	236	21	6	1	11	1	1128	100
South East Coast	246	25	546	55	198	20	3	0	6	1	999	100
South Central	233	25	512	56	168	18	5	1	3	0	921	100
South West	333	27	651	53	226	18	7	1	8	1	1225	100
West Midlands	309	27	602	52	246	21	3	0	6	1	1166	100
North West	487	31	768	49	288	18	10	1	13	1	1566	100
Wales	221	29	379	50	149	20	0	0	5	1	754	100
Northern Ireland	72	29	125	50	42	17	0	0	9	4	248	100
Scotland	262	23	570	51	272	24	10	1	13	1	1127	100
United Kingdom	**3462**	**26**	**6815**	**52**	**2657**	**20**	**57**	**0**	**113**	**1**	**13104**	**100**

Table 59 : 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	24	1	23	1	12	1	49	3	1732
East Midlands	17	2	17	2	16	2	36	4	940
East of England	25	2	18	1	11	1	47	4	1298
London	19	2	44	4	11	1	60	5	1128
South East Coast	10	1	39	4	6	1	49	5	999
South Central	6	1	22	2	3	0	31	3	921
South West	12	1	11	1	8	1	30	2	1225
West Midlands	11	1	18	2	6	1	31	3	1166
North West	16	1	31	2	13	1	60	4	1566
Wales	7	1	9	1	5	1	20	3	754
Northern Ireland	11	4	15	6	9	4	20	8	248
Scotland	13	1	7	1	13	1	28	2	1127
United Kingdom	**171**	**1**	**254**	**2**	**113**	**1**	**461**	**4**	**13104**

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

Table 60 : 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	350	21	644	38	384	23	194	12	111	7	1683	100
East Midlands	204	23	338	37	233	26	91	10	38	4	904	100
East of England	252	20	467	37	311	25	135	11	86	7	1251	100
London	228	21	373	35	267	25	119	11	81	8	1068	100
South East Coast	178	19	371	39	237	25	118	12	46	5	950	100
South Central	192	22	327	37	208	23	107	12	56	6	890	100
South West	273	23	458	38	275	23	116	10	73	6	1195	100
West Midlands	245	22	417	37	269	24	122	11	82	7	1135	100
North West	363	24	562	37	346	23	155	10	80	5	1506	100
Wales	181	25	274	37	167	23	75	10	37	5	734	100
Northern Ireland	58	25	87	38	54	24	17	7	12	5	228	100
Scotland	220	20	395	36	256	23	146	13	82	7	1099	100
United Kingdom	**2744**	**22**	**4713**	**37**	**3007**	**24**	**1395**	**11**	**784**	**6**	**12643**	**100**

Table 61 : 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	67	17	25	8	12	8	12	32	48	2	3
East Midlands	38	11	29	3	8	4	11	20	53	0	0
East of England	64	26	41	6	9	4	6	27	42	1	2
London	72	28	39	17	24	11	15	16	22	0	0
South East Coast	48	20	42	4	8	3	6	20	42	1	2
South Central	45	21	47	2	4	2	4	20	44	0	0
South West	45	12	27	3	7	4	9	25	56	1	2
West Midlands	53	13	25	8	15	5	9	27	51	0	0
North West	63	14	22	8	13	14	22	27	43	0	0
Wales	19	2	11	1	5	0	0	15	79	1	5
Northern Ireland	11	2	18	2	18	1	9	6	55	0	0
Scotland	53	24	45	6	11	4	8	18	34	1	2
United Kingdom	**526**	**142**	**27**	**62**	**12**	**59**	**11**	**255**	**48**	**8**	**2**

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 62 : Screening cases per surgeon					
Region	Total surgeons	Mean	Minimum	Median	Maximum
N East, Yorks & Humber	67	34	1	30	126
East Midlands	38	33	1	36	80
East of England	64	26	1	20	104
London	72	21	1	15	82
South East Coast	48	28	1	20	112
South Central	45	26	1	16	90
South West	45	35	1	33	110
West Midlands	53	27	1	30	91
North West	63	31	1	25	89
Wales	19	51	1	56	102
Northern Ireland	11	30	5	37	57
Scotland	53	26	1	11	199
United Kingdom	**526**	**32**	**1**	**30**	**199**

Table 63 : Number of surgeons treating each woman									
Region	Total cancers	Number of women treated by…							
		No referral		1 surgeon		2 surgeons		3+ surgeons	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2294	7	0	2287	100	0	0	0	0
East Midlands	1229	0	0	1188	97	41	3	0	0
East of England	1697	7	0	1690	100	0	0	0	0
London	1479	31	2	1416	96	32	2	0	0
South East Coast	1332	13	1	1319	99	0	0	0	0
South Central	1134	9	1	1097	97	28	2	0	0
South West	1564	10	1	1554	99	0	0	0	0
West Midlands	1448	6	0	1442	100	0	0	0	0
North West	1930	19	1	1868	97	43	2	0	0
Wales	963	0	0	963	100	0	0	0	0
Northern Ireland	327	4	1	320	98	3	1	0	0
Scotland	1395	0	0	1395	100	0	0	0	0
United Kingdom	**16792**	**106**	**1**	**16539**	**98**	**147**	**1**	**0**	**0**

Table 64 : Proportion of women referred to consultant surgeons according to annual caseload of surgeon											
Region	Total (referred)	<10 cases		10-19 cases		20-29 cases		30-99 cases		100+ cases	
		No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	2287	46	2	117	5	183	8	1711	75	230	10
East Midlands	1229	40	3	39	3	98	8	1093	86	0	0
East of England	1690	55	3	101	6	96	6	1334	79	104	6
London	1448	123	8	257	17	270	18	830	56	0	0
South East Coast	1319	48	4	55	4	66	5	1038	79	112	8
South Central	1125	45	4	32	3	49	4	1027	89	0	0
South West	1554	35	2	44	3	99	6	1266	81	110	7
West Midlands	1442	37	3	119	8	114	8	1172	81	0	0
North West	1911	41	2	118	6	331	17	1464	75	0	0
Wales	963	5	1	11	1	0	0	845	88	102	11
Northern Ireland	323	13	4	26	8	22	7	265	81	0	0
Scotland	1395	93	7	79	6	105	8	919	66	199	14
United Kingdom	**16686**	**484**	**3**	**920**	**5**	**1415**	**8**	**13057**	**78**	**957**	**6**

Table 65 : Explanations for surgeons treating less than 10 screening cases in 2007/08									
Region	Total	Other symptomatic caseload >30 year	Joined NHSBSP	Left NHSBSP	Plastic surgeon	Private practice	Surgeon from other region	No infor-mation	Other
N East, Yorks & Humber	17	4	1	3	1	0	5	0	3
East Midlands	11	8	0	0	0	1	2	0	0
East of England	26	1	0	0	2	6	13	2	2
London	28	12	1	2	2	5	4	2	0
South East Coast	20	3	3	3	0	1	10	0	0
South Central	21	4	0	2	3	5	6	0	1
South West	12	2	0	1	0	1	7	0	1
West Midlands	13	4	1	0	1	2	3	2	0
North West	14	10	0	1	0	1	2	0	0
Wales	2	1	0	0	1	0	0	0	0
Northern Ireland	2	2	0	0	0	0	0	0	0
Scotland	24	5	1	14	0	0	4	0	0
United Kingdom	**142**	**56**	**4**	**26**	**10**	**11**	**22**	**6**	**7**

Table 66 : Number of therapeutic operations for cancers with a non-operative diagnosis (C5 and/or B5)														
Region	0		1		2		3+		Unknown		Total		Repeat (2+) rate	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	44	2	1718	78	417	19	34	2	3	0	2216	100	451	20
East Midlands	23	2	958	81	182	15	20	2	0	0	1183	100	202	17
East of England	20	1	1237	78	312	20	22	1	0	0	1591	100	334	21
London	33	2	1054	75	285	20	19	1	8	1	1399	100	304	22
South East Coast	24	2	954	77	246	20	23	2	0	0	1247	100	269	22
South Central	10	1	837	79	198	19	18	2	1	0	1064	100	216	20
South West	16	1	1108	75	327	22	22	1	0	0	1473	100	349	24
West Midlands	14	1	1096	80	234	17	32	2	0	0	1376	100	266	19
North West	22	1	1488	80	323	17	15	1	1	0	1849	100	338	18
Wales	18	2	729	79	159	17	22	2	0	0	928	100	181	20
Northern Ireland	6	2	258	84	42	14	2	1	0	0	308	100	44	14
Scotland	23	2	1121	83	189	14	10	1	0	0	1343	100	199	15
United Kingdom	**253**	**2**	**12558**	**79**	**2914**	**18**	**239**	**1**	**13**	**0**	**15977**	**100**	**3153**	**20**

Table 67 : Number of therapeutic operations for cancers without a non-operative diagnosis (B5 and/or C5)														
	Open biopsy only		1		2		3+		Unknown		Total cancers		Repeat (2+) rate	
Region	No	%	No	%	No	%	No	%	No	%	No	%	No	%
N East, Yorks & Humber	35	45	38	49	4	5	1	1	0	0	78	100	5	6
East Midlands	18	39	22	48	6	13	0	0	0	0	46	100	6	13
East of England	53	50	52	49	1	1	0	0	0	0	106	100	1	1
London	32	40	45	56	2	3	0	0	0	0	80	100	2	3
South East Coast	45	53	36	42	3	4	1	1	0	0	85	100	4	5
South Central	34	49	30	43	5	7	1	1	0	0	70	100	6	9
South West	43	47	40	44	6	7	2	2	0	0	91	100	8	9
West Midlands	34	47	31	43	7	10	0	0	0	0	72	100	7	10
North West	43	53	36	44	0	0	1	1	1	1	81	100	1	1
Wales	8	23	20	57	7	20	0	0	0	0	35	100	7	20
Northern Ireland	12	63	7	37	0	0	0	0	0	0	19	100	0	0
Scotland	28	54	22	42	2	4	0	0	0	0	52	100	2	4
United Kingdom	**385**	**47**	**379**	**47**	**43**	**5**	**6**	**1**	**1**	**0**	**815**	**100**	**49**	**6**

Table 68 : Number of therapeutic operations (invasive cancers)																
	0		1		2		3+		Unknown		No Surgery		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1	0	1376	78	331	19	22	1	2	0	37	2	1769	100	353	20
East Midlands	1	0	782	82	143	15	14	1	0	0	14	1	954	100	157	16
East of England	5	0	1038	79	240	18	15	1	0	0	17	1	1315	100	255	19
London	8	1	867	75	232	20	13	1	8	1	27	2	1155	100	245	21
South East Coast	13	1	776	76	193	19	17	2	0	0	24	2	1023	100	210	21
South Central	4	0	732	79	173	19	12	1	0	0	7	1	928	100	185	20
South West	4	0	936	76	266	22	19	2	0	0	12	1	1237	100	285	23
West Midlands	9	1	942	80	190	16	25	2	0	0	11	1	1177	100	215	18
North West	7	0	1289	82	258	16	11	1	1	0	15	1	1581	100	269	17
Wales	1	0	608	79	129	17	16	2	0	0	15	2	769	100	145	19
Northern Ireland	3	1	212	85	32	13	1	0	0	0	2	1	250	100	33	13
Scotland	3	0	956	83	162	14	6	1	0	0	20	2	1147	100	168	15
United Kingdom	**59**	**0**	**10514**	**79**	**2349**	**18**	**171**	**1**	**11**	**0**	**201**	**2**	**13305**	**100**	**2520**	**19**

Table 69 : Number of therapeutic operations (non-invasive cancers)																
	0		1		2		3+		Unknown		No surgery		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	34	7	362	72	84	17	13	3	1	0	6	1	500	100	97	19
East Midlands	16	6	188	75	39	16	6	2	0	0	2	1	251	100	45	18
East of England	48	13	240	65	71	19	7	2	0	0	3	1	369	100	78	21
London	24	8	219	72	51	17	5	2	0	0	4	1	303	100	56	18
South East Coast	31	10	206	70	53	18	6	2	0	0	0	0	296	100	59	20
South Central	29	15	131	67	27	14	5	3	1	1	3	2	196	100	32	16
South West	39	12	204	65	61	19	5	2	0	0	4	1	313	100	66	21
West Midlands	25	10	180	69	47	18	6	2	0	0	3	1	261	100	53	20
North West	36	11	214	67	60	19	5	2	0	0	4	1	319	100	65	20
Wales	7	4	138	73	35	19	6	3	0	0	3	2	189	100	41	22
Northern Ireland	9	13	50	70	9	13	1	1	0	0	2	3	71	100	10	14
Scotland	25	10	182	75	29	12	4	2	0	0	3	1	243	100	33	14
United Kingdom	**323**	**10**	**2314**	**70**	**566**	**17**	**69**	**2**	**2**	**0**	**37**	**1**	**3311**	**100**	**635**	**19**

Table 70 : Number of therapeutic operations (invasive cancers) with initial BCS														
	0		1		2		3		4		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1	0	1008	76	294	22	22	2	0	0	1325	100	316	24
East Midlands	1	0	541	78	136	20	13	2	1	0	692	100	150	22
East of England	3	0	803	79	201	20	12	1	2	0	1021	100	215	21
London	6	1	652	74	214	24	12	1	1	0	885	100	227	26
South East Coast	12	1	613	74	186	22	12	1	5	1	828	100	203	25
South Central	4	1	566	77	157	21	12	2	0	0	739	100	169	23
South West	4	0	743	74	242	24	17	2	0	0	1006	100	259	26
West Midlands	8	1	752	78	177	18	21	2	4	0	962	100	202	21
North West	7	1	939	79	230	19	10	1	1	0	1187	100	241	20
Wales	0	0	454	77	120	20	15	3	1	0	590	100	136	23
Northern Ireland	2	1	177	84	31	15	1	0	0	0	211	100	32	15
Scotland	2	0	703	81	152	18	6	1	0	0	863	100	158	18
United Kingdom	**50**	**0**	**7951**	**77**	**2140**	**21**	**153**	**1**	**15**	**0**	**10309**	**100**	**2308**	**22**

Table 71 : Number of therapeutic operations (non-invasive cancers) with initial BCS																
	0		1		2		3		4		Unknown		Total		Repeat (2+) rate	
Region	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	34	9	260	67	80	21	12	3	1	0	0	0	387	100	93	24
East Midlands	16	9	120	66	39	22	6	3	0	0	0	0	181	100	45	25
East of England	47	15	190	61	66	21	6	2	1	0	0	0	310	100	73	24
London	24	11	146	65	50	22	4	2	1	0	0	0	225	100	55	24
South East Coast	30	12	155	64	52	21	5	2	1	0	0	0	243	100	58	24
South Central	28	17	106	64	25	15	4	2	1	1	1	1	165	100	30	18
South West	39	15	161	61	57	22	4	2	1	0	0	0	262	100	62	24
West Midlands	25	12	134	64	45	21	6	3	0	0	0	0	210	100	51	24
North West	35	14	159	62	57	22	5	2	0	0	0	0	256	100	62	24
Wales	7	5	103	70	33	22	5	3	0	0	0	0	148	100	38	26
Northern Ireland	8	15	36	67	9	17	1	2	0	0	0	0	54	100	10	19
Scotland	24	14	122	69	27	15	4	2	0	0	0	0	177	100	31	18
United Kingdom	**317**	**12**	**1692**	**65**	**540**	**21**	**62**	**2**	**6**	**0**	**1**	**0**	**2618**	**100**	**608**	**23**

Table 72 : 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	1232	82	248	17	17	1	2	0	1499	100	265	18
East Midlands	738	86	113	13	11	1	0	0	862	100	124	14
East of England	945	82	192	17	13	1	0	0	1150	100	205	18
London	779	79	188	19	10	1	8	1	985	100	198	20
South East Coast	662	82	138	17	7	1	0	0	807	100	145	18
South Central	681	82	142	17	11	1	0	0	834	100	153	18
South West	849	80	202	19	10	1	0	0	1061	100	212	20
West Midlands	838	84	139	14	20	2	0	0	997	100	159	16
North West	1062	84	191	15	3	0	1	0	1257	100	194	15
Wales	573	84	100	15	8	1	0	0	681	100	108	16
Northern Ireland	124	89	15	11	1	1	0	0	140	100	16	11
Scotland	910	87	127	12	5	0	0	0	1042	100	132	13
United Kingdom	**9393**	**83**	**1795**	**16**	**116**	**1**	**11**	**0**	**11315**	**100**	**1911**	**17**

Table 73 : 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	84	82	18	17	1	1	0	0	103	100	19	18
East Midlands	6	100	0	0	0	0	0	0	6	100	0	0
East of England	29	85	5	15	0	0	0	0	34	100	5	15
London	31	70	13	30	0	0	0	0	44	100	13	30
South East Coast	60	72	17	20	6	7	0	0	83	100	23	28
South Central	18	90	2	10	0	0	0	0	20	100	2	10
South West	48	66	24	33	1	1	0	0	73	100	25	34
West Midlands	59	84	10	14	1	1	0	0	70	100	11	16
North West	152	82	30	16	4	2	0	0	186	100	34	18
Wales	4	100	0	0	0	0	0	0	4	100	0	0
Northern Ireland	70	88	10	13	0	0	0	0	80	100	10	13
Scotland	0	-	0	-	0	-	0	-	0	-	0	-
United Kingdom	**561**	**80**	**129**	**18**	**13**	**2**	**0**	**0**	**703**	**100**	**142**	**20**

Table 74 : 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	341	79	80	18	12	3	1	0	434	100	92	21
East Midlands	183	80	39	17	6	3	0	0	228	100	45	20
East of England	212	73	71	24	7	2	0	0	290	100	78	27
London	204	78	53	20	6	2	0	0	263	100	59	22
South East Coast	188	76	54	22	6	2	0	0	248	100	60	24
South Central	115	77	28	19	6	4	1	1	150	100	34	23
South West	182	74	60	24	5	2	0	0	247	100	65	26
West Midlands	165	75	47	21	7	3	0	0	219	100	54	25
North West	214	76	63	22	4	1	0	0	281	100	67	24
Wales	132	78	32	19	6	4	0	0	170	100	38	22
Northern Ireland	49	83	9	15	1	2	0	0	59	100	10	17
Scotland	173	86	26	13	3	1	0	0	202	100	29	14
United Kingdom	**2158**	**77**	**562**	**20**	**69**	**2**	**2**	**0**	**2791**	**100**	**631**	**23**

Table 75 : 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	36	39	52	57	4	4	0	0	92	100	56	61
East Midlands	31	49	29	46	3	5	0	0	63	100	32	51
East of England	35	44	42	53	2	3	0	0	79	100	44	56
London	37	54	29	42	3	4	0	0	69	100	32	46
South East Coast	42	51	36	44	4	5	0	0	82	100	40	49
South Central	19	43	24	55	1	2	0	0	44	100	25	57
South West	24	34	40	57	6	9	0	0	70	100	46	66
West Midlands	30	43	36	52	3	4	0	0	69	100	39	57
North West	49	54	37	41	4	4	0	0	90	100	41	46
Wales	20	36	27	49	8	15	0	0	55	100	35	64
Northern Ireland	14	67	7	33	0	0	0	0	21	100	7	33
Scotland	29	45	35	54	1	2	0	0	65	100	36	55
United Kingdom	**366**	**46**	**394**	**49**	**39**	**5**	**0**	**0**	**799**	**100**	**433**	**54**

Table 76 : 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	1498	99	1484	99	3	0	103	98	100	97	1	1	92	96	39	42	49	53
East Midlands	862	99	851	99	2	0	6	100	6	100	0	0	63	90	31	49	26	41
East of England	1150	99	1141	99	2	0	34	94	31	91	1	3	79	92	42	53	31	39
London	978	98	952	97	4	0	44	98	41	93	2	5	69	90	41	59	21	30
South East Coast	807	98	781	97	9	1	83	95	76	92	3	4	82	89	40	49	33	40
South Central	834	98	819	98	2	0	20	95	19	95	0	0	44	93	19	43	22	50
South West	1061	99	1044	98	10	1	73	100	73	100	0	0	70	96	27	39	40	57
West Midlands	997	99	986	99	1	0	70	99	68	97	1	1	69	97	37	54	30	43
North West	1256	99	1238	99	4	0	186	97	180	97	0	0	90	93	57	63	27	30
Wales	681	99	674	99	2	0	4	100	4	100	0	0	55	95	23	42	29	53
Northern Ireland	140	96	134	96	1	1	80	99	79	99	0	0	21	57	8	38	4	19
Scotland	1042	100	1034	99	4	0	0	-	0	-	0	-	65	97	34	52	29	45
United Kingdom	**11306**	**99**	**11138**	**99**	**44**	**0**	**703**	**97**	**677**	**96**	**8**	**1**	**799**	**92**	**398**	**50**	**341**	**43**

Table 77 : Repeat axillary operations for invasive cancers with positive nodal status					
	Re ax op & with SLNB		Re ax op & without/unknown SLNB		Total
Region	No	%	No	%	invasive
N East, Yorks & Humber	50	13	42	11	380
East Midlands	23	13	16	9	183
East of England	62	21	32	11	300
London	74	27	13	5	274
South East Coast	42	20	10	5	212
South Central	50	25	11	5	203
South West	59	23	24	9	260
West Midlands	54	20	14	5	270
North West	61	19	25	8	317
Wales	28	19	5	3	151
Northern Ireland	7	18	0	0	39
Scotland	17	7	26	10	250
United Kingdom	**527**	**19**	**218**	**8**	**2839**

APPENDIX F: ADJUVANT THERAPY DATA TABLES (78 – 127)

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

Table 78 : 2006/07 cases supplied to the NHSBSP & ABS at BASO adjuvant audit

Region	Total Cancers	No data supplied		Excluded cases		Total Eligible		Complete data*	
		No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	1965	0	0	211	11	1754	89	1501	76
East Midlands	1189	0	0	33	3	1156	97	1156	97
East of England	1602	195	12	249	16	1158	72	1067	67
London	1474	6	0	141	10	1327	90	1218	83
South East Coast	1223	337	28	42	3	844	69	551	45
South Central	1146	0	0	67	6	1079	94	1005	88
South West	1662	0	0	111	7	1551	93	1351	81
West Midlands	1399	157	11	146	10	1096	78	798	57
North West	1770	0	0	67	4	1703	96	1578	89
Wales	825	0	0	17	2	808	98	802	97
Northern Ireland	245	87	36	3	1	155	63	152	62
Scotland	1405	0	0	31	2	1374	98	1297	92
United Kingdom	**15905**	**782**	**5**	**1118**	**7**	**14005**	**88**	**12476**	**78**

* cases which are eligible and with complete RT, CT and HT data

Table 79 : 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	1754	1559	89	1701	97	1704	97	1501	86
East Midlands	1156	1156	100	1156	100	1156	100	1156	100
East of England	1158	1093	94	1127	97	1137	98	1067	92
London	1327	1280	96	1307	98	1269	96	1218	92
South East Coast	844	679	80	812	96	644	76	551	65
South Central	1079	1044	97	1060	98	1041	96	1005	93
South West	1551	1459	94	1440	93	1460	94	1351	87
West Midlands	1096	1017	93	880	80	993	91	798	73
North West	1703	1678	99	1614	95	1606	94	1578	93
Wales	808	807	100	808	100	802	99	802	99
Northern Ireland	155	154	99	154	99	152	98	152	98
Scotland	1374	1316	96	1350	98	1353	98	1297	94
United Kingdom	**14005**	**13242**	**95**	**13409**	**96**	**13317**	**95**	**12476**	**89**

Table 80 : 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	1155	85	162	12	42	3	1359	155	42	47	13	168	45	370
East Midlands	833	89	98	11	2	0	933	84	40	29	14	96	46	209
East of England	813	89	93	10	9	1	915	63	27	16	7	156	66	235
London	881	86	108	11	32	3	1021	123	42	32	11	136	47	291
South East Coast	434	69	52	8	145	23	631	69	32	20	9	124	58	213
South Central	784	89	83	9	14	2	881	79	42	14	7	94	50	187
South West	1076	88	107	9	34	3	1217	121	40	46	15	137	45	304
West Midlands	811	90	90	10	2	0	903	108	59	37	20	39	21	184
North West	1176	85	148	11	63	5	1387	153	53	53	18	82	28	288
Wales	580	89	68	10	2	0	650	27	18	12	8	115	75	154
Northern Ireland	105	84	17	14	3	2	125	18	64	7	25	3	11	28
Scotland	1003	89	114	10	4	0	1121	135	55	30	12	80	33	245
United Kingdom	**9651**	**87**	**1140**	**10**	**352**	**3**	**11143**	**1135**	**42**	**343**	**13**	**1230**	**45**	**2708**

Table 81 : PgR status of invasive and non-invasive cancers														
	Invasive						Total Invasive	Non-invasive						Total non-inv
	Positive		Negative		Not done or unknown			Positive		Negative		Not done or unknown		
Region	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
N East, Yorks & Humber	745	55	265	19	349	26	1359	92	25	52	14	226	61	370
East Midlands	327	35	136	15	470	50	933	17	8	26	12	166	79	209
East of England	341	37	155	17	419	46	915	40	17	25	11	170	72	235
London	774	76	210	21	37	4	1021	101	35	48	16	142	49	291
South East Coast	324	51	95	15	212	34	631	55	26	31	15	127	60	213
South Central	546	62	170	19	165	19	881	39	21	25	13	123	66	187
South West	672	55	197	16	348	29	1217	77	25	41	13	186	61	304
West Midlands	573	63	175	19	155	17	903	68	37	46	25	70	38	184
North West	998	72	303	22	86	6	1387	122	42	84	29	82	28	288
Wales	173	27	81	12	396	61	650	4	3	6	4	144	94	154
Northern Ireland	75	60	27	22	23	18	125	16	57	8	29	4	14	28
Scotland	619	55	259	23	243	22	1121	46	19	30	12	169	69	245
United Kingdom	**6167**	**55**	**2073**	**19**	**2903**	**26**	**11143**	**677**	**25**	**422**	**16**	**1609**	**59**	**2708**

Table 82 : PgR status of ER negative invasive cases								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	6	4	130	80	26	16	162	100
East Midlands	7	7	72	73	19	19	98	100
East of England	7	8	74	80	12	13	93	100
London	6	6	102	94	0	0	108	100
South East Coast	5	10	47	90	0	0	52	100
South Central	6	7	70	84	7	8	83	100
South West	5	5	84	79	18	17	107	100
West Midlands	3	3	87	97	0	0	90	100
North West	3	2	144	97	1	1	148	100
Wales	5	7	53	78	10	15	68	100
Northern Ireland	2	12	13	76	2	12	17	100
Scotland	4	4	103	90	7	6	114	100
United Kingdom	**59**	**5**	**979**	**86**	**102**	**9**	**1140**	**100**

Table 83 : HER-2 status of invasive cancers								
	Positive		Negative		Not Done or Unknown		Total	
Region	No.	%	No.	%	No.	%	No.	%
N East, Yorks & Humber	133	10	929	68	297	22	1359	100
East Midlands	115	12	544	58	274	29	933	100
East of England	83	9	649	71	183	20	915	100
London	131	13	763	75	127	12	1021	100
South East Coast	42	7	369	58	220	35	631	100
South Central	69	8	439	50	373	42	881	100
South West	177	15	766	63	274	23	1217	100
West Midlands	91	10	673	75	139	15	903	100
North West	156	11	900	65	331	24	1387	100
Wales	45	7	416	64	189	29	650	100
Northern Ireland	22	18	86	69	17	14	125	100
Scotland	146	13	942	84	33	3	1121	100
United Kingdom	**1210**	**11**	**7476**	**67**	**2457**	**22**	**11143**	**100**

Table 84 : 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	865	72	332	28	1197	132	39	209	61	341	1004	64	555	36	1559
East Midlands	691	74	242	26	933	90	43	119	57	209	789	68	367	32	1156
East of England	683	80	176	20	859	101	45	125	55	226	791	72	302	28	1093
London	752	76	236	24	988	115	41	165	59	280	871	68	409	32	1280
South East Coast	391	77	118	23	509	52	31	118	69	170	443	65	236	35	679
South Central	667	78	183	22	850	54	30	129	70	183	725	69	319	31	1044
South West	917	81	216	19	1133	106	35	193	65	299	1031	71	428	29	1459
West Midlands	730	87	105	13	835	84	48	90	52	174	819	81	198	19	1017
North West	968	71	397	29	1365	112	39	173	61	285	1092	65	586	35	1678
Wales	489	75	160	25	649	66	43	88	57	154	557	69	250	31	807
Northern Ireland	91	73	33	27	124	16	57	12	43	28	107	69	47	31	154
Scotland	792	74	283	26	1075	127	55	106	45	233	920	70	396	30	1316
United Kingdom	**8036**	**76**	**2481**	**24**	**10517**	**1055**	**41**	**1527**	**59**	**2582**	**9149**	**69**	**4093**	**31**	**13242**

Table 85 : 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	305	23	1039	77	1344	1	0	336	100	337	306	18	1395	82	1701
East Midlands	212	23	721	77	933	0	0	209	100	209	212	18	944	82	1156
East of England	183	21	707	79	890	4	2	225	98	229	188	17	939	83	1127
London	273	27	734	73	1007	4	1	281	99	285	277	21	1030	79	1307
South East Coast	106	17	504	83	610	0	0	202	100	202	106	13	706	87	812
South Central	201	23	664	77	865	1	1	183	99	184	203	19	857	81	1060
South West	244	22	890	78	1134	0	0	280	100	280	244	17	1196	83	1440
West Midlands	296	41	427	59	723	0	0	149	100	149	297	34	583	66	880
North West	304	23	1005	77	1309	2	1	276	99	278	307	19	1307	81	1614
Wales	137	21	513	79	650	1	1	153	99	154	138	17	670	83	808
Northern Ireland	40	32	85	68	125	1	4	26	96	27	41	27	113	73	154
Scotland	329	30	769	70	1098	0	0	244	100	244	329	24	1021	76	1350
United Kingdom	**2630**	**25**	**8058**	**75**	**10688**	**14**	**1**	**2564**	**99**	**2578**	**2648**	**20**	**10761**	**80**	**13409**

Table 86 : 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	1144	85	196	15	1340	43	13	298	87	341	1191	70	513	30	1704
East Midlands	742	80	191	20	933	80	38	129	62	209	832	72	324	28	1156
East of England	727	81	169	19	896	30	13	203	87	233	760	67	377	33	1137
London	849	87	132	13	981	40	14	236	86	276	894	70	375	30	1269
South East Coast	424	89	55	11	479	38	23	127	77	165	462	72	182	28	644
South Central	759	89	98	11	857	36	21	137	79	173	802	77	239	23	1041
South West	1046	89	124	11	1170	45	17	218	83	263	1097	75	363	25	1460
West Midlands	736	89	89	11	825	40	25	119	75	159	781	79	212	21	993
North West	1030	79	273	21	1303	119	43	157	57	276	1163	72	443	28	1606
Wales	500	78	145	22	645	20	13	133	87	153	520	65	282	35	802
Northern Ireland	109	88	15	12	124	13	50	13	50	26	123	81	29	19	152
Scotland	1012	91	102	9	1114	27	12	204	88	231	1044	77	309	23	1353
United Kingdom	**9078**	**85**	**1589**	**15**	**10667**	**531**	**21**	**1974**	**79**	**2505**	**9669**	**73**	**3648**	**27**	**13317**

Table 87 : 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	1	6	18	796	59	1355	207	54	381
East Midlands	6	21	28	661	70	938	122	64	190
East of England	2	14	14	661	71	931	128	60	213
London	7	44	16	686	66	1037	178	65	274
South East Coast	0	0	3	331	52	632	112	54	209
South Central	2	50	4	583	69	849	140	62	226
South West	2	13	16	815	68	1192	214	62	343
West Midlands	0	0	9	803	76	1051	16	44	36
North West	2	17	12	943	67	1404	147	51	287
Wales	5	45	11	454	71	636	98	61	161
Northern Ireland	0	-	0	94	72	130	13	52	25
Scotland	0	0	11	769	68	1129	151	65	234
United Kingdom	**27**	**19**	**142**	**7596**	**67**	**11284**	**1526**	**59**	**2579**

Table 88 : 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	1	6	16	695	66	1056	169	59	287
East Midlands	4	17	24	591	76	773	96	71	136
East of England	2	18	11	569	77	737	112	67	167
London	7	54	13	584	74	789	161	74	219
South East Coast	0	0	3	296	62	474	95	62	154
South Central	1	50	2	536	76	702	130	73	177
South West	1	8	12	742	78	953	174	69	252
West Midlands	0	0	9	716	82	872	14	64	22
North West	2	20	10	846	72	1169	120	58	208
Wales	5	50	10	405	78	519	79	65	121
Northern Ireland	0	-	0	80	75	106	11	58	19
Scotland	0	0	10	667	72	925	125	67	186
United Kingdom	**23**	**19**	**120**	**6727**	**74**	**9075**	**1286**	**66**	**1948**

Table 89 : 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	2	98	35	284	34	40	84
East Midlands	2	50	4	64	42	154	24	47	51
East of England	0	0	3	86	46	188	15	34	44
London	0	0	2	99	41	240	16	33	49
South East Coast	0	-	0	35	22	158	17	31	55
South Central	1	100	1	43	31	138	10	21	48
South West	0	0	1	68	31	217	38	44	86
West Midlands	0	-	0	82	48	172	2	17	12
North West	0	0	1	94	43	220	18	27	67
Wales	0	0	1	47	41	114	19	49	39
Northern Ireland	0	-	0	14	64	22	2	33	6
Scotland	0	0	1	102	52	197	25	53	47
United Kingdom	**3**	**19**	**16**	**832**	**40**	**2104**	**220**	**37**	**588**

Table 90 : 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	3	19	16	229	22	1056	73	25	287
East Midlands	9	38	24	166	21	773	37	27	136
East of England	2	18	11	137	19	737	44	26	167
London	6	46	13	190	24	789	77	35	219
South East Coast	0	0	3	72	15	474	34	22	154
South Central	1	50	2	140	20	702	60	34	177
South West	6	50	12	168	18	953	70	28	252
West Midlands	1	11	9	288	33	872	7	32	22
North West	3	30	10	248	21	1169	53	25	208
Wales	6	60	10	92	18	519	39	32	121
Northern Ireland	0	-	0	34	32	106	6	32	19
Scotland	1	10	10	271	29	925	57	31	186
United Kingdom	**38**	**32**	**120**	**2035**	**22**	**9075**	**557**	**29**	**1948**

Table 91 : Invasive cancers with adjuvant therapy by age								
Age group	Radiotherapy		Chemotherapy		Hormone Therapy		Total	
	No.	%	No.	%	No.	%	No.	%
<=48	0	0	1	100	1	100	1	0
49	81	75	43	40	94	87	108	81
50-52	984	79	432	35	1056	85	1238	984
53-55	746	79	338	36	753	80	941	746
56-58	1000	79	419	33	1055	83	1264	1000
59-61	1155	78	406	27	1271	85	1490	1155
62-64	1170	77	329	22	1278	85	1512	1170
65-67	1017	75	239	18	1165	86	1358	1017
68-70	1036	73	174	12	1226	86	1423	1036
71+	400	64	41	7	534	86	623	400
Total	**7589**	**76**	**2422**	**24**	**8433**	**85**	**9958**	**7589**

* with completed data only

Table 92 : Non-invasive cancers with adjuvant therapy by age						
Age group	Radiotherapy		Hormone Therapy		Total non-invasive	
	No.	%	No.	%	No.	%
<=48	0	-	0	-	0	0
49	21	45	10	21	47	21
50-52	153	37	76	18	416	153
53-55	121	47	61	24	257	121
56-58	149	46	63	19	327	149
59-61	150	44	71	21	339	150
62-64	139	45	68	22	306	139
65-67	101	36	59	21	281	101
68-70	115	37	62	20	308	115
71+	33	31	21	20	107	33
Total	**982**	**41**	**491**	**21**	**2388**	**982**

Table 93 : 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	15	1	29	2	64	5	24	2	213	18	57	5	591	50	45	4	142	12	1180
East Midlands	24	3	36	4	94	10	17	2	151	16	38	4	425	46	18	2	130	14	933
East of England	9	1	30	4	87	10	9	1	108	13	32	4	434	52	15	2	115	14	839
London	13	1	21	2	32	3	14	1	141	15	53	6	489	52	38	4	144	15	945
South East Coast	2	0	11	3	19	5	7	2	76	19	10	2	224	56	12	3	42	10	403
South Central	2	0	13	2	47	6	6	1	132	16	30	4	441	53	20	2	134	16	825
South West	9	1	16	1	41	4	6	1	153	14	49	5	631	59	18	2	146	14	1069
West Midlands	7	1	10	2	32	5	1	0	69	11	32	5	291	44	13	2	199	30	654
North West	8	1	64	5	104	8	29	2	228	18	74	6	584	46	36	3	151	12	1278
Wales	10	2	26	4	90	14	6	1	89	14	21	3	299	46	31	5	73	11	645
Northern Ireland	0	0	2	2	3	2	2	2	19	15	8	6	60	48	10	8	20	16	124
Scotland	10	1	13	1	25	2	16	2	196	18	44	4	508	48	44	4	207	19	1063
United Kingdom	**109**	**1**	**271**	**3**	**638**	**6**	**137**	**1**	**1575**	**16**	**448**	**4**	**4977**	**50**	**300**	**3**	**1503**	**15**	**9958**

Table 94 : 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	152	50	115	38	0	0	23	8	0	0	14	5	0	0	0	0	305
East Midlands	4	2	78	37	48	23	0	0	39	19	0	0	40	19	0	0	0	0	209
East of England	3	1	109	50	82	37	0	0	10	5	0	0	14	6	0	0	2	1	220
London	2	1	136	52	86	33	0	0	14	5	2	1	23	9	0	0	1	0	264
South East Coast	0	0	92	62	24	16	0	0	13	9	0	0	19	13	0	0	0	0	148
South Central	1	1	93	55	41	24	0	0	28	17	1	1	5	3	0	0	0	0	169
South West	1	0	145	56	70	27	0	0	19	7	0	0	23	9	0	0	0	0	258
West Midlands	0	0	63	46	47	34	0	0	19	14	0	0	8	6	0	0	0	0	137
North West	1	0	110	40	43	16	0	0	53	19	1	0	64	23	0	0	1	0	273
Wales	1	1	75	49	57	37	0	0	11	7	0	0	9	6	0	0	0	0	153
Northern Ireland	0	0	7	27	5	19	1	4	3	12	0	0	10	38	0	0	0	0	26
Scotland	1	0	87	38	113	50	0	0	14	6	0	0	11	5	0	0	0	0	226
United Kingdom	**15**	**1**	**1147**	**48**	**731**	**31**	**1**	**0.0**	**246**	**10**	**4**	**0.2**	**240**	**10**	**0**	**0.0**	**4**	**0.2**	**2388**

Table 95 : 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	2	10	7	35	17	85	20	100	20	100	20	100	37
East Midlands	0	0	3	50	6	100	6	100	6	100	6	100	27.5
East of England	3	8	14	38	31	84	37	100	37	100	37	100	35
London	1	3	10	33	28	93	29	97	30	100	30	100	39
South East Coast	1	7	5	33	14	93	15	100	15	100	15	100	36
South Central	2	8	18	69	26	100	26	100	26	100	26	100	27.5
South West	2	7	12	41	24	83	27	93	28	97	29	100	36
West Midlands	0	0	1	8	4	33	8	67	12	100	12	100	75.5
North West	3	8	18	47	35	92	36	95	37	97	38	100	31.5
Wales	3	25	8	67	11	92	11	92	12	100	12	100	21.5
Northern Ireland	0	0	1	25	3	75	4	100	4	100	4	100	45
Scotland	2	9	8	35	16	70	18	78	20	87	23	100	43
United Kingdom	**19**	**8**	**105**	**42**	**215**	**85**	**237**	**94**	**247**	**98**	**252**	**100**	**35**

Table 96 : 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	2	5	12	29	36	86	41	98	42	100	42	100	35.5
East Midlands	2	6	13	42	25	81	29	94	30	97	30	97	34
East of England	3	6	26	49	44	83	52	98	53	100	53	100	32
London	3	5	24	38	53	84	57	90	57	90	61	97	35
South East Coast	0	0	8	20	30	73	39	95	41	100	41	100	47
South Central	0	0	17	39	39	89	43	98	44	100	44	100	35.5
South West	0	0	13	20	46	71	60	92	64	98	65	100	47
West Midlands	0	0	5	21	19	79	20	83	22	92	24	100	42.5
North West	2	3	28	44	60	94	62	97	64	100	64	100	33.5
Wales	1	6	9	56	15	94	15	94	16	100	16	100	28.5
Northern Ireland	0	0	1	14	6	86	7	100	7	100	7	100	43
Scotland	3	6	16	33	35	71	43	88	48	98	49	100	43
United Kingdom	**16**	**3**	**172**	**34**	**408**	**82**	**468**	**94**	**488**	**98**	**496**	**99**	**37**

Table 97 : 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	116	9	787	59	1273	96	1303	98	1311	99	1320	100	28
East Midlands	103	11	597	66	849	94	869	96	875	97	890	99	27
East of England	75	9	518	60	819	94	849	98	851	98	861	99	28
London	33	3	361	37	866	89	927	95	937	96	959	98	35
South East Coast	28	5	255	42	561	92	593	97	601	98	610	100	34
South Central	80	9	527	62	814	95	836	98	840	98	850	100	27
South West	51	4	526	45	1093	93	1154	98	1164	99	1173	100	32
West Midlands	98	11	522	59	798	90	857	97	868	98	875	99	28
North West	108	8	745	56	1293	97	1320	99	1327	99	1337	100	29
Wales	73	12	465	74	619	99	626	100	628	100	628	100	23
Northern Ireland	21	17	76	63	115	95	120	99	120	99	121	100	24
Scotland	118	11	697	64	1028	94	1061	98	1067	98	1080	99	28
United Kingdom	**904**	**8**	**6076**	**56**	**10128**	**94**	**10515**	**98**	**10589**	**98**	**10704**	**99**	**29**

Table 98 : 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	20	6	136	42	300	92	320	98	322	99	325	100	33.5
East Midlands	17	10	105	60	164	94	171	98	173	99	174	100	28
East of England	13	7	96	54	162	91	176	98	179	100	179	100	30
London	6	3	70	31	194	86	215	95	223	99	226	100	40
South East Coast	0	0	34	20	139	81	167	97	169	98	172	100	42
South Central	3	2	74	52	127	89	140	99	142	100	142	100	29
South West	1	0	50	21	183	77	226	95	237	100	238	100	42
West Midlands	8	5	61	38	131	82	150	94	157	98	159	99	35
North West	14	6	111	50	210	94	220	99	222	100	222	100	31
Wales	9	7	81	59	128	93	136	99	137	100	137	100	29
Northern Ireland	3	14	13	62	18	86	21	100	21	100	21	100	28
Scotland	14	7	96	49	173	89	186	95	191	98	193	99	31
United Kingdom	**108**	**5**	**927**	**42**	**1929**	**88**	**2128**	**97**	**2173**	**99**	**2188**	**100**	**34**

Table 99 : 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	3	0	42	6	312	47	550	83	629	95	657	99	62
East Midlands	1	0	5	1	305	59	508	98	516	99	519	100	57
East of England	3	1	13	2	315	59	476	90	503	95	518	98	56
London	2	0	19	4	279	52	475	88	514	95	533	99	59
South East Coast	2	1	18	6	121	37	195	60	258	80	305	94	77.5
South Central	0	0	11	2	189	38	396	79	467	93	493	99	65
South West	22	3	59	8	276	38	626	87	677	94	707	98	65
West Midlands	0	0	6	1	203	43	418	88	448	94	458	96	63
North West	8	1	34	5	386	52	627	85	693	94	721	98	59
Wales	0	0	23	6	164	42	352	90	387	99	389	100	64
Northern Ireland	0	0	0	0	14	22	56	89	62	98	63	100	69
Scotland	11	2	16	3	287	53	474	88	516	96	523	97	58
United Kingdom	**52**	**1**	**246**	**4**	**2851**	**48**	**5153**	**86**	**5670**	**95**	**5886**	**98**	**62**

Table 100 : 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	0	0	8	6	69	52	111	84	128	97	131	99	59
East Midlands	0	0	3	3	53	60	84	95	87	99	88	100	56
East of England	0	0	2	2	58	59	82	84	94	96	98	100	55
London	1	1	3	3	49	44	92	83	106	95	110	99	64
South East Coast	1	2	2	4	20	40	33	66	41	82	47	94	70.5
South Central	0	0	0	0	18	35	36	69	43	83	52	100	70
South West	1	1	3	3	48	45	93	88	103	97	104	98	67
West Midlands	0	0	0	0	38	45	76	90	83	99	83	99	62.5
North West	1	1	4	4	61	55	93	85	104	95	109	99	57
Wales	0	0	2	3	24	36	54	82	63	95	66	100	66
Northern Ireland	0	0	0	0	5	31	11	69	14	88	16	100	73
Scotland	0	0	0	0	74	59	120	95	126	100	126	100	56
United Kingdom	**4**	**0**	**27**	**3**	**517**	**50**	**885**	**85**	**992**	**95**	**1030**	**99**	**61**

Table 101 : 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	0	0	0	0	39	6	277	42	493	74	643	97	97
East Midlands	0	0	0	0	21	4	302	58	462	89	515	99	85
East of England	0	0	4	1	46	9	282	53	433	81	510	96	89
London	0	0	0	0	26	5	212	39	382	70	513	94	98
South East Coast	3	1	6	2	16	5	89	27	169	51	290	88	119
South Central	0	0	0	0	18	4	164	33	370	74	484	97	100
South West	0	0	6	1	59	8	230	32	537	75	687	95	103
West Midlands	0	0	0	0	16	3	198	42	376	79	454	95	96
North West	1	0	4	1	59	8	355	48	589	80	714	97	91
Wales	0	0	0	0	37	9	188	48	336	86	387	99	92
Northern Ireland	0	0	0	0	2	3	22	35	50	79	62	98	103
Scotland	0	0	6	1	37	7	258	48	431	80	517	96	91
United Kingdom	**4**	**0**	**26**	**0**	**376**	**6**	**2577**	**43**	**4628**	**77**	**5776**	**96**	**96**

Table 102 : 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	1	1	6	5	56	42	86	65	130	98	98.5
East Midlands	0	0	0	0	3	3	38	42	74	82	89	99	93.5
East of England	0	0	0	0	5	5	48	48	71	72	98	99	93
London	1	1	1	1	6	5	33	29	73	65	109	97	105
South East Coast	1	2	1	2	3	6	15	29	29	56	45	87	112.5
South Central	0	0	0	0	0	0	14	26	32	60	50	94	106
South West	0	0	0	0	3	3	17	16	57	54	101	95	118
West Midlands	0	0	0	0	1	1	33	39	60	71	83	99	101.5
North West	1	1	1	1	6	5	52	47	87	79	108	98	92.5
Wales	0	0	0	0	2	3	21	32	47	71	65	98	102
Northern Ireland	0	0	0	0	0	0	3	19	11	69	15	94	112
Scotland	0	0	0	0	5	4	52	41	103	81	124	98	97
United Kingdom	**3**	**0**	**4**	**0**	**40**	**4**	**382**	**36**	**730**	**70**	**1017**	**97**	**101**

Table 103 : 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	1197	77	18	1	341	22	3	0	1559	100
East Midlands	933	81	14	1	209	18	0	0	1156	100
East of England	859	79	8	1	226	21	0	0	1093	100
London	988	77	11	1	280	22	1	0	1280	100
South East Coast	509	75	0	0	170	25	0	0	679	100
South Central	850	81	9	1	183	18	2	0	1044	100
South West	1133	78	19	1	299	20	8	1	1459	100
West Midlands	835	82	8	1	174	17	0	0	1017	100
North West	1365	81	27	2	285	17	1	0	1678	100
Wales	649	80	4	0	154	19	0	0	807	100
Northern Ireland	124	81	1	1	28	18	1	1	154	100
Scotland	1075	82	8	1	233	18	0	0	1316	100
United Kingdom	**10517**	**79**	**127**	**1**	**2582**	**19**	**16**	**0**	**13242**	**100**

Table 104 : 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	822	69	360	30	15	1	0	0	1197	100
East Midlands	621	67	288	31	24	3	0	0	933	100
East of England	653	76	195	23	11	1	0	0	859	100
London	742	75	229	23	16	2	1	0	988	100
South East Coast	393	77	113	22	3	1	0	0	509	100
South Central	672	79	176	21	2	0	0	0	850	100
South West	885	78	238	21	10	1	0	0	1133	100
West Midlands	656	79	169	20	10	1	0	0	835	100
North West	968	71	388	28	9	1	0	0	1365	100
Wales	464	71	175	27	10	2	0	0	649	100
Northern Ireland	82	66	42	34	0	0	0	0	124	100
Scotland	776	72	289	27	10	1	0	0	1075	100
United Kingdom	**7734**	**74**	**2662**	**25**	**120**	**1**	**1**	**0**	**10517**	**100**

Table 105 : Radiotherapy for invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	772	94	50	6	822	100
East Midlands	605	97	16	3	621	100
East of England	608	93	45	7	653	100
London	669	90	73	10	742	100
South East Coast	363	92	30	8	393	100
South Central	594	88	78	12	672	100
South West	823	93	62	7	885	100
West Midlands	633	96	23	4	656	100
North West	850	88	118	12	968	100
Wales	450	97	14	3	464	100
Northern Ireland	75	91	7	9	82	100
Scotland	698	90	78	10	776	100
United Kingdom	**7140**	**92**	**594**	**8**	**7734**	**100**

Table 106 : Invasive size of invasive cancers treated by 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	23	46	14	28	9	18	3	6	1	2	0	0	0	0	50	100
East Midlands	2	13	5	31	4	25	3	19	0	0	0	0	2	13	16	100
East of England	18	40	6	13	8	18	5	11	1	2	1	2	6	13	45	100
London	30	41	18	25	12	16	8	11	3	4	0	0	2	3	73	100
South East Coast	14	47	11	37	3	10	2	7	0	0	0	0	0	0	30	100
South Central	35	45	19	24	17	22	3	4	1	1	0	0	3	4	78	100
South West	30	48	15	24	10	16	6	10	1	2	0	0	0	0	62	100
West Midlands	7	30	7	30	7	30	0	0	0	0	0	0	2	9	23	100
North West	43	36	27	23	27	23	13	11	3	3	3	3	2	2	118	100
Wales	4	29	3	21	2	14	2	14	1	7	0	0	2	14	14	100
Northern Ireland	2	29	1	14	2	29	1	14	1	14	0	0	0	0	7	100
Scotland	22	28	19	24	27	35	9	12	0	0	0	0	1	1	78	100
United Kingdom	**230**	**39**	**145**	**24**	**128**	**22**	**55**	**9**	**12**	**2**	**4**	**1**	**20**	**3**	**594**	**100**

Table 107 : Invasive cancers treated by conservation surgery without radiotherapy								
		>20mm		Grade III		Nodal status positive	
Region	Total	No	%	No	%	No	%
North, Yorks & Humber	50	4	8	7	14	7	14
East Midlands	16	3	19	2	13	3	19
East of England	45	7	16	4	9	13	29
London	73	11	15	14	19	12	16
South East Coast	30	2	7	0	0	0	0
South Central	78	4	5	1	1	7	9
South West	62	7	11	8	13	6	10
West Midlands	23	0	0	1	4	4	17
North West	118	19	16	11	9	16	14
Wales	14	3	21	2	14	5	36
Northern Ireland	7	2	29	4	57	0	0
Scotland	78	9	12	23	29	15	19
United Kingdom	**594**	**71**	**12**	**77**	**13**	**88**	**15**

Table 108 : Radiotherapy for non-invasive cancers treated by conservation surgery						
	Radiotherapy		No radiotherapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	129	60	87	40	216	100
East Midlands	87	66	44	34	131	100
East of England	101	59	71	41	172	100
London	114	55	92	45	206	100
South East Coast	49	40	74	60	123	100
South Central	51	36	89	64	140	100
South West	105	47	120	53	225	100
West Midlands	82	66	42	34	124	100
North West	112	55	93	45	205	100
Wales	66	59	46	41	112	100
Northern Ireland	15	68	7	32	22	100
Scotland	125	74	43	26	168	100
United Kingdom	**1036**	**56**	**808**	**44**	**1844**	**100**

Table 109 : Cytonuclear grade of non-invasive cancers treated by conservation surgery without radiotherapy												
	High		Intermediate		Low		Not assessable		Unknown		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	24	28	37	43	16	18	9	10	1	1	87	100
East Midlands	6	14	18	41	12	27	2	5	6	14	44	100
East of England	9	13	34	48	18	25	6	8	4	6	71	100
London	30	33	17	18	20	22	11	12	14	15	92	100
South East Coast	29	39	22	30	18	24	5	7	0	0	74	100
South Central	29	33	32	36	20	22	5	6	3	3	89	100
South West	34	28	37	31	35	29	14	12	0	0	120	100
West Midlands	9	21	21	50	7	17	4	10	1	2	42	100
North West	34	37	32	34	17	18	6	6	4	4	93	100
Wales	6	13	16	35	17	37	6	13	1	2	46	100
Northern Ireland	4	57	1	14	2	29	0	0	0	0	7	100
Scotland	8	19	16	37	11	26	4	9	4	9	43	100
United Kingdom	**222**	**27**	**283**	**35**	**193**	**24**	**72**	**9**	**38**	**5**	**808**	**100**

Table 110 : 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	53	61	18	21	2	2	10	11	4	5	87	100
East Midlands	31	70	5	11	0	0	2	5	6	14	44	100
East of England	47	66	11	15	0	0	5	7	8	11	71	100
London	44	48	15	16	4	4	7	8	22	24	92	100
South East Coast	51	69	15	20	0	0	0	0	8	11	74	100
South Central	59	66	22	25	2	2	3	3	3	3	89	100
South West	81	68	18	15	1	1	0	0	20	17	120	100
West Midlands	27	64	8	19	1	2	3	7	3	7	42	100
North West	64	69	18	19	0	0	4	4	7	8	93	100
Wales	24	52	11	24	0	0	5	11	6	13	46	100
Northern Ireland	4	57	2	29	1	14	0	0	0	0	7	100
Scotland	28	65	8	19	1	2	3	7	3	7	43	100
United Kingdom	**513**	**63**	**151**	**19**	**12**	**1**	**42**	**5**	**90**	**11**	**808**	**100**

Table 111 : 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	112	7	40	2	1192	70	18	1	337	20	2	0	1701	100
East Midlands	68	6	27	2	838	72	14	1	209	18	0	0	1156	100
East of England	64	6	21	2	805	71	8	1	229	20	0	0	1127	100
London	76	6	22	2	909	70	14	1	285	22	1	0	1307	100
South East Coast	35	4	13	2	562	69	0	0	202	25	0	0	812	100
South Central	61	6	20	2	784	74	9	1	184	17	2	0	1060	100
South West	73	5	27	2	1034	72	19	1	280	19	7	0	1440	100
West Midlands	57	6	26	3	640	73	8	1	149	17	0	0	880	100
North West	101	6	39	2	1169	72	27	2	278	17	0	0	1614	100
Wales	53	7	12	1	585	72	4	0	154	19	0	0	808	100
Northern Ireland	12	8	4	3	109	71	1	1	27	18	1	1	154	100
Scotland	78	6	31	2	989	73	8	1	244	18	0	0	1350	100
United Kingdom	**790**	**6**	**282**	**2**	**9616**	**72**	**130**	**1**	**2578**	**19**	**13**	**0**	**13409**	**100**

Table 112 : Chemotherapy for ER negative node positive invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	32	80	8	20	40	100
East Midlands	25	93	2	7	27	100
East of England	14	67	7	33	21	100
London	21	95	1	5	22	100
South East Coast	9	69	4	31	13	100
South Central	20	100	0	0	20	100
South West	22	81	5	19	27	100
West Midlands	19	73	7	27	26	100
North West	37	95	2	5	39	100
Wales	9	75	3	25	12	100
Northern Ireland	4	100	0	0	4	100
Scotland	26	84	5	16	31	100
United Kingdom	**238**	**84**	**44**	**16**	**282**	**100**

Table 113 : Chemotherapy for ER negative node negative invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	51	46	61	54	112	100
East Midlands	30	44	38	56	68	100
East of England	30	47	34	53	64	100
London	48	63	28	37	76	100
South East Coast	12	34	23	66	35	100
South Central	24	39	37	61	61	100
South West	35	48	38	52	73	100
West Midlands	30	53	27	47	57	100
North West	40	40	61	60	101	100
Wales	19	36	34	64	53	100
Northern Ireland	7	58	5	42	12	100
Scotland	47	60	31	40	78	100
United Kingdom	**373**	**47**	**417**	**53**	**790**	**100**

Table 114 : 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	13	25	37	73	1	2	51	100
East Midlands	0	0	1	3	29	97	0	0	30	100
East of England	0	0	7	23	22	73	1	3	30	100
London	0	0	6	13	42	88	0	0	48	100
South East Coast	0	0	1	8	11	92	0	0	12	100
South Central	0	0	6	25	18	75	0	0	24	100
South West	0	0	3	9	30	86	2	6	35	100
West Midlands	0	0	4	13	26	87	0	0	30	100
North West	0	0	9	23	30	75	1	3	40	100
Wales	1	5	4	21	14	74	0	0	19	100
Northern Ireland	0	0	2	29	5	71	0	0	7	100
Scotland	0	0	6	13	40	85	1	2	47	100
United Kingdom	**1**	**0**	**62**	**17**	**304**	**82**	**6**	**2**	**373**	**100**

Table 115 : 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	1300	76	212	12	192	11	1704	100
East Midlands	925	80	128	11	103	9	1156	100
East of England	863	76	109	10	165	15	1137	100
London	981	77	138	11	150	12	1269	100
South East Coast	488	76	67	10	89	14	644	100
South Central	845	81	95	9	101	10	1041	100
South West	1155	79	151	10	154	11	1460	100
West Midlands	843	85	117	12	33	3	993	100
North West	1296	81	201	13	109	7	1606	100
Wales	603	75	81	10	118	15	802	100
Northern Ireland	122	80	24	16	6	4	152	100
Scotland	1139	84	141	10	73	5	1353	100
United Kingdom	**10560**	**79**	**1464**	**11**	**1293**	**10**	**13317**	**100**

Table 116 : 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	1145	88	8	1	146	11	1	0	1300	100
East Midlands	833	90	8	1	84	9	0	0	925	100
East of England	799	93	3	0	61	7	0	0	863	100
London	857	87	4	0	120	12	0	0	981	100
South East Coast	424	87	0	0	64	13	0	0	488	100
South Central	767	91	6	1	71	8	1	0	845	100
South West	1043	90	7	1	104	9	1	0	1155	100
West Midlands	741	88	7	1	95	11	0	0	843	100
North West	1128	87	18	1	150	12	0	0	1296	100
Wales	575	95	2	0	26	4	0	0	603	100
Northern Ireland	104	85	1	1	17	14	0	0	122	100
Scotland	1001	88	7	1	131	12	0	0	1139	100
United Kingdom	**9417**	**89**	**71**	**1**	**1069**	**10**	**3**	**0**	**10560**	**100**

Table 117 : Hormone therapy for ER positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	1110	97	35	3	1145	100
East Midlands	735	88	98	12	833	100
East of England	719	90	80	10	799	100
London	827	96	30	4	857	100
South East Coast	416	98	8	2	424	100
South Central	739	96	28	4	767	100
South West	1009	97	34	3	1043	100
West Midlands	721	97	20	3	741	100
North West	999	89	129	11	1128	100
Wales	498	87	77	13	575	100
Northern Ireland	104	100	0	0	104	100
Scotland	990	99	11	1	1001	100
United Kingdom	**8867**	**94**	**550**	**6**	**9417**	**100**

Table 118 : ER positive invasive cancers without hormone therapy							
	Total	<15mm		Grade I or II		Node negative	
Region	cases	No.	%	No.	%	No.	%
N East, Yorks & Humber	35	23	66	26	74	29	83
East Midlands	98	82	84	88	90	92	94
East of England	80	60	75	75	94	70	88
London	30	20	67	26	87	20	67
South East Coast	8	3	38	7	88	6	75
South Central	28	14	50	23	82	23	82
South West	34	25	74	23	68	22	65
West Midlands	20	11	55	15	75	12	60
North West	129	78	60	112	87	99	77
Wales	77	66	86	73	95	76	99
Northern Ireland	0	0	-	0	-	0	-
Scotland	11	8	73	5	45	8	73
United Kingdom	**550**	**390**	**71**	**473**	**86**	**457**	**83**

Table 119 : Hormone therapy for ER negative, PgR positive invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	4	67	2	33	6	100
East Midlands	4	57	3	43	7	100
East of England	4	57	3	43	7	100
London	3	50	3	50	6	100
South East Coast	3	60	2	40	5	100
South Central	3	60	2	40	5	100
South West	3	60	2	40	5	100
West Midlands	1	33	2	67	3	100
North West	2	67	1	33	3	100
Wales	2	40	3	60	5	100
Northern Ireland	2	100	0	0	2	100
Scotland	3	75	1	25	4	100
United Kingdom	**34**	**59**	**24**	**41**	**58**	**100**

Table 120 : Hormone therapy for all ER negative cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	13	6	199	94	212	100
East Midlands	9	7	119	93	128	100
East of England	8	7	101	93	109	100
London	12	9	126	91	138	100
South East Coast	5	7	62	93	67	100
South Central	15	16	80	84	95	100
South West	23	15	128	85	151	100
West Midlands	17	15	100	85	117	100
North West	24	12	177	88	201	100
Wales	2	2	79	98	81	100
Northern Ireland	2	8	22	92	24	100
Scotland	21	15	120	85	141	100
United Kingdom	**151**	**10**	**1313**	**90**	**1464**	**100**

Table 121 : ER status for non-invasive cancers with hormone therapy								
	ER positive		ER negative		ER unknown/ not done		Total*	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	38	10	2	1	3	1	43	12
East Midlands	64	31	3	1	13	6	80	38
East of England	27	11	1	0	2	1	30	13
London	36	12	2	1	2	1	40	14
South East Coast	38	18	0	0	0	0	38	18
South Central	31	17	1	1	4	2	36	19
South West	37	12	5	2	3	1	45	15
West Midlands	38	21	2	1	0	0	40	22
North West	112	39	3	1	4	1	119	41
Wales	15	10	0	0	5	3	20	13
Northern Ireland	13	46	0	0	0	0	13	46
Scotland	27	11	0	0	0	0	27	11
United Kingdom	**476**	**18**	**19**	**1**	**36**	**1**	**531**	**20**

*Number of non-invasive cancers with hormone therapy as a percentage of the number of non-invasive cancers

Table 122 : Hormone therapy for ER positive non-invasive cancers						
	Hormone therapy		No hormone therapy		Total	
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**
N East, Yorks & Humber	38	26	108	74	146	100
East Midlands	64	76	20	24	84	100
East of England	27	44	34	56	61	100
London	36	30	84	70	120	100
South East Coast	38	59	26	41	64	100
South Central	31	44	40	56	71	100
South West	37	36	67	64	104	100
West Midlands	38	40	57	60	95	100
North West	112	75	38	25	150	100
Wales	15	58	11	42	26	100
Northern Ireland	13	76	4	24	17	100
Scotland	27	21	104	79	131	100
United Kingdom	**476**	**45**	**593**	**55**	**1069**	**100**

Table 123 : Chemotherapy for ER and PgR negative invasive cancers						
	Chemotherapy		No chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	69	53	60	47	129	100
East Midlands	41	57	31	43	72	100
East of England	40	55	33	45	73	100
London	74	74	26	26	100	100
South East Coast	20	44	25	56	45	100
South Central	38	55	31	45	69	100
South West	45	55	37	45	82	100
West Midlands	48	59	34	41	82	100
North West	76	54	64	46	140	100
Wales	22	42	31	58	53	100
Northern Ireland	9	69	4	31	13	100
Scotland	66	65	35	35	101	100
United Kingdom	**548**	**57**	**411**	**43**	**959**	**100**

Table 124 : ER and PgR negative invasive cancers without chemotherapy									
		>20mm		Grade III		Nodal status positive		HER-2 positive	
Region	Total cases	No.	%	No.	%	No.	%	No.	%
North, Yorks & Humber	60	7	12	28	47	6	10	16	27
East Midlands	31	1	3	21	68	1	3	7	23
East of England	33	5	15	18	55	4	12	11	33
London	26	6	23	7	27	1	4	3	12
South East Coast	25	4	16	14	56	4	16	5	20
South Central	31	5	16	13	42	0	0	4	13
South West	37	7	19	19	51	4	11	8	22
West Midlands	34	3	9	17	50	7	21	6	18
North West	64	12	19	37	58	2	3	11	17
Wales	31	2	6	9	29	3	10	4	13
Northern Ireland	4	2	50	2	50	0	0	0	0
Scotland	35	5	14	20	57	5	14	9	26
United Kingdom	**411**	**59**	**14**	**205**	**50**	**37**	**9**	**84**	**20**

Table 125 : Chemotherapy for HER-2 positive invasive cancers						
	Chemotherapy		No Chemotherapy		Total	
Region	No.	%	No.	%	No.	%
N East, Yorks & Humber	66	50	67	50	133	100
East Midlands	48	42	67	58	115	100
East of England	33	41	48	59	81	100
London	58	45	72	55	130	100
South East Coast	21	53	19	48	40	100
South Central	40	58	29	42	69	100
South West	66	39	103	61	169	100
West Midlands	55	69	25	31	80	100
North West	68	47	77	53	145	100
Wales	27	60	18	40	45	100
Northern Ireland	13	59	9	41	22	100
Scotland	80	56	64	44	144	100
United Kingdom	**575**	**49**	**598**	**51**	**1173**	**100**

Table 126 : HER-2 positive invasive cancers without chemotherapy							
		>20mm		Grade III		Nodal status positive	
Region	**Total cases**	**No.**	**%**	**No.**	**%**	**No.**	**%**
North, Yorks & Humber	67	10	15	16	24	12	18
East Midlands	67	8	12	16	24	4	6
East of England	48	6	13	16	33	11	23
London	72	11	15	9	13	6	8
South East Coast	19	3	16	8	42	2	11
South Central	29	8	28	6	21	1	3
South West	103	10	10	23	22	13	13
West Midlands	25	2	8	8	32	2	8
North West	77	20	26	21	27	7	9
Wales	18	1	6	5	28	4	22
Northern Ireland	9	1	11	1	11	0	0
Scotland	64	10	16	22	34	5	8
United Kingdom	**598**	**90**	**15**	**151**	**25**	**67**	**11**

Table 127 : 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	67	7	10	29	43	20	30	7	10	2	3
East Midlands	67	12	18	28	42	21	31	1	1	1	1
East of England	48	2	4	20	42	12	25	6	13	2	4
London	72	24	33	30	42	11	15	3	4	2	3
South East Coast	19	2	11	6	32	6	32	2	11	1	5
South Central	29	3	10	13	45	6	21	3	10	1	3
South West	103	19	18	45	44	22	21	11	11	0	0
West Midlands	25	0	0	12	48	10	40	1	4	0	0
North West	77	10	13	30	39	21	27	7	9	2	3
Wales	18	2	11	6	33	8	44	1	6	0	0
Northern Ireland	9	2	22	5	56	2	22	0	0	0	0
Scotland	64	5	8	28	44	21	33	5	8	2	3
United Kingdom	**598**	**88**	**15**	**252**	**42**	**160**	**27**	**47**	**8**	**13**	**2**

APPENDIX G: SURVIVAL ANALYSIS DATA TABLES (128-136)

DATA OBTAINED FROM THE SURVIVAL AUDIT OF SCREEN-DETECTED BREAST CANCERS FOR CANCERS DIAGNOSED BETWEEN 1 APRIL 2001 AND 31 MARCH 2002

Table 128 : Cause of death of eligible invasive cancers with death before 31/03/2008

	Breast cancer		Other cancer		Non-cancer		Unknown		Total deaths		
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	47	48	25	26	25	26	1	1	98	10	949
East Midlands	27	63	10	23	6	14	0	0	43	7	592
East of England	35	56	10	16	16	26	1	2	62	8	789
London	25	45	13	23	15	27	3	5	56	9	654
South East Coast	38	64	10	17	11	19	0	0	59	10	619
South Central	29	63	3	7	13	28	1	2	46	9	519
South West	37	52	16	23	17	24	1	1	71	10	698
West Midlands	47	63	14	19	14	19	0	0	75	12	652
North West	55	62	17	19	17	19	0	0	89	9	968
Wales	17	52	7	21	9	27	0	0	33	7	463
Northern Ireland	7	88	0	0	1	13	0	0	8	5	148
United Kingdom	**364**	**57**	**125**	**20**	**144**	**23**	**7**	**1**	**640**	**9**	**7051**

Table 129 : Cause of death of eligible micro-invasive cancers with death before 31/03/2008

	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	12
East Midlands	0	-	0	-	0	-	0	-	0	0	9
East of England	0	-	0	-	0	-	0	-	0	0	8
London	0	0	0	0	1	100	0	0	1	10	10
South East Coast	0	0	0	0	1	100	0	0	1	10	10
South Central	0	-	0	-	0	-	0	-	0	0	3
South West	3	100	0	0	0	0	0	0	3	30	10
West Midlands	0	0	0	0	1	100	0	0	1	17	6
North West	1	100	0	0	0	0	0	0	1	11	9
Wales	0	0	1	100	0	0	0	0	1	25	4
Northern Ireland	0	-	0	-	0	-	0	-	0	0	1
United Kingdom	**4**	**50**	**1**	**13**	**3**	**38**	**0**	**0**	**8**	**10**	**82**

Table 130 : Cause of death of eligible non-invasive cancers with death before 31/03/2008

	Breast cancer		Other cancer		Non-cancer		Unknown		Total deaths		
Region	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**Total**
N East, Yorks & Humber	3	23	6	46	4	31	0	0	13	5	248
East Midlands	2	33	2	33	2	33	0	0	6	4	151
East of England	2	22	5	56	2	22	0	0	9	4	230
London	0	0	7	78	2	22	0	0	9	5	184
South East Coast	2	40	3	60	0	0	0	0	5	3	165
South Central	5	50	4	40	1	10	0	0	10	7	150
South West	1	33	2	67	0	0	0	0	3	2	184
West Midlands	0	0	2	33	4	67	0	0	6	4	160
North West	4	40	5	50	0	0	1	10	10	5	196
Wales	0	0	0	0	1	100	0	0	1	1	97
Northern Ireland	0	-	0	-	0	-	0	-	0	0	45
United Kingdom	**19**	**26**	**36**	**50**	**16**	**22**	**1**	**1**	**72**	**4**	**1810**

Table 131 : 5 year relative survival by region – primary invasive cancers only			
Region	**1999/00**	**2000/01**	**2001/02**
N East, Yorks & Humber	97.3 (95.7,99.0)	96.4 (94.7,98.1)	95.9 (94.0,97.7)
East Midlands	95.9 (93.5,98.4)	95.8 (93.4,98.1)	98.8 (96.8,100.7)
East of England	96.6 (94.4,98.7)	97.1 (95.0,99.2)	98.3 (96.5,100.1)
London	96.1 (94.0,98.3)	98.1 (96.2,100.0)	97.8 (95.7,99.8)
South East Coast	96.4 (94.1,98.8)	97.0 (94.8,99.2)	96.9 (94.7,99.0)
South Central	96.7 (94.3,99.2)	96.4 (94.0,98.8)	98.0 (95.8,100.2)
South West	97.4 (95.5,99.3)	95.9 (93.7,98.1)	96.5 (94.4,98.7)
West Midlands	94.2 (91.8,96.6)	95.6 (93.3,97.8)	95.2 (93.0,97.5)
North West	97.5 (95.7,99.4)	95.6 (93.7,97.6)	96.5 (94.8,98.2)
Wales	96.1 (93.3,98.9)	95.9 (93.0,98.7)	99.3 (97.1,101.4)
Northern Ireland	93.8 (89.1,98.4)	96.6 (92.9,100.4)	98.9 (95.3,102.6)
United Kingdom	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**

Table 132 : 5 year relative survival by age for primary invasive cancers			
Age	**1999/00**	**2000/01**	**2001/02**
<50	94.6 (90.3,99.0)	94.0 (89.5,98.5)	101.4 (101.4,101.4)
50-52	96.1 (94.8,97.4)	96.2 (94.9,97.4)	96.4 (95.1,97.7)
53-55	95.2 (93.6,96.9)	94.9 (93.3,96.5)	95.5 (94.0,97.0)
56-58	95.4 (93.7,97.0)	96.4 (94.9,98.0)	95.8 (94.3,97.3)
59-61	95.8 (94.1,97.5)	96.1 (94.4,97.8)	96.5 (94.9,98.1)
62-64	96.1 (94.3,97.9)	95.5 (93.6,97.3)	97.1 (95.5,98.8)
65-68	98.9 (96.3,101.6)	98.3 (95.7,100.9)	99.2 (96.8,101.7)
69-70	99.4 (94.1,104.7)	98.2 (92.8,103.6)	101.2 (96.7,105.7)
>70	109.2 (104.6,113.8)	105.0 (100.2,109.7)	108.3 (104.2,112.4)
All invasive cancers	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**

Table 133 : 5 year relative survival by invasive tumour size for primary invasive cancers			
Size	**1999/00**	**2000/01**	**2001/02**
<15mm	100.0 (99.3,100.7)	99.3 (98.6,100.1)	100.2 (99.5,100.8)
15-≤20mm	95.8 (94.4,97.2)	96.3 (95.0,97.6)	97.6 (96.3,99.0)
>20-≤35mm	90.2 (88.0,92.4)	91.2 (89.1,93.3)	92.4 (90.7,94.1)
>35-≤50mm	81.9 (74.9,88.9)	85.6 (79.9,91.4)	88.8 (82.2,95.3)
>50mm	65.6 (53.1,78.1)	78.4 (65.9,91.0)	77.1 (69.0,85.2)
Unknown	100.4 (99.6,101.3)	99.4 (98.5,100.4)	100.4 (99.5,101.3)
All invasive cancers	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**

Table 134 : 5 year relative survival by grade for primary invasive cancers			
Grade	**1999/00**	**2000/01**	**2001/02**
I	101.0 (100.2,101.8)	99.7 (98.8,100.6)	101.8 (101.1,102.4)
II	97.1 (96.2,98.1)	97.7 (96.8,98.6)	97.7 (96.8,98.6)
III	87.2 (85.0,89.4)	86.7 (84.4,89.0)	87.5 (85.3,89.7)
Unknown	96.3 (88.9,103.7)	100.4 (96.4,104.4)	97.7 (89.1,106.4)
All invasive cancers	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**

Table 135 : 5 year relative survival by nodal status for primary invasive cancers			
Nodal status	**1999/00**	**2000/01**	**2001/02**
Positive	88.0 (86.1,89.9)	89.2 (87.4,91.0)	88.9 (87.1,90.7)
Negative	99.2 (98.5,99.8)	99.0 (98.3,99.6)	100.0 (99.4,100.6)
Unknown	98.6 (96.2,101.1)	95.0 (92.3,97.8)	96.8 (93.8,99.7)
All invasive cancers	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**

Table 136 : 5 year relative survival by NPI prognostic group for primary invasive cancers			
NPI group	**1999/00**	**2000/01**	**2001/02**
EPG	101.1 (100.2,102.0)	100.2 (99.2,101.2)	102.2 (101.5,102.9)
GPG	100.2 (99.3,101.1)	99.1 (98.1,100.1)	100.1 (99.2,100.9)
MPG1	96.4 (94.9,98.0)	98.1 (96.8,99.4)	96.7 (95.2,98.1)
MPG2	88.7 (85.8,91.6)	89.6 (86.7,92.4)	92.0 (89.4,94.6)
PPG	70.5 (65.7,75.3)	71.2 (66.2,76.2)	70.4 (65.4,75.3)
Unknown	97.8 (95.6,99.9)	96.0 (93.8,98.1)	100.1 (99.2,100.9)
All invasive cancers	**96.5 (95.8,97.2)**	**96.4 (95.7,97.0)**	**97.2 (96.6,97.8)**