NELA
National Emergency Laparotomy Audit

THE IMPACT OF COVID-19 ON EMERGENCY LAPAROTOMY – AN INTERIM REPORT OF THE NATIONAL EMERGENCY LAPAROTOMY AUDIT

23 MARCH 2020 – 30 SEPTEMBER 2020

RCOA Royal College of Anaesthetists | NIAA HSRC Health Services Research Centre | Royal College of Surgeons of England Advancing Surgical Care | HQIP Healthcare Quality Improvement Partnership

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1 Executive Summary

Aim of this report
In this interim report, we describe the impact that the first wave of the COVID-19 pandemic had on the key standards of care provided for patients undergoing emergency bowel surgery in England and Wales. Previous reports of the National Emergency Laparotomy Audit (NELA) have shown that each year around 25000 patients undergo emergency bowel surgery in England and Wales to manage acute gastrointestinal conditions including cancer, bleeding, ischaemia, obstruction, intra-abdominal sepsis or complications of previous surgery [1]. NELA was one of the few commissioned national audit projects that was recommended to continue during the first national COVID-19 lockdown [2] and the data collected by hospital teams during this lockdown period are presented in this interim report.

How many hospitals contributed to this report?
173 hospitals in England and Wales continued to collect data and submit them to the Audit during the period analysed and presented in this report. This compares with 176 in NELA Year 6 (2019), the most recent year before the onset of the COVID-19 pandemic. We thank all of the teams for doing this despite the pressures faced by staff during the first months of the COVID-19 pandemic.

Who is this report relevant to?
This interim report is important for clinical staff, audit staff, senior leadership teams and executive teams and commissioners of care. It is particularly important to consider the results as recovery and restart planning post COVID-19 begins. It is also relevant to patients and their families and those who have lived-experience of emergency bowel surgery.

Definitions
For the purposes of this report, patients were considered COVID-19 positive if they had a positive reverse transcriptase-polymerase chain reaction (RT-PCR) test or if they had clinical signs and symptoms of COVID-19, particularly in the early phase when widespread testing was not available.

Patients were considered COVID-19 negative if they had no classic symptoms or a negative RT-PCR test.

Where patients are referred to as non-COVID-19, this includes both those who met the definition of COVID-19 negative, as well as those with unknown COVID-19 status.

COVID-19-managed patients refers to cases where staff were working in personal protective equipment (PPE) suitable for use during aerosol generating procedures (AGPs), or where usual theatre practices were adapted to minimize risk to staff and patients from presumed COVID-19 infection.

Data are presented for the time period of 23 March 2020 to 30 September 2020. 23 March has been chosen because this is the date that the national UK lockdown commenced in

response to the increasing numbers of patients with COVID-19 and pressures on the National Health Service (NHS). For ease of comparison, graphs are extended to before this period, and comparative numbers are presented for the same time period in 2019, which falls into NELA Year 6. Where patterns of activity are presented on a weekly basis (Monday – Sunday), the Year 6 first week (1) commences on 3 December 2018 and last week in September commences on 23 September 2019 (week 43). For Year 7 data the first week (1) commences on 2 December 2019 and last week in September commences on 21 September 2020 (week 43).

High-risk is defined as a predicted risk of death within 30 days greater than or equal to 5% when assessed by any means (including clinical judgement and/or risk prediction tools) [3].

1.1 Summary of results from 23 March 2020 – 30 September 2020

1. There were 10546 patients who had emergency bowel surgery
2. Of these, 867 patients had a perioperative diagnosis of COVID-19 (COVID-positive)
3. The median length of stay was 12 days in COVID-19 positive patients, and 9 days for non-COVID-19 patients (compared with 10 days for the same period in Year 6)
4. The 30-day mortality of COVID-19 positive patients was 12.5%.
5. The 30-day mortality for non-COVID-19 patients was 7.2% (compared to 9.0% in the same period in audit Year 6)

The NELA key standards of care are presented below[1].

1. 85.3% of patients had a preoperative assessment of risk documented (84.7% in Year 6)
2. 96.6% of high-risk patients had a consultant surgeon present in theatre (94.6% in Year 6) and 93% of high-risk patients had a consultant anaesthetist present in theatre (92.5% in Year 6)
3. 82% of all high-risk patients were admitted to critical care (86.4% in Year 6). 81.7% of high-risk non-COVID-19 patients were admitted to critical care whereas 84.4% of high-risk COVID-19 positive patients were admitted to critical care
4. 18.8% of all patients undergoing emergency bowel surgery were over the age 65 and frail (19% in Year 6)

Conclusion

There was an overall reduction in the number of patients who had emergency bowel surgery after the national lockdown commenced. Data collected by NELA do not include

[1] **Results for the same time period in 2019 (Year 6) are given in parentheses.**

patients who presented with acute abdominal pathology but who then did not proceed to surgical intervention.

Reassuringly, standards of care for patients in England and Wales needing emergency bowel surgery during the first six months of the COVID-19 pandemic appear to have been maintained with consultant delivered care and assessment of risk continuing at similar rates as in the previous year. However, rates of admission to critical care decreased. Further analysis will be needed to understand if there were any regional variations, or variations over time.

The influence on mortality will also need to be analysed further. The apparent higher mortality rates for COVID-19 positive patients, and the lower mortality rates for patients without COVID-19 undergoing emergency bowel surgery may be multifactorial. Possible influences may include that fewer patients presented to hospital for surgery overall, decision making, such as opting to manage a patient conservatively, by clinical teams changed and that very high-risk patients were not operated upon and had alternative management pathways. Understanding this further is beyond the scope of this report.

2 Introduction

The emergence of SARS-CoV-2 and the World Health Organization declaring a COVID-19 pandemic in March 2020 has resulted in large scale changes in how health care is provided. During the early phase of the pandemic, the lack of robust knowledge and understanding about how a novel coronavirus such as COVID-19 might spread from infected patients to staff, and its impacts on outcomes for patients undergoing surgery, meant that clinical staff were often changing practices; juggling different levels of PPE stock and having to change how patients physically moved through a hospital on their care pathway. Guidance changed rapidly and multiple societies and colleges issued recommendations based mainly on expert opinion, rather than evidence base, in the earlier stages of the pandemic. For example, the Royal College of Surgeons recommended that laparoscopic procedures should only be considered "in selected individual cases where the clinical benefit to the patient substantially exceeds the risk of potential viral transmission" [4]. Studies such as COVID:HAREM showed that the management of acute abdominal problems such as acute appendicitis changed in response to these concerns [5]. NELA has tried to capture how this evolving scenario impacted upon the processes and standards of care.

3 Methods

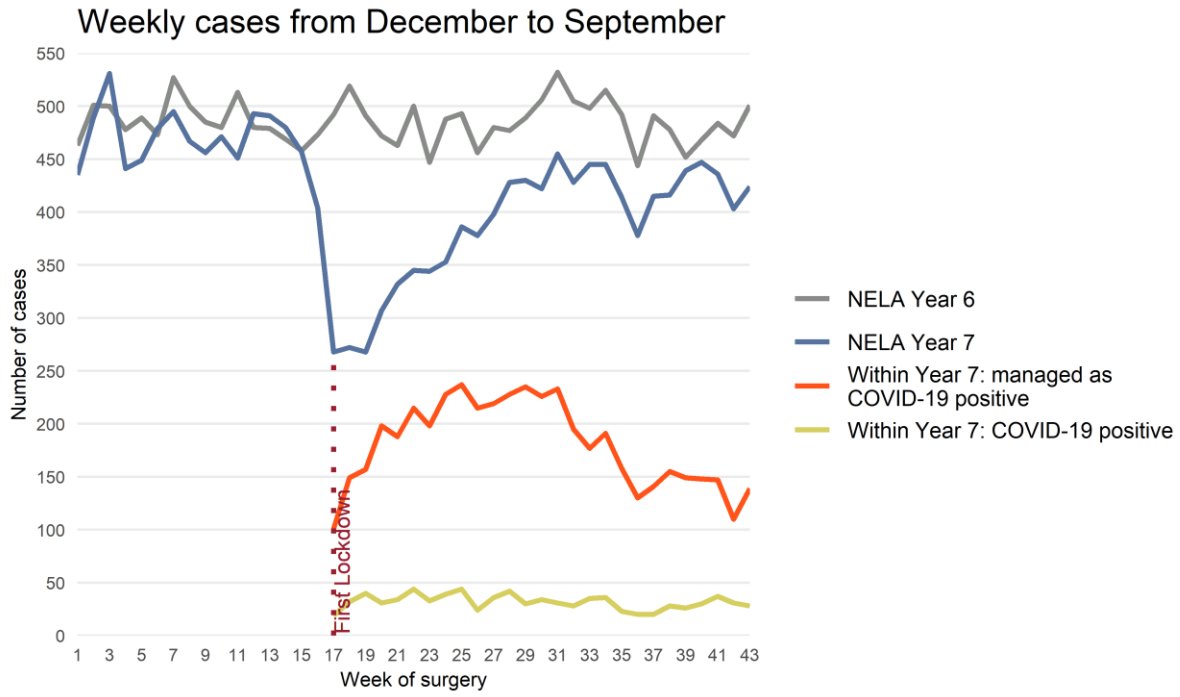
Data for the period of 23 March 2020 to 30 September 2020 were analysed after the final locking date for all submitted patients (31 January 2021) for the Year 7 dataset. Results are compared with the previous year of reporting for the same time periods. Key standards of care that NELA reports against are described and outcomes such as length of stay, return to theatre and unplanned admission to critical care are analysed. As an interim report, case ascertainment is not described because data linkage with the Hospital Episode Statistics and Patient Episode Database for Wales data are awaited. Similarly, data linkage with the Office of National Statistics has not yet been received for this time period. Therefore, descriptions of mortality refer to inpatient mortality rates.

4 Key Findings

Total number of patients undergoing emergency bowel surgery

During the first months of the pandemic, the number of patients entered into the NELA database was around 20% lower (10546 vs 13024 patients) than the same time period in 2019. This is in keeping with the patterns of admissions for other acute medical pathologies such as acute coronary syndromes. A decline in the number of operative procedures was also described in other national audit projects [6-8]. It is not yet known whether this represents a reduction in the actual number of operations performed, a reduction in data entry due to other priorities, or re-deployment of staff. Once we have received data from Hospital Episode Statistics and Patient Episode Database for Wales, additional details will be presented in the Seventh NELA Patient report due to be published in autumn 2021.

Figure 1. A national picture of the change to emergency bowel surgery caseload based on date of surgery

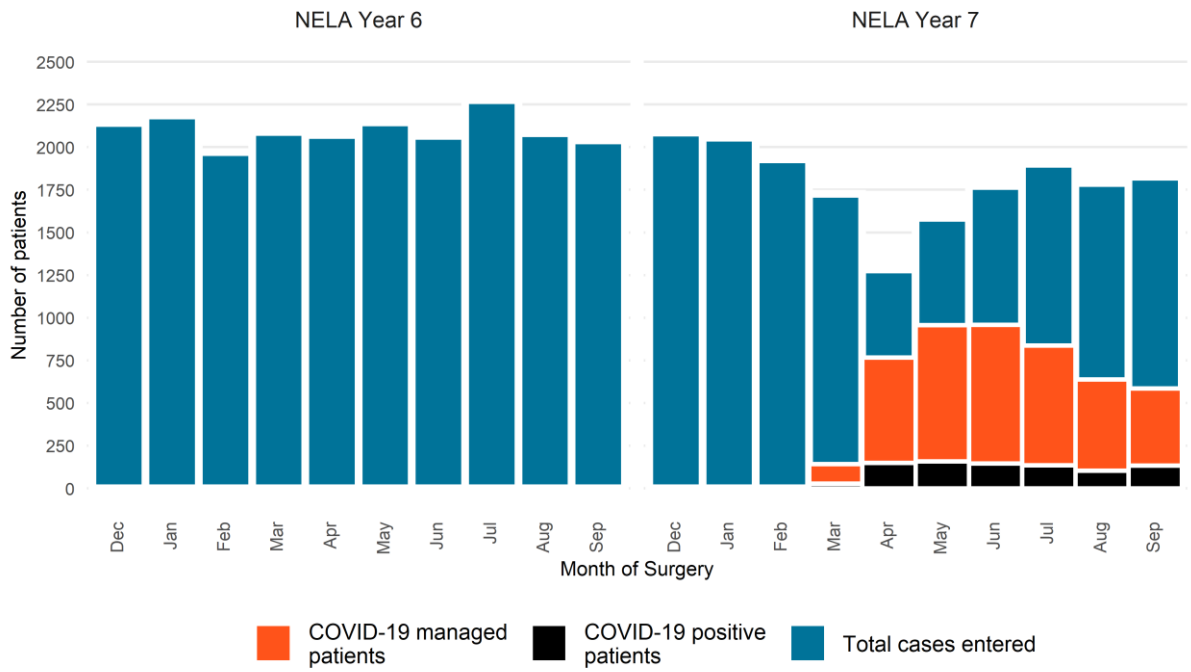


Notes on graph:
Weeks start on Monday.

Year 6 - first week (1) commences on 3 December 2018 and last week in September commences on 23 September 2019 (week 43)

Year 7 - first week (1) commences on 2 December 2019 and last week in September commences on 21 September 2020 (week 43)

Figure 2. Number of patients by month of surgery and COVID-19 status



5 Testing of patients undergoing emergency bowel surgery for COVID-19

The use of RT-PCR testing for COVID-19 was both limited and variable at the beginning of the pandemic. There was also regional variation in access to PCR testing, as more hospitals received access to their own testing facilities. The details of the timeline that individual hospitals gained access to testing facilities are not available to NELA.

As time passed, fewer patients were "managed as COVID-19 positive" which correlates with the increase in PCR testing and more certainty in diagnostic results.

Figure 3. Proportion of patients undergoing emergency bowel surgery who were "managed as COVID-19" (from 23 March 2020)

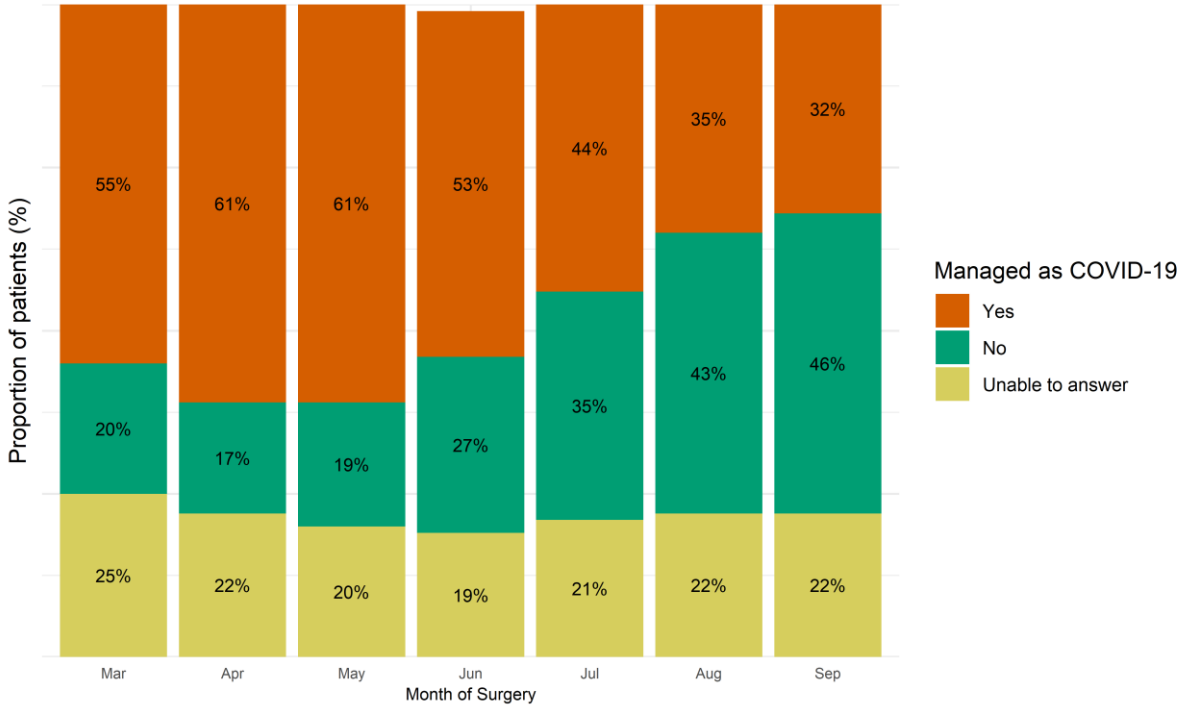


Table 1. COVID-19 status of patients undergoing emergency bowel surgery from 23 March 2020 to 30 September 2020

COVID-19 status	Number of patients (n = 10546)
Diagnosis of COVID-19 made preoperatively (positive antigen test or clinical diagnosis)	305
Diagnosis of COVID-19 made postoperatively	538
Diagnosis of COVID-19 made at any time during admission	24
Not infected throughout inpatient stay	8515
COVID-19 test not done	482
Unable to answer	682

Table 2. Number of patients, by date of surgery each month, undergoing emergency bowel surgery in the same time period for 2019 and 2020

Month of Surgery	NELA Year 6 (Mar to Sept 2019)	NELA Year 7 (Mar to Sept 2020)	COVID-19 positive
Mar	431	260	30
Apr	2014	1282	151
May	2129	1590	159
Jun	2060	1819	149
Jul	2272	1934	139
Aug	2080	1811	104
Sep	2038	1850	135
Total	**13024**	**10546**	**867**

6 Patient characteristics

The characteristics and risk profiles of patients undergoing emergency bowel surgery between March and September 2020 were similar to the same time period in Year 6.

Table 3. Comparison of patient characteristics

Characteristics	NELA Year 6 (Mar to Sept 2019) (n = 13024) n (%)	NELA Year 7 (Mar to Sept 2020) (n = 10546) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19* (n = 9679) n (%)	COVID positive (n = 867) n (%)
30-day in-hospital mortality	1171 (9.0)	803 (7.6)	695 (7.2)	108 (12.5)
Median length of stay in days	10.0	9.0	9.0	12.0
Mean length of stay in days	15.5	14.1	13.7	18.8
NELA calculated risk				
High	6002 (46.1)	4533 (43.0)	4097 (42.3)	436 (50.3)
Low	6905 (53.0)	5915 (56.1)	5496 (56.8)	419 (48.3)
Missing	117 (0.9)	98 (0.9)	86 (0.9)	12 (1.4)
Documented risk				
High	5687 (43.7)	4378 (41.5)	3931 (40.6)	447 (51.6)
Low	5338 (41.0)	4617 (43.8)	4305 (44.5)	312 (36.0)
Not Documented	1999 (15.3)	1551 (14.7)	1443 (14.9)	108 (12.5)
Sex				
Female	6833 (52.5)	5308 (50.3)	4876 (50.4)	432 (49.8)
Male	6191 (47.5)	5238 (49.7)	4803 (49.6)	435 (50.2)
Age group				
18-39	1333 (10.2)	1147 (10.9)	1053 (10.9)	94 (10.8)
40-49	1191 (9.1)	944 (9.0)	867 (9.0)	77 (8.9)
50-59	1979 (15.2)	1669 (15.8)	1536 (15.9)	133 (15.3)
60-69	2579 (19.8)	2090 (19.8)	1900 (19.6)	190 (21.9)
70-79	3415 (26.2)	2779 (26.4)	2564 (26.5)	215 (24.8)
80-89	2240 (17.2)	1723 (16.3)	1573 (16.3)	150 (17.3)
≥90	287 (2.2)	194 (1.8)	186 (1.9)	8 (0.9)

Characteristics	NELA Year 6 (Mar to Sept 2019) (n = 13024) n (%)	NELA Year 7 (Mar to Sept 2020) (n = 10546) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19* (n = 9679) n (%)	COVID positive (n = 867) n (%)
ASA Score**				
ASA 1	1284 (9.9)	978 (9.3)	912 (9.4)	66 (7.6)
ASA 2	4724 (36.3)	3993 (37.9)	3713 (38.4)	280 (32.3)
ASA 3	4703 (36.1)	4002 (37.9)	3658 (37.8)	344 (39.7)
ASA 4	2123 (16.3)	1485 (14.1)	1315 (13.6)	170 (19.6)
ASA 5	190 (1.5)	88 (0.8)	81 (0.8)	7 (0.8)
Urgency of Surgery				
Immediate < 2hrs	1519 (11.7)	949 (9.0)	861 (8.9)	88 (10.1)
Urgency 2-6hrs	5029 (38.6)	4019 (38.1)	3678 (38.0)	341 (39.3)
Urgency 6-18hrs	4249 (32.6)	3734 (35.4)	3423 (35.4)	311 (35.9)
Expedited > 18hrs	2223 (17.1)	1842 (17.5)	1715 (17.7)	127 (14.6)
Frailty				
≥ 65 and Frail (CFS*** ≥5)	2474 (19.0)	1982 (18.8)	1792 (18.5)	190 (21.9)

* non-COVID-19 - includes COVID-19 negative patients and patients for whom the COVID-19 status is unknown
** ASA: American Society of Anesthesiologists Physical Status Classification System
*** CFS: Clinical Frailty Scale

7 The indications and procedures performed for emergency bowel surgery

A decline in the total number of patients undergoing emergency bowel surgery was seen from shortly before the 23 March 2020 national UK lockdown.

The indications for surgery and procedures performed were similar between Year 6 and Year 7, and between patients COVID-19 positive and non-COVID-19 patients.

There was no change in the number of operations that were completed laparoscopically (9.6% vs 9.7% in Year 6).

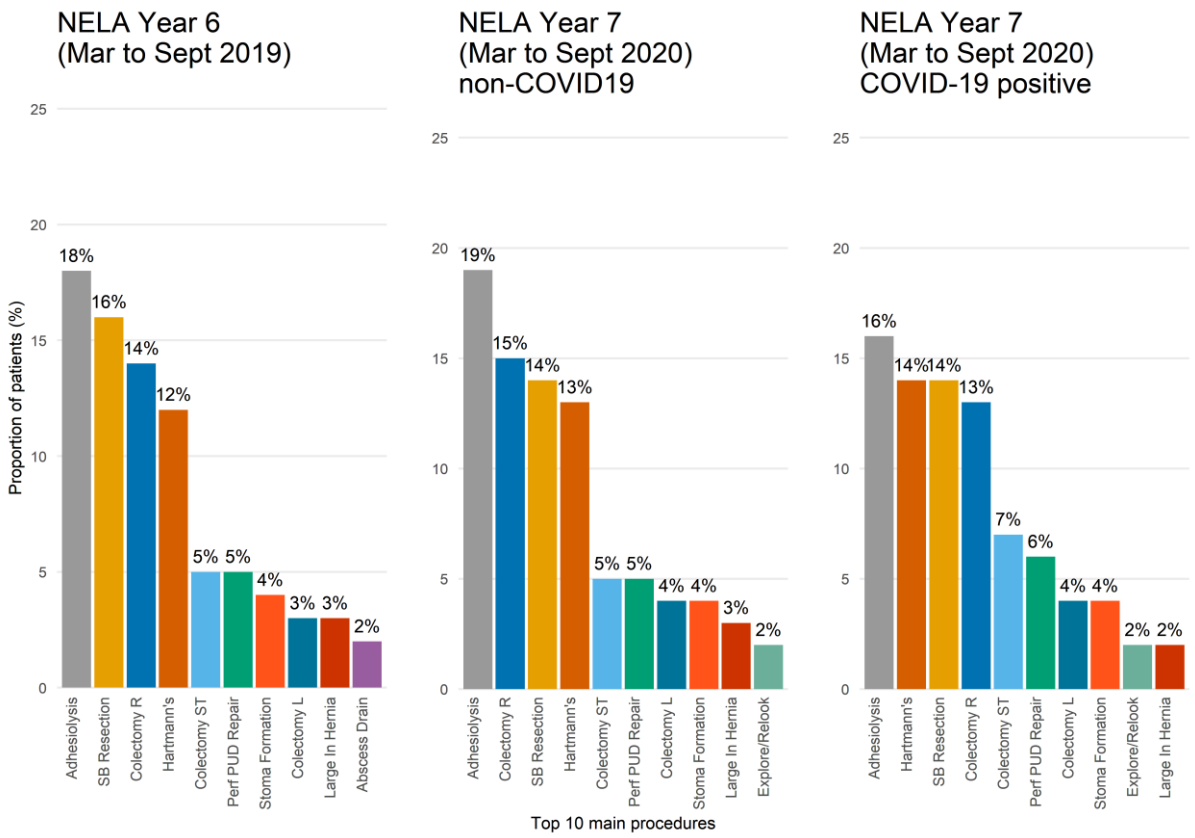
Table 4. Indications for surgery compared between patients COVID-19 positive and all NELA patients

Indication for Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - (non-COVID-19) n (%)	NELA Year 7 (Mar to Sept 2020) (COVID-19 positive) n (%)
Sepsis	5377 (41.3)	3782 (39.1)	391 (45.1)
Obstruction	7841 (60.2)	6089 (62.9)	489 (56.4)
Ischaemia	1126 (8.6)	793 (8.2)	89 (10.3)
Bleeding	351 (2.7)	218 (2.3)	22 (2.5)
Other	82 (0.6)	63 (0.7)	11 (1.3)

7.1 Procedures performed at surgery

The surgical procedures required by patients at laparotomy during the pandemic are presented below. Whilst there appears, for this reporting period, to be little change in the pattern of surgery performed, time may reveal a change in emergency surgical procedures needed by patients presenting for emergency bowel surgery as any possible impact of the 'pause' in elective surgery to accommodate the pressures of COVID-19 on acute hospitals is revealed.

Figure 4. A comparison of procedures performed on COVID-19 positive patients compared to all NELA patients



8 Key process measures

Processes throughout the whole patient pathway changed significantly due to COVID-19 [9]. Despite the challenges that clinical staff faced, key standards of care for patients undergoing emergency bowel surgery were not adversely affected. When compared with the same time period in 2019:

• There was an overall increase in the use of CT scanning and reporting in March - September 2020
• Timeliness to theatre was not significantly affected
• There was increased consultant presence in theatre for both COVID-19 positive patients and patients without COVID-19

8.1 Documented Risk

Key Process Measure
The proportion of patients for whom a risk assessment was documented before surgery.

Key findings:
• 85.3% of patients overall had a documented risk assessment before surgery (84.7% in Year 6)
• 85.1% of non-COVID-19 patients had a documented risk assessment before surgery
• 87.5% of COVID-19 positive patients had a documented risk assessment before surgery

Accurate assessment of perioperative risk of death is a crucial part of clinical decision making. No risk scoring methodology is perfect, and so a combination of clinical judgement and formal risk assessments are required. This should utilise assessments of frailty, nutritional status and cognitive function as well as physiological risk assessments. However, none of these (including the NELA risk adjustment tool) could take into account the potential added risk associated with COVID-19.

(See table 5 in the Appendices)

8.2 CT scan performed and reported

Key process measure
The proportion of patients who received a CT scan which was reported by an in-house consultant radiologist before surgery (minimum standard 85%).

Key Findings
• 66.9% of all non-COVID-19 patients had a CT scan which was reported by an in-house consultant radiologist before surgery (62.2% in Year 6)
• 67.5% of COVID-19 positive patients had a CT scan which was reported by an in-house consultant radiologist before surgery

(See table 6 in the Appendices)

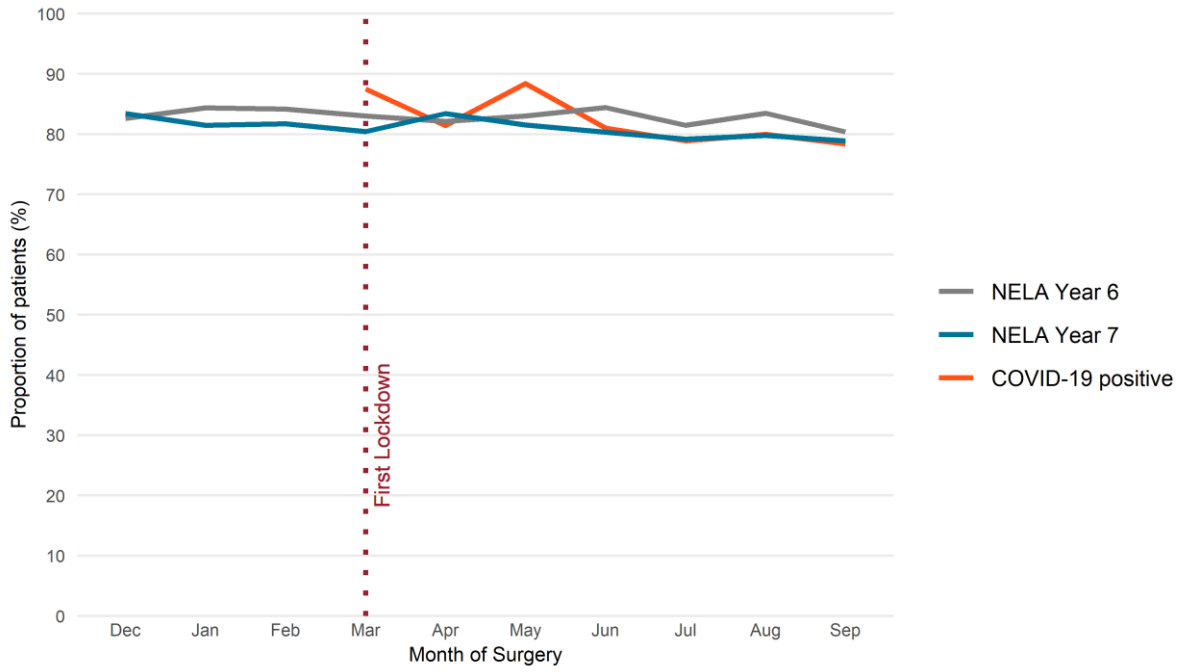
8.3 Timeliness to theatre

Key process measure
The proportion of patients arriving in theatre in a timescale appropriate for the urgency of surgery (minimum standard 85%).

Key Findings
• 80.2% of non-COVID-19 patients arrived in theatre within an appropriate timeframe given for the urgency of surgery (82.6% in Year 6)
• 81.9% of COVID-19 positive patients arrived in theatre within an appropriate timeframe given for the urgency of surgery

(See table 7 in the Appendices)

Figure 5. Changes over time in the percentage of patients arriving in theatre within an appropriate timeframe for their level of urgency



8.4 Consultant presence in theatre

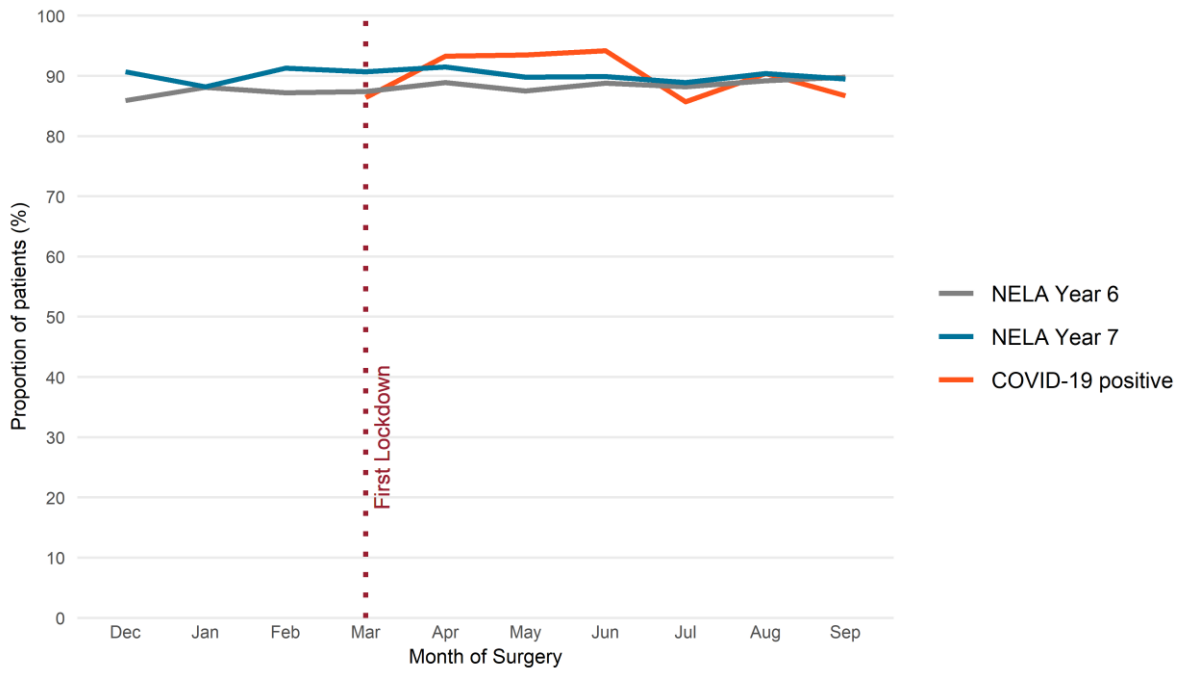
Key process measure
The proportion of patients who had both a consultant surgeon and anaesthetist present in theatre when the 30-day predicted risk of death ≥5%.

Key Findings
• 96.6% of high-risk patients had consultant surgeon present in theatre (94.6% in Year 6)

• 93% of high-risk patients had consultant anaesthetist present in theatre (92.5% in Year 6)
• 90% of high-risk patients had both a consultant anaesthetist and consultant surgeon present in theatre (88.5% in Year 6)

(See table 8 in the Appendices)

Figure 6. Changes over time in the percentage of high-risk patients who had both a consultant surgeon and anaesthetist present in theatre



8.5 Postoperative admission to critical care for all patients

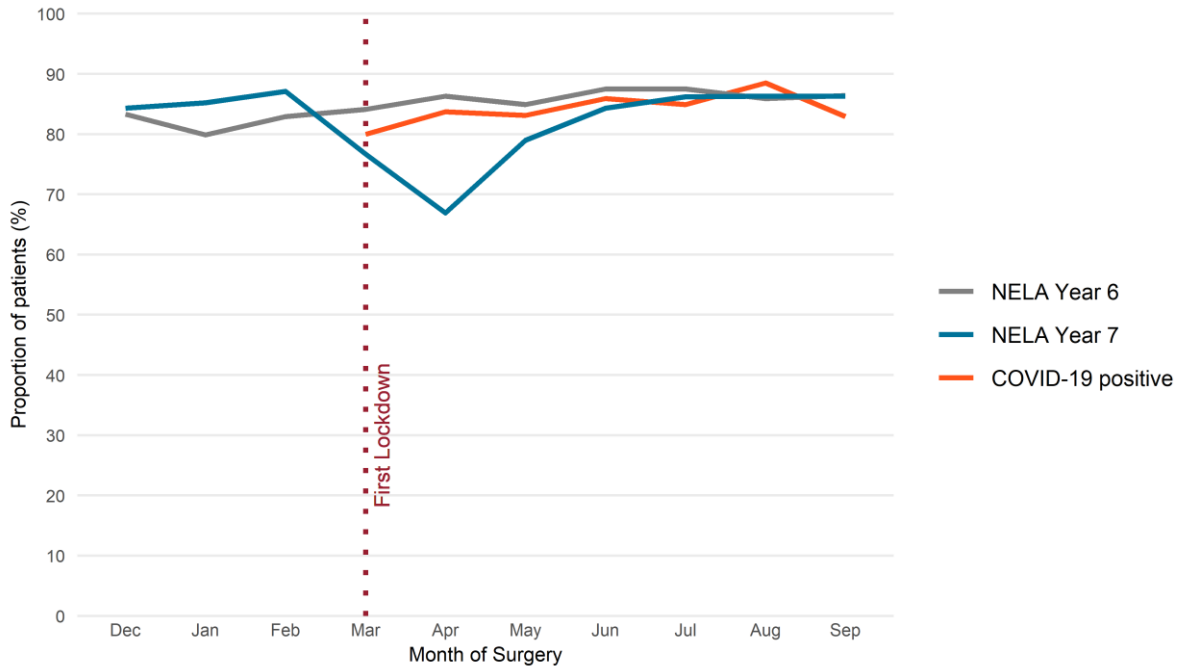
Key process measure
The proportion of patients who were admitted directly to critical care when risk of death ≥5%.

Key Findings
• 82% of all high-risk patients were admitted to critical care (86.4% in Year 6)
• 81.7% of high-risk non-COVID-19 patients were admitted to critical care
• 84.4% of high-risk COVID-19 positive patients were admitted to critical care

The rapid need to create surge capacity critical care beds to meet the demand of COVID-19 placed the system under unprecedented pressure. This pressure was not only on physical space, ventilators and equipment but also on the staff caring for patients. Despite the overall number of laparotomies performed, and the pause in elective surgery, patients with pathology other than COVID-19 continued to present and require critical care.

(See table 9 in the Appendices)

Figure 7. Changes over time in the percentage of high-risk patients who were admitted to critical care



9 Outcomes

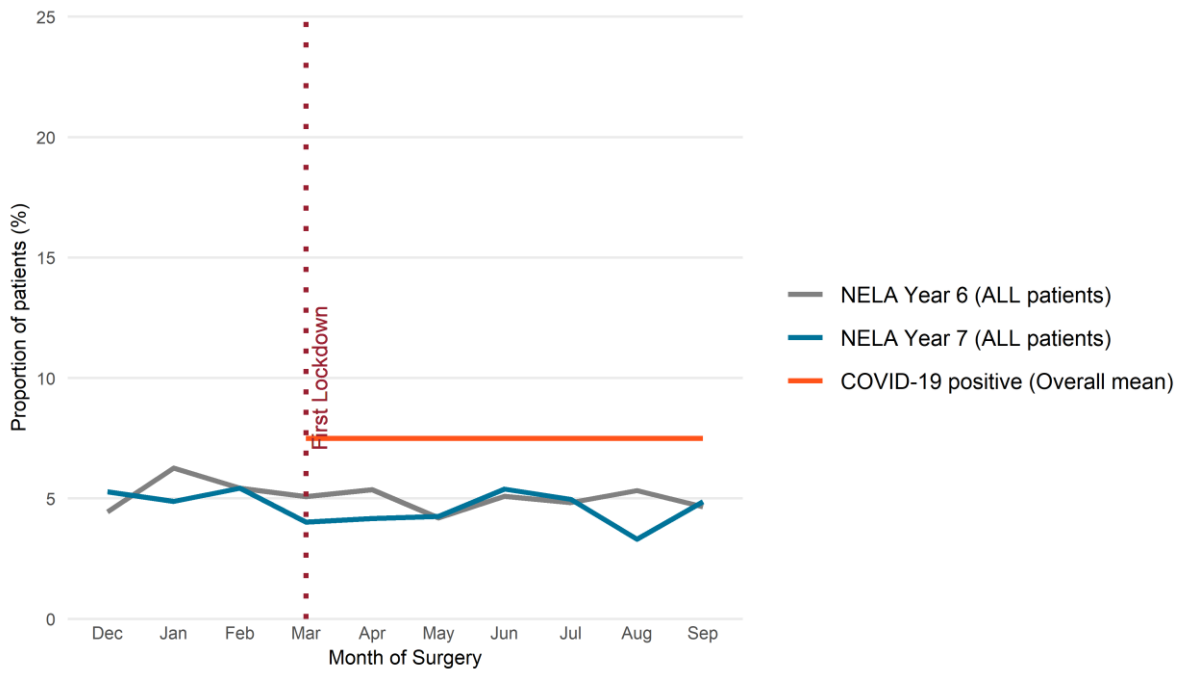
9.1 Unplanned returns to theatre

Key findings

- 4.2% of non-COVID-19 patients required unplanned return to theatre (4.9% in Year 6)
- 7.5% of COVID-19 positive patients required unplanned return to theatre

NELA does not capture data on the reason for unplanned returns to theatre for further surgery.

Figure 8. Changes over time in the proportion of patients with an unplanned return to theatre



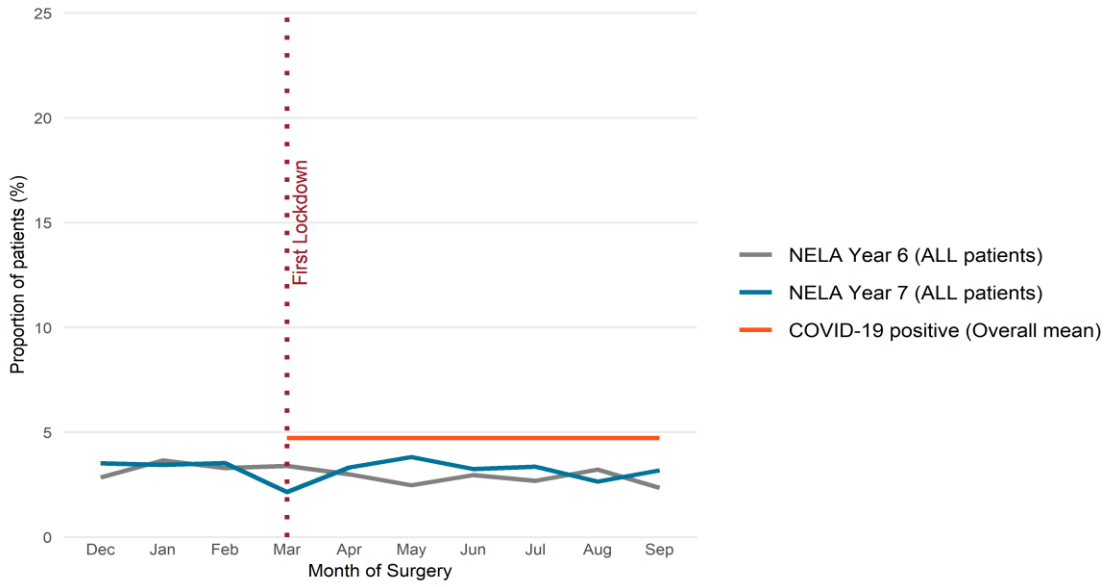
9.2 Unplanned admission to critical care

Key findings

• 3.1% of non-COVID-19 patients required unplanned admission to critical care (2.8% in Year 6)

• 4.7% of COVID-19 positive patients required unplanned admission to critical care

Figure 9. Changes over time in the proportion of patients with unplanned admission to critical care

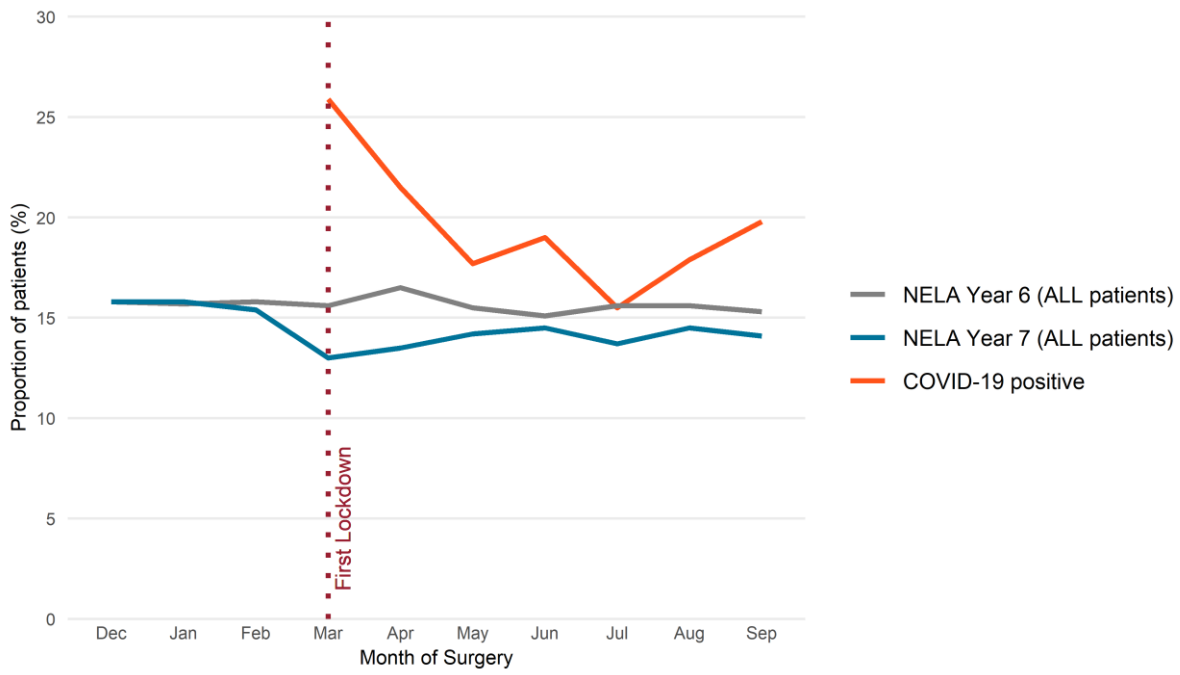


9.3 Postoperative length of stay

Key findings

- Overall the median length of stay was 9 days in non-COVID-19 patients (10 days in Year 6)
- The median length of stay was 12 days in COVID-19 positive patients

Figure 10. Changes over time in the mean length of stay of patients surviving to hospital discharge following emergency laparotomy



9.4 30-day unadjusted inpatient mortality

For COVID-19 positive patients who had emergency bowel surgery, the inpatient mortality within 30 days was 12.5%. For the same groups of patients, the average NELA calculated risk of death within 30 days was 9.9%. This means that 26% more patients in this group died than expected if they had not had COVID-19. This is consistent with other studies which show that postoperative outcomes are worse if a patient has COVID-19 [7, 10]. The NELA risk score does not account for COVID-19 status, but this data demonstrates that COVID-19 infection status should be considered by clinicians when planning care, and discussing treatment options with patients and their families.

In those patients who were COVID-19 negative, inpatient mortality within 30 days was 6.9%. For the same group of patients, the average NELA calculated risk of death within 30 days was 8.1%. This means that 15% fewer patients in this group died than we would have expected in an ordinary NELA year.

Table 13. NELA predicted mortality risk and actual 30-day mortality

COVID-19	Total patients (n)	30-day in-hospital mortality (n)	30-day in-hospital mortality (%)	Mean NELA Risk (%)	Standardised Mortality Ratio (SMR)	(Bootstrapped[2] 95 % CI for SMR)	
No	8515	589	6.9	8.1	0.852	(0.792,	0.912)
Yes	867	108	12.5	9.9	1.256	(1.058,	1.470)
Unknown	1164	106	9.1	7.8	1.165	(0.980,	1.349)
No/ unknown combined	9679	695	7.2	8.1	0.888	(0.830,	0.945)

Table 14. 30-day unadjusted mortality rates in all NELA patients compared to all patients 23 March 2020 - 30 September 2020 and COVID-19 positive patients

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	38 (8.8)	20 (8.7)	< 10 patients
Apr	182 (9)	91 (8)	31 (20.5)
May	191 (9)	103 (7.2)	19 (11.9)
Jun	169 (8.2)	113 (6.8)	10 (6.7)
Jul	208 (9.2)	123 (6.9)	17 (12.2)
Aug	200 (9.6)	123 (7.2)	< 10 patients
Sep	183 (9)	122 (7.1)	18 (13.3)

10 Conclusion

COVID-19 is here to stay and it is clear that there has been an impact on both elective and emergency surgery. This interim report provides a snapshot of emergency surgical activity in the early months of the pandemic where NELA data demonstrates an overall reduction in the number of patients who had emergency bowel surgery after the first national lockdown commenced.

It is reassuring that several standards of care (for instance, consultant presence and risk assessment) for patients in England and Wales needing emergency bowel surgery during the first six months of the COVID-19 pandemic appear to have been maintained at similar rates

[2] **Percentile bootstrap was used for confidence intervals, using 10,000 bootstrap samples (2,000 samples each from five imputed data sets with imputed missing values of risk indicators)**

as in the previous year. However, it is not surprising that rates of admission to critical care decreased, given the pressure that COVID-19 placed on critical care occupancy.

The influence on mortality will need to be analysed further. The apparent 25% higher mortality rates for COVID-19 positive patients, and the lower mortality rates for COVID-19 negative patients undergoing emergency bowel surgery may be multifactorial. It may represent the trajectory of improving mortality rates reported by NELA over the last few years. It may also reflect that decision making by clinical teams changed such that the very high-risk patients were offered alternative management pathways rather than surgery. Understanding this further is beyond the scope of this report.

The vast NELA database will need further interrogation to answer many of the questions raised by this report. But it is clear that clinical staff have worked to, where possible, maintain standards of care for this high-risk group of patients needing emergency surgery.

Thank you to all the teams around the country who have continued to take as best possible care of patients needing emergency bowel surgery over the last year.

11 References

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12 Appendices

12.1 COVID-19 changes to the NELA dataset

Shortly after the first national UK lockdown began in March 2020, the NELA team sought to add additional questions to the NELA case report form. These additions were reviewed and approved by the Health Research Authority Confidentiality Advisory Group in June 2020. NELA is grateful to the teams who completed these retrospectively, and acknowledges the commitment that this took. The additional questions were the following:

7.10 Please indicate the patient's SARS-CoV-2/COVID-19 infection status:

- *Infected at time of surgery based on a recent positive RT-PCR antigen (swab) test*
- *Considered as infected at time of surgery on clinical grounds despite negative (ie false negative) or indeterminate antigen test*
- *Positive antigen test or clinical diagnosis of COVID-19 during admission but unable to determine whether pre/post-op from the medical record*
- *Not infected at time of surgery based on clinical presentation AND negative swab but had a new positive antigen test or clinical diagnosis of COVID-19 post-operatively*
- *Considered to be not infected throughout inpatient stay*
- *Antigen test not done*
- *Unable to answer*

7.11 Regardless of actual COVID status, was the patient managed as infected with COVID whilst in the theatre suite for their initial emergency laparotomy (this does not mean, was enhanced PPE used only for the AGPs)

- *Yes*
- *No*
- *Unable to answer*

7.12 Please indicate the patient's SARS-CoV-2 antibody status

- *Positive*
- *Negative*
- *Not tested*
- *Unable to answer*

12.2 Table 5. Number of patients with preoperative documented risk

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	366 (84.9)	200 (87)	24 (80)
Apr	1688 (83.8)	967 (85.5)	133 (88.1)
May	1807 (84.9)	1188 (83)	143 (89.9)
Jun	1737 (84.3)	1415 (84.7)	134 (89.9)
Jul	1965 (86.5)	1533 (85.4)	125 (89.9)
Aug	1747 (84)	1453 (85.1)	89 (85.6)
Sep	1715 (84.2)	1480 (86.3)	111 (82.2)
Overall	**11025 (84.7)**	**8236 (85.1)**	**759 (87.5)**

12.3 Table 6. Proportion of patients receiving a CT scan preoperatively and CT scans being reported by a consultant radiologist preoperatively

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	272 (63.1)	150 (65.2)	17 (56.7)
Apr	1221 (60.6)	782 (69.1)	102 (67.5)
May	1322 (62.1)	964 (67.4)	117 (73.6)
Jun	1264 (61.4)	1134 (67.9)	110 (73.8)
Jul	1442 (63.5)	1168 (65.1)	93 (66.9)
Aug	1337 (64.3)	1157 (67.8)	64 (61.5)
Sep	1238 (60.7)	1120 (65.3)	82 (60.7)
Overall	**8096 (62.2)**	**6475 (66.9)**	**585 (67.5)**

12.4 Table 7. Proportion of patients arriving in theatre within an appropriate timeframe for their level of urgency

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	295 (85.5)	127 (80.4)	21 (87.5)
Apr	1256 (82.4)	656 (83.9)	92 (81.4)
May	1321 (83.2)	807 (80.8)	99 (88.4)
Jun	1254 (84.4)	932 (80.3)	77 (81.1)

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Jul	1332 (81.5)	1040 (79.2)	71 (78.9)
Aug	1276 (83.5)	1004 (79.8)	60 (80)
Sep	1206 (80.4)	1001 (78.9)	69 (78.4)
Overall	**7940 (82.6)**	**5567 (80.2)**	**489 (81.9)**

12.5 Table 8. Proportion of high-risk patients who had both a consultant surgeon and anaesthetist present in theatre

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	181 (84.2)	85 (93.4)	19 (86.4)
Apr	893 (88.7)	500 (91.1)	84 (93.3)
May	875 (87.5)	604 (89.2)	87 (93.5)
Jun	838 (88.8)	684 (89.4)	81 (94.2)
Jul	981 (88.3)	766 (89.2)	66 (85.7)
Aug	901 (89.2)	707 (90.5)	47 (90.4)
Sep	884 (89.7)	725 (89.7)	65 (86.7)
Overall	**5553 (88.5)**	**4071 (89.9)**	**449 (90.7)**

12.6 Table 9. Proportion of high-risk patients admitted directly to critical care postoperatively

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	185 (84.5)	50 (58.8)	16 (80)
Apr	869 (86.4)	335 (64.1)	77 (83.7)
May	859 (85)	540 (78.6)	74 (83.1)
Jun	831 (87.5)	653 (84.1)	73 (85.9)
Jul	977 (87.5)	740 (86.3)	62 (84.9)
Aug	841 (85.9)	676 (86.1)	46 (88.5)
Sep	841 (86.3)	703 (86.6)	58 (82.9)
Overall	**5403 (86.4)**	**3697 (81.7)**	**406 (84.4)**

12.7 Table 10. Numbers and percentages of patients with an unplanned return to theatre according to COVID-19 status

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	27 (6.3)	< 10 patients	< 10 patients
Apr	106 (5.3)	42 (3.7)	< 10 patients
May	88 (4.1)	60 (4.2)	< 10 patients
Jun	105 (5.1)	82 (4.9)	16 (10.7)
Jul	110 (4.8)	86 (4.8)	< 10 patients
Aug	111 (5.3)	55 (3.2)	< 10 patients
Sep	95 (4.7)	71 (4.1)	19 (14.1)
Overall	**642 (4.9)**	**402 (4.2)**	**65 (7.5)**

12.8 Table 11. Proportion of patients with unplanned admission to critical care

Month of Surgery	NELA Year 6 (Mar to Sept 2019) n (%)	NELA Year 7 (Mar to Sept 2020) - non-COVID-19 n (%)	NELA Year 7 (Mar to Sept 2020) COVID-19 positive n (%)
Mar	11 (2.6)	< 10 patients	< 10 patients
Apr	59 (2.9)	35 (3.1)	< 10 patients
May	53 (2.5)	55 (3.8)	< 10 patients
Jun	61 (3)	51 (3.1)	< 10 patients
Jul	61 (2.7)	59 (3.3)	< 10 patients
Aug	67 (3.2)	46 (2.7)	< 10 patients
Sep	48 (2.4)	50 (2.9)	< 10 patients
Overall	**360 (2.8)**	**297 (3.1)**	**41 (4.7)**

12.9 Table 12. Postoperative length of stay by month

Month of Surgery	NELA Year 6 (Mar to Sept 2019) Median length of stay [IQR] (days)	NELA Year 7 (Mar to Sept 2020) - (non-COVID-19) Median length of stay [IQR] (days)	COVID-19 positive Median length of stay [IQR] (days)
Mar	9 [6-17]	6 [4-11]	15 [8-27]
Apr	11 [7-20]	8 [5-15]	14 [8-23]
May	10 [6-18]	9 [6-15]	13 [7-25]
Jun	10 [6-18]	9 [6-16]	12 [7-20]

Month of Surgery	NELA Year 6 (Mar to Sept 2019) Median length of stay [IQR] (days)	NELA Year 7 (Mar to Sept 2020) - (non-COVID-19) Median length of stay [IQR] (days)	COVID-19 positive Median length of stay [IQR] (days)
Jul	10 [7-18]	10 [6-16]	10 [7-17.75]
Aug	11 [7-19]	10 [6-17]	10 [6-17.75]
Sep	11 [7-19]	10 [6-17]	12 [7-26.5]