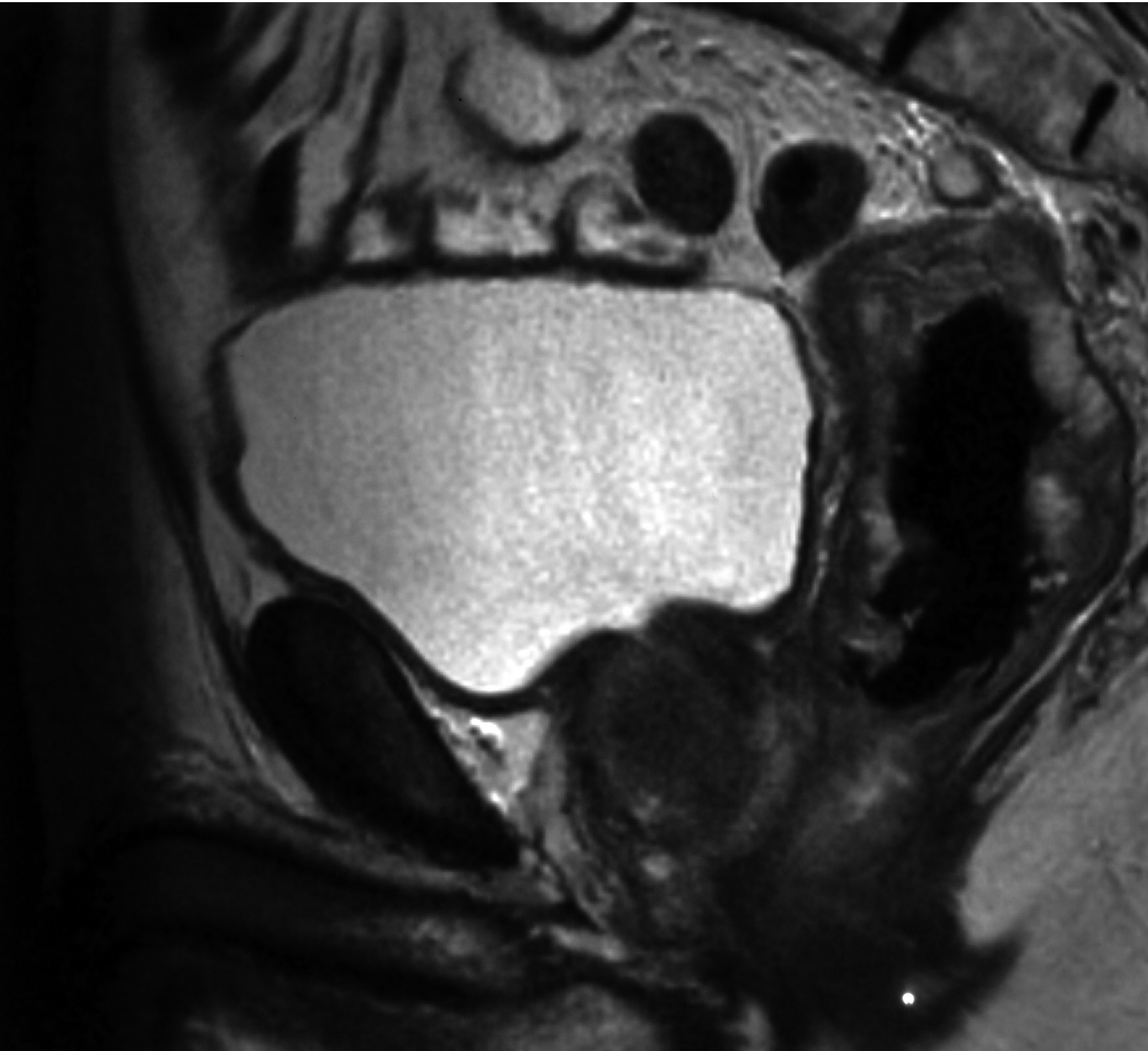


# National Bowel Cancer Audit 2010



This Annual Report contains data from the 2008/09 reporting period, which covers patients with a diagnosis date from 1 August 2008 to 31 July 2009. Data from Wales covers the period 1 August 2008 to 31 March 2009.

This report was prepared by:

**Association of Coloproctology of Great Britain and Ireland**

Paul Finan  
Jason Smith

**The Royal College of Surgeons of England**

Marialena Trivella  
Jan van der Meulen

**The NHS Information Centre for health and social care**

Kimberley Greenaway  
Arthur Yelland

The National Bowel Cancer Audit Annual Report 2010 is available to download at [www.ic.nhs.uk/bowelreports](http://www.ic.nhs.uk/bowelreports)

Prepared in partnership with:



**The Association of Coloproctology of Great Britain and Ireland (ACPGBI)** is the professional body that represents UK colorectal surgeons. ACPGBI provided a clinical interpretation of the data analysed in the 2010 Annual Report.



**The Royal College of Surgeons of England (RCS)** is an independent professional body committed to enabling surgeons to achieve and maintain the highest standards of surgical practice and patient care. The RCS carried out the analysis of the data for the 2010 Annual Report.



**The NHS Information Centre for health and social care (The NHS IC)** is England's central, authoritative source of essential data and statistical information for frontline decision makers in health and social care. The NHS IC managed the publication of the 2010 Annual Report.



**The Healthcare Quality Improvement Partnership (HQIP)** promotes quality in healthcare. HQIP holds commissioning and funding responsibility for the National Bowel Cancer Audit and other national clinical audits as part of the National Clinical Audit & Patient Outcomes Programme (NCAPOP).

# National Bowel Cancer Audit 2010



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# Acknowledgements

The National Bowel Cancer Audit, commissioned by the Healthcare Quality Improvement Partnership (HQIP), has been developed by the Association of Coloproctology of Great Britain and Ireland (ACPGBI) and is managed by the Clinical Audit Support Unit within the NHS Information Centre.

The data for Wales has been supplied by the Cancer Information System Cymru (CANISC) team. Jeff Stamatakis reviewed these data and advised on this report.

The analyses for this report were carried out by the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England (Marialena Trivella and Jan van der Meulen) with support from the NHS Information Centre (Arthur Yelland).

The clinical direction and writing of the report was undertaken by Jason Smith and Paul Finan from the ACPGBI. Additional comment on the clinical content was received from Jeff Stamatakis and Mike Thompson.

The Project Team and Board would like to thank the clinical and non-clinical staff at all NHS trusts who collected and submitted data to the Audit for their hard work, support and leadership.

We would like to acknowledge the contribution of the Open Exeter Helpdesk.

The National Bowel Cancer Audit project team consists of:

- Paul Finan (ACPGBI)
- Jason Smith (ACPGBI)
- Kimberley Greenaway (The IC)
- Arthur Yelland (The IC)

The National Bowel Cancer Audit Project Board consists of:

- Nigel Scott (ACPGBI)
- Julie Henderson (The IC)
- Helen Laing (HQIP)

# Foreword

Clinical audit has become one of the most important aspects of surgery in the modern era. At best it has been responsible for driving up the standards of surgery as exemplified by the Cardiothoracic surgeons following the Bristol enquiry and it behoves all of us in the surgical community to follow that leadership. The Association of Coloproctology of Great Britain & Ireland (ACPGBI) is proud of the fact that our Association has been leading in a similar fashion since 2000 when our first National Bowel Cancer Audit (NBOCAP) was presented. At that time only about 30 per cent of Trusts provided the raw data from which national data outcomes could be extracted. In this audit (which is still completely voluntary) we have 98 per cent of Trusts contributing and in Wales the figure is now 100 per cent.

Since 1999 compulsory self-audit has become part of the General Medical Council's revalidation process for doctors and therefore contribution to the NBOCAP actually facilitates the colorectal surgeon's ability to compile and compare data for annual enhanced appraisal which is soon to become part of the structure of the revalidation process. It is in any event sensible for surgeons to be aware of their own outcomes so as to be able to provide themselves, their patients and their management with up to date figures regarding their current and past performance. This is especially important if the system of "payment by results" is to function properly since without such data it would be meaningless.

The NBOCAP came into being in July 2000 and the first edition was published by Jeff Stamatakis, Mike Thompson and Helen Chave of the ACPGBI together with Robin Kinsman of Dendrite Clinical Systems. The concept of the Audit had come about following an approach by the Joint Consultants Committee to several specialist groups including ACPGBI regarding a quality control initiative. The intention was to establish a series of professionally led studies that would define outcomes and benchmarks in specific areas of care. ACPGBI, through the office of the President at that time, Professor George Parks, initiated an audit of malignant large bowel obstruction and this paved the way for successive audits of Colorectal Cancer outcomes throughout the UK over the last decade.

This year our audit, which was commissioned by the Healthcare Quality Improvement Partnership (HQIP), has been managed by the Clinical Audit Support Unit within the NHS Information Centre, under the Project Manager, Kimberley Greenaway. Much of the clinical interpretation of the data has been performed by the Clinical Effectiveness Unit of the Royal College of Surgeons. Our grateful thanks must go to all of these institutions but especially to Paul Finan and Jason Smith who have compiled the report as well as to Jeff Stamatakis and Mike Thompson who have also contributed. This current report records process of care and outcomes on over 23,000 cases and, for the 2011 report, we are in possession of more than 28,000 cases which represents over 85 per cent of all colorectal cancers. This is a truly great achievement especially bearing in mind the voluntary nature of the submissions. Nevertheless we really need 100 per cent compliance if we are truly to be able to deliver accurate meaningful analysis of our endeavours on a national basis.

Next year we hope to go one step further. The ACPGBI has recognised that we need to streamline the acquisition of the raw data using the entirety of the databases available. This will require co-operation of all the major stakeholders, something which ACPGBI hopes to bring about by inclusive discussions at a very high level. Furthermore, we have a view that we need to revise the audit data collection down to a minimum data set and then have the ability to audit individual areas. The topics that found favour for the next few years are 30-day post-operative mortality, emergency care, complications and low rectal cancer. We will need to alter the data set by July 2012 so that data could be collected from 1 August 2012 if we are to achieve such an analysis in forthcoming years. We also wish to develop the systems such that we can move towards a real time data base. We appreciate that a simple web-based system which could be altered to facilitate individual audits would be an advantage but there is a very real risk that temporarily there might be a drop in case ascertainment and that Trusts with established cancer recording systems would not readily resource a separate submission of data.

There is therefore much work to be done and a lot of negotiation to be undertaken but we must strive towards a standard of excellence in audit processing which is nevertheless deliverable to all of our membership.



**Mike Parker**  
President ACPGBI

# Executive Summary

This annual report of the National Bowel Cancer Audit contains data collected on patients with a diagnosis date between 1 August 2008 and 31 July 2009 - the reporting period 2008/09.

There continues to be an overall increase in submitted cases with over 23,000 cases recorded. This year case ascertainment has been calculated using contemporaneous HES data and registrations from the Welsh Cancer Intelligence and Surveillance Unit (WCISU).

Data quality in several areas has improved markedly and this is referenced in the main findings. A separate data completeness report has been circulated to all submitting units to highlight areas of improved data completeness and to illustrate where data fields are not being completed. There are several areas where firm conclusions cannot be made because of missing data.

This year considerable time and effort has been applied to the design of algorithms to refine the submitted data, to remove duplicate tumour records and to demonstrate the effect of "missing data".

The 2009 report measured aspects of process and outcome against a number of key standards or guidelines from NICE and the ACPGBI and so, rather than repeating these, comparative figures between the 2009 and 2010 reports are provided to illustrate both progress within the Audit and areas which need attention in future years.

As other methods are developed for the gathering of population-based data on patients with bowel cancer, it is the view of the Project Team that the data set for the national audit needs to be refined, be flexible and concentrate on clinical aspects of care which are not readily available from these other sources. Linkage of data sets is now possible and the national audit should identify bespoke audit projects but, at the same time, use the systems and networks that have allowed the Audit to achieve the widespread coverage observed over recent years.



**Paul Finan**  
Clinical Lead,  
National Bowel Cancer Audit

# Main Findings

- All Trusts in England and Wales remain registered with the National Audit.
- Only three Trusts failed to submit data although a further five submitted fewer than five cases. All Trusts in Wales contributed to the Audit. Overall Trust participation has increased to 98 per cent as compared with 95 per cent in 2009.
- Using the HES and WCISU data case ascertainment has been calculated to be 74.7 per cent for English Trusts and over 80 per cent for Trusts from Wales. The way case ascertainment was calculated for the 2009 and 2010 reports differs and so comparisons cannot be made.
- Data completeness for the five variables previously used for risk-adjusted modelling for post-operative mortality has shown a marked improvement with 92.9 per cent of data fields being completed. Overall data completeness for Welsh Trusts was 97.3 per cent.
- The proportion of cases discussed at an MDT rose to 95 per cent (from 83.7 per cent in the 2009 report) and, where stated, 80 per cent of cases were seen by a nurse specialist (an increase from 51.2 per cent in 2009 report). The MDT variable was missing in 7 per cent of cases and no evidence for nurse involvement in 30 per cent.
- There has been no difference in age distribution nor in distribution by site as compared with previous reports.
- Some form of surgical procedure was performed in 75 per cent of cases and a major resection was undertaken in 60 per cent of patients. Urgent or emergency surgery was more common in colonic (27 per cent) than rectal surgery (12 per cent).
- Laparoscopic procedures continued to increase with 25 per cent of cases being completed laparoscopically. The mode of surgery however was not stated in 20 per cent of cases.
- Overall post-operative mortality continued to fall but increased mortality rates were seen again in urgent and emergency cases as compared with elective/scheduled cases. Differences were noted between Networks and Trusts.
- Despite a surgical procedure being performed in over 70 per cent of cases, the Dukes' stage was still missing in 25-30 per cent. This is however a marked improvement from the 2009 report and two important variables in the risk-adjusted modelling, ASA grade and urgency of operation were reported extremely well.
- In rectal cancer cases there was evidence of the use of MR imaging in over 60 per cent of cases but there was uncertainty or no evidence of reported use in 37 per cent of patients.
- The reporting of pathological variables has improved. Where noted, positive circumferential margins were seen in 10.9 per cent of cases but the variable was missing in just under half of cases. It is likely that this is NOT a failure to report within a Trust, from the pathology department, but a failure to submit the data to the Audit. In cases of rectal cancer where radiotherapy had been employed pre-operatively, the positive margin rate was little different (7.3 per cent following short course and 10.6 per cent after long course treatment).
- Reported APER rates are affected by the denominator but the observation of 22.9 per cent of major resections for rectal cancer being an APER is a more believable figure than that obtained last year.

## Recommendations

- Trusts should continue to review their audit data and, using both this report and the recently distributed data completeness report, ensure that accurate and complete data is being submitted to the national audit. Where the data is seen to be missing this should prompt corrective action and further discussion so that accurate comparative feedback can be of value.
- It is vital that MDTs should arrive at an accurate integrated staging of as many cases of bowel cancer as possible. Following a major resection the pathological stage should be recorded in 100 per cent of cases. Where there is no surgery this is very often due to advanced, disseminated disease and can be allocated to modified Dukes' D stage. Only in cases of local excision or polypectomy or where no procedure has been undertaken because of patient preference or associated co-morbidities would a full stage be unavailable.
- It is vitally important that radiological evidence of distant metastatic disease is reported as this has a major effect on observed outcomes.
- Pathologists should continue to report and ensure accurate uploading of the minimum data set of the Royal College of Pathologists. The current recommendation from the Royal College of Pathologists is to use TNM version 5 although the Audit can work with later versions as long as that is indicated in the submission.
- Although there are now other population-based data sets in existence the Audit continues to contribute to the national cancer data repository and many of the clinically determined variables requested are not available through other sources eg, ASA grade, urgency of operation. MDTs are encouraged to continue the improved submission of such data items.
- Post-operative mortality continues to fall but the increased mortality observed in urgent and emergency surgical cases should prompt measures to convert cases of obstruction to an elective procedure whenever possible.
- As laparoscopic techniques become more commonly employed, current NICE guidance of training should be encouraged.
- Complications following surgical resection are poorly reported and these should be recorded and submitted to the Audit.
- Post-operative death is uncommon. The risk-adjusted variables outlined in this report and those that were used in the 2009 report should be recorded in all cases. MDTs are encouraged to discuss all deaths and consider whether they were expected or unexpected and, if unexpected, were they due to avoidable or unavoidable factors.
- With the inception of the LOREC programme all MDTs should consider revision of the protocols for the use of pre-operative radiotherapy in cases of rectal cancer and ensure that full discussion of the surgical options in rectal cancer, including the risk of a permanent stoma, is a part of the pre-operative counselling for all patients.
- As more comparative information becomes available to MDTs, from a variety of sources, there should be regular discussions at a local level to ensure that complete data is submitted to the Audit and any perceived outlying status is investigated promptly. This may involve local audits, review of submitted data, and in depth analysis using case notes.

# 1. Introduction

The first Association of Coloproctology of Great Britain and Ireland (ACPGBI), 'national' report on bowel cancer was published in 1999 by Jeff Stamatakis, Mike Thompson and Helen Chave on behalf of the members of the Association. This was the first of many subsequent reports written by the Association that have indirectly helped improve the management of bowel cancer in the UK. In the forward of that report, the then President of the ACPGBI, John Nicholls stated:

“With the experience gained from this exercise, the foundations are in place for the development of a national audit for large bowel cancer and, at a later date, other diseases.”

Data from the first report was collected from 1997 onwards. As such, with the publication of the current report the ACPGBI has been auditing bowel cancer for almost 15 years. Over the last decade and a half there have been 8 national bowel cancer reports covering a considerable period of change in the management of bowel cancer, including advances in imaging, pre-operative adjuvant treatment, stenting and laparoscopic surgery to name but a few. Where appropriate some comparisons have been made with the state of the Audit now and how it was when it all started 15 years ago. As an Association we must ask ourselves whether or not we have accomplished the aims that John Nicholls set out for us in 1999?

Over the years the Audit has tried to address a number of themes, including 'Risk-Adjusted Outcomes', 'Knowing Your Results', 'Assessing Quality' and 'Open Reporting'. This year, as well as providing the usual audit comparators that individual units use to see how they are performing, we have concentrated in a little more detail on rectal cancer. This is an important topic now that the Low Rectal Cancer National Development Programme (LOREC) is about to start. Members are encouraged to read more about this important development on the LOREC website – [www.lorec.nhs.uk](http://www.lorec.nhs.uk).

The long-term aims of the Audit are:

- to measure the quality of care received by patients with bowel cancer
- to ensure that “best practice” can be identified and encouraged
- to identify variation with the service at a trust, cancer network or national level.

To do this, the Audit investigates variations in treatment of patients with bowel cancer as well as in its outcomes. The results are reported at cancer network and trust level in England and at hospital level for Ireland.

The very first audit on malignant bowel obstruction, published in 1999 included data on 1,046 patients. All general surgeons in England and Wales and members of The Association of Coloproctology in Scotland and Ireland were invited to participate. Approximately 25 per cent returned paper forms with data from 294 surgeons in 148 hospitals. In 2005 the first National Bowel Cancer Audit, NBOCAP, report was published after it received funding from the Healthcare Commission and later from the Healthcare Quality Improvement Partnership as part of the National Clinical Audit Patient Outcomes Programme of the English Department of Health. In 2005 the National Bowel Cancer Audit became a partnership between the ACPGBI and the NHS Information Authority, later becoming the NHS Information Centre. It has since developed into a clinical audit achieving full national coverage.

Compared with previous audit reports the current audit has almost complete coverage of trusts treating bowel cancer in England and complete coverage in Wales. The 2010 Annual Report has data submitted on 23,769 patients, 72 per cent of the expected number of cases for the Audit period in England and 100 per cent in Wales. This is a significant achievement and all participants are to be congratulated on their commitment to the Audit.

One of the challenges with the National Bowel Cancer Audit is to continue the process of audit within the framework of the management of large bowel cancer whilst appreciating that the whole area of cancer intelligence has been re-visited with the formation of the National Cancer Intelligence Network (NCIN). There is a close working relationship between those that manage the national bowel cancer audit project and the NCIN. It is likely that the Audit, whilst collecting a revised minimum data set will concentrate, within this framework, on specific audits. This will commence with data collected from August 2012.

## 2. Methods

### 2.1 Data collection

The Audit is funded to include all NHS trusts in England and Wales. In addition, two hospitals from Northern Ireland and a further two from the Republic of Ireland have regularly reported patients to the Audit. The Audit inclusion criteria include all patients with a diagnosis of bowel cancer admitted for the first time to a NHS trust in England and Wales. This 2010 Annual Report includes patients diagnosed between 1 August 2008 and 31 July 2009. All participating trusts submit their data via the Open Exeter system – visit [www.ic.nhs.uk/bowel](http://www.ic.nhs.uk/bowel) for more information. The Welsh data is submitted directly from the CANISC system to the Open Exeter system. Data from Scotland, Northern Ireland and the Republic of Ireland is sent to the NHS Information Centre (The IC), via Secure File Transfer, for inclusion in the annual report.

Several assumptions had to be made when collating and analysing the data in order to produce the report for this year. These assumptions are clearly stated throughout the text of the report. The analytical and clinical members (Project Team) of NBOCAP determined the assumptions used. A working group of the Association has been established to decide on the clinical direction of the Audit and the subsequent revision of the dataset. The Group will consider developments in treatment including LAPCO (LAParoscopic COlorectal Training Programme) and LOREC (LOW REctal Cancer Training Programme) as well as a need to report outcome measures in a timely fashion.

### 2.2 Data cleaning

#### Multiple records

The dataset consists of a patient record, a tumour record, a treatment record and a follow up record. All of these records are linked by the caespell number when entered into the Open Exeter data collection system.

In [Table 2.1](#), it is shown that for about two thirds of the patient records there was one tumour record and one treatment record in the linked data set. A very small number

of patient records were linked to two tumour records or more. However, about one in five patient records were linked to at least two treatment records. It was assumed that these multiple tumour and multiple treatment records involved the same tumour episode if their dates fell within a period of two years. If that was the case an algorithm developed by the Project Team was applied to reconcile potentially conflicting information between the multiple records. Although the true incidence of synchronous is low the system, as it currently stands, might miss true, synchronous lesions.

#### Multiple tumour records

If multiple tumour records were available, we considered a second tumour diagnosed within two years as a duplicate record, irrespective of the tumour site. Second tumours, diagnosed more than two years after a first tumour, were considered to be a separate cancer.

If a second tumour record was present, that was diagnosed within two years; we always took the earlier date of diagnosis and the more advanced or more severe results from the available records. If there was conflicting information about tumour site, this was resolved by choosing the site that was compatible with available treatment information; if no treatment record was available, the most distal site was chosen.

After application of these rules, we identified 43 patients diagnosed between 1 August 2007 and 31 July 2009 (ie, also including the previous audit year). These patients were not included in this report.

#### Multiple treatment records

In case of conflicting information on treatment information, we chose the most recent date and the value that reflected the most advanced or severe results. We considered that procedures and treatments were carried out if that was recorded in at least one of the multiple treatment records. In case of conflicting information about the surgical procedure, we took the procedure that was most compatible with the site recorded in the tumour record.

**Table 2.1**  
Distribution of multiple records per patient record on unique identifier

	Diagnosis date			
	Previously reported		Current audit period	
	1 Aug 2007- 31 July 2008		1 Aug 2008 – 31 July 2009*	
	Number	%	Number**	%
One tumour record, one treatment record	14,727	70.2	15,978	67.2
One tumour record and no treatment record	1453	6.9	1916	8.0
One tumour, multiple treatment records	4182	19.9	5189	21.8
Multiple tumours, no treatment record	9	0.04	16	0.1
Multiple tumours, 1 treatment record	127	0.6	90	0.4
Multiple tumours, multiple treatment record (in total for all tumours)	491	2.34	580	2.4
<b>Total</b>	<b>20,989</b>	<b>100</b>	<b>23,769</b>	<b>100</b>

\* The data from England, Northern Ireland and the Republic of Ireland included patients with a date of diagnosis from 1 August 2008 to 31 July 2009. However, data from Wales included patients with a date of diagnosis from 1 August 2008 to 31 March 2009.

\*\* Note that the total number of records showing here does not match the total number of patients included in the analyses included in this report as further data cleaning took place to eliminate duplicates and erroneous entries.

## Identifying patients with rectal cancer

In this report, the treatment of patients with rectal cancer has been given special attention. Data quality for reporting of 'Site of Tumour' is not as good as it should be, and cannot always be used to determine whether or not a patient has a rectal cancer. An algorithm was therefore developed by the Project Team to classify a patient in the Audit as having a rectal cancer:

- Patients that had 'site' reported as rectal cancer without a report of surgical treatment
- Patients that had 'site' reported as rectal cancer with a report of surgical treatment that was appropriate for rectal cancer
- Patients that had a report of administration of radiotherapy (irrespective of cancer site and surgical treatment)
- Patients that had a T stage reported on an MRI scan (irrespective of cancer site and surgical treatment)

The cancer site was considered to be unknown if according to the agreed records in the database:

- Patients had colon or rectosigmoid cancer with a procedure that is only appropriate for rectal cancer (APER, TART and TEMS).

## Determining Dukes' stage

Dukes' staging was supplied directly to the Audit by the participating trusts as both pathological and modified Dukes' stage. This reported Dukes' stage was updated based on additional information that could be derived from the submitted data in the following way:

- Patients who had major surgery were considered to have Dukes' stage A if the T stage was reported to be T1 or T2 and the nodes were reported to be negative
- Patients who had major surgery were considered to have Dukes' stage B if the T stage was reported to be T3 or T4 and the nodes were reported to be negative
- Patients who had major surgery were considered to have Dukes' stage C if the nodes were reported to be positive
- If any of the fields, including pre-operative staging fields, indicated that a patient had distant metastases, patients were considered to have Dukes' stage D
- In case of conflicting staging information, the most advanced stage was adopted.

Where pre-operative neoadjuvant therapy has been used, the potential reduction in the total number of nodes retrieved will affect the determination of Dukes' stage through the process above. However, the combination of both pathological and modified Dukes' staging data, taking all staging modalities into account, is still considered to be the best approach for the Audit.

## 2.3 Case ascertainment

Case ascertainment was calculated by comparing the number of tumour cases reported to the Audit with the total number of eligible cases recorded in the Hospital Episode Statistics (HES). Whereas in previous years historical cancer registry data was used to estimate the total number of cases, the Audit was able to use contemporaneous HES data. The patient inclusion criteria for the 2010 Annual Report, is all patients with bowel cancer diagnosed between 1 August 2008 and 31 July 2009.

Wales Cancer Intelligence and Surveillance Unit (WCISU) registrations were used for Wales taking into account that the data only covered patients with a date of diagnosis between 1 August 2008 and 31 March 2009.

Case ascertainment could not be reported for either Northern Ireland or the Republic of Ireland because of the lack of denominator data.

## 2.4 Data completeness

Data completeness for the 2010 Annual Report was defined as the percentage completeness of the five data items previously used, in the 2009 report, to risk-adjust for 30-day post-operative mortality (ASA grade, Dukes' stage, age, urgency of operation, and type of procedure). Data completeness for each trust was expressed as the average of the five percentages. Clearly this method of calculating data completeness only allows reporting for cases treated with major surgery. In this report comment is made on the completeness of additional individual data items as appropriate and this should not be confused with the above.

## 2.5 Handling missing data

The design of the dataset does not directly allow the distinction of patients who had undergone non-operative treatment or in whom the data item was just missing. The Project Team devised another algorithm as follows:

- We identified all patients for whom data on the type of surgical procedure was missing
- In these patients, we looked for further information that indicated that they might have undergone a surgical procedure (eg, number of excised nodes, circumferential margins, post-operative complications)
- If such information could be found, we grouped the patients with missing data on type of surgery into the category "other procedure"
- If such information could not be found, we assumed that they had not had a surgical treatment.

Similar issues arose for diagnostic and staging procedures. For example, we have reported that a CT or MRI scan was carried out if we could find information about their results.

## 2.6 Statistical Analysis

The majority of the results reported in this audit report are descriptive. The results of categorical data items are reported as percentages. *The denominator is, in most cases, the number of patients for whom the value of the data item was complete, so cases with missing data were not included in most of the calculations.* Therefore, results will differ from previous reports where cases of missing data items were included in the denominator.

Results are typically grouped by cancer network and/or trust. The 30 English cancer networks were used in the analyses, however since this reporting period the number has dropped to 28 cancer networks. The results for Wales are reported according to where the multidisciplinary team who discussed the patients' management were located. All hospitals in Northern Ireland and the Republic of Ireland are grouped together within each country.

### Funnel plots

Funnel plots were used to present the 30-day post-operative mortality after major surgery. In this funnel plot, the 30-day post-operative mortality for each trust is presented as a function of the total number of patients who had major surgery. The "target" was specified as the average 30-day post-operative mortality in all patients who had major surgery included in the national audit. The "limits of acceptable performance" were based on statistical criteria. Results were considered "acceptable" if they were not statistically significantly different from the target at a 0.05 level (represented by the inner funnel limit, which is a threshold for an "alert") or at a 0.002 level (represented by the outer funnel level, which is a threshold for an "alarm"). This would imply that 95 per cent of the trusts or hospitals are expected to be within the inner funnel limit and 99.8 per cent within the outer funnel limit, if they are all performing according to the target. In this report, we consider only those trusts with results outside the outer funnel limit as potential outliers. This is in line with the recently published Detection and management of outliers document prepared by The National Clinical Audit Advisory Group and published by the Department of Health ([www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_123589](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_123589)).

### Adjusted mortality results

Multivariable logistic regression was carried out to estimate risk-adjusted 30-day post-operative mortality results for patients undergoing major surgery. Only trusts with a level of completeness of the mortality data of 80 per cent or above were included. The logistic regression model for the 2010 report included the patients' sex, age, ASA grade, Dukes' stage, cancer site, procedure and urgency of operation. Multiple imputation was used to fill in missing data.

All statistical calculations were performed with Stata version 11.

## 3. Trust participation, case ascertainment and data completeness

### 3.1 Trusts and Cancer Network

Trust participation, case ascertainment and data completeness are reported according to the following algorithm:

- 1) Take Surgery Provider Organisation Code where available
- 2) If not, take Place First Seen Organisation Code
- 3) If not, take Treatment Original Organisation Code
- 4) If not, take Tumour Original Organisation Code.

### 3.2 Participation

This annual report includes data on patients diagnosed with bowel cancer between 1 August 2008 and 31 July 2009. The data submitted from Wales covered a different time period (1 August 2008 and 31 March 2009) and as such covers only 66 per cent of the reporting time period of the other countries. This will potentially skew the results for Wales and members are referred to the full Welsh report available for download off the Wales NHS website ([www.wales.nhs.uk/sites3/Documents/322/Wales%20Bowel%20Cancer%20Report%20July%202010.pdf](http://www.wales.nhs.uk/sites3/Documents/322/Wales%20Bowel%20Cancer%20Report%20July%202010.pdf)) for a fuller description of bowel cancer treatment in Wales.

#### England

In this audit period, 147 English NHS Trusts in England participated and no data was received from three English Trusts. In this report however, we will report the results for 150 English sites as three hospitals within Worcestershire Acute Hospitals NHS Trust and two within the Western Sussex Hospitals NHS Trust are part of different cancer networks.

The following English Trusts (with their cancer network in brackets) reported no patients to the Audit:

- West Hertfordshire Hospitals NHS Trust (Mount Vernon)
- University College London Hospital NHS Foundation Trust (North London)
- Ashford and St Peter's Hospital NHS Trust (Surrey, West Sussex & Hampshire)

The following Trusts reported five patients or fewer to the Audit:

- Medway NHS Trust (Kent & Medway)
- The Mid Cheshire Hospital NHS Trust (Greater Manchester and Cheshire)
- Doncaster and Bassetlaw Hospitals NHS Foundation Trust (North Trent)
- The Princess Alexandra Hospital NHS Trust (North London)
- North Middlesex University Hospital NHS Trust (North London)

The 147 participating English NHS Trusts, representing 98 per cent participation in England, reported 21,891 patients. This is an improvement on last year's 95 per cent participation.

#### Wales

The patients from Wales are reported according to the multidisciplinary team (MDT) in which they were first discussed. All 13 Welsh MDTs participated – 100 per cent participation, a maintained excellence from Wales.

The Audit included 1,256 patients from Wales – please see the comments on data submission from Wales above. Based on previous years data this number of patients is as expected.

#### Northern Ireland

Two sites in Northern Ireland participated during the Audit period. They reported 374 patients.

#### Republic of Ireland

Two Irish sites, both in Dublin, participated and reported 248 patients. Clearly these data represent only a small proportion of cases treated in the Republic but, for the purposes of comparative audit, and as a service to members of the Association, they are included and submissions from other units within the Republic is to be encouraged.

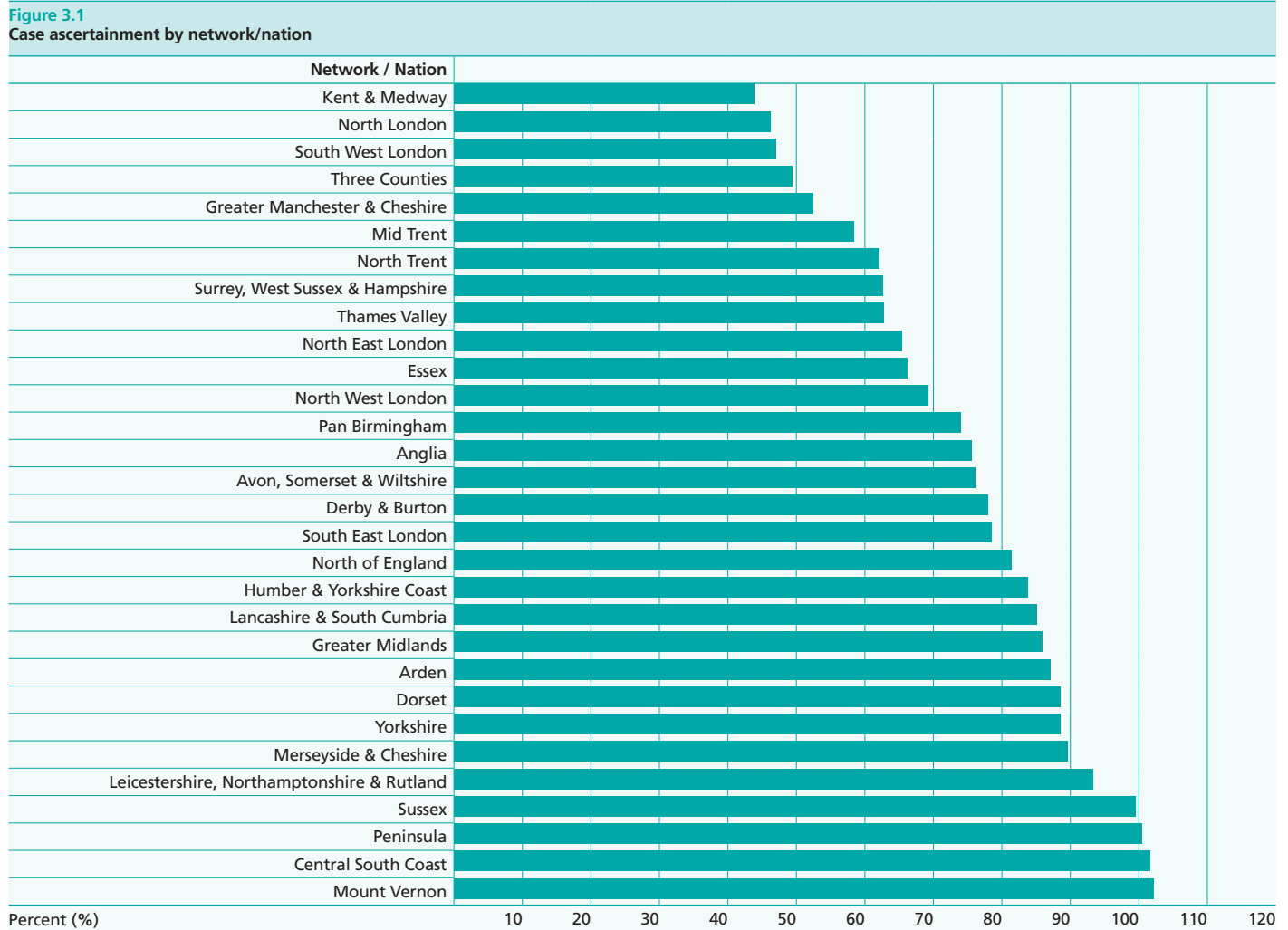
### 3.3 Case ascertainment in England and Wales

Overall case ascertainment was 74.7 per cent for English Trusts. Of the 150 English sites, 25 (16.7 per cent) had a case ascertainment of 50 per cent or less, 36 (24.0 per cent) a case ascertainment between 50 per cent and 80 per cent, 84 (56.0 per cent) a case ascertainment between 80 per cent and 120 per cent, and 5 (3.3 per cent) a case ascertainment above 120 per cent. Full details of case ascertainment are shown in [Appendix 1](#). Calculation of case ascertainment presents many problems but on this occasion comparison with HES data was used. In the 2009 Report we used historical data from Cancer Registries. These differing methods make comparisons between reports difficult nevertheless underlying trends can be noted and is pleasing to see the improvement year on year.

In [Figure 3.1](#), we display the case ascertainment for the participating English networks. This has been done in an attempt to prompt the cancer network leads to positively encourage their respective Trusts to participate in the Audit and improve their overall figures. Case ascertainment varied from just below 43.8 per cent in Kent & Medway to close to 100 per cent in Sussex, Peninsula, Central South Coast and Mount Vernon.

The overall case ascertainment in Wales was 97.3 per cent. Case ascertainment was between 80 per cent and 120 per cent in all 13 participating MDTs. Results for the individual MDTs in England and Wales are shown in [Appendix 1](#).

As explained before, case ascertainment for the participating hospitals in Northern Ireland and the Republic of Ireland could not be estimated because we did not have the total number of patients admitted with a diagnosis date within the audit period.



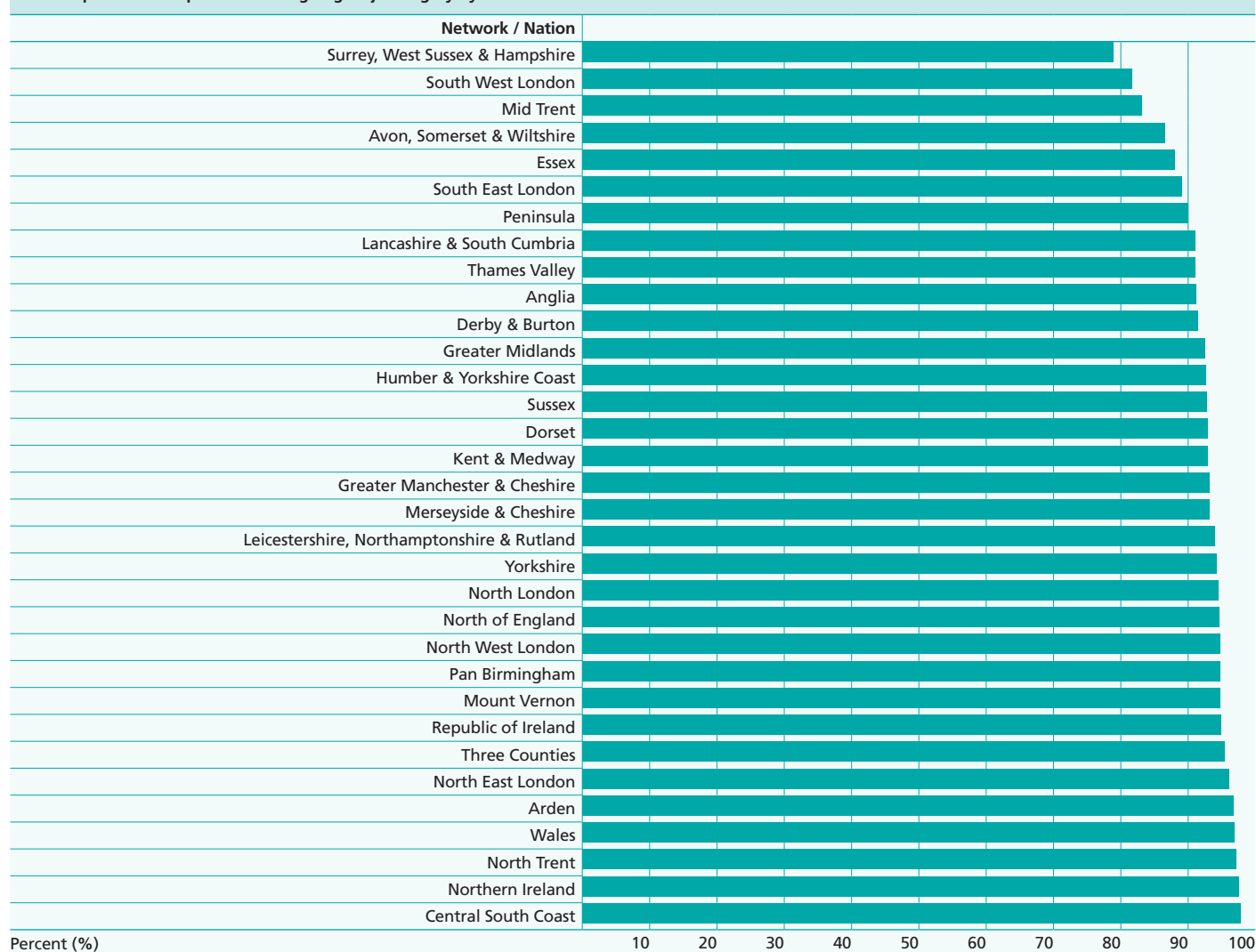
### 3.4 Data completeness

Overall data completeness based on the previously used mortality model variables of ASA grade, Dukes' stage, age, urgency of operation, and type of procedure in all patients undergoing major surgery was 92.9 per cent.

Data completeness was 92.6 per cent in England, and varied according to cancer network from 78.9 per cent in Surrey, West Sussex & Hampshire to 97.9 per cent in Central South Coast (Figure 3.2). Appendix 1 demonstrates that data completeness of the 143 sites that reported patients undergoing major surgery to the Audit was below 50.0 per cent in one trust, between 50 per cent and 80 per cent in 18 trusts (12.6 per cent), and 80 per cent and over in 124 trusts (86.7 per cent). Data completeness was 96.8 per cent in Wales, 97.5 per cent in Northern Ireland, and 94.9 per cent in the Republic of Ireland (Figure 3.2), a distinct improvement on the 2009 Annual Report.

Although overall data completeness is excellent for the previously mentioned five variables, one can see that with some of the individual data items, mentioned later in the report, a considerable proportion have missing values. For example, the results of the CT scan are not available in about 40 per cent of the patients. It is not known whether a nurse specialist saw a patient in one third of the cases and in about 30-40 per cent of the patients, submitted to the Audit, who underwent a major resection, there is no information about important pathological variables eg, extramural vascular invasion or circumferential margin status. All trusts have received a data completeness report which should focus attention on these missing data items.

**Figure 3.2**  
Data completeness for patients undergoing major surgery by network/nation



## 4. Audit Results

In this section, we report the results at national level and according to cancer network or nation. Some key results for the individual Trusts relate to all patients and are presented in [Appendix 2](#) (patients discussed at MDT meeting, assessed by clinical nurse specialist, CT scan results). Corresponding results for patients undergoing major surgery are presented in [Appendix 3](#) (patients with advanced disease at the time of surgery (Dukes' stage D), major surgery carried out as an urgent or emergency procedure, median lymph nodes taken, observed and adjusted 30-day mortality).

### 4.1 Audit population

This report includes 23,769 patients who were diagnosed with bowel cancer in the Audit period ([Table 4.1](#)). The most common age to develop bowel cancer is still in the 70s and this has not changed at all compared with the first ACP report. It is also interesting to note that the ASA distribution is almost identical to that published in 1999. Three quarters of patients were identified as having undergone some form of surgical treatment and about 60 per cent were recorded as having had a major surgical procedure. Patients were considered to have undergone a major surgical procedure if they had a segmental colectomy of some sort, a colectomy, an anterior resection (AR), an abdominoperineal excision of the rectum (APER), or a Hartmann's procedure.

About three quarters of all included patients were 65 years or above and slightly less than 60 per cent were men. About 60 per cent were diagnosed with colon cancer, about one third with rectal cancer, and the remaining with rectosigmoid cancer according to the definition used for rectal cancer ([Section 2.2](#)).

**Table 4.1**  
Characteristics of all patients with bowel cancer included in the current audit report

		Number	(%)
Total number of reported cases		23,769	
Total number of surgically treated cases		18,215	76.6
Total number of major resections		14,450	60.8
Sex	Male	13,481	56.8
	Female	10,279	43.2
	Missing (% of total)	9 (0.04)	
Age group	≤65 yrs	6711	28.2
	65-74 yrs	7213	30.4
	75-84 yrs	7253	30.5
	84-94 yrs	2515	10.6
	≥85 yrs	77	0.3
Cancer Site	Colon	14,524	61.4
	Rectosigmoid	1497	6.3
	Rectum	7648	32.3
	Unknown (% of total)	100 (0.4)	

## Description of patients according to cancer site

Table 4.2 demonstrates that among the 23,669 patients with a known cancer site those diagnosed with rectal cancer were more often men and younger than those diagnosed with colon cancer. As can be expected, the sex and age distribution of patients with rectosigmoid cancer fell somewhere in between the characteristics of patients with rectal and colon cancer.

		Colon		Rectosigmoid		Rectal	
		Number	(%)	Number	(%)	Number	(%)
<b>Total patients per cancer site</b>		14,524		1497		7648	
<b>Sex</b>	Male	7714	53.1	907	60.6	4807	62.9
	Female	6806	46.9	590	39.4	2836	37.1
	Missing (% of total)	4 (0.03)		0 (0.0)		5 (0.7)	
<b>Age-group</b>	≤65 yrs	3613	24.9	420	28.1	2647	34.6
	65-74 yrs	4375	30.1	496	33.1	2319	30.3
	75-84 yrs	4803	33.1	434	29.0	1975	25.8
	85-94 yrs	1690	11.6	144	9.6	676	8.9
	≥95 yrs	43	0.3	3	0.2	31	0.4
<b>Dukes'</b>	A	1236	11.4	178	17.0	1094	22.5
	B	4018	36.9	327	31.2	1229	25.3
	C	2969	27.3	272	26.0	1290	26.5
	D	2663	24.5	270	25.8	1247	25.7
	Missing (% of total)	3638 (25.1)		450 (30.1)		2788 (36.5)	
<b>Liver metastasis</b>	Liver metastasis	1568	10.8	175	11.7	736	9.6
	Normal Liver	7068	48.7	699	46.7	3848	50.3
	Liver uncertain (includes missing data)	5888	40.5	623	41.6	3064	40.1

## Advanced disease

About a quarter of patients had advanced bowel cancer (Dukes' stage D) at the time of presentation. This is quite an increase on 1999 (19 per cent), which is interesting as the 1999 report was concerned with obstructed cancers but is probably nearer the true figure in a period prior to the full introduction of a national screening programme. Ten per cent of the patients were reported as having liver metastases according to the CT scan. About half of the patients were reported to have a normal liver according to CT scan results. The interpretation of the CT results is hampered however as they were uncertain or unavailable in about 40 per cent of the patients. There will be a percentage of patients categorised as Dukes' D without liver metastases, but the majority will have liver disease. It is likely that the data item on CT diagnosed liver disease is poorly reported. It is very important that units submitting data are as vigilant as possible when completing these data items for the Audit and indicate the result of the CT scan as well as providing a date for the scan.

In England 24.7 per cent of the patients had Dukes' stage D cancer. The corresponding figures were 25.7 per cent for Wales, 30.1 per cent for Northern Ireland, and 24.1 per cent for the Republic of Ireland. [Figure 4.1](#) demonstrates that the proportion of patients with Dukes' stage D varied according to network. This proportion varied from 8.7 per cent in Surrey, West Sussex & Hampshire to 35.5 per cent in Mount Vernon. There are significant variations in the rates of presentation of advanced disease worldwide, but not to this extent across a nation as small as the UK. The figures reported here are likely to be the results of under-reporting.

It is reassuring to see that the proportion of cases of advanced stage bowel cancer undergoing major surgery who had advanced stage cancer (Dukes' D) remains fairly constant at around the 13-14 per cent level. The impact of the National Bowel Cancer Screening Programme will not be seen on this figure for a number of years. It is also important to realise that advanced stage disease is not a contraindication to surgery. With advances in neo-adjuvant/adjuvant therapy, and increasing resection rates for liver and lung metastases it is possible to offer patients a good quality of prolonged life despite major surgical intervention. Some patients with advanced disease will of course require surgery for bleeding or less commonly, with the increasing use of colonic stents, obstruction. [Table 4.4](#) gives a breakdown, by Dukes' stage, of cases treated both electively and urgently and there appears, if one looks at the proportion of Dukes' stage A and D in the elective versus urgent/emergency category, to be a general trend to more advanced cases presenting and being treated urgently or as an emergency.

## 4.2 Patient management

### Discussion at an MDT meeting and assessment by clinical nurse specialist.

[Table 4.3](#) demonstrates that more than 95 per cent of the patients, irrespective of cancer site, were discussed at a multidisciplinary team (MDT) meeting. Around 80 per cent were seen by a clinical nurse specialist and again this percentage did not vary appreciably according to cancer site.

This is a great improvement on the 2009 report where 83.7 per cent were discussed at the MDT and 51.2 per cent seen by a CNS. This is an important item to report as it indicates that almost all bowel cancer patients are now being treated by the multidisciplinary approach and being seen by a high quality nurse specialist with all the benefits this entails. This is also an important peer review measure that trusts now need to self-report.

*NICE guidance and Peer Review recommendations are that 95 per cent to 100 per cent of patients should be discussed at an MDT meeting.*

*NICE guidance is that 100 per cent of patients should be seen by a specialist nurse.*

### CT scan

CT scan results were reported for 60 per cent of the patients with no difference according to cancer site. This is a difficult measure to report, as it is a derived measure. We do not have a specific data item to say whether or not a CT scan was done and have to rely on the result of the CT scan to say it has been done. Unfortunately we suspect that a proportion of patients with a normal CT of their liver will not have the item reported in the Audit at all leading to a significant amount of missing data. As previously mentioned we will report next year evidence to support the overall use of CT scans to stage disease but in order to correct the stage the results of the CT scan will need to be reported and require a concerted effort in the future.

*NICE guidance is that 100 per cent of patients should have a CT scan.*

## Surgery

Overall 76.5 per cent of patients underwent a surgical procedure, with 60.6 per cent undergoing a major resection. This is little different from the 2009 report, but a 15 per cent reduction from 4 years ago, and a 32 per cent reduction from a decade ago. On those patients who had surgery, 82.5 per cent of patients with colon cancer underwent major surgery and this percentage was 76.2 per cent for those with rectosigmoid cancer, and 72.8 per cent for those with rectal cancer. The reasons for this observation are probably twofold. In the early days of the Audit, cases were submitted primarily by surgeons and a surgical procedure was likely to have occurred whereas it is now common practice to populate the Audit from cancer management systems which are more comprehensive and used within the setting of the MDT. Cases presenting to the MDT with advanced disease or who are considered for non-operative management are more likely to be included. This observation reflects the Audit being more than an audit of surgical management alone.

In those patients who did not undergo surgical treatment it is apparent that this is considered more often in those with rectal cancer (14.7 per cent) as compared with tumours of the rectosigmoid (12.8 per cent) or colon (11.9 per cent). The reasons for this are not clear from the Audit. Table 4.3 shows that there is little difference between those patients who did and did not undergo a surgical procedure in terms of their age or sex but the observation of 75 per cent of those not undergoing surgery being staged as Dukes' D must reflect widespread disease on imaging (the reason for stating Stage D without surgery). It is also worth noting the non-surgical rate in those over 85 years of age, an observation seen in a recent report from the NCIN on major resection rates ([www.ncin.org.uk](http://www.ncin.org.uk)).

**Table 4.3**  
Characteristics of 23,669 patients according to whether a surgical procedure was performed

		Treatment			
		No surgical procedure		Surgical procedure	
		Number	%	Number	%
<b>Number of patients</b>		6,047		17,622	
<b>Sex</b>	<b>Male</b>	3439	56.9	9989	56.7
	<b>Female</b>	2606	43.1	7626	43.3
	<b>Missing (% total)</b>	2 (0.03)		7 (0.04)	
<b>Age-group</b>	<b>≤65 yrs</b>	1463	24.2	5217	29.6
	<b>65-74 yrs</b>	1483	24.5	5707	32.4
	<b>75-84 yrs</b>	1987	32.9	5225	29.7
	<b>85-94 yrs</b>	1064	17.6	1446	8.2
	<b>≥95 yrs</b>	50	0.8	27	0.2
<b>Dukes' stage</b>	<b>A</b>	118	4.7	2390	16.8
	<b>B</b>	263	10.4	5311	37.3
	<b>C</b>	231	9.1	4300	30.2
	<b>D</b>	1927	75.9	2253	15.8
	<b>Missing (% total)</b>	3508 (58.0)		3368 (19.1)	

27.9 per cent of the surgical procedures in patients with colon cancer were urgent or carried out as an emergency, whereas the corresponding percentage was 22.4 per cent in those with rectosigmoid cancer and 12.6 per cent in those with rectal cancer. Rectal cancer tends to present less acutely and the only real indication to perform an emergency rectal cancer resection is perforation of the bowel. Obstruction can be stented or defunctioned allowing correct staging of the rectal cancer and the opportunity for the patient to have pre-operative radiotherapy and surgery by a trained colorectal surgeon.

About one quarter of all surgical procedures were fully completed laparoscopically. There were only small differences in the proportion of patients treated laparoscopically according to cancer site. It is interesting to note that 70 per cent of the laparoscopic resections performed were for colonic/rectosigmoid tumours. The LAPCO programme trains surgeons specifically for colonic surgery and the evidence behind the efficacy and suitability of laparoscopic surgery for rectal cancer is controversial and the subject of the next report.

### Major surgery

The characteristics of the patients undergoing major surgery are presented in [Table 4.4](#).

A quarter of patients, reported to the Audit, as undergoing major surgery for colon cancer and a third of patients, reported to the Audit, as undergoing major surgery for rectal cancer were older than 75 years. About a third of patients with colon cancer had an ASA status of III ("restrictive disease") or worse, whereas the corresponding proportion for rectal cancer was about a quarter. 25 patients were classified as ASA V (not expected to survive 24 hours). 30-day mortality in this group was 40 per cent, but the Audit does not yet collect sufficient information on co-morbidity to analyse this group further. ASA grading is a vital component of the Audit and a data item not collected elsewhere. It is encouraging to see that ASA grading is collected in around 80 per cent of surgical cases although further improvement in recording of this valuable item is to be encouraged.

### Dukes' stage

About a third of the patients with colon cancer had loco-regional disease with positive nodes, and about one in eight distant metastases. Distant metastases were less often found in patients with rectal cancer.

In England, 12.4 per cent of the patients who had major surgery had Dukes' stage D. The corresponding figures were 10.9 per cent for Wales, 23.9 per cent for Northern Ireland, and 24.1 per cent for the Republic of Ireland. The Audit is not yet sophisticated enough to describe in detail the management of patients with metastatic disease. With improvements in chemotherapy, new trial data and the willingness of liver surgeons to operate on metastases more patients with distant metastatic disease are now being offered surgery. However the bowel surgery they receive may be a considerable time after the diagnosis. Equally, as previously mentioned recognition of non-curable metastatic disease may lead to a reluctance to resect the primary tumour.

[Figure 4.2](#) demonstrates again that the proportion of patients with Dukes' stage D at the time they had major surgery was high in Northern Ireland. In England, it varied from 3.7 per cent in Surrey, West Sussex & Hampshire to 24.1 per cent in the Three Counties ([Figure 4.2](#)) – these results should be interpreted with caution as this is most likely a reflection of under-reporting of Dukes' stage.

**Table 4.4**  
Description of Dukes' stage according to urgency of surgery in 14,355 patients undergoing a major resection

	Urgency of major resection										
	Elective		Scheduled		Urgent		Emergency		Missing (% total)		
	Number	%	Number	%	Number	%	Number	%	Number	%	
<b>Number of patients</b>	8,696		2,226		1,596		1,228		609		
<b>Dukes' stage</b>	<b>A</b>	1,508	19.5	363	17.8	134	9.9	30	2.8	78	17.5
	<b>B</b>	3,032	39.2	815	40.0	522	38.7	398	37.2	190	42.7
	<b>C</b>	2,429	31.4	635	31.2	429	31.8	366	34.2	125	28.1
	<b>D</b>	761	9.8	223	11.0	264	19.6	276	25.8	52	11.7
	<b>Missing (% total)</b>	966 (11.1)		190 (8.5)		247 (15.5)		158 (12.9)		164 (26.9)	

## Urgency of operative procedure

About a quarter of patients reported as having major surgery for colon cancer had an urgent or emergency procedure. The corresponding percentages were 20 per cent for patients with rectosigmoid cancer and 10 per cent for those with rectal cancer. The 'true' emergency surgery rate is likely to be lower than reported here if The National Confidential Enquiry into Patient Outcome and Death (NCEPOD) definitions are applied correctly. An 'emergency' operation is one carried out at the same time as resuscitation usually within 1 hour of presentation. With this definition in mind there are few situations where bowel cancer resections need to be done as an emergency. Most bowel cancer surgical procedures, presenting via the 'emergency' take system, will be operated on as an urgent (after resuscitation and within 24 hours) or as an elective case. Previous NBOCAP reports have highlighted the need for submitting units to be clear about the urgency grading for surgery and we would encourage units to look at this again.

CEPOD classification:

- Elective: Operation at a time to suit both patient and surgeon eg, after an elective admission
- Scheduled: An early operation but not immediately life-saving. Operation usually within 3 weeks
- Urgent: As soon as possible after resuscitation and usually within 24 hours
- Emergency: Immediate and life-saving operation, resuscitation simultaneous with surgical treatment. Operation usually within 2 hours.

Major surgery was carried out as an urgent or emergency procedure in 21.0 per cent of the cases in England, in 17.2 per cent in Wales, 9.1 per cent in Northern Ireland, and in 22.5 per cent in the Republic of Ireland. The proportion of major surgical procedures carried out urgently or as an emergency varied from 8.6 per cent in Dorset to 47.5 per cent in Surrey, West Sussex & Hampshire (Figure 4.3). This again may be due to misreporting of urgency of surgery as described above. It is not conceivable that nearly 1:2 patients with bowel cancer in Surrey require surgery for their bowel cancer within 24 hours of presentation. If one compares these results to the 1999 MBO study, 13.8 per cent were done as an emergency and 46.6 per cent as urgent.

*NICE guidance is that facilities and services should be established to provide stenting for patients with intestinal obstruction, particularly those with serious comorbidity, so that high-risk emergency surgery may be avoided.*

## Surgery

About 60 per cent of the patients with colon cancer underwent a right hemicolectomy and this represents 38 per cent of all major resections performed. About three quarters of patients with rectosigmoid cancer and about two thirds with rectal cancer had an anterior resection. Table 4.4 also demonstrates that the cancer site and the reported procedure do not always correspond and this is the reason the Project Team had to apply various algorithms as described in Section 2. We urge all submitting units to please check their submissions that the cancer site does correspond with the procedure performed – patients with rectal cancer very rarely need a right hemicolectomy for their disease! Either the site or the procedure is reported incorrectly, and if it is not possible for us to work out which from the other data items we have to discount the procedure which will affect the unit's overall outcomes.

### 4.3 Surgical & pathological outcomes after major surgery

The outcomes of major surgery are presented in Table 4.5 according to cancer site.

#### Extramural vascular invasion

Extramural vascular invasion was observed more frequently in patients who had major surgery because of colon cancer (30.8 per cent) than in those who had the procedure because of rectal cancer (22.8 per cent). Units are reminded to check with their pathologist that they are accurately reporting extramural vascular invasion and not lymphovascular invasion. The Audit currently does not collect data on the latter, but it can easily be confused with the former.

#### Excised lymph nodes

The median number of excised lymph nodes did not vary a lot according to type of surgery. The median number of excised nodes was less for rectal cancer surgery (13) than colonic surgery (15) as expected and this is likely to be due to the effects of radiotherapy. Previous work by this group on the nodal harvest model ([www.riskprediction.org.uk](http://www.riskprediction.org.uk)) has shown the effect of radiotherapy on reducing nodal harvest.

We found that 43.9 per cent of patients who had major surgery for colon cancer had at least one positive node. The corresponding figures were 42.3 per cent for rectosigmoid cancer and 38.7 per cent for rectal cancer. This again is probably a reflection of the late presentation of disease in the UK. The advent of the screening programme should hopefully show a decrease in this with a greater proportion of Dukes' A and polyp cancers as are seen in other countries. The effect will not be seen for a number of years.

### Length of hospital stay

The length of hospital stay was longer for patients who had major surgery for rectal cancer (median 10 days) than for those who had the procedure for another cancer site (median 8 days).

The Audit does not yet collect information on units who participate in Enhanced Recovery Programmes ([www.dh.gov.uk/en/Healthcare/Electivecare/Enhancedrecovery/index.htm](http://www.dh.gov.uk/en/Healthcare/Electivecare/Enhancedrecovery/index.htm)) or more importantly whether or not an individual patient was entered into the programme, completed it successfully or had to come out of the programme. There is anecdotal evidence that patients who require a stoma will stay longer than those who do not, even when put through enhanced recovery. Pre-operative stoma education, using models etc can reduce this effect, but consumes a lot of resources and the impact on cost-effectiveness has not been established.

LOS did correlate with the presence or not of a stoma in rectal cancer surgery (11 vs 8 days respectively) and it is likely that this accounts for the increased LOS of rectal cancer surgery over colonic surgery.

Length of stay varied considerably as has been shown before in previous reports. 25 per cent of the patients had a length of stay of 6 days or shorter. Also 25 per cent of the patients stayed in hospitals 13 days or longer and 10 per cent stayed 24 days or longer.

Length of stay was somewhat longer in the Republic of Ireland. Median length of stay was 8 days in England, 8.5 days in Wales, 7 days in Northern Ireland, and 11 days in the Republic of Ireland. The only real difference between nations was a slightly higher ASA grade in the Republic of Ireland compared to the others, but this was not significant due to small numbers.

In England, 77.1 per cent of the patients stayed longer than 5 days in hospital. This percentage was 80.0 per cent in Wales, 76.2 per cent in Northern Ireland and 93.3 per cent in the Republic of Ireland. [Figure 4.4](#) shows that the percentage of English patients who stayed in hospital more than 5 days was highest in Greater Manchester and Cheshire (88.7 per cent) and lowest in Surrey, West Sussex & Hampshire (50.7 per cent).

### Post-operative mortality

Mortality within the first 30 days after major surgery was 4.0 per cent for patients with colon cancer, 3.7 per cent for patients with rectosigmoid cancer, and 2.7 per cent for patients with rectal cancer. Mortality was considerably higher in those who had emergency surgery (9.3 per cent with colon cancer, 11.7 per cent with rectosigmoid cancer, and 12.3 per cent with rectal cancer), but is considerably lower than in 1999 where the mortality from surgery for malignant bowel obstruction was 15.7 per cent overall, 20 per cent for 'emergency' surgery and 17.2 per cent in 'urgent' surgery. Mortality figures reported by the Audit are slightly different to those reported elsewhere (such as from the National Cancer Data Repository) due to incomplete data in the Audit. Although date of death is populated automatically from the Open Exeter system if there is no 'date-of-surgery' reported by the submitting unit it is impossible to calculate 30-day mortality for those particular patients. Of patients who had undergone a major surgical procedure, 9.3 per cent had no reported date of surgery or an invalid date (date of surgery before date of diagnosis or after date of death).

In England, 3.4 per cent of the patients undergoing major surgery died within 30 days of surgery. This figure was 4.0 per cent in Wales - please note that the figure reported for Wales in the recently released CSCG Wales Bowel Cancer Report ([www.wales.nhs.uk/sites3/Documents/322/Wales%20Bowel%20Cancer%20Report%20July%202010.pdf](http://www.wales.nhs.uk/sites3/Documents/322/Wales%20Bowel%20Cancer%20Report%20July%202010.pdf)) was 4.6 per cent. The difference is due mainly to the different reporting period of the CSCG report compared with this report. The mortality figures cannot be calculated for Northern Ireland and the Republic of Ireland as the data on 30-day mortality was missing in more than 80 per cent of the cases. [Figure 4.5](#) demonstrates that the reported 30-day mortality varied from 0.7 per cent in Dorset to 6.7 per cent in North East London.

As explained in [Section 2.6](#), a logistic regression model was used to produce the risk-adjusted results. The risk model is presented in [Table 4.6](#). This model discriminated well between patients who died within the first 30 days after surgery and those who survived (area under receiver operating characteristics curve 0.80, 95 per cent CI 0.78 to 0.82). The model fitted the data well (Hosmer – Lemeshow goodness-of-fit test  $p = 0.4$ ).

The funnel plots identify how much of the variation can be expected from random fluctuation. However, they do not take into account that a large number of trust/providers are being compared simultaneously. As a result of these "multiple comparisons", the chance of observing a false-positive results (ie, a result above the funnel whereas the unit performs according to the target) increases considerably and hence the results of a single year are to be treated with caution. Persistent under performance over the course of 3-5 years should trigger action (Thompson et al *Colorectal Disease* 2010; 12: 783-791) and guidance on the process of communication with potential outlying units should follow that recommended by the Department of Health and Healthcare Quality Improvement Partnership in

the document "Detection and Management of Outliers" prepared by the National Clinical Advisory Group ([www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_123589](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_123589)).

The Audit will need to undertake further data validation work after this report. This will include cross-referencing the audit data with contemporaneous data from the HES, PEDW, cancer registry databases and the national cancer data repository. An important aspect of this work relates to the cases where invalid dates of diagnosis, surgery or death were reported. Currently, we only considered patients to have died within 30 days after surgery and if the dates of diagnosis, surgery and death were not in conflict (ie, date of diagnosis should be before date of surgery and date of surgery should be before date of death).

A further note of caution is required for the trusts that did not report patients undergoing major surgery to the Audit. A recent study examined the mortality results according to Hospital Episode Statistics data in patients undergoing major a resection of colorectal cancer at English NHS trusts between 1 August 2007 and 31 July 2008 (AM Almoudaris et al, Br J Surg 2011;98:132-139). They compared the mortality according to HES in 15,815 patient treated in the 132 Trusts that submitted data to the National Bowel Cancer Audit (case ascertainment of 10 per cent or higher) with the 1907 patients in the 20 non-submitting Trusts (case ascertainment below 10 per cent). The 30-day post-operative mortality of 4.0 per cent in submitting Trust was significantly lower than the 5.2 per cent in the non-submitting Trusts.

**Table 4.5**  
Description of management of the 23,669 patients with known cancer site

		Colon		Rectosigmoid		Rectal	
		Number	%	Number	%	Number	%
<b>Total patients per cancer site</b>		14,524		1497		7648	
<b>Patients undergoing surgery</b>		11,612		1153		5350	
<b>Discussed at multi-disciplinary team meeting</b>	<b>Yes</b>	12,934	95.2	1328	95.3	6818	96.3
	<b>No</b>	647	4.8	66	4.7	259	3.7
	<b>Missing (% of total)</b>	943 (6.5)		103 (6.9)		571 (7.5)	
<b>Seen by clinical nurse specialist</b>	<b>Yes</b>	7776	77.2	815	79.4	3992	81.9
	<b>No</b>	2303	22.8	212	20.6	884	18.1
	<b>Missing (% of total)</b>	4445 (30.6)		470 (31.4)		2772 (36.2)	
<b>CT scan results reported</b>	<b>Yes</b>	8636	59.5	874	58.4	4584	59.9
	<b>Uncertain scan results or not reported</b>	5888	40.5	623	41.6	3064	40.1
<b>Surgery type</b>	<b>Major resection</b>	9583	82.5	879	76.2	3893	72.8
	<b>Local excision</b>	218	1.9	40	3.5	216	4.0
	<b>Non resectional procedure</b>	433	3.7	87	7.5	455	8.5
	<b>Other procedure</b>	1378	11.9	147	12.8	786	14.7
	<b>No surgery (% of total)</b>	2912 (20.0)		344 (23.0)		2298 (30.0)	
<b>Urgency of operation</b>	<b>Elective</b>	6202	58.2	657	62.2	3273	67.0
	<b>Scheduled</b>	1486	13.9	163	15.4	1000	20.4
	<b>Urgent</b>	1581	14.8	127	12.0	448	9.2
	<b>Emergency</b>	1392	13.1	109	10.3	166	3.4
	<b>Missing (% of total)</b>	951 (8.2)		97 (8.4)		463 (8.7)	
	<b>No surgery (% of total)</b>	2912 (20.0)		344 (23.0)		2298 (30.0)	
<b>Laparoscopy</b>	<b>Open</b>	6304	68.3	582	64.7	2955	69.6
	<b>Laparoscopic then open</b>	316	3.4	32	3.6	138	3.3
	<b>Laparoscopic converted to open</b>	301	3.3	45	5.0	153	3.6
	<b>Laparoscopic completed</b>	2309	25.0	240	26.7	1000	23.5
	<b>Missing (% of total)</b>	2382 (20.5)		254 (22.0)		1104 (20.6)	
	<b>No surgery (% of total)</b>	2912 (20.0)		344 (23.0)		2298 (30.0)	

Frequencies for 2008/2009							
		Colon		Rectosigmoid		Rectal	
		Number	%	Number	%	Number	%
<b>Total patients undergoing major resection</b>		9583		879		3893	
<b>Sex</b>	Male	5026	52.5	540	61.4	2512	64.6
	Female	4556	47.5	339	38.6	1376	35.4
	Missing (% of total)	1 (0.01)		0 (0.0)		5 (0.1)	
<b>Age-group</b>	≤65 yrs	2475	25.8	258	29.4	1537	39.5
	65-74 yrs	3086	32.2	306	34.8	1302	33.4
	75-84 yrs	3107	32.4	262	29.8	880	22.6
	85-94 yrs	899	9.4	53	6.0	174	4.5
	≥95 yrs	16	0.2	0	0	0	0
<b>ASA</b>	ASA 1: fit	1113	14.4	134	18.4	604	18.9
	ASA 2: relevant disease	3887	50.3	362	49.6	1774	55.5
	ASA 3: restrictive disease	2325	30.1	201	27.5	746	23.3
	ASA 4: life-threatening disease	389	5.0	29	4.0	71	2.2
	ASA 5: moribund	19	0.2	4	0.5	2	0.1
	Missing (% of total)	1850 (19.3)		149 (17.0)		696 (17.9)	
<b>Dukes' stage</b>	A	1046	12.4	148	19.0	919	27.1
	B	3603	42.6	298	38.1	1056	31.2
	C	2637	31.2	242	31.0	1105	32.6
	D	1173	13.9	93	11.9	310	9.1
	Missing (% of total)	1124 (11.7)		98 (11.2)		503 (12.9)	
<b>Urgency</b>	Elective	5518	60.3	547	64.2	2631	70.4
	Scheduled	1321	14.4	135	15.8	770	20.6
	Urgent	1237	13.5	94	11.0	265	7.1
	Emergency	1078	11.8	77	9.0	73	1.9
	Missing (% of total)	429 (4.5)		26 (2.3)		154 (4.0)	
<b>Procedure</b>	Right hemicolectomy	5456	56.9	23	2.6	68	1.8
	Transverse colectomy	83	0.9	0	0	2	0.1
	Left hemicolectomy	780	8.1	20	2.3	12	0.3
	Sigmoid colectomy	987	10.3	53	6.0	28	0.7
	Total/subtotal colectomy	249	2.6	19	2.2	52	1.3
	Anterior resection	1566	16.3	650	74.0	2549	65.5
	APER	0	0	0	0	922	23.7
	Hartmann procedure	462	4.8	114	13.0	260	6.7

**Table 4.7**  
Surgical & pathological outcomes in 14,355 patients who had major surgery by cancer site

	Colon		Rectosigmoid		Rectal		
	Number	%	Number	%	Number	%	
<b>Total patients undergoing major resection</b>	9583		879		3893		
<b>Extramural Vascular Invasion</b>	Positive	1886	30.8	138	24.3	576	22.8
	Negative	4241	69.2	429	75.7	1955	77.2
	Missing (% of total)	3456 (36.1)		312 (35.5)		1362 (35.0)	
<b>Median number of excised lymph nodes</b>	Median	15		15		13	
	Range	0 – 153		0 – 99		0 – 102	
	Interquartile range	11 – 21		10 – 21		9 – 19	
<b>At least one positive node found</b>	Yes	3650	43.9	322	42.3	1316	38.7
	No	4660	56.1	440	57.7	2086	61.3
	Missing (% of total)	1273 (13.3)		117 (13.3)		491 (12.6)	
<b>Length of hospital stay (LOS)</b>	Median LOS	8		8		10	
	Range	0 – 425		0 – 384		0 – 397	
	Interquartile range	5 – 13		6 – 14		7 – 15	
<b>Length of stay longer than 5 days</b>	Yes	5251	74.2	518	77.1	2578	84.9
	No	1822	25.8	154	22.9	458	15.1
	Missing (% of total))	2510 (26.2)		207 (23.6)		857 (22.0)	
<b>30-day death following major surgery</b>	Yes	372	4.0	32	3.7	103	2.7
	No	8934	96.0	828	96.3	3671	97.3
	Missing (% of total)	277 (2.9)		19 (2.2)		119 (3.1)	
<b>30-day mortality by urgency of operation</b>	Elective	144/5372	2.7	11/537	2.1	64/2569	2.5
	Scheduled	35/1240	2.8	2/129	1.6	18/720	2.5
	Urgent	79/1208	6.5	9/93	9.7	8/259	3.1
	Emergency	100/1057	9.5	9/75	12.0	9/72	12.5

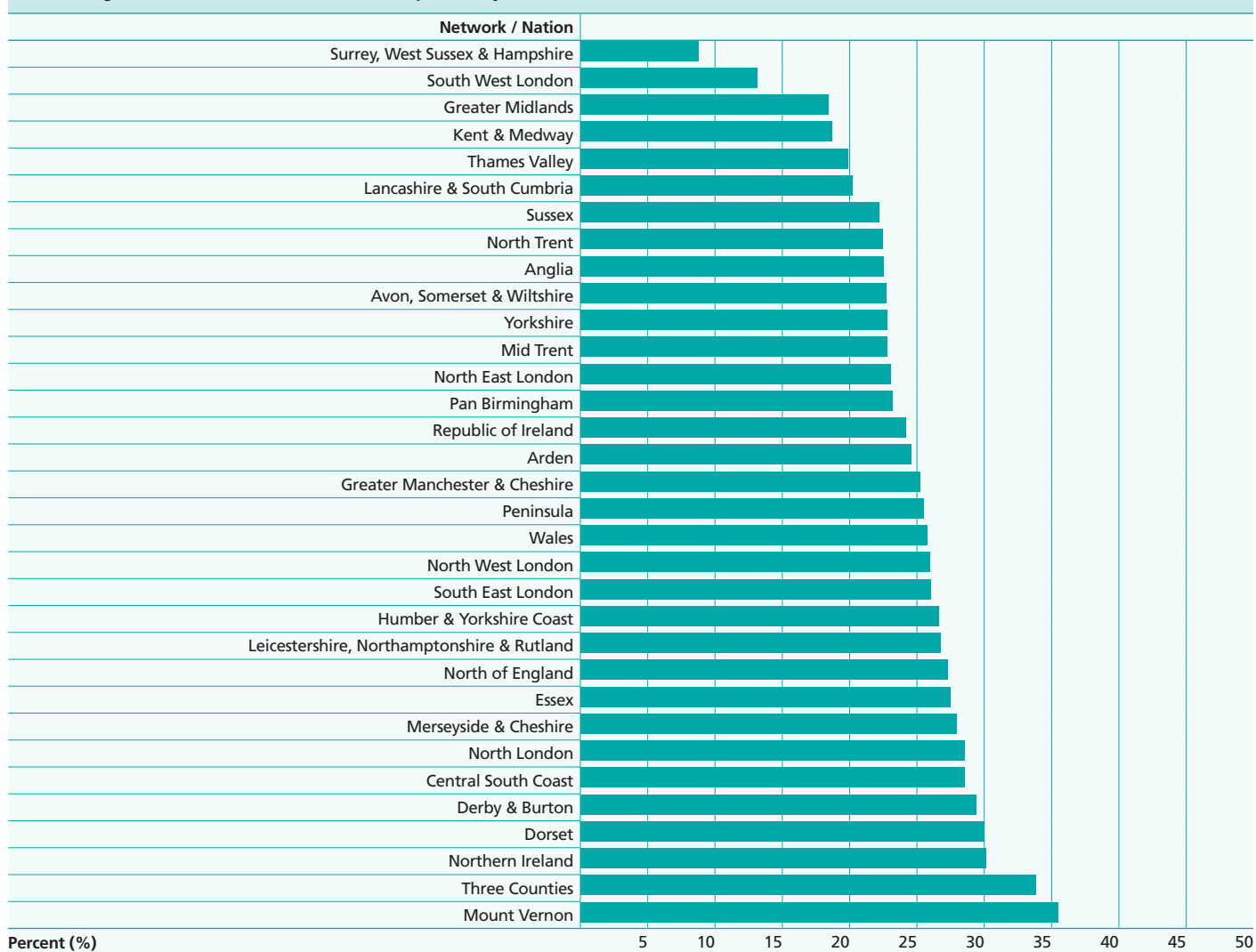
**Table 4.8**  
**Logistic regression model of 30-day post-operative mortality after major surgery for bowel cancer**

		Odds ratio*	95% CI
Sex	Male	1	
	Female	0.79	0.65 to 0.95
Age**	50 yrs	0.44	
	60 yrs	0.60	
	70 yrs	1	
	80 yrs	2.06	
	90 yrs	5.25	
ASA	ASA 1: fit	1	
	ASA 2: relevant disease	2.27	1.26 to 4.08
	ASA 3: restrictive disease	4.06	2.21 to 7.47
	ASA 4: life-threatening disease	10.16	5.46 to 18.90
	ASA 5: moribund	31.06	11.84 to 81.46
Dukes' stage	A	1	
	B	1.01	0.72 to 1.42
	C	1.25	0.89 to 1.76
	D	1.63	1.09 to 2.43
Urgency	Elective	1	
	Scheduled	0.97	0.68 to 1.37
	Urgent	1.77	1.36 to 2.29
	Emergency	2.42	1.86 to 3.15
Procedure	Right hemicolectomy	1	
	Transverse colectomy	2.27	1.13 to 4.56
	Left hemicolectomy	0.87	0.56 to 1.37
	Sigmoid colectomy	0.73	0.48 to 1.10
	Total/subtotal colectomy	1.35	0.77 to 2.39
	Anterior resection	1.00	0.77 to 1.29
	APER	1.07	0.67 to 1.70
	Hartmann procedure	1.02	0.74 to 1.41

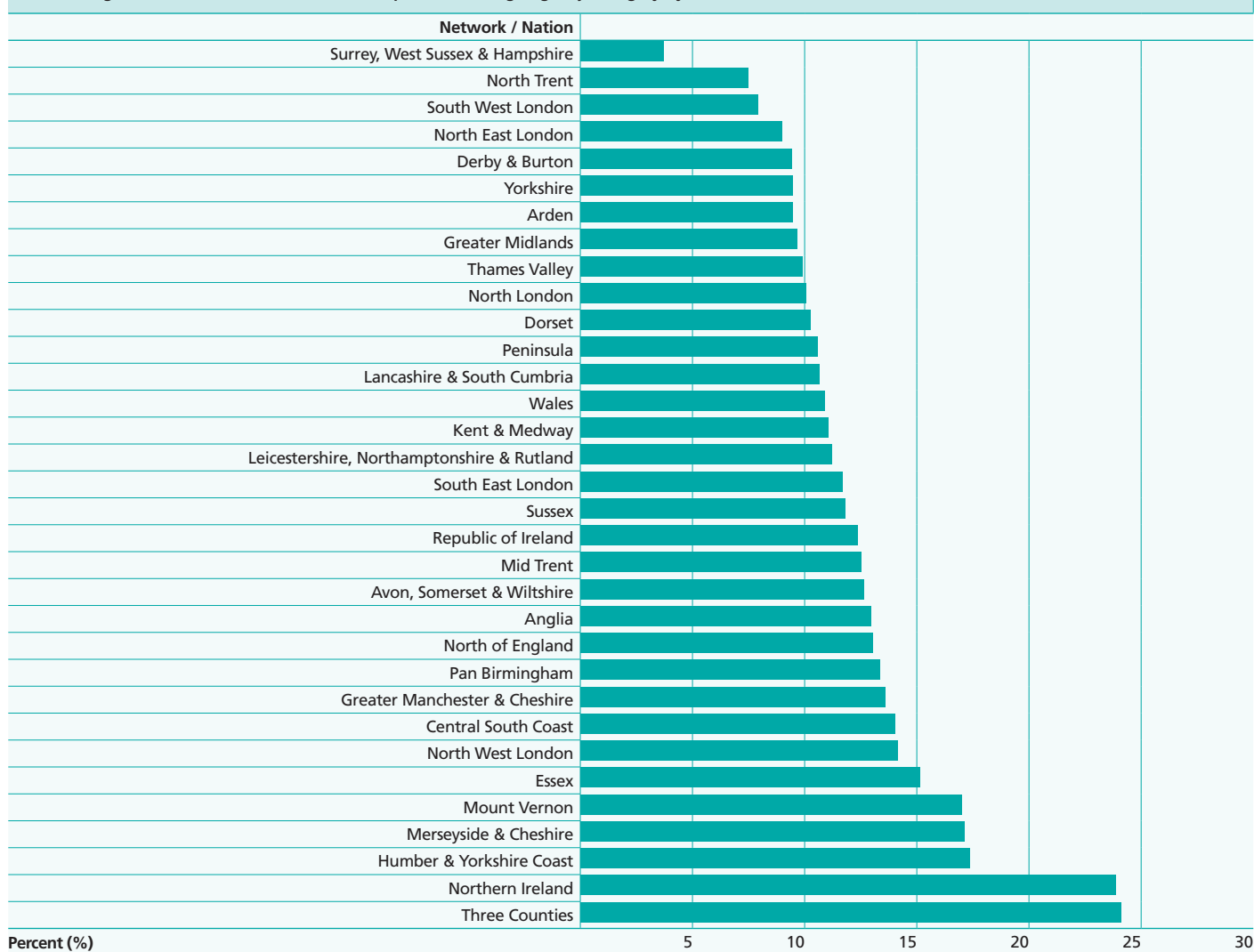
\* "1" indicates the baseline category

\*\* Age was included as a linear and as a quadratic term in the model: odds ratio was 0.92 (0.84 to 1.00) for age and 1.0011 (1.0004 to 1.0017) for age<sup>2</sup>.

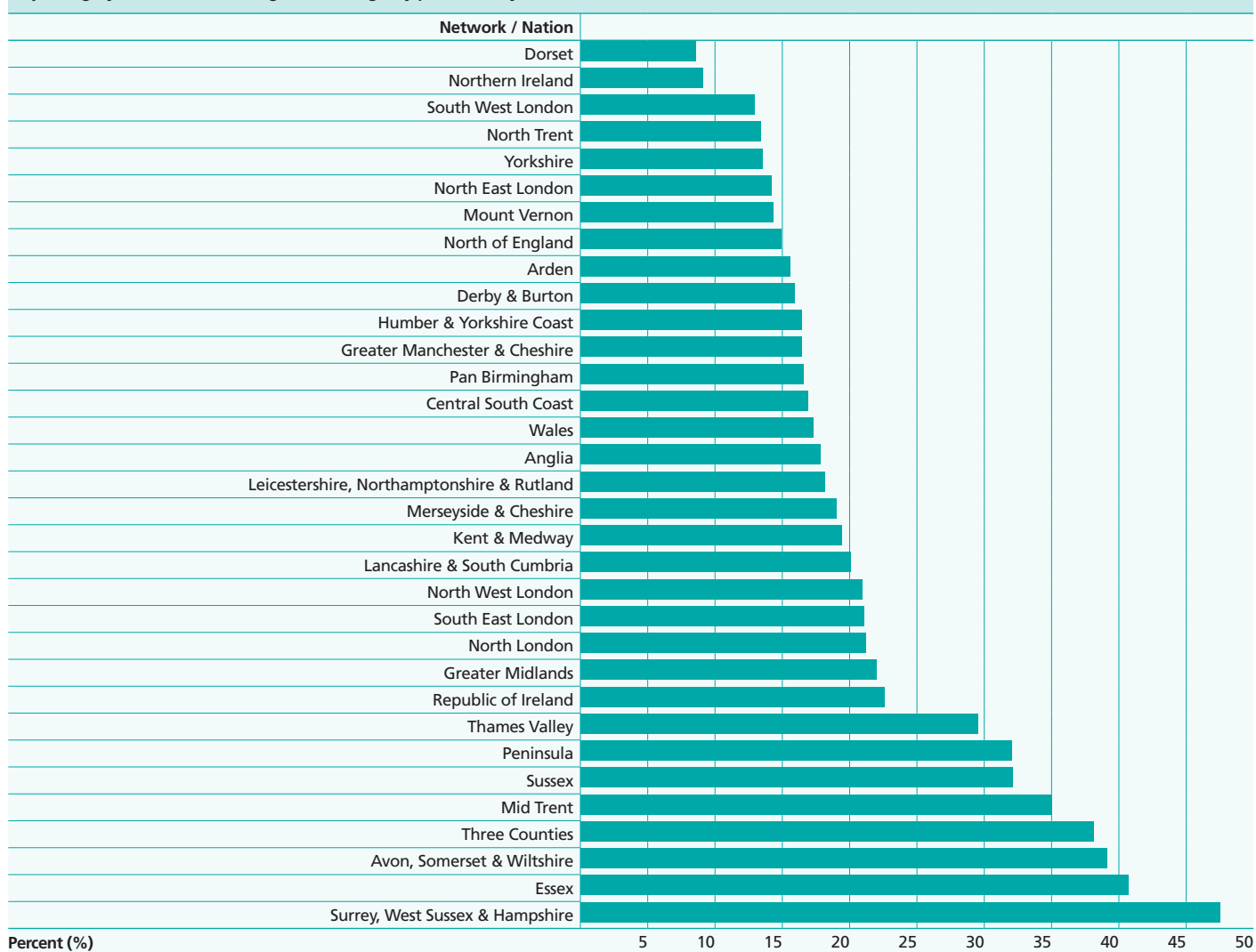
**Figure 4.1**  
**Dukes' D stage around time of initial treatment in all patients by network/nation**



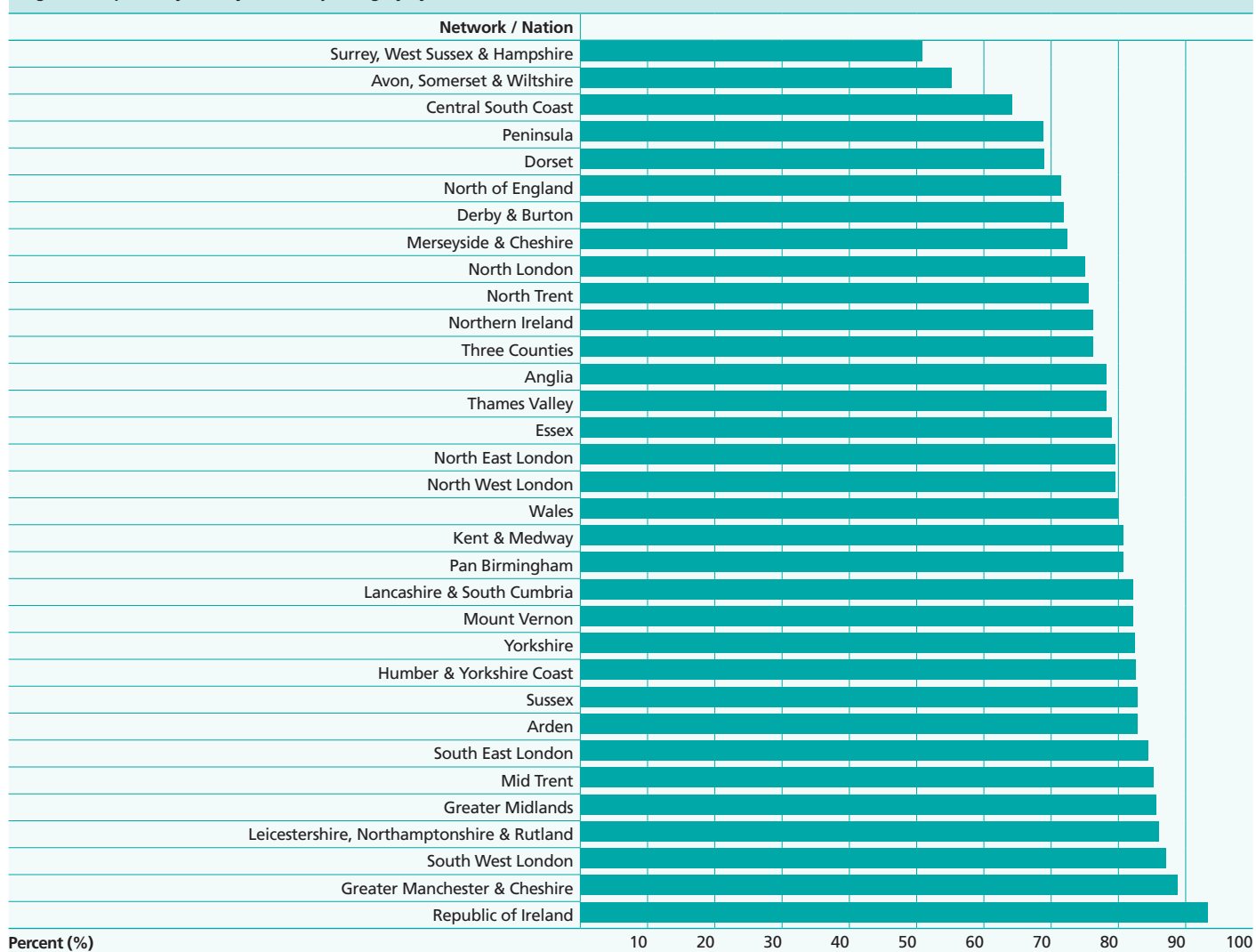
**Figure 4.2**  
**Dukes' D stage around time of initial treatment in patients undergoing major surgery by network/nation**



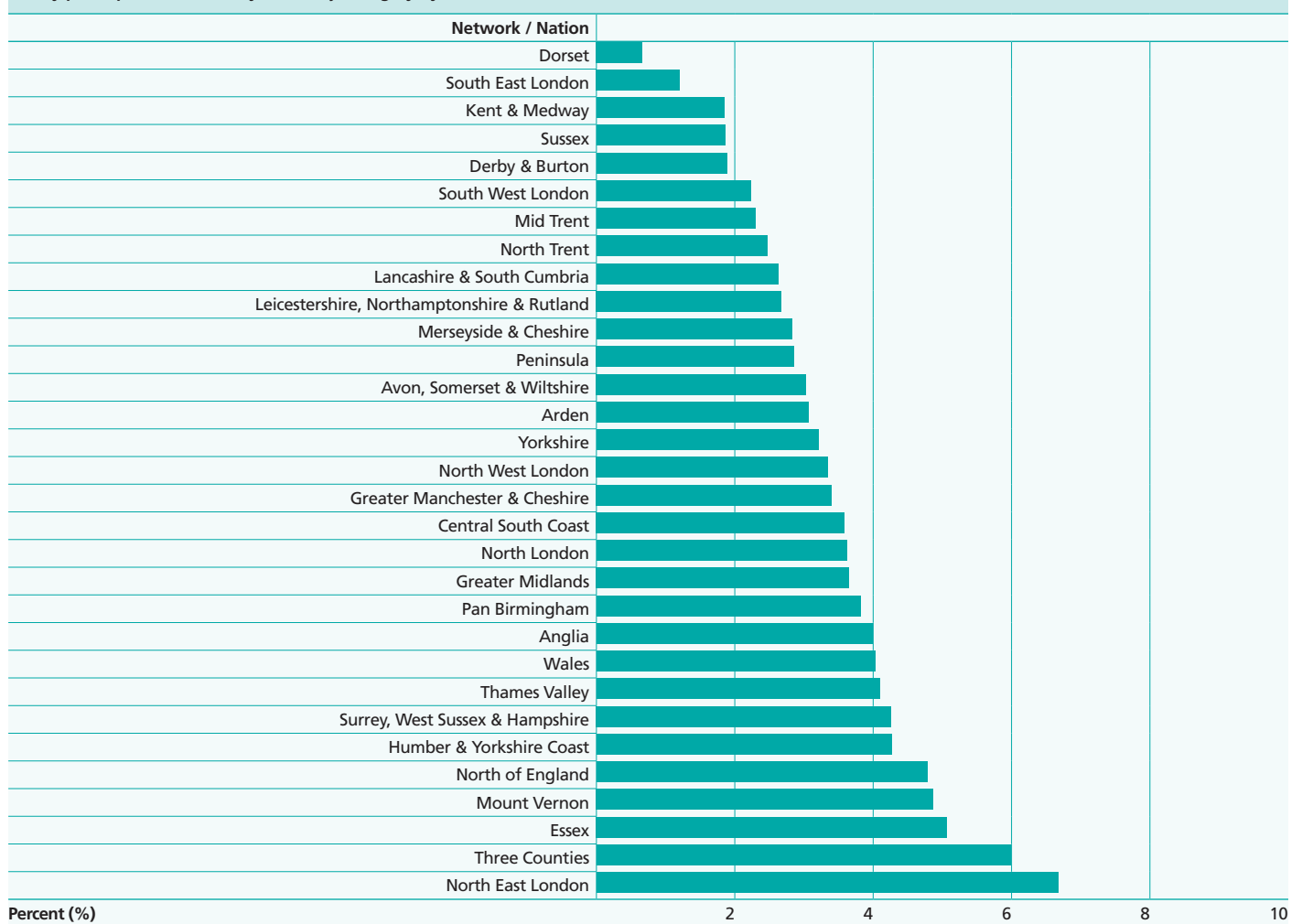
**Figure 4.3**  
Major surgery carried out as an urgent or emergency procedure by network/nation



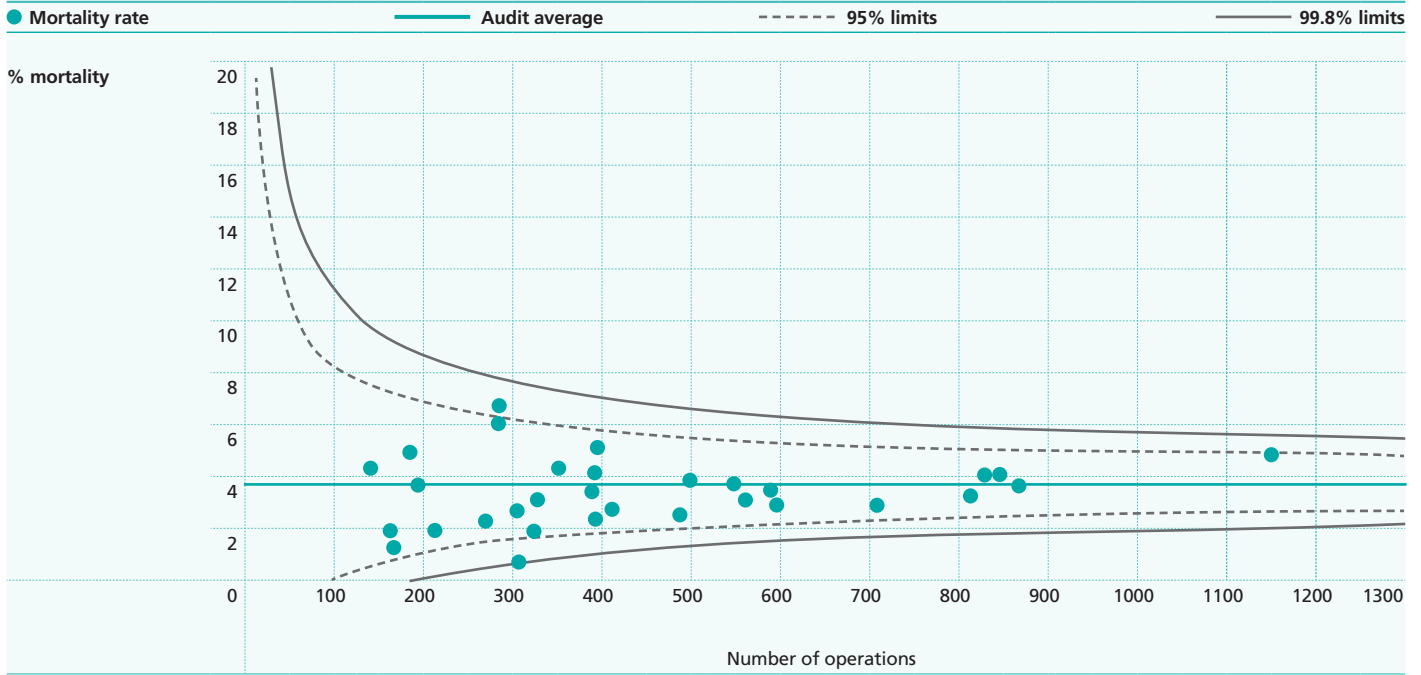
**Figure 4.4**  
**Length of hospital stay > 5 days after major surgery by network/nation**



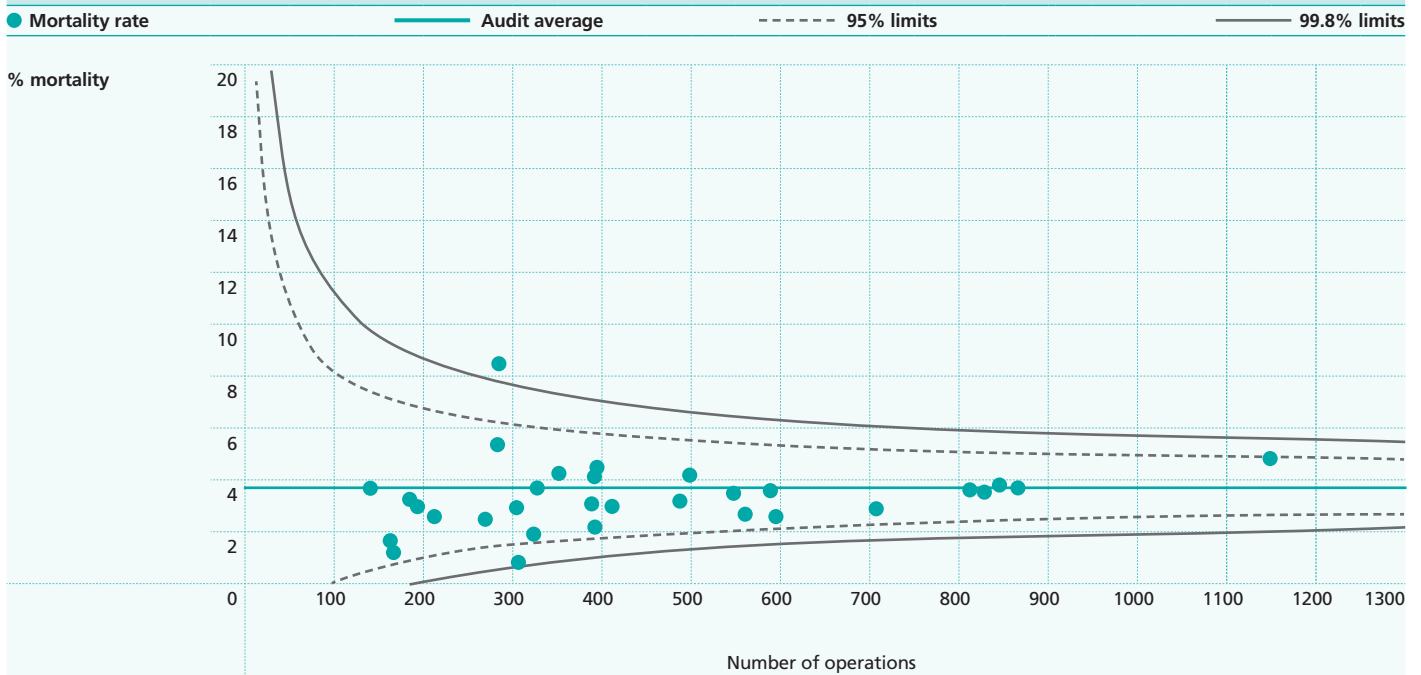
**Figure 4.5**  
**30-day post-operative mortality after major surgery by network/nation**



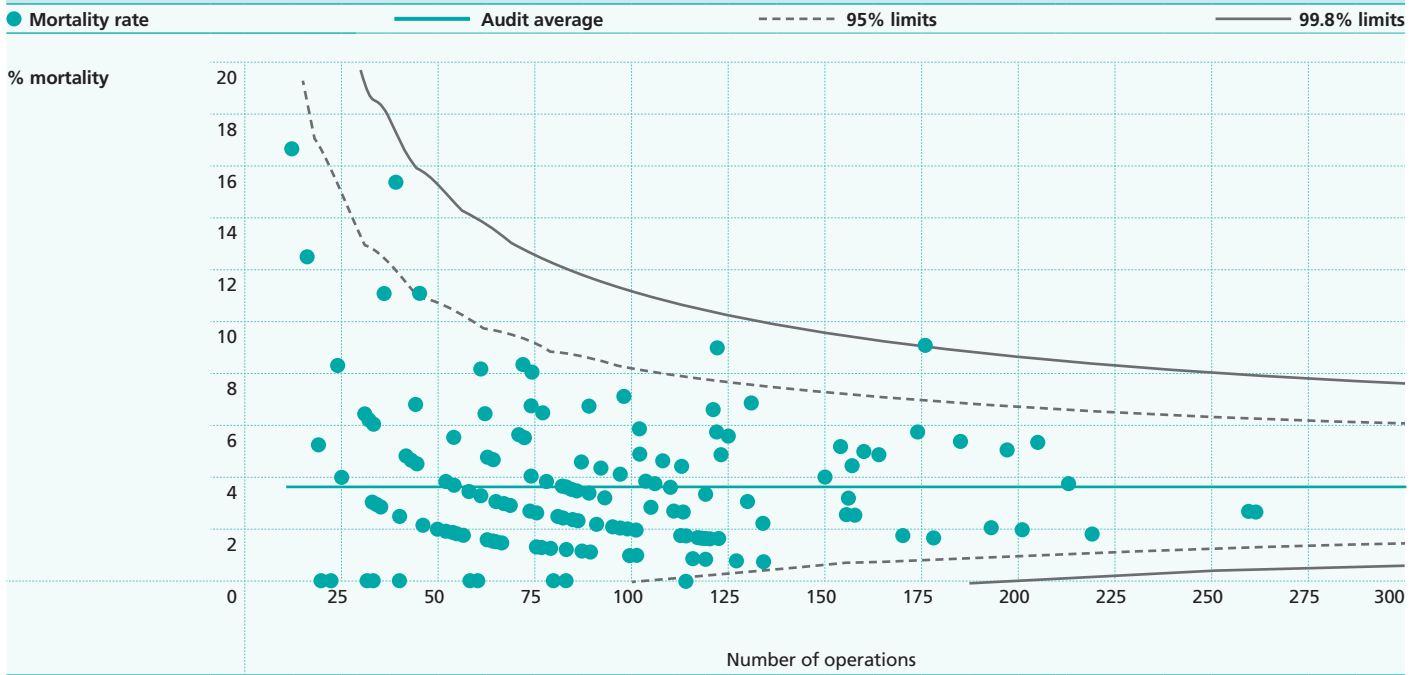
**Figure 4.6**  
30-day post-operative mortality by network/nation



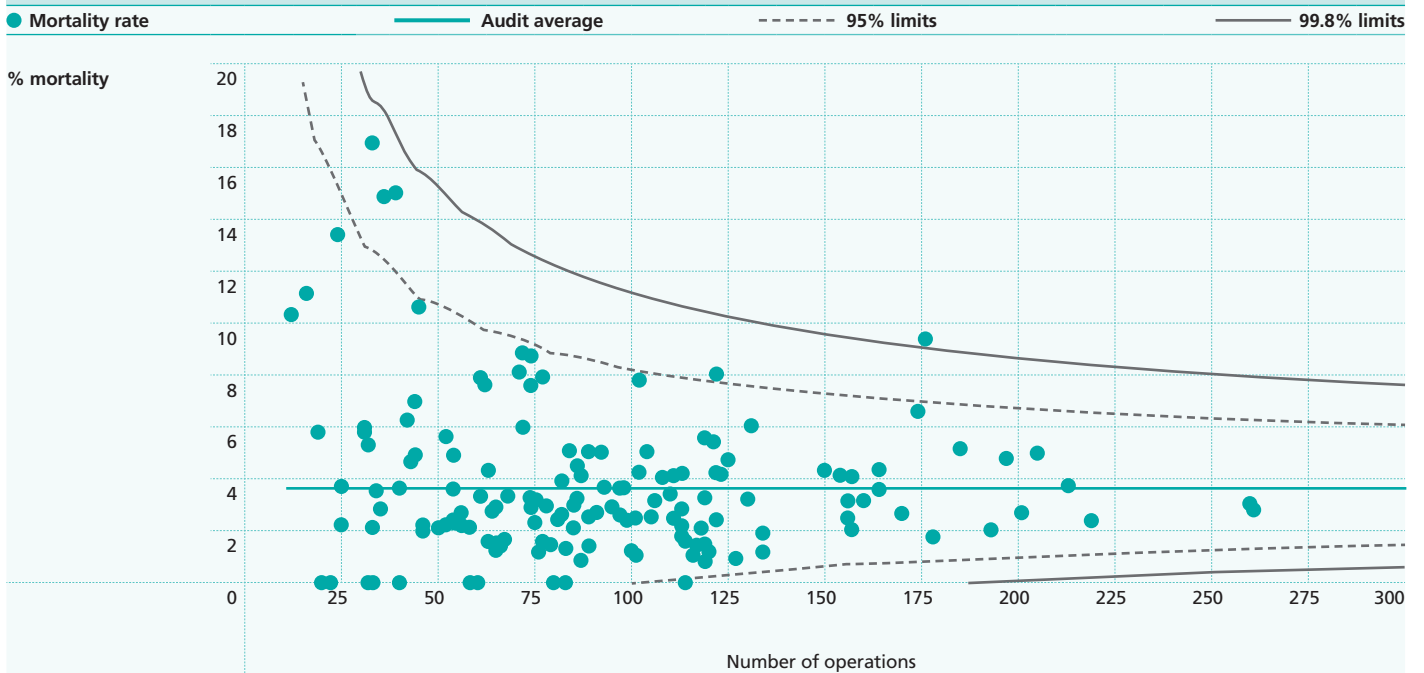
**Figure 4.7**  
Risk-adjusted 30-day post-operative mortality by network/nation



**Figure 4.8**  
30-day post-operative mortality by trust/site with more than 10 cases



**Figure 4.9**  
Risk-adjusted 30-day post-operative mortality by trust/site with more than 10 cases



## 5. Additional information on patients with rectal cancer who had major surgery

### 5.1 Patient management

#### MRI scan

Of the 3893 patients with rectal cancer who had a major procedure, 62.9 per cent of the patients had results of an MRI scan reported to the Audit (Table 5.1).

#### Pre-operative radiotherapy

32.2 per cent had a report of a short or long course of pre-operative radiotherapy (Table 5.1). No pre-operative radiotherapy was reported in 62.0 per cent.

		Number	%
Total number of patients with rectal cancer who had a major resection		3893	
MRI scan results reported	Yes	2450	62.9
	Uncertain results or not reported	1443 (37.1)	
Pre-operative radiotherapy	Short course	519	13.3
	Long course	736	18.9
	Other (incl. post-operative)	225	5.8
	No radiotherapy or not reported	2413	62.0
Circumferential resection margins	Negative	1847	89.1
	Positive	227	10.9
	Missing (% of total)	1819 (46.7)	
Rectal surgical procedures	Anterior Resection (AR)	2549	65.5
	APER	922	23.7
	Hartmann's	260	6.7
	Other procedure	162	4.1
Stoma	Permanent	860	26.2
	Temporary	1207	36.7
	None	1221	37.1
	Missing (% of total)	605 (15.5)	

It is difficult for the Project Team to make many comments on the management of rectal cancer in terms of radiotherapy as the amount of missing data is so high (Table 5.2).

According to the data we have in the Audit and ignoring the missing data, 10 per cent of rectal tumours are stage T4 based on pathological data. For the tumours staged as T4 pre-operatively, 52 per cent had pre-operative radiotherapy, and tumours staged as T3 or T4, 48 per cent received pre-operative radiotherapy. Whilst the decision to give radiotherapy is based on a number of factors and not just T-stage, these figures do seem a little low, especially for T4 tumours. This is an area where submitting units need to improve on their data submissions. We will analyse by result of MR scan and date of MR scan next year so that the true incidence of use of MR scanning to stage rectal cancer can be ascertained.

**Table 5.2**  
Description of management of patients with rectal cancer who had major surgery

Pre-op MRI T stage								
XRT	Tx	T1	T2	T3	T4	Miss	Total	
SCRT	4	6	125	242	16	126	519	
LCRT	0	7	84	390	96	159	736	
Other	0	2	21	50	9	143	225	
None	22	51	520	662	93	1065	2413	
<b>Total</b>	<b>26</b>	<b>66</b>	<b>750</b>	<b>1344</b>	<b>214</b>	<b>1493</b>	<b>3893</b>	
Post-op pathological T stage								
XRT	pTx	pT0	pT1	pT2	pT3	pT4	Miss	Total
SCRT	2	4	35	143	267	25	43	519
LCRT	10	68	36	164	320	41	97	736
Other	1	4	7	20	90	62	41	225
None	22	22	214	569	1030	204	352	2413
<b>Total</b>	<b>35</b>	<b>98</b>	<b>292</b>	<b>896</b>	<b>1707</b>	<b>332</b>	<b>533</b>	<b>3893</b>
Pre-op MRI N stage								
XRT	N0	N1	N2	Miss	Total			
SCRT	147	172	33	167	519			
LCRT	104	262	158	212	736			
Other	24	25	18	158	225			
None	619	364	143	1287	2413			
<b>Total</b>	<b>894</b>	<b>823</b>	<b>352</b>	<b>1824</b>	<b>3893</b>			
Post-op pathological N stage								
XRT	pNx	pN0	pN1	pN2	Miss	Total		
SCRT	3	289	133	49	45	519		
LCRT	4	404	143	89	96	736		
Other	0	80	62	44	39	225		
None	20	1258	503	283	349	2413		
<b>Total</b>	<b>27</b>	<b>2031</b>	<b>841</b>	<b>465</b>	<b>529</b>	<b>3893</b>		

## 5.2 Outcomes

### Circumferential margins

Microscopically positive circumferential margins (R1 resection) were reported in 10.9 per cent of the patients, but it has to be noted that information on the circumferential margins was not available in 46.7 per cent of the patients. From the audit data we are therefore unable to report on the true margin status for each resected rectal cancer. Submitting units are encouraged to ensure that the margin status is contained within the pathology report and that this vital quality measure is uploaded to the Audit.

Several studies have shown a conclusive link of positive margins with local recurrence. The Dutch TME trial did show a positive CRM in 18.2 per cent of patients, but local recurrence rates were not this high as post-operative radiotherapy was mandatory in the non-irradiated patients. Without submitting units being accurate on the data for CRM involvement it will be impossible for the Audit to comment fully on appropriate use of post-operative radiotherapy. From [Table 5.3](#) however it does appear that patients who receive long course radiotherapy were twice as likely as others to have a positive margin after surgery (reflecting the more advanced disease – [Table 5.2](#)), and that almost 1:5 patients having LCRT will be expected to have a positive margin after surgery. Radiotherapy treatments throughout England are now being submitted to NCIN and there is scope in future audit reports to investigate this area further.

At this stage the Audit is not capable of reporting local recurrence rates, as data on local recurrence is not collected. This will be addressed in the forthcoming revision of the data set, but accurate CRM involvement will make future analysis of local recurrence more reliable and clinically useful especially as more data becomes available on the poor prognosis of positive margin patients. A recent multi-centre trial has shown that although pre-operative radiotherapy has benefits to patients, the benefits are only really realised in those with negative margins ([www.redjournal.org/article/S0360-3016\(02\)04291-8/abstract](http://www.redjournal.org/article/S0360-3016(02)04291-8/abstract)). Furthermore there is evidence that the figure we use for indicating a positive margin (<1mm) should be increased to <2mm ([http://journals.lww.com/ajsp/Abstract/2002/03000/Circumferential\\_Margin\\_Involvement\\_Is\\_Still\\_an.9.aspx](http://journals.lww.com/ajsp/Abstract/2002/03000/Circumferential_Margin_Involvement_Is_Still_an.9.aspx)).

**Table 5.3**  
Frequency of type of radiotherapy according to circumferential margins in 3893 patients with rectal cancer who had major surgery

		Circumferential margins					
		Positive		Negative		Missing	
		Number	(%)	Number	(%)	Number	(%)
<b>Number of patients</b>		227		1847		1819	
<b>Radiotherapy</b>	<b>Short pre-operative</b>	26	11.5	329	17.8	164	9.0
	<b>Long pre-operative</b>	50	22.0	420	22.7	266	14.6
	<b>Other</b>	20	8.8	77	4.2	128	7.0
	<b>None</b>	131	57.7	1021	55.3	1261	69.3

## Resection type

About two thirds of patients, submitted to the Audit, had undergone an anterior resection (AR) and about a quarter of patients had an abdominoperineal excision of the rectum (APER). A Hartmann's procedure and other major resections were observed in about 10 per cent of the patients.

The APER rate was 22.9 per cent in England, 35.4 per cent in Wales, 21.4 per cent in Northern Ireland, and 20.0 per cent in the Republic of Ireland. The rate varied among English cancer networks from 11.1 per cent in Surrey, West Sussex & Hampshire to 37.9 per cent in the Thames Valley (Figure 5.1). These figures have to be treated with caution given potential issues with respect to data completeness and quality. One can only look at trends over time and APER rates are subject to considerable variation, sometimes merely by altering the denominator. Outcomes from the LOREC study should give additional information on this measure.

NICE guidance states that APER rates should be kept to a minimum and the ACPGBI guidance recommend that the overall proportion of rectal cancers treated by APER should be less than 30 per cent.

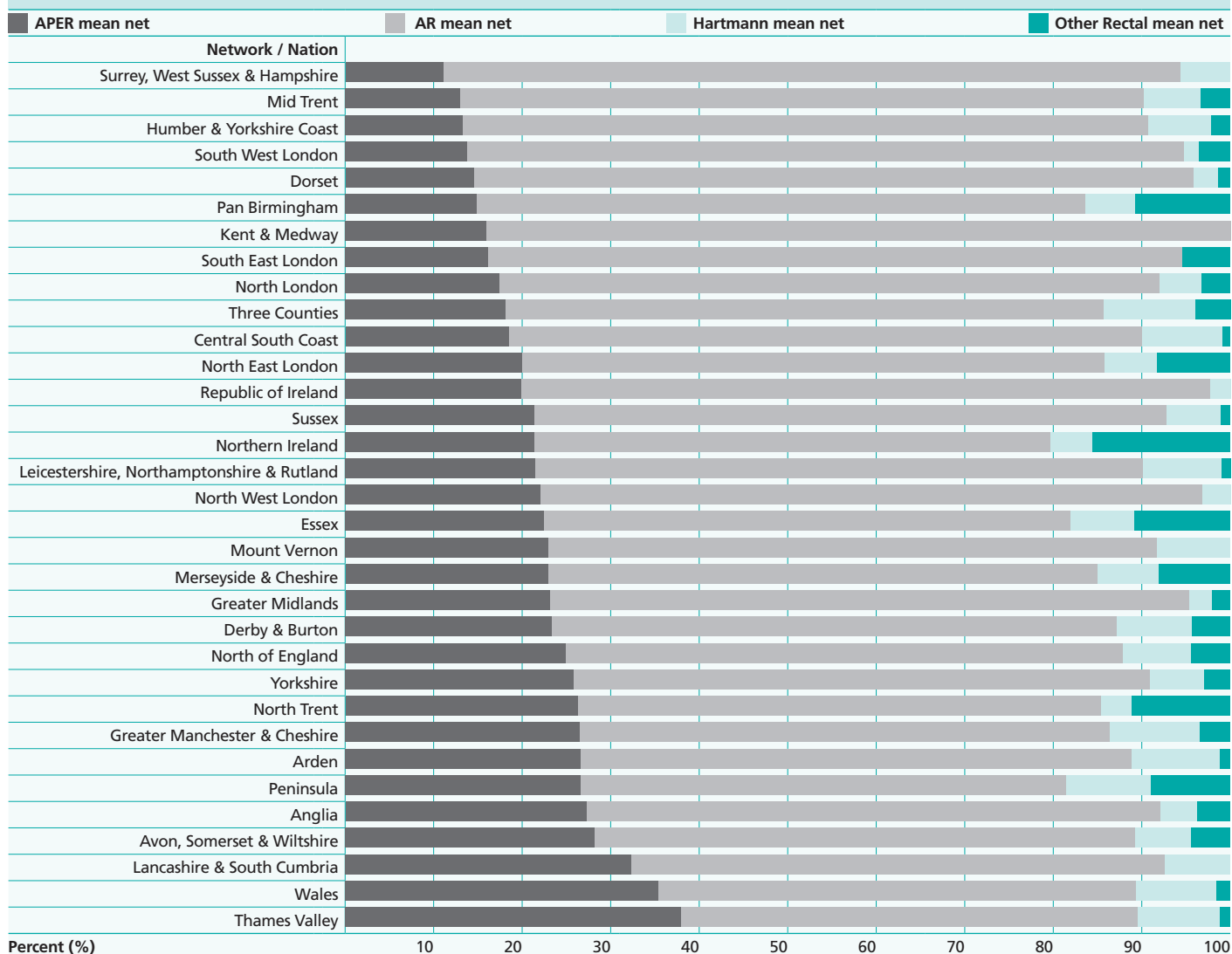
## 5.3 Outcomes according to pre-operative radiotherapy

Table 5.4 compares outcomes after major surgery in patients with rectal cancer who had a short or a long course of pre-operative radiotherapy with those who had no pre-operative radiotherapy at all. The differences in outcomes between these three groups are relatively small. The largest differences are seen in the 30-day mortality (3.9 per cent after a short course and 2.3 per cent after a long course radiotherapy compared to 2.7 per cent in patients without radiotherapy), but even these differences are not statistically significant ( $p = 0.2$ ).

**Table 5.4**  
Description of outcomes of patients with rectal cancer according to pre-operative radiotherapy

		Pre-operative radiotherapy					
		Short course		Long course		No	
		Number	%	Number	%	Number	%
<b>Number of patients</b>		519		736		2413	
<b>Extramural Vascular invasion</b>	<b>Positive</b>	84	21.3	105	18.4	334	23.1
	<b>Negative</b>	310	78.7	466	81.6	1113	76.9
	<b>Missing (% of total)</b>	125 (24.1)		165 (22.4)		966 (40.0)	
<b>Median number of excised lymph nodes</b>	<b>Median</b>	13		11		14	
	<b>Range</b>	0 – 158		0 – 42		0 – 102	
	<b>Interquartile range</b>	10 – 19		7 – 16		10 – 19	
<b>At least one positive node found</b>	<b>Yes</b>	183	38.4	242	36.4	789	37.9
	<b>No</b>	293	61.6	422	63.6	1291	62.1
	<b>Missing (% of total)</b>	43 (8.3)		72 (9.8)		333 (13.8)	
<b>Circumferential resection margins</b>	<b>Negative</b>	329	92.7	420	89.4	1021	88.6
	<b>Positive</b>	26	7.3	50	10.6	131	11.4
	<b>Missing (% of total)</b>	164 (31.6)		266 (36.1)		1261 (52.3)	
<b>Length of hospital stay (LOS)</b>	<b>Median LOS</b>	11		9		10	
	<b>Range</b>	0 – 109		0 – 373		0 – 397	
	<b>Interquartile range</b>	7 – 17		7 – 14		7 – 16	
<b>Length of stay longer than 5 days</b>	<b>Yes</b>	60	13.7	73	11.5	285	16.0
	<b>No</b>	378	86.3	564	88.5	1496	84.0
	<b>Missing (% of total)</b>	81 (15.6)		99 (13.5)		632 (26.2)	
<b>30-day death</b>	<b>Yes</b>	20	3.9	16	2.3	64	2.7
	<b>No</b>	487	96.1	692	97.7	2270	97.3
	<b>Missing (% of total)</b>	12 (2.3)		28 (3.8)		79 (3.3)	

**Figure 5.1**  
Major Surgery for rectal cancer by network/nation



## 6. Discussion

In this audit we can report almost complete coverage of all hospitals treating bowel cancer in England & Wales and have substantial contributions from the other parts of the UK & Ireland. Case ascertainment is also up again this year and has shown a year on year increase. This report, and the recently circulated data completeness report, has also demonstrated an improvement in the completeness of data being submitted to the Audit. However, we cannot be complacent as we are still missing data on approximately 30 per cent of incident cancers in England alone. Problems with incomplete data submission can not be over-emphasised and, as is clear from this report, any observations on measures recorded have to be treated with extreme caution. It has been said before, and is worth repeating, we can only report on the data that is submitted.

There are many positive messages from this year's audit report including:

- Contributions from Northern Ireland, and the Republic of Ireland
- Data completeness is improving
- Confirmation of all deaths by established links with ONS through Open Exeter
- Cross database linking of the audit data with other national repositories – in this report HES, but future reports will include more
- Better handling of missing data items
- Increased involvement of the MDT in the management of bowel cancer
- Greater accessibility of specialist nurses for bowel cancer patients
- The continued reduction in post-operative mortality
- A further reduction in LOS
- Significant increase in laparoscopic colonic and rectal cancer surgery
- Low R1 resection rate for rectal cancer
- Stable APER rate (although with significant variation)

This year the production of the annual report has met with some difficulties in cleaning and analysing the submitted data. Some of these issues have been mentioned in previous reports and remain unchanged. Changing providers for the bulk of the analysis has only allowed previous issues to come to light again and new issues to be identified as discussed at the beginning of this report. Each year lessons are learnt but it should be remembered that the Audit is very often collecting data which is not routinely collected elsewhere.

It has however become clear that the dataset is no longer sufficient for the needs of the Audit. As such the current chair of NBOCAP has arranged for a working party to be convened under the auspices of the President of the ACPGBI with all interested parties able to contribute. The purposes of such a group is to define how we wish to see the Audit develop over the next few years and then make the dataset fit the questions that need to be answered. In the fullness of time this may necessitate a change to the data collection system and reconfiguration users systems to produce a new output for the Audit.

Many will be aware of the work of the National Cancer Intelligence Network and the creation of the National Cancer Data Repository. Although this has many strengths, and provides population-based data, it depends on timely linkage of HES and Cancer Registry data. Currently it only covers England although there are plans to extend this to other parts of the United Kingdom. If such a cancer intelligence system exists, and there is agreement that audit and repository data can be linked in the future, then the very real question will be "What is the purpose of the Audit?" That question and challenge was at the very heart of the recent meeting and it seems clear that the data set needs revision, the Audit needs more flexibility and that, in addition to providing clinical input into the national cancer information systems, it needs to identify specific areas of practice that can be audited.

If we think about the way bowel cancer treatment has changed over the last decade and the questions we now need to answer then the current audit structure is not able to give those answers in detail or at all in some cases. Has the Audit achieved what it set out to do? To answer John Nicholls question posed with the first ACP audit on malignant large bowel obstruction whether we have achieved a national audit of large bowel cancer, the answer has to be a resounding 'yes'. Equally, times change and the Audit will need to move with these changes.

There are a number of areas we need to improve and these can be neatly summarised as an improvement in data completeness and data quality. In particular we need greater attention to be paid to the following:

- Staging data
- Urgency of surgery
- Cancer site
- Procedure type
- CRM involvement
- Radiotherapy use
- Complications
- Causes of post-operative death

We have made no comment on complications in this year's report, as the data completeness is incredibly poor. We would strongly urge members to rethink the importance of major post-operative complications as a data item, as it is one of the first things that is looked at when a surgeon's competence is called into question. There is the opportunity to look at re-admission rates and unexpected returns to theatre using HES data but there will be a need for a clinical contribution, via the Audit, when one has complications following surgery.

Of the many items that have been identified in the 2010 report a particular effort needs to be made by MDTs and the submitting units to fully stage the disease. With increasing use of cross-sectional imaging techniques and information available to the colorectal team which is not, and may not be, confirmed histologically, a fully integrated clinico-pathological stage should be available on most patients with colorectal cancer and most definitely on all undergoing a surgical intervention. It would be of value to also record whether the intended surgical treatment was considered curative or palliative. One further area which is to be explored is the use of evidence, outcome and process-based indicators with the possibility of a composite indicator which can be returned to all submitting units for audit purposes. This can only happen however if data completeness receives renewed efforts by all concerned with this national audit.

## 7. Conclusions / Recommendations

The Audit now needs to move into a new era and capture more detailed information to answer the important questions that are being asked about the management of bowel cancer in the UK & Ireland. To facilitate this over the next few years the type of data we collect must change, the way we collect it must change and we must use all available databases and not just the NBOCAP data collected through Open Exeter.

If we are to pursue important information such as patient related outcome measures, local recurrence after rectal cancer surgery, the outcomes of laparoscopic rectal cancer surgery, the management of low rectal cancer, the benefits or issues around enhanced recovery and to link these with the other important national programmes (LAPCO, LOREC, NHSBSP etc) then we have to make some significant changes.

The ACPGBI audit has long been held in great respect internationally and has been considered at the forefront of audit in bowel cancer. We should strive to maintain this position and the first step on that road is to improve data quality and completeness for the items we really need to collect. We need to remove those items that are never used in the Audit and add the newer ones to answer the questions posed above.

The NBOCAP is to move into the next decade with renewed vigour and will continue to be one of the most important sources of bowel cancer information in the UK. For that we need continued involvement of our members to whom we are already indebted to their dedication to the Audit.

Thank you to all those who have contributed to this year's and previous reports.

# Appendices

# Appendix 1: Case ascertainment and data completeness trust / hospital site in England, Wales, Northern Ireland and The Republic of Ireland for the period 2008 / 2009

Case ascertainment and data completeness are allocated to trusts using an algorithm (explained in [Section 3.1](#)) that prioritises place of surgery. Clatterbridge Centre for Oncology NHS Foundation Trust is a tertiary centre that mainly provides oncological treatment for bowel cancer patients so although the Trust submitted data to the 2010 Annual Report no cases have been allocated to the Trust. Ashford and St Peter's Hospitals NHS Trust did not submit any data to the 2010 Annual Report but 18 cases have been allocated to the trust.

Grade	Case Ascertainment (CA)	Data Completeness (DC)
Good	● >80 % completeness	<20 % missing
Fair	■ 50-80 % completeness	20-50 % missing
Poor	▲ <50 % completeness	>50 % missing

Appendix 1				
Code	Network / Trust Name	Number of cases reported to the Audit	Case ascertainment	Data completeness major surgery
<b>N01</b>	<b>Lancashire &amp; South Cumbria</b>			
RTX	University Hospitals of Morecambe Bay NHS Trust	248	90.5% ●	88.0% ●
RXL	Blackpool, Fylde and Wyre Hospitals NHS Foundation Trust	222	103.7% ●	99.3% ●
RXN	Lancashire Teaching Hospitals NHS Foundation Trust	197	80.4% ●	86.7% ●
RXR	East Lancashire Hospitals NHS Trust	164	67.5% ■	71.5% ■
<b>N02</b>	<b>Greater Manchester &amp; Cheshire</b>			
RBT	The Mid Cheshire Hospitals NHS Trust	2	1.3% ▲	
RBV	Christie, Hospital NHS Foundation Trust	37	34.3% ▲	98.2% ●
RJN	East Cheshire NHS Trust	35	25.4% ▲	80.0% ■
RM2	University Hospitals of South Manchester NHS Foundation Trust	97	82.9% ●	100.0% ●
RM3	Salford Royal NHS Foundation Trust	122	88.4% ●	98.2% ●
RM4	Trafford Healthcare NHS Trust	61	80.3% ●	99.6% ●
RMC	Bolton Hospitals NHS Trust	148	90.2% ●	80.2% ●
RMP	Tameside and Glossop Acute Services NHS Trust	110	89.4% ●	91.4% ●
RRF	Wrightington, Wigan and Leigh NHS Trust	10	7.1% ▲	96.7% ●
RW3	Central Manchester University Hospitals NHS Foundation Trust	124	121.6% ●	97.6% ●
RW6	Pennine Acute Hospitals NHS Trust	117	26.7% ▲	98.7% ●
RWJ	Stockport NHS Foundation Trust	122	68.2% ■	86.3% ●
<b>N03</b>	<b>Merseyside &amp; Cheshire</b>			
RBL	Wirral University Teaching Hospital NHS Foundation Trust	230	100.9% ●	95.5% ●
RBN	St Helens and Knowsley Hospitals NHS Trust	169	98.8% ●	92.8% ●
REM	Aintree University Hospitals NHS Foundation Trust	192	83.5% ●	86.1% ●
REN	Clatterbridge Centre for Oncology NHS Foundation Trust	n/a	n/a	n/a
RJR	Countess of Chester Hospital NHS Foundation Trust	124	99.2% ●	99.0% ●
RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	170	76.2% ■	96.9% ●
RVY	Southport and Ormskirk Hospital NHS Trust	142	88.8% ●	85.9% ●
RWW	Warrington and Halton Hospitals NHS Foundation Trust	157	85.8% ●	97.4% ●
<b>N06</b>	<b>Yorkshire</b>			
RAE	Bradford Teaching Hospitals NHS Foundation Trust	168	92.3% ●	95.9% ●
RCB	York Hospitals NHS Foundation Trust	195	98.5% ●	98.1% ●
RCD	Harrogate and District NHS Foundation Trust	83	79.0% ■	96.7% ●
RCF	Airedale NHS Trust	118	105.4% ●	89.1% ●
RR8	Leeds Teaching Hospitals NHS Trust	312	84.8% ●	86.9% ●
RWY	Calderdale and Huddersfield NHS Foundation Trust	150	67.3% ■	95.9% ●
RXF	Mid Yorkshire Hospitals NHS Trust	258	98.9% ●	99.3% ●

## Appendix 1 (continued)

Code	Network / Trust Name	Number of cases reported to the Audit	Case ascertainment	Data completeness major surgery
<b>N07</b>	<b>Humber &amp; Yorkshire Coast</b>			
RCC	Scarborough and North East Yorkshire Health Care NHS Trust	66	54.1% ■	92.8% ●
RJL	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	186	91.2% ●	92.9% ●
RWA	Hull and East Yorkshire Hospitals NHS Trust	252	91.3% ●	92.5% ●
<b>N08</b>	<b>North Trent</b>			
RFF	Barnsley Hospital NHS Foundation Trust	102	75.6% ■	94.2% ●
RFR	The Rotherham NHS Foundation Trust	119	82.1% ●	95.2% ●
RFS	Chesterfield Royal Hospital NHS Foundation Trust	174	95.6% ●	98.2% ●
RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	317	85.9% ●	99.0% ●
RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	4	1.2% ▲	100.0% ●
<b>N11</b>	<b>Pan Birmingham</b>			
RBK	Walsall Hospitals NHS Trust	89	69.0% ■	93.9% ●
RR1	Heart of England NHS Foundation Trust	319	78.0% ■	89.9% ●
RRK	University Hospital Birmingham NHS Foundation Trust	144	65.2% ■	99.1% ●
RXK	Sandwell and West Birmingham Hospitals NHS Trust	183	78.2% ■	98.7% ●
<b>N12</b>	<b>Arden</b>			
RJC	South Warwickshire General Hospitals NHS Trust	140	110.2% ●	99.8% ●
RKB	University Hospitals Coventry and Warwickshire NHS Trust	202	79.2% ■	100.0% ●
RLT	George Eliot Hospital NHS Trust	74	100.0% ●	94.5% ●
RWP01	Alexandra Hospital (Worcestershire Acute Hospitals NHS Trust)	73	69.5% ■	84.8% ●
<b>N13</b>	<b>Mid Trent</b>			
RK5	Sherwood Forest Hospitals NHS Foundation Trust	166	86.0% ●	96.2% ●
RWD	United Lincolnshire Hospitals NHS Trust	56	11.9% ▲	99.6% ●
RX1	Nottingham University Hospitals NHS Trust	341	113.7% ●	71.9% ■
<b>N14</b>	<b>Derby / Burton</b>			
RJF	Burton Hospitals NHS Trust	117	71.8% ■	92.5% ●
RTG	Derby Hospitals NHS Foundation Trust	237	81.4% ●	90.7% ●
<b>N15</b>	<b>Leicestershire, Northamptonshire &amp; Rutland</b>			
RNQ	Kettering General Hospital NHS Trust	153	104.8% ●	91.2% ●
RNS	Northampton General Hospital NHS Trust	100	53.2% ■	84.8% ●
RWE	University Hospitals of Leicester NHS Trust	438	107.9% ●	97.9% ●
<b>N20</b>	<b>Mount Vernon</b>			
RC9	Luton and Dunstable Hospital NHS Foundation Trust	131	98.5% ●	61.6% ■
RWH	East and North Hertfordshire NHS Trust	238	104.4% ●	100.0% ●
RWG	West Hertfordshire Hospitals NHS Trust	0		
<b>N21</b>	<b>North West London</b>			
RAS	The Hillingdon Hospital NHS Trust	91	85.0% ●	99.2% ●
RC3	Ealing Hospital NHS Trust	47	92.2% ●	93.5% ●
RFW	West Middlesex University Hospital NHS Trust	59	72.0% ■	94.4% ●
RQM	Chelsea and Westminster Hospital NHS Foundation Trust	83	101.2% ●	97.0% ●
RV8	North West London Hospitals NHS Trust	53	25.1% ▲	77.7% ■
RYJ	Imperial College Healthcare NHS Trust	227	82.2% ●	95.9% ●

**Appendix 1 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Case ascertainment	Data completeness major surgery
<b>N22</b>	<b>North London</b>			
RAL	Royal Free Hampstead NHS Trust	48	44.0% ▲	79.4% ■
RAP	North Middlesex University Hospital NHS Trust	5	5.6% ▲	
RKE	The Whittington Hospital NHS Trust	70	85.4% ●	97.0% ●
RRV	University College London Hospitals NHS Foundation Trust	0		
RQW	The Princess Alexandra Hospital NHS Trust	4	2.5% ▲	
RVL	Barnet and Chase Farm Hospitals NHS Trust	171	83.4% ●	97.9% ●
<b>N23</b>	<b>North East London</b>			
RF4	Barking, Havering and Redbridge Hospitals NHS Trust	189	59.1% ■	92.0% ●
RGC	Whipps Cross University Hospital NHS Trust	89	61.4% ■	99.4% ●
RNH	Newham University Hospital NHS Trust	46	65.7% ■	95.9% ●
RNJ	Barts and The London NHS Trust	60	73.2% ■	99.1% ●
RQX	Homerton University Hospital NHS Foundation Trust	51	106.3% ●	97.6% ●
<b>N24</b>	<b>South East London</b>			
RJ1	Guy's and St Thomas' NHS Foundation Trust	24	14.0% ▲	80.0% ●
RJ2	The Lewisham Hospital NHS Trust	104	85.2% ●	85.6% ●
RJZ	King's College Hospital NHS Foundation Trust	108	97.3% ●	95.5% ●
RYQ	South London Healthcare NHS Trust	186	139.8% ●	85.2% ●
<b>N25</b>	<b>South West London</b>			
RAX	Kingston Hospital NHS Trust	115	82.1% ●	98.4% ●
RJ6	Mayday Healthcare NHS Trust	71	54.6% ■	92.2% ●
RJ7	St George's Healthcare NHS Trust	35	20.8% ▲	76.4% ■
RPY	The Royal Marsden NHS Foundation Trust	19	9.4% ▲	100.0% ●
RVR	Epsom and St Helier University Hospitals NHS Trust	154	78.6% ■	56.5% ■
<b>N26</b>	<b>Peninsula</b>			
RA9	South Devon Health Care NHS Foundation Trust	182	96.8% ●	96.6% ●
RBZ	Northern Devon Healthcare NHS Trust	125	88.7% ●	98.2% ●
REF	Royal Cornwall Hospitals NHS Trust	308	101.7% ●	98.6% ●
RH8	Royal Devon and Exeter NHS Foundation Trust	286	101.4% ●	93.8% ●
RK9	Plymouth Hospitals NHS Trust	264	107.8% ●	54.2% ■
<b>N27</b>	<b>Dorset</b>			
RBD	Dorset County Hospital NHS Foundation Trust	128	84.8% ●	78.8% ■
RD3	Poole Hospital NHS Foundation Trust	181	100.6% ●	96.1% ●
RDZ	Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	171	81.0% ●	99.8% ●
<b>N28</b>	<b>Avon, Somerset &amp; Wiltshire</b>			
RA3	Weston Area Health NHS Trust	82	92.1% ●	87.1% ●
RA4	Yeovil District Hospital NHS Foundation Trust	132	89.2% ●	90.8% ●
RA7	University Hospitals Bristol NHS Foundation Trust	106	60.9% ■	77.5% ■
RBA	Taunton and Somerset NHS Foundation Trust	76	32.8% ▲	84.4% ●
RD1	Royal United Hospital Bath NHS Trust	223	93.3% ●	78.8% ■
RVJ	North Bristol NHS Trust	227	98.7% ●	96.1% ●
<b>N29</b>	<b>3 Counties</b>			
RLQ	Hereford Hospitals NHS Trust	120	109.1% ●	99.8% ●
RTE	Gloucestershire Hospitals NHS Foundation Trust	93	18.9% ▲	89.3% ●
RWP50	Worcestershire Royal Hospital (Worcestershire Acute Hospitals NHS Trust)	158	106.0% ●	95.9% ●

**Appendix 1 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Case ascertainment	Data completeness major surgery
<b>N30</b>	<b>Thames Valley</b>			
RD7	Heatherwood and Wexham Park Hospitals NHS Foundation Trust	177	95.2% ●	40.0% ▲
RD8	Milton Keynes General Hospital NHS Foundation Trust	45	38.8% ▲	68.8% ■
RHW	Royal Berkshire NHS Foundation Trust	196	80.7% ●	97.1% ●
RN3	Great Western Hospitals NHS Foundation Trust	160	84.2% ●	88.3% ●
RTH	Oxford Radcliffe Hospitals NHS Trust	174	45.1% ▲	94.6% ●
RXQ	Buckinghamshire Hospitals NHS Trust	85	39.9% ▲	99.7% ●
<b>N31</b>	<b>Central South Coast</b>			
5QT	Isle of Wight NHS PCT	94	102.2% ●	88.4% ●
RHM	Southampton University Hospitals NHS Trust	254	88.5% ●	98.3% ●
RHU	Portsmouth Hospitals NHS Trust	309	104.0% ●	98.4% ●
RN1	Winchester and Eastleigh Healthcare NHS Trust	150	105.6% ●	99.6% ●
RN5	Basingstoke & North Hampshire NHS Foundation Trust	82	51.3% ■	96.6% ●
RNZ	Salisbury NHS Foundation Trust	135	87.1% ●	98.0% ●
RYR16	St Richard's Hospital (Western Sussex Hospitals NHS Trust)	166	448.6% ●	100.0% ●
<b>N32</b>	<b>Surrey, West Sussex &amp; Hampshire</b>			
RA2	Royal Surrey County Hospital NHS Trust	156	86.7% ●	92.7% ●
RDU	Frimley Park Hospital NHS Foundation Trust	170	76.6% ■	62.8% ■
RTK	Ashford and St Peter's Hospitals NHS Trust	18	9.8% ▲	
RTP	Surrey and Sussex Healthcare NHS Trust	123	76.4% ■	85.8% ●
<b>N33</b>	<b>Sussex</b>			
RXC	East Sussex Hospitals NHS Trust	255	86.1% ●	92.7% ●
RXH	Brighton and Sussex University Hospitals NHS Trust	161	70.9% ■	84.6% ●
RYR18	Worthing Hospital (Western Sussex Hospitals NHS Trust)	175	246.5% ●	98.3% ●
<b>N34</b>	<b>Kent &amp; Medway</b>			
RN7	Dartford and Gravesham NHS Trust	55	42.6% ▲	97.4% ●
RPA	Medway NHS Trust	1	0.8% ▲	
RVV	East Kent Hospitals NHS Trust	201	51.9% ■	
RWF	Maidstone and Tunbridge Wells NHS Trust	151	52.8% ■	91.3% ●
<b>N35</b>	<b>Greater Midlands</b>			
RJD	Mid Staffordshire General Hospitals NHS Trust	134	99.3% ●	98.4% ●
RJE	University Hospital of North Staffordshire NHS Trust	252	83.4% ●	84.1% ●
RL4	The Royal Wolverhampton Hospitals NHS Trust	223	91.0% ●	99.2% ●
RNA	Dudley Group of Hospitals NHS Trust	171	77.4% ■	83.5% ●
RWP31	Kidderminster Hospital (Worcestershire Acute Hospitals NHS Trust)	36	720.0% ●	64.2% ■
RXW	Shrewsbury and Telford Hospital NHS Trust	253	75.3% ■	95.4% ●
<b>N36</b>	<b>North of England</b>			
RE9	South Tyneside NHS Foundation Trust	98	86.7% ●	98.6% ●
RLN	City Hospitals Sunderland NHS Foundation Trust	168	81.6% ●	91.0% ●
RNL	North Cumbria Acute Hospitals NHS Trust	155	56.2% ■	88.5% ●
RR7	Gateshead Health NHS Foundation Trust	133	90.5% ●	96.2% ●
RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	216	77.4% ■	99.2% ●
RTF	Northumbria Health Care NHS Foundation Trust	293	90.2% ●	93.1% ●
RTR	South Tees Hospitals NHS Trust	233	83.2% ●	94.0% ●
RVW	North Tees and Hartlepool NHS Trust	208	90.8% ●	98.5% ●
RXP	County Durham and Darlington NHS Foundation Trust	267	83.4% ●	92.6% ●

**Appendix 1 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Case ascertainment	Data completeness major surgery
<b>N37</b>	<b>Anglia</b>			
RC1	Bedford Hospital NHS Trust	124	90.5% ●	72.1% ■
RCX	The Queen Elizabeth Hospital King's Lynn NHS Trust	143	88.3% ●	95.8% ●
RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	92	50.5% ■	61.9% ■
RGP	James Paget Healthcare NHS Foundation Trust	155	106.9% ●	97.6% ●
RGQ	Ipswich Hospital NHS Trust	108	46.4% ▲	
RGR	West Suffolk Hospitals NHS Trust	177	101.7% ●	99.3% ●
RGT	Cambridge University Hospitals NHS Foundation Trust	74	30.3% ●	97.3% ●
RM1	Norfolk and Norwich University Hospital NHS Trust	371	93.7% ●	92.0% ●
RQQ	Hinchingbrooke Health Care NHS Trust	96	96.0% ●	97.8% ●
<b>N38</b>	<b>Essex</b>			
RAJ	Southend University Hospital NHS Foundation Trust	149	74.5% ■	91.1% ●
RDD	Basilston and Thurrock University Hospitals NHS Foundation Trust	129	70.1% ■	94.7% ●
RDE	Colchester Hospital University NHS Foundation Trust	236	102.2% ●	81.7% ●
RQ8	Mid Essex Hospital Services NHS Trust	28	13.8% ▲	92.5% ●
	<b>Wales</b>			
7A1A1	Glan Clwyd Cancer Services	101	92.7% ●	100.0% ●
7A1AU	Ysbyty Gwynedd	110	94.0% ●	97.8% ●
7A1A4	Ysbyty Maelor Wrexham	89	117.1% ●	93.5% ●
7A6AM	Nevill Hall Hospital	71	89.9% ●	94.1% ●
7A6AR	Royal Gwent Hospital	133	81.6% ●	98.0% ●
7A4C1	Cardiff Hospitals	169	94.9% ●	92.6% ●
7A5B3	Prince Charles Hospital	86	119.4% ●	98.4% ●
7A5B1	Royal Glamorgan Hospital	57	105.6% ●	100.0% ●
7A3CJ	Princess of Wales Hospital Bridgend	107	102.9% ●	99.7% ●
7A3C7	Swansea Hospitals	141	106.0% ●	92.9% ●
7A2AJ	Bronglais General Hospital	28	82.4% ●	100.0% ●
7A2AL	West Wales General Hospital	93	94.9% ●	99.4% ●
7A2BL	Withybush General Hospital	71	95.9% ●	99.2% ●
	<b>Northern Ireland</b>			
NI	The Southern Health & Social Care Trust, Northern Ireland	175		99.2% ●
ULSTER	The South Eastern Health and Social Care Trust, Ulster	199		96.1% ●
	<b>Republic of Ireland</b>			
Beau	Beaumont Hospital, Dublin	120		91.3% ●
SJH	St James's Hospital, Dublin	128		98.9% ●

## Appendix 2: Results for all patients reported to the Audit according to trust / hospital site in England, Wales, Northern Ireland and The Republic of Ireland

The denominator used in this table is the number cases in each trust where the value of the data item was complete (as described in [Section 2.6](#)). Therefore, the results are not comparable with those in the 2009 Annual Report.

In this table results are left blank if they could not be calculated as a result of missing data.

Appendix 2					
Code	Network / Trust Name	Number of cases reported to the Audit	Discussed at MDT meeting	Seen by clinical nurse specialist	CT scan results reported
<b>N01</b>	<b>Lancashire &amp; South Cumbria</b>				
RTX	University Hospitals of Morecambe Bay NHS Trust	248	99.2%	18.4%	0.8%
RXL	Blackpool, Fylde and Wyre Hospitals NHS Foundation Trust	222	90.0%	93.9%	84.7%
RXN	Lancashire Teaching Hospitals NHS Foundation Trust	197	95.4%	0.0%	13.2%
RXR	East Lancashire Hospitals NHS Trust	164	72.0%	75.4%	3.0%
<b>N02</b>	<b>Greater Manchester &amp; Cheshire</b>				
RBT	The Mid Cheshire Hospitals NHS Trust	2	100.0%	.	50.0%
RBV	Christie, Hospital NHS Foundation Trust	37	77.1%	82.8%	78.4%
RJN	East Cheshire NHS Trust	35	80.6%	65.4%	5.7%
RM2	University Hospitals of South Manchester NHS Foundation Trust	97	46.4%	100.0%	86.6%
RM3	Salford Royal NHS Foundation Trust	122	98.3%	99.1%	0.0%
RM4	Trafford Healthcare NHS Trust	61	91.8%	96.7%	98.4%
RMC	Bolton Hospitals NHS Trust	148	.	63.5%	0.0%
RMP	Tameside and Glossop Acute Services NHS Trust	110	92.7%	95.5%	75.5%
RRF	Wrightington, Wigan and Leigh NHS Trust	10	.	100.0%	80.0%
RW3	Central Manchester University Hospitals NHS Foundation Trust	124	100.0%	0.0%	80.6%
RW6	Pennine Acute Hospitals NHS Trust	117	91.1%	89.4%	80.3%
RWJ	Stockport NHS Foundation Trust	122	97.4%	100.0%	76.2%
<b>N03</b>	<b>Merseyside &amp; Cheshire</b>				
RBL	Wirral University Teaching Hospital NHS Foundation Trust	230	96.8%	43.6%	80.4%
RBN	St Helens and Knowsley Hospitals NHS Trust	169	100.0%	92.1%	27.8%
REM	Aintree University Hospitals NHS Foundation Trust	192	99.2%	66.0%	36.5%
REN	Clatterbridge Centre for Oncology NHS Foundation Trust	n/a	n/a	n/a	n/a
RJR	Countess of Chester Hospital NHS Foundation Trust	124	100.0%	98.9%	87.9%
RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	170	100.0%	97.9%	0.6%
RVY	Southport and Ormskirk Hospital NHS Trust	142	96.1%	20.7%	39.4%
RWW	Warrington and Halton Hospitals NHS Foundation Trust	157	92.1%	96.6%	35.0%
<b>N06</b>	<b>Yorkshire</b>				
RAE	Bradford Teaching Hospitals NHS Foundation Trust	168	100.0%	97.8%	86.3%
RCB	York Hospitals NHS Foundation Trust	195	99.5%	100.0%	85.6%
RCD	Harrogate and District NHS Foundation Trust	83	100.0%	100.0%	94.0%
RCF	Airedale NHS Trust	118	100.0%	68.4%	77.1%
RR8	Leeds Teaching Hospitals NHS Trust	312	98.4%	74.0%	0.0%
RWY	Calderdale and Huddersfield NHS Foundation Trust	150	69.2%	98.4%	73.3%
RXF	Mid Yorkshire Hospitals NHS Trust	258	100.0%	98.5%	86.0%
<b>N07</b>	<b>Humber &amp; Yorkshire Coast</b>				
RCC	Scarborough and North East Yorkshire Health Care NHS Trust	66	100.0%	100.0%	74.2%
RJL	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	186	100.0%	86.4%	75.8%
RWA	Hull and East Yorkshire Hospitals NHS Trust	252	77.4%	94.3%	75.8%

## Appendix 2 (continued)

Code	Network / Trust Name	Number of cases reported to the Audit	Discussed at MDT meeting	Seen by clinical nurse specialist	CT scan results reported
<b>N08</b>	<b>North Trent</b>				
RFF	Barnsley Hospital NHS Foundation Trust	102	99.0%	100.0%	83.3%
RFR	The Rotherham NHS Foundation Trust	119	100.0%	100.0%	90.8%
RFS	Chesterfield Royal Hospital NHS Foundation Trust	174	100.0%	85.3%	90.2%
RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	317	99.4%	80.8%	94.3%
RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	4	100.0%	100.0%	50.0%
<b>N11</b>	<b>Pan Birmingham</b>				
RBK	Walsall Hospitals NHS Trust	89	100.0%	100.0%	58.4%
RR1	Heart of England NHS Foundation Trust	319	100.0%	97.7%	68.0%
RRK	University Hospital Birmingham NHS Foundation Trust	144	100.0%	98.4%	92.4%
RXK	Sandwell and West Birmingham Hospitals NHS Trust	183	97.6%	100.0%	15.3%
<b>N12</b>	<b>Arden</b>				
RJC	South Warwickshire General Hospitals NHS Trust	140	98.6%	98.2%	92.1%
RKB	University Hospitals Coventry and Warwickshire NHS Trust	202	100.0%	94.6%	78.2%
RLT	George Eliot Hospital NHS Trust	74	100.0%	97.6%	86.5%
RWP01	Alexandra Hospital (Worcestershire Acute Hospitals NHS Trust)	73	100.0%	91.7%	65.8%
<b>N13</b>	<b>Mid Trent</b>				
RK5	Sherwood Forest Hospitals NHS Foundation Trust	166	99.4%	98.7%	97.0%
RWD	United Lincolnshire Hospitals NHS Trust	56	98.0%	100.0%	83.9%
RX1	Nottingham University Hospitals NHS Trust	341	98.2%	100.0%	23.2%
<b>N14</b>	<b>Derby / Burton</b>				
RJF	Burton Hospitals NHS Trust	117	100.0%	100.0%	8.5%
RTG	Derby Hospitals NHS Foundation Trust	237	98.7%	92.1%	86.5%
<b>N15</b>	<b>Leicestershire, Northamptonshire &amp; Rutland</b>				
RNQ	Kettering General Hospital NHS Trust	153	88.2%	100.0%	0.0%
RNS	Northampton General Hospital NHS Trust	100	87.4%	92.6%	79.0%
RWE	University Hospitals of Leicester NHS Trust	438	100.0%	87.8%	75.6%
<b>N20</b>	<b>Mount Vernon</b>				
RC9	Luton and Dunstable Hospital NHS Foundation Trust	131	99.2%	.	80.9%
RWH	East and North Hertfordshire NHS Trust	238	98.7%	95.2%	75.6%
RWG	West Hertfordshire Hospitals NHS Trust	0			
<b>N21</b>	<b>North West London</b>				
RAS	The Hillingdon Hospital NHS Trust	91	100.0%	95.9%	75.8%
RC3	Ealing Hospital NHS Trust	47	97.9%	97.6%	80.9%
RFW	West Middlesex University Hospital NHS Trust	59	94.9%	98.3%	79.7%
RQM	Chelsea and Westminster Hospital NHS Foundation Trust	83	98.8%	91.4%	86.7%
RV8	North West London Hospitals NHS Trust	53	100.0%	94.1%	58.5%
RYJ	Imperial College Healthcare NHS Trust	227	100.0%	81.7%	90.7%
<b>N22</b>	<b>North London</b>				
RAL	Royal Free Hampstead NHS Trust	48	100.0%	95.5%	87.5%
RAP	North Middlesex University Hospital NHS Trust	5	100.0%	.	20.0%
RKE	The Whittington Hospital NHS Trust	70	100.0%	100.0%	72.9%
RRV	University College London Hospitals NHS Foundation Trust	0			
RQW	The Princess Alexandra Hospital NHS Trust	4	100.0%	.	0.0%
RVL	Barnet and Chase Farm Hospitals NHS Trust	171	97.1%	88.7%	90.1%

**Appendix 2 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Discussed at MDT meeting	Seen by clinical nurse specialist	CT scan results reported
<b>N23</b>	<b>North East London</b>				
RF4	Barking, Havering and Redbridge Hospitals NHS Trust	189	90.2%	86.7%	70.4%
RGC	Whipps Cross University Hospital NHS Trust	89	100.0%	98.7%	92.1%
RNH	Newham University Hospital NHS Trust	46	100.0%	100.0%	78.3%
RNJ	Barts and The London NHS Trust	60	93.3%	100.0%	95.0%
RQX	Homerton University Hospital NHS Foundation Trust	51	98.0%	97.5%	82.4%
<b>N24</b>	<b>South East London</b>				
RJ1	Guy's and St Thomas' NHS Foundation Trust	24	100.0%	100.0%	66.7%
RJ2	The Lewisham Hospital NHS Trust	104	99.0%	79.4%	11.5%
RJZ	King's College Hospital NHS Foundation Trust	108	100.0%	78.5%	93.5%
RYQ	South London Healthcare NHS Trust	186	100.0%	100.0%	1.1%
<b>N25</b>	<b>South West London</b>				
RAX	Kingston Hospital NHS Trust	115	98.3%	99.0%	86.1%
RJ6	Mayday Healthcare NHS Trust	71	100.0%	100.0%	62.0%
RJ7	St George's Healthcare NHS Trust	35	95.5%	100.0%	40.0%
RPY	The Royal Marsden NHS Foundation Trust	19	89.5%	93.8%	73.7%
RVR	Epsom and St Helier University Hospitals NHS Trust	154	98.9%	.	0.0%
<b>N26</b>	<b>Peninsula</b>				
RA9	South Devon Health Care NHS Foundation Trust	182	100.0%	94.4%	89.0%
RBZ	Northern Devon Healthcare NHS Trust	125	96.8%	89.9%	85.6%
REF	Royal Cornwall Hospitals NHS Trust	308	100.0%	100.0%	8.1%
RH8	Royal Devon and Exeter NHS Foundation Trust	286	99.3%	94.4%	83.6%
RK9	Plymouth Hospitals NHS Trust	264	100.0%	62.1%	0.0%
<b>N27</b>	<b>Dorset</b>				
RBD	Dorset County Hospital NHS Foundation Trust	128	100.0%	98.5%	46.1%
RD3	Poole Hospital NHS Foundation Trust	181	94.4%	96.3%	89.0%
RDZ	Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	171	100.0%	100.0%	90.1%
<b>N28</b>	<b>Avon, Somerset &amp; Wiltshire</b>				
RA3	Weston Area Health NHS Trust	82	100.0%	87.3%	70.7%
RA4	Yeovil District Hospital NHS Foundation Trust	132	98.5%	29.5%	34.8%
RA7	University Hospitals Bristol NHS Foundation Trust	106	99.1%	21.8%	19.8%
RBA	Taunton and Somerset NHS Foundation Trust	76	98.6%	43.6%	55.3%
RD1	Royal United Hospital Bath NHS Trust	223	100.0%	0.0%	39.0%
RVJ	North Bristol NHS Trust	227	99.6%	6.3%	30.4%
<b>N29</b>	<b>3 Counties</b>				
RLQ	Hereford Hospitals NHS Trust	120	100.0%	94.2%	88.3%
RTE	Gloucestershire Hospitals NHS Foundation Trust	93	98.7%	98.7%	86.0%
RWP50	Worcestershire Royal Hospital (Worcestershire Acute Hospitals NHS Trust)	158	94.2%	65.4%	91.8%
<b>N30</b>	<b>Thames Valley</b>				
RD7	Heatherwood and Wexham Park Hospitals NHS Foundation Trust	177	97.9%	.	0.0%
RD8	Milton Keynes General Hospital NHS Foundation Trust	45	100.0%	0.0%	0.0%
RHW	Royal Berkshire NHS Foundation Trust	196	98.1%	93.1%	50.5%
RN3	Great Western Hospitals NHS Foundation Trust	160	98.1%	54.4%	32.5%
RTH	Oxford Radcliffe Hospitals NHS Trust	174	98.3%	100.0%	83.3%
RXQ	Buckinghamshire Hospitals NHS Trust	85	98.8%	89.2%	90.6%

**Appendix 2 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Discussed at MDT meeting	Seen by clinical nurse specialist	CT scan results reported
<b>N31</b>	<b>Central South Coast</b>				
5QT	Isle of Wight NHS PCT	94	97.8%	94.6%	81.9%
RHM	Southampton University Hospitals NHS Trust	254	78.0%	.	52.8%
RHU	Portsmouth Hospitals NHS Trust	309	100.0%	0.0%	88.3%
RN1	Winchester and Eastleigh Healthcare NHS Trust	150	99.3%	96.5%	93.3%
RN5	Basingstoke & North Hampshire NHS Foundation Trust	82	82.7%	90.0%	84.1%
RNZ	Salisbury NHS Foundation Trust	135	94.1%	96.0%	93.3%
RYR16	St Richard's Hospital (Western Sussex Hospitals NHS Trust)	166	98.2%	64.5%	84.3%
<b>N32</b>	<b>Surrey, West Sussex &amp; Hampshire</b>				
RA2	Royal Surrey County Hospital NHS Trust	156	100.0%	45.7%	63.5%
RDU	Frimley Park Hospital NHS Foundation Trust	170	98.8%	0.0%	0.6%
RTK	Ashford and St Peter's Hospitals NHS Trust	18	.	0.0%	0.0%
RTP	Surrey and Sussex Healthcare NHS Trust	123	100.0%	21.3%	23.6%
<b>N33</b>	<b>Sussex</b>				
RXC	East Sussex Hospitals NHS Trust	255	99.6%	89.1%	71.8%
RXH	Brighton and Sussex University Hospitals NHS Trust	161	100.0%	64.2%	0.6%
RYR18	Worthing Hospital (Western Sussex Hospitals NHS Trust)	175	98.8%	82.2%	3.4%
<b>N34</b>	<b>Kent &amp; Medway</b>				
RN7	Dartford and Gravesham NHS Trust	55	98.2%	96.4%	83.6%
RPA	Medway NHS Trust	1	100.0%	.	0.0%
RVV	East Kent Hospitals NHS Trust	201	61.1%	.	0.0%
RWF	Maidstone and Tunbridge Wells NHS Trust	151	100.0%	98.4%	85.4%
<b>N35</b>	<b>Greater Midlands</b>				
RJD	Mid Staffordshire General Hospitals NHS Trust	134	99.2%	82.1%	21.6%
RJE	University Hospital of North Staffordshire NHS Trust	252	100.0%	12.4%	1.2%
RL4	The Royal Wolverhampton Hospitals NHS Trust	223	99.5%	15.4%	35.9%
RNA	Dudley Group of Hospitals NHS Trust	171	99.3%	54.6%	25.7%
RWP31	Kidderminster Hospital (Worcestershire Acute Hospitals NHS Trust)	36	100.0%	0.0%	30.6%
RXW	Shrewsbury and Telford Hospital NHS Trust	253	52.2%	68.5%	51.0%
<b>N36</b>	<b>North of England</b>				
RE9	South Tyneside NHS Foundation Trust	98	99.0%	100.0%	89.8%
RLN	City Hospitals Sunderland NHS Foundation Trust	168	96.9%	73.8%	67.3%
RNL	North Cumbria Acute Hospitals NHS Trust	155	100.0%	100.0%	91.0%
RR7	Gateshead Health NHS Foundation Trust	133	100.0%	96.4%	78.9%
RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	216	99.5%	96.2%	84.3%
RTF	Northumbria Health Care NHS Foundation Trust	293	99.3%	95.8%	76.5%
RTR	South Tees Hospitals NHS Trust	233	88.8%	34.2%	46.4%
RVW	North Tees and Hartlepool NHS Trust	208	97.6%	0.0%	81.3%
RXP	County Durham and Darlington NHS Foundation Trust	267	100.0%	99.4%	88.8%
<b>N37</b>	<b>Anglia</b>				
RC1	Bedford Hospital NHS Trust	124	99.2%	51.2%	47.6%
RCX	The Queen Elizabeth Hospital King's Lynn NHS Trust	143	90.8%	5.2%	32.9%
RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	92	98.9%	17.6%	6.5%
RGP	James Paget Healthcare NHS Foundation Trust	155	97.9%	93.4%	81.9%
RGQ	Ipswich Hospital NHS Trust	108	97.2%	.	0.0%
RGR	West Suffolk Hospitals NHS Trust	177	99.4%	98.7%	16.4%
RGT	Cambridge University Hospitals NHS Foundation Trust	74	94.6%	98.6%	91.9%
RM1	Norfolk and Norwich University Hospital NHS Trust	371	100.0%	72.5%	58.2%
RQQ	Hinchingbrooke Health Care NHS Trust	96	100.0%	86.6%	67.7%

**Appendix 2 (continued)**

Code	Network / Trust Name	Number of cases reported to the Audit	Discussed at MDT meeting	Seen by clinical nurse specialist	CT scan results reported
<b>N38</b>	<b>Essex</b>				
RAJ	Southend University Hospital NHS Foundation Trust	149	93.2%	86.9%	79.9%
RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	129	93.8%	96.7%	92.2%
RDE	Colchester Hospital University NHS Foundation Trust	236	99.1%	.	72.9%
RQ8	Mid Essex Hospital Services NHS Trust	28	88.9%	96.0%	85.7%
	<b>Wales</b>				
7A1A1	Glan Clwyd Cancer Services	101	98.0%	86.0%	91.1%
7A1AU	Ysbyty Gwynedd	110	100.0%	90.0%	88.2%
7A1A4	Ysbyty Maelor Wrexham	89	96.3%	94.0%	65.2%
7A6AM	Nevill Hall Hospital	71	100.0%	100.0%	60.6%
7A6AR	Royal Gwent Hospital	133	100.0%	100.0%	88.0%
7A4C1	Cardiff Hospitals	169	100.0%	95.0%	84.0%
7A5B3	Prince Charles Hospital	86	98.7%	94.7%	64.0%
7A5B1	Royal Glamorgan Hospital	57	100.0%	94.6%	89.5%
7A3CJ	Princess of Wales Hospital Bridgend	107	99.0%	83.5%	84.1%
7A3C7	Swansea Hospitals	141	94.0%	99.0%	78.7%
7A2AJ	Bronglais General Hospital	28	96.4%	77.8%	75.0%
7A2AL	West Wales General Hospital	93	100.0%	80.6%	75.3%
7A2BL	Withybush General Hospital	71	100.0%	100.0%	95.8%
	<b>Northern Ireland</b>				
NI	The Southern Health & Social Care Trust, Northern Ireland	175	1.7%	80.1%	80.0%
ULSTER	The South Eastern Health and Social Care Trust, Ulster	199	98.0%	.	65.3%
	<b>Republic of Ireland</b>				
Beau	Beaumont Hospital, Dublin	120	48.6%	100.0%	87.5%
SJH	St James's Hospital, Dublin	128	93.0%	88.3%	89.8%

# Appendix 3: Results for patients who had major surgery according to trust / hospital site in England, Wales, Northern Ireland and The Republic of Ireland

In this table results are left blank if they could not be calculated as a result of missing data.

Appendix 3							
Code	Network / Trust Name	Number of patients undergoing major surgery	Patients with Dukes' D at time of major surgery	Major surgery carried out as an urgent or emergency procedure	Median number lymph nodes excised	Observed 30-day mortality	Adjusted 30-day mortality
<b>N01</b>	<b>Lancashire &amp; South Cumbria</b>						
RTX	University Hospitals of Morecambe Bay NHS Trust	20	14.3%	15.0%	10	0.0%	0.0%
RXL	Blackpool, Fylde and Wyre Hospitals NHS Foundation Trust	150	13.6%	15.3%	12	4.0%	4.3%
RXN	Lancashire Teaching Hospitals NHS Foundation Trust	95	7.5%	12.8%	10	2.1%	3.0%
RXR	East Lancashire Hospitals NHS Trust	40	0.0%	57.5%	.	0.0%	0.0%
<b>N02</b>	<b>Greater Manchester &amp; Cheshire</b>						
RBT	The Mid Cheshire Hospitals NHS Trust				12		
RBV	Christie, Hospital NHS Foundation Trust	22	9.5%	0.0%	14	0.0%	0.0%
RJN	East Cheshire NHS Trust	7	0.0%	0.0%	19	0.0%	0.0%
RM2	University Hospitals of South Manchester NHS Foundation Trust	63	25.4%	12.7%	14	1.6%	1.6%
RM3	Salford Royal NHS Foundation Trust	68	12.5%	13.2%	14.5	2.9%	3.2%
RM4	Trafford Healthcare NHS Trust	52	7.7%	15.4%	12	1.9%	2.3%
RMC	Bolton Hospitals NHS Trust	89	10.6%	42.9%	10	6.7%	5.1%
RMP	Tameside and Glossop Acute Services NHS Trust	77	8.8%	14.5%	16.5	6.5%	7.9%
RRF	Wrightington, Wigan and Leigh NHS Trust	6	0.0%	0.0%	13	0.0%	0.0%
RW3	Central Manchester University Hospitals NHS Foundation Trust	33	15.2%	27.3%	13	3.0%	2.2%
RW6	Pennine Acute Hospitals NHS Trust	93	20.0%	26.9%	13	3.2%	3.7%
RWJ	Stockport NHS Foundation Trust	79	10.4%	8.3%	15.5	1.3%	1.4%
<b>N03</b>	<b>Merseyside &amp; Cheshire</b>						
RBL	Wirral University Teaching Hospital NHS Foundation Trust	156	29.0%	10.3%	13	3.2%	3.2%
RBN	St Helens and Knowsley Hospitals NHS Trust	89	11.5%	23.2%	20	1.1%	1.4%
REM	Aintree University Hospitals NHS Foundation Trust	119	9.5%	30.8%	11	3.4%	3.4%
RJR	Countess of Chester Hospital NHS Foundation Trust	61	18.6%	14.8%	19	3.3%	3.3%
RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	84	3.7%	20.2%		3.6%	5.3%
RVY	Southport and Ormskirk Hospital NHS Trust	85	37.5%	18.1%	14	3.5%	3.2%
RWW	Warrington and Halton Hospitals NHS Foundation Trust	114	7.7%	17.7%	15	1.8%	1.5%
<b>N06</b>	<b>Yorkshire</b>						
RAE	Bradford Teaching Hospitals NHS Foundation Trust	102	13.6%	8.8%	16	4.9%	4.2%
RCB	York Hospitals NHS Foundation Trust	127	6.8%	19.8%	12	0.8%	1.0%
RCD	Harrogate and District NHS Foundation Trust	72	6.9%	8.5%	15	8.3%	8.8%
RCF	Airedale NHS Trust	75	10.4%	8.2%	21	2.7%	3.3%
RR8	Leeds Teaching Hospitals NHS Trust	193	7.7%	17.9%	17	2.1%	2.0%
RWY	Calderdale and Huddersfield NHS Foundation Trust	74	11.7%	8.1%	16.5	6.8%	8.8%
RXF	Mid Yorkshire Hospitals NHS Trust	170	10.8%	13.5%	13	1.8%	2.8%
<b>N07</b>	<b>Humber &amp; Yorkshire Coast</b>						
RCC	Scarborough and North East Yorkshire Health Care NHS Trust	36	12.5%	16.7%	8	11.1%	15.0%
RJL	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	119	10.2%	15.7%	14	0.8%	0.8%
RWA	Hull and East Yorkshire Hospitals NHS Trust	197	22.0%	16.8%	12.5	5.1%	4.7%

## Appendix 3 (continued)

Code	Network / Trust Name	Number of patients undergoing major surgery	Patients with Dukes' D at time of major surgery	Major surgery carried out as an urgent or emergency procedure	Median number lymph nodes excised	Observed 30-day mortality	Adjusted 30-day mortality
<b>N08</b>	<b>North Trent</b>						
RFF	Barnsley Hospital NHS Foundation Trust	83	10.1%	10.8%	9	0.0%	0.0%
RFR	The Rotherham NHS Foundation Trust	99	10.7%	15.2%	16	2.0%	2.4%
RFS	Chesterfield Royal Hospital NHS Foundation Trust	102	3.1%	15.8%	13	5.9%	7.7%
RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	201	7.0%	12.4%	26	2.0%	2.7%
RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	3	33.3%	0.0%	25.5	0.0%	0.0%
<b>N11</b>	<b>Pan Birmingham</b>						
RBK	Walsall Hospitals NHS Trust	82	16.7%	22.0%	19	3.7%	4.0%
RR1	Heart of England NHS Foundation Trust	185	15.5%	15.8%	20	5.4%	4.9%
RRK	University Hospital Birmingham NHS Foundation Trust	113	17.0%	11.6%	20	1.8%	1.8%
RXK	Sandwell and West Birmingham Hospitals NHS Trust	119	5.2%	18.5%	20	3.4%	5.7%
<b>N12</b>	<b>Arden</b>						
RJC	South Warwickshire General Hospitals NHS Trust	104	12.5%	18.3%	13	3.8%	5.1%
RKB	University Hospitals Coventry and Warwickshire NHS Trust	130	9.2%	18.5%	19	3.1%	3.2%
RLT	George Eliot Hospital NHS Trust	40	11.8%	10.0%	13	2.5%	3.7%
RWP01	Alexandra Hospital (Worcestershire Acute Hospitals NHS Trust)	54	2.0%	7.4%	12	1.9%	2.3%
<b>N13</b>	<b>Mid Trent</b>						
RK5	Sherwood Forest Hospitals NHS Foundation Trust	120	21.6%	81.7%	14	1.7%	1.2%
RWD	United Lincolnshire Hospitals NHS Trust	54	7.5%	25.9%	15.5	5.6%	3.6%
RX1	Nottingham University Hospitals NHS Trust	219	4.1%	8.3%	.	1.8%	2.4%
<b>N14</b>	<b>Derby / Burton</b>						
RJF	Burton Hospitals NHS Trust	91	17.5%	16.5%	.	2.2%	2.7%
RTG	Derby Hospitals NHS Foundation Trust	122	4.3%	15.4%	17	1.6%	2.4%
<b>N15</b>	<b>Leicestershire, Northamptonshire &amp; Rutland</b>						
RNQ	Kettering General Hospital NHS Trust	59	0.0%	25.9%	16	0.0%	0.0%
RNS	Northampton General Hospital NHS Trust	92	5.6%	9.8%	11	4.3%	5.1%
RWE	University Hospitals of Leicester NHS Trust	261	14.5%	19.3%	14	2.7%	2.8%
<b>N20</b>	<b>Mount Vernon</b>						
RC9	Luton and Dunstable Hospital NHS Foundation Trust	25	0.0%	0.0%	.	4.0%	3.3%
RWH	East and North Hertfordshire NHS Trust	160	17.5%	16.3%	14	5.0%	3.1%
RWG	West Hertfordshire Hospitals NHS Trust						
<b>N21</b>	<b>North West London</b>						
RAS	The Hillingdon Hospital NHS Trust	78	11.8%	32.1%	10	3.8%	3.0%
RC3	Ealing Hospital NHS Trust	31	7.7%	9.7%	14	6.5%	5.9%
RFW	West Middlesex University Hospital NHS Trust	43	27.3%	7.0%	18	4.7%	4.7%
RQM	Chelsea and Westminster Hospital NHS Foundation Trust	46	15.0%	21.7%	16	2.2%	2.0%
RV8	North West London Hospitals NHS Trust	35	3.7%	23.5%	15	2.9%	2.8%
RYJ	Imperial College Healthcare NHS Trust	156	15.1%	20.5%	25	2.6%	2.5%
<b>N22</b>	<b>North London</b>						
RAL	Royal Free Hampstead NHS Trust	34	9.1%	6.5%	13	2.9%	3.2%
RAP	North Middlesex University Hospital NHS Trust						
RKE	The Whittington Hospital NHS Trust	54	10.0%	44.2%	16	3.7%	2.4%
RQW	The Princess Alexandra Hospital NHS Trust						
RRV	University College London Hospitals NHS Foundation Trust						
RVL	Barnet and Chase Farm Hospitals NHS Trust	106	10.4%	14.2%	14	3.8%	3.1%

## Appendix 3 (continued)

Code	Network / Trust Name	Number of patients undergoing major surgery	Patients with Dukes' D at time of major surgery	Major surgery carried out as an urgent or emergency procedure	Median number lymph nodes excised	Observed 30-day mortality	Adjusted 30-day mortality
<b>N23</b>	<b>North East London</b>						
RF4	Barking, Havering and Redbridge Hospitals NHS Trust	97	10.3%	15.7%	14	2.1%	2.6%
RGC	Whipps Cross University Hospital NHS Trust	71	5.7%	8.5%	14	5.6%	9.0%
RNH	Newham University Hospital NHS Trust	39	15.2%	23.1%	15.5	15.4%	15.1%
RNJ	Barts and The London NHS Trust	45	11.4%	15.6%	18	11.1%	10.6%
RQX	Homerton University Hospital NHS Foundation Trust	33	3.2%	9.7%	18	6.1%	17.2%
<b>N24</b>	<b>South East London</b>						
RJ1	Guy's and St Thomas' NHS Foundation Trust	4	0.0%	0.0%	16.5	0.0%	0.0%
RJ2	The Lewisham Hospital NHS Trust	32	4.2%	8.0%	17.5	0.0%	0.0%
RJZ	King's College Hospital NHS Foundation Trust	66	28.3%	20.0%	18	1.5%	1.5%
RYQ	South London Healthcare NHS Trust	65	0.0%	28.6%	17	1.5%	1.3%
<b>N25</b>	<b>South West London</b>						
RAX	Kingston Hospital NHS Trust	86	9.3%	20.9%	16	3.5%	4.5%
RJ6	Mayday Healthcare NHS Trust	64	9.7%	4.9%	14	1.6%	1.5%
RJ7	St George's Healthcare NHS Trust	33	15.0%	5.6%	20	0.0%	0.0%
RPY	The Royal Marsden NHS Foundation Trust	6	33.3%	0.0%	23.5	0.0%	0.0%
RVR	Epsom and St Helier University Hospitals NHS Trust	81	0.0%	.	.	2.5%	2.6%
<b>N26</b>	<b>Peninsula</b>						
RA9	South Devon Health Care NHS Foundation Trust	100	10.8%	19.0%	15	1.0%	1.2%
RBZ	Northern Devon Healthcare NHS Trust	67	4.8%	98.5%	15	3.0%	1.6%
REF	Royal Cornwall Hospitals NHS Trust	213	8.1%	22.1%	17	3.8%	3.8%
RH8	Royal Devon and Exeter NHS Foundation Trust	119	15.3%	22.7%	11	1.7%	1.6%
RK9	Plymouth Hospitals NHS Trust	97	26.3%	35.6%	.	4.1%	3.8%
<b>N27</b>	<b>Dorset</b>						
RBD	Dorset County Hospital NHS Foundation Trust	80	5.9%	19.0%	19	0.0%	0.0%
RD3	Poole Hospital NHS Foundation Trust	114	7.5%	7.9%	18	0.0%	0.0%
RDZ	Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	113	15.0%	5.3%	15	1.8%	2.2%
<b>N28</b>	<b>Avon, Somerset &amp; Wiltshire</b>						
RA3	Weston Area Health NHS Trust	65	12.9%	12.5%	14	1.5%	1.6%
RA4	Yeovil District Hospital NHS Foundation Trust	87	5.3%	89.7%	18	1.1%	0.9%
RA7	University Hospitals Bristol NHS Foundation Trust	56	6.5%	23.2%	12.5	1.8%	2.1%
RBA	Taunton and Somerset NHS Foundation Trust	32	30.0%	12.9%	14	6.3%	6.0%
RD1	Royal United Hospital Bath NHS Trust	164	13.9%	23.1%	17	4.9%	4.3%
RVJ	North Bristol NHS Trust	157	12.6%	49.3%	19	2.5%	2.0%
<b>N29</b>	<b>3 Counties</b>						
RLQ	Hereford Hospitals NHS Trust	87	18.6%	23.0%	13	4.6%	4.2%
RTE	Gloucestershire Hospitals NHS Foundation Trust	75	13.3%	22.8%	17	2.7%	2.4%
RWP50	Worcestershire Royal Hospital (Worcestershire Acute Hospitals NHS Trust)	122	35.0%	56.2%	15	9.0%	8.5%
<b>N30</b>	<b>Thames Valley</b>						
RD7	Heatherwood and Wexham Park Hospitals NHS Foundation Trust	12	.	.	13.5	16.7%	9.6%
RD8	Milton Keynes General Hospital NHS Foundation Trust	16	0.0%	100.0%	10.5	12.5%	10.4%
RHW	Royal Berkshire NHS Foundation Trust	56	8.0%	14.3%	16	1.8%	2.7%
RN3	Great Western Hospitals NHS Foundation Trust	125	8.3%	40.0%	14	5.6%	4.6%
RTH	Oxford Radcliffe Hospitals NHS Trust	118	15.1%	22.9%	22	1.7%	2.1%
RXQ	Buckinghamshire Hospitals NHS Trust	65	7.8%	18.5%	16	3.1%	2.9%

## Appendix 3 (continued)

Code	Network / Trust Name	Number of patients undergoing major surgery	Patients with Dukes' D at time of major surgery	Major surgery carried out as an urgent or emergency procedure	Median number lymph nodes excised	Observed 30-day mortality	Adjusted 30-day mortality
<b>N31</b>	<b>Central South Coast</b>						
5QT	Isle of Wight NHS PCT	62	18.4%	17.3%	18	6.5%	7.9%
RHM	Southampton University Hospitals NHS Trust	178	12.4%	18.3%	14	1.7%	1.8%
RHU	Portsmouth Hospitals NHS Trust	205	19.1%	22.4%	13	5.4%	5.3%
RN1	Winchester and Eastleigh Healthcare NHS Trust	111	9.2%	1.8%	16	2.7%	4.2%
RN5	Basingstoke & North Hampshire NHS Foundation Trust	77	26.2%	15.6%	14	1.3%	1.6%
RNZ	Salisbury NHS Foundation Trust	111	7.9%	18.9%	17	2.7%	2.5%
RYR16	St Richard's Hospital (Western Sussex Hospitals NHS Trust)	123	8.9%	17.9%	12	4.9%	4.2%
<b>N32</b>	<b>Surrey, West Sussex &amp; Hampshire</b>						
RA2	Royal Surrey County Hospital NHS Trust	52	1.9%	11.8%	23	3.8%	5.3%
RDU	Frimley Park Hospital NHS Foundation Trust	58	12.5%	91.4%	24	3.4%	2.0%
RTK	Ashford and St Peter's Hospitals NHS Trust						
RTP	Surrey and Sussex Healthcare NHS Trust	31	4.5%	23.3%	14.5	6.5%	6.1%
<b>N33</b>	<b>Sussex</b>						
RXC	East Sussex Hospitals NHS Trust	134	14.0%	22.4%	18	2.2%	1.9%
RXH	Brighton and Sussex University Hospitals NHS Trust	74	11.8%	70.3%	13	2.7%	2.8%
RYR18	Worthing Hospital (Western Sussex Hospitals NHS Trust)	116	9.3%	19.0%	13	0.9%	1.1%
<b>N34</b>	<b>Kent &amp; Medway</b>						
RN7	Dartford and Gravesham NHS Trust	46	4.7%	15.2%	16	2.2%	2.1%
RPA	Medway NHS Trust						
RVV	East Kent Hospitals NHS Trust						
RWF	Maidstone and Tunbridge Wells NHS Trust	117	13.5%	21.1%	17	1.7%	1.5%
<b>N35</b>	<b>Greater Midlands</b>						
RJD	Mid Staffordshire General Hospitals NHS Trust	89	10.5%	31.8%	12.5	3.4%	2.6%
RJE	University Hospital of North Staffordshire NHS Trust	44	0.0%	9.5%	14	4.5%	4.5%
RL4	The Royal Wolverhampton Hospitals NHS Trust	154	14.6%	23.4%	20	5.2%	4.1%
RNA	Dudley Group of Hospitals NHS Trust	108	7.1%	34.6%	10	4.6%	4.2%
RWP31	Kidderminster Hospital (Worcestershire Acute Hospitals NHS Trust)	19	11.1%	0.0%	15	5.3%	5.5%
RXW	Shrewsbury and Telford Hospital NHS Trust	134	5.6%	8.3%	16	0.7%	1.2%
<b>N36</b>	<b>North of England</b>						
RE9	South Tyneside NHS Foundation Trust	83	12.2%	14.5%	14	1.2%	1.3%
RLN	City Hospitals Sunderland NHS Foundation Trust	105	2.3%	18.1%	14	2.9%	2.5%
RNL	North Cumbria Acute Hospitals NHS Trust	101	11.5%	11.2%	14	2.0%	2.6%
RR7	Gateshead Health NHS Foundation Trust	110	18.7%	13.8%	14	3.6%	3.4%
RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	157	10.3%	14.7%	18	4.5%	4.0%
RTF	Northumbria Health Care NHS Foundation Trust	174	10.0%	9.9%	14	5.7%	6.5%
RTR	South Tees Hospitals NHS Trust	113	4.5%	15.9%	15	2.7%	2.8%
RVW	North Tees and Hartlepool NHS Trust	131	26.6%	28.2%	14	6.9%	6.0%
RXP	County Durham and Darlington NHS Foundation Trust	176	16.4%	10.1%	12	9.1%	9.4%

## Appendix 3 (continued)

Code	Network / Trust Name	Number of patients undergoing major surgery	Patients with Dukes' D at time of major surgery	Major surgery carried out as an urgent or emergency procedure	Median number lymph nodes excised	Observed 30-day mortality	Adjusted 30-day mortality
<b>N37</b>	<b>Anglia</b>						
RC1	Bedford Hospital NHS Trust	76	14.0%	16.9%	15	1.3%	1.2%
RCX	The Queen Elizabeth Hospital King's Lynn NHS Trust	85	2.4%	11.8%	8	2.4%	2.2%
RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	54	16.7%	22.6%	16	5.6%	4.7%
RGP	James Paget Healthcare NHS Foundation Trust	98	13.8%	35.7%	11	7.1%	3.7%
RGQ	Ipswich Hospital NHS Trust						
RGR	West Suffolk Hospitals NHS Trust	122	23.1%	22.1%	16	5.7%	4.2%
RGT	Cambridge University Hospitals NHS Foundation Trust	60	13.6%	8.3%	12	0.0%	0.0%
RM1	Norfolk and Norwich University Hospital NHS Trust	260	8.2%	11.2%	13	2.7%	3.0%
RQQ	Hinchingbrooke Health Care NHS Trust	74	21.1%	21.9%	13	8.1%	7.9%
<b>N38</b>	<b>Essex</b>						
RAJ	Southend University Hospital NHS Foundation Trust	121	10.7%	34.4%	14	6.6%	5.6%
RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	86	12.9%	10.6%	10	2.3%	3.4%
RDE	Colchester Hospital University NHS Foundation Trust	164	18.1%	65.2%	10	4.9%	3.8%
RQ8	Mid Essex Hospital Services NHS Trust	24	33.3%	33.3%	15	8.3%	13.7%
	<b>Wales</b>						
7A1A1	Glan Clwyd Cancer Services	64	12.5%	25.0%	14	4.7%	2.8%
7A1AU	Ysbyty Gwynedd	72	6.9%	16.7%	14	5.6%	5.8%
7A1A4	Ysbyty Maelor Wrexham	55	9.6%	14.0%	23	1.8%	2.4%
7A6AM	Nevill Hall Hospital	44	2.8%	15.9%	19	6.8%	6.6%
7A6AR	Royal Gwent Hospital	82	17.5%	14.6%	12	2.4%	2.8%
7A4C1	Cardiff Hospitals	113	10.4%	16.5%	13	4.4%	4.1%
7A5B3	Prince Charles Hospital	61	6.9%	16.9%	14	8.2%	7.8%
7A5B1	Royal Glamorgan Hospital	42	16.7%	14.3%	10	4.8%	6.3%
7A3CJ	Princess of Wales Hospital Bridgend	74	15.1%	9.5%	17	4.1%	3.3%
7A3C7	Swansea Hospitals	101	10.0%	24.0%	16	1.0%	1.1%
7A2AJ	Bronglais General Hospital	25	16.0%	16.0%	13	4.0%	2.2%
7A2AL	West Wales General Hospital	63	4.8%	21.0%	9	4.8%	4.3%
7A2BL	Withybush General Hospital	50	12.2%	16.0%	14	2.0%	2.1%
	<b>Northern Ireland</b>						
NI	The Southern Health & Social Care Trust, Northern Ireland	127	29.8%	12.6%	16		
ULSTER	The South Eastern Health and Social Care Trust, Ulster	148	18.6%	6.1%	15		
	<b>Republic of Ireland</b>						
Beau	Beaumont Hospital, Dublin	94	9.0%	31.9%			
SJH	St James's Hospital, Dublin	88	14.9%	12.5%	16.5		

# Appendix 4: Results for patients with rectal cancer who had major surgery according to trust / hospital site in England, Wales, Northern Ireland and The Republic of Ireland

In this table results are left blank if they could not be calculated as a result of missing data.

Appendix 4						
Code	Network / Trust Name	Number of patients with rectal cancer undergoing major surgery	MRI scan results reported	Pre-operative radiotherapy (short or long)	APER rate	Permanent stoma rate
<b>N01</b>	<b>Lancashire &amp; South Cumbria</b>					
RTX	University Hospitals of Morecambe Bay NHS Trust	4	50.0%	25.0%	75.0%	0.0%
RXL	Blackpool, Fylde and Wyre Hospitals NHS Foundation Trust	38	97.4%	56.8%	28.9%	36.8%
RXN	Lancashire Teaching Hospitals NHS Foundation Trust	15	66.7%	28.6%	26.7%	0.0%
RXR	East Lancashire Hospitals NHS Trust	11	54.5%	0.0%	36.4%	0.0%
<b>N02</b>	<b>Greater Manchester and Cheshire</b>					
RBT	The Mid Cheshire Hospitals NHS Trust					
RBV	Christie, Hospital NHS Foundation Trust	12	66.7%	36.4%	25.0%	25.0%
RJN	East Cheshire NHS Trust	2	50.0%	50.0%	0.0%	0.0%
RM2	University Hospitals of South Manchester NHS Foundation Trust	17	88.2%	41.2%	11.8%	17.6%
RM3	Salford Royal NHS Foundation Trust	10	60.0%	0.0%	20.0%	40.0%
RM4	Trafford Healthcare NHS Trust	16	100.0%	87.5%	31.3%	56.3%
RMC	Bolton Hospitals NHS Trust	20	0.0%	0.0%	20.0%	.
RMP	Tameside and Glossop Acute Services NHS Trust	23	82.6%	60.9%	43.5%	84.6%
RRF	Wrightington, Wigan and Leigh NHS Trust	1	0.0%	100.0%	0.0%	.
RW3	Central Manchester University Hospitals NHS Foundation Trust	1	100.0%	100.0%	0.0%	100.0%
RW6	Pennine Acute Hospitals NHS Trust	27	81.5%	38.5%	40.7%	47.8%
RWJ	Stockport NHS Foundation Trust	18	50.0%	17.6%	11.1%	50.0%
<b>N03</b>	<b>Merseyside &amp; Cheshire</b>					
RBL	Wirral University Teaching Hospital NHS Foundation Trust	44	90.9%	58.5%	15.9%	29.5%
RBN	St Helens and Knowsley Hospitals NHS Trust	17	11.8%	66.7%	41.2%	0.0%
REM	Aintree University Hospitals NHS Foundation Trust	37	75.7%	75.0%	8.1%	14.3%
RJR	Countess of Chester Hospital NHS Foundation Trust	9	0.0%	55.6%	44.4%	0.0%
RQ6	Royal Liverpool and Broadgreen University Hospitals NHS Trust	27	0.0%	52.0%	37.0%	.
RVY	Southport and Ormskirk Hospital NHS Trust	22	59.1%	28.6%	4.5%	0.0%
RWW	Warrington and Halton Hospitals NHS Foundation Trust	31	64.5%	67.7%	35.5%	45.0%
<b>N06</b>	<b>Yorkshire</b>					
RAE	Bradford Teaching Hospitals NHS Foundation Trust	21	100.0%	81.0%	38.1%	0.0%
RCB	York Hospitals NHS Foundation Trust	46	78.3%	45.5%	17.4%	14.8%
RCD	Harrogate and District NHS Foundation Trust	18	94.4%	72.2%	22.2%	38.9%
RCF	Airedale NHS Trust	14	85.7%	42.9%	42.9%	50.0%
RR8	Leeds Teaching Hospitals NHS Trust	50	0.0%	0.0%	28.0%	.
RWY	Calderdale and Huddersfield NHS Foundation Trust	27	74.1%	11.1%	11.1%	26.3%
RXF	Mid Yorkshire Hospitals NHS Trust	68	91.2%	66.2%	29.4%	33.3%
<b>N07</b>	<b>Humber &amp; Yorkshire Coast</b>					
RCC	Scarborough and North East Yorkshire Health Care NHS Trust	11	63.6%	36.4%	18.2%	81.8%
RJL	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	35	57.1%	25.0%	8.6%	21.4%
RWA	Hull and East Yorkshire Hospitals NHS Trust	52	82.7%	72.5%	15.4%	21.2%
<b>N08</b>	<b>North Trent</b>					
RFF	Barnsley Hospital NHS Foundation Trust	21	76.2%	0.0%	23.8%	33.3%
RFR	The Rotherham NHS Foundation Trust	29	82.8%	55.2%	17.2%	17.2%
RF5	Chesterfield Royal Hospital NHS Foundation Trust	27	85.2%	40.7%	33.3%	32.0%
RHQ	Sheffield Teaching Hospitals NHS Foundation Trust	66	66.7%	69.4%	28.8%	37.9%
RP5	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	1	100.0%	0.0%	0.0%	0.0%

## Appendix 4 (continued)

Code	Network / Trust Name	Number of patients with rectal cancer undergoing major surgery	MRI scan results reported	Pre-operative radiotherapy (short or long)	APER rate	Permanent stoma rate
<b>N11</b>	<b>Pan Birmingham</b>					
RBK	Walsall Hospitals NHS Trust	26	19.2%	16.7%	11.5%	16.0%
RR1	Heart of England NHS Foundation Trust	46	63.0%	32.6%	8.7%	13.9%
RRK	University Hospital Birmingham NHS Foundation Trust	38	47.4%	47.1%	13.2%	33.3%
RXK	Sandwell and West Birmingham Hospitals NHS Trust	31	41.9%	22.6%	29.0%	6.5%
<b>N12</b>	<b>Arden</b>					
RJC	South Warwickshire General Hospitals NHS Trust	27	85.2%	51.9%	25.9%	37.0%
RKB	University Hospitals Coventry and Warwickshire NHS Trust	35	2.9%	8.8%	28.6%	22.2%
RLT	George Eliot Hospital NHS Trust	14	78.6%	69.2%	28.6%	38.5%
RWP01	Alexandra Hospital (Worcestershire Acute Hospitals NHS Trust)	14	78.6%	53.8%	21.4%	72.7%
<b>N13</b>	<b>Mid Trent</b>					
RK5	Sherwood Forest Hospitals NHS Foundation Trust	36	88.9%	66.7%	16.7%	25.0%
RWD	United Lincolnshire Hospitals NHS Trust	11	90.9%	81.8%	27.3%	45.5%
RX1	Nottingham University Hospitals NHS Trust	45	53.3%	2.2%	6.7%	8.9%
<b>N14</b>	<b>Derby &amp; Burton</b>					
RJF	Burton Hospitals NHS Trust	24	16.7%	20.8%	20.8%	.
RTG	Derby Hospitals NHS Foundation Trust	23	69.6%	33.3%	26.1%	36.4%
<b>N15</b>	<b>Leicestershire, Northamptonshire &amp; Rutland</b>					
RNQ	Kettering General Hospital NHS Trust	4	0.0%	0.0%	0.0%	.
RNS	Northampton General Hospital NHS Trust	28	67.9%	0.0%	21.4%	100.0%
RWE	University Hospitals of Leicester NHS Trust	70	90.0%	85.5%	22.9%	37.9%
<b>N20</b>	<b>Mount Vernon</b>					
RC9	Luton and Dunstable Hospital NHS Foundation Trust	11	81.8%	0.0%	27.3%	45.5%
RWH	East and North Hertfordshire NHS Trust	50	40.0%	0.0%	22.0%	44.4%
RWG	West Hertfordshire Hospitals NHS Trust					
<b>N21</b>	<b>North West London</b>					
RAS	The Hillingdon Hospital NHS Trust	17	58.8%	23.5%	17.6%	17.6%
RC3	Ealing Hospital NHS Trust	9	66.7%	0.0%	33.3%	33.3%
RFW	West Middlesex University Hospital NHS Trust	15	100.0%	73.3%	26.7%	21.4%
RQM	Chelsea and Westminster Hospital NHS Foundation Trust	14	100.0%	58.3%	28.6%	50.0%
RV8	North West London Hospitals NHS Trust	4	100.0%	0.0%	25.0%	33.3%
RYJ	Imperial College Healthcare NHS Trust	36	91.7%	45.7%	16.7%	18.2%
<b>N22</b>	<b>North London</b>					
RAL	Royal Free Hampstead NHS Trust	14	78.6%	58.3%	28.6%	35.7%
RAP	North Middlesex University Hospital NHS Trust					
RKE	The Whittington Hospital NHS Trust	19	63.2%	26.3%	5.3%	9.1%
RRV	University College London Hospitals NHS Foundation Trust					
RQW	The Princess Alexandra Hospital NHS Trust					
RVL	Barnet and Chase Farm Hospitals NHS Trust	30	80.0%	26.9%	20.0%	31.0%
<b>N23</b>	<b>North East London</b>					
RF4	Barking, Havering and Redbridge Hospitals NHS Trust	34	82.4%	66.7%	26.5%	25.0%
RGK	Whipps Cross University Hospital NHS Trust	23	91.3%	65.2%	13.0%	10.0%
RNH	Newham University Hospital NHS Trust	14	7.1%	0.0%	21.4%	33.3%
RNJ	Barts and The London NHS Trust	9	88.9%	44.4%	22.2%	66.7%
RQX	Homerton University Hospital NHS Foundation Trust	5	20.0%	33.3%	0.0%	0.0%

**Appendix 4 (continued)**

Code	Network / Trust Name	Number of patients with rectal cancer undergoing major surgery	MRI scan results reported	Pre-operative radiotherapy (short or long)	APER rate	Permanent stoma rate
<b>N24</b>	<b>South East London</b>					
RJ1	Guy's and St Thomas' NHS Foundation Trust	1	0.0%	100.0%	0.0%	.
RJ2	The Lewisham Hospital NHS Trust	11	63.6%	9.1%	27.3%	25.0%
RJZ	King's College Hospital NHS Foundation Trust	18	88.9%	50.0%	16.7%	16.7%
RYQ	South London Healthcare NHS Trust	7	14.3%	0.0%	0.0%	0.0%
<b>N25</b>	<b>South West London</b>					
RAX	Kingston Hospital NHS Trust	14	85.7%	0.0%	14.3%	21.4%
RJ6	Mayday Healthcare NHS Trust	14	71.4%	0.0%	7.1%	.
RJ7	St George's Healthcare NHS Trust	11	36.4%	0.0%	45.5%	50.0%
RPY	The Royal Marsden NHS Foundation Trust	4	75.0%	25.0%	0.0%	0.0%
RVR	Epsom and St Helier University Hospitals NHS Trust	15	0.0%	0.0%	0.0%	.
<b>N26</b>	<b>Peninsula</b>					
RA9	South Devon Health Care NHS Foundation Trust	22	90.9%	38.1%	36.4%	36.4%
RBZ	Northern Devon Healthcare NHS Trust	11	100.0%	0.0%	9.1%	9.1%
REF	Royal Cornwall Hospitals NHS Trust	49	73.5%	0.0%	18.4%	4.1%
RH8	Royal Devon and Exeter NHS Foundation Trust	31	48.4%	16.7%	35.5%	61.3%
RK9	Plymouth Hospitals NHS Trust	22	36.4%	5.3%	31.8%	0.0%
<b>N27</b>	<b>Dorset</b>					
RBD	Dorset County Hospital NHS Foundation Trust	16	0.0%	0.0%	18.8%	14.3%
RD3	Poole Hospital NHS Foundation Trust	22	68.2%	0.0%	18.2%	28.6%
RDZ	Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	37	75.7%	0.0%	10.8%	10.8%
<b>N28</b>	<b>Avon, Somerset &amp; Wiltshire</b>					
RA3	Weston Area Health NHS Trust	11	54.5%	55.6%	81.8%	0.0%
RA4	Yeovil District Hospital NHS Foundation Trust	29	75.9%	4.2%	17.2%	0.0%
RA7	University Hospitals Bristol NHS Foundation Trust	14	21.4%	12.5%	35.7%	0.0%
RBA	Taunton and Somerset NHS Foundation Trust	5	100.0%	0.0%	0.0%	0.0%
RD1	Royal United Hospital Bath NHS Trust	55	43.6%	43.6%	32.7%	0.0%
RVJ	North Bristol NHS Trust	45	62.2%	0.0%	17.8%	6.7%
<b>N29</b>	<b>3 Counties</b>					
RLQ	Hereford Hospitals NHS Trust	30	50.0%	30.0%	10.0%	34.5%
RTE	Gloucestershire Hospitals NHS Foundation Trust	24	58.3%	33.3%	8.3%	12.5%
RWP50	Worcestershire Royal Hospital (Worcestershire Acute Hospitals NHS Trust)	23	82.6%	35.0%	39.1%	52.2%
<b>N30</b>	<b>Thames Valley</b>					
RD7	Heatherwood and Wexham Park Hospitals NHS Foundation Trust	2	0.0%	0.0%	0.0%	.
RD8	Milton Keynes General Hospital NHS Foundation Trust	9	33.3%	0.0%	44.4%	0.0%
RHW	Royal Berkshire NHS Foundation Trust	9	88.9%	75.0%	11.1%	22.2%
RN3	Great Western Hospitals NHS Foundation Trust	26	38.5%	60.9%	53.8%	26.9%
RTH	Oxford Radcliffe Hospitals NHS Trust	22	59.1%	0.0%	36.4%	42.9%
RXQ	Buckinghamshire Hospitals NHS Trust	19	94.7%	52.6%	31.6%	38.9%
<b>N31</b>	<b>Central South Coast</b>					
5QT	Isle of Wight NHS PCT	15	80.0%	35.7%	26.7%	36.4%
RHM	Southampton University Hospitals NHS Trust	58	75.9%	30.4%	27.6%	39.5%
RHU	Portsmouth Hospitals NHS Trust	62	80.6%	24.6%	12.9%	24.2%
RN1	Winchester and Eastleigh Healthcare NHS Trust	27	74.1%	0.0%	11.1%	5.6%
RN5	Basingstoke & North Hampshire NHS Foundation Trust	22	100.0%	0.0%	0.0%	5.9%
RNZ	Salisbury NHS Foundation Trust	31	83.9%	0.0%	22.6%	38.7%
RYR16	St Richard's Hospital (Western Sussex Hospitals NHS Trust)	27	70.4%	38.5%	25.9%	33.3%

**Appendix 4 (continued)**

Code	Network / Trust Name	Number of patients with rectal cancer undergoing major surgery	MRI scan results reported	Pre-operative radiotherapy (short or long)	APER rate	Permanent stoma rate
<b>N32</b>	<b>Surrey, West Sussex &amp; Hampshire</b>					
RA2	Royal Surrey County Hospital NHS Trust	7	42.9%	0.0%	14.3%	14.3%
RDU	Frimley Park Hospital NHS Foundation Trust	3	0.0%	0.0%	0.0%	0.0%
RTK	Ashford and St Peter's Hospitals NHS Trust					
RTP	Surrey and Sussex Healthcare NHS Trust	8	37.5%	0.0%	12.5%	0.0%
<b>N33</b>	<b>Sussex</b>					
RXC	East Sussex Hospitals NHS Trust	32	59.4%	22.2%	18.8%	0.0%
RXH	Brighton and Sussex University Hospitals NHS Trust	34	47.1%	9.1%	17.6%	0.0%
RYR18	Worthing Hospital (Western Sussex Hospitals NHS Trust)	32	53.1%	15.6%	28.1%	0.0%
<b>N34</b>	<b>Kent &amp; Medway</b>					
RN7	Dartford and Gravesham NHS Trust	7	100.0%	28.6%	28.6%	
RPA	Medway NHS Trust					
RVV	East Kent Hospitals NHS Trust					
RWF	Maidstone and Tunbridge Wells NHS Trust	18	88.9%	23.5%	11.1%	6.7%
<b>N35</b>	<b>Greater Midlands</b>					
RJD	Mid Staffordshire General Hospitals NHS Trust	25	4.0%	0.0%	32.0%	0.0%
RJE	University Hospital of North Staffordshire NHS Trust	8	37.5%	14.3%	12.5%	0.0%
RL4	The Royal Wolverhampton Hospitals NHS Trust	40	45.0%	14.8%	30.0%	22.5%
RNA	Dudley Group of Hospitals NHS Trust	26	69.2%	4.3%	19.2%	19.2%
RWP31	Kidderminster Hospital (Worcestershire Acute Hospitals NHS Trust)	3	100.0%	0.0%	0.0%	0.0%
RXW	Shrewsbury and Telford Hospital NHS Trust	49	63.3%	0.0%	18.4%	18.4%
<b>N36</b>	<b>North of England</b>					
RE9	South Tyneside NHS Foundation Trust	27	51.9%	58.3%	22.2%	24.0%
RLN	City Hospitals Sunderland NHS Foundation Trust	31	64.5%	64.5%	19.4%	30.0%
RNL	North Cumbria Acute Hospitals NHS Trust	27	70.4%	37.0%	33.3%	40.0%
RR7	Gateshead Health NHS Foundation Trust	35	80.0%	36.4%	28.6%	50.0%
RTD	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	40	82.5%	65.0%	22.5%	28.2%
RTF	Northumbria Health Care NHS Foundation Trust	67	44.8%	59.1%	34.3%	38.8%
RTR	South Tees Hospitals NHS Trust	33	54.5%	0.0%	18.2%	0.0%
RVW	North Tees and Hartlepool NHS Trust	36	36.1%	16.7%	19.4%	0.0%
RXP	County Durham and Darlington NHS Foundation Trust	52	69.2%	50.0%	21.2%	26.1%
<b>N37</b>	<b>Anglia</b>					
RC1	Bedford Hospital NHS Trust	17	58.8%	0.0%	11.8%	0.0%
RCX	The Queen Elizabeth Hospital King's Lynn NHS Trust	17	17.6%	0.0%	17.6%	0.0%
RGN	Peterborough and Stamford Hospitals NHS Foundation Trust	15	0.0%	0.0%	60.0%	0.0%
RGP	James Paget Healthcare NHS Foundation Trust	22	54.5%	31.8%	31.8%	31.8%
RGQ	Ipswich Hospital NHS Trust					
RGR	West Suffolk Hospitals NHS Trust	29	24.1%	0.0%	0.0%	0.0%
RGT	Cambridge University Hospitals NHS Foundation Trust	25	64.0%	50.0%	28.0%	44.0%
RM1	Norfolk and Norwich University Hospital NHS Trust	72	20.8%	31.3%	27.8%	25.0%
RQQ	Hinchingbrooke Health Care NHS Trust	19	78.9%	71.4%	57.9%	47.4%
<b>N38</b>	<b>Essex</b>					
RAJ	Southend University Hospital NHS Foundation Trust	34	82.4%	42.4%	41.2%	36.7%
RDD	Basildon and Thurrock University Hospitals NHS Foundation Trust	27	81.5%	66.7%	22.2%	40.7%
RDE	Colchester Hospital University NHS Foundation Trust	44	40.9%	22.6%	11.4%	19.0%
RQ8	Mid Essex Hospital Services NHS Trust	6	100.0%	50.0%	0.0%	16.7%

**Appendix 4 (continued)**

Code	Network / Trust Name	Number of patients with rectal cancer undergoing major surgery	MRI scan results reported	Pre-operative radiotherapy (short or long)	APER rate	Permanent stoma rate
<b>Wales</b>						
7A1A1	Glan Clwyd Cancer Services	20	85.0%	68.4%	35.0%	30.0%
7A1AU	Ysbyty Gwynedd	15	53.3%	53.3%	13.3%	60.0%
7A1A4	Ysbyty Maelor Wrexham	16	81.3%	80.0%	18.8%	28.6%
7A6AM	Nevill Hall Hospital	10	80.0%	70.0%	40.0%	.
7A6AR	Royal Gwent Hospital	32	68.8%	45.2%	31.3%	53.8%
7A4C1	Cardiff Hospital	36	83.3%	58.8%	38.9%	37.5%
7A5B3	Prince Charles Hospital	21	57.1%	21.1%	28.6%	23.8%
7A5B1	Royal Glamorgan Hospital	16	81.3%	23.1%	37.5%	56.3%
7A3CJ	Princess of Wales Hospital Bridgend	25	88.0%	64.0%	28.0%	48.0%
7A3C7	Swansea Hospital	36	44.4%	40.0%	50.0%	69.7%
7A2AJ	Bronglais General Hospital	7	85.7%	14.3%	42.9%	16.7%
7A2AL	West Wales General Hospital	14	64.3%	21.4%	35.7%	64.3%
7A2BL	Withybush General Hospital	15	93.3%	42.9%	53.3%	60.0%
<b>Northern Ireland</b>						
NI	The Southern Health & Social Care Trust, Northern Ireland	34	50.0%	41.2%	11.8%	23.5%
ULSTER	The South Eastern Health and Social Care Trust, Ulster	50	42.0%	0.0%	28.0%	42.9%
<b>Republic of Ireland</b>						
Beau	Beaumont Hospital, Dublin	24	87.5%	75.0%	25.0%	29.2%
SJH	St James's Hospital, Dublin	21	90.5%	42.9%	14.3%	14.3%

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Document reference: IC18050111

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#### **Need to know more?**

T. 0845 300 6016  
E. [enquiries@ic.nhs.uk](mailto:enquiries@ic.nhs.uk)  
[www.ic.nhs.uk](http://www.ic.nhs.uk)

The NHS Information Centre  
for health and social care  
1 Trevelyan Square  
Boar Lane  
Leeds  
LS1 6AE