

The Anaesthesia and Critical Care COVID-19 Activity Tracking (ACCC-Track) survey



Emira Kursumovic



Tim Cook



Andrew Kane



Richard Armstrong



Jasmeet Soar

Key findings

- Between October 2020 and January 2021, we conducted three national surveys to track anaesthetic, surgical and critical care activity during the second COVID-19 pandemic wave in the UK (rounds 1, 2 and 3).
- We surveyed all NHS hospitals where surgery is undertaken. Response rates, by round, were 64%, 56% and 51%.
- Despite important regional variations, the surveys showed increasing systemic pressure on anaesthetic and perioperative services due to the need to support critical care pandemic demands.
- During rounds 1 and 2, approximately one in eight anaesthetic staff were not available for anaesthetic work. Approximately one in five operating theatres was closed and activity fell in those that were open. Some mitigation was achieved by relocation of surgical activity to other locations. Approximately one quarter of all surgical activity was lost, with paediatric and non-cancer surgery most impacted.
- During January 2021, the system was largely overwhelmed. Almost one third of anaesthesia staff were unavailable, 42% of theatres were closed, national surgical activity reduced to less than half, including reduced cancer and emergency surgery. Redeployed anaesthesia staff increased critical care workforce by 125%.
- Three-quarters of critical care units were so expanded that planned surgery could not be safely resumed. At all times, the greatest resource limitation was staff. Owing to lower response rates from the most pressed regions and hospitals, these results may underestimate the true impact.
- These findings have important implications for understanding what has happened during the COVID-19 pandemic, for planning recovery and building a system that will better respond to future waves or new epidemics.
- Between June 2021 and October 2022, we conducted two further surveys (rounds 4 and 5) with a limited response rate, so data were not analysed from these rounds.

What we already know

During the COVID-19 pandemic there was considerable focus on the escalation of critical care capacity, capability and delivery. In many UK hospitals, critical care and anaesthesia departments work together and share staff. The expansion of critical care capability inevitably led to redeployment of staff, space, equipment and drugs intended for anaesthesia and perioperative care (ICS 2021, ICNARC 2021a). In the first wave of the pandemic, most planned surgery was stopped for several months but after this, there were specific efforts made to restore surgical activity and to maintain activity, even in the face of subsequent waves of pandemic activity (Stevens 2002, FICM 2020a). The extent of disruption of anaesthetic and perioperative activity in the second wave has not been clearly documented. When NAP7 was postponed due to the emerging COVID-19 pandemic in March 2020, as part of assessing when anaesthetic and perioperative services might have returned to a stable baseline and thus be ready for starting NAP7, we undertook a series of national surveys to track activity during the second wave of the pandemic.

Methods

The Anaesthesia and Critical Care COVID-19 Activity Tracking (ACCC-Track) survey did not meet the definition of research as per the UK Policy Framework for Health and Social Care Research (HRA 2017), was deemed a service evaluation and thus did not require research ethics committee approval. The conduct of ACCC-Track was approved by the RCoA Clinical Quality and Research Board. The project used the network of around 330 local coordinators established in all NHS hospitals and many independent sector hospitals in the UK ([Chapter 6 Methods](#)). After the postponement of NAP7, as part of planning for restarting, we initially devised the ACCC-Track survey to determine the degree of disruption of perioperative services and readiness to start NAP7. A questionnaire was submitted to all Local Coordinators in July 2020, results of which showed that a majority (75%) supported the concept of the ACCC-Track survey. An electronic survey tool (SurveyMonkey®, Momentive,

Niskayuna, NY, USA) was used to conduct three successive ACCC-Track surveys. The survey tracked changes of systemic stress in surgical and critical care during different stages of the COVID-19 pandemic. Rounds 2 and 3 differed from round 1 (Appendix 8.1) by removal of questions that did not need repetition and addition of new questions as indicated. Drafts of the survey were reviewed and tested before distribution, by clinicians involved with NAP7 and the RCoA quality improvement committee.

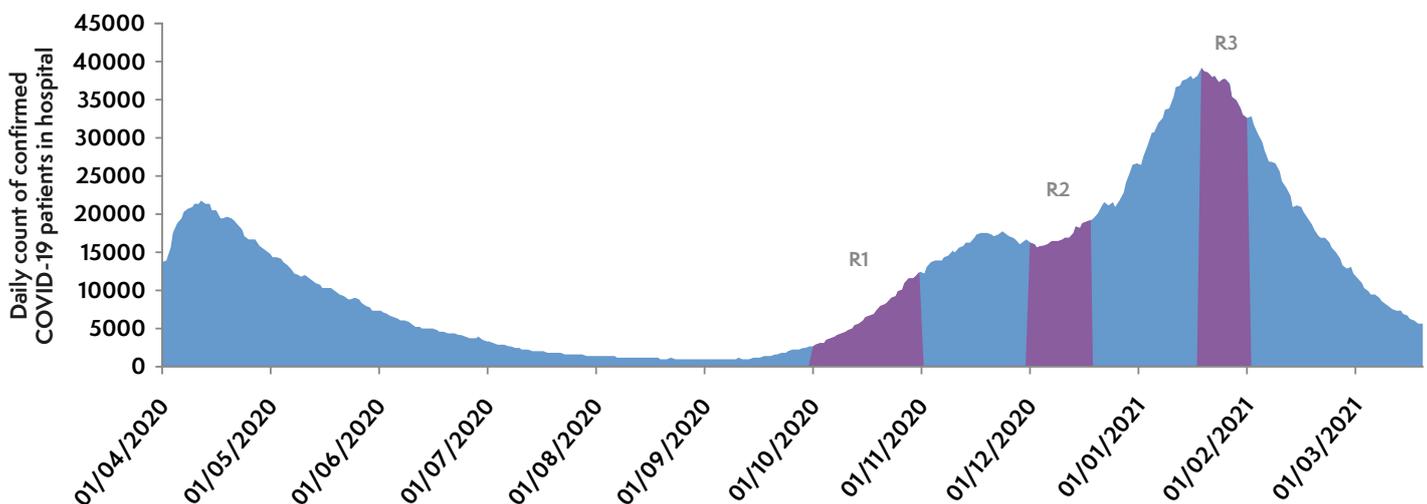
Rounds 1 and 2 of the survey were sent to all Local Coordinators. Responses were encouraged by email reminders at regular intervals to Local Coordinators and to anaesthetic department clinical leads once per round. Respondents were asked to provide information for the main hospital site they represented, which was identified by region and name of hospital. Response rates from the independent sector were limited and, for round 3, only the 273 Local Coordinators representing 420 NHS hospitals were asked to respond (NAP7 2020). This analysis only included data from NHS hospitals.

Duplicate responses and those that did not record a hospital site and/or region were excluded. Since some Local Coordinators represented more than one hospital across multiple sites, the hospital response rate was calculated using the 420 NHS hospitals with anaesthesia provision as the denominator. This denominator was cross-referenced using NHS Digital (2020b) and NAP7 lists of hospital sites (National Audit Project 2020). Data collection periods were as follows: round 1 (R1) for the month of October 2020; round 2 (R2) for two weeks between 1 and 18 December 2020; round 3 (R3) for two weeks between 18 and 31 January 2021. Surveys could be submitted for four to five weeks after distribution. These three rounds corresponded to different stages of the second wave, as recorded on the UK government's COVID-19 data website (UK HSA 2021): round 1 from the start of the second wave and before the second lockdown in England; round 2 shortly after the end of this lockdown, during a period of slowly increasing hospital activity,

and round 3 during the third lockdown and shortly after the peak of the secondary surge caused by the SARS-CoV-2 Kent B117 variant (Frampton 2021). The relationship between the timing of the surveys and UK hospital admissions due to COVID-19 is shown in Figure 8.1. In each round, respondents were asked about anaesthesia/surgical activity, including the number of operating theatres open for activity at the hospital site and their productivity compared with the previous year, measures taken to increase theatre capacity at other locations (eg another NHS or independent sector hospital), reorganisation of care pathways and changes to staffing levels, including COVID-19 related staff sickness and redeployment (Appendix 8.1).

Organisational disruption of anaesthetic and critical care departments were assessed using the red-amber-green (RAG) rating criteria for 'space, staff, stuff (equipment) and systems' described in 'Restarting planned surgery in the context of the COVID-19 pandemic' (FICM 2020a), which was a joint publication of the four UK organisations supporting the ICM-Anaesthesia COVID-19 hub (<https://icmanaesthesiacovid-19.org>) (Appendix 8.1). Each 'red' rating describes a system 'not ready for a return', 'amber' a system 'close to being ready for a return' and 'green' a system 'ready for a return' to undertaking planned surgery (Appendix 8.2; FICM 2020a). Overall organisational disruption of perioperative services can be measured by combining red and amber responses. Round 1 examined the types of personal protective equipment and organisational processes used in operating theatres for patients designated as at low and high risk of SARS-CoV-2 infection. Rounds 2 and 3 assessed the degree of critical care expansion and disruption using the levels of the staged resurgence plan (SRP) described in the ICM-anaesthesia hub document 'Anaesthesia and critical care: guidance for Clinical Directors on preparations for a possible second surge in COVID-19', which in September 2020 advised departments across the UK how to respond to the second COVID-19 wave by increasing critical care capacity while also protecting planned surgery (FICM 2020b). Five stages of

Figure 8.1 Timing of the surveys and number of hospital admissions due to COVID-19 in the UK. The purple areas represent the timeline for R1 (October 2020), R2 (December 2020) and R3 (January 2021). Data adapted from UK HSA (2021). <https://coronavirus.data.gov.uk/details/healthcare>



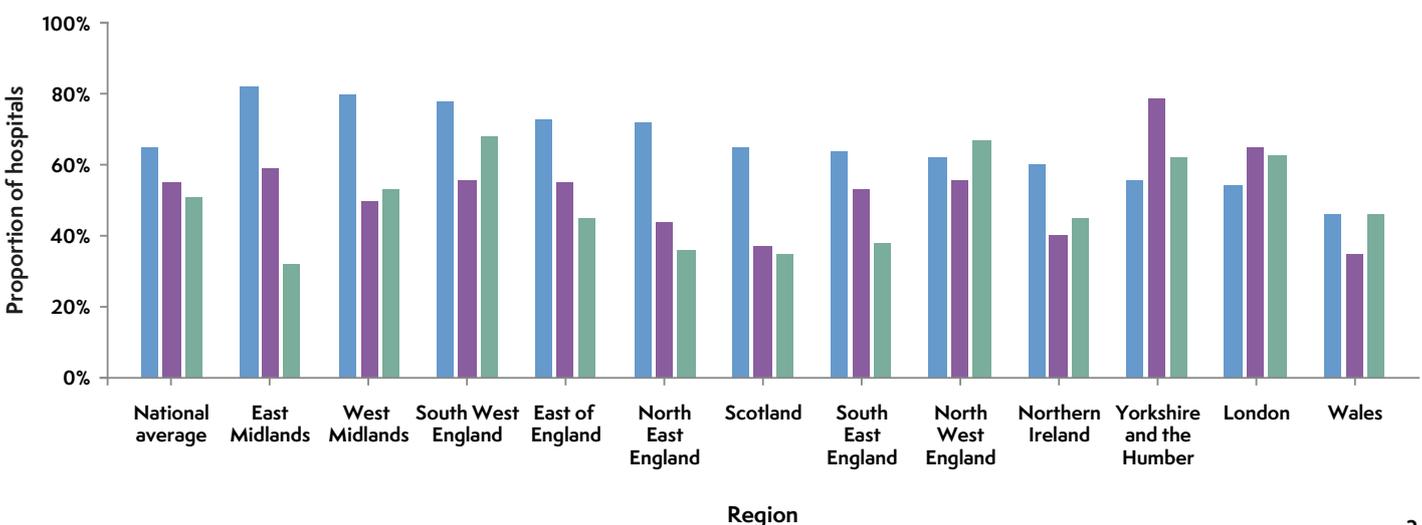
critical care capacity surge are described (Appendix 8.2): stage 1, an endemic level of COVID-19 activity; stage 2, increased demand but met within established capacity; stages 3–5, normal capacity (or capability) is exceeded and in stage 5, there is a need to transfer to external local or regional networks as part of mutual aid. Round 3 collected the number of critically ill COVID-19 patients transferred into and out of respondents' hospitals as part of mutual aid.

Data from SurveyMonkey were exported into, cleaned and analysed in Microsoft Excel® version 2021 (Microsoft, Inc., Redmond, WA, USA). Qualitative data were imported and analysed using NVivo version 2020 (QSR, International Pty Ltd., MA, USA), identifying common themes. Incomplete responses to individual questions were accepted with missing data noted as a non-response, except in questions that required comparative analysis (eg difference in the number of theatres open or difference in the number of cases performed compared with a previous time point), in which case the responses were excluded from analysis. When estimating changes in anaesthesia and ICU workforce and the number of lost operations per day, an adjustment was made for non-responders and survey response to provide an estimate of national impact. Data from August 2020 NHS Workforce Statistics (NHS Digital 2021) were used as the denominator for the number of current anaesthesia (13,119) and critical care (2404) staff in England and were scaled up to UK levels by multiplying by 1.187 (ONS 2020).

What we found

Responses were received from 176 (64%) NHS Local Coordinators in R1, 154 (56%) in R2 and 140 (51%) in R3. These Local Coordinators represented 65% of NHS hospitals in R1, 54% in R2 and 51% in R3. The response rate varied by region (Figure 8.2). In R1, this ranged from 80% from the East and West Midlands, to 46% from Wales, in R2 80% from Yorkshire and Humber region to 35% from Wales and in R3 from 68% from the South West to 32% from the East Midlands. Response rate fell most between R2 and R3, with half the regions having a less than 50% response rate in R3.

Figure 8.2 UK and regional variations in the proportion of NHS hospitals that responded to the ACCC-Track surveys for October 2020 (R1 ■), December 2020 (R2 ■) and January 2021 (R3 ■)



A summary of key results is presented here, with a more detailed analysis of theatre processes and personal protective equipment and detailed results by region presented in Appendix 8.2.

Staff and space were the resources most frequently affected (Figure 8.3). Nationally, between R1 and R3, green ratings for staff reduced from 58.3% to 16.5% and for space from 61.1% to 20.3%. Stuff (equipment) and systems were less impacted; green ratings for both fell to approximately 50% in R3. In R1 and R2, 54% and 68% of departments, respectively, had at least one red or amber domain and therefore self-declared as not ready for a return to planned surgery. In R3, this rose to 90%. In R3, no region reported being above 50% green for space or staff with most above 80% amber/red, of which most were red.

In R2, 45% reported ICU expansion beyond baseline capacity (SRP 3–5) and in 15% there was an imminent or actual need for mutual aid to transfer critically ill COVID-19 patients to other hospitals (SRP 4–5; Figure 8.4). In R3, 74% of ICUs were expanded above capacity with 39% likely or actually needing mutual aid. In R3, 133 respondents (accounting for approximately 40% of all UK hospitals, but a greater proportion of all critical care units) reported admission of approximately 900 patients transferred under mutual aid and transfer of 600 to another hospital under mutual aid.

In R2, by nation, ICU expansion above normal capacity was highest in England (49%) and lowest in Scotland (17%; Figure 8.4). The South West was the least impacted region in England with 33% of ICUs needing to expand, compared with 60% in North East England and the East Midlands (Figure 8.5). Potential or actual use of mutual aid transfers ranged from 0% in the North West and South West England to 36% of hospitals in the East of England. In R3, 75% of hospitals in England, Northern Ireland and Wales expanded their ICUs and 67% of hospitals in Scotland. Within English regions, expansion rates ranged from 45% (Yorkshire and Humber) to 100% (North East). The potential or actual need for mutual aid transfers ranged from 0% in North East England to 78% in West Midlands.

Figure 8.3 Proportion of respondents that reported red (not able to resume planned surgery), amber (nearly able to resume planned surgery) or green (able to resume planned surgery) for 'space, staff, stuff (equipment) and systems' categories for R1 (October 2020), R2 (December 2020), R3 (January 2021). 'Overall hospital status' indicates the proportion of respondents reporting at least one of staff, space, stuff or systems red, no red and at least one amber, all green, (FICM 2020a).

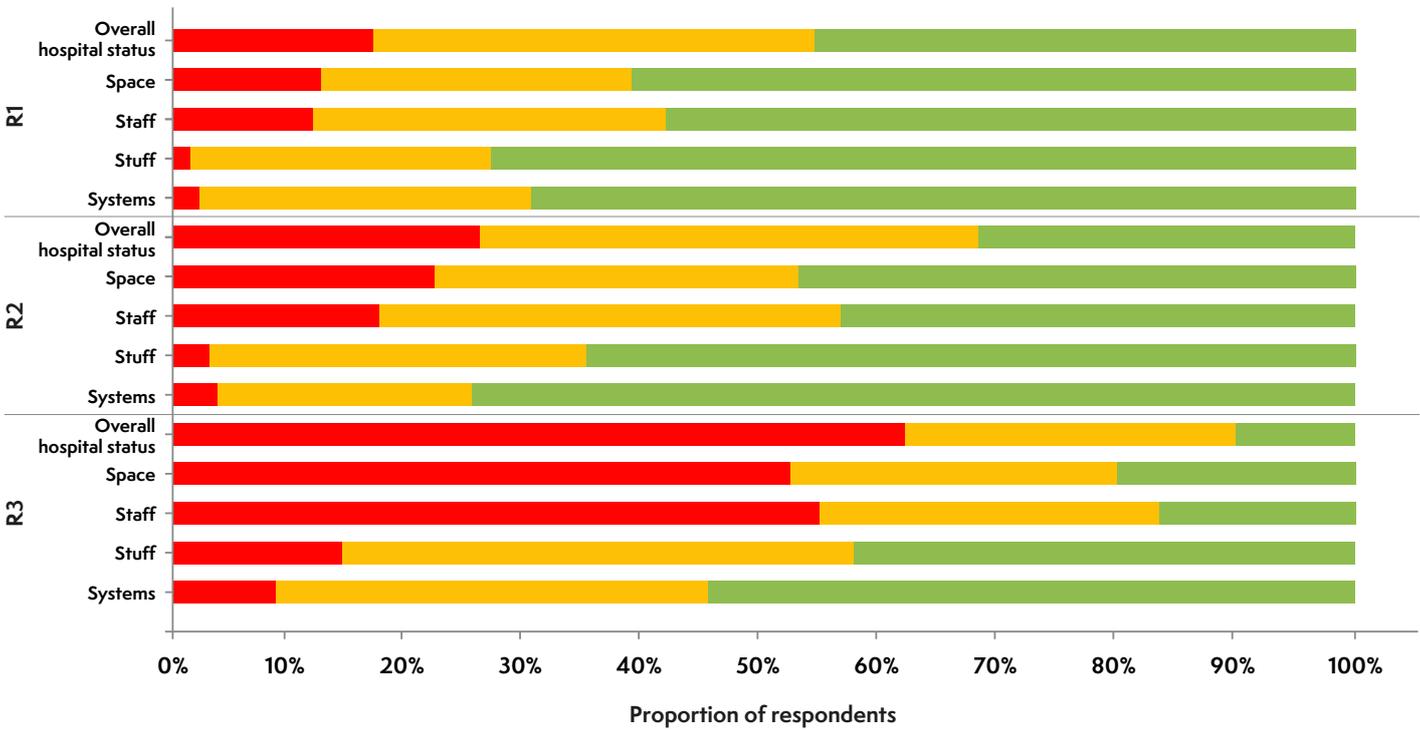


Figure 8.4 Proportion of respondents that reported the state of the responding hospitals' ICUs as per staged resurgence plan (SRP) stages for R2 (December 2020) and R3 (January 2021), across the UK and within the different nations. SRP1 represents an endemic level of COVID-19 activity; SRP2 increased demand but met within established capacity; SRP3 demand exceeds the established capacity and requires expansion; SRP4 high likelihood of occupying maximum expanded capacity; SRP5 there is a need to transfer to external local or regional networks as part of mutual aid (FICM 2020b).

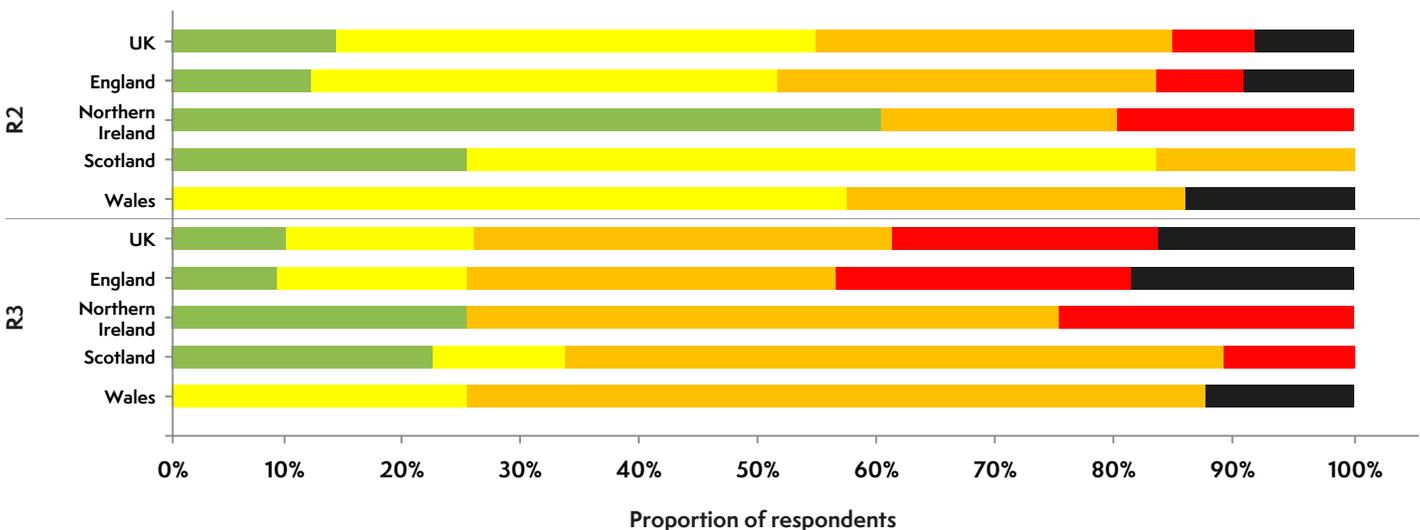


Figure 8.5 Regional variations in the proportion of respondents that reported the state of the responding hospitals' ICUs as per staged resurgence plan (SRP) stages for R2 (December 2020) and R3 (January 2021), across the UK and within the different nations. SRP1 ■ represents an endemic level of COVID-19 activity; SRP2 ■ increased demand but met within established capacity; SRP3 ■ demand exceeds the established capacity and requires expansion; SRP4 ■ high likelihood of occupying maximum expanded capacity; SRP5 ■ there is a need to transfer to external local or regional networks as part of mutual aid (FICM 2020b).

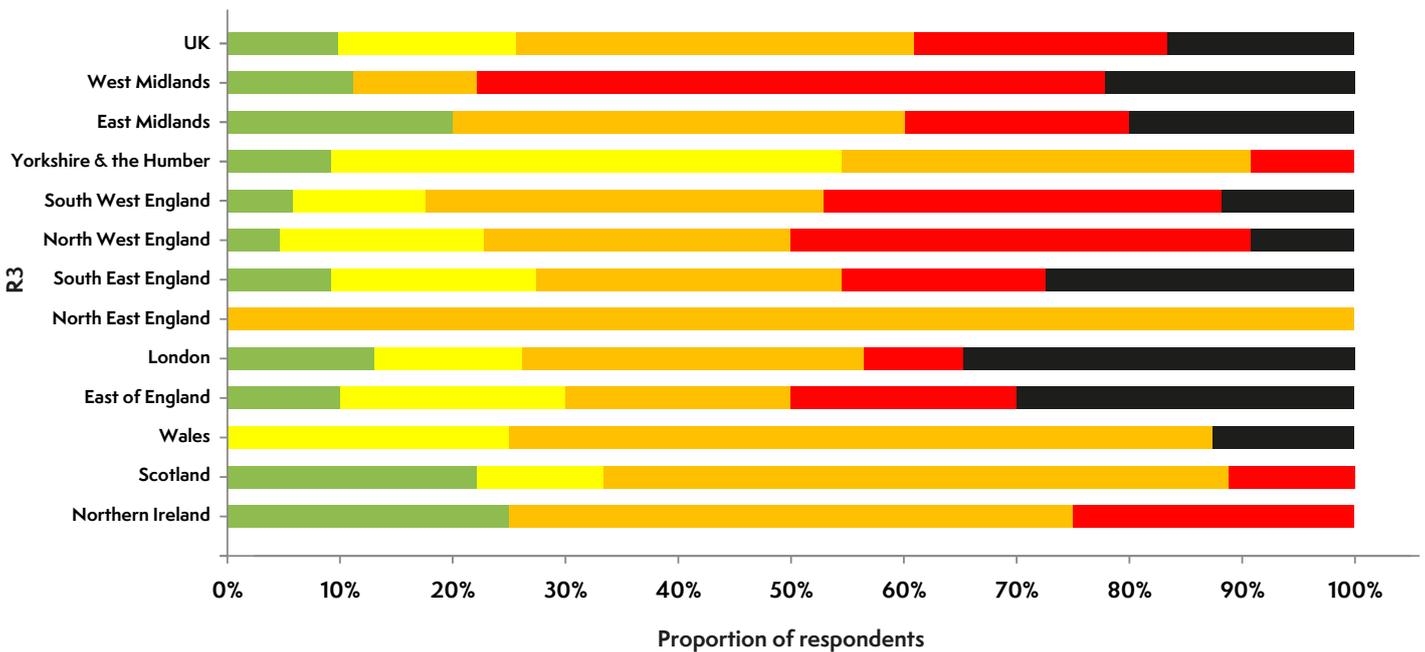
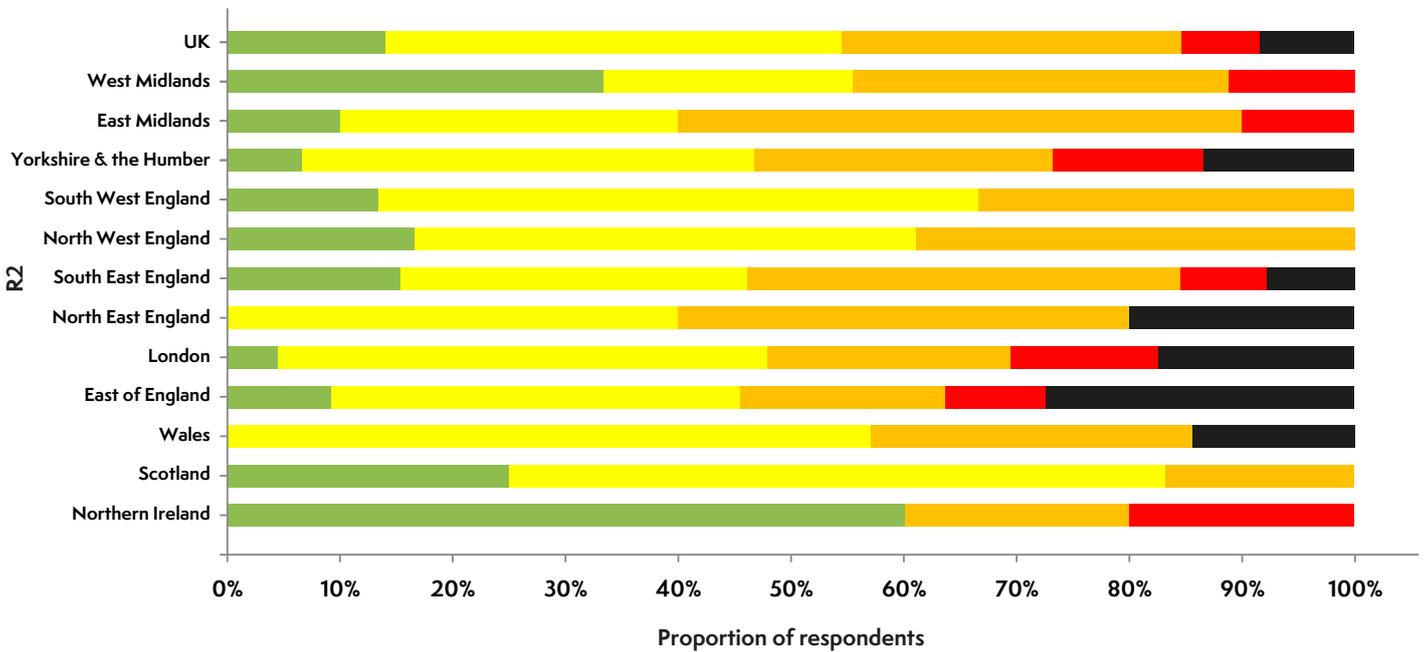


Figure 8.6 shows the impact of COVID-19 on absences within the anaesthetic workforce. A progressive loss of the anaesthesia workforce was seen through the survey rounds, largely due to redeployment to critical care, resulting in a simultaneous increase in the critical care workforce. Loss of anaesthetic staff due to redeployment to non-patient-facing roles, shielding, self-isolation, quarantine and sickness as a result of COVID-19 did not change substantially between R1 and R3. The overall impact on national anaesthesia staffing was: 12% loss in October 2020, 15% loss in December 2020 and 29% loss in January 2021. The redeployment to critical care increased the critical care workforce by approximately 38% in October 2020, rising to an approximately 125% increase in January 2021.

A progressive decrease in anaesthesia and surgical activity was reported across the UK, with the highest impact in R3. Among all respondents, the average proportion of theatres closed increased from 15% in R1 to 42% in R3 (Figure 8.7). Regionally, the steepest rises in theatre closures were in London and the East and South East of England regions, which all had among the lowest rates of closure until R3. In R3, five regions (42%) had more than 50% of their normal theatre capacity closed, eight (67%) more than 40%, and ten (83%) more than 30%.

Figure 8.6 Impact on anaesthesia and critical care staffing levels. Total number of anaesthetists and/or intensivists off work or redeployed to ICU activities as a result of COVID-19, in R1 (October 2020), R2 (December 2020) and R3 (January 2021) from responding hospital sites.

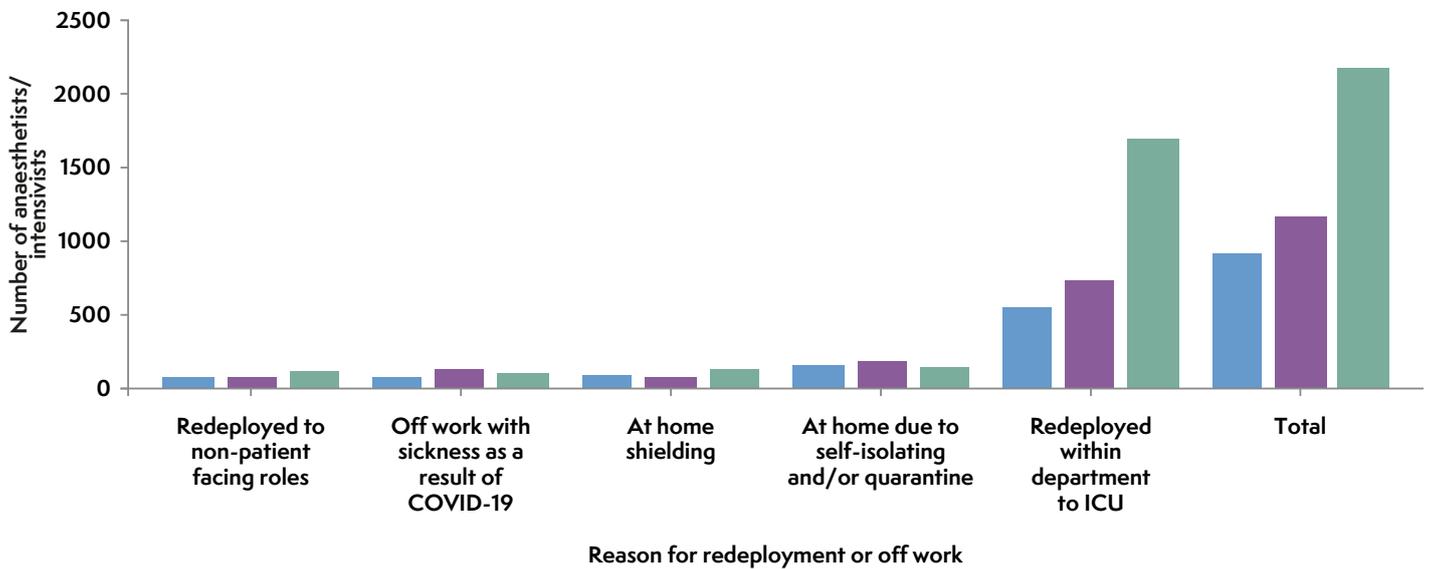
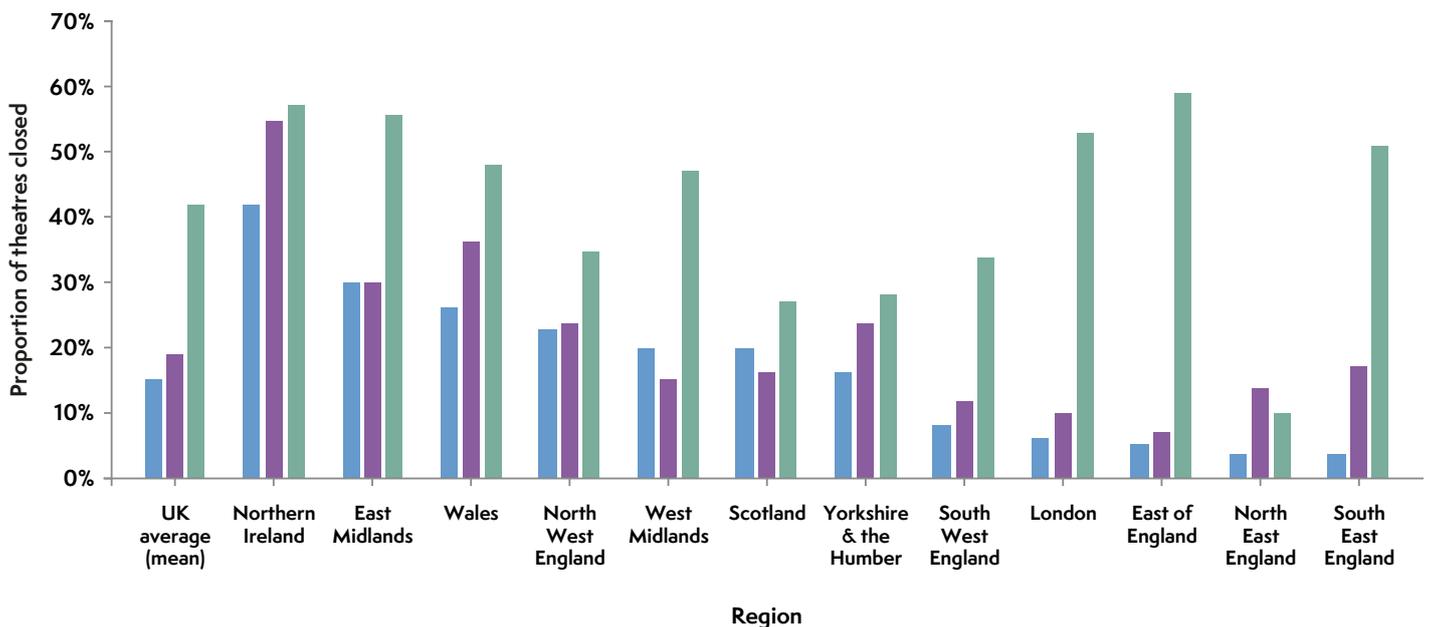


Figure 8.7 UK and regional variations of the average (mean) proportion of operating theatres closed compared with the same period the previous year, at R1 (October 2020), R2 (December 2020) and R3 (January 2021)



The overall use of external sites to maintain surgical activity decreased from R1 (10%) to R3 (8%) (Figure 8.8). While some regions were able to maintain external surgical capacity between R1 and R3 (London and South East England both maintained >10%), this reduced in many (eg North West England 10% to 8% and Yorkshire and the Humber 12% to 7%) and increased in only one (East of England 14% to 15%). In R1, in five regions (East of England, London, South East, South West and North

East) external theatre expansion exceeded theatre closures. This reduced to two regions (East of England and London) in R2 and in R3 theatre closures exceeded external expansion in all regions.

In those theatres that were open, theatre activity declined in all rounds compared with the corresponding previous year (Figure 8.9). Between R1 and R3, near-normal productivity (75–100%) fell from 48% to 32% and operating at less than 50% productivity increased from 10% to 27%.

Figure 8.8 UK and regional variations in the capacity to expand theatre activity to external locations. Expansion is provided as the proportion of theatres that are open at external locations compared to the total number of theatres that were open the previous year, at R1 (October 2020), R2 (December 2020) and R3 (January 2021).

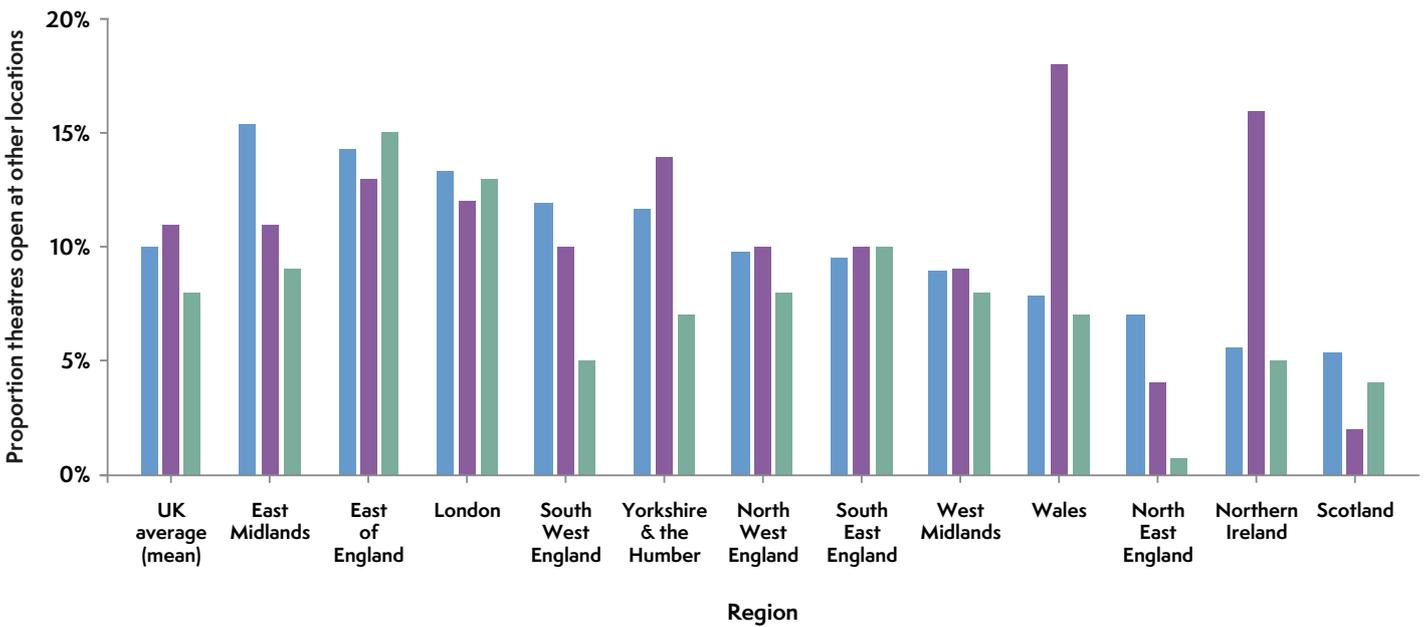
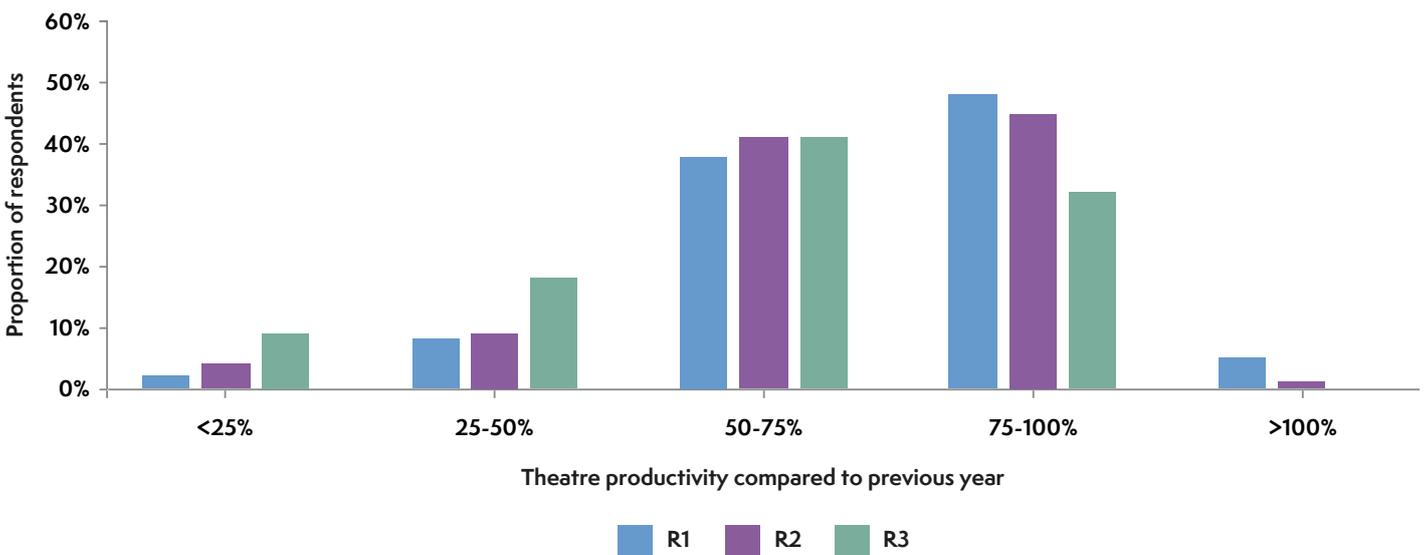


Figure 8.9 Proportion of respondents reporting theatre productivity in theatres that were open/working, compared with the same period the previous year, at R1 (October 2020), R2 (December 2020) and R3 (January 2021)



Surgical activity, compared with 12 months previously, reduced in all rounds of the survey, but most markedly in R3 (Figure 8.10). At all times, the greatest impacts were, in descending order, paediatric, non-cancer elective, cancer and emergency surgery. In R3, paediatric and non-cancer elective surgery activity were

at less than one third of the previous year's activity and cancer surgery was reduced by more than one third. Regional variation in impact was noted, particularly among paediatric and non-cancer surgical activity (Figures 8.11-14).

Figure 8.10 Average UK percentage of surgical activity at R1 (October 2020), R2 (December 2020) and R3 (January 2021) compared with the corresponding previous year's activity

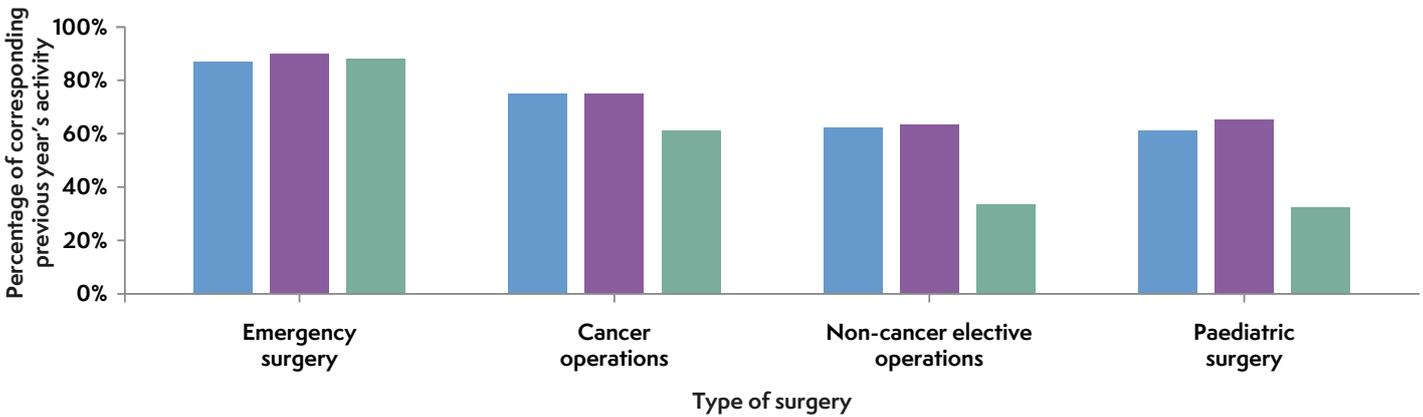


Figure 8.11 UK and regional variations in the average percentage of paediatric surgery activity at R1 (October 2020), R2 (December 2020) and R3 (January 2021) compared with the corresponding previous year's activity

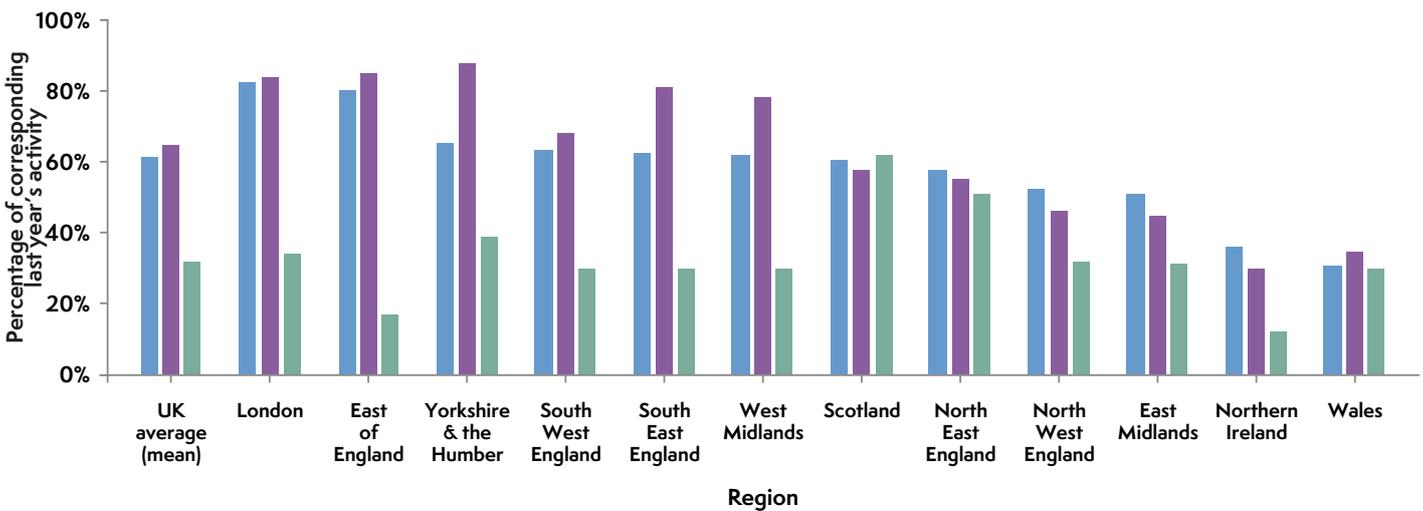


Figure 8.12 UK and regional variations in the average percentage of non-cancer elective surgery activity at R1 (October 2020), R2 (December 2020) and R3 (January 2021) compared with the corresponding previous year's activity

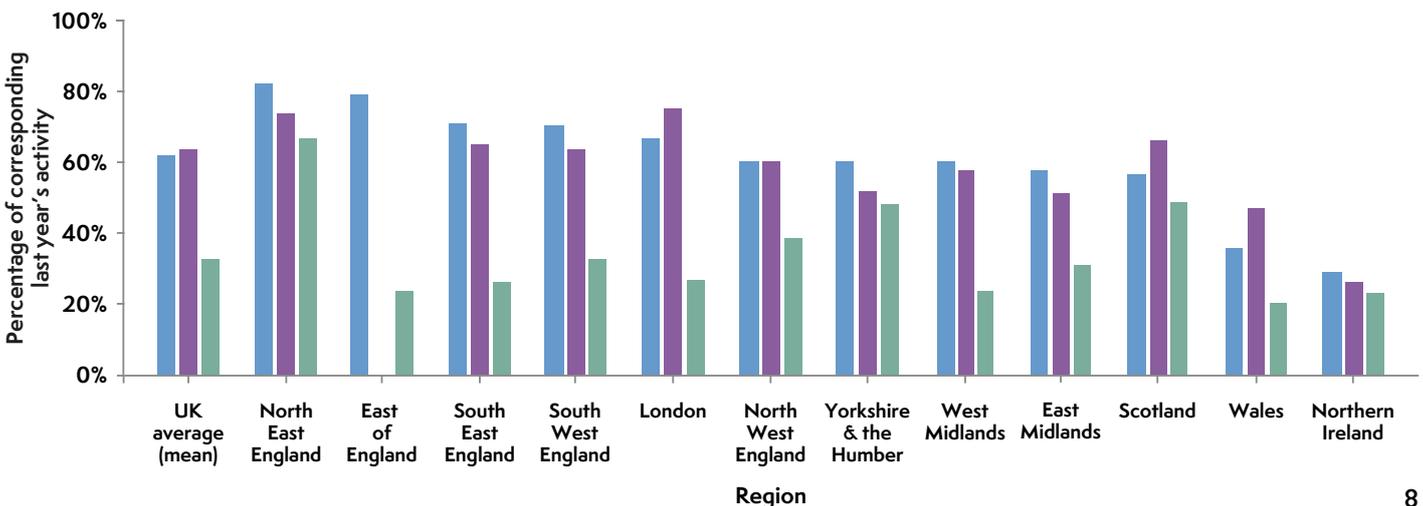


Figure 8.13 UK and regional variations in the average percentage of cancer surgery activity at R1 (October 2020), R2 (December 2020) and R3 (January 2021) compared with the corresponding previous year's activity

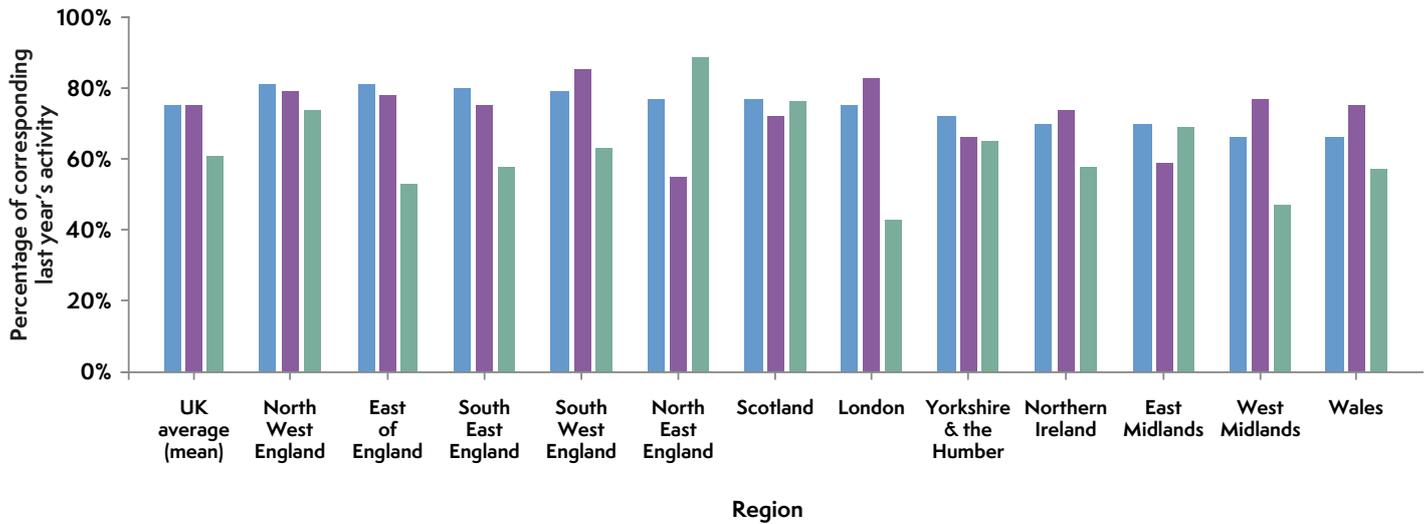
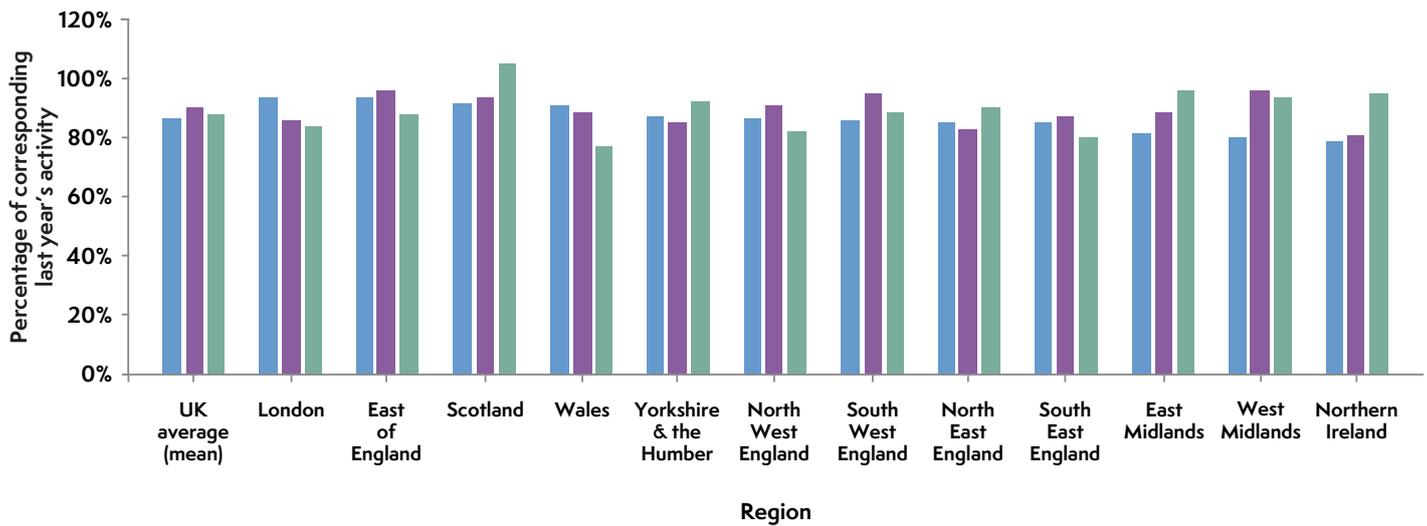


Figure 8.14 UK and regional variations in the average percentage of emergency surgery activity at R1 (October 2020), R2 (December 2020) and R3 (January 2021) compared with the corresponding previous year's activity



Measured over a 24 h period, in R1 and R2 overall surgical activity was reduced by a little over one quarter compared with 12 months previously (Figure 8.15). This equates to approximately 5000 operations not performed each day in the NHS. In R3, surgical activity was reduced by 54% compared with 12 months previously; this is equivalent to 9770 operations lost per day across the UK and more than 2 million per year.

Figure 8.15 Proportion of operations (%) completed over a 24-h period, from responding hospital, sites compared with the previous year, at R1 (October 2020), R2 (December 2020) and R3 (January 2021). Blue ■ denotes the proportion of active surgical cases completed and purple ■ the proportion of lost surgical cases that were completed on the same date the previous year.



Qualitative open responses for factors facilitating the delivery of perioperative care included staff flexibility (eg new rotas, extra shift work), use of virtual communication and presence of separate low-risk COVID-19 areas ([Appendix 8.1](#)). Barriers included staffing issues, critical care bed and theatre availability. Although themes were similar during R1 and R3 ([Appendix 8.1](#)) in R1, issues surrounding personal protective equipment supply and testing facilities were reported, whereas cessation of elective work only featured in R3, in which there was also an increase in number of respondents reporting lack of staff and space compared with R1.

Discussion

The three rounds of this service evaluation have provided a clear picture of increasing systemic stress and disruption of anaesthetic and peri-operative services throughout the UK, as a consequence of the second wave of the COVID-19 pandemic and the need to support increased critical care demand. During rounds 1 and 2, anaesthetic staff and perioperative services were significantly impacted by the pandemic. Staff and space constraints had the greatest impact. Surgical activity was reduced by both significant closure of operating theatres and reduced activity within those that were open. Some mitigation of this was achieved by relocation of surgical activity to external sites, but in most locations this did not fully match the reduction in surgical activity and, overall, more than one quarter of all surgical activity was lost. Paediatric and non-cancer surgery were most impacted, with less impact on cancer surgery and emergencies. Round 1 of the survey was undertaken when UK COVID-19 hospital activity was increasing and shortly before much of the UK entered lockdown in November 2020. Round 2 took place after that lockdown was lifted and as UK COVID-19 hospital activity continued to slowly increase. Overall, measures of system stress increased by a small amount between October and December 2020, including redeployment of staff from anaesthesia to critical care and, by December, approximately half of critical care units were expanded to the extent that planned surgery could not be safely undertaken.

Round 3 took place shortly after the peak of the second surge and showed that the system was close to breaking point. The number of open operating theatres fell further, as did efficiency in those that were open. Hospitals were less able to relocate activity to other locations, although whether this was due to staff shortage or other factors, such as contractual arrangements, is not clear. Almost one in three anaesthetic staff was unavailable for anaesthetic activity as redeployments more than doubled the critical care workforce. All but one quarter of critical care units were expanded to the extent that planned surgery could not be safely undertaken. As a result, surgical activity fell precipitously, with all types of surgery affected. In hard-pressed regions, paediatric and non-cancer surgery fell to 12–20% of normal activity and even cancer surgery fell to below half normal activity.

In rounds 1 and 2, reduced perioperative capability led to a decrease in surgical activity of a little over one quarter compared with previous years. In Round 3, surgical activity decreased to below half of normal. With estimates of NHS surgical activity, in which anaesthetists are involved, being approximately 4 million episodes per year (Sury 2014), these figures represent an annual loss of surgical activity of approximately 1–2 million cases per year. In the spring of 2020, almost all planned surgical activity ceased and, despite explicit efforts to resume and maintain this from July 2020 onwards, it is clear that this has been hampered. Other sources make similar estimates of surgical workload lost – with numbers of patients added to waiting lists being estimated as approximately 1.5–2 million (Dobbs 2021) and 2 million (BMA 2021). When this accumulated surgical activity is added to pre-existing waiting lists, cumulative waiting lists now are estimated to be between 4.5 (Dobbs 2021) and 7.5 million (BMA 2021).

Optimistically, control of COVID-19 in the UK will be achieved by a combination of prolonged lockdown and extensive vaccination (Cook 2021). Resumption of surgical activity and perioperative services will need to go hand in hand with decompression and step-down of expanded critical care provision (ICM 2021, FICM 2020a). Our data illustrate very clearly that anaesthetists (and in all probability other healthcare providers working in operating theatres) have been central in the critical care response to the pandemic, and that they will have been similarly impacted. It is acknowledged that as a consequence of increased amount and intensity of workload, decreased leave, psychological burden and moral injury the physical and psychological needs of the workforce must be considered in planning recovery of non-COVID healthcare services (Price 2021).

There is a marked regional variation in most of the measures we have examined. To some extent, this variation may reflect temporal variations in the impact of the pandemic on different geographical regions. However, as well as variation in demand, different regions may vary in baseline capacity and ability to expand services. In regions or hospitals with lower numbers of critical care beds per head of population or staff per hospital bed, relatively smaller rises in community prevalence of COVID-19 might lead to higher system stress. For instance, London has approximately 10 critical care beds per 100,000 head of population, compared with the South West, where the figure is less than 6 (Batchelor 2020). This perhaps partially explains why we observed similar impacts on service delivery in London and the South West region despite them having almost four-fold differences in rates of critical care occupancy per head of population in the three periods of the survey (ICNARC 2021a).

The surveys in part illustrate the pressure points in the current system. These are clearly space and, most particularly, staff. The fact that critical care expansion requires redeployment of substantial numbers of anaesthetists is likely to have important implications for at least the next year, as critical care services work flexibly to address fluctuations in demand or stepwise

expansion. This in turn will have important implications for addressing surgical waiting lists. Expansion of both space and anaesthetic workforce are likely to be inevitable requirements.

There is some evidence that we sampled from hospitals with less systemic stress. The hospitals that responded, likely to represent between one third and half of all critical care units, reported approximately 900 mutual aid admissions in December 2020 to January 2021. This is broadly consistent with data from the Intensive Care Research and Audit Centre, which recorded 1971 transfers between critical care units in December 2020 and January 2021, including 1634 for mutual aid (ICNARC 2021b), compared with 54, 12 months previously (NHS Digital 2020a). Our respondents reported 50% more mutual aid admissions to their hospitals than transfers out, and as each mutual aid transfer must have a decompressing and receiving unit, this provides some support for the idea that we preferentially sampled from less systemically stressed sites.

There are some limitations to our surveys. We have had decreasing response rates, falling to 50% in round 3. In normal circumstances, some will consider response rates of above 60% to be necessary to be judged representative of the population sampled. Others regard 40% as sufficient (Story and Tait 2019). Our surveys specifically targeted departments during a pandemic, including when capability pressures were increasing or saturated and survey responses were required rapidly. It is plausible, and perhaps likely, that within regions the more systemically stressed hospitals were less likely to respond and the data support this supposition. It is therefore also plausible that the results of the survey underestimate the true extent of the 'system stress' due to failure to capture data from the most stressed part of the system. This is likely to be most marked when overall clinical pressure was highest, in round 3. The surveys required respondents to compare activity at the time of the survey to activity a year previously and also to measure activity

over 24 h. In some cases, the responses were estimated but subanalysis of only those reported as accurate did not change the overall results. Finally, for some regions, only a small number of hospitals replied so that these regional results may be less reliable.

In conclusion, we have documented the systemic stress on anaesthetic and perioperative services during the second wave of the COVID-19 pandemic in the UK. This shows growing pressures between October and December 2020 because of critical care demands, predominantly on staff and space. Falls in surgical activity by having to close operating theatres and reduce activity was mitigated by use of resources in other locations. In January 2021, shortly after the peak of the second surge, there is evidence that systemic resilience was overwhelmed; almost one third of anaesthesia staff were unavailable and surgical activity reduced to less than half, impacting all surgery, including cancer surgery and emergencies. At all times the greatest resource limitation was staffing, followed by space. The findings have important implications for understanding what has happened during the COVID-19 pandemic and for planning recovery and building a system that will be better able to respond to future waves or new epidemics.

ACCC-Track 4 and 5

As part of the NAP7 launch ([Chapter 6 Methods](#)), ACCC-Track round 4 survey was sent out as part of the Local Coordinator's Baseline Survey aimed at assessing the national overview of the COVID-19 impact on anaesthetic and surgical activity in June 2021. The survey questionnaire followed the previous format of the previous three rounds. A shortened version of ACCC-Track, round 5, was finally launched in August 2022 and closed in October 2022. We received a total of 90 and 75 responses for round 4 and round 5, respectively. Because of the limited response rate, data from these rounds were not analysed.

References

- Batchelor 2020: Batchelor G. Revealed: huge regional variation in NHS' ability to meet coronavirus demand. *Health Serv J* 19 March 2020. <https://www.hsj.co.uk/quality-and-performance/revealed-huge-regional-variation-in-nhs-ability-to-meet-coronavirus-demand/7027153.article> [accessed 18 April 2021].
- BMA 2021: British Medical Association. *Rest, Recover, Restore: Getting UK health services back on track*. London: BMA; 2021. <https://www.bma.org.uk/media/3910/nhs-staff-recover-report-final.pdf> [accessed 14 April 2021].
- Cook 2021: Cook TM, Roberts JV. Impact of vaccination by priority group on UK deaths, hospital admissions and intensive care admissions from COVID-19. *Anaesthesia* 2021; 76: 608–16.
- Dobbs 2021: Dobbs TD, Gibson JAG, Fowler AJ *et al*. Surgical activity in England and Wales during the COVID-19 pandemic: a nationwide observational cohort study. *Br Anaesth* 2021; 127: 196–204.
- Frampton 2021: Frampton D, Rampling T, Cross A *et al*. Genomic characteristics and clinical effect of the emergent SARS-CoV-2 B.1.1.7 lineage in London, UK: a whole-genome sequencing and hospital-based cohort study. *Lancet Infect Dis* 2021; 21: 1246–56.
- HRA 2017: Health Research Authority. HRA decision tools: defining research. 2017. http://www.hra-decisiontools.org.uk/research/docs/DefiningResearchTable_Oct2017-1.pdf [accessed 10 April 2021].
- FICM 2020a: *Restarting Planned Surgery in the Context of the COVID-19 pandemic: A strategy document from the Royal College of Anaesthetists, Association of Anaesthetists, Intensive Care Society and Faculty of Intensive Care Medicine*. London: RCoA; 2020. <https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5eac2a173d65cd27933fca88/1588341272367/Restarting-Planned-Surgery.pdf> [accessed 30 January 2021].
- FICM 2020b: *Anaesthesia and Critical Care: Guidance for Clinical Directors on preparations for a possible second surge in COVID-19: A strategy document from the Royal College of Anaesthetists, Association of Anaesthetists, Intensive Care Society and Faculty of Intensive Care Medicine*. London: RCoA; 2020. <https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5f68ce9ccda1805270405136/1600704156814/Second-Surge-Guidance.pdf> [accessed 6 April 2021].
- ICNARC 2021a: Intensive Care National Audit and Research Centre. *ICNARC Report on COVID-19 in Critical Care: England, Wales and Northern Ireland, 26 March 2021*. <https://www.icnarc.org/Our-Audit/Audits/Cmp/Reports> [accessed 8 April 2021].
- ICNARC 2021b: Intensive Care National Audit and Research Centre. *COVID-19 Report*. Table appendix, 26 March 2021. London: ICNARC. <https://www.icnarc.org/Our-Audit/Audits/Cmp/Reports> [accessed 8 April 2021].

COVID-19 and anaesthetic activity

ICS 2021: Intensive Care Society. *Recovery and Restitution of Critical Care Services during the COVID-19 Pandemic*. London: Intensive Care Society; 2021. https://www.baccn.org/static/uploads/resources/Recovery_and_Restitution_-_finalV2.pdf (accessed 8 April 2021).

National Audit Project 2020: NAP7 Sites. <http://www.nationalauditprojects.org.uk/NAP7-Sites> (accessed 1 November 2020).

NHS Digital 2020a: Critical Care Bed Capacity and Urgent Operations Cancelled 2019–20 Data. <https://www.england.nhs.uk/statistics/statistical-work-areas/critical-care-capacity/critical-care-bed-capacity-and-urgent-operations-cancelled-2019-20-data/> (accessed 20 April 2021).

NHS Digital 2020b: NHS Workforce Statistics, April 2020. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/april-2020> (accessed 1 November 2020).

NHS Digital 2021: NHS Workforce Statistics, December 2020. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/december-2020> (accessed 8 April 2021).

ONS 2020: Office for National Statistics. Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland. <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland> (accessed 10/4/21)

Price 2021: Price J, Sheraton T, Self R, Cook TM. The need for safe, stable and sustainable resumption of planned surgery in an era of COVID-19. *Anaesthesia* 2021; 76: 875–8.

Stevens 2020: Stevens S, Pritchard A. Important – for action – third phase of NHS response to COVID-19. [Letter] 31 July 2020. <https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/07/Phase-3-letter-july-31-2020.pdf> (accessed 10 April 2021).

Sury 2014: Sury MRJ, Palmer JHMG, Cook TM *et al*. The state of UK anaesthesia: a survey of National Health Service activity in 2013. *Br J Anaesth* 2014; 113: 575–84.

Story 2019: Story DA, Tait AR. Survey research. *Anesthesiology* 2019; 130: 192–202.

UK HSA 2021: UK Government. Coronavirus (COVID-19) in the UK. Healthcare in United Kingdom. <https://coronavirus.data.gov.uk/details/healthcare> (accessed 10 April 2021).

Appendix 8.2

Red–amber–green rating: minimum requirements for restarting elective surgery and procedures

From: FICM (2020a)

Within each category, preparedness for a return to activity is RAG-rated; that is, **red** (not ready for a return), **amber** (close to being ready for a return) and **green** (ready for a return).

Space

- Baseline capacity: maximum critical care bed capacity before the pandemic.
- Expanded capacity: maximum critical care bed capacity achieved to manage the increased workload associated with the pandemic.

RED

- Critical care occupancy close to expanded capacity.
- Patients in temporary ICUs in operating theatres scheduled for elective use or in other locations to be used in the surgical pathway (eg post-anaesthesia care unit or surgical ward).
- No planning for creating COVID-19-positive and COVID-19-negative patient separation in critical care facilities to accommodate planned and unexpected admissions after elective surgery.

AMBER

- Critical care occupancy reduced from expanded capacity and approaching baseline capacity.
- Other hospitals in the regional ICU network still using temporary ICU facilities, including the use of paediatric ICUs for adult patients.
- Plans for COVID-19-positive and COVID-19-negative critical care beds and pathways in development but not complete.

GREEN

- Critical care occupancy close to 85% of baseline capacity.
- COVID-19-positive and COVID-19-negative critical care bed and pathway separation enacted and effective.

Staff

RED

- Theatre staff, perioperative care staff and anaesthetists still significantly committed to critical care duties.
- Critical care staffing ratios significantly higher than pre-pandemic levels and reliant on non-ICU staff.
- Out-of-hours resident on call duties being performed by consultant and specialist, associate specialist and speciality (SAS) anaesthetists.
- Shielded and higher-risk anaesthetists not performing patient-facing activities.

AMBER

- Working patterns of anaesthetic, theatre and perioperative care staff of all professions still significantly impacted by pandemic surge conditions and recovery from these.
- Critical care staffing ratios above pre-pandemic levels or reliant on non-ICU staff.
- Trainee on call rotas restored but less than normal number of trainees available for work.
- Plans in place for sufficient numbers of consultant and SAS anaesthetists to be available to provide cover for planned surgical activity, but not yet fully in place.
- Planning for adequate staff numbers to restart non-theatre anaesthetic activities such as preoperative assessment, acute pain rounds and perioperative medicine activity but adequate numbers not yet available.
- Planning for returning higher-risk anaesthetists to patient-facing activities after appropriate risk assessments but not yet implemented.

GREEN

- Elective surgical pathways fully staffed by intact theatre and perioperative care staff rotas.
- Critical care staffing ratios at or near pre-pandemic levels.
- Trainee on call rotas restored with normal numbers of trainees.
- Sufficient numbers of consultant and SAS anaesthetists available to provide normal staffing levels for the planned surgical activity to be delivered.
- Non-theatre activities ready to be restarted.
- Higher-risk anaesthetists returned to patient-facing activities where appropriate.

Stuff (equipment)

RED

- Equipment used in surgical pathways still in extensive use for critical care patients (eg anaesthetic machines and infusion pumps).
- Shortages of personal protective equipment (PPE) and other equipment necessary for effective infection control.
- Non-availability or low stock levels of key drugs used in critical care and anaesthesia such as first-line choice of neuromuscular blocking drugs, opioid analgesics, hypnotics, sedatives, inhalational anaesthetics, inotropes and vasopressors.
- Non-availability of postoperative critical care equipment either in general ICU capacity or for specific forms of support such as renal replacement therapy or non-invasive ventilation.

AMBER

- Adequate numbers of anaesthetic machines and infusion pumps available but insufficient in reserve in case of damage or machine malfunction.
- Stocks of PPE and other equipment necessary for effective infection control adequate for potential increases in critical care activity and increasing surgical activity but supply chain not assured.
- Stocks of key drugs used in critical care and anaesthesia adequate but uncertain resupply through normal supply chain routes.
- Postoperative critical care capacity limited and in competition with ongoing COVID-19 requirements.

GREEN

- Minimal equipment usually used in the surgical patient pathway in use in critical care, with adequate equipment in reserve in case of damage or machine malfunction.
- Adequate stocks of PPE and other equipment necessary for effective infection control for potential critical care and planned surgical activity with assured supply chain.
- Adequate supplies of key drugs used in critical care and anaesthesia with secure supply chain identified.
- Good availability of critical care capacity and all relevant organ support modalities.

Systems

RED

- COVID-19-positive and COVID-19-negative pathways for surgical care not developed or implemented.
- COVID-19 testing not sufficiently available for patients and staff.
- Anaesthetic services key to supporting theatre activity not active (eg preoperative assessment, acute pain service and perioperative medicine activity).

AMBER

- COVID-19-positive and COVID-19-negative pathways for surgical care planned but not yet implemented.
- COVID-19 testing available for patients and staff, with clear policies in development for how testing can protect staff, protect patients and facilitate efficient surgical services.
- Staffing and facilities for anaesthetic services key to supporting theatre activity available.
- Policies in development for the rational prioritisation of surgical patients as theatre capacity becomes available but does not yet fully match demand.
- Policies in development for the rational prioritisation of surgical patients as critical care capacity becomes available but does not yet fully match demand.

GREEN

- COVID-19-positive and COVID-19-negative pathways for surgical care fully implemented.
- Anaesthetic services key to supporting theatre activity functioning well.
- COVID-19 testing available for patients and staff, with clear policies in place for how testing will protect staff, protect patients and facilitate efficient surgical services.
- Policies for the rational prioritisation of surgical patients as theatre capacity becomes available are fully implemented.
- Policies implemented for the rational prioritisation of surgical patients as critical care capacity becomes available.

Implementation

If any of space, staff, stuff or systems are RAG-rated 'red', then planned surgery should not restart. When all four are RAG-rated 'green', it is likely that planned surgery can proceed and move towards normal activity. When any of the four are RAG-rated 'amber', it will not be possible to undertake normal levels of planned surgical activity and it may not be safe to undertake any.

Intensive care unit Staged Resurgence Plan

From: FICM (2020b).

SRP1 Continuing endemic COVID-19 activity.

SRP2 Increasing demand for critical care services that can be met within current established capacity.

SRP3 Demand for critical care exceeds current established capacity, requiring mobilisation of expanded capacity.

SRP4 Demand for critical care exceeds established capacity with a likelihood that it will occupy maximum expanded capacity.

SRP5 Demand for critical care exceeds maximum expanded capacity; need for transfer of critically ill COVID-19 patients to external facilities.

Anaesthesia and Critical Care COVID-19 Tracking survey results

The remainder of results are provided in Tables 8.1–8.4 and Figures 8.16–8.42. Questions surrounding turnaround times/fallow times (question 43 and 44) during round 1 (October 2020) have been omitted for analysis because it appeared that the question was misinterpreted by many responders.

Table 8.1 Themes of the main problems and barriers in delivering perioperative care in the responding hospitals during the COVID-19 pandemic

| Main barriers | October 2020 | January 2021 |
|--|--------------|--------------|
| | (n)* | (n)* |
| Staffing issues | 34 | 57 |
| Bed availability (including inpatient and ICU beds) | 23 | 35 |
| Problems with testing | 16 | 2 |
| Lack of theatre availability (with some areas labelled as 'red') | 11 | 18 |
| Problems with availability of PPE | 12 | 0 |
| Unclear protocols (step-down, PPE guidelines, preassessment) | 7 | 0 |
| Staff fear and wellbeing concerns | 3 | 0 |
| Poor communication from senior management | 2 | 0 |
| IT issues prevented virtual clinics | 2 | 0 |
| No elective surgery planned | 0 | 9 |
| Patient surge | 0 | 14 |

* Some responses included more than one barrier.
PPE, personal protective equipment.
IT, information technology.

Table 8.3 Themes of the main problems and barriers in delivering critical care services in the responding hospitals during the COVID-19 pandemic

| Main barriers | January 2021 |
|--|--------------|
| | (n)* |
| Staffing issues | 58 |
| Bed availability (including inpatient and ICU beds) | 28 |
| Problems with testing | 1 |
| Lack of theatre availability (with some areas labelled as 'red') | 1 |
| Personal protective equipment | 1 |
| Patient surge | 8 |

* Some responses included more than one barrier.

Table 8.2 Themes of the main facilitators and enablers in delivering perioperative care in the responding hospitals during the COVID-19 pandemic

| Main facilitator | October 2020 | January 2021 |
|---|--------------|--------------|
| | (n)* | (n)* |
| Separate non-COVID-19 areas (ie green pathways, sites, etc) | 42 | 31 |
| Good teamwork | 30 | 5 |
| Flexibility of staff (new rotas, extra shifts) | 24 | 28 |
| Testing | 15 | 7 |
| Effective leadership | 14 | 0 |
| Use of the private sector | 12 | 3 |
| Positive staff attitude | 11 | 0 |
| Good supply of PPE | 9 | 1 |
| Virtual communication for preassessment | 8 | 4 |
| Planning | 7 | 4 |
| Good communication | 5 | 2 |
| Training staff on new protocols and PPE use | 5 | 0 |
| Additional funding | 2 | 0 |
| Prioritisation | 0 | 7 |
| Expansion of theatre capacity | 0 | 4 |
| Vaccination | 0 | 3 |

* Some responses included more than one answer.
PPE, personal protective equipment.

Table 8.4 Themes of the main facilitators and enablers in delivering critical care services in the responding hospitals during the COVID-19 pandemic

| Main facilitator | January 2021 |
|---|--------------|
| | (n)* |
| Separate non-COVID-19 areas (ie green pathways, sites, etc) | 3 |
| Good teamwork | 6 |
| Flexibility of staff (new rotas, extra shifts) | 34 |
| Prioritisation | 1 |
| Use of the private sector | 1 |
| Expansion of theatre capacity | 12 |

* Some responses included more than one facilitator.

Figure 8.16 Regional variations in the proportion of respondents that reported red (not able to resume planned surgery), amber (nearly able to resume planned surgery) or green (able to resume planned surgery) for ‘space’ in the space, staff, stuff (equipment) and systems’ categories for R1 (October 2020), R2 (December 2020), R3 (January 2021)

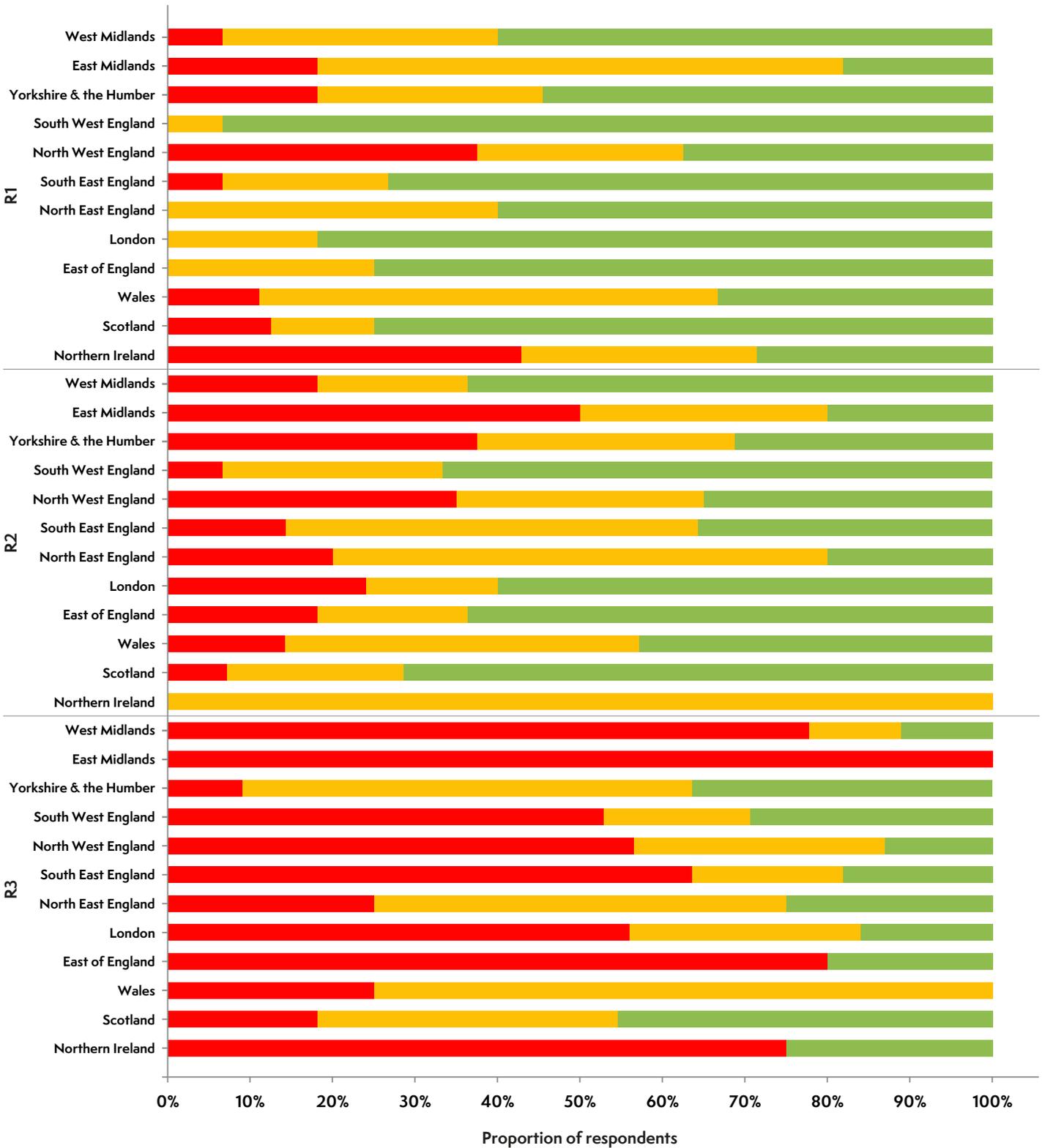


Figure 8.17 Regional variations in the proportion of respondents that reported red (not able to resume planned surgery), amber (nearly able to resume planned surgery) or green (able to resume planned surgery) for 'staff in the space, staff, stuff (equipment) and systems' categories for R1 (October 2020), R2 (December 2020), R3 (January 2021)

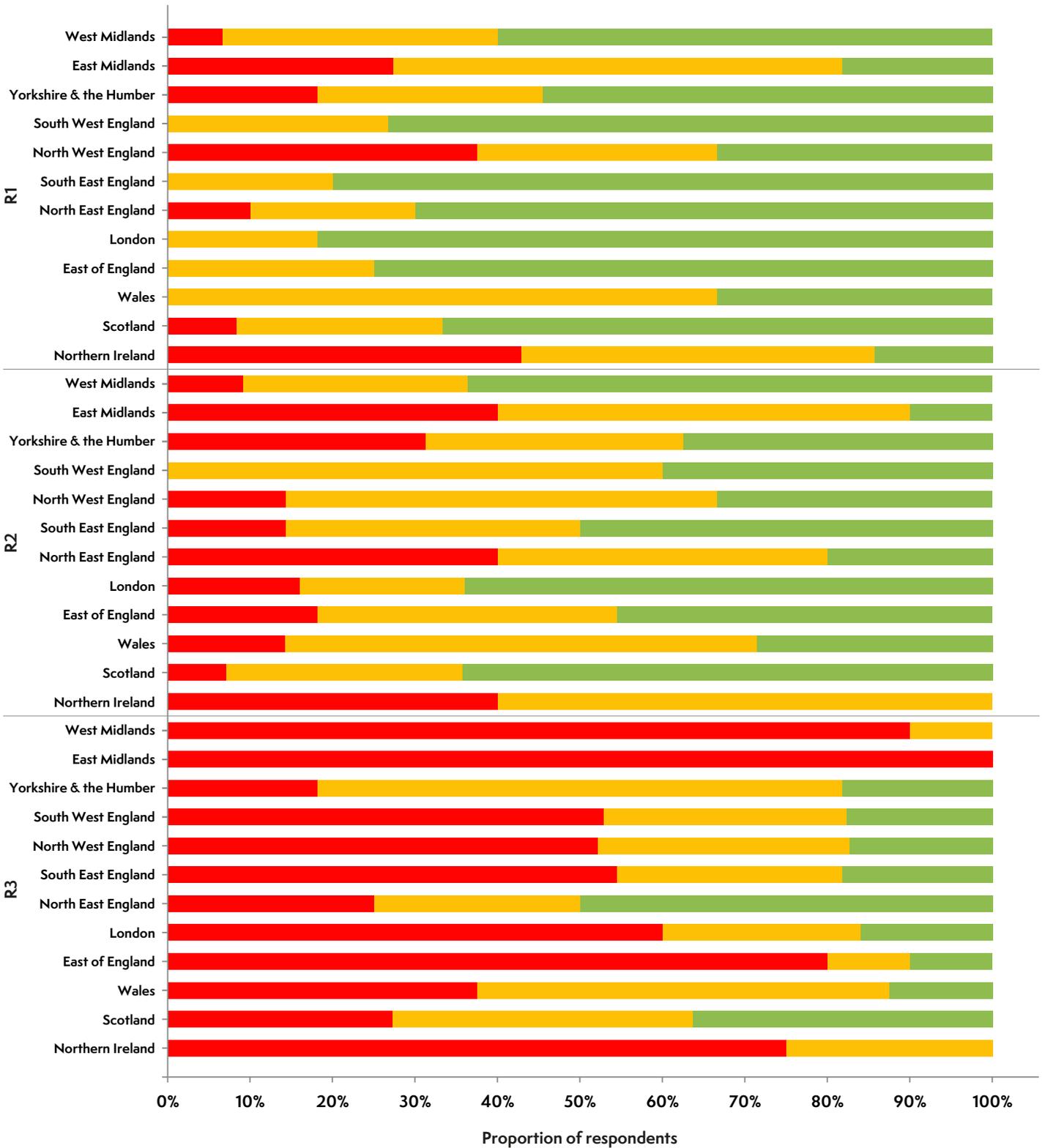


Figure 8.18 Regional variations in the proportion of respondents that reported red (not able to resume planned surgery), amber (nearly able to resume planned surgery) or green (able to resume planned surgery) for 'stuff in the space, staff, stuff (equipment) and systems' categories for R1 (October 2020), R2 (December 2020), R3 (January 2021)

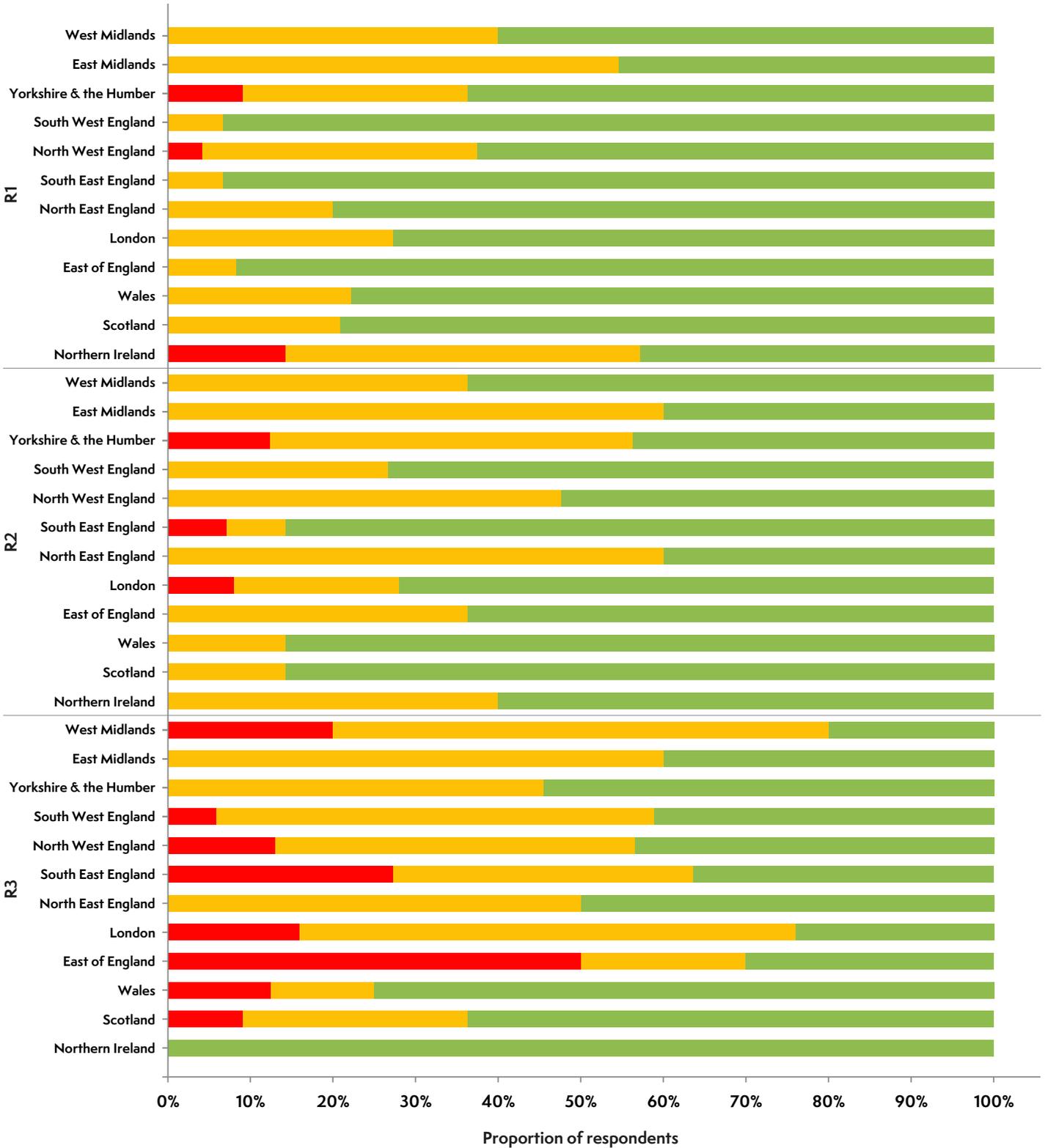


Figure 8.19 Regional variations in the proportion of respondents that reported red (not able to resume planned surgery), amber (nearly able to resume planned surgery) or green (able to resume planned surgery) for 'systems' in the space, staff, staff (equipment) and systems' categories for R1 (October 2020), R2 (December 2020), R3 (January 2021)

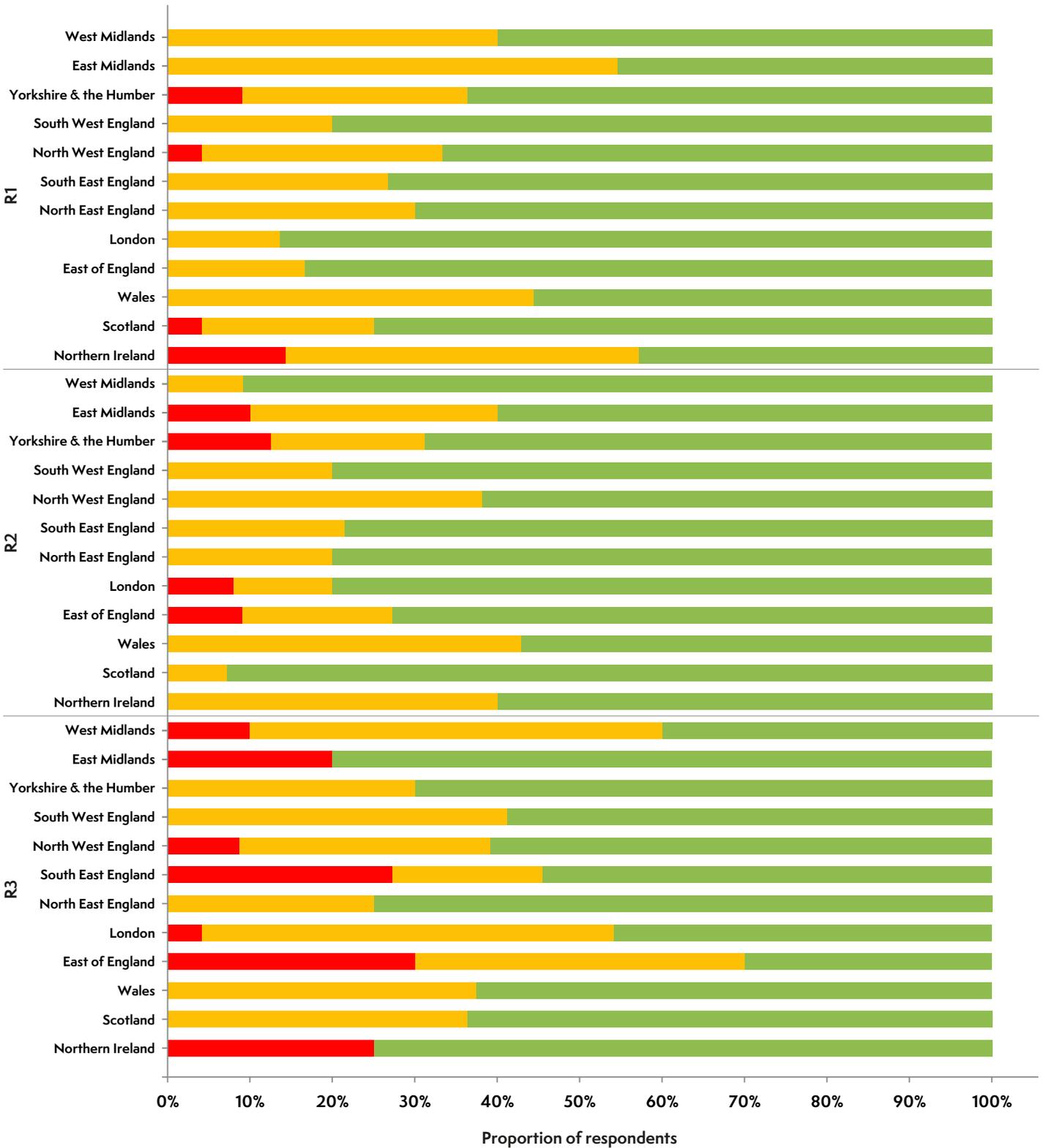


Figure 8.20 Opinion regarding the delivery of perioperative care based on five-point Likert scaling rate. Proportion of respondents reporting on the change in the delivery of care at R2 (December 2020) and R3 (January 2021) compared with the previous survey round.

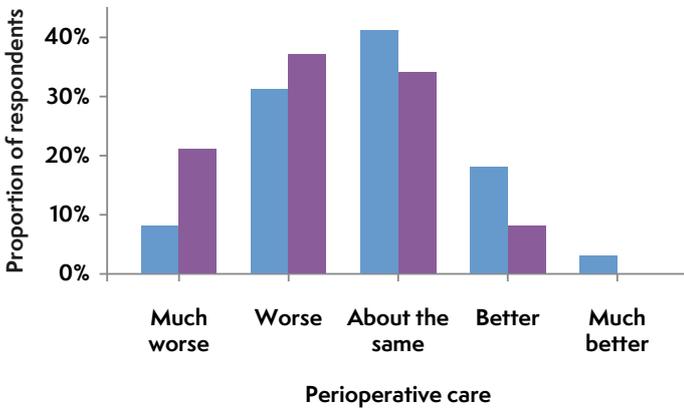


Figure 8.21 Opinion regarding the delivery of critical care services based on a five-point Likert scale rate. Proportion of respondents reporting on the change in the delivery of care at R3 (January 2021) compared with R2 (December 2020).

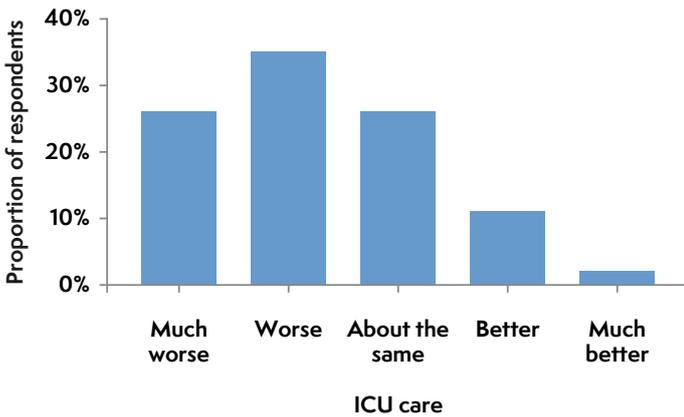


Figure 8.22 Proportion of respondents reporting on the presence and location of a designated 'low/er risk' COVID-19 theatre area/suite, at R1 (October 2020), R2 (December 2020) and R3 (January 2021)

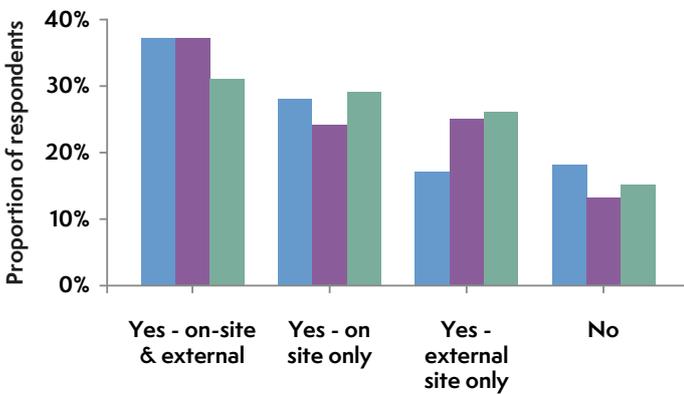


Figure 8.23 Regional variations in the proportion of respondents reporting on the presence and location of a designated ‘low/lower risk’ COVID-19 theatre area/suite, at R1 (October 2020), R2 (December 2020) and R3 (January 2021). The presence of ‘on site and external locations’ is represented by purple ■, ‘on site only’ locations by yellow ■, ‘external only’ by pink ■ and ‘no’ presence is represented by grey ■.

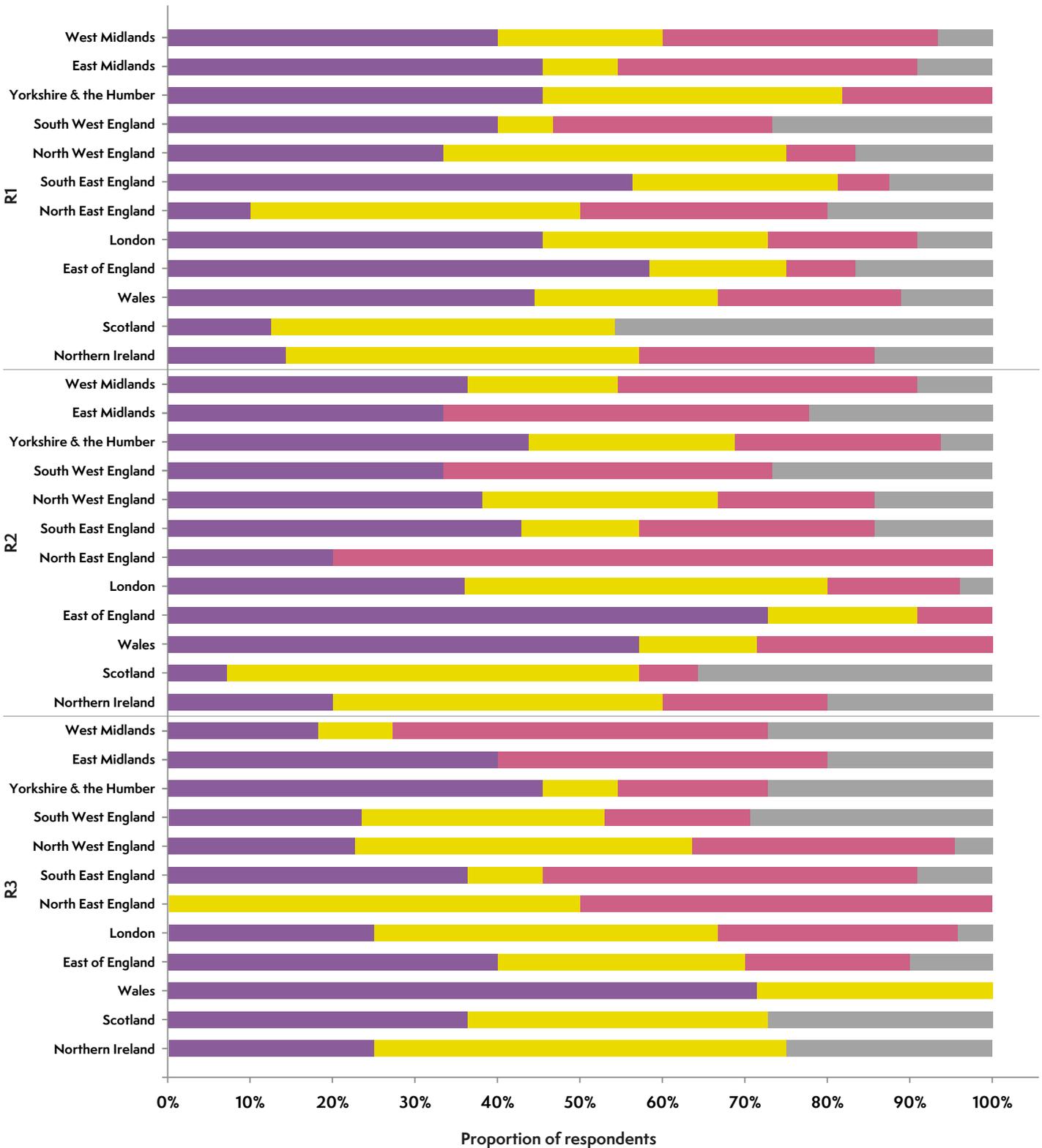


Figure 8.24 Proportion of total anaesthesia/critical care staff by grade across responding hospital sites, in October 2019 (blue), October 2020 (purple) and the percentage increase (green) in staffing levels (October 2020 vs 2019)

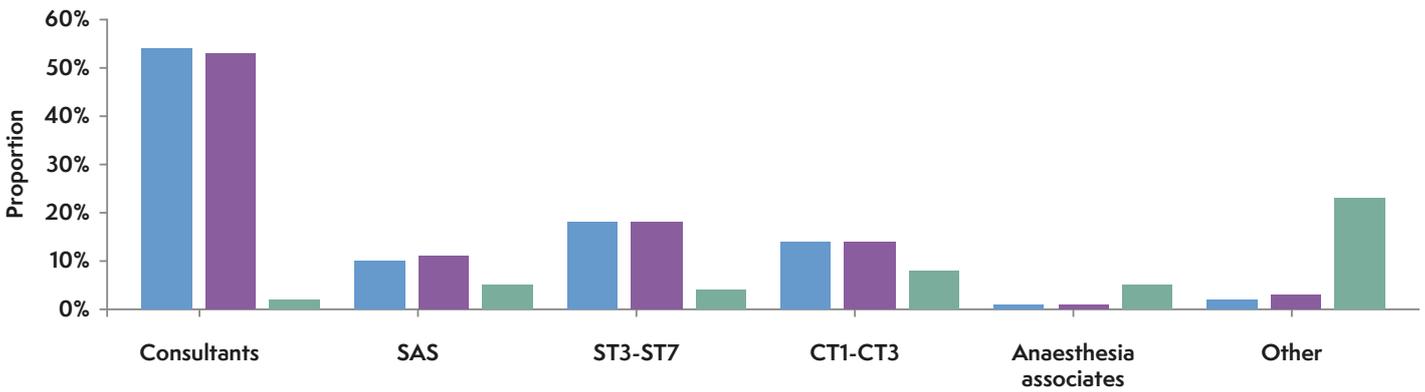


Figure 8.25 Proportion of respondents reporting on the length of self-isolation required for elective adult surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing adult surgery only included. PCR, Polymerase chain reaction.

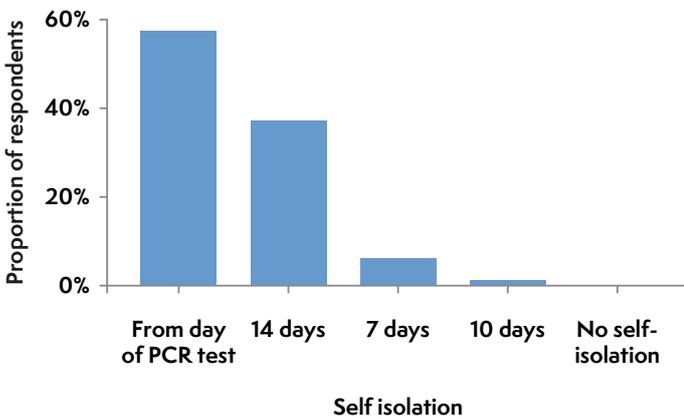


Figure 8.26 Proportion of respondents reporting on polymerase chain reaction (PCR) antigen SARS-CoV-2 preoperative testing requirements for elective adult surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing adult surgery only included.

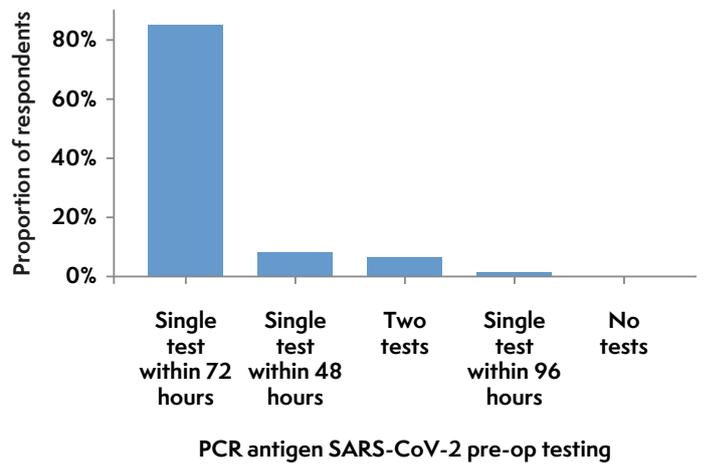


Figure 8.27 Proportion of respondents reporting on the preoperative COVID-19 symptom screening requirements for elective adult surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing adult surgery only included.

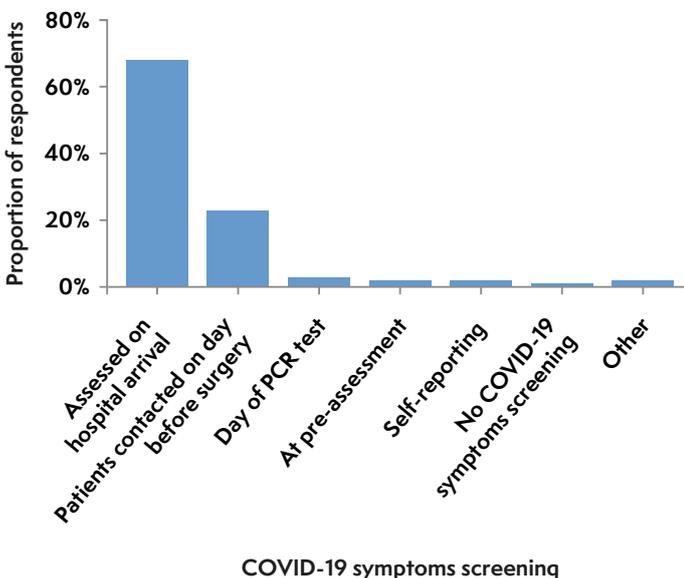


Figure 8.28 Proportion of respondents reporting on the type of patient flow arrangements for elective adult surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing adult surgery only included.

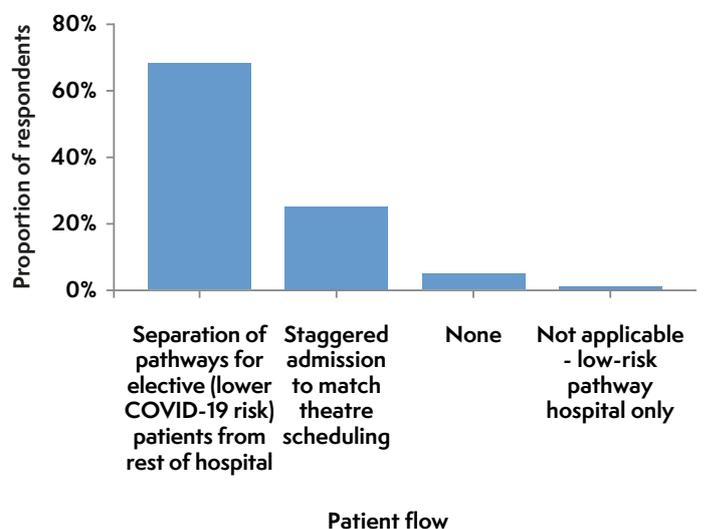


Figure 8.29 Proportion of respondents reporting on any change in green/low COVID-19 risk theatre pathways for elective adult surgery at their hospital site, at R2 (December 2020) and R3 (January 2021) compared with the previous survey round. Responses from hospitals performing adult surgery only included.

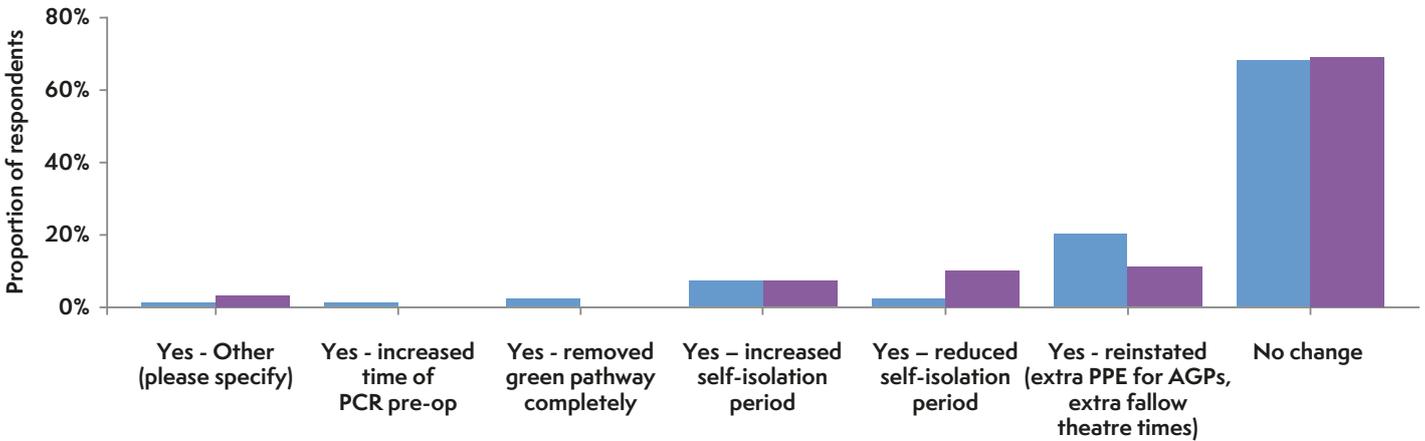


Figure 8.30 Proportion of respondents reporting on the individual self-isolation requirements for elective paediatric surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing elective paediatric surgery only included.

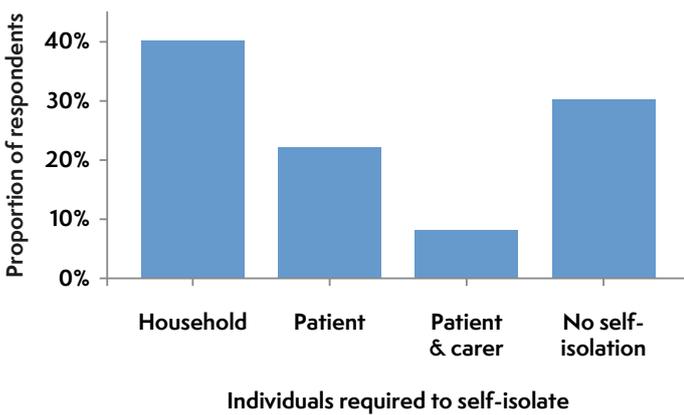


Figure 8.31 Proportion of respondents reporting on the length of self-isolation required for elective paediatric surgery at their hospital site at R1 (October 2020). Responses from hospitals that require self-isolation for performing elective paediatric surgery only included. PCR, polymerase chain reaction.

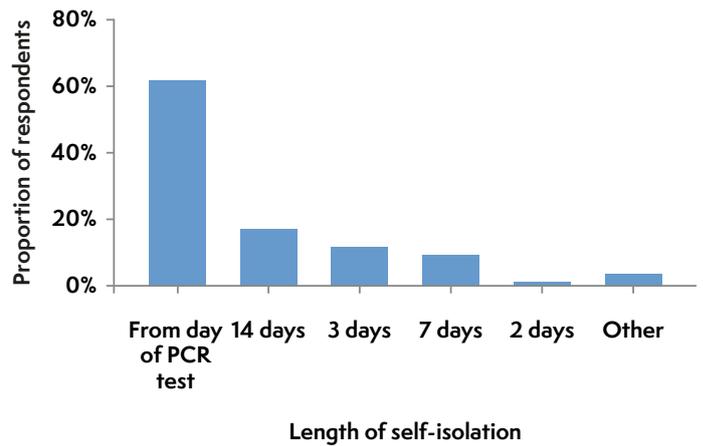


Figure 8.32 Proportion of respondents reporting on polymerase chain reaction (PCR) antigen SARS-CoV-2 preoperative testing requirements for elective paediatric surgery at their hospital site, at R1 (October 2020). Responses from hospitals performing elective paediatric surgery only included.

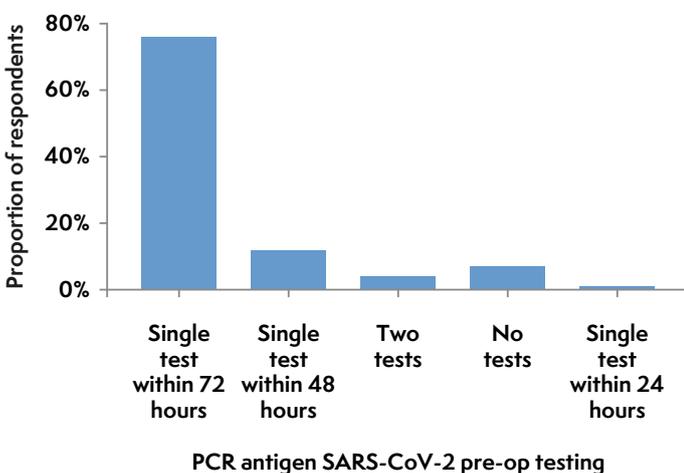


Figure 8.33 Proportion of respondents reporting on the preoperative COVID-19 symptom screening requirements for elective paediatric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective paediatric surgery only included.

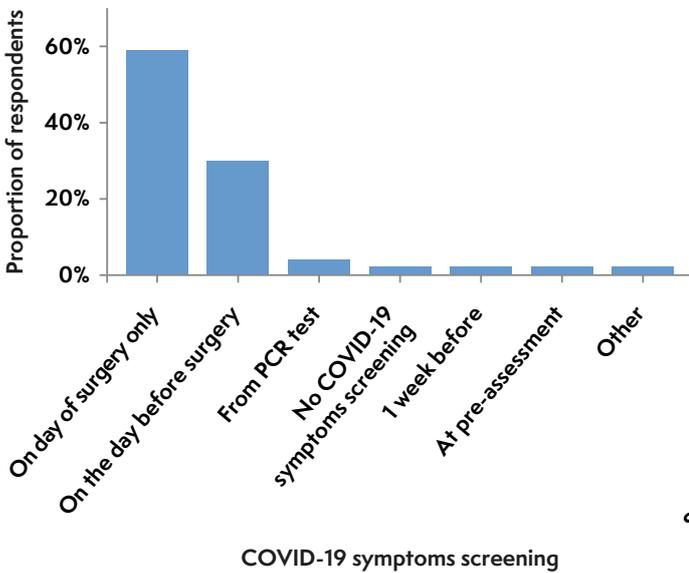


Figure 8.34 Proportion of respondents reporting on the type of patient flow arrangements for elective paediatric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective paediatric surgery only included.

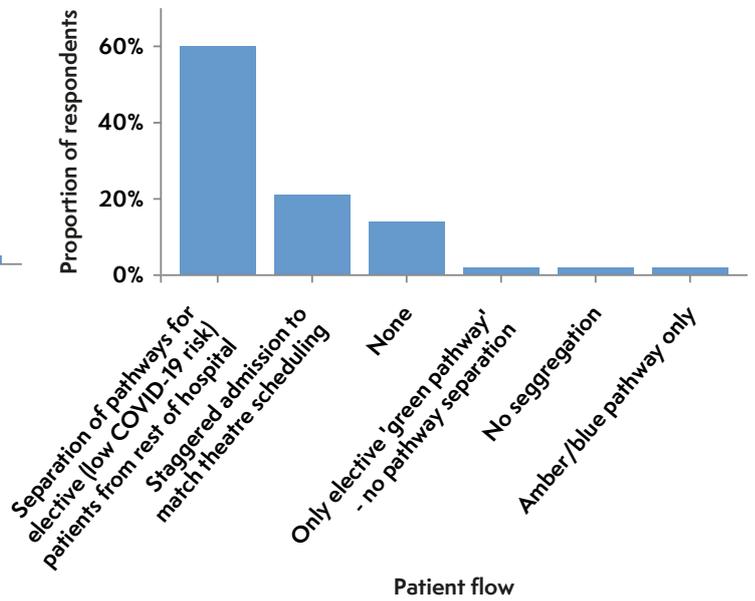


Figure 8.35 Proportion of respondents reporting on the individual self-isolation requirements for elective obstetric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective obstetric surgery only included.



Figure 8.36 Proportion of respondents reporting on the length of self-isolation required for elective obstetric surgery at their hospital site at R1 (October 2020). Responses from hospitals that require self-isolation for performing elective obstetric surgery only included. PCR, polymerase chain reaction.

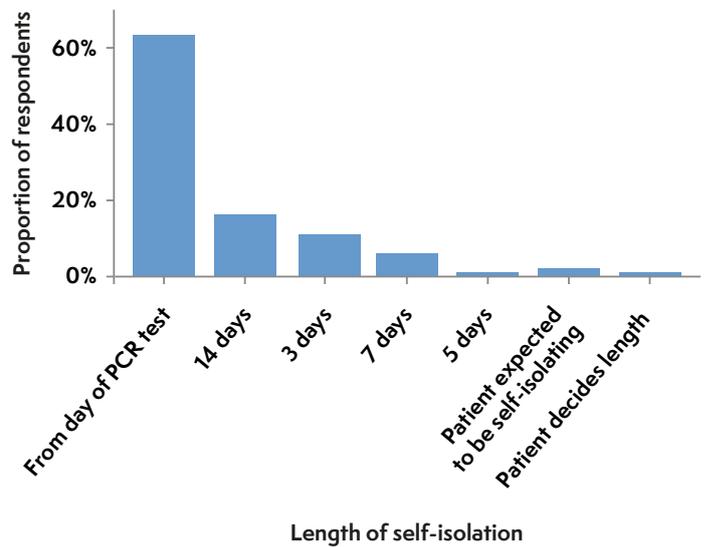


Figure 8.37 Proportion of respondents reporting on polymerase chain reaction (PCR) antigen SARS-CoV-2 preoperative testing requirements for elective obstetric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective obstetric surgery only included.

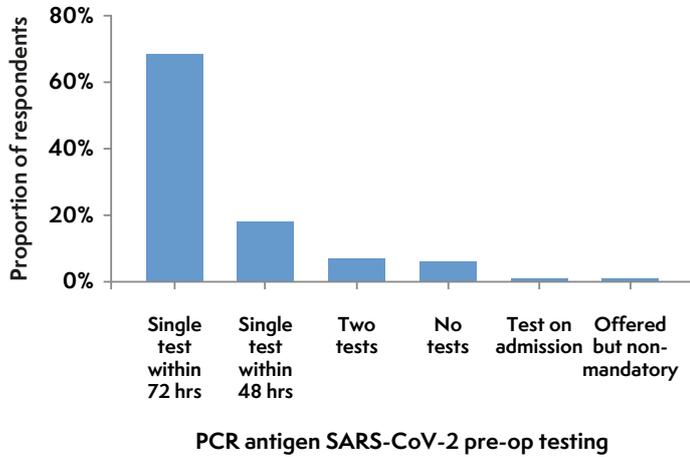


Figure 8.38 Proportion of respondents reporting on the preoperative COVID-19 symptom screening requirements for elective obstetric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective obstetric surgery only included. PCR, polymerase chain reaction.

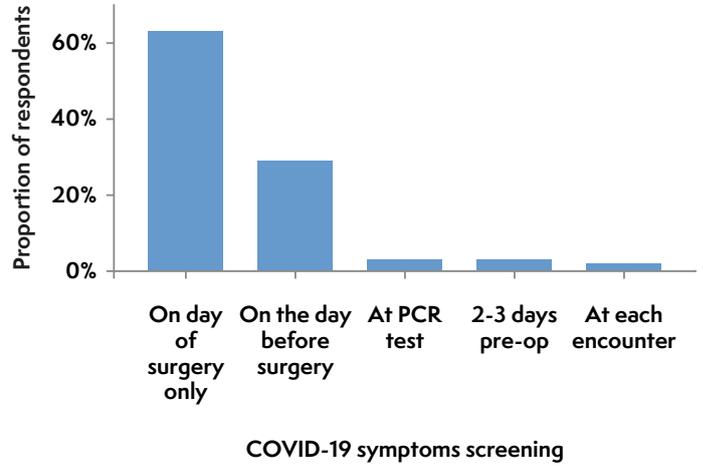


Figure 8.39 Proportion of respondents reporting on the type of patient flow arrangements for elective obstetric surgery at their hospital site at R1 (October 2020). Responses from hospitals performing elective obstetric surgery only included.

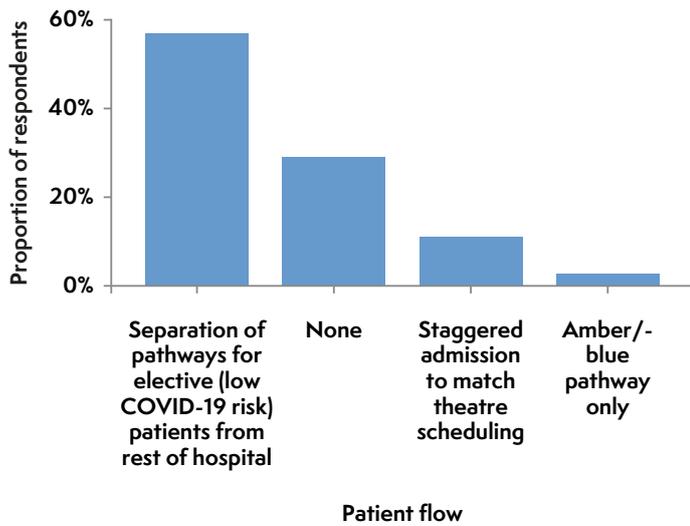


Figure 8.40 Proportion of respondents reporting on the level of personal protective equipment (PPE) precautions for anaesthesia-related procedures for a COVID-19 low-risk pathway at R1 (October 2020). PPE arrangements include 'airborne' (green), 'droplet' (blue), 'contact' (yellow) and 'no' (grey) precautions.

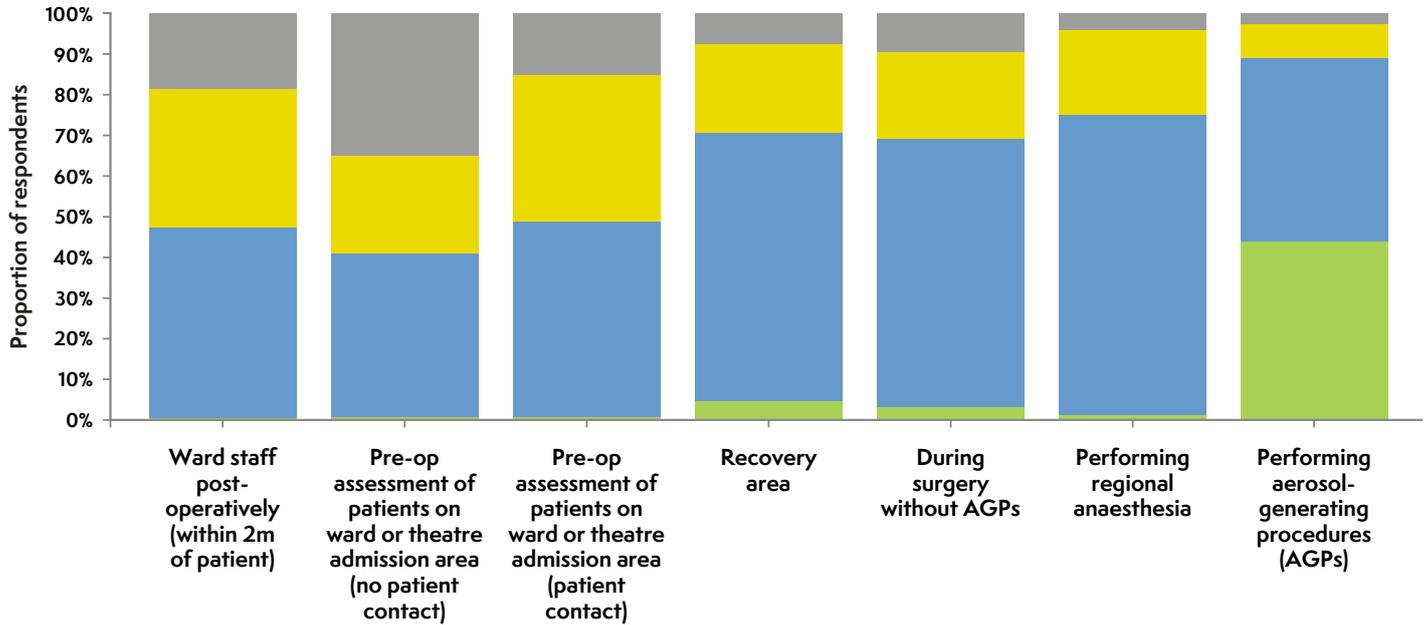


Figure 8.41 Proportion of respondents reporting on the level of personal protective equipment (PPE) precautions for anaesthesia-related procedures for a COVID-19 high-risk pathway at R1 (October 2020). PPE arrangements include 'airborne' (green), 'droplet' (blue), 'contact' (yellow) and 'no' (grey) precautions.

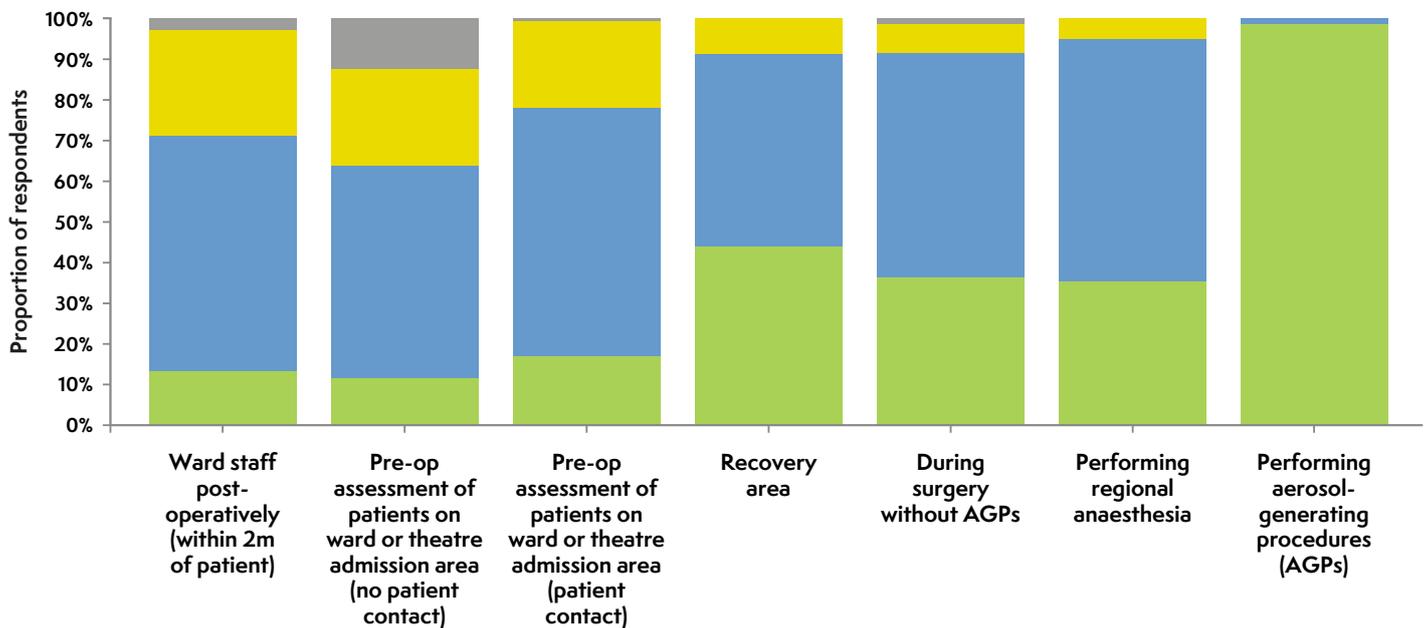


Figure 8.42 Proportion of respondents reporting the location of supraglottic airway removal for COVID-19 low-risk pathways at R1 (October 2020). Locations include in recovery only ■, in theatre only ■ and both recovery and theatre ■.

