


# The impact of coronavirus disease 2019 pandemic on working dynamics of junior and middle grade doctors in the United Kingdom: Learning from their experience requires immediate improvement in health care planning and management—An outcome analysis of a nationwide survey

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## Abstract

**Objectives:** Severe acute respiratory syndrome coronavirus 2 (coronavirus disease 2019) pandemic had an unprecedented impact on health services across the world resulting in increased demand of intensive care capacity, opening Nightingale hospitals, and mass movement of doctors across various specialities. This unplanned redeployment raised concerns among various health care workers. The objective of the current study is to explore working dynamics and experience of junior and middle grade doctors during current pandemic.

**Methods:** We organised a nationwide cross-sectional survey of junior and middle grade doctors working in the United Kingdom. The survey was aimed to study their level of participation during coronavirus disease 2019 pandemic and its impact on their clinical practices and well-being.

**Results:** In total, 1564 completed questionnaires with representations from all regions of the United Kingdom were included. The mean age of respondents was 30.64 years (95% confidence interval +1.025; standard deviation = 9.9057). There were 51.5% females with significantly more participants from Black, Asian, and minority ethnic group ( $n=835$ ,  $p=0.0073$ ); 963 (61.6%,  $p \leq 0.0001$ ) doctors were redeployed outside their primary speciality. The major redeployments were from other specialities to Intensive Therapy Units (41.8%,  $p \leq 0.001$ ); 63.3% of respondents spend more than 8 weeks in redeployed speciality ( $p \leq 0.0001$ ). There was a significant impact of coronavirus disease 2019 on personal, mental, and physical well-being of doctors. The major areas requiring immediate attention include proper leadership and clinical support (64.1%), pre-deployment planning and induction (48.5%), redeployment according to the skills and/or in familiar specialities (44.6%), and regular mental and physical well-being checks (37%).

**Conclusion:** The outcome of the survey concluded with four major recommendations, including the need to have a named supervisor for these doctors, structured induction program, regular well-being checks, and involving them in crisis planning. These recommendations will help to shape future health care policies and management particularly when it is related to redeployment of doctors during any crisis or pandemic.

## Keywords

Coronavirus disease 2019, health care planning and management, junior and middle grade doctors' workforce

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## Introduction

The first case of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (coronavirus disease 2019 (COVID-19)) in the United Kingdom was reported in February 2020.<sup>1</sup> The pandemic reached its first peak during March and April followed by a second peak in September and October. During the first peak of this pandemic in April 2020, there were about 20,000

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in-patients with COVID-19, with more than 3200 admitted in intensive care units for mechanical ventilation.<sup>2</sup> Latest figures have shown that during second surge, there are more than 18,000 in-patients with more than 1300 on ventilators.<sup>2</sup> This resulted in increased demand of intensive care capacity, opening Nightingale hospitals, and mass movement of doctors across various specialities to provide acute care for patients. In addition to these challenges, there has always been winter pressure on hospital capacity resulting in opening of new winter pressure wards. This mass influx of patients has resulted in large-scale movement and redeployment of doctors, nurses, and other medical and allied medical professionals.<sup>3</sup> There are around 59,259 doctors in training and 43,147 registered doctors in non-training posts in the United Kingdom,<sup>4</sup> including around 20,000 staff grade, associate specialist and speciality doctors (SAS) doctors.<sup>5</sup> These doctors are major workforce of National Health Service (NHS) who have worked tirelessly with passion and dedication by rapidly adapting to their new roles and responsibilities. However, when moved out from their scope of practice, there have been concerns about patient's safety, working within good medical practice (GMC) guidelines, and indemnity covers. This has resulted in additional anxiety, stress, and burnouts. To better understand these issues, we conducted a nationwide survey of junior and middle grade doctors to gauge insight into their experience while working during this pandemic, and also asked about their opinion on how to better prepare for future. To our knowledge, this is the largest reported junior and middle grade doctors' cross-sectional survey from the United Kingdom.

## Methods

### *Study design and sample size*

We designed a nationwide cross-sectional survey to understand the impact of COVID-19 pandemic on junior and middle grade doctors working for NHS in the United Kingdom. The survey was designed to record their primary speciality, redeployment dynamics, impact of COVID-19 on their clinical work, and personal well-being. We used single-item measures of emotional exhaustion (EE) and depersonalization (DP) for assessing burnout.<sup>6</sup> [survey proforma is available as online supplemental material] There are around 100,000 junior and middle grade doctors working in training and non-training posts across the United Kingdom.<sup>5</sup> We calculated study sample size using 99.9% confidence interval and 5% margin of error from this workforce. We were required minimum of 1071 responses for the present study.<sup>7</sup>

### *Survey questionnaire validation*

In the process of development of the survey questionnaire, we first did its face validation by giving it to two senior clinicians who have carried out cross-sectional survey studies in the past, including one expert in the field of intensive care medicine. Due to time constraints, as a result of COVID-19

pandemic, we conducted a small pilot study on 20 junior and middle grade doctors who have been working and have been redeployed during COVID-19 pandemic. In response to face validation and outcome of the pilot study, we created our final study questionnaire.

## Study population

The survey questionnaire was randomly circulated to junior and middle grade doctors working in NHS UK. The questionnaire was sent by post, email, and handout. The survey was aimed to see their level of participation during COVID-19 pandemic, issues related to redeployment, their experience and learning from the pandemic, physical and mental challenges, induction and support provided to them, their personal well-being, willingness to participate in possible subsequent waves, and their suggestions about how to better use junior and middle grade doctor workforce in future.

### *Data collection and statistical analysis*

The survey remained opened for one calendar month from 1 to 30 June 2020. We received 1627 responses, which gave less than 4% margin of error with 99.9% confidence level; 63 responses were excluded from the study, including 46 incomplete responses and 17 responses from doctors who did not work during peak of this pandemic. Microsoft Excel and MedCalc statistical software programs were used for data analysis. Baseline characteristics were compared using *t* test, Fisher's exact test, or Chi-square test where appropriate. Probability value and odds ratios were calculated where required. Linear regression plots are used to study the relationship between various dependent and independent variables and presented as scatterplot.

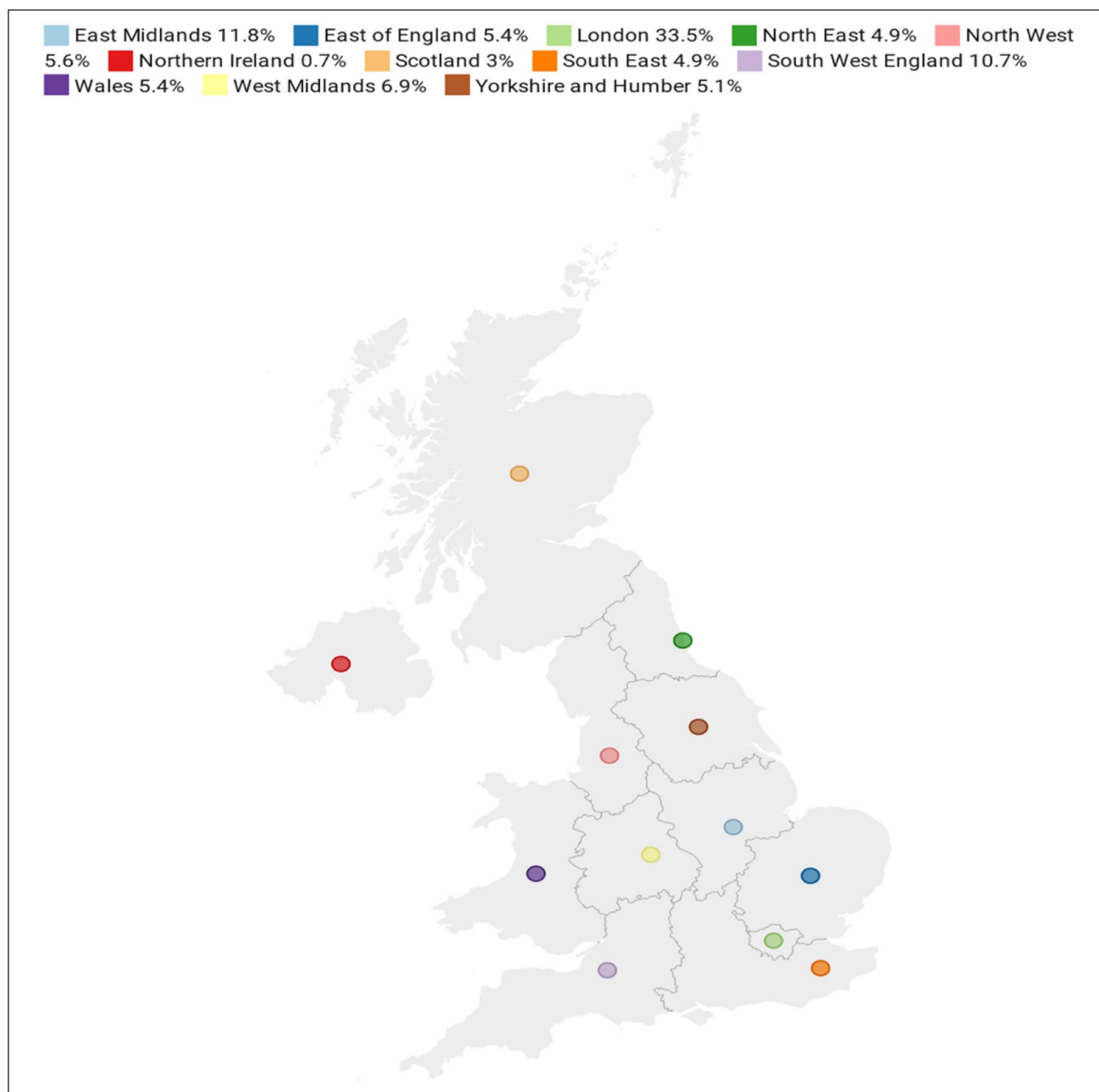
### *Consent and ethics*

The study was approved by the Department of Clinical Governance at St George's University Hospitals NHS Foundation Trust, London, under registration number AUDI000941-2021. We used Medical Research Council UK and NHS Research Ethics Committee online toolkit to confirm that this survey does not require their ethical approval. In the introduction section of the questionnaire, all participants were asked for their consent to use their data for publication. We received 100% consent rate.

## Results

### *Geographical distribution and general demographics of study population*

In total, 1564 completed questionnaires from doctors who have been working during COVID-19 pandemic were included in this current study. All regions of the United Kingdom were well represented (Figure 1). The mean age of respondents was



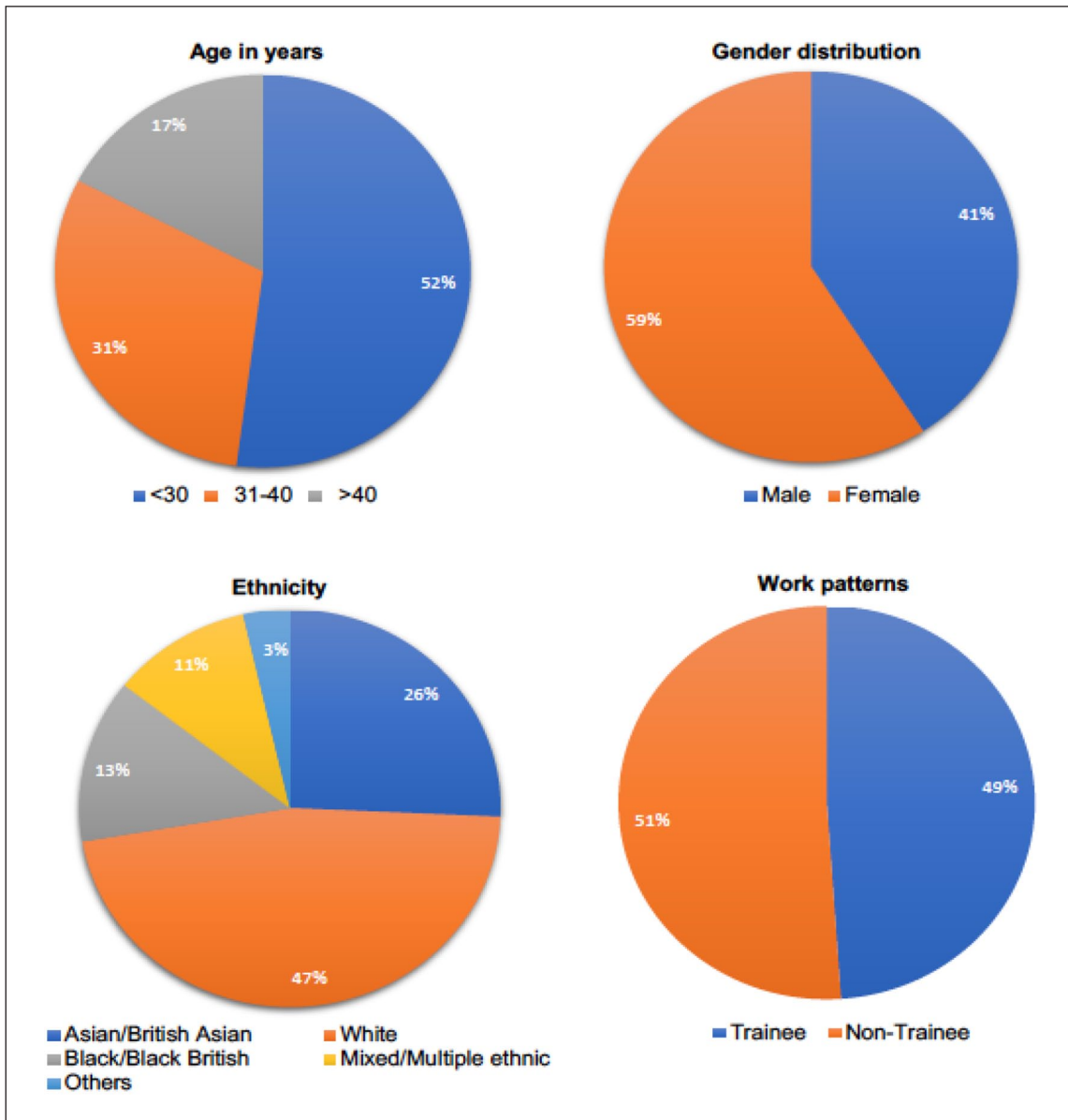
**Figure 1.** Geographical distribution of participants.

30.64 years (95% confidence interval (CI)  $\pm 1.025$ ; standard deviation (SD)=9.9057). There were 51.5% females with significantly more participants from Black, Asian, and minority ethnicity ( $n=835$ ) compared with White ( $n=729$ ) ( $p=0.0073$ ). There was no difference between training ( $n=765$ ) and non-training ( $n=799$ ) doctors ( $p=0.3899$ ; Figure 2).

### **Impact of COVID-19 on various specialities and redeployment dynamics**

All major specialities were well represented in the current study (Figure 3). Out of 1564 respondent, 963 (61.6%) were

redeployed to other specialities ( $p \leq 0.0001$ ). Majority of these redeployments were from medicine and allied specialities (54.7%) followed by surgery and allied subspecialities (22.1%), anaesthesiology (14.1%), and other minor specialities (9%). The major redeployments were from other specialities to intensive therapy unit (ITU)/critical care units (CCU) (41.8%;  $p \leq 0.001$ ) (Figure 4(a)). This was secondary to expansion in critical care capacity across all hospitals particularly in tertiary care hospitals (Figure 4(d)). Majority of deployments were from medicine and allied specialities (54.4%;  $p \leq 0.0001$ ) (Figure 4(b)); 63.3% of respondents spend more than 8 weeks in redeployed speciality



**Figure 2.** General demographics of study population.

( $p \leq 0.0001$ ) with majority of doctors from medicine followed by anesthesiology (Figure 4(c)). In general, anesthesiology and medicine and allied were more significantly affected specialities by this mass redeployment.

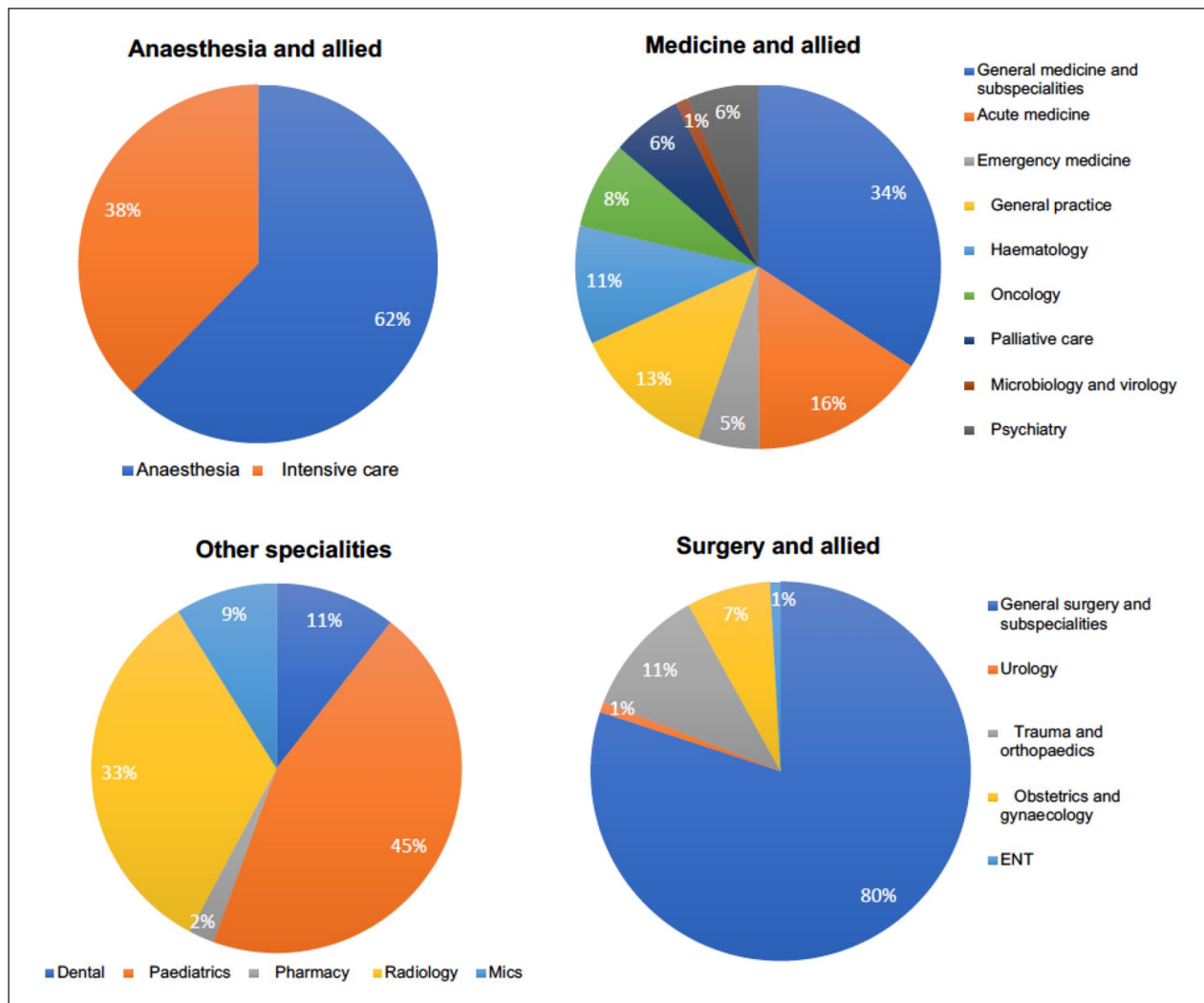
### *Impact of COVID-19 on doctors' clinical practice, performance, and well-being*

Majority of doctors had an impact of COVID-19 on their clinical practices irrespective of the fact if they stayed in their primary speciality or redeployment elsewhere (Table 1). This all happened due to unfamiliar surroundings, increased work demand, nature of COVID-19 disease causing sudden deterioration of the patients, and rapid influx of

patients to hospitals. This unprecedented work intensity required more support for junior and middle grade doctors, which unfortunately was not readily available that resulted in more adverse impact on physical and mental well-being of these doctors (Table 1). When burnout was gauged using single questions with the highest factor loading on the EE and DP, 85.25% ( $n = 1333$ ) and 64.7% ( $n = 1012$ ) responded positively, suggesting very high impact of COVID-19 on doctors' well-being.

### *Areas of improvement for future*

Various areas for improvement were suggested. Among others, the major areas requiring immediate attention were



**Figure 3.** Representation of different specialities in the cross-sectional survey.

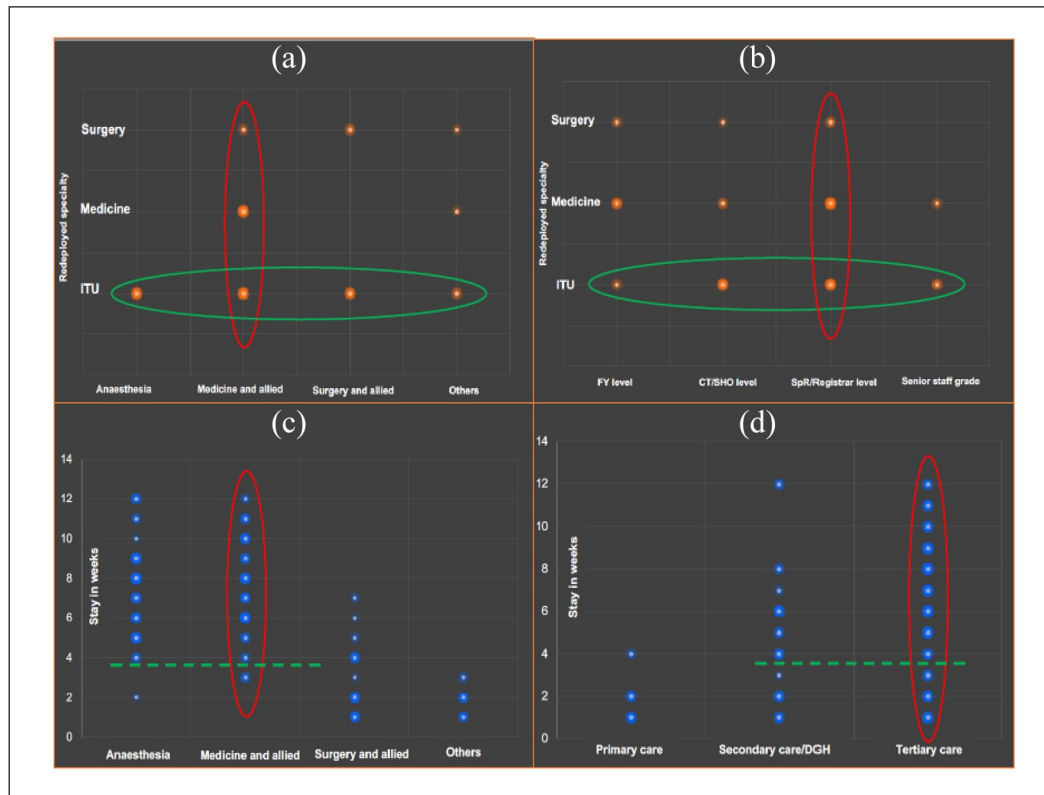
proper leadership and clinical support (64.1%) followed by pre-deployment planning and induction (48.5%), deployment according to the skills and/or in familiar specialities (44.6%), and regular mental and physical well-being checks (37%).

### Discussion

COVID-19 pandemic had an unprecedented impact on health care services across the world. In the United Kingdom, the pandemic resulted in national response by increasing NHS critical care capacity by increasing intensive care beds in hospitals, opening Nightingale hospitals, and mass movement of doctors across various specialities to provide acute care services for patients. This cross-speciality rapid mass movement of junior and middle grade doctors not only required rapid learning and adaptation of new knowledge and skills by them but also put them under intense pressure.<sup>8</sup> To our knowledge, this is the largest

cross-speciality national survey of junior and middle grade doctors working during COVID-19 pandemic. The survey had good representation from female, Black, Asian and minority ethnicity (BAME), and training/non-training doctors, which makes this more reliable to represent junior and middle grade doctors' views across the United Kingdom. Majority of doctors were moved from other specialities to cover critical care units. This was due to increase demand of intensive care beds, staff sicknesses, and self-isolations.<sup>9-11</sup> Majority of redeployment to ITU was from anaesthesia due to airway training, but there were doctors moved from other specialities with no airway training.<sup>12-15</sup> Majority of these doctors were pulled out from medical specialities to cover critical care units. Other specialities were also affected by this mass redeployment to cover unfamiliar specialities resulting in stress and anxiety among these doctors. Burnout syndrome is generally more common among ITU doctors.<sup>16,17</sup> This is due to the higher and stressful workload and need for specialised skills in





**Figure 4.** Redeployment dynamics during COVID-19 pandemic: (a) primary speciality to redeployed speciality dynamics, (b) level of experience to redeployed speciality dynamics, (c) primary speciality and length of deployment dynamics, and (d) hospital type and length of deployment dynamics.

**Table 1.** Impact of COVID-19 on junior and middle grade doctors working during pandemic.

Impact of COVID-19	Cohort A ( <i>n</i> =963) Redeployed to another speciality		Cohort B ( <i>n</i> =601) Stayed within allied speciality		RR	OR	<i>p</i> value
	Yes	No	Yes	No			
Routine clinical practice	936	27	531	70	1.1	4.57	<0.00001
Mental well-being	901	62	432	169	1.3	5.69	<0.00001
Physical well-being	895	68	498	103	1.2	2.72	<0.00001
Personal/family life	932	31	554	47	1.05	2.55	<0.000048
Leadership support	257	706	289	312	1.41	2.54	<0.00001
Debriefing and feedback	286	677	307	294	1.59	2.15	<0.00001

COVID-19: coronavirus disease 2019; OR: odds ratio; RR: relative risk.

intensive care units.<sup>18</sup> There is also higher dependence on colleagues to carry out even simple tasks due to compromised airway.<sup>19</sup> Majority of doctors who were redeployed to ITU felt that pressure due to lack of their experience in dealing with such critical cases. Lack of senior support and leadership in unfamiliar surroundings made a bad situation even worse and increased their stress and anxiety. Many studies have shown that better leadership produces better outcome.<sup>20,21</sup> Lessons learned from Ebola outbreak emphasised the importance of better leadership in disease outbreaks.<sup>22,23</sup> Doctors redeployed to other non-ITU specialities

had similar experiences. They also experienced higher workload due to colleague sicknesses, shielding, or self-isolation. In addition to that, doctors working outside ITU faced additional challenges of lack of personal protective equipment (PPE) particularly during first surge.<sup>24</sup> PPE itself not only affected the personal performance of the doctors but also resulted in prolonged delay in patients' turnover.<sup>25</sup> Other challenges included delays in getting investigations due to increased transit time through various departments, risk of COVID-19 infection from non-symptomatic patients requiring acute care,<sup>26</sup> and adapting to

non-standard medical practices particularly in surgical specialities where laparoscopic procedures were converted to open surgeries.<sup>27-29</sup> All these new and sudden changes put intense pressure on all medical and non-medical staff. One of the other challenges faced by junior and middle grade doctors was to get a structured feedback at the end of their redeployment. Since there was no named supervisor, junior and middle grade doctors struggled to get structured feedbacks for their portfolios. This survey was designed to have a structured approach toward identifying doctors' issues and provide some solutions endorsed by these junior and middle grade doctors. We therefore recommend that when doctors are redeployed to other specialities, there should be small teams with a named leader and a senior person (recommendation 1). This will help to identify a single point of contact, who is easily approachable and available. It was also felt that there was no coordination between clinical and managerial teams and then between consultant and non-consultant grade doctors. Various published studies support including doctors in management planning with better outcomes.<sup>19-21</sup> Therefore, we recommend that junior doctors' representation should be part of redeployment planning (recommendation 2). This will not only help in initial workforce planning but will also provide continuous feedback, which in turn can help to tailor-made workforce deployments according to service need and availability of suitable junior doctors. Focused training results in better clinical outcomes. In the current era of medical practice, simulation training has helped to improve doctors' confidence, knowledge, skills, and communication. Various studies have shown that the patient outcomes are better when the team is well trained<sup>30,31</sup> and have good induction, particularly for junior doctors.<sup>32,33</sup> We therefore recommend that there should be structured training and proper induction program for doctors (recommendation 3), particularly when they are moved out of their current clinical scope of work. There is no doubt about the fact that mental and physical well-being is directly associated with better outcomes.<sup>34,35</sup> Our final recommendation, therefore, is to ensure regular debriefing and well-being checks of these doctors to ensure that they are mentally and physically well and are not getting burnt out (recommendation 4). It is very encouraging that the vast majority of these doctors are very understanding and flexible. They are willing to support the services under any crisis situation. Therefore, we emphasize that their views should be respected and be part of any future crisis planning. Learning outcomes from this study can also be used to support other medical and non-medical professionals, who have to work under such exceptional circumstances. There is published data highlighting various challenges experienced by senior medical,<sup>36,37</sup> nursing,<sup>38,39</sup> and other allied health care professionals.<sup>40,41</sup> The recommendation from our study can be used in setting up support network for these professionals.

Recommendations	Benefits and impact
1: Named leader and/or supervisor	<i>I. Available and approachable II. Better day to day planning III. Feedback and debriefing</i>
2: Representation in planning	<i>I. Better understanding of junior and middle grade doctor's issues II. Feeling of getting involved III. Sharing responsibilities</i>
3: Training and induction	<i>I. Better awareness of clinical expectations and working environment II. Better use of time and skills III. Better outcomes with less stress</i>
4: Regular wellbeing checks	<i>I. Avoid burnouts II. Better work-life balance III. Better patient outcome</i>

We acknowledge some limitations to our study due to the nature of the study and time constraints. This pandemic has impacted people in various ways, including their personal, social, emotional, and mental well-being. The current standard for burnout assessment is the Maslach Burnout Inventory (MBI), a well-validated instrument consisting of 22 items answered on a 7-point Likert-type scale. However, the length of the MBI can limit its utility in physician surveys and particularly during times of pandemic where doctors are already under extreme pressure. Therefore, we used the single questions with the highest factor loading on the EE and DP.<sup>6</sup> This is a well-validated tool that gives meaningful information on burnout in medical professionals. We acknowledge that it may not give all the required information about burnout for which a separate study is required.

## Conclusion

COVID-19 pandemic undoubtedly affected the entire world. It brought new challenges to the frontline workers who were never seen or known before. Among these workers, junior and middle grade doctors are a significant workforce who worked tirelessly under extreme and stressful conditions. The outcome of the survey concluded with four major recommendations to support these doctors. These included the following: the need to have a named supervisor for each doctor who can provide continuous support and mentorship, structured induction and training program that can provide an overview of what is expected and signpost resources, regular well-being checks to avoid burnout syndrome, and involving them in crisis planning by giving them representation in governance structure. We believe that these recommendations will not only help to shape future health care policies and management particularly when it is related to redeployment of junior and middle grade doctors during any crisis or pandemic but will also improve confidence of these doctors in health care support system.

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## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Informed consent

All the participants provided their informed consent for participation in this study. In the introduction section of the questionnaire, all participants were asked for their consent to use their data for publication. We received 100% consent rate.

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## Supplemental material

Supplemental material [survey proforma] for this article is available online.

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