National Bowel Cancer Audit

Annual Report 2022

An audit of the care received by people with bowel cancer in England and Wales diagnosed between 01 April 2020 and 31 March 2021, and patients diagnosed between 01 April 2019 and 31 March 2020 who underwent a major resection after 31 March 2020.

The National Bowel Cancer Audit (NBOCA)

The NBOCA aims to describe and compare the quality of care and outcomes of patients diagnosed with bowel cancer in England and Wales. Further information can be found here.

The NBOCA collects data on items which have been identified as good measures of clinical care. It compares variation between English NHS trusts or hospitals, and Welsh multidisciplinary teams (MDTs), as well as changes in care over time. A guide to the outcomes measured in patients with bowel cancer is available here. This includes information about which outcomes are risk-adjusted and outlier-reported.

The outcomes of patients that were treated during the COVID-19 pandemic are not being outlier-reported. This is in recognition of the impact that the pandemic has had on making the robust, valid, and fair publication of provider-level outcomes unreliable. The only outcome that is outlier-reported this year is 2-year all-cause mortality after major resection because it includes patients having surgery before the pandemic.

NBOCA has previously published data at individual surgeon and trust/hospital level for English NHS trusts on the ACPGBI website as part of the Clinical Outcomes Publication (COP) programme. The COP process was suspended due to the COVID-19 pandemic at surgeon level, with results fed back directly to individual trusts/hospitals about their surgeons' performance to support their local quality assurance processes. Trust/hospital outcomes, reflecting the outcomes achieved by MDTs, are still publicly available for key performance indicators within the NBOCA Annual Report and will continue to be reported with risk adjustment where methodology allows.

Prepared in partnership with:

The Association of Coloproctology of Great Britain and Ireland (ACPGBI) is the professional body that represents UK colorectal surgeons. ACPGBI assisted in the clinical interpretation of the data presented in the 2022 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 Project Team based in the Clinical Effectiveness Unit (CEU) at the RCS carried out the analysis of the data for the 2022 Annual Report.

NHS Digital is the trading name for the Health and Social Care Information Centre (HSCIC). We support NHS staff at work, help people get the best care, and use the nation's health data to drive research and transform services. Our teams design, develop and operate the national IT and data services that support clinicians at work, help patients get the best care, and use data to improve health and care. NHS Digital will merge into NHS England in 2023.

The Healthcare Quality Improvement Partnership (HQIP) is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement in patient outcomes, and in particular, to increase the impact that clinical audit, outcome review programmes and registries have on healthcare quality in England and Wales. HQIP holds the contract to commission, manage and develop the National Clinical Audit and Patient Outcomes Programme (NCAPOP), comprising around 40 projects covering care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual projects, other devolved administrations and crown dependencies.

Contents

Acknowledgements

The National Bowel Cancer Audit (NBOCA), commissioned by the Healthcare Quality Improvement Partnership (HQIP) and funded by NHS England and the Welsh Government, has been developed by the Association of Coloproctology of Great Britain and Ireland (ACPGBI). It is managed by the Clinical Audit and Registries Management Service within NHS Digital on behalf of the Clinical Effectiveness Unit (CEU) of the Royal College of Surgeons of England (RCS).

The data for Wales has been supplied by the Cancer Network Information System Cymru (CaNISC).

The NBOCA forms part of the National Gastrointestinal Cancer Audit Programme alongside the National Oesophago-Gastric Cancer Audit (NOGCA). The National Gastrointestinal Cancer Audit Programme has an overarching Project Board team with representatives from both audits. Each audit retains its own Clinical Advisory Group, Project Team, and Patient and Carer Panel.

The analyses and writing for this report were carried out by the NBOCA Project Team within the Clinical Effectiveness Unit of the Royal College of Surgeons of England with support from NHS Digital, Miss Nicola Fearnhead (Consultant Colorectal Surgeon) and Dr Michael Braun (Consultant Oncologist).

The NBOCA Clinical Advisory Group consists of a wide range of professionals who provide input from a diverse range of perspectives on the Annual Report, including patient representatives and bowel cancer charity representatives. Patient, carer and bowel cancer charity representatives on the NBOCA Patient and Carer Panel provide input to NBOCA and advised on the production of the Patient Report.

NBOCA uses data provided by patients and collected by the NHS as part of their care and support. The Project Team and Board would like to thank the clinical and non-clinical staff at all National Health Service (NHS) trusts and Welsh Health Boards who collected and submitted data to the audit for their hard work, support and leadership.

The NBOCA Project Team consists of:

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The National Gastrointestinal Cancer Audit Project Board consists of:

Chair

Neil Mortensen	President, Royal College of Surgeons of England

Members

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Chris Dew	Programme Head, NHS Digital
Martyn Evans	Clinical Advisory Group Chair and Representative for Wales
Rebecca Muirhead	Representative, Royal College of Radiologists
Gareth Popham	Assistant Manager, Welsh Cancer Network
Caroline Rogers	Associate Director for Quality & Development, HQIP
Sarah Walker	Project Manager, HQIP

The 2022 NBOCA Clinical Advisory Group consists of the NBOCA Project Team and:

Chair

Martyn Evans	Chair and Representative for Wales

Members

Robert Arnott	Patient Representative, NBOCA Patient & Carer Panel
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Sarah Walker	Project Manager, HQIP
Nick West	Associate Professor of Pathology
Lisa Wilde	Bowel Cancer UK Representative

Foreword

It is a great privilege as ACPGBI President to write the foreword for the 2022 NBOCA Report. I must confess to reading it with a degree of trepidation, given it encompassed for the most part the start of COVID-19. It won't come as much of a surprise to the many of you who continued to work through this time period, that the pandemic has had a huge impact on colorectal cancer (CRC) care, and the report documents that impact. However, it is not all bad.

It is reassuring that pretty much all hospitals/trusts/MDTs report both their 2 year and overall mortality rates, and that there has only been a marginal increase in both. It is not surprising that the number of colorectal cancer cases diagnosed reduced in the first wave of COVID-19, but also testament to the industry and resilience of healthcare professionals that they had returned to normal by October 2020, as diagnostic pathways resumed. It is also reassuring that laparoscopic and robotic surgery rates continue to climb, whilst length of stay, unplanned return to theatre and positive CRM rates are all reducing. Rates of major resection for rectal cancer are also falling, as local excision rates increase and enhanced surveillance after complete response from neo-adjuvant therapy is accepted as standard practice. And yet our patients with temporary stomas are spending far too long waiting to have them reversed…

The use of adjuvant chemotherapy dropped with the first wave of COVID-19, but as with CRC diagnostics, had returned to normal by Q1 in 2021. What is surprising to see is that there is still significant variation in administration of chemotherapy for Stage III disease, and levels of toxicity. It is this variation that continues to pervade colorectal cancer management – rates of laparoscopic and robotic surgery being two surgical examples. Despite the national GIRFT (Getting it Right First Time) and NCIP (National Consultant Information Programme) initiatives it seems that variation in practice still exists to a significant extent.

The report also highlights the fact that some 15% of hospitals/trusts/MDTs do fewer than 10 rectal cancer resections a year, whilst 49% do fewer than 20. This raises the question as to whether rectal cancer cases should be referred on from the lower to higher volume adjacent centres. Is it really acceptable for a unit to operate on such a small number of rectal cancer cases? The number of rectal cancer resections done by individuals within units also needs consideration with the question here being whether there is a case for not all colorectal surgeons operating on rectal cancer.

Finally, I would also like to recognise and acknowledge the huge amount of work required to produce this report - our partners within NHS Digital, the Clinical Effectiveness Unit at the Royal College of Surgeons of England, and the Healthcare Quality Improvement Partnership (HQIP). Secondly, we should recognise the value of the input from our Patient and Carer Panel who provide careful oversight and emphasise the focus on the patient. Thirdly, I would like to acknowledge all the individuals within individual units who collate and submit data to the audit – without them there is no audit.

Charles Maxwell-Armstrong
President
Association of Coloproctology of Great Britain and Ireland

1. Executive Summary

This report includes patients diagnosed with bowel cancer between 01 April 2020 and 31 March 2021. It also includes patients diagnosed between 01 April 2019 and 31 March 2020 (2021 Annual Report cohort) who underwent a major resection after 31 March 2020. These patients were all diagnosed and/or treated during the COVID-19 pandemic and their outcomes are not outlier-reported. The exception is 2-year all-cause mortality after major resection that only includes patients treated pre-pandemic, and this outcome is outlier-reported.

The 2022 Annual Report is written for clinicians, commissioners, regulators and other professional stakeholders. It aims to be a more concise report than in previous years, focussing on (i) change over time and (ii) variation (both geographical and between-unit). A separate Patient Report, prepared in close consultation with NBOCA's Patient and Carer Panel, summarises the main findings of this report for a patient and public audience.

Key Findings

Chapter 3 – Quality Improvement

- The proportion of hospitals/trusts/MDTs meeting each local NBOCA QI target has reduced for 7 out of 10 targets during the COVID-19 pandemic compared to the previous audit period. This is most marked for the 18-month unclosed diverting ileostomy QI target.
- The local QI targets with the highest proportion of hospitals/trusts/MDTs meeting them are 2-year survival (98%) and 90-day post-operative mortality (96%).
- The local QI target with the lowest proportion of hospitals/trusts/MDTs meeting it is "the proportion of patients seen by Clinical Nurse Specialist (CNS)" (31%).
- In the last audit period (2019/20), of those hospitals/trusts/MDTs with information for all 10 local QI targets, 8% met all 10 targets, 44% met 9 or more targets and 72% met 8 or more targets. During this audit period (2020/21), 3% met all 10 targets, 18% met 9 or more targets and 53% met 8 or more targets.

Chapter 4 – Care Pathways During and Beyond the COVID-19 Pandemic

- There was a substantial reduction in the number of patients diagnosed with bowel cancer during the first wave of the COVID-19 pandemic across all referral pathways, except for emergency presentations which remained constant.
- The number of patients diagnosed with bowel cancer returned to normal around October 2020.
- The number of patients diagnosed via screening has steadily increased since 2015, although there was a considerable dip in screening during the first wave of the COVID-19 pandemic in 2020 when services paused locally for infection control and clinical safety reasons.
- There is geographical variation in the proportion of patients with stage I or II disease (23% to 48%). However, there also remains variation in the proportion of patients with missing pre-treatment staging (2% to 22%) which makes interpretation of this finding problematic.
- Mismatch Repair (MMR) testing is a NICE recommendation. Completion of MMR status within NBOCA has improved from 13% in 2018/19 to 21% in this audit period, with half of English Cancer Alliances improving their completion rates. There is nationwide room for improvement in pre-operative MMR testing, and recording of this important prognostic factor, to aid clinical and oncological decision-making.

Chapter 5 – Peri-operative Care

- 90-day post-operative mortality has increased marginally from 2.7% in 2019/20 to 3.1%, although there is little geographical or between-unit variation.
- 90-day post-operative mortality increased for patients undergoing urgent/emergency surgery from 8.9% in 2019/20 to 11.2% during the COVID-19 pandemic in 2020/21.
- The proportion of patients undergoing laparoscopic surgery has increased year on year from 48% in 2013 to 66% in 2021, with persistent geographical variation (44% to 74%).
- Robotic surgery uptake has increased from 0.3% in 2013 to 6% in 2021, with geographical variation (0% to 13%).
- Unplanned return to theatre has reduced over time from 8.3% in 2016/17 to 7.2% in 2020/21. There was some increased between-unit variation during this audit period compared to the last audit period.
- Length of stay following elective/scheduled procedures has steadily reduced over time. The proportion of patients staying in hospital for 5 days or less has increased from 35% in 2016/17 to 45% in 2020/21.
- Overall, during the COVID-19 pandemic, length of stay decreased from 7 days (IQR 5-11 days) in 2019/20 to 6 days (IQR 4-9 days) this audit period, with no associated increase in 30-day unplanned readmissions (11.1% in 2019/20 compared to 11.3% this audit period).

Chapter 6 – Oncological Management

- The use of adjuvant chemotherapy for patients with pathological stage III colon cancer decreased substantially during the first wave of the COVID-19 pandemic, subsequently returning to normal levels by the first quarter of 2021.
- Considerable between-unit variation persists in the use of adjuvant chemotherapy for resected stage III colon cancer with 21 hospitals/trusts/MDTs (14%) lying outside the 95% funnel limits.
- Overall, 25% of patients receiving adjuvant chemotherapy for stage III colorectal cancer experienced a severe acute toxicity necessitating overnight hospital admission. This varied between units from 11% to 49%.
- For all patients, overall 2-year all-cause mortality remains stable at 32% for 2018/19 compared to 33% for 2016/17. The patients in this cohort were treated prior to the first wave of the COVID-19 pandemic.
- There have been small improvements in 2-year all-cause mortality by different treatment groups. For example, for patients not having excision of their tumour, 2-year all-cause mortality reduced from 73% in 2016/17 to 70% in 2018/19.
- There has been an increase in between-unit variation for 2-year cancer-specific mortality (seven hospitals/trusts/MDTs lying above the inner funnel limits in the 2020/21 audit period compared to three trusts/hospitals/MDTs in the 2019/20 audit period).

Chapter 7 – Rectal Cancer Management

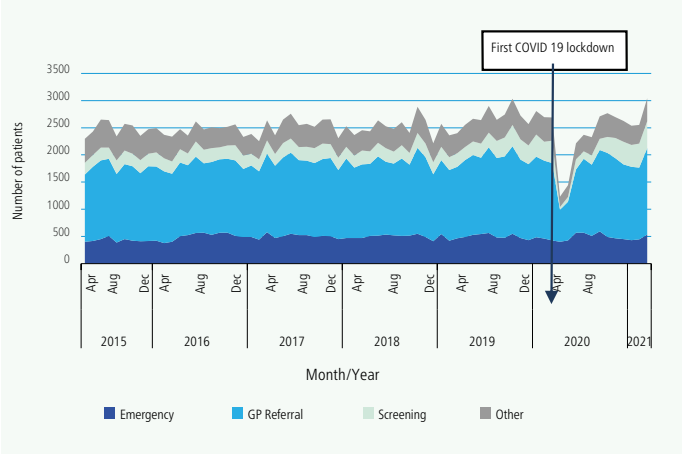
- Since 2016/17, the proportion of patients with rectal cancer that have a major resection has reduced from 54% to 47%.
- The reduction in major resections has been associated with an increase in the use of local excision for early rectal cancer, complete clinical response after neo-adjuvant therapy precipitating enhanced surveillance following publication of OnCoRe, and an increase in total neo-adjuvant therapy (TNT) for locally advanced rectal cancers.
- During the COVID-19 pandemic, there was a shift towards the use of short-course radiotherapy whether as primary holding treatment prior to delayed resectional surgery, or as part of TNT for more locally advanced rectal cancer. This was a major shift in practice during that time. Patients having short-course radiotherapy during the COVID-19 pandemic were younger, fitter, and with fewer comorbidities and more advanced T- and N-stage disease.
- There has been an associated further increase in the geographical variation in the use of different types of neo-adjuvant chemoradiotherapy. For example, the use of short-course radiotherapy varied from 3% to 42% in 2019 compared to 2020 where it varied from 9% to 60%.
- The proportion of patients with a positive circumferential resection margin has reduced from 8.3% in 2016/17 to 7.4% this audit period.
- Between 1st April 2020 and 31st March 2021, 15% of hospitals/trusts/MDTs performed fewer than 10 rectal cancer resections and 49% of hospitals/trusts/MDTs performed fewer than 20 rectal cancer resections.
- There has been a substantial increase in the proportion of patients who do not have their diverting ileostomy closed in the 18 months after an anterior resection. This has increased from approximately 29% in 2015/16 to 47% in 2019/20, and may reflect the impact of the COVID-19 pandemic on waiting lists. With emerging evidence of the negative impact of unclosed ileostomy on patient quality of life and even potentially on long-term survival, this will be a key focus area for future local and national quality improvement initiatives.

CARE PATHWAYS

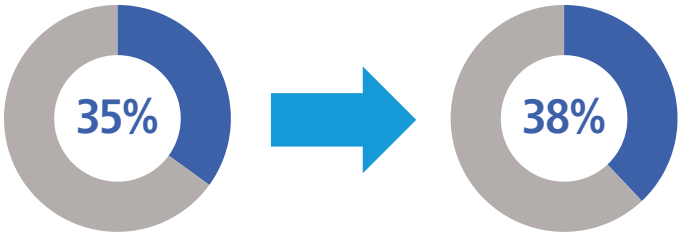
28,523

patients were diagnosed with bowel cancer in England and Wales between 1 April 2020 and 31 March 2021.

- Reduction in number of patients diagnosed during COVID-19 pandemic
- All referral pathways affected except emergency presentation
- Diagnostic numbers returned to normal in October 2020

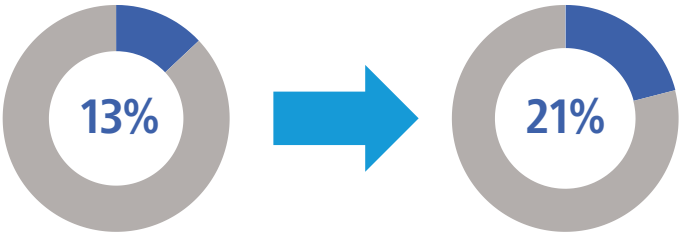


Proportion of patients presenting with stage I and II colorectal cancer



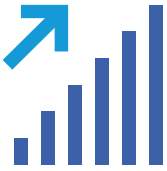
2016/17 — 2020/21

Proportion of patients with Mismatch Repair recorded in NBOCA data



2018/19 — 2020/21

PERI-OPERATIVE CARE



3.1% in 2020/21

2.7% in 2019/20

90-day post-operative mortality

8.3% in 2016/17

7.2% in 2020/21

Unplanned return to theatre

11.3% in 2020/21

10.3% in 2016/17

30-day unplanned readmission

45% in 2020/21

35% in 2016/17

Elective length of stay 5 days or less

SURVIVAL

33% in 2016/17

32% in 2018/19

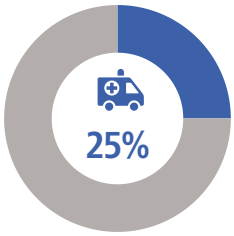
2-year all-cause mortality

ONCOLOGICAL MANAGEMENT

61% in 2019

57% in 2020

Adjuvant chemotherapy for stage III colon cancer



Severe acute toxicity after adjuvant chemotherapy

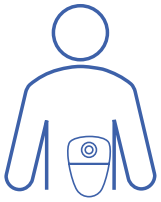
RECTAL CANCER MANAGEMENT

37% Permanent stoma after rectal cancer surgery

54% in 2016/17

47% in 2020/21

Major surgery for rectal cancer



47% in 2019/20

29% in 2015/16

Unclosed diverting ileostomy

52% in 2020

31% in 2019

Short-course radiotherapy for rectal cancer

Main Recommendations

Number	Recommendation	Related National Guidance	Where in the report and rationale
1	All hospitals/trusts/MDTs should review the individual local outcomes provided by NBOCA and agree on three targeted local quality improvement initiatives for 2023. These should focus on areas where local QI metrics are not being met, or are close to falling short of the target.	National Bowel Cancer Audit. Quality Improvement Plan (2021)	Full report, Chapter 3, Table 3.1 (page 14) & Appendix Each provider should use bespoke NBOCA results to implement relevant and meaningful changes to clinical practice.
2	Participation and engagement with the NBOCA quality improvement plan to focus on improving cancer outcomes targeting the areas most relevant to the hospital/trust/MDT, with particular emphasis on the performance measures with the most national variation:		
	a) 18-month diverting ileostomy closure	ACPGBI: Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017) – Surgical Management	Full report, Chapter 7, page 44 Substantial increase in the proportion of patients with an unclosed diverting ileostomy at 18 months with considerable between-unit variation.
	b) 30-day unplanned return to theatre	National Bowel Cancer Audit. Quality Improvement Plan (2021)	Full report, Chapter 5, page 28–29 Considerable between-unit variation in 30-day unplanned return to theatre.
	c) Administration of adjuvant chemotherapy following major resection for stage III colon cancer	NICE: Colorectal cancer. [NG151] (January 2020)	Full report, Chapter 6, page 33 Reduction in adjuvant chemotherapy use during the COVID-19 pandemic from 61% in 2019 to 57% in 2020.
3	Bowel cancer charities should continue to raise awareness and educate patients, particularly about the symptoms and signs of bowel cancer. They should also promote engagement with the NHS England Bowel Cancer Screening Programme and Bowel Screening Wales, highlighting the advantages of early diagnosis.	National Bowel Cancer Screening Programme – England Bowel Cancer Screening Wales	Supplementary report, Supplementary Table 1, Page 2 Patients identified via screening are more likely to have curative disease.

Number	Recommendation	Related National Guidance	Where in the report and rationale
4	Hospitals/trusts/MDTs should support local developments in the implementation of diagnostic and surgical hubs in order to help to mitigate the impacts of COVID-19 on elective diagnoses and treatments.	Royal College of Surgeons of England. A New Deal for Surgery. (2021) NHS England. Delivering plan for tackling the COVID-19 backlog of elective care. (2022)	Full report, Chapter 4 (page 16–17) , Chapter 5 (page 23), and Chapter 6 (page 31)
5	Review and take action to improve participation, coding, data quality, and timely reporting for NBOCA, in particular for:		
	a) >70% completeness for risk adjustment variables (particularly TNM staging and ASA grade) for patients undergoing surgery.	National Bowel Cancer Audit. Quality Improvement Plan (2021)	Full report, Chapter 2, page 13 Providers excluded from analyses due to poor data completion.
	b) Completion of genomics data for all patients including MMR/MSI status. c) In addition, Lynch germline testing should be ordered where MMR deficiency is identified and referral to clinical genetics for those where Lynch syndrome is diagnosed.	NICE: Molecular testing strategies for Lynch syndrome in people with colorectal cancer. [DG27] (February 2017) NHS England: Lynch Handbook (July 2021) NICE: Colorectal cancer. [NG151] (January 2020) NICE: Quality Statement 1: Testing for Lynch syndrome RM Partners. Lynch syndrome early diagnosis pathway for colorectal cancer. Training Courses.	Full report, Chapter 4, page 19–20 and 22 Only one fifth of patients had MMR status recorded in NBOCA data.
	d) Completion of data item relating to patients being seen by a Clinical Nurse Specialist (CNS).	ACPGBI: Guidelines for the Management of Cancer of the Colon, Rectum and Anus (2017) – Surgical Management	Full report, Chapter 3, page 14 Only 31% of hospitals/trusts/MDTs met this local QI target.
	e) Improved completion and accuracy of pre-treatment TNM staging.	NHS Long Term Plan for Cancer (2019), Cancer Cancer Delivery Plan for Wales (2016), Detecting cancer earlier	Full report, Chapter 4, page 21 There is geographical variation (2% to 22%) in missing pre-treatment staging. Pre-treatment staging is crucial to understand treatment pathways and to evaluate for stage migration following the COVID-19 pandemic.

Twitter: Follow @NBOCA_CEU for regular updates, including any new publications.

Short Reports and Publications

- Hospital- and surgeon-level volumes for rectal cancer surgery in England and implications for Wales

Methods were developed to improve the accuracy and robustness of the measurement of rectal surgery volume, as well as identifying patient, unit, and surgeon-level characteristics associated with rectal surgery volumes.

- Development and validation of a coding framework to identify severe acute toxicity from systemic anti-cancer therapy using hospital administrative data

A comprehensive coding framework was developed and validated to identify severe acute toxicity from systemic anti-cancer therapy in hospital administrative data.

- Outcomes of colorectal cancer resection in patients with inflammatory bowel disease: a national population-based analysis in England and Wales

This study compared early post-operative outcomes and 2-year cancer-specific mortality following colorectal cancer resection in patients with and without inflammatory bowel disease.

- Health service planning to assess the expected impact of centralising specialist cancer services on travel times, equity, and outcomes: a national population-based modelling study.

A health services planning model was developed to estimate the expected impacts of different centralisation scenarios on travel time, equity in access to services, patient outcomes, and hospital workload, using rectal cancer surgery as an example.

- Severity of dementia and survival in patients diagnosed with colorectal cancer: a national cohort study in England and Wales

This study assessed the impact of varying severities of dementia on 2-year overall survival.

- Impact of patient choice and hospital competition on patient outcomes after rectal cancer surgery: a national population-based study

The correlation was measured between choice and competition on outcomes after rectal cancer surgery.

- Linkage of multiple electronic health record datasets using a 'spine linkage' approach compared with all 'pairwise linkages'

An efficient approach was developed and validated for accurately linking more than two national clinical datasets through one 'spine dataset', using patients with bowel cancer undergoing emergency surgery as an example.

Quality Improvement (QI)

Following the launch of the NBOCA QI Plan this annual report includes a new QI chapter (Chapter 3) which explains the aim of the plan and how hospitals/trusts/MDTs are expected to use the plan to stimulate local quality improvement. It summarises the number of local QI targets being met by hospitals/trusts/MDTs and how this has changed over time.

NBOCA Quarterly Reports

NBOCA now provides quarterly feedback to hospitals/trusts/MDTs on the care and outcomes of bowel cancer patients using HES data linked to ONS mortality data. Work will continue to provide more comprehensive, frequent, and timely feedback to support the NBOCA QI work.

NBOCA Organisational Survey

The 2022 Organisational Survey results are available to download and are also used to report the services available at each hospital/trust/MDT on the Trust Results pages of the website. A big thank you to the clinical leads of the hospitals/trusts/MDTs for providing this information which also helps NBOCA to better understand variation in care and outcomes of bowel cancer patients.

National Cancer Audit Collaborating Centre

The Clinical Effectiveness Unit (CEU) at the Royal College of Surgeons of England has established the National Cancer Audit Collaborating Centre, delivering five new national cancer audits in breast cancer (primary and metastatic), ovarian, pancreatic, non-Hodgkin lymphoma and kidney cancer. The new centre is part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP), commissioned by the Healthcare Quality Improvement Partnership (HQIP) on behalf of NHS England and the Welsh Government. It is anticipated that NBOCA and other existing NCAPOP cancer audits will join the National Cancer Audit Collaborating Centre after the end of their currently commissioned work programmes.

International Collaboration of Colorectal Cancer Audits/Registries

NBOCA has a leading role in setting up a new international collaboration of colorectal cancer audits and registries with members so far from 9 countries across Europe, Australasia, North and South America. The aims of the collaboration include learning across audits, making international comparisons of care and outcomes, and international collaborations for boosting sample sizes.

NIHR-funded Cancer Recurrence Project

Members of the NBOCA Project Team have secured NIHR funding for an ambitious 3-year project: Identifying Cancer Recurrence within Patient Care Pathways across Linked National Clinical Datasets (Award ID NIHR132459). This focuses primarily on bowel cancer and assessing whether the methods can then be applied to breast and prostate cancer.

2. Methods

An updated Methodology Supplement for 2022 is available. It includes a description of the methodology used to estimate performance indicators and to risk-adjust outcomes. Only 2-year all-cause mortality after major resection has undergone outlier analysis this year, due to the impact of the COVID-19 pandemic. Potential outliers are managed following the NBOCA Outlier Policy.

In addition to outliers, we also record providers who undertake colorectal cancer surgery but do not meet case ascertainment or data completeness targets which results in apparent exclusion from the reported data or precludes adequate risk adjustment. The outlying providers in terms of data entry and completeness are recorded below.

Local Quality Improvement Target

★ >80% case ascertainment

The following providers submitted data on fewer than 10 patients in 2020/21:

- Mid and South Essex NHS Foundation Trust - Broomfield Hospital
- Royal Free London NHS Foundation Trust
- Southport and Ormskirk Hospital NHS Trust

The following providers submitted greater than 10 cases prior to linkage deadline, but had fewer than 10 linked surgical cases in the analysis extract for 2020/21:

- Barnsley Hospital NHS Foundation Trust
- Salisbury NHS Foundation Trust
- The Princess Alexandra Hospital NHS Trust
- United Lincolnshire Hospitals NHS Trust - Lincoln and Grantham

Local Quality Improvement Target

★ Data item completeness for risk adjustment >70%

Providers with insufficient data completeness for risk adjustment

90-day mortality, 30-day emergency readmission, and unplanned return to theatre:

- Homerton University Hospital NHS Foundation Trust (TNM and ASA)
- Sherwood Forest Hospitals NHS Foundation Trust (ASA)
- St George's University Hospitals NHS Foundation Trust (TNM and ASA)

2-year survival:

- Dartford and Gravesham NHS Trust (TNM)
- East and North Hertfordshire NHS Trust (TNM)
- Hull and East Yorkshire Hospitals NHS Trust (ASA)
- Southport and Ormskirk Hospital NHS Trust (TNM)
- St. George's University Hospitals NHS Foundation Trust (TNM and ASA)

18-month unclosed diverting ileostomy:

- None

3. Quality Improvement

3.1 NBOCA Quality Improvement Plan

In 2021, NBOCA launched its Quality Improvement Plan which can be accessed here in full. The aim of the plan is to involve all members of the MDTs managing patients with colorectal cancer, covering the entire patient care pathway including diagnosis, peri-operative care, neo-adjuvant and adjuvant treatments, stage IV disease, and end of life care.

The quality improvement metrics have been selected to cover two broad aspects of colorectal cancer care: "Improving Patient Experience" and "Improving Cancer Outcomes". Each metric has a national and local target. NBOCA will provide hospitals/trusts/MDTs with the relevant metrics. All hospitals/trusts/MDTs will be expected to adopt local quality improvement strategies in 2-3 areas where they have poor or lower than average performance.

Further resources for quality improvement are available here. NBOCA ran a successful live in-person QI workshop at the 2022 ACPGBI Annual Meeting in Edinburgh and has a workshop planned for the 2023 ACPGBI Annual Meeting in Manchester. We have plans to showcase successful local QI initiatives in our newsletters to help share and disseminate good ideas to improve practice.

3.2 Summary of NBOCA QI Targets

The following 10 local QI metrics and their corresponding targets are currently reported at local level by NBOCA (Table 3.1). Further metrics are under development, particularly focussing on oncological input to the patient pathway.

Local Quality Improvement Target

★ Local targets have been highlighted throughout the report in boxes like this

Table 3.1
NBOCA local QI metrics

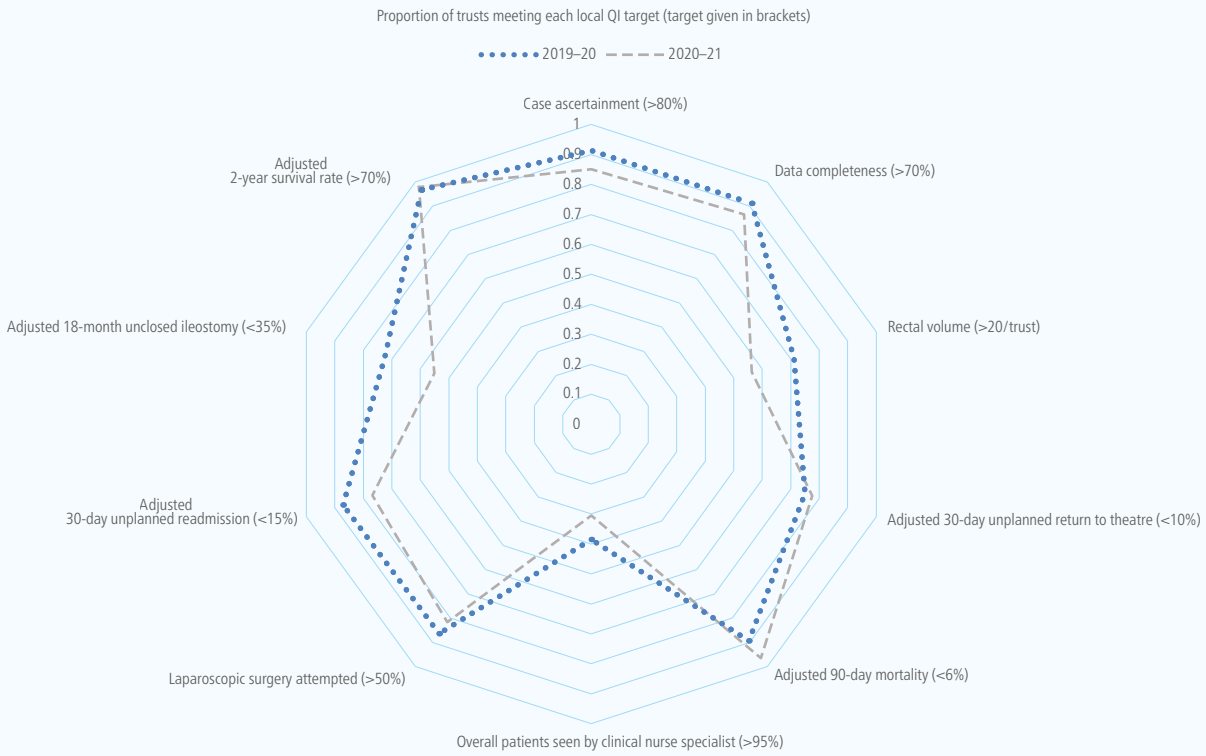
QI Metric	Local Target
Case ascertainment	> 80%
Data item completeness for risk-adjustment for surgical patients	> 70%
Reported annual rectal cancer resection volume	> 20 cases
Risk-adjusted unplanned return to theatre after colorectal resection	< 10%
Risk-adjusted 90-day mortality after colorectal resection	< 6%
Proportion of patients seen by Clinical Nurse Specialist (CNS)	> 95%
Laparoscopic surgery attempted	> 50%
Risk-adjusted 30-day unplanned readmissions	< 15%
Risk-adjusted 18-month unclosed diverting ileostomy after anterior resection	< 35%
Risk-adjusted 2-year survival after colorectal resection	> 70%

Table 3.2 and Figure 3.1 summarise the percentage of hospitals/trusts/MDTs meeting each local QI target during the COVID-19 pandemic this audit period and how these have changed from the previous audit period. The proportion of providers meeting each target has reduced for 7 of the 10 targets during the COVID-19 pandemic in 2020/21, most markedly for adjusted 18-month unclosed ileostomy rate and rectal cancer resection volume. The target met by the lowest number of hospitals/trusts/MDTs is 'Patients seen by clinical nurse specialist >95%', with only 31% of hospitals/trusts/MDTs meeting this target in this audit period and only 39% in last audit period. While this may represent a data completion issue, the target is important in emphasising the importance of specialist colorectal nurses in enhancing the patient experience.

Table 3.2
Percentage of hospitals/trusts/MDTs meeting each QI target

	Local QI target	% hospitals/trusts/MDTs meeting target	
		2019/20	2020/21
Case ascertainment	>80%	91.3	85.0
Data completeness	>70%	91.1	86.6
Rectal volume	>20/trust	71.1	56.4
Adjusted 30-day unplanned return to theatre	<10%	75.0	77.5
Adjusted 90-day mortality	<6%	89.4	96.4
Overall patients seen by clinical nurse specialist	>95%	38.5	30.6
Laparoscopic surgery attempted	>50%	86.5	81.7
Adjusted 30-day unplanned readmission	<15%	87.1	76.8
Adjusted 18-month unclosed ileostomy	<35%	72.4	55.1
Adjusted 2-year survival rate	>70%	96.6	97.9

Figure 3.1
Proportion of hospitals/trusts/MDTs meeting each local QI target in 2019/20 and 2020/21



In the last audit period (2019/20), of those hospitals/trusts/MDTs with information for all 10 local QI targets, 8% met all 10 targets, 44% met 9 or more targets and 72% met 8 or more targets (Table 3.3). Fewer than 2% of hospitals/trusts/MDTs met fewer than 6 of the 10 targets in 2019/20. During this audit period (2020/21), of those hospitals/trusts/MDTs with information for all 10 local QI targets, 3% met all 10 targets, 18% met 9 or more targets and 53% met 8 or more targets (Table 3.3). Fewer than 2% of hospitals/trusts/MDTs met fewer than 6 of the 10 targets in 2020/21.

Table 3.3
Number of local QI targets met by hospitals/trusts/MDTs with information for all 10 targets

	2019/20	2020/21
% of hospitals/trusts/MDTs meeting all 10 targets	7.9	3.3
% of hospitals/trusts/MDTs meeting 9 or more targets	44.4	18.3
% of hospitals/trusts/MDTs meeting 8 or more targets	72.2	53.3
% of hospitals/trusts/MDTs meeting 7 or more targets	88.1	83.3
% of hospitals/trusts/MDTs meeting 6 or more targets	98.4	96.6
% of hospitals/trusts/MDTs meeting 5 or more targets	98.4	98.3
% of hospitals/trusts/MDTs meeting 4 or more targets	100.0	100.0

4. Care Pathways During and Beyond the COVID-19 Pandemic

4.1 Trends over time in care pathways

In response to the COVID-19 pandemic the government issued the first national lockdown on 23 March 2020 with the advice to "stay at home, save lives, protect the NHS" contributing to changes in health-seeking behaviours. During the first wave of the pandemic there was a significant reduction in the use of endoscopy and the NHS England Bowel Cancer Screening Programme and Bowel Screening Wales were paused locally (see below). In addition, the COVID-19 pandemic impacted the ability of hospitals/trusts/MDTs to report data.

During this audit period (2020-21), there has been a considerable reduction in the number of patients diagnosed with bowel cancer and undergoing surgical procedures, in particular major resections (Table 4.1). The characteristics of the 28,523 patients diagnosed with bowel cancer during this audit period are described, by referral pathway, in Supplementary Table 1.

Prior to the COVID-19 pandemic, the number of bowel cancer patients reported to the audit had been slowly increasing (Figure 4.1). At the start of the COVID-19 pandemic, there was a considerable reduction in the number of diagnoses via all referral pathways, except emergency presentation. The number of patients diagnosed as an emergency has remained relatively constant, and this persisted during the first wave of the COVID-19 pandemic in 2020. By approximately October 2020, monthly numbers had returned to normal for all referral pathways, with the hint of a possible increase at the start of 2021.

Overall, the number of patients diagnosed via screening has increased over time (Figure 4.1). Faecal Immunochemical Test (FIT) was introduced to the screening programme in England from June 2019, and Wales had completed a phased roll-out in September 2019. FIT testing was also being offered nationally as a diagnostic adjunct as part of NICE DG30 guidance to test patients presenting without rectal bleeding but with low-risk unexplained symptoms. Additional guidance on the use of FIT testing during the pandemic was also provided.

The NHS England Bowel Cancer Screening Programme and Bowel Screening Wales were paused locally for infection control and clinical safety reasons during the first wave of the COVID-19 pandemic in March 2020. The dramatic effect of this public health pandemic crisis can be seen in the graph. According to NBOCA data, 3,532 patients were diagnosed via screening in 2019 compared to 3,094 in 2020.

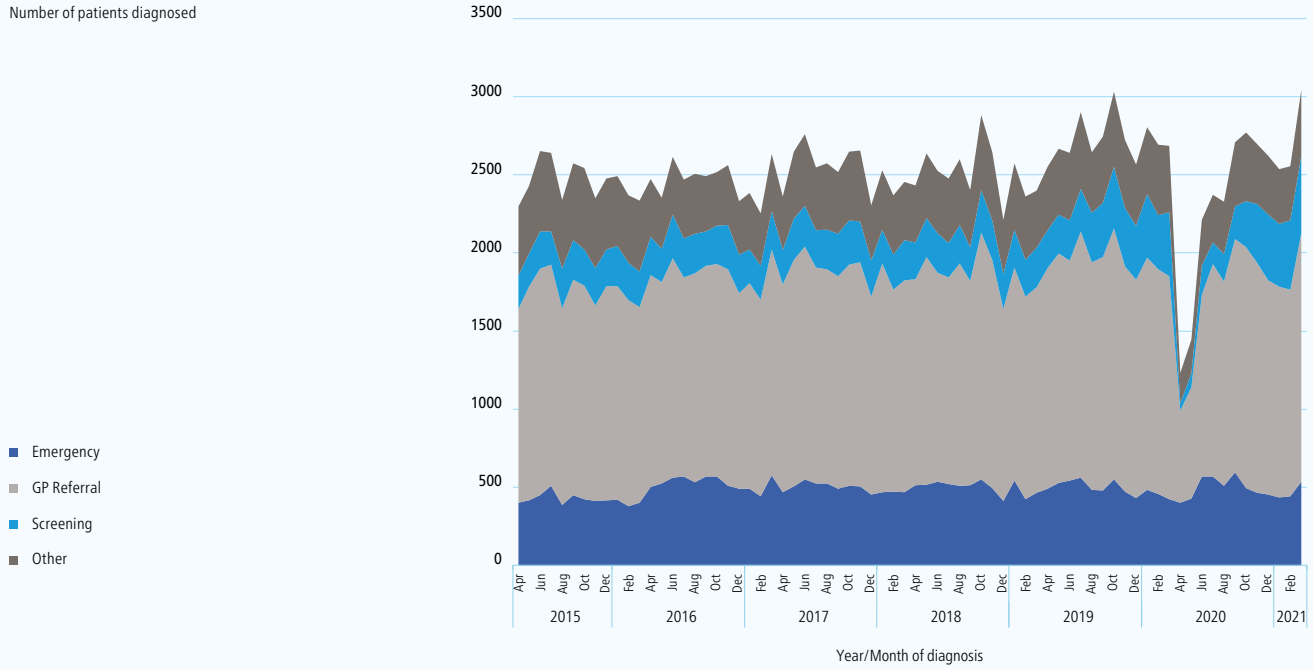
Of note, the uptake rate of bowel cancer screening in England was considerably improved from 63% in 2019/20 to 70% in 2020/21 (Young person and adult screening KPI data: annual (April 2020 to March 2021). Similarly, primary care cluster data in Wales shows the uptake rate improved from 61.5% in 2019-20 to 67.1% in 2020-21. These improvements might reflect better participation due to the rollout of FIT, coupled with social distancing restrictions and the public being asked to stay at home during the COVID-19 pandemic.

Table 4.1
Numbers of patients diagnosed and undergoing surgical procedures by year of diagnosis

	2016–17		2017–18		2018–19		2019–20		2020–21	
	N	%	N	%	N	%	N	%	N	%
Total	29,596		30,366		30,152		32,656		28,523	
Major Resection	18,571	62.7	18,421	60.7	17,221	57.1	18,755	57.4	15,891	55.7
Local Excision	1,205	4.1	1,190	3.9	1,161	3.9	1,403	4.3	1,031	3.6
Non-resectional Surgery	1,792	6.1	1,847	6.1	2,062	6.8	2,310	7.1	2,044	7.2
No Surgery	8,028	27.1	8,908	29.3	9,708	32.2	10,188	31.2	9,557	33.5

The reduced number of major resections may reflect several confounding factors (Table 4.1). Firstly, as there are less patients being diagnosed, this will impact on the number of patients requiring a major resection. Secondly, during the initial wave of the COVID-19 pandemic there were many changes to usual practice. Rapidly changing national guidelines initially prioritised only emergency and urgent surgery, decisions were made to avoid operating on bowel cancer patients vulnerable to acquiring in-hospital COVID-19 infection, and alternative non-operative treatments were used where possible (e.g., short-course radiotherapy). There were also issues with resource allocation due to the diversion of healthcare resources and staff sickness. Thirdly, it is likely that there was reduced data submission during the COVID-19 pandemic. Finally, the proportion of patients with rectal cancer who are not having a major resection due to complete pathological response following long-course chemoradiotherapy has increased.

Figure 4.1
Number of patients diagnosed with bowel cancer between April 2015 and March 2021, by referral source



One of the key ambitions in the NHS Long Term Plan for cancer is that, by 2028, 75% of cancer patients will be diagnosed with stage I or II disease. The detection of earlier, more treatable cancers is also a focus of the Quality Statement for Cancer in Wales.

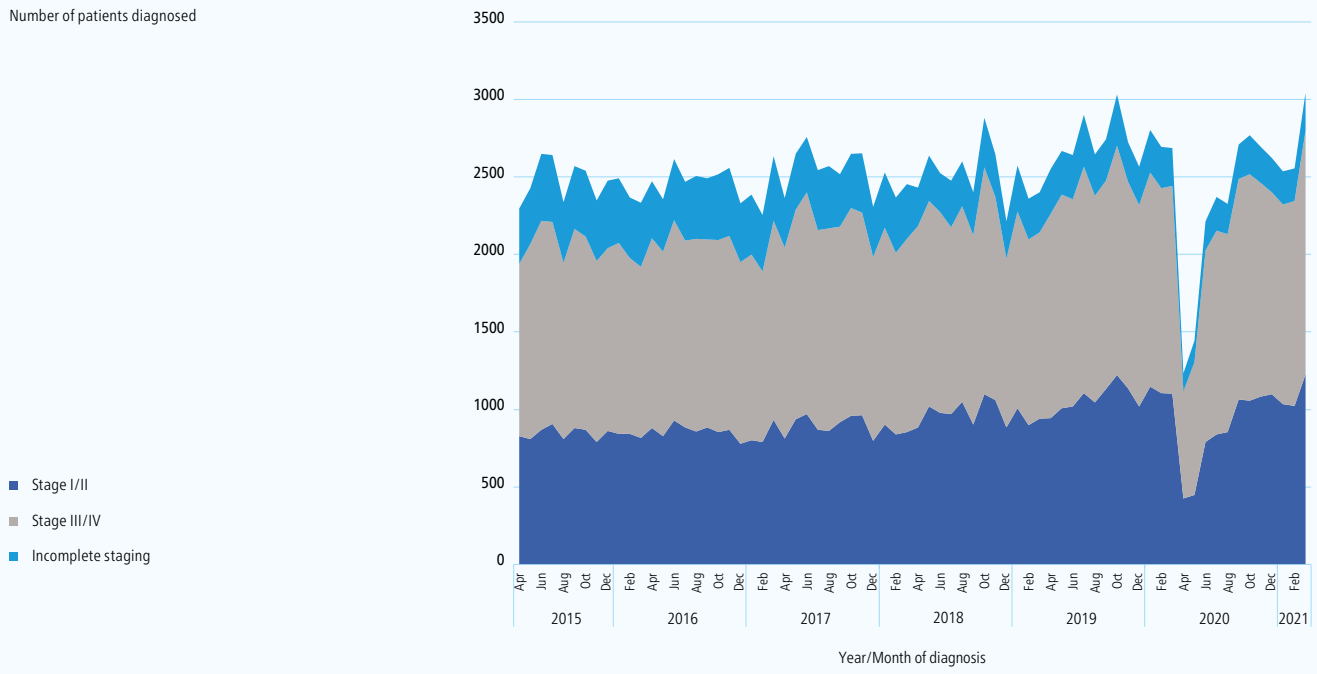
A key recommendation of the 2021 Annual Report was to improve the completion and accuracy of pre-treatment TNM staging. From 2016/17 to 2020/21, the proportion of patients with incomplete staging has steadily improved, decreasing from 16% to 9%.

Over time, the number of patients presenting with stage I or II disease has increased steadily, compared to the number of patients presenting with stage III or IV disease which has remained relatively stable (Figure 4.2). The proportion of patients diagnosed with stage I or II disease had improved from 35% in 2016/17 to 40% in 2019/20. For this year's audit period, it had reduced to 38%, which is likely to be due to the ongoing infection control requirements which necessitated longer slots for patients having endoscopic procedures.

It will be important to monitor trends in staging at diagnosis to identify stage migration due to delays in diagnosis and treatment during the COVID-19 pandemic. To reflect this, the accurate recording of pre-treatment staging is a metric within the NBOCA Quality Improvement Plan.

The vast majority of colorectal cancer patients who present electively with non-metastatic disease would be expected to undergo major resection unless they had an early stage tumour amenable to local excision. Patients with colon cancer would be expected to proceed straight to surgery, in contrast to rectal cancer patients who may undergo various neo-adjuvant treatments.

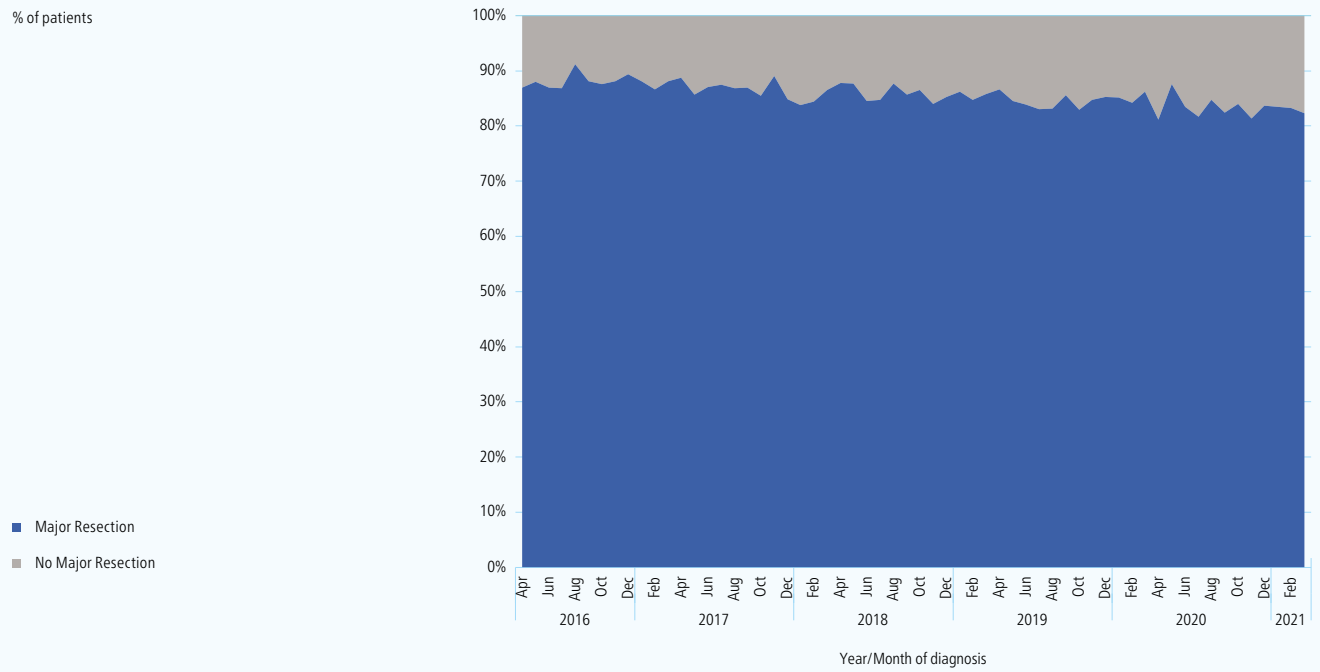
Figure 4.2
Number of patients diagnosed with bowel cancer between April 2015 and March 2021, by pre-treatment staging*



*Stage I: T1/T2, N0, M0, Stage II: T3/T4, N0, M0, Stage III: any T, N1/N2, M0, Stage IV: any T, any N, M1.
Unable to stage: missing N or M-stage

Taking this into account, the definition used for patients considered to have "potentially curable" disease was patients presenting electively with stage T2 to T4 non-metastatic colon cancer. The characteristics of these patients are described in Supplementary Table 2. The proportion of potentially curative colon cancer patients undergoing major resection has reduced slightly over time, but with no clear impact of the COVID-19 pandemic on this proportion (Figure 4.3). This implies that when patients were diagnosed with resectable disease during the pandemic, they were still likely to be offered resection if fit for surgery. The overall longer trend may reflect emerging evidence about the risk-benefit balance in treating elderly or frail patients with resection of colorectal cancer.

Figure 4.3
Percent of patients having a major resection for elective presentation of T2 to T4 non-metastatic colon cancer diagnosed April 2015 to March 2021



Current NICE guidelines recommend that all patients diagnosed with colorectal cancer should undergo genetic testing to identify those patients who may have cancer due to Lynch syndrome. In addition, further NICE guidelines recommend that all patients with metastatic colorectal cancer suitable for Systemic Anti-Cancer Therapy (SACT) are tested for *RA*S and *BRAF (V600E)* mutations to guide treatment.

A key recommendation from the 2021 Annual report was to improve the capture of genomics data. Completion of MMR status for all patients within NBOCA data has increased from 13% in 2018/19 to 21% in 2020/21 (Table 4.2). Reporting continues to be highest in those who underwent a major resection or had a completed pathology file. According to NHS England figures, we have estimated that approximately 30-50% of all new colorectal cancer diagnoses had MMR testing in 2018. This information was not readily available online for Wales and, at the time of writing this report, we had been unable to obtain this information from other sources.

Table 4.2
Number and proportion of patients with mismatch repair result recorded in NBOCA data after CRC diagnosis between 1 April 2018 and 31st March 2021 in England and Wales*

	2018–19			2019–20			2020–21		
	Overall	No. with MMR result recorded	%	Overall	No. with response	%	Overall	No. with response	%
All patients	29,570	3,820	12.9	31,909	5,134	16.1	27,871	5,766	20.7
With completed pathology file	17,673	3,282	18.6	19,876	4,499	22.6	16,247	4,502	27.7
Major Resection (MR) reported	16,994	3,088	18.2	18,457	4,203	22.8	15,617	4,244	27.2
MR & complete pathology file	15,758	3,054	19.4	17,668	4,177	23.6	14,649	4,152	28.3

*Excludes patients with tumours of the appendix and those with discrepancies between the date of diagnosis and date of surgery i.e. date of surgery predates date of diagnosis by more than 6 months

Younger patients remain more likely to have a record of MMR testing with 31% of those in the youngest age group compared to 25% of those in the oldest age group (Table 4.3). This might be partly explained by differences in treatment intent between young and elderly patients meaning that younger patients are more likely to have an assessment of their genomics to inform SACT treatment.

To reflect the updated guidelines, multiple new genomic data items were added to the NBOCA dataset in 2021/22 including microsatellite instability (MSI), and *BRAF (V600E)*, *KRAS*, and *NRAS* mutations. We have approval, going forward, to link the NBOCA dataset to genomics data from the National Disease Registration Service (NDRS) to provide accurate high-quality data for these new data items.

Table 4.3
Number and proportion of patients with mismatch repair result reported to the audit by age, amongst patients diagnosed between 1 April 2018 and 31st March 2021 who underwent major resection in England and Wales

	2018–19			2019–20			2020–21		
	Overall	No. with response	%	Overall	No. with response	%	Overall	No. with response	%
<50 years	1,080	241	22.3	1,161	312	26.9	1,056	332	31.4
50-59 years	2,375	477	20.1	2,427	584	24.1	1,911	546	28.6
60-74 years	7,586	1,332	17.6	8,692	1,942	22.3	7,361	1,991	27.1
75-84 years	4,845	849	17.5	5,100	1,132	22.2	4,331	1,137	26.3
≥85 years	1,108	189	17.1	1,077	233	21.6	958	238	24.8

4.2 Variation in care pathways

The proportion of patients presenting via the different referral pathways continues to differ according to English Cancer Alliances and Wales. Emergency presentations vary from 14% to 30%, GP referrals from 44% to 69%, screening referrals from 7% to 18%, and "other" referrals (e.g., referral from another medical professional) vary from 4% to 19% (Supplementary Figure 1).

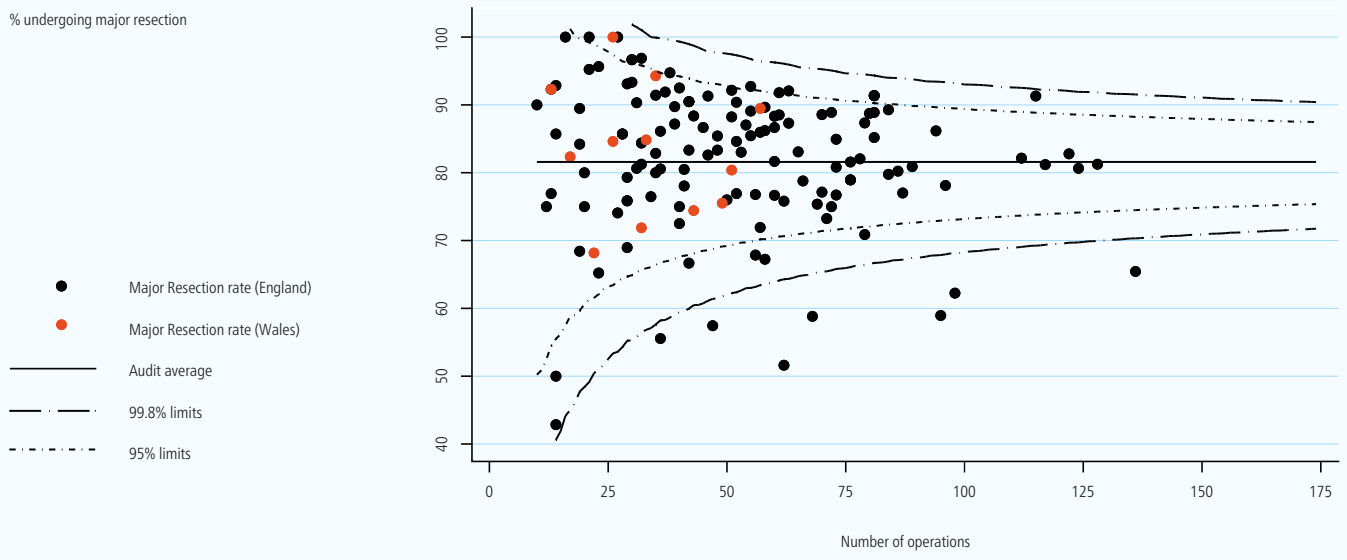
The proportion of patients presenting with stage I or II disease varies from 23% to 48% across English Cancer Alliances and Wales (Supplementary Figure 2). The proportion of patients with missing pre-treatment staging also varies from 2% to 22% making interpretation of geographical differences in pre-treatment staging problematic.

There is considerable variation between trusts/hospitals/MDTs in the proportion of patients undergoing major resection for potentially curative colon cancer in 2020 (Figure 4.4). 27 trusts/hospitals/MDTs fell outside the inner limits (95% limits), and this has increased from 20 trusts/hospitals/MDTs in 2019.

There also remains marked geographical variation in the completion of MMR status within NBOCA data (Figure 4.5). One English Cancer Alliance recorded 81% of patients tested for MMR for 2020/21 compared to the highest result of 58% in the 2019/20 audit cohort. Wales has not submitted any data for this variable, an issue that needs to be addressed within data collection processes and technology. Overall, approximately half of the English Cancer Alliances have improved their MMR completion rate. There is still nationwide room for improvement in pre-operative MMR/MSI testing, and recording of this important prognostic factor, to aid clinical and oncological decision-making. It is possible that the COVID-19 pandemic impacted completion of this data item. The 2022 Organisational Survey provides up-to-date information about which hospitals/trusts/MDTs offer the different types of genomic testing.

There may also be barriers to accessing these specialist results for members of the healthcare team entering NBOCA data and these too may have been further exacerbated by the COVID-19 pandemic. Linkage of NBOCA data to genomics data from the NDRS should improve data completeness and quality in future reports.

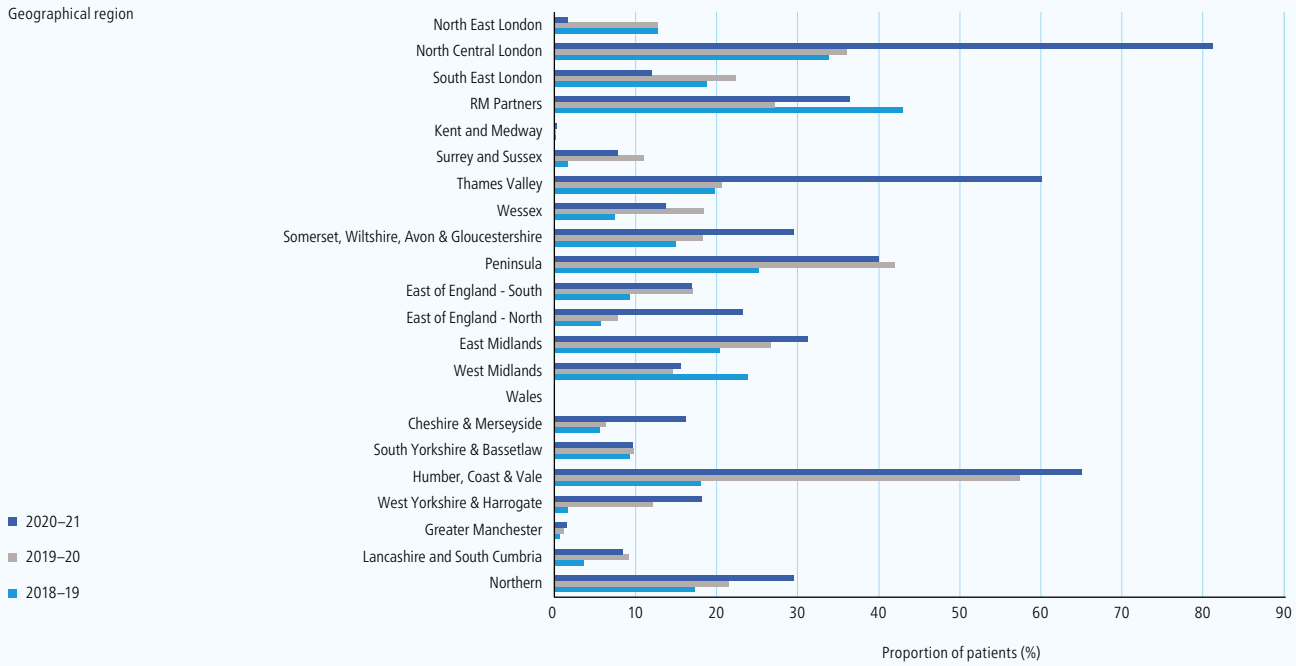
Figure 4.4
Percent of patients having a major resection in 2020 for elective presentation of T2 to T4 non-metastatic colon cancer, by English NHS trust/hospital/Welsh MDT*. Audit average = 81.6%.



* Excludes 2 tertiary referral providers and 5 trusts with <10 patients fulfilling criteria

Figure 4.5

Percent of patients with mismatch repair/microsatellite instability result reported to the audit after bowel cancer diagnosis between 1 April 2018 and 31st March 2021, by English Cancer Alliance/country (Wales). NB. Wales have not submitted any data.



5. Peri-operative Care

5.1 Trends over time in peri-operative care

There has been a marginal increase in 90-day post-operative mortality from 2.7% in 2019/20 to 3.1% in 2020/21 (Table 5.1) but rates are comparable to 2017/18 and 2018/19.

Local Quality Improvement Target

★ <6% risk-adjusted 90-day mortality

Table 5.1
Number of patients dying within 90 days of a major resection for bowel cancer in England and Wales, by year of diagnosis

	2016–17		2017–18		2018–19		2019–20		2020–21	
	N	%	N	%	N	%	N	%	N	%
Total patients*	29,595		30,362		30,139		32,610		27,780	
Undergoing major resection**	18,570		18,419		17,214		18,722		15,361	
Died within 90 days of major resection	650	3.5	586	3.2	519	3.0	500	2.7	473	3.1
Missing mortality	13	(0.1)	15	(0.1)	9	(0.1)	15	(0.1)	15	(0.1)

* Total patients submitted to NBOCA when patient identifiers sent for linkage to ONS/HES/PEDW: 743 patients were added to the 2020–21 cohort after linkage
** 187 major resections occurring after 31st October 2021 excluded from 2020-21 to match previous years reporting

90-day post-operative mortality has remained stable in 2020/21 compared to the previous year across all categories of urgency of surgical operation except for emergency operations (Table 5.2). For patients having emergency surgery, mortality has increased from 8.9% in the 2019/20 audit period to 11.2% during the COVID-19 pandemic in 2020/21, although this rate is comparable to those seen prior to 2019/20.

Additional work by NBOCA evaluating surgical outcomes during the first wave of the COVID-19 pandemic supports the finding that mortality increased for emergency operations. Possible explanations include COVID-19 infection in the pre-vaccination era increased the risk of post-operative mortality, changes in health-seeking behaviours meaning that patients presented later than usual, human factors (e.g., impacts of operating in personal protective equipment and redeployment of usual theatre staff), and shifts towards operating in the independent sector where infrastructure, resources, and staffing were different.

Table 5.2
90-day post-operative mortality in patients who had major surgery in England and Wales, by surgical urgency

		2016–17		2017–18		2018–19		2019–20		2020–21	
		N	%	N	%	N	%	N	%	N	%
90-day mortality by urgency of operation	**Elective**	241/11,529	2.1	211/11,723	1.8	202/11,161	1.8	178/11,352	1.6	156/9,801	1.6
	Scheduled	93/3,892	2.4	81/3,762	2.2	68/3,293	2.1	59/3,325	1.8	43/2,314	1.9
	Urgent	98/1,231	8.0	83/1,041	8.0	64/927	6.9	114/2,260	5.0	62/1,212	5.1
	Emergency	216/1,821	11.9	206/1,742	11.8	177/1,646	10.8	146/1,643	8.9	206/1,836	11.2
	Missing urgency of operation	2/84	2.4	5/136	3.7	8/178	4.5	3/127	2.4	6/183	3.3

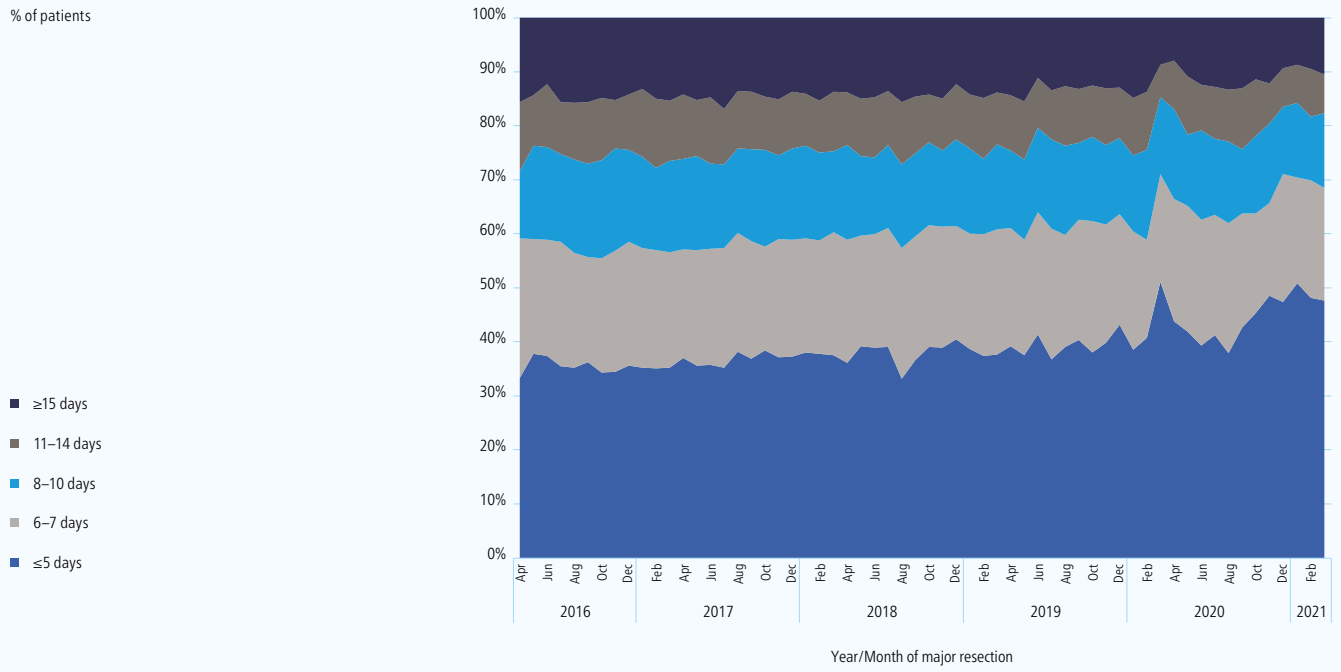
187 major resections occurring after 31st October 2021 excluded from 2020–21 to match previous years reporting

Overall, following major resection the median length of inpatient stay for this audit period was 6 days (IQR 4-9 days). This is slightly shorter than the median length of stay in 2019/20 which was 7 days (IQR 5-11 days). Patients having an elective or scheduled procedure had a median length of stay of 6 days (IQR 4-9 days) compared to those having an emergency or urgent procedure who had a median length of stay of 9 days (IQR 6-15 days).

Length of stay following elective/scheduled procedures has steadily reduced over time (Figure 5.1). For example, the proportion of patients staying in hospital for 5 days or less after elective/scheduled surgery has increased from 35% in 2016/17 to 45% in 2020/21. Over the same period, the proportion of patients staying in hospital for 15 days or longer after elective/scheduled surgery has reduced from 15% to 11%.

Possible explanations for the improvements in length of stay over time include the increased uptake and developed experience with laparoscopic surgery, Enhanced Recovery After Surgery (ERAS) programmes, and improved access to surgical expertise post-discharge, for example, surgical "hot clinics" and increased use of telemedicine.

Figure 5.1
Length of stay for patients having elective or scheduled major surgery for bowel cancer between April 2016 and March 2021*

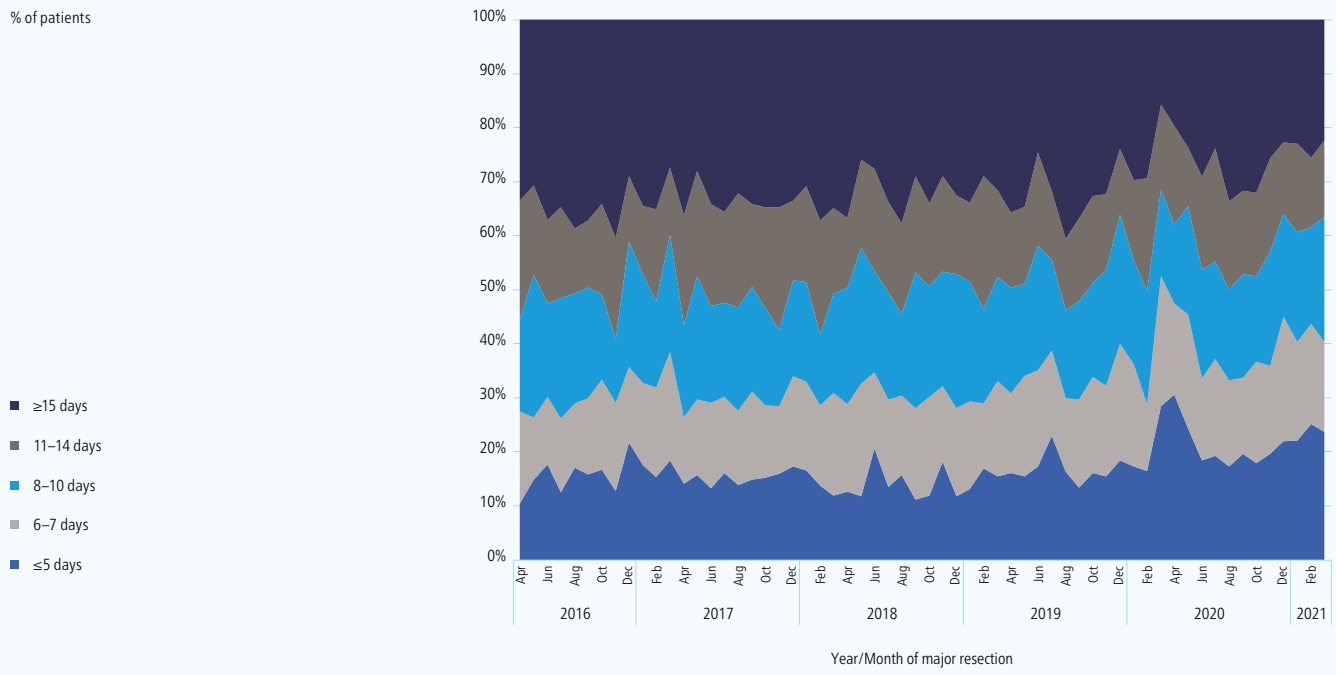


* Welsh data for patients diagnosed between April 2019 and March 2020 excluded due to almost all patients being recorded as undergoing urgent/emergency surgery

Over time, the length of stay for urgent and emergency procedures has remained more stable (Figure 5.2). Since the 2016/17 audit period, the proportion of patients with a length of stay of 5 days or less has increased from 16% to 22%. Similarly, the proportion of patients staying 15 days or longer has reduced from 34% in 2016/17 to 25% in 2020/21.

During the first wave of the COVID-19 pandemic, there was a considerable reduction in length of stay across all surgical urgencies. A possible explanation for this is that the risk of nosocomial COVID-19 encouraged faster discharge of patients. In addition, during the first wave of the COVID-19 pandemic, changes to surgical practice were recommended. These included performing fewer anastomoses in colorectal surgery (e.g., Hartmann's procedure for rectal cancer) and operating predominantly on fitter, low-risk patients who would be less likely to succumb to nosocomial COVID-19 infection. These changes may have contributed to the observed shorter length of stay.

Figure 5.2
Length of stay for patients having urgent or emergency major surgery for bowel cancer between April 2016 and March 2021*



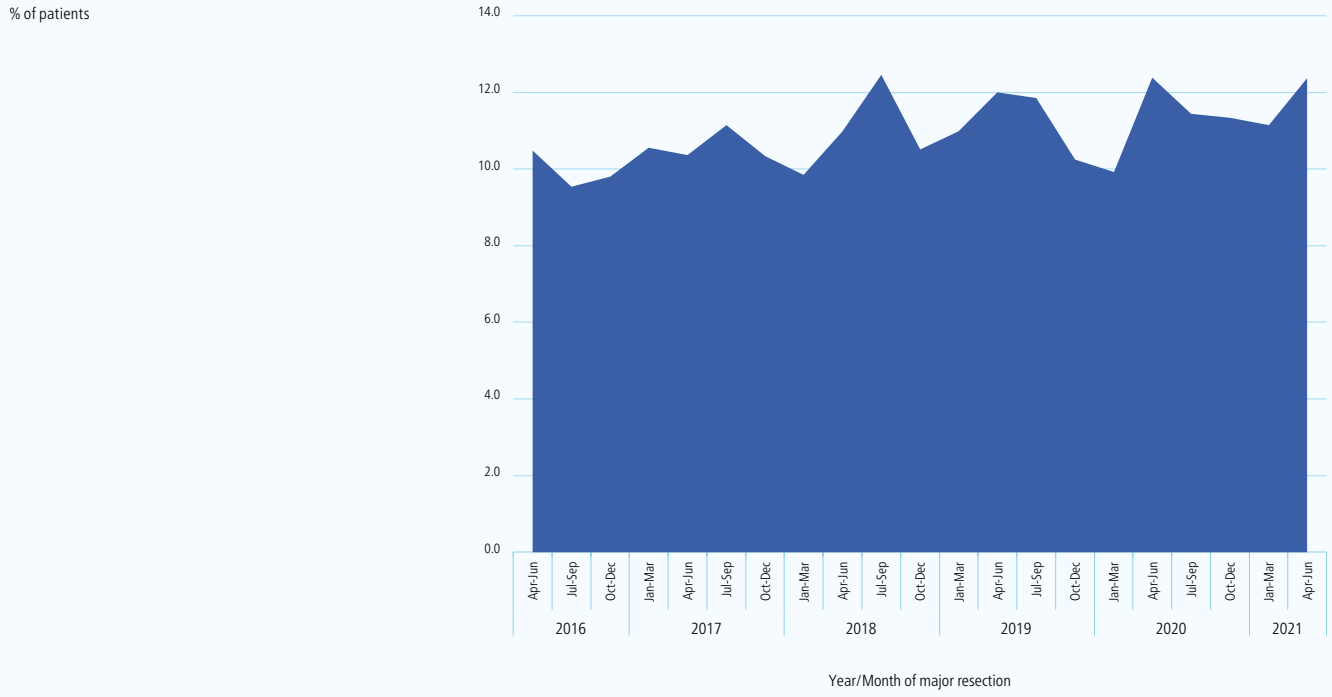
* Welsh data for patients diagnosed between April 2019 and March 2020 excluded due to almost all patients being recorded as undergoing urgent/emergency surgery

The proportion of patients with a 30-day unplanned readmission has increased slightly over time (Figure 5.3). For this audit period, this percent was 11.3% compared to 10.3% in 2016/17. This audit period the percent of patients with a 30-day unplanned readmission remains comparable to 2019/20 when it was 11.1%. There appears to be a slight increase in 30-day unplanned readmission during the first wave of the COVID-19 pandemic, however, this could represent random variation. Coupled with the reduced length of stay, it is reassuring that there has not been a considerable increase in 30-day unplanned readmissions this audit period.

Local Quality Improvement Target

★ <15% risk-adjusted 30-day unplanned readmissions

Figure 5.3
Percentage of patients with a 30-day unplanned readmission following major resection between April 2016 and March 2021

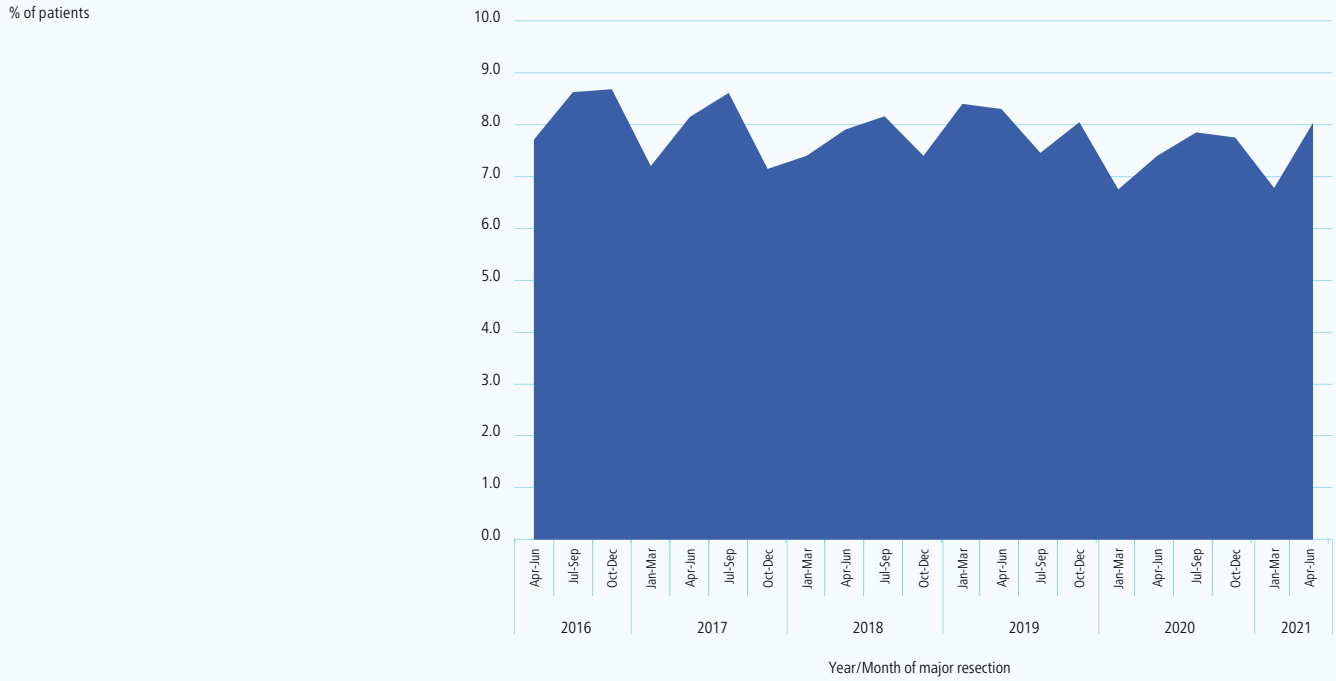


The proportion of patients with an unplanned return to theatre (URTT) following a major resection has reduced over time (Figure 5.4). Overall, there did not appear to be any substantial effect of the COVID-19 pandemic on this. The percent of patients with an URTT this audit period was 7.2% compared to 8.3% in 2016/17.

Local Quality Improvement Target

★ <10% risk-adjusted unplanned return to theatre after colorectal resection

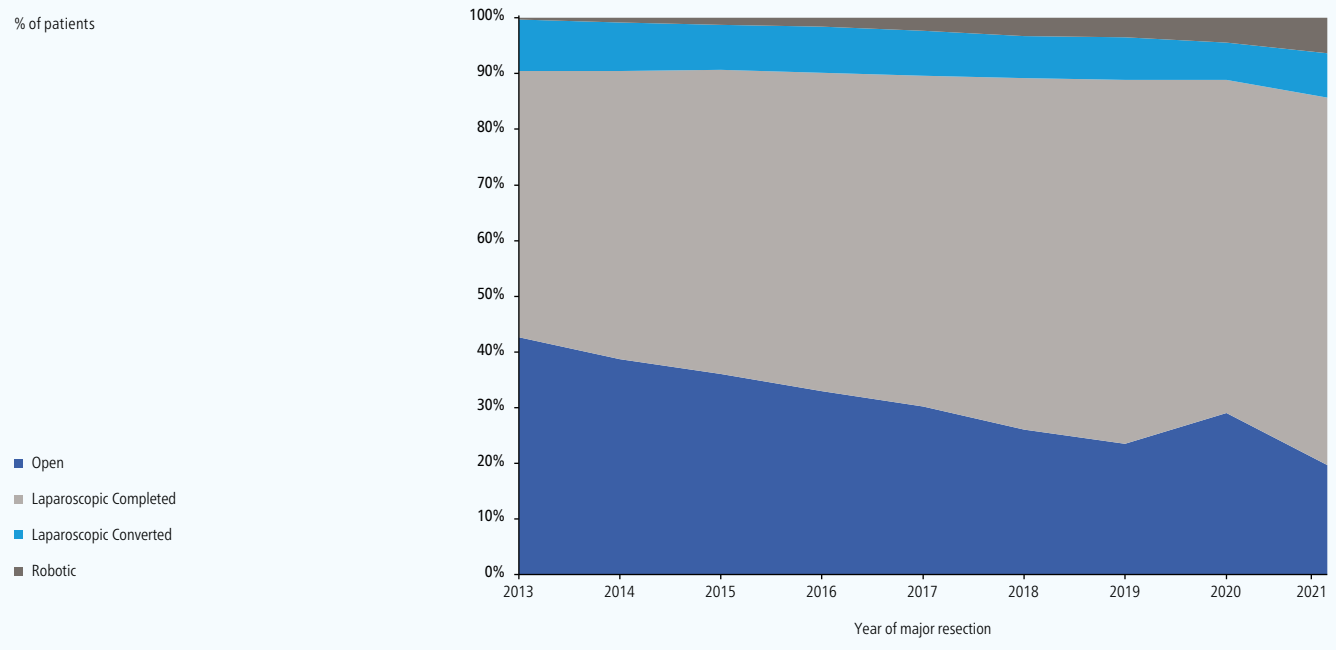
Figure 5.4
Percentage of patients with a 30-day unplanned return to theatre following major resection between April 2016 and March 2021



Since 2013, there has been a gradual reduction in the use of open surgery (43% in 2013 and 20% in 2021) associated with an increase in the use of laparoscopic surgery (48% in 2013 and 66% in 2021) (Figure 5.5). There has also been a slow increase in the uptake of robotic surgery from 0.3% in 2013 to 6% in 2021.

During the COVID-19 pandemic, there was a temporary increase in the proportion of patients having an open procedure (29% compared to 24% in the previous year) (Figure 5.5). This can be explained by initial guidelines advocating the use of open surgery due to concerns about the transmission of COVID-19 via insufflation gases used during laparoscopic procedures. This upward trend in open surgery has subsequently reversed.

Figure 5.5
Surgical access for major resections between 2013 and 2021

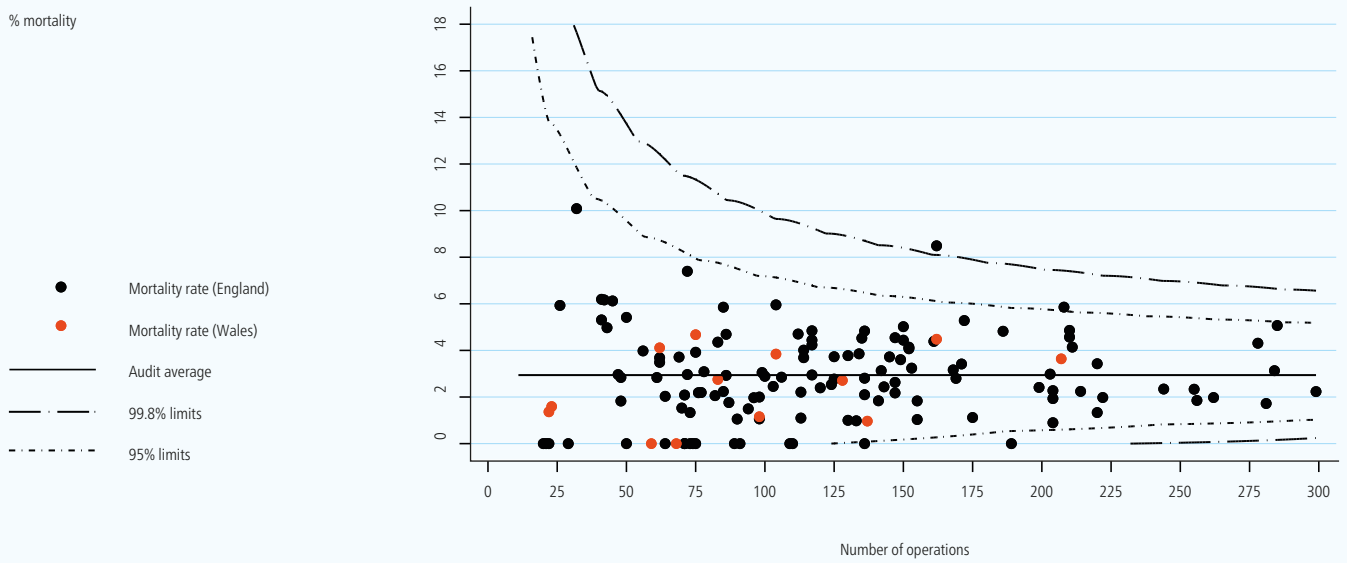


5.2 Variation in peri-operative care

There is no outlier-reporting on any of the peri-operative outcomes this year, acknowledging the wider impact of the pandemic on outcomes that were outside of individual units' control. Hospitals/trusts/MDTs can review their results in the Appendix on the website and monitor their more recent performance using the NBOCA quarterly reports.

Figure 5.6 shows risk-adjusted 90-day post-operative mortality for English NHS trusts/hospitals and Welsh MDTs. Following risk adjustment, there were two English hospitals/trusts above the 95% limits, one of which was above the 99.8% limits. Last audit period (2019/20) there were three different English trusts/hospitals and one Welsh MDT above the 95% limits, but none above the 99.8% limits.

Figure 5.6
Adjusted 90-day post-operative mortality for trusts/hospitals/MDTs with more than ten elective/emergency operations for patients diagnosed between 01 April 2019 and 31 March 2021 who underwent major resection between 01 April 2020 and 31 October 2021. Audit average = 2.9%.

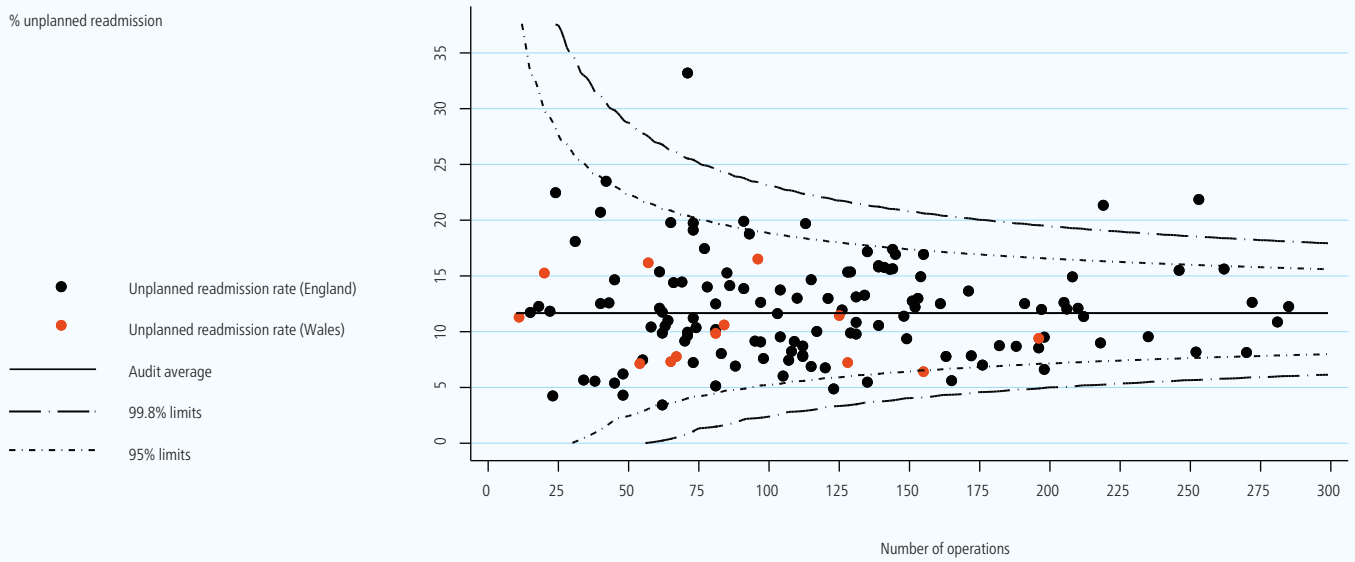


There is between-unit variation in risk-adjusted length of stay reported within the Appendix.

Figure 5.7 shows risk-adjusted 30-day unplanned readmission by English trust/hospital and Welsh MDT. Following risk-adjustment, six English hospitals/trusts were above the 95% funnel limits and three of these were above the 99.8% limits. Last audit period (2019/20), there were five English hospitals/trusts above the 95% limits and three of these were above the 99.8% limits. All six hospitals/trusts are different to the last audit period.

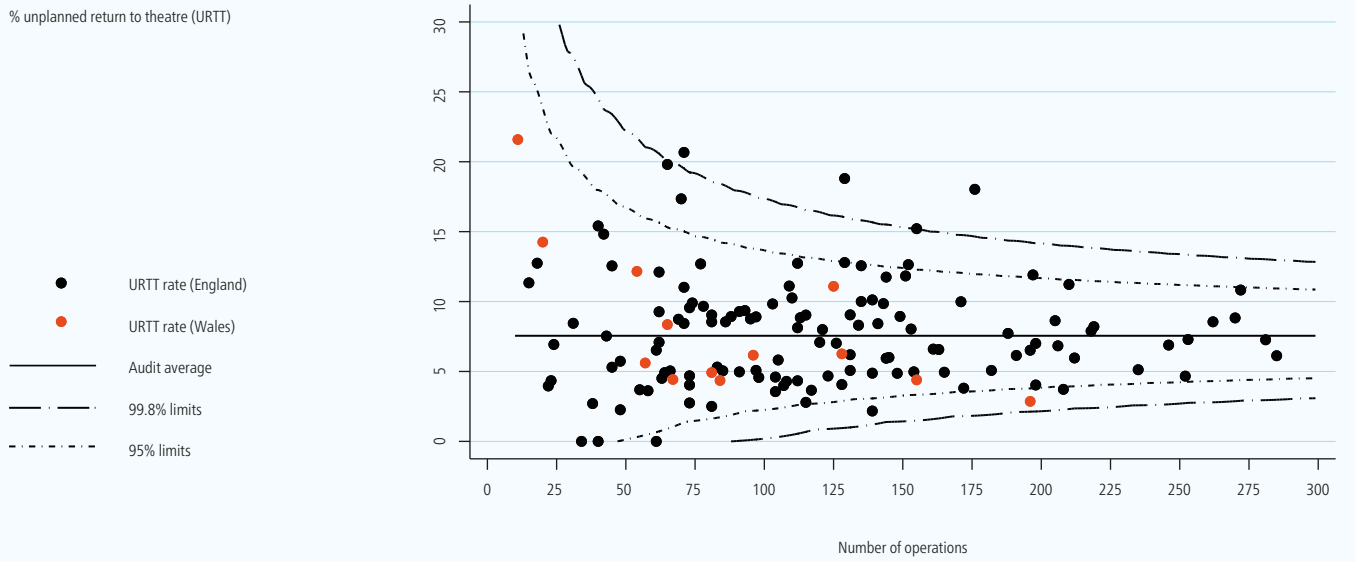
Figure 5.8 shows adjusted proportions of URTT at hospital/trust/MDT level. Following risk adjustment, there were eight English hospitals/trusts above the 95% funnel limits with four of these above the 99.8% limits. In the 2019/20 audit period, there were eight English hospitals/trusts above the 95% funnel limits but only one of these was above the 99.8% funnel limit. Only one English hospital/trust was above the 95% limits in both audit periods.

Figure 5.7
Adjusted 30-day unplanned readmission by trusts/hospitals/MDTs for patients diagnosed between 01 April 2019 and 31 March 2021 who underwent major resection between 01 April 2020 and 31 October 2021. Audit average = 11.7%.



An increase in variation in URTT might be explained by changes during the COVID-19 pandemic. For example, human factors such as personal protective equipment affecting communication and dexterity, and differences in the operating environment such as major resections being undertaken in the independent sector and different theatre teams due to redeployment, staff sickness, and social distancing restrictions. Between-unit disparities may have arisen due to differential rates of COVID-19 infection, as well as disparities in access to surgical "cold sites" as demonstrated in additional work by NBOCA.

Figure 5.8
Adjusted 30-day unplanned return to theatre (elective and emergency admissions) by trusts/hospitals/MDTs with more than ten operations for patients diagnosed between 01 April 2019 and 31 March 2021 who underwent major resection between 01 April 2020 and 31 October 2021. Audit average = 7.6%.



Local Quality Improvement Target

★ Laparoscopic surgery attempted in >50% of major resections

There was a considerable amount of geographical variation in surgical access by English Cancer Alliance/ Wales. The proportion of patients undergoing laparoscopic procedures varied from 44% to 74%, with the proportion of patients requiring conversion to an open procedure varying between 3% and 13%. In addition, the proportion of patients having robotic procedures varied from 0% to 13% (Supplementary Figure 3).

The 2022 organisational survey provides updated information on which units are providing robotic surgery for colorectal cancer. The NBOCA team plan to amend the local quality improvement target published in the next iteration of the NBOCA QI plan to include robotic surgery.

6. Oncological Management

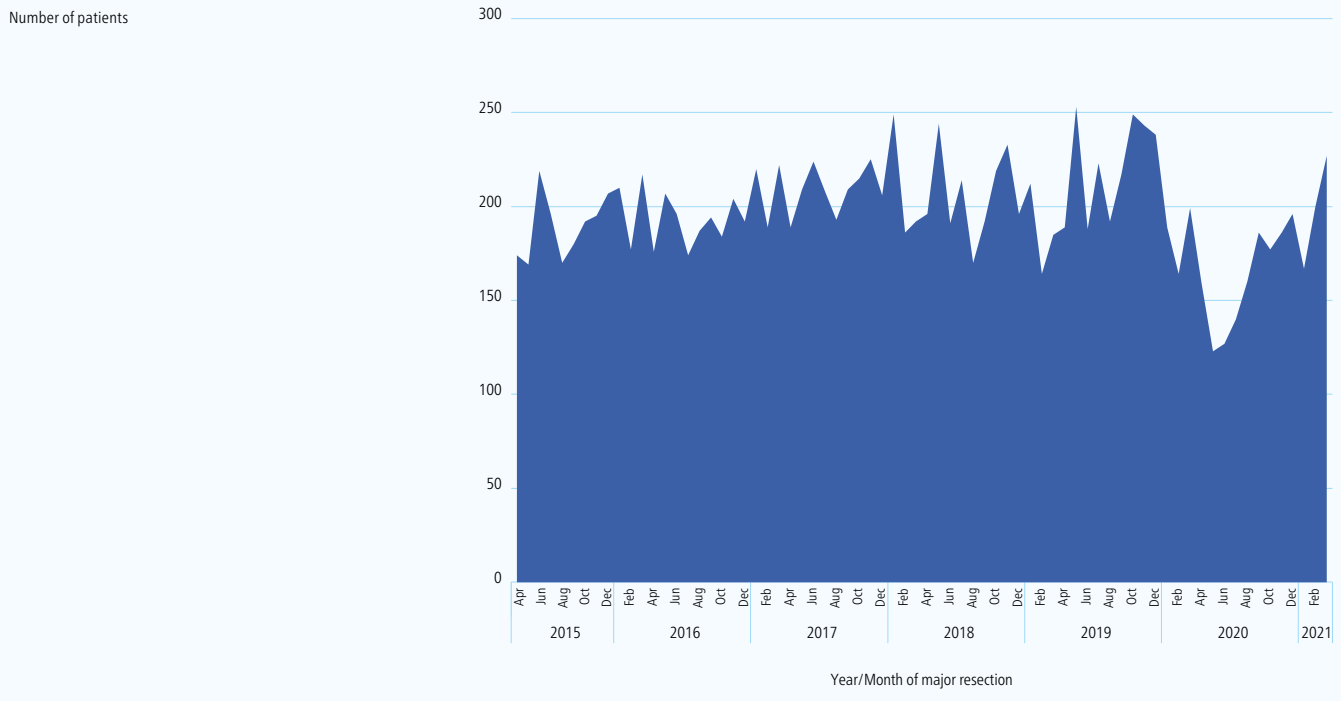
6.1 Trends over time in oncological management

Updated national guidelines recommend the use of capecitabine and oxaliplatin (CAPOX), 5-fluorouracil (5-FU) and oxaliplatin (FOLFOX) or single agent fluoropyrimidine (capecitabine or 5-FU) as adjuvant chemotherapy for stage III colon cancer. Choice and duration of adjuvant chemotherapy should be dependent on staging, performance status, comorbidities, age, and patient choice. Systemic Anti-Cancer Therapy (SACT) data is currently only available for England. Methodology developed to capture administration of adjuvant chemotherapy in PEDW is currently used to report on adjuvant chemotherapy in Wales.

The use of adjuvant chemotherapy for stage III colon cancer had increased slightly over time from 58% for patients undergoing major resection in 2015 to 61% for patients undergoing major resection in 2019. Overall, for patients undergoing major resection in 2020, there was a drop back to 57% (Figure 6.1). This reflects a substantial reduction in the numbers of patients receiving adjuvant chemotherapy following a major resection in the first wave of the COVID-19 pandemic between April 2020 and August 2020. This subsequently appears to have recovered, but not until the first quarter of 2021.

NICE guidelines released during the first wave of the COVID-19 pandemic aimed to prioritise adjuvant chemotherapy over palliative chemotherapy. The reduction in adjuvant chemotherapy during the first wave of the COVID-19 pandemic is likely to reflect several factors. Firstly, decision making evolved to consider the increased risks from COVID-19 of delivering immunosuppressive drugs, particularly in the elderly and frail, as well as to avoid the need for acute care services (e.g., HDU/ITU) in the event of chemotherapy toxicity. Secondly, patients may have been more likely to decline chemotherapy during the COVID-19 pandemic due to the perceived risks of immunosuppression and wish to avoid hospital visits. Thirdly, fewer major resections were being undertaken and therefore less adjuvant treatment was given. It is also likely that single agent chemotherapy was used in preference to combination therapy to reduce the likelihood of severe toxicity from neutropenic sepsis.

Figure 6.1
Number of patients in England receiving adjuvant chemotherapy following major resection with pathological stage III colon cancer between 2015 and 2021 (according to date of surgery)



Although conventionally five years of follow-up is used to determine when an individual with colorectal cancer is cured, the vast majority of patients who develop recurrent disease will do so within two years and we therefore report 2-year all-cause and cancer-specific mortality. For this audit period, we report on patients diagnosed between 01 April 2016 and 31 March 2019. These patients therefore precede the COVID-19 pandemic.

2-year all-cause mortality for all patients diagnosed with bowel cancer in the 2018/19 audit period had remained stable at 32% compared to 33% in the 2016/17 audit period (Table 6.1). 2-year all-cause mortality showed small improvements over the same period for patients having a major resection (from 17% in 2016/17 to 15% in 2018/19) and for patients not having excision of their tumour (from 73% in 2016/17 to 70% in 2018/19).

Local Quality Improvement Target

★ >70% risk-adjusted 2-year survival following major resection

Table 6.1
2-year all-cause mortality over time for all patients diagnosed between 01 April 2016 and 31 March 2019 in England and Wales*

		2016–17		2017–18		2018–19	
		N	%	N	%	N	%
All patients		**29,185**		**29,770**		**29,423**	
Died within 24 months of diagnosis	Yes	9,610	33.1	9,911	33.5	9,456	32.3
	No	19,428	66.9	19,705	66.5	19,806	67.7
	Missing (% of total)	147 (0.5)		154 (0.5)		161 (0.5)	
Underwent Major Resection**		**19,173**	65.7	**19,111**	64.2	**18,871**	64.1
Died within 24 months of diagnosis	Yes	3,153	16.5	2,993	15.7	2,833	15.1
	No	15,956	83.5	16,052	84.3	15,986	84.9
	Missing (% of total)	64 (0.2)		66 (0.2)		52 (0.2)	
Underwent Local Excision**		**1,198**	4.1	**1,153**	3.9	**1,105**	3.8
Died within 24 months of diagnosis	Yes	103	8.7	97	8.5	92	8.4
	No	1,087	91.3	1,050	91.5	999	91.6
	Missing (% of total)	8 (0.0)		6 (0.0)		14 (0.0)	
No Excision of Tumour		**8,814**	30.2	**9,506**	31.9	**9,447**	32.1
Died within 24 months of diagnosis	Yes	6,354	72.7	6,821	72.4	6,531	69.8
	No	2,385	27.3	2,603	27.6	2,821	30.2
	Missing (% of total)	75 (0.3)		82 (0.3)		95 (0.3)	

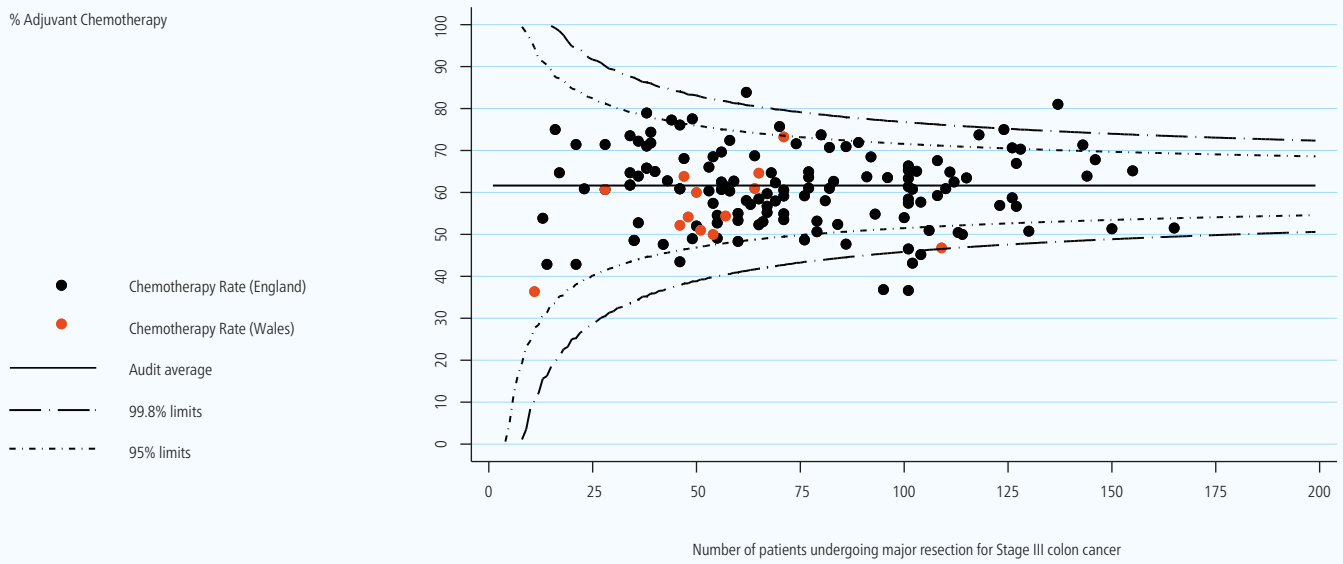
* Patients whose date of diagnosis was >182 days after the recorded date of surgery were excluded unless the date of surgery was between April 2016 – March 2019 in which case it was used to allocate audit year of diagnosis.

** Local Excision/ Major Resection had to occur within one year of diagnosis; due to under-reporting of surgery for patients diagnosed April 2018 – March 2019, this has been updated from HES/ PEDW where available

6.2 Variation in oncological management

Figure 6.2 shows that considerable between-unit variation persists in the use/uptake of adjuvant chemotherapy for stage III colon cancer. There were 21 hospitals/trusts/MDTs (14%) outside the 95% funnel limits. Five of these were below the 99.8% funnel limits. This reflects some improvement compared to the last audit period where there were seven sites below the outer funnel limits.

Figure 6.2
Adjuvant chemotherapy use/uptake in patients with stage III colon cancer by English trusts/hospitals and Welsh MDTs with more than ten operations, for patients undergoing major resection between 01 December 2017 and 31 August 2020. Audit average = 61.6%.



The indications, use and complexity of SACT are constantly increasing and evolving, with the frequent approval of new drugs. Due to their narrow therapeutic index, there is a risk of varying severities of associated toxicities particularly for the established cytotoxic chemotherapies.

Methodological work conducted by NBOCA has enabled the development of a broad and comprehensive coding framework which allows the capture of severe acute toxicity within hospital administrative data. This is a toxicity necessitating an overnight hospital admission and corresponds to at least a Grade 3 Common Terminology Criteria for Adverse Event (CTCAE). The CTCAE is a classification system designed for use in trials to help clinicians detect and more accurately document the nature and severity of adverse events.

Figure 6.3 demonstrates severe acute toxicity rates for patients receiving adjuvant chemotherapy for pathological stage III colorectal cancer. Overall, the mean severe acute toxicity rate was 25%. This varied between units from 11% to 49%. There were 10 English NHS trusts/hospitals outside the 95% limits. Of these, three English NHS trusts/hospitals were outside the 99.8% limits.

Figure 6.3
Adjusted severe acute toxicity rates for patients receiving adjuvant chemotherapy for pathological stage III colorectal cancer, by English NHS trusts/hospitals treating more than ten patients. Audit average = 25.4%.

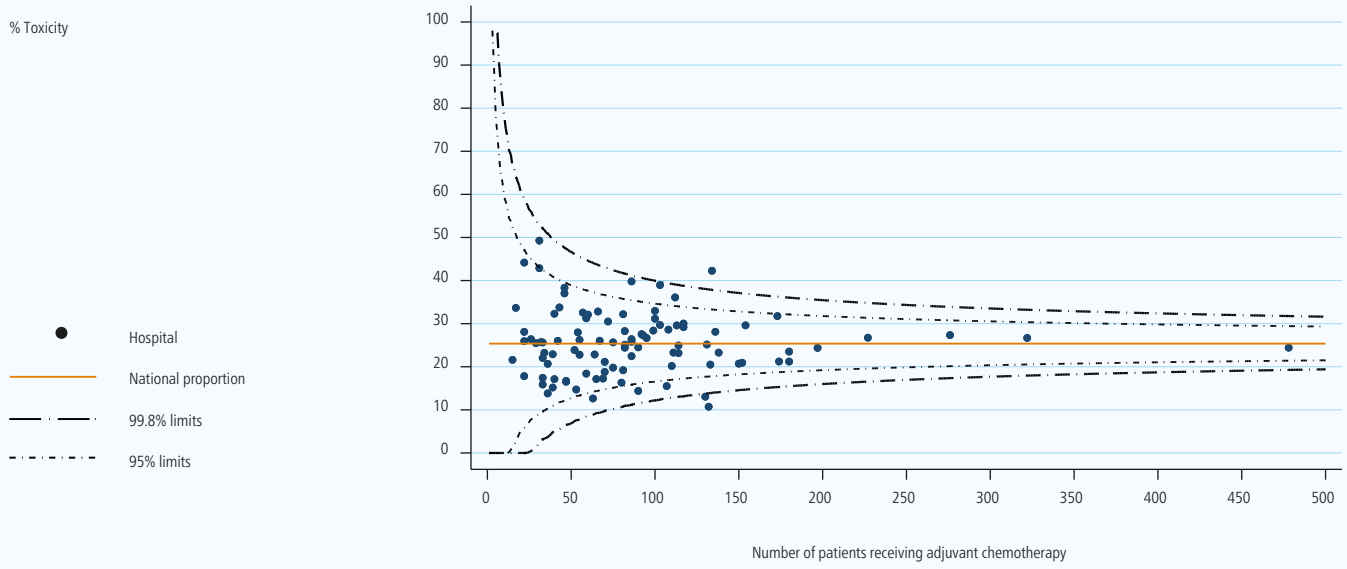


Figure 6.4 shows adjusted 2-year all-cause mortality rates for patients undergoing major resection at hospital/trust/MDT level. Following risk-adjustment, there were eight hospitals/trusts/MDTs above the 95% funnel limits and two of these were above the 99.8% limits. This compares to a similar eight hospitals/trusts/MDTs above the 95% funnel limits last audit period. However, only one hospital/trust was above the 99.8% funnel limits last audit period. None of the hospitals/trusts/MDTs above the 95% limits were the same across audit periods.

Figure 6.4
Adjusted 2-year all-cause mortality rate for patients who underwent a major resection between 01 April 2018 and 31 March 2019, by English NHS trusts/Welsh MDTs with more than ten operations. Audit average = 17.7%.

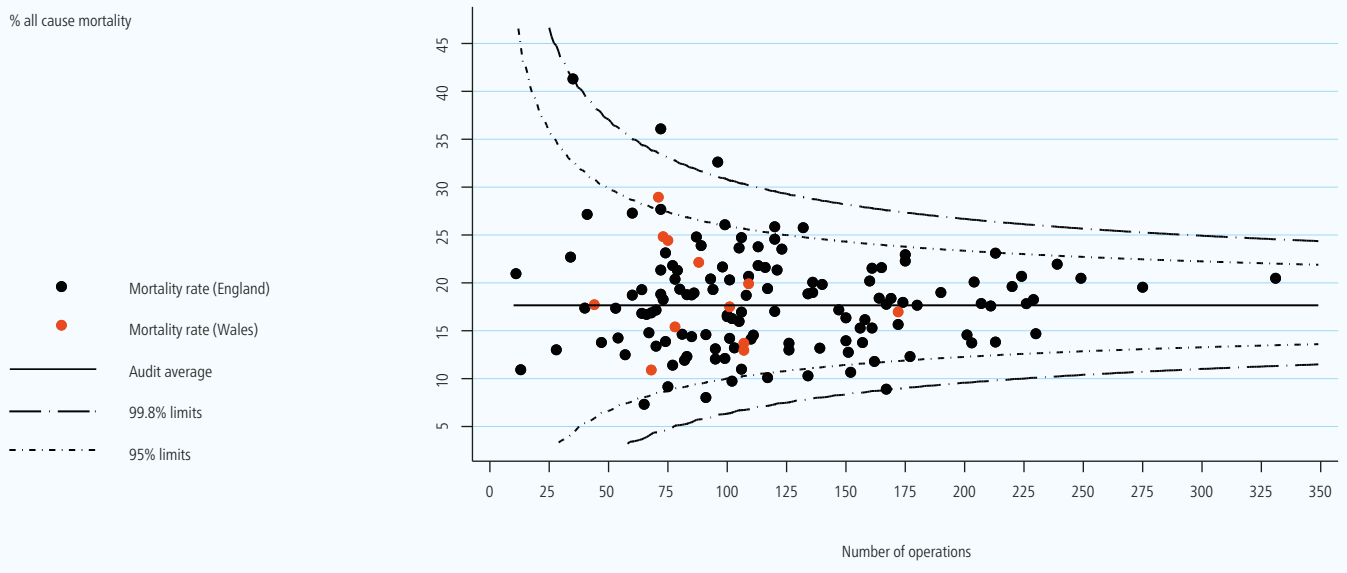
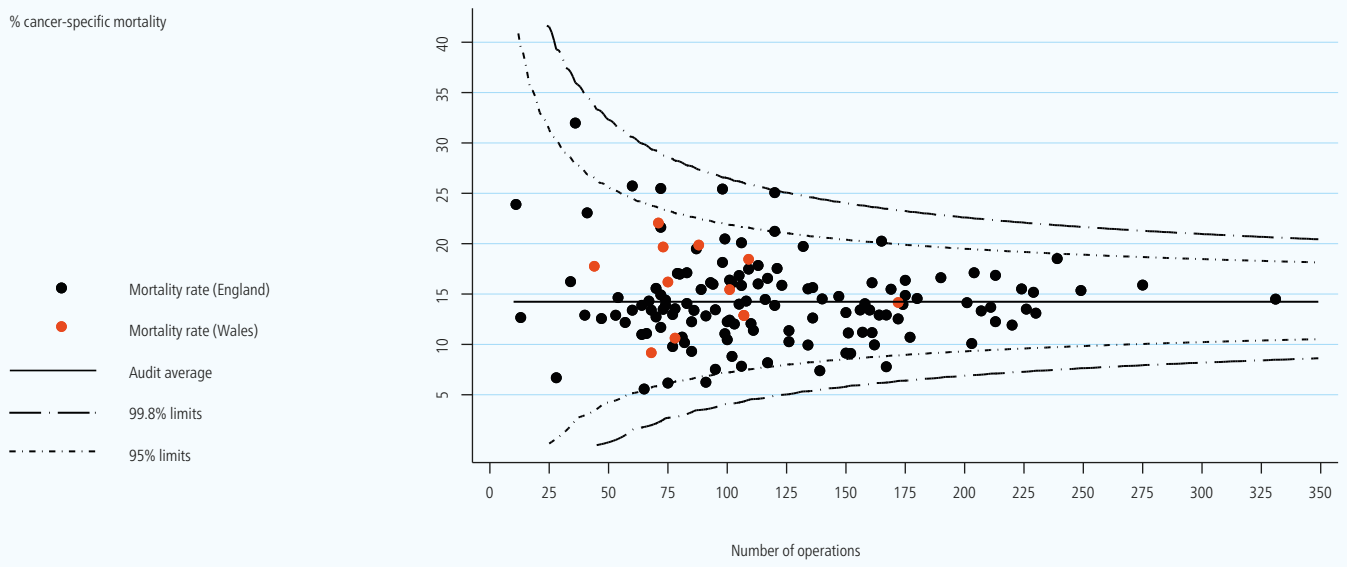


Figure 6.5 demonstrates variation in between-unit adjusted 2-year cancer-specific mortality for patients undergoing major resection. There has been an increase in variation this year with seven English hospitals/trusts lying above the inner funnel limits compared to three English trusts/hospitals and one Welsh MDT last audit period. There are no hospitals/trusts/MDTs above the outer funnel limits compared to one English trust/hospital last audit period. Four of the English hospitals/trusts above the inner funnel limits were also above the inner funnel limits for all-cause mortality.

Overall, there was less between-unit variation for cancer-specific mortality compared to all-cause mortality.

Figure 6.5
Adjusted cancer-specific 2-year mortality rate for patients who underwent a major resection between 01 April 2018 and 31 March 2019, by English NHS trusts/Welsh MDTs with more than ten patients. Audit average = 14.2%.



7. Rectal Cancer Management

7.1 Trends over time in rectal cancer management

During this audit period, 7,486 patients were diagnosed with rectal cancer. Of these, 46.5% had a major resection compared to 54% in the 2016/17 audit period (Table 7.1). Both the number of patients diagnosed and the proportion undergoing major resection are considerably lower than previous audit years. This likely reflects fewer patients being operated on during the COVID-19 pandemic, as well as reduced data submission during this period. This is on a background of changes in rectal cancer management advocating organ preservation where feasible. This includes an increase in "watchful waiting" following complete clinical response to neo-adjuvant chemoradiotherapy, and trials of total neo-adjuvant treatment for more locally advanced techniques indicating higher rates of organ preservation.

Table 7.1
Management of rectal cancer patients as reported to NBOCA in England and Wales, by year of diagnosis

	2016–17		2017–18		2018–19		2019–20		2020–21	
	N	%	N	%	N	%	N	%	N	%
Total Rectal Cancer Patients	8,300		8,467		8,565		8,813		7,486	
Major Resection	4,483	54.0	4,424	52.2	4,137	48.3	4,234	48.0	3,482	46.5
Local Excision	595	7.2	606	7.2	629	7.3	678	7.7	477	6.4
Non-resectional Surgery	599	7.2	599	7.1	649	7.6	734	8.3	642	8.6
No Surgery	2,623	31.6	2,838	33.5	3,150	36.8	3,167	35.9	2,885	38.5

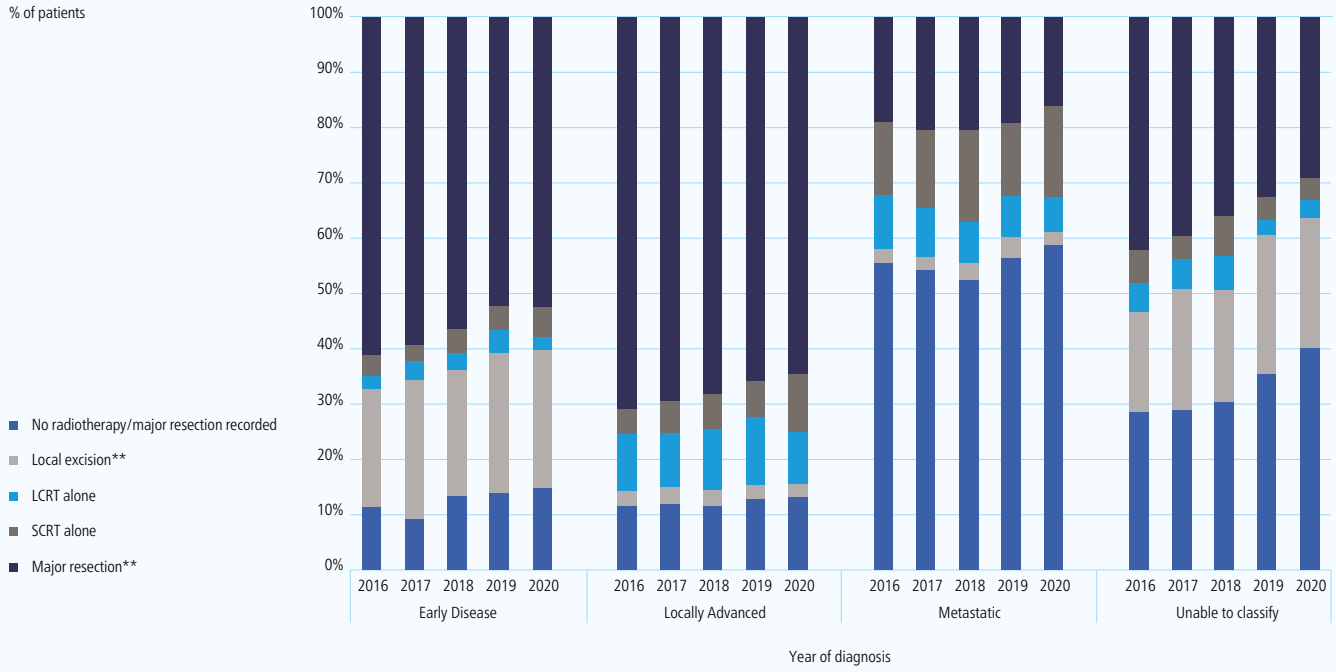
The recommendations for the management of rectal cancer in NICE guidelines are partly based on tumour staging at diagnosis. Figure 7.1 shows the change in rectal cancer management over time separately for three clinical groups: patients with early rectal cancer; locally advanced disease; and metastatic disease. Supplementary Table 3 shows the difference in patient and tumour characteristics and treatment for these different clinical groups.

Since 2016 for early rectal cancers, there has been a reduction in the proportion of patients having a major resection (61% in 2016 compared to 52% in 2020). This has been associated with an increasing use of local excision for early rectal cancer. At the same time complete clinical response after neo-adjuvant therapy has precipitated enhanced surveillance following publication of OnCoRe and there has been an increase in the use of total neo-adjuvant therapy (TNT) for locally advanced rectal cancers (Figure 7.1).

For locally advanced rectal cancers, there has also been a reduction in the proportion of patients having a major resection (70% in 2016 compared to 65% in 2020), associated with an increase in those having radiotherapy. Finally, in patients with metastatic rectal cancer, there has been a slight increase in the proportion of patients who do not have a record of radiotherapy or major resection (56% in 2016 to 59% in 2020).

There was a slight increase across all clinical groups in the proportion of patients not having radiotherapy or a major resection in 2020 compared to 2019 (Figure 7.1). In addition, compared to 2019, in 2020 there was a reduction across all three clinical groups in the use of long-course radiotherapy (LCRT), and an increase in the use of short-course radiotherapy (SCRT) (Figure 7.1). This is due to a sharp increase in the proportion of patients receiving SCRT during the first wave of the COVID-19 pandemic (Figure 7.2). The use of SCRT remained higher up until the end of 2020.

Figure 7.1
Changes in rectal cancer management over time by clinical group*

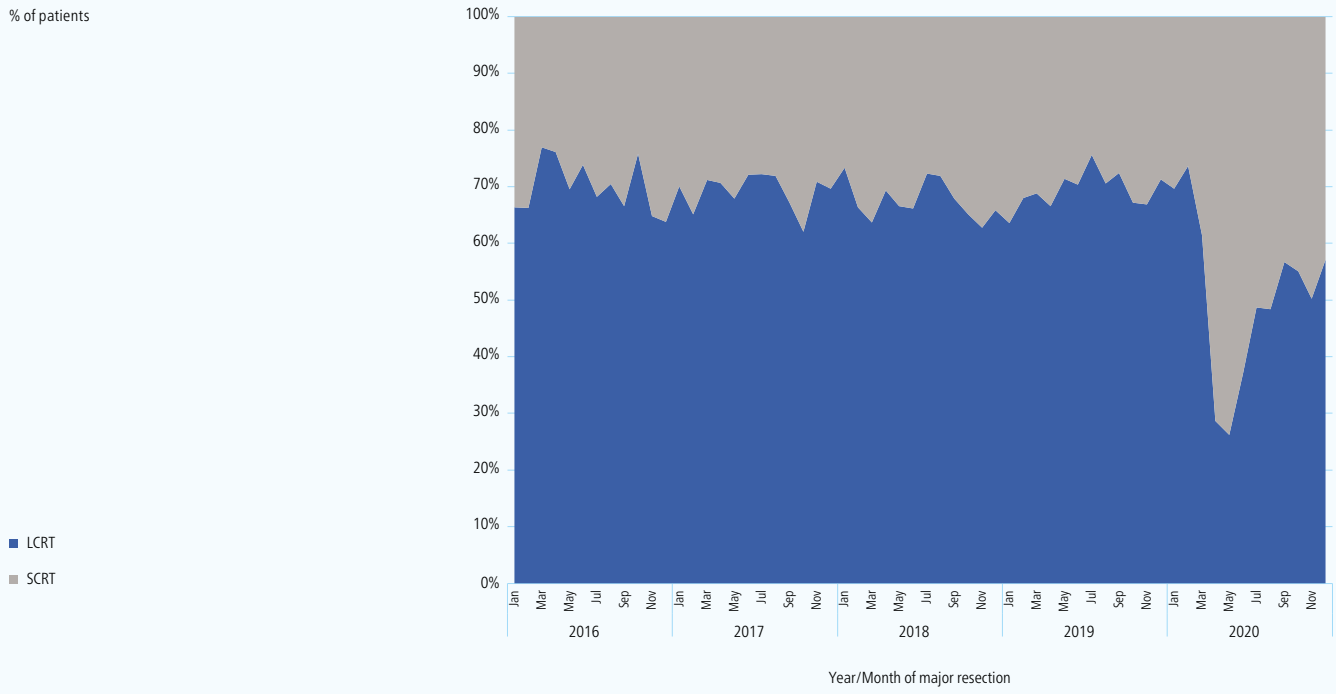


*** Clinical Groups**

Early Disease:	T1/2, N0, M0
Locally Advanced:	any T, N1/N2, M0 or T3/4, N0, M0
Metastatic:	any T, any N, M1
Incomplete:	any other staging that includes missing data that prevents classification

** This represents the last treatment recorded

Figure 7.2
Changes in type of neo-adjuvant radiotherapy used over time



Historically, patients having short-course radiotherapy have been older, more comorbid, less fit, and with less advanced disease. During the COVID-19 pandemic, the characteristics of patients receiving SCRT have changed considerably (Table 7.2).

The patients treated with SCRT during the COVID-19 pandemic have been younger (52% aged under 75 years in 2019 compared to 60% in 2020), less comorbid (42.5% with no comorbidities in 2019 versus 46% in 2020), and fitter (38% with performance status 0 in 2019 versus 46% in 2020). In addition, these patients had more advanced T-stage (75.5% with T3/T4 disease in 2019 versus 83% in 2020) and N-stage (65% with N1/N2 disease in 2019 versus 62% in 2020).

The patients treated with SCRT were also more likely to go on to have curative surgery with 28% having an APER in 2020 compared to 22% in 2019, and 36% having an anterior resection in 2020 compared to 31% in 2019.

The characteristics of patients having LCRT or no radiotherapy remained largely similar in 2020 compared to 2019. Patients receiving LCRT were slightly younger and fitter, with more advanced T-stage disease.

Overall, for those having neo-adjuvant radiotherapy, 52% had SCRT in 2020 compared to 31% in 2019. The initial increased use of SCRT is due to COVID-19 related recommendations but subsequently in 2020 trials of Total Neo-adjuvant Therapy (TNT) incorporating SCRT followed by combination chemotherapy demonstrated benefits compared to LCRT in fit patients. For this reason it is likely that higher rates of SCRT as a component of TNT will be continue to be observed in the future.

Table 7.2
Characteristics of patients having short-course radiotherapy in 2019 compared to 2020

		Received short-course radiotherapy			
		2019		2020	
		Number	%	Number	%
Total no. patients		920		1,389	
Sex	Male	610	66.4	932	67.1
	Female	308	33.6	456	32.9
	Missing (% of total)	2 (0.2)		1 (0.1)	
Age-group	<50 yrs	51	5.5	77	5.5
	50-59 yrs	79	8.6	178	12.8
	60-74 yrs	344	37.4	581	41.8
	75-79 yrs	123	13.4	203	14.6
	80-84 yrs	162	17.6	181	13.0
	85+ yrs	161	17.5	169	12.2
Referral	Non-screening	852	92.6	1,279	92.1
	Screening	68	7.4	110	7.9
Pre-treatment TNM T-stage	T0/T1	27	3.1	30	2.2
	T2	188	21.5	204	15.1
	T3	521	59.5	871	64.4
	T4	140	16.0	247	18.3
	Missing (% of total)	44 (4.8)		37 (2.7)	
Pre-treatment TNM N-stage	N0	334	38.2	465	34.6
	N1	333	38.1	546	40.7
	N2	208	23.8	332	24.7
	Missing (% of total)	45 (4.9)		46 (3.3)	
Pre-treatment TNM M-stage	M0	689	76.1	1,103	80.0
	M1	216	23.9	275	20.0
	Missing (% of total)	15 (1.6)		11 (0.8)	
Performance Status	Normal activity	311	38.0	586	46.4
	Walk & light work	276	33.7	437	34.6
	Walk & all self care:up >50%	159	19.4	177	14.0
	Ltd self care: confined >50%	63	7.7	57	4.5
	Completely disabled	10	1.2	5	0.4
	Missing (% of total)	101 (11.0)		127 (9.1)	
Comorbidities (from HES)	0	377	42.5	602	45.7
	1	306	34.5	418	31.7
	2+	205	23.1	297	22.6
	Missing/ Not Known (% of total)	32 (3.5)		72 (5.2)	
Surgical Procedure	Anterior Resection	133	30.9	261	35.9
	APER	95	22.1	206	28.3
	Hartman's	26	6.1	53	7.3
	Pelvic Exenteration	5	1.2	19	2.6
	Local Excision	62	14.4	44	6.1
	Stoma/Stent	84	19.5	111	15.3
	Other surgery	25	5.8	33	4.5
	None reported	490 (53.3)		662 (47.7)	

The proportion of patients with a positive circumferential resection margin (CRM) has improved from 8.3% in 2016/17 to 7.4% in this audit period (Table 7.3). It is a reassuring finding that this has not been affected by potentially more difficult operating conditions during the COVID-19 pandemic.

Table 7.3
Circumferential resection margin status for those with rectal cancer undergoing major resection in England and Wales, by year of diagnosis

		2016–17		2017–18		2018–19		2019–20		2020–21	
		N	%	N	%	N	%	N	%	N	%
Total patients		4,483		4,424		4,137		4,234		3,482	
Recorded margin status	Negative	3,411	91.7	3,573	89.3	3,351	92.1	3,575	92.8	2,875	92.6
	Positive	309	8.3	428	10.7	289	7.9	276	7.2	230	7.4
	Missing	763 (17.0)		423 (9.6)		497 (12.0)		383 (9.0)		377 (10.8)	

The overall number of patients having a major resection for rectal cancer has reduced slightly due to the COVID-19 pandemic (Table 7.4). In this audit period, 60% of patients had an anterior resection, and 37% had rectal cancer surgery leading to a permanent stoma (APER or Hartmann's) (Table 7.4). The proportions of each different type of major resection have remained stable. However, this only includes major resections up until 31 March 2020 in order to match the cohort included in the permanent stoma and 18-month unclosed diverting ileostomy metrics. It will be important to continue to monitor this trend, as during the first wave of the COVID-19 pandemic more risk averse operating was undertaken, and we are likely to see an increase in the proportion of low Hartmann's procedures performed.

Table 7.4
Type of major resection performed for rectal cancer in England and Wales, by year of surgery

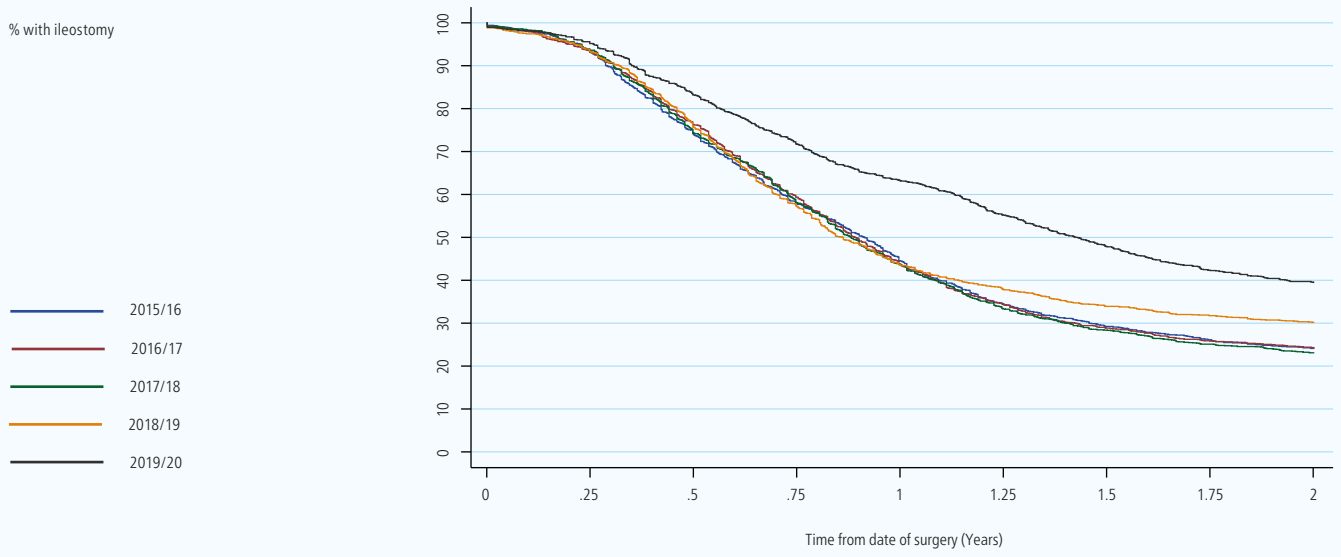
	2015–16		2016–17		2017–18		2018–19		2019–20	
	N	%	N	%	N	%	N	%	N	%
Total	3,296		4,200		4,235		3,986		3,878	
Anterior Resection	2,121	64.4	2,552	60.8	2,542	60.0	2,433	61.0	2,337	60.3
Abdomino-perineal excision of rectum (APER)	773	23.5	1,128	26.9	1,167	27.6	1,056	26.5	1,066	27.5
Hartmann's	306	9.3	412	9.8	442	10.4	408	10.2	381	9.8
Other	96	2.9	108	2.6	84	2.0	89	2.2	94	2.4

The proportion of patients receiving a stoma at the time of their anterior resection has remained relatively stable over time and is 76% for this audit period (Table 7.5). However, there has been a substantial increase in the proportion of patients who do not have their ileostomy reversed by 18 months. This has increased from around 28-29% up to 47% this audit period. This likely reflects the impact of the pandemic on waiting lists (Figure 7.3). With emerging evidence of the negative impact of unclosed ileostomy on patient quality of life and even potentially on long-term survival, this will be a key focus area for future local and national quality improvement initiatives.

Table 7.5
Stoma status within 30 days of surgery and 18 months post-surgery in patients undergoing an anterior resection in England and Wales, by year of surgery

		2015–16		2016–17		2017–18		2018–19		2019–20	
		N	%	N	%	N	%	N	%	N	%
Total		2,121		2,552		2,542		2,433		2,337	
Stoma status at surgery	No stoma	490	23.1	509	19.9	534	21.0	555	22.8	559	23.9
	Ileostomy	1,385	65.3	1,688	66.1	1,645	64.7	1,477	60.7	1,410	60.3
	Colostomy	246	11.6	355	13.9	363	14.3	401	16.5	368	15.7
	Ileostomy at 18 months in those with Ileostomy at surgery	404	29.2	481	28.5	464	28.2	495	33.5	669	47.4

Figure 7.3
Time to ileostomy reversal, by year of surgery



7.2 Variation in rectal cancer management

Local Quality Improvement Target

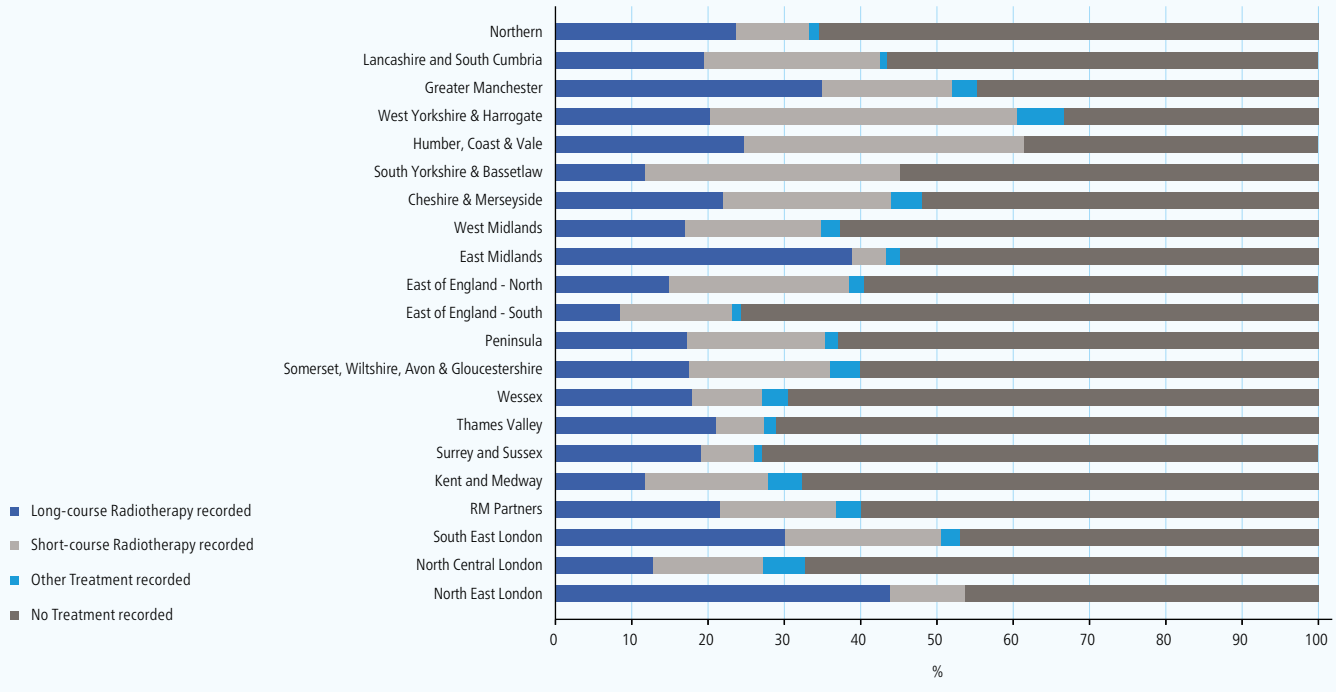
★ Reported annual rectal cancer resection volume ≥20 per trust/hospital/MDT

NICE guidelines have recommended that providers should be performing a minimum of 10 rectal cancer resections per year. According to data submitted for major resections dated between 1st April 2020 and 31st March 2021 (with a recorded diagnosis date after 1st April 2019), 15% of hospitals/trusts/MDTs performed fewer than 10 rectal cancer resections and 49% of hospitals/trusts/MDTs performed fewer than 20 rectal cancer resections within this 12-month period. This compares to 11% and 35% respectively in the last audit period.

The NBOCA only has access to RTDS data for England but are in the process of linking to radiotherapy data for Wales. During 2020, for patients having a major resection for rectal cancer, there was considerable geographical variation in the use of neo-adjuvant radiotherapy across English Cancer Alliances from 24% to 66% (Figure 7.4). For patients that received neo-adjuvant treatment, the proportion receiving LCRT varied from 26% to 88%, and the proportion receiving SCRT varied from 9% to 60%. This represents an increase in variation compared to 2019

It is anticipated that the use of TNT will further impact on the post-pandemic management of rectal cancer and could result in further geographical variation. NBOCA will strive to develop methodology to allow an evaluation of TNT in future reports, including the impact of this change on geographical variation in practice.

Figure 7.4
Treatment pathways for rectal cancer patients diagnosed between 01 January 2020 and 31 December 2020 who underwent major resection, by English Cancer Alliance* performing surgery



* Incomplete pre-operative treatment in audit dataset for Wales therefore unable to include Welsh data this audit period

Figure 7.5 shows adjusted proportions of patients undergoing a rectal cancer resection where a permanent stoma is created. After risk adjustment, there was substantial between-unit variation with 25 hospitals/trusts/MDTs above the 95% funnel limits. Of these, 12 were above the 99.8% funnel limits. This remains comparable to the last audit period where there were 26 hospitals/trusts/MDTs above the 95% funnel limits with 13 of these above the 99.8% limits. There were an additional 25 hospitals/trusts/MDTs below the 95% funnel limits and, of these, 12 were below the 99.8% funnel limits.

Figure 7.5
Adjusted proportion of rectal cancer patients receiving an abdomino-perineal excision of rectum (APER)/pelvic exenteration/Hartmann's by trust/hospital/MDT between 01 April 2015 and 31 March 2020. Audit average = 36.4%.

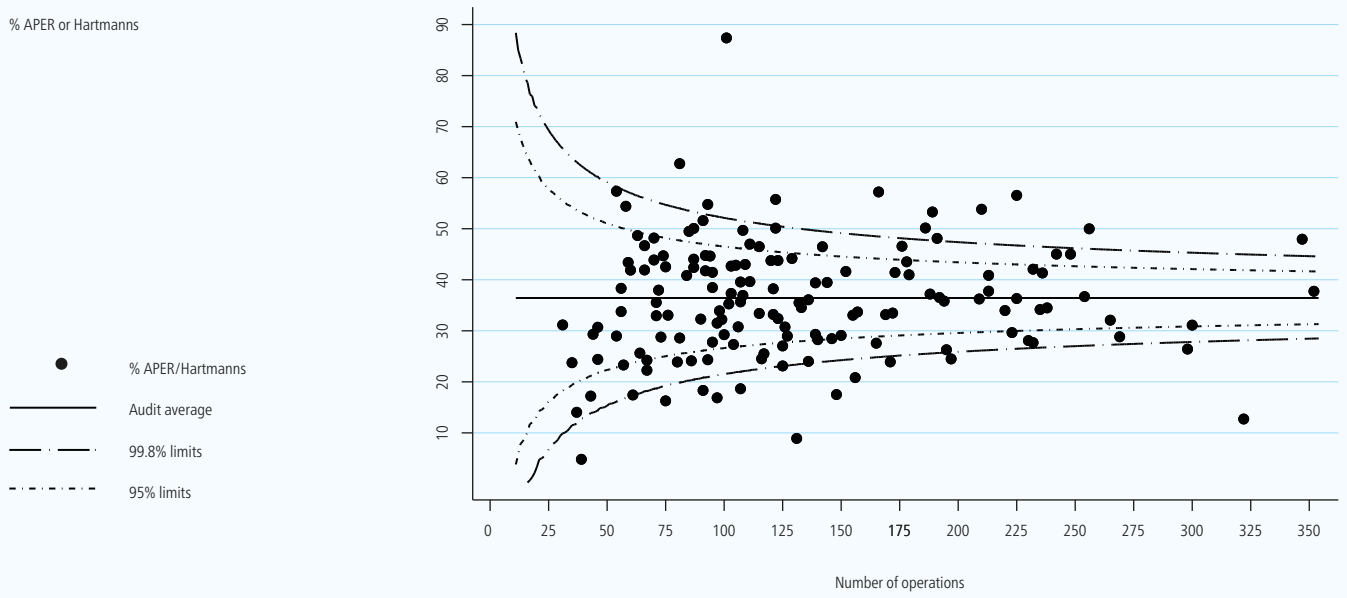


Figure 7.6 shows the adjusted proportions of 18-month unclosed diverting ileostomies for trusts/hospitals/MDTs. After risk-adjustment, there were 19 hospitals/trusts/MDTs above the 95% funnel limits and, of these, four were above the 99.8% funnel limits. In addition, there were 16 hospitals/trusts/MDTs below the 95% funnel limits and, of these, four were below the 99.8% funnel limits.

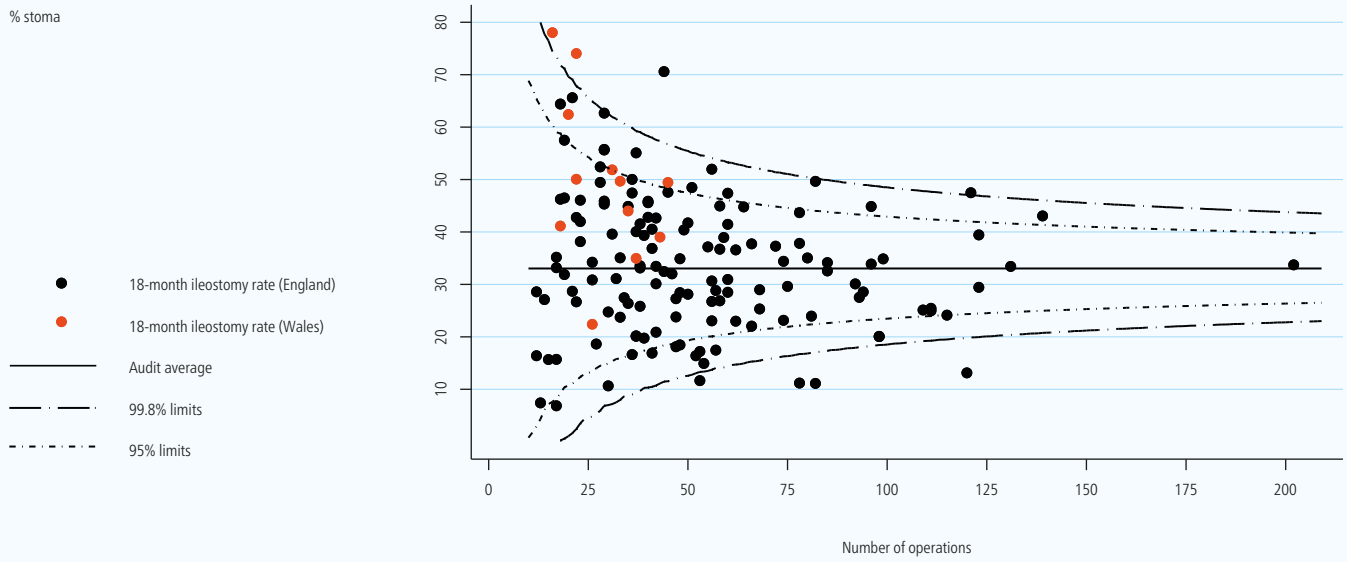
This represents more between-unit variation than in the last audit period where there were 17 hospitals/trusts/MDTs above the 95% funnel limits with three above the 99.8% limits, and 10 hospitals/trusts/MDTs below the 95% funnel limits with four below the 99.8% limits. It is important to note that this performance indicator covers a 5-year reporting period and there is therefore substantial overlap between last year and this year.

Local Quality Improvement Target

★ <35% risk-adjusted 18-month unclosed diverting ileostomy after anterior resection

Possible explanations for the variation include differential rates of post-operative recovery including complications such as wound infections and anastomotic leaks, utilisation or complications from adjuvant chemotherapy, or disease progression. In addition, there are often no set pathways or protocols for stoma closure as the final part of the patient's treatment pathway and the timing of this final surgical intervention is often also variable. It is likely that considerable differences exist in administrative factors such as waiting list volumes for other urgent procedures which may affect the prioritisation of stoma reversal. As expected, these factors appear to have been exacerbated by the COVID-19 pandemic.

Figure 7.6
Adjusted unclosed diverting ileostomy rate for anterior resections performed at English trust/Welsh MDT level between 01 April 2015 and 31 March 2020. Audit average = 33.0%.



Appendix 1 – Individual English trust/hospital & Welsh MDT results

All results are published on our website. Please access your individual Trust/hospital/MDT results by clicking on the relevant hyperlink below.

Trust/hospital/MDT results are also available in an Excel spreadsheet here.

Northern
County Durham and Darlington NHS Foundation Trust
Gateshead Health NHS Foundation Trust
North Cumbria Integrated Care NHS Foundation Trust
North Tees and Hartlepool NHS Foundation Trust
Northumbria Healthcare NHS Foundation Trust
South Tees Hospitals NHS Foundation Trust
South Tyneside and Sunderland NHS Foundation Trust
The Newcastle Upon Tyne Hospitals NHS Foundation Trust
Lancashire & South Cumbria
Blackpool Teaching Hospitals NHS Foundation Trust
East Lancashire Hospitals NHS Trust
Lancashire Teaching Hospitals NHS Foundation Trust
University Hospitals of Morecambe Bay NHS Foundation Trust
Greater Manchester
Bolton NHS Foundation Trust
Manchester University NHS Foundation Trust - North Manchester General Hospital
Manchester University NHS Foundation Trust – Manchester Royal Infirmary
Manchester University NHS Foundation Trust – Wythenshawe Hospital
Pennine Acute Hospitals NHS Trust
Salford Royal NHS Foundation Trust
Stockport NHS Foundation Trust
Tameside and Glossop Integrated Care NHS Foundation Trust
The Christie NHS Foundation Trust
Wrightington, Wigan and Leigh NHS Foundation Trust

Humber, Coast and Vale
Hull and East Yorkshire Hospitals NHS Trust
Northern Lincolnshire and Goole NHS Foundation Trust
York and Scarborough Teaching Hospitals NHS Foundation Trust
South Yorkshire and Bassetlaw
Barnsley Hospital NHS Foundation Trust
Chesterfield Royal Hospital NHS Foundation Trust
Doncaster and Bassetlaw Hospitals NHS Foundation Trust
Sheffield Teaching Hospitals NHS Foundation Trust
The Rotherham NHS Foundation Trust
West Yorkshire and Harrogate
Airedale NHS Foundation Trust
Bradford Teaching Hospitals NHS Foundation Trust
Calderdale and Huddersfield NHS Foundation Trust
Harrogate and District NHS Foundation Trust
Leeds Teaching Hospitals NHS Trust
Mid Yorkshire Hospitals NHS Trust
Cheshire and Merseyside
Countess of Chester Hospital NHS Foundation Trust
East Cheshire NHS Trust
Liverpool University Hospital NHS Foundation Trust
Mid Cheshire Hospitals NHS Foundation Trust
Southport and Ormskirk Hospital NHS Trust
St Helens and Knowsley Hospitals NHS Trust
Warrington and Halton Hospitals NHS Foundation Trust
Wirral University Teaching Hospital NHS Foundation Trust

West Midlands
George Eliot Hospital NHS Trust
Sandwell and West Birmingham Hospitals NHS Trust
Shrewsbury and Telford Hospital NHS Trust
South Warwickshire NHS Foundation Trust
The Dudley Group NHS Foundation Trust
The Royal Wolverhampton NHS Trust
University Hospitals Birmingham NHS Foundation Trust
University Hospitals Coventry and Warwickshire NHS Trust
University Hospitals of Derby and Burton NHS Foundation Trust - Queens Hospital (Burton)
University Hospitals of Derby and Burton NHS Foundation Trust - Royal Derby Hospital
University Hospitals of North Midlands NHS Trust
Walsall Healthcare NHS Trust
Worcestershire Acute Hospitals NHS Trust
Wye Valley NHS Trust
East Midlands
Kettering General Hospital NHS Foundation Trust
Northampton General Hospital NHS Trust
Nottingham University Hospitals NHS Trust
Sherwood Forest Hospitals NHS Foundation Trust
United Lincolnshire Hospitals NHS Trust – Lincoln and Grantham
United Lincolnshire Hospitals NHS Trust – Pilgrim Hospital Boston
University Hospitals of Derby and Burton NHS Foundation Trust - Royal Derby Hospital
University Hospitals of Leicester NHS Trust
East of England - North
Cambridge University Hospitals NHS Foundation Trust
East Suffolk and North Essex NHS Foundation Trust
James Paget University Hospitals NHS Foundation Trust
Norfolk and Norwich University Hospitals NHS Foundation Trust
North West Anglia NHS Foundation Trust
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
West Suffolk NHS Foundation Trust

East of England - South
Bedfordshire Hospitals NHS Trust
East and North Hertfordshire NHS Trust
Mid and South Essex NHS Foundation Trust - Basildon University Hospital
Mid and South Essex NHS Foundation Trust – Broomfield Hospital
Mid and South Essex NHS Foundation Trust – Southend University Hospital
Milton Keynes Hospital NHS Foundation Trust
The Princess Alexandra Hospital NHS Trust
West Hertfordshire Hospitals NHS Trust
Thames Valley
Buckinghamshire Healthcare NHS Trust
Great Western Hospitals NHS Foundation Trust
Oxford University Hospitals NHS Trust
Royal Berkshire NHS Foundation Trust
South East London
Guy's and St Thomas' NHS Foundation Trust
King's College Hospital NHS Foundation Trust - King's College Hospital
King's College Hospital NHS Foundation Trust - Princess Royal University Hospital
Lewisham and Greenwich NHS Trust
RM Partners (West London)
Chelsea and Westminster Hospital NHS Foundation Trust
Croydon Health Services NHS Trust
Epsom and St Helier University Hospitals NHS Trust
Imperial College Healthcare NHS Trust
Kingston Hospital NHS Foundation Trust
London North West Hospitals NHS Trust
St George's University Hospitals NHS Foundation Trust
The Hillingdon Hospitals NHS Foundation Trust
The Royal Marsden NHS Foundation Trust

North Central London
North Middlesex University Hospital NHS Trust
Royal Free London NHS Foundation Trust
The Whittington Hospital NHS Trust
University College London Hospitals NHS Foundation Trust
North East London
Barking, Havering and Redbridge University Hospitals NHS Trust
Barts Health NHS Trust
Homerton University Hospital NHS Foundation Trust
Peninsula
Plymouth Hospitals NHS Trust
Royal Cornwall Hospitals NHS Trust
Royal Devon University Healthcare NHS Foundation Trust - North Devon District Hospital
Royal Devon University Healthcare NHS Foundation Trust - Royal Devon and Exeter Hospital
Torbay and South Devon NHS Foundation Trust
Somerset, Wiltshire, Avon and Gloucestershire
Gloucestershire Hospitals NHS Foundation Trust
North Bristol NHS Trust
Royal United Hospitals Bath NHS Foundation Trust
Salisbury NHS Foundation Trust
Somerset NHS Foundation Trust
University Hospitals Bristol and Weston NHS Foundation Trust
Yeovil District Hospital NHS Foundation Trust
Wessex
Dorset County Hospital NHS Foundation Trust
Hampshire Hospitals NHS Foundation Trust - Basingstoke and North Hampshire Hospital
Hampshire Hospitals NHS Foundation Trust - Royal Hampshire County Hospital
Isle of Wight NHS Trust
Portsmouth Hospitals NHS Trust
University Hospitals Dorset NHS Foundation Trust
University Hospital Southampton NHS Foundation Trust

Kent & Medway
Dartford and Gravesham NHS Trust
East Kent Hospitals University NHS Foundation Trust
Maidstone and Tunbridge Wells NHS Trust
Medway NHS Foundation Trust
Surrey & Sussex
Ashford and St Peter's Hospitals NHS Foundation Trust
East Sussex Healthcare NHS Trust
Frimley Health NHS Foundation Trust - Heatherwood and Wexham Park Hospitals
Frimley Health NHS Foundation Trust - Frimley Park Hospital
Royal Surrey County Hospital NHS Foundation Trust
Surrey and Sussex Healthcare NHS Trust
University Hospitals Sussex NHS Foundation Trust – Royal Sussex County Hospital
University Hospitals Sussex NHS Foundation Trust- St. Richard's Hospital
University Hospitals Sussex NHS Foundation Trust- Worthing Hospital
Wales
Bronglais MDT
Cardiff MDT
Nevill Hall Hospital MDT
Prince Charles Hospital MDT
Princess of Wales MDT
Royal Glamorgan Hospital MDT
Royal Gwent Hospital MDT
Swansea MDT
West Wales General & Prince Phillip MDT
Withybush General MDT
Ysbyty Glan Clwydd MDT
Ysbyty Gwynedd MDT
Ysbyty Maelor MDT

Appendix 2 – Outlier communications

The individual outlier responses are published here.

Appendix 3 – Glossary

Abdomino-perineal excision of the rectum (APER) - operation to remove the entire rectum and anal canal. The patient is left with a permanent stoma**.**

Adjusted - a way of reporting results that takes into account differences between the patients that each trust/hospital/MDT or region is treating. This allows comparisons to be made more fairly.

Adjuvant therapy – these are treatments given to a patient after they have surgery and might consist of chemotherapy and/or radiotherapy.

Anterior resection - operation to remove part, or all, of the rectum.

American Society of Anaesthesiologists (ASA) grade – a system for assessing how fit somebody is before they have surgery, with a value of 1 representing the most fit.

Cancer Alliance - at a regional level, results in England are reported according to Cancer Alliance. This is a particular geographical area containing many hospitals.

Chemotherapy - drug therapy used to treat cancer. It may be used alone, or in combination with other types of treatment (for example surgery or radiotherapy).

Circumferential resection margin – this refers to the surface of the specimen which has been removed and involves measuring how much healthy tissue surrounds the tumour. A negative circumferential resection margin (CRM) is defined as more than 1mm of healthy tissue beyond the tumour. Surgeons want to achieve a negative CRM when they remove a tumour as it reduces the risk of the tumour coming back again in the future.

Clinical Nurse Specialist – a nurse with specialist qualifications to manage and care for patients with bowel cancer. This nurse is usually a patient's first point of contact if they have any concerns or questions.

Complete clinical response (cCR) – this is a term used to describe the disappearance of a rectal tumour following neo-adjuvant treatment according to clinical, radiological and endoscopic investigations. This means that the tumour is no longer visible on scans or a 'camera' test of the bowel. It might be possible for patients with complete clinical response to undergo 'watch and wait' rather than surgery. This involves intensive follow-up to monitor for tumour regrowth.

Diverting ileostomy – this is a type of stoma. It involves bringing out a section of small bowel on to the surface of the abdomen. A diverting ileostomy is often formed during an anterior resection procedure for rectal cancer. During an anterior resection, the section of bowel containing the tumour is removed and the ends are anastomosed (joined) back together. The ileostomy is made before the site of the join and diverts poo to allow the join time to heal and also if the join were to leak, the consequences should be less severe. This type of stoma can be reversed (small bowel put back inside abdomen) once the join has healed.

Hartmann's procedure - operation to remove an area of the bowel on the left hand side of the abdomen and top end of the rectum. It involves the formation of a stoma, but this is not necessarily permanent.

Health board - in Wales, bowel cancer services are provided by Health Boards which serve distinct geographical areas. The multidisciplinary teams operate within these.

Faecal Immunochemical Test (FiT) – a stool sample is provided by the patient and is then tested for the amount of blood within it. Abnormal levels of blood within the stool will lead to a recommendation for telescopic examination of the bowel. FIT testing is used as part of national screening for asymptomatic patients, but can also be used for 'low risk' symptomatic patients. The level of blood which needs to be detected in the stool for symptomatic patients is much lower than for screening. This means that a recent negative screening test should not be relied upon if patients subsequently present with symptoms.

Laparoscopic – also known as minimally invasive surgery or keyhole surgery. This is a type of surgical procedure performed through small cuts in the skin instead of the larger cuts used in open surgery.

Local excision - procedure done with instruments inserted through the anus (often during a colonoscopy), without cutting into the skin of the abdomen to remove just a small piece of the lining of the colon or rectum wall.

Lynch syndrome – this is an inherited genetic defect which can be identified via blood tests (MMR/MSI testing). People with Lynch syndrome have an increased risk of a range of cancers. Bowel cancer is the most common cancer associated with Lynch syndrome.

Metastatic disease - cancer that has spread from where it first started in the body. These can also be called secondary cancers.

Mismatch repair (MMR) – describes cells that have changes in certain genes that are involved with copying DNA. When cells are MMR deficient, this is associated with Lynch syndrome (see above) and can lead to cancer. In addition, knowing whether a tumour is MMR deficient helps with planning treatment and predicting prognosis. Microsatellite instability (MSI) is a similar type of genetic change.

Multidisciplinary Team (MDT) - an MDT is a group of bowel cancer experts based within a hospital who discuss and plan the treatment of every patient with bowel cancer. The MDT includes surgeons, cancer specialists, nurses, radiologists, histopathologists and palliative care physicians. Patients from referring hospitals will be discussed in their closest specialist bowel MDT. At a local level, results from Wales are reported according to multidisciplinary teams.

Neo-adjuvant therapy – these are treatments given to a patient before they have surgery and might consist of chemotherapy and/or radiotherapy.

Open surgery - an operation carried out by cutting an opening in the abdomen.

Performance status – a system for assessing how a disease is affecting the daily living abilities of a person. A score is attributed between 0 and 4, as follows:

0 = Fully active.

1 = Some restriction but cares for self.

2 = Ambulatory >50% of time, occasional assistance needed.

3 = Ambulatory ≤50% of time, nursing care needed.

4 = Bedbound.

Permanent stoma – This involves bringing out a section of large bowel on to the surface of the abdomen. This type of stoma cannot be reversed. It is formed when two ends of bowel cannot be joined back together or, sometimes, if joining together the two ends of bowel would result in poor bowel function which would impair a patient's quality of life.

Palliative care - care given to patients whose disease cannot be cured. It aims to improve quality of life rather than extending life.

Radiotherapy - the treatment of disease, especially cancer, using x-rays or similar forms of radiation.

Robotic surgery – this allows surgeons to control surgical instruments whilst sitting at a special console away from the patient during the operation.

Screening – the aim of screening is to try to detect cancers early. People aged 60-74 are invited to take part in bowel cancer screening every 2 years. They do this by providing a poo sample that is tested for traces of blood. They will be invited to have a camera test of the bowel if this is positive. The screening age is gradually being lowered to 50 years in England and Wales.

Staging - a way of describing the size of a cancer and how far it has grown. Staging is important because it helps decide which treatments are required. Stage I and II cancers are localised to the bowel. Stage III cancers have spread to the lymph glands. Stage IV cancers have spread to other parts of the body, for example, the liver or lungs.

Stent – a flexible, hollow tube designed to keep a section of the bowel open when it has become blocked.

Stoma – a surgical opening in the abdomen through which the bowel is brought out onto the surface of the skin. Colostomy and ileostomy are types of stoma.

Total neo-adjuvant therapy (TNT) – this is a new approach to treating rectal cancer and involves both systemic chemotherapy and neo-adjuvant chemoradiotherapy prior to surgery.

Toxicity – chemotherapy often has side effects which can make you unwell. This is called toxicity and can be of varying severity. It includes, for example, diarrhoea and vomiting.

TNM Staging - a system to describe the amount and spread of cancer in the body. The 'T' refers to 'Tumour' and describes the main tumour. The 'N' refers to 'Nodes' and describes how many lymph nodes or 'glands' have cancer. The 'M' refers to 'Metastases' and describes cancer that has spread to other parts of the body.

Trust - an organisation within the English NHS, made up of one or more hospitals, and generally serving one geographical area.