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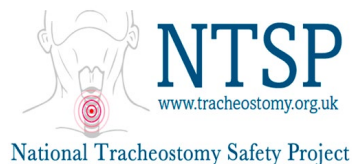
#intensivelycaring

Intensive Care 2020 and beyond: Co-developing the future



In this the 50th year of the Intensive Care Society we felt it was the appropriate time to take stock of what we have learned and to present a renewed vision of the future.”

Endorsing organisations



Intensive Care 2020 and beyond: Co-developing the future

We are very grateful to Charlotte Summers and her team of contributors for this major report, born amidst the sustained pressure and accelerated learning of COVID-19, but with its eyes on the future and underlying trends, as well as new perspectives gained from the pandemic.

It is founded on the experiences and insights of hundreds of frontline clinicians and some of the organisations representing them, and as such, represents a unique breadth of multi professional input.

It addresses fundamental questions at the heart of intensive care – what it is and what it is for; and highlights the unique attributes at the centre of our specialty, particularly the flattened hierarchy and combination of skills at the bedside which characterise intensive care.

It showcases how critical care is not just confined within the walls of an ICU but plays a broader role across the wider hospital environment – so vividly illustrated in 2020 – and identifies important research themes of survivorship and long-term impact which emphasise that a stay in the intensive care unit is just the first step in a patient’s recovery.

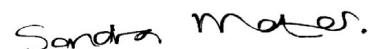
This is a visionary piece of work focussed on the human at the centre of intensive care – patient and professional alike – and reflects the values of our field and of the Society. We commend it to you and warmly congratulate the Chair, participants and team on the extensive work that has gone into it.



Dr Ganesh Suntharalingam
ICS President



Dr Stephen Webb
ICS President-Elect



Dr Sandy Mather
ICS Chief Executive

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Introduction

It has been 20 years since the publication of the seminal 'Comprehensive Critical Care' report which outlined a vision for intensive care across the UK. Much has happened since this report was published, including the recent coronavirus pandemic. In this, the 50th year of the Intensive Care Society, we felt it was the appropriate time to take stock of what we have learned and to present a renewed vision of the future.



In this light, and to inform national policies relating to intensive care services, the Society launched the cross-community 'Intensive Care 2020 and Beyond' workstream. The process involved a series of focus groups with participants from across our community examining and debating six of the big questions regarding the delivery intensive care services. In addition, more than 500 members of our community completed our 'One Simple Change' online survey, identifying both the one thing they would most like to maintain and the one thing they would most like to lose from intensive care practice. This work gives voice to the professionals who are integral cogs in the turning wheels of intensive care services.

The 'Intensive Care 2020 and Beyond: Co-developing the future' report presents the findings from our extensive engagement across the intensive care workforce, with findings presented under each 'big question', and serves as a roadmap to be considered by policymakers and clinicians alike. We have particularly highlighted what are considered by the intensive care community to be the most pressing unanswered questions – the priorities that need to be addressed through future data collection, analysis, and research within intensive care and beyond. There will undoubtedly be important areas that were not highlighted during this exercise. This report in no way diminishes these, but is a synthesis of the topics prioritised by the participants in the process.

I am grateful to the many people who have given their time to support the creation of this report (see page 26) but should particularly recognise the contribution of the Intensive Care Society management team and Nirandeep Rehill from UCLPartners, without whom the report would never have come to fruition.

A handwritten signature in black ink, appearing to read 'Charlotte Summers'.

Dr Charlotte Summers
Chair of intensive care 2020 & beyond

1 What is Intensive Care for?

Our panel struggled to encapsulate in a single sentence what intensive care is for. However, they identified the following as key functions of intensive care services, representing not only the provision of expertise across healthcare organisations, but also the critical enabling function of that expertise in delivering a range of patient pathways and services across their Trusts:

- **Providing specialist multidisciplinary skills and ratios at the bedside**

This is a role that hospital colleagues look to critical care for with respect to managing acutely unwell or unstable patients, to enable *‘Care than cannot be delivered safely or with quality within ward-based nursing, allied health professional, and doctor ratios’*^[1]. This incorporates the management of patients with high levels of dependency from a number of causes including, requiring advanced pain relief, delirium management, palliative care support, acute-on-chronic disease management.

- **Delivering organ support**

Intensive care is one of the few places where potentially life-threatening organ failure can be safely managed, and that will always be a facet of what intensive care delivers. However, the role of intensive care should include *‘preventing organ failure that would result in a reduction in quantity and quality of life. Organ failure is a failure in itself.’*

- **Supporting colleagues & patients on wards and in emergency departments**

Intensive care adds value beyond the geographic limits of the intensive care unit by having a long-term commitment to the support of patients and healthcare professionals across hospitals, and often beyond. With respect to organ support, intensive care provides leadership to those who are best placed to prevent the clinical deterioration of patients with a view to increasing both quality and quantity of life. Outreach teams provide support for colleagues and patients in a variety of settings, including managing sepsis, treatment escalation planning, and reducing ward based cardiac arrests. *‘Critical care is a skillset not a geography’ ‘not for ICU doesn’t necessarily mean not for critical care input, we can still provide support.’*

- **Providing infrastructure necessary to enable delivery of patient care pathways**

Intensive care supports delivery of a range of care pathways, including cancer treatment pathways, and specific treatments, such as complex surgery and transplantation. *‘There are a number of services that couldn’t work without us.’*

- **Delivering time-critical intervention when it is needed**

The time-critical nature of intensive care can be applied to many contexts. The time at which intensive care support is required is finely balanced, varying according to care pathway and the individual patient. Intensive care may also be time-bound, to oversee a defined period of instability and potential deterioration, rather than acute deterioration *per se*. Most notably in the recent context, the crucial role of intensive care within the wider healthcare system at the time of surge, be it due to winter pressures, mass events. or a pandemic, must be integral to planning. *'When crisis strikes, we will step in'*.

Priority questions for research

The Panel agreed that two aspects of intensive care were in urgent need of being better understood:

Survivorship

Intensive care cannot just be about survival at discharge from an intensive care unit. We need to understand more about long-term functional consequences for the different groups of patients that experience critical care; this requires a wholesale change in the way we evaluate, improve, and communicate about our outcomes. There is likely variation between patient groups, but this is very poorly understood. *'We need a fundamental change - functional outcomes and restoration of well-being are very very important.'*

The long-term costs and benefits of intensive care – to patients, families, and society

From understanding survivorship, we need to understand both the costs of receiving intensive care, and the value intensive care brings to the different groups of patients, their families and wider society; These should include consideration of their on-going health-care requirements, well-being and employment, to enable clinicians and patients to have better informed and shared decision-making when planning treatment. *'We add value to the acutely unwell patient, but the amount of this value is not universally applied across all our patients.'*

- What is the impact of intensive care on **longer term functional outcomes and how can we maximise outcomes that are important to patients?**
- What are the **patient-rated outcomes and experiences** of intensive care?
- What is the **cost-effectiveness of intensive care for different patient groups**, when considering the long-term benefits and impacts of treatment on patients, their family, and society as a whole?
- What happens to **patients who don't get admitted** to ICU?
- How do we measure **the value of critical care outreach?**

2 How many ICU beds do we need?

There has been a recent spotlight on the international variation in provision of intensive care services, and unprecedented pressures to rapidly generate increased capacity in the wake of a global pandemic. However, year-on-year, much smaller seasonal surges in demand lead to cancellations of elective surgical procedures. The view of our panel with regards to the infrastructure requirements for intensive care units drew the following conclusions:

- **There is a lack of robust data to inform a generic model for all**

We have very limited data to generate a recommended model for intensive care bed requirements. Comparisons between trusts are problematic as what is counted as part of the intensive care service is not well defined. Different trusts operate different models of care with different categories of provision across a range of services, which may or may not be included within their intensive care bed footprint, for example cardiac surgery, coronary care, neurosurgery, major trauma, other settings where CPAP or NIV may be delivered, and post-anaesthetic care units.

- **A classification system based on patient needs for multidisciplinary staffing input is preferable to one that only considers physical beds**

‘a bed is not just a bed, but all the infrastructure required around that bed’.

The Level 0/1/2/3 classification system described in Guidelines for the Provision of Intensive Care Services (GPICS) second edition (2019)^[2] focusses heavily on organ support as the determinant of the resources required for patient management. However, this may not translate to staffing levels needed for an individual patient: Some Level 2 patients can require more nursing or therapist input than a sedated patient Level 3 patient. In addition, flexible beds often bring little or no therapist staffing. Paradoxically, high levels of staffing may keep patients from requiring a Level 3 bed.

‘The ability to care for an agitated patient on CPAP is not to be underestimated, and the nursing care and AHP skill required to keep them out of ICU is vital.’

The current model of care system is not sufficiently nuanced to capture the range of care needs, particularly at Level 2:

‘The demand for Level 3 beds is relatively stable and predictable. For Level 2 beds, we have “responsive” Level 2 (may need 1:1 or even higher), “proactive” (may need 1:2 or lower). Mixed in with this we have “Intermediate care” and requirement for future “surge”.’

- **The best way to build flexible capacity needs to be explored**

We need a system that enables flexible capacity for the frequent and seasonal surges in demand that often affect sub-Level 3 patients, with their varied requirements for nursing and therapist input. The capacity to safely accommodate periods of surge demand will need to be able to operate in an integrated manner with the non-surge services, to allow usual services to continue. Surge capacity will need to consider what is required to safely manage a range of patients, including those with tracheostomies and requiring acute non-invasive ventilation, as well as how we might work flexibly across traditional boundaries between intensive care and other services, within and across trusts. An important consideration when considering capacity across network is the feasibility of moving resources – including staff - around a network.

Survey findings:

Concerns about ‘capacity’ ranked in the top two items for both questions

- **13.6% of respondents** voted increased capacity as the change to maintain for the next 20 years
 - 44 respondents (62%) specified this as workforce capacity
 - 19 respondents (27%) referred to this as bed capacity
- **12% of respondents** voted capacity constraints as the single thing to lose over the next 20 years
 - 18 respondents (31%) referred to beds and 16 (28%) referred to workforce

Reduced Staff- to- patient ratios was the third most commonly mentioned change to lose for the next 20 years – cited by 8.9% of respondents

- 6 of the 43 respondents made specific reference to ratios being disproportionate to need at lower levels of care

Priority questions for research

- How should we **categorise patient care needs** so we can design an infrastructure and staffing model based on those needs?
- What is the role of **intensive care in the acute patient journey** from the community, through hospital, and back to the community once again? How do outreach and follow-up/rehabilitation services integrate into that journey?

3 Who should staff intensive care?

In recent months, intensive care staff have worked alongside colleagues from other disciplines and non-critical care specialists on a daily basis. The COVID-19 pandemic required rapid adaptation of previous intensive care working practices and provided a rich experience to understand essential tasks that need to be delivered. Panel members highlighted the following:

- **A multidisciplinary intensive care team is valued, but is not consistently recognised, available, or used within all hospitals, and the allied health professions integral to the delivery of high-quality of care are often not adequately represented in intensive care management structures**

The many allied health professionals providing vital input to patient care are rarely directly employed by intensive care services, but rather are often shared across hospital services. One study of critical care pharmacists found that only 5% were actually employed by critical care^[3]. There is wide variation in how included allied health professionals feel as part of the intensive care team – some feel well integrated, while others such as speech and language therapists do not^[4].

'We have embedded clinical pharmacists who are superb, but I look at speech and language therapy input in other Trusts and I am very jealous those units have someone with those skills and capabilities. How do we put those little beacons of brilliance into all units?'



Image: a few members of the intensive care team, University Hospital Coventry



Image: the intensive care therapy team, University Hospitals Plymouth NHS Trust

- **Some work can be shared across disciplines**

The flattened hierarchy, teams-based approaches and task-focussed work occurring during the COVID-19 pandemic have encouraged staff to *'listen and learn from each other'* and *'share skills and blend a bit more'*.

It 'enabled us to think about all of the professionals available in our teams'.

'Historically, critical care nurses have not been keen to relinquish their care activities. COVID-19 has pushed us to do this and provided us with the opportunity to perhaps review what the key activities are of critical care nurses, what should be retained or devolved'.

However, task-based approaches lose the holistic picture. No robust systems were put in place to evaluate the impact of these new models or structures of working on process, patient outcomes or experience, or staff experience and well-being.

The ability to benefit from multidisciplinary working in this way may be more limited for some district general hospitals who may have fewer staff resources to draw on.

- **Essential staff include non-traditional intensive care providers, and non-clinical staff**

We must consider how we ensure wider support for roles essential for intensive care provision such as IT, data analysts, and other technical non-healthcare staff, as well as supporting the roles of non-traditional intensive care providers such as ODPs.

'When people get really busy, having others who can set up CPAP, filters, run through transducer sets is invaluable'.

- **Capacity within the consultant-level medical workforce has limited for surge**

Anaesthesia and many other specialities have joined intensive care teams during the pandemic. Many of them have relevant specialist skills, e.g. Anaesthesia, ENT, Emergency, Acute, and Respiratory Medicine specialists. Intensive care will need to consider how to develop more collaborative working with both other hospital specialties, and non-medical practitioners (e.g. Consultant Therapists).

Priority questions for research

- **What are the roles required** to deliver high-quality intensive care across an organisation?
- How do we **quantify the required non-healthcare provider staffing** needed with intensive care?
- How do we **integrate nursing and other clinical roles**? What is the impact of doing that on staff retention & patient outcomes? What have we learnt from the introduction of ACCPs about how to address workforce gaps?

Survey findings:

Increased multidisciplinary team working was the most commonly mentioned change to keep for the future, cited by 13.8% of respondents, referring to collaboration with other disciplines and specialisms both within and outside of the intensive care unit.

- **12% of respondents** voted capacity constraints as the single thing to lose over the next 20 years
 - 18 respondents (31%) referred to beds and 16 (28%) referred to workforce

Lack of multidisciplinary working was highlighted as a something to lose by **5% of respondents**.

- Approximately half reported issues in working between medical specialties, while seven out of 26 made specific reference to not having enough allied health professionals on the ICU.

4 How should we develop intensive care staff?

Intensive care requires the provision of specific knowledge and skills. The COVID experience has forced employment of strategies to both rapidly cross-skill a non-specialist workforce, and up-skill or refresh skills in junior or former intensive care staff. One legacy of COVID will be a breadth of available training resources, although our panel recognised that the rapidity of deployment means the quality of this training has been under-evaluated. The following were the key observations from the panel:

Regarding training in general:

- **The qualification(s) necessary to work in intensive care are not well defined**

Accreditation opportunities in intensive care remain limited outside of the medical specialty training scheme and the advanced nurse practitioner programme. There may be merit in working across disciplines to iterate and co-develop standards/competencies that are specific for intensive care.

- **Barriers to training exist, in particular for allied health professionals**

Many of the non-medical workforce have minimal study leave or funding support to progress their educational development. Furthermore, for all staff groups, there is a tension between balancing educational needs against the need to deliver a service, with time to access training further diminished due to need to fill rota gaps; A finding echoed in a Critical Care workforce analysis for the Welsh Government^[5]. Technological solutions that offer blended online and in-person approaches, and lower cost, may enable reductions in both the time and costs required for training. Clear leadership is also needed from all intensive care professions to support their members and address this professional inequality.

Regarding experiences from the COVID-19 first wave:

- **Multidisciplinary training opportunities are valued**

As discussed during Question 3, training alongside other disciplines has offered a breadth of informal sharing of knowledge and experience that has been particularly valued, for example by offering suggestions for eye protection during proning by an ophthalmologist.

- **Task-focussed training can be rapid, but deeper understanding is often limited**

Task-focussed training and the use of standard operating procedures have enabled rapid training in discrete tasks, although the depth of understanding that results is often constrained.

'We had to just give them basic grounding, not in depth. For example, they might not pick up interactions'.

'This was good for the what and the how but not the why'.

- **Simulation-based and immersive training techniques** were thought to be particularly effective, although robust data are lacking to support this view in the intensive care setting, and they are not currently available to all staff.

'When given immersive experience Band sixes were able to step up. I think a lot of non-specialist staff, among all specialities, have the capabilities to work in critical care.'

- **Debriefing has been commonly used but optimal practice is still not known**

Responding to COVID has driven the trialling of rapid learning processes to identify problems and initiate improvements in real time. **Debriefing** is one such practice that is generally supported, but there is a need to understand which models or individual components are most conducive to disseminating and implementing the changes required, and how to support all staff to engage with the process.

- **COVID has presented the opportunity to train a 'reservist' workforce but how should their skills be maintained?**

The crucial role has emerged of a 'reservist workforce' who can be called upon at times of surge. During COVID they have been drawn from anaesthetists and a range of non-intensive care staff across all disciplines, who now have had training and some experience. Maintenance of their competence in a time of business-as-usual presents a challenge that needs to be addressed.



Priority questions for research

- **Can we map competencies across the breadth of the multidisciplinary team?** – what are the core skills necessary for all intensive care staff, and where does each professional bring unique competence?
- How do we **analyse changes to training and education** to understand what has worked?
- How should we incorporate **debriefing** into routine practice, and how can we evaluate whether it is effective?

Survey findings:

The process for training and accreditation in Intensive Care Medicine was frequently mentioned:

- **12% of respondents** voted changes to intensive care medicine training as the single thing to lose over the next 20 years
- **11.8% of respondents** chose training as the single thing to keep going forwards

Increased opportunities for non-medical training were raised by 20 (3.8%) of respondents as being the single thing to keep, with a similar number citing barriers to training such as lack of time and funding to take up CPD opportunities being the single thing to lose



Image above: Gloucestershire Critical Care Team

5 How do we know how good we are?

Measuring outcomes following intensive care has often focussed on standardised mortality ratios at certain timepoints in the patient journey (e.g. discharge from ICU or hospital). Such endpoints provide unidimensional and short-term indicators of outcome, missing many other important aspects of health service quality and patient experience. The following key themes emerged as particularly pertinent to assessing quality of intensive care provision:

- **We need to understand what is important to all our end users – including patients, staff, families/caregivers, and commissioners – to understand what we need to measure**

This should be the basis for deciding relevant metrics for routine data collection, and is necessary to identify and bridge gaps between what is prioritised by service commissioners, and what is prioritised by patients and families.

'We need to go and talk to our patients more.'

- **Understanding what happens after discharge from the ICU is critical**

As raised in Question 1, we do not have good information to share with our patients about what they might reasonably expect after experiencing intensive care. Follow-up of patients in primary or secondary care – is imperative, as is a core outcome set for intensive care, which links to data on medium and longer term functional and well-being outcomes alongside mortality.

'How sad is it that we haven't collected this data in 25 years?'

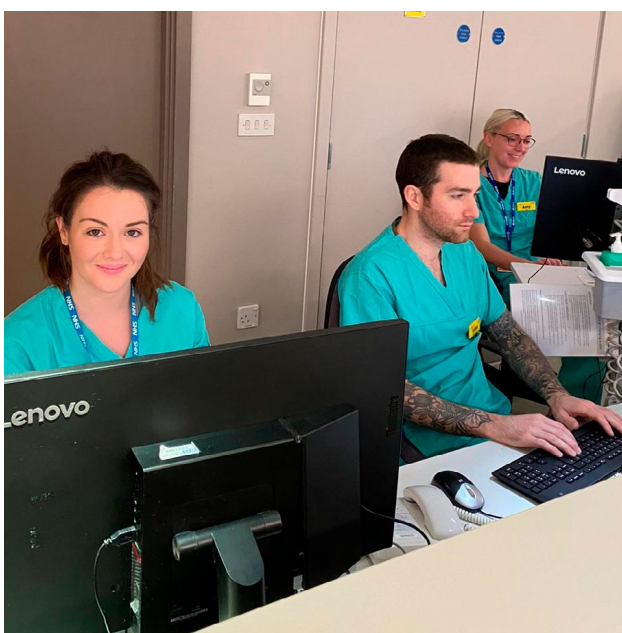


Image above: intensive care physiotherapists, Heath hospital, Cardiff

- **Qualitative outcomes need to be captured – and acted upon**

The important qualitative outcomes were viewed as being currently neglected by commissioners and research funders, including patient experience on and after step-down from intensive care units, and staff experience of working in intensive care. Qualitative outcomes may also be particularly relevant for evaluating the role critical care outreach teams play in supporting healthcare provision outside intensive care units. Data collection in and of itself is not sufficient, there needs to be a mechanism for the implementation of change based on data collected, and subsequent evaluation of the impact.

Of note, there may be a tension between staff/patient experience and outcomes, which is important to understand, and may have implications for any proposed centralisation of services.

- **Expectation management - What can we do to improve public understanding of Intensive Care?**

The panel identified a need to counter the sometime over-optimistic presentation of intensive care outcomes in popular media. How might we play a role in managing patient and family expectations prior to ICU admission, as well as work with third-sector partners and various forms of media to improve society's understanding of our role and outcomes?

Priority questions for research

- What do the **end users of intensive care - patients, families & staff** – think is important to measure?
- What should **Trusts measure** and how can they act on their findings?
- What are the important **longer-term outcomes** for patients?
- What is the most effective way for us to **engage with the public and society** to communicate realistic expectations for outcomes following intensive care?

Survey findings:

The increased focus on rehabilitation was cited by 4% of respondents as the one change to maintain going forwards

- Unanimous among these responses was reference to the increased availability of therapists and facilities on ICUs to enable early rehabilitation

6 What is the role of research in intensive care?

Research is integral to improving patient care and outcomes. High quality research remains the optimal way of assessing the effectiveness of therapeutic interventions and understanding healthcare quality.

- **All intensive care services should be supported in being ‘research active’**

All staff members can play important roles in the research process, from idea generation through to implementation of evidence-based care at the bedside. A framework for considering a research active workforce is illustrated in Figure 1.

- **Research is not currently equally embedded across intensive care, nor is it considered an integral part of their role by most staff**

Not all intensive care services prioritise research, or embed it in their practice, and this is likely influenced by the culture of the local leadership. Non-medical staff engagement with research is often patchy. One major impact of the variability of research engagement is inequality in the opportunity for patients to participate in clinical trials.

‘We need to do something about unit culture.’

‘It is doctors that do that.’

‘Often your own profession don’t support you.’

- **There is inequality in access to opportunities for intensive care staff to be involved in research – particularly in non-medical roles**

Some staff groups have less opportunity to engage in research as part of personal professional development than others, this inequality exists across all disciplines, but was particularly voiced by members of the non-medical workforce:

‘Medicine has been much better at supporting the clinical academic model. We’re playing catch up in nursing and AHP world.’

‘How do we support young researchers coming forward? We are a small speciality and have to go to the big funders.’

- **Mentors and role models are important in the development of researchers**

For those who do wish to become researchers, identifying mentors and role models is critical, alongside wider support networks. The intensive care community should look to develop ways of supporting mentoring and support networks focussed on the needs of early career and non-medical researchers.

Figure 1: Adapted from the Framework of research involvement, indicating the four different levels based on the descriptors of Wylie-Rossett and colleagues^[5] and the British Dietetic Association^[6]



Priority questions for research

- How can we ensure **equitable access to research for patients**?
- How can **we make access to research opportunities** competency rather than professional based?
- How can we support cultural change **and embed research across all of intensive care** to improve patient's access to research participation?

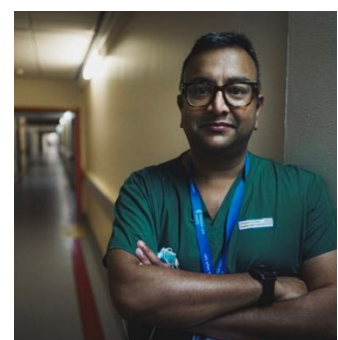
Survey findings:

Use of data and evidence to inform practice was mentioned as the choice of **4.3% of respondents** as the single change to maintain in intensive care

- This included references to evidence-based medicine, research and audit including reference to specific programmes, protocols, and guidelines such as ICNARC and GPICS

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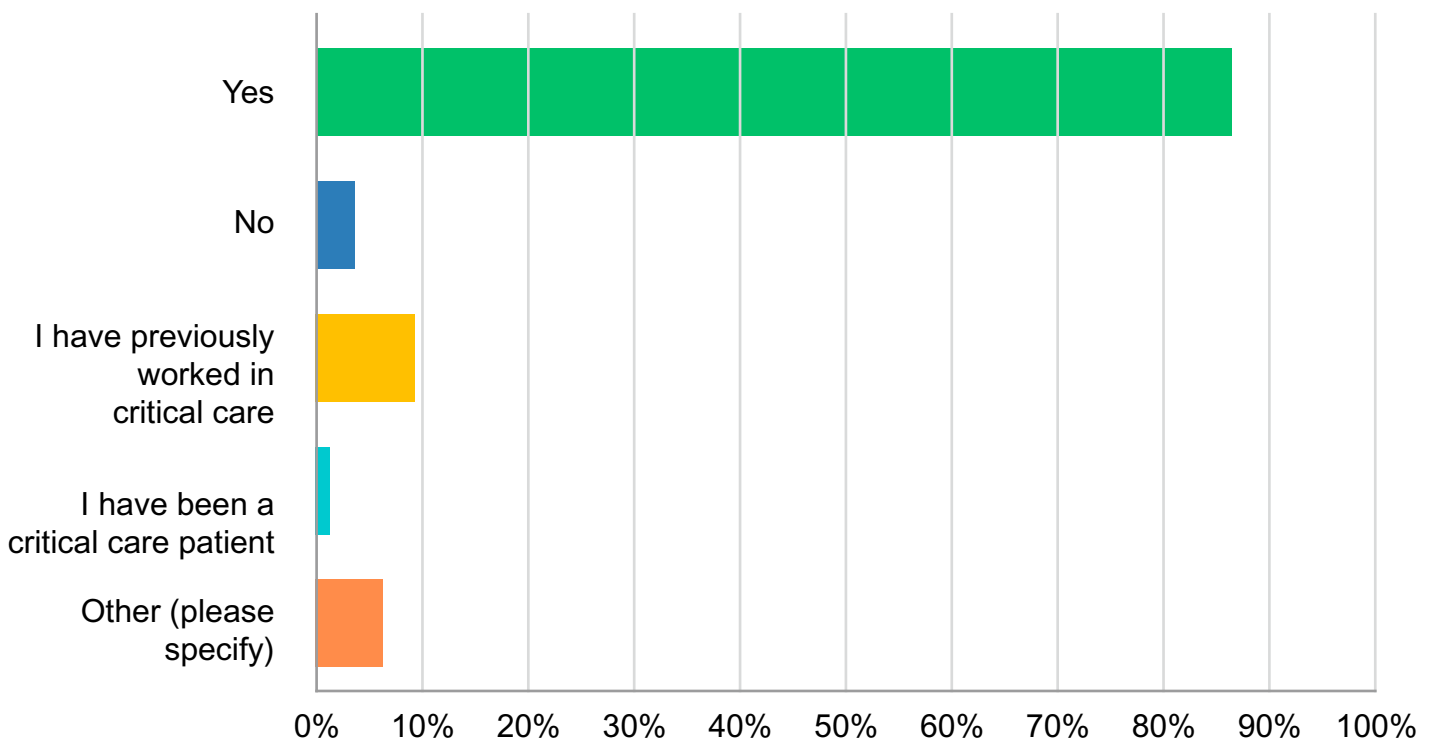
The survey

To seek the views of the intensive care community, an online survey was available from 30 April 2020 until 14 June 2020.

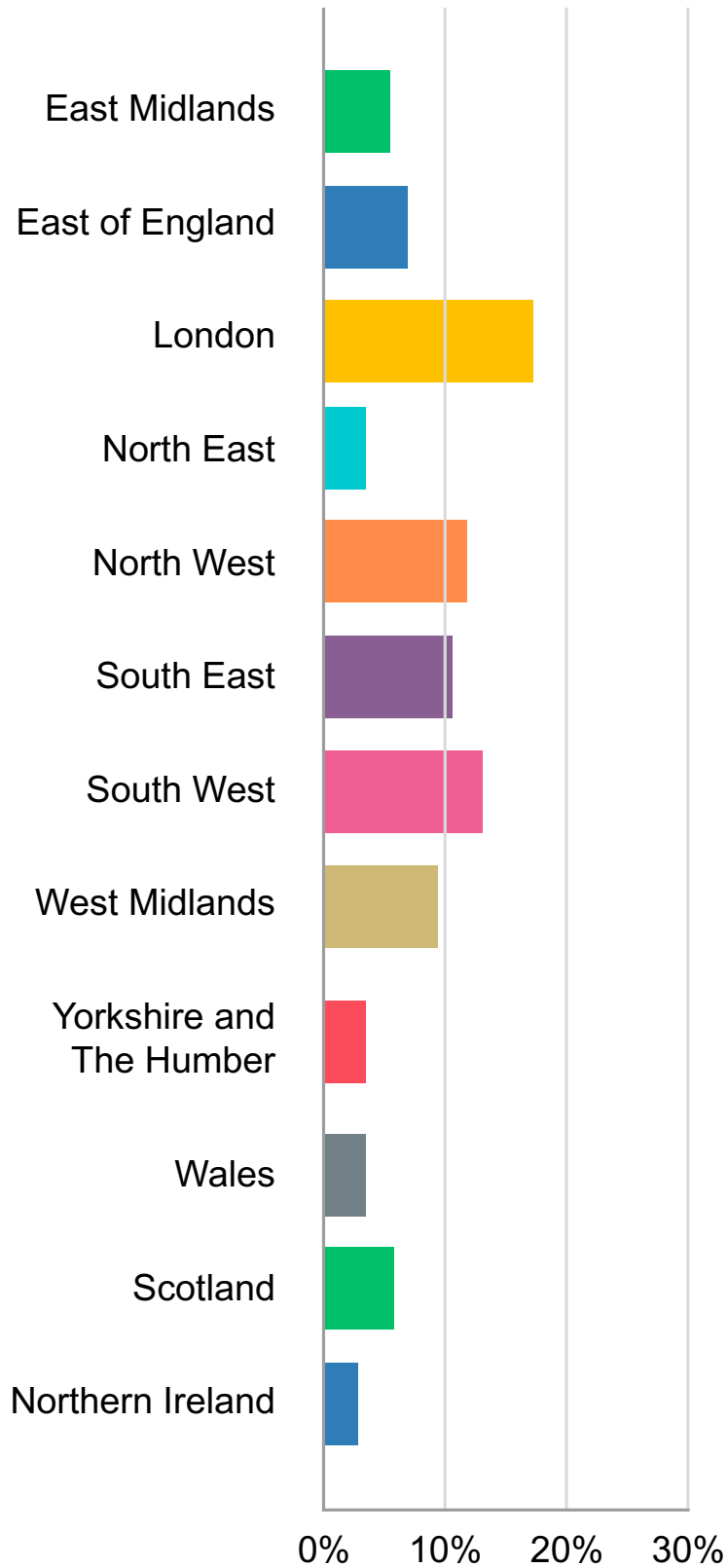
Survey respondents

There were 516 unique participants, the vast majority (86%) of whom reported they currently working in intensive care. Respondents were based across all regions of the UK – the highest proportion were from London (18.3%), the South West (13.75%), and the North West (12.75%), and the fewest were from Northern Ireland (3.39%).

Do you currently work in critical care?



In which region of the UK are you based?



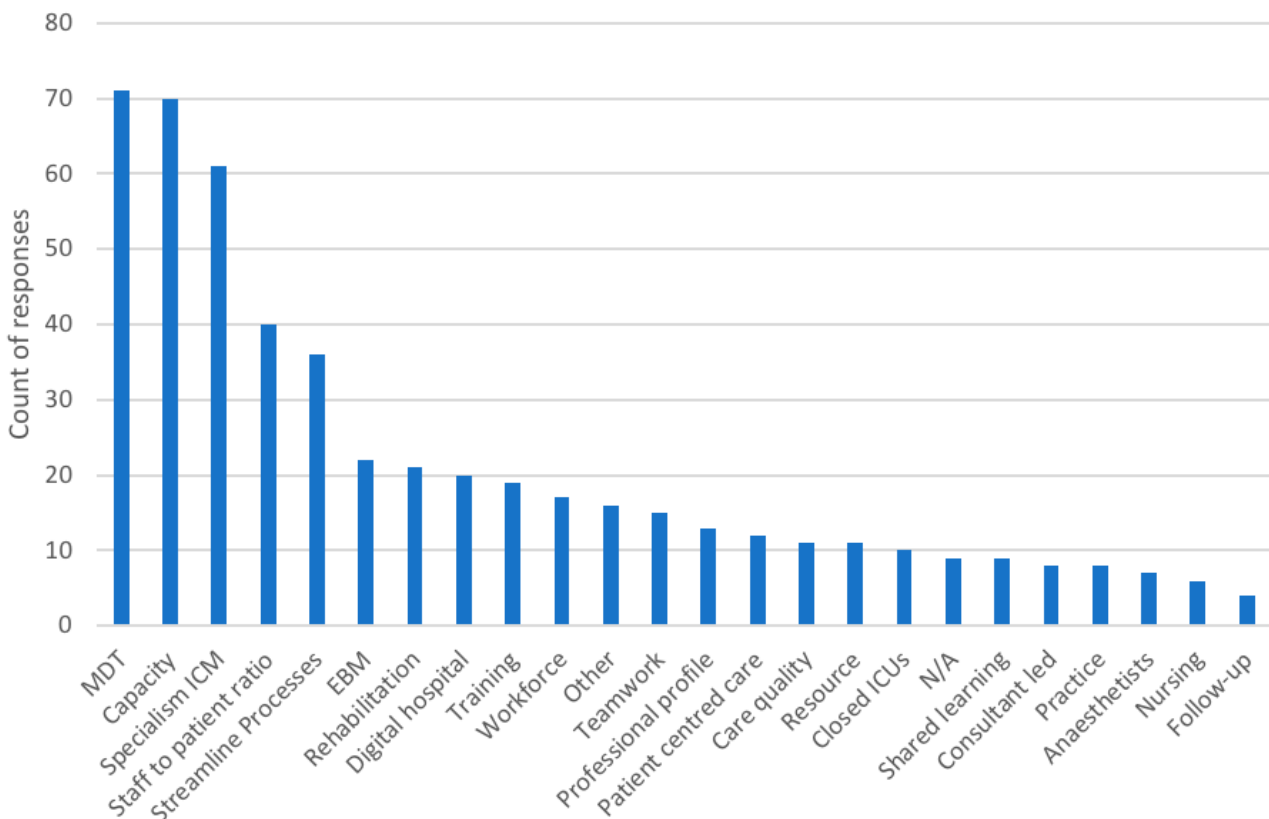
Survey Responses

The survey asked the following three questions:

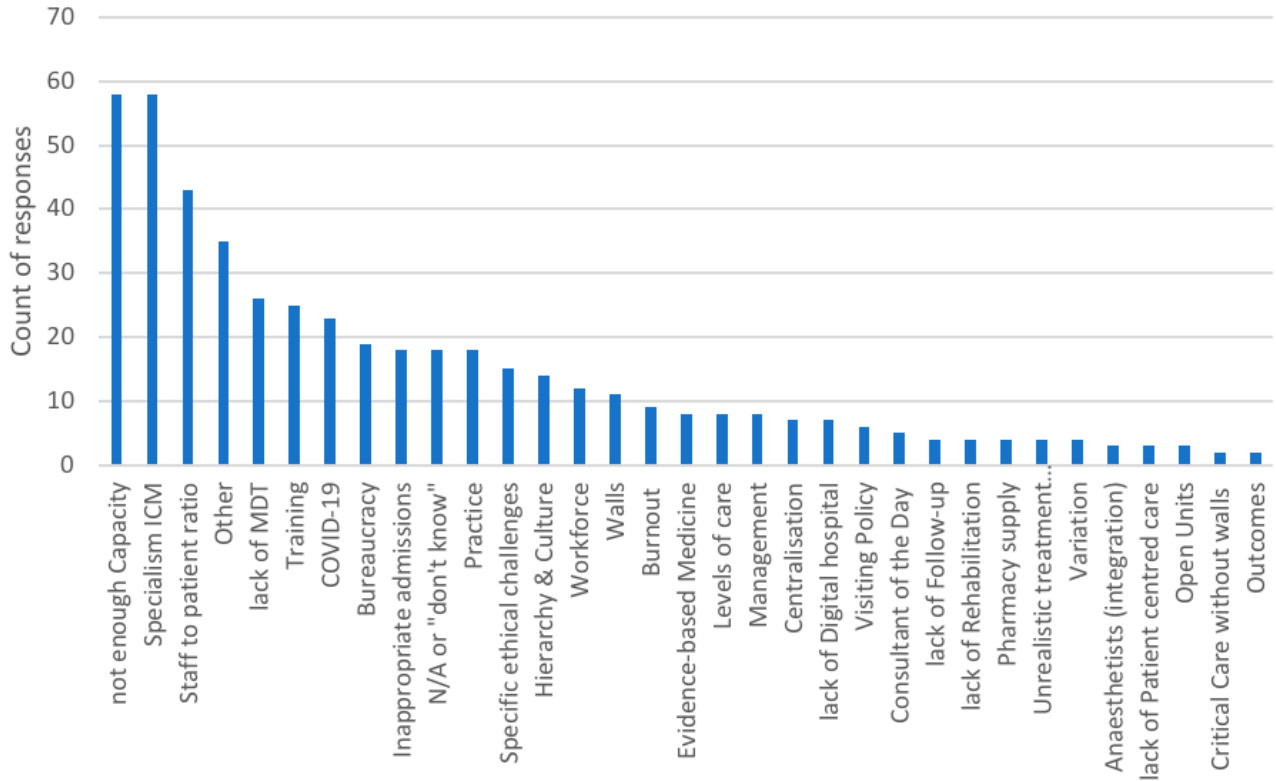
1. What single change relating to critical care would you most like to keep?
2. What single change relating to critical care would you most like to lose?
3. Please share below any additional thoughts you may have regarding how critical care should develop over the next 20 years.

All responses were in free-text format. Responses were coded and allocated to broad categories to understand the areas that were most frequently cited, as an indicator of strength of opinion.

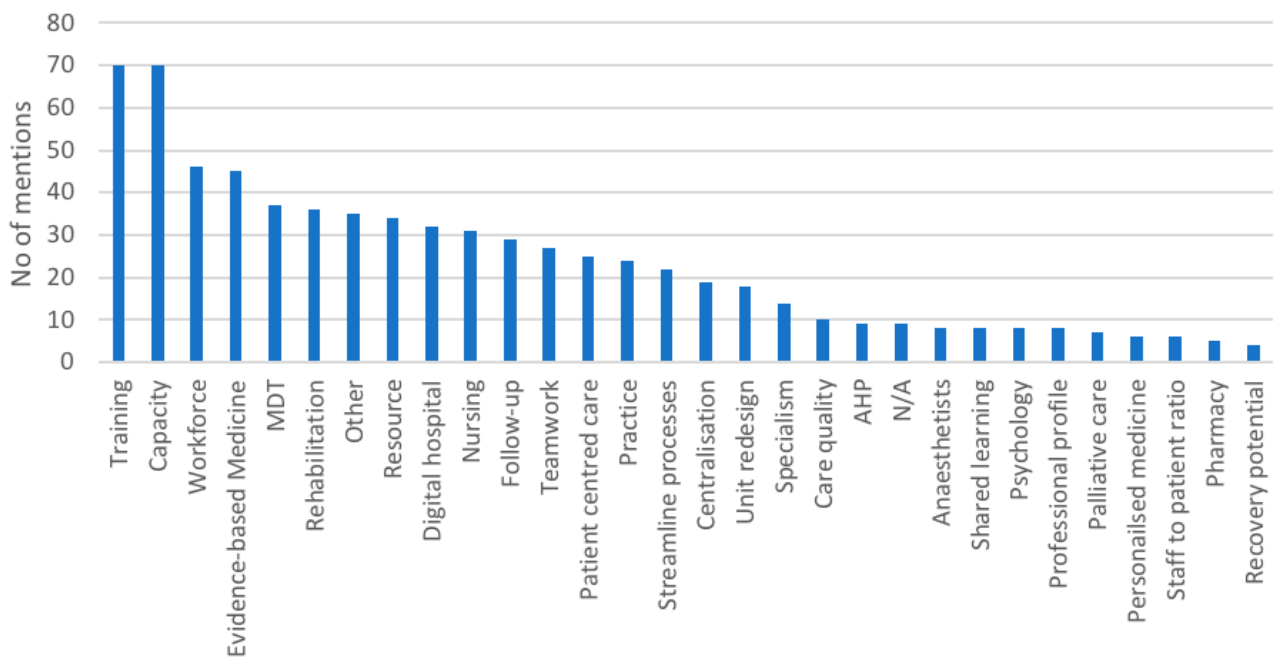
Q1: What single change relating to critical care would you most like to keep?



Q2: What single change relating to critical care would you most like to lose?



Q3 - Please share below any additional thoughts you may have regarding how critical care should develop over the next 20 years.



Intensive care 2020 and beyond participants

Stakeholder organisations represented

Intensive Care Society

Paediatric Critical Care Society

Association of Anaesthetists of Great Britain and Ireland

Royal College of Anaesthetists

Royal College of Nursing

Faculty of Intensive Care Medicine

NHSE Critical Care Clinical Reference Group

Intensive Care National Audit and Research Collaborative

Critical Care Networks

Getting it Right First Time / Critical Care Leadership Forum

Scottish Intensive Care Society

UK Critical Care Research Group

National Institute for Health Research

British Dietetics Association

British Association of Critical Care Nurses

The Association of Chartered Physiotherapists in Respiratory Care

Royal College of Occupational Therapists

Royal College of Speech and Language Therapists

UK Critical Care Nursing Alliance

Psychologists in Critical Care UK

Abbreviations

ACCP	Advanced Critical Care Practitioner
COVID	Coronavirus Disease 2019
CPAP	Continuous positive pressure ventilation
GPICS	Guidelines for the Provision of Intensive Care Services
ICU	Intensive Care Unit
ICNARC	Intensive Care National Audit & Research Centre
NIV	Non-invasive ventilation
ODP	Operating department practitioner
ODN	Operational Delivery Networks
SOP	Standard operating procedure

Glossary

Level 0 - Patients whose needs can be met through normal ward care in an acute hospital.

Level 1 - Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team.

Level 2 - Patients requiring more detailed observation or intervention including support for a single failing organ system or post-operative care or those 'stepping down' from Level 3 care.

Level 3 - Patients requiring advanced respiratory support alone, or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure.

Contributors

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