

# Diversity in surgery: the perceptions of aspiring surgeons

## Abstract

**Background/Aims** This study aimed to explore definitions of diversity, and views and attitudes towards diversity in healthcare among future generations of surgical trainees.

**Methods** This was a prospective, cohort study via an online questionnaire during a virtual, nationwide surgical course, targeted at aspiring surgeons.

**Results** Out of 202 participants, 166 met the inclusion criteria. Participants' definitions of diversity most frequently included race, gender and ethnicity, with fewer than 50.0% recognising pregnancy, communication style or political preference in their definition. Of the respondents, 56.0% (93/166) believed that the surgical community did not do enough to encourage diversity. The rising cost of training, lack of diverse role models and dated ideologies were identified as barriers to achieving greater diversity within surgery.

**Conclusions** Important components of diversity continue to be under-recognised. Surgery must maximise diversity to attract, support and motivate the next generation of surgeons, for the benefit of the health service and the populations it serves.

**Key words:** Diversity; Inclusion; Junior doctor; Professionalism; Surgery; Workforce

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## Introduction

Inequalities in diversity, equity and inclusion within healthcare are well documented and remain a topic of development throughout medicine and particularly within surgery. Diversity can be defined as the existence of variations of different characteristics within a group of people (Togioka et al, 2022). These characteristics can be everything that makes humans unique including, but not limited to, age, religion, race, gender, sexual orientation, ethnicity, style of communication, political preference, disability, geographical location and marital status (Diversity for Social Impact, 2021). Diversity in the workplace is increased when staff represent a wide range of experiences and backgrounds.

Diversity within healthcare is important for many reasons. It can boost employee morale, increase quality of care for diverse populations and improve patient outcomes (Rosenkranz et al, 2021). The corporate world, after years of growth in antidiscriminatory legislation, was among the first to realise the rewards of increased workforce diversity, benefitting from increased employee retention, engagement and sector profitability (Anand and Winters, 2008; Rosenkranz et al, 2021). Some medical specialities have followed suit, with increased racial and gender diversity in medicine resulting in a range of superior patient outcomes (Alsan et al, 2019). Despite the documented benefits, a traditional lack of diversity seems to have persisted within surgery compared to medicine and other professions (Cortés-Guiral et al, 2021). It is difficult to fully understand why this is, but it has been partly attributed to the disparities in income, career progression and difference in academic recognition that women and under-represented minorities experience in the field (Cortés-Guiral et al, 2021).

The Human Equality Act 2010 builds on a list of protected characteristics and strives to promote diversity, provide equal opportunity and prevent discrimination within society. Despite this legislation, the UK gender pay gap, Black Lives Matter and the Me Too movement continue to reveal inequalities among society, pushing uncomfortable conversations to the forefront of global discussion. Race, sex and gender remain topical conversations, but other crucial components of the Human Equality Act 2010, including age, disability, pregnancy and religion, have been less politically prevalent. This narrow

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focus has been demonstrated before in surgery, where a group of surgeons had a limited appreciation of the factors that contribute to true diversity (Ortega et al, 2021).

There have been recent complaints that the Royal College of Surgeons of England does not serve its members equally, is not a diverse or inclusive institution and no longer reflects modern society or the changing face of surgery. In response to these concerns, the Royal College of Surgeons of England released the Kennedy report, an independent review into diversity within its organisation, which resulted in 16 key recommendations for change (Kennedy, 2021). In addition, the British Orthopaedic Trainee Association (2022) has recognised the broadness of diversity in their formal culture and diversity statement, reinforcing that a workforce should be representative of the society it looks after to deliver the highest standards of patient care.

Maximising diversity within surgery will create more representative role models, improve trainee satisfaction and, most importantly, improve patient care. Currently, there is little insight into the views of future surgeons in the UK regarding this topic. This study aims to explore the understanding and opinions of aspiring higher surgical trainees regarding diversity, their views and attitudes towards current levels of diversity within surgery, and the perceived barriers to diversity in the field. Furthermore, it aims to gain junior doctor perspectives on how to approach this conversation in the future.

### Methods

This was a prospective cohort study, using a mixed qualitative, quantitative questionnaire. Following a literature review, two of the authors established a draft questionnaire, focusing the content on current issues regarding diversity in surgery. This was evaluated for its content validity by the wider authorship group, and was piloted with local core trainee level doctors before distribution.

Following local dissemination, the final 23-question survey was sent to all delegates registering for a national, free surgical webinar teaching series ([Appendix 1](#)). This series was aimed at junior doctors, with content focused on the various surgical specialties, equipping participants with fundamental skills and knowledge needed as a day one core surgical trainee or equivalent in that specialty.

In the UK, undergraduate medical training lasts 5–6 years, followed by 2 years of foundation training or equivalent. Doctors wishing to pursue surgery complete 2 years of core surgical training or equivalent. In order to embark on higher surgical specialty training, individuals must attain a National Training Number via a national selection process. Candidates must achieve their core competencies and satisfactory progression to be eligible to apply for this process.

The questionnaire was hosted on a virtual platform and circulated to the 232 candidates who registered for the course. The survey was open for a 2-week period in September 2021. Inclusion criteria for this study were responding participants currently working as junior doctors within surgery in the UK. Incomplete questionnaires were excluded. Other exclusion criteria were responses from non-UK based candidates and all non-surgically themed training grades. Baseline demographic data were collected, including gender, ethnicity and sexual orientation. The questionnaire also included 'free text' answers, from which the authors derived and collated major paraphrased themes. Responses to these questions were analysed using reflexive thematic analysis performed by the authorship group. As per the NHS Health Research Authority's online decision tool, this study did not require formal ethical approval.

### Results

In total, 202 UK-based participants responded to the survey. Of these, 36 were medical students, leaving 166 that met the inclusion criteria. There was a 100% response rate from participants attending the course, with all respondents answering all non-demographic related questions. Demographic data of respondents are shown in [Table 1](#). The three most prevalent deaneries that respondents were working in were south London ( $n=25$ ; 15.1%), north central and east London ( $n=17$ ; 10.2%) and east of England ( $n=17$ ; 10.2%). The deaneries with the fewest participants were Northern Ireland ( $n=1$ ; 0.6%), Kent Surrey and Sussex ( $n=2$ ; 1.2%) and Thames Valley ( $n=4$ ; 2.4%). Regarding their future career,

**Table 1. Demographic data of participants meeting inclusion criteria**

Demographics		n	Percentage (%)
Sex	Male	71/137	51.8
	Female	55/137	40.1
	Prefer not to say	11/137	8.0
Current grade	CT1/ST1	56/166	33.7
	CT2/ST2	22/166	13.3
	F1	27/166	16.3
	F2	19/166	11.5
	Trust registrar	5/166	3.0
	Junior clinical fellow	37/166	22.3
Ethnicity	Arab	12/166	7.2
	Asian or Asian British	62/166	37.4
	Black African or Caribbean or Black British	15/166	9.0
	Prefer not to say	19/166	11.5
	White – British, Irish or any other white background	44/166	26.5
	Other	14/166	8.4
Sexuality	Asexual	1/166	0.6
	Bisexual	4/166	2.4
	Gay/lesbian	2/166	1.2
	Prefer not to say	24/166	14.5
	Straight/heterosexual	134/166	80.7

44.0% (73) of candidates were most likely to pursue trauma and orthopaedics, 38.6% (64) general surgery and 20.5% (34) plastic surgery.

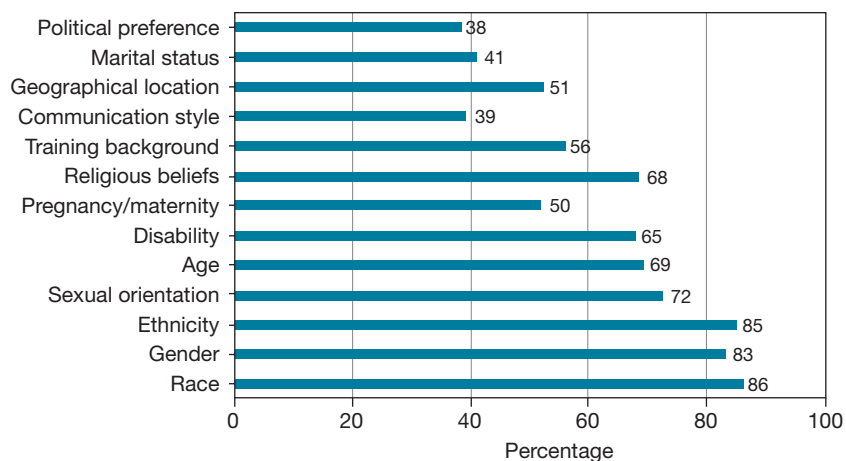
Race, ethnicity and gender were most frequently included in participants’ definitions of diversity (Figure 1). More than 60% of participants agreed that sexual orientation, religious beliefs, age and disability contributed to a definition of diversity. Just over half included current geographical location and training background in their definition. Fifty per cent or fewer of respondents recognised pregnancy/maternity, marital status, political preference and communication style in their definition.

Respondents were asked about their perceptions of and feelings towards diversity within surgery (Table 2). Further questions elicited views of methods of increasing diversity in surgery. A total of 81.3% (135) of the respondents felt that surgery should prioritise inclusion of women and under-represented minorities in selection of leadership and faculty, and 64.5% (107) of respondents felt that surgery should require a certain percentage or quota of diverse individuals as part of leadership and faculty. Figures 2 and 3 represent the cohort’s views of the three least and most diverse surgical specialities.

The final questions asked for free text answers to ‘What do you perceive to be the barriers to diversity among surgery?’ and ‘How can surgery increase diversity in membership, faculty, and leadership positions?’, with space for additional comments. Table 3 summarises the themes emerging from these responses.

## Discussion

The surgical profession as a whole is working to improve diversity within all specialities. Commonly described biases against individual characteristics such as race, sexual orientation



**Figure 1.** Responses to categories when asked ‘How do you define diversity?’.

and gender have served as a barrier to diversity within surgery. This presents ethical issues and also prevents healthcare benefitting from a diverse and inclusive workforce (Cobianchi et al, 2021). The Royal College of Surgeons of England has implemented a diversity, equity and inclusion action plan (Bearfield et al, 2021) following evidence of sexism and institutional racism within its organisation. Addressing unacceptable behaviour and unconscious cultural and systemic bias within surgery is vital so that equal workplace opportunity, patient experience and healthcare-related outcomes can be maximised. This descriptive study outlines perceptions of aspiring junior surgeons in the UK on diversity in the surgical workforce. The responses add to the growing body of literature emphasising the importance of diversity in the workforce for high-quality patient care.

Participants in this study most frequently selected race, gender and ethnicity when asked to define diversity. A study by Ortega et al (2021) found that members of the Orthopaedic Training Association in north America similarly prioritised race, gender and ethnicity when asked the same question. The current cohort rated the importance of diversity within surgery as 8/10 on average (on a scale of 1 (not important) to 10 (extremely important)). During the last decade, there have been candid discussions regarding race, gender and ethnicity within medicine and surgery and the authors hypothesise that the high level of importance given to these issues in the current generation is a direct consequence. While this is a positive finding, the lack of recognition of other important areas of discrimination remains high. Disability, for example, was only recognised as part of diversity by 66% of participants. Miller et al (2009) analysed the experiences of medical students with different forms of

**Table 2. Views regarding diversity in surgery**

Question		n (out of 166)	Percentage (%)
Do you think the surgical field encourages diversity?	No	93	56.0
	Yes	73	44.0
Do you think the surgical field creates a welcoming environment for members of all races, genders, beliefs, and sexual orientations?	No	81	48.8
	Yes	85	51.2
Do you think the surgical field is representative of the community in which it provides care for?	No	103	62.1
	Yes	63	37.9
How much emphasis on diversity is there in surgery? (0=very little/not enough emphasis, 10=lots/too much emphasis)	Average of 166 responses	4.91	
How important do you think diversity is in surgery? (0=not important at all, 10=extremely important)	Average of 166 responses	8.02	

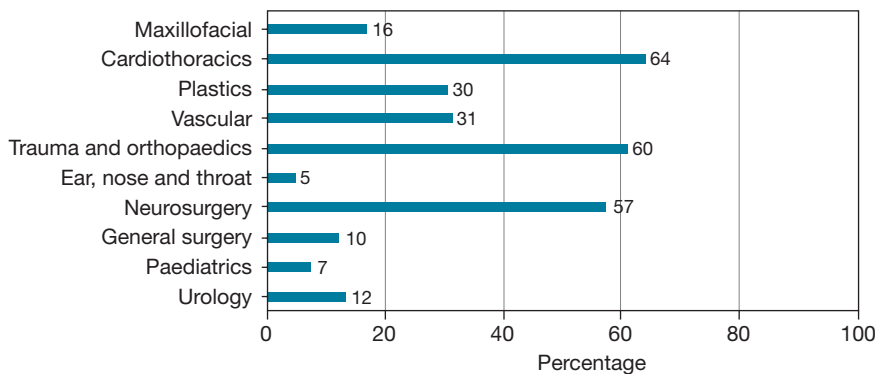


Figure 2. Responses to the question ‘Which three specialities do you think are the least diverse?’.

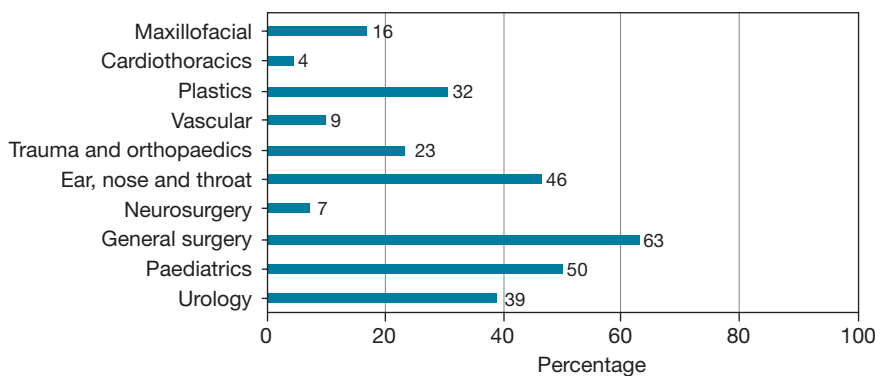


Figure 3. Responses to the question ‘Which three specialities do you think are the most diverse?’.

disability, and found that 12% had experienced disability-related discrimination and 75% felt that some disabilities could prevent someone from studying medicine. The current study highlights a lack of awareness that disability forms a fundamental part of diversity. The results question whether some protected characteristics may be more subject to prejudice, preventing diversity, than others. Further research comparing perceptions of bias between those with and without protected characteristics is vital to better understand this topic.

**Table 3. Prominent themes from respondents’ views on perceived barriers to diversity within surgery and suggestions regarding how surgery can increase diversity**

Perceived barriers to diversity within surgery	Lack of diversity in mentorship and leadership; reducing role models for trainees
	Fuelling of common stereotypes, with a culture resistant to change
	Less than full time training appears to be stigmatised
	Lack of support structures to assist parents’ return to work, especially mothers
	Expensive portfolios; current ‘pay to win’ culture
Suggestions of how surgery can increase diversity in membership, faculty and leadership	Emphasis on diversity from the medical school selection process, through to the selection of leadership and faculty. Example: widening participation schemes
	Reduce emphasis on expensive, timely portfolio building in selection, as it discriminates against those with large commitments outside of work
	Quota systems may ensure fair representation of under-represented minority groups
	Maternity/paternity leave should be split between partners, with additional support provided to reduce the rate of de-skilling
	Training selection should also encourage meritocracy; disregarding background, gender and ethnicity

Interestingly, fewer than 50% of the cohort recognised pregnancy and maternity in their definition of diversity, but free text comments revealed themes of distress surrounding the disadvantage at which maternity leave places trainees, describing it as a barrier to training within surgery. The definition of diversity is complex, multifactorial and seemingly subjective. In future, the whole spectrum encompassed by the concept of diversity must be recognised and promoted within the surgical workforce. In achieving this, the surgical field will not only better represent the population it cares for, but will also capitalise on the student-, trainee- and patient-related benefits of a diverse workforce.

Fifty-six per cent of the cohort felt that the surgical profession did not encourage diversity, and 48.8% felt it did not create a welcoming environment for people of all races, genders, beliefs and sexual orientations. Themes from the comment section attributed this to a lack of representative role models. The comments also described frustration towards a self-perpetuating cycle of unconscious bias that selects white men into positions of power, leadership and responsibility within surgery. Although recognition is leading to change, a significant proportion of leadership positions within healthcare remains occupied by white men, despite the NHS having a predominantly female workforce (Rosenkranz et al, 2021). The percentage of women in surgery remains disproportionate to the number of women attending medical school in the UK. Movements like '#Ilooklikeasurgeon' attracted global media attention and aimed to raise awareness regarding these gender disparities, attempting to remove the perceived barrier that surgical specialities are male dominated (Logghe et al, 2017).

Sixty-two per cent of participants felt that surgery was not representative of the populations it served. This is concerning, given the established benefits of commonality between care providers and patients, including improved communication, decision making and overall outcomes (Bristow et al, 2004; Simms, 2013). An analysis of American workforce diversity indicated that the face of surgery is changing with time and becoming more progressive and inclusive of women and under-represented minority groups (Siotos et al, 2019). Suggested methods of accelerating this change include reforming election and selection processes within surgery, focused mentoring for under-represented minorities and consideration of diversity quotas for hiring and promoting within surgery; the latter of which has sparked debate (Simms, 2013).

More than 80% of participants supported prioritisation of the inclusion of women and under-represented minorities in the selection of leadership and faculty. Intriguingly, 64.5% believed surgery should require minimum quotas of diverse individuals as part of leadership and faculty, raising an interesting debate surrounding selection quotas and affirmative action in medicine and surgery. There is some support, among the surgical community, for a meritocracy-based selection process, as opposed to relying on set quotas, despite the under-representation of women in surgery (Wood, 2020; Lai and Mundy, 2021). The implications of quotas should be carefully considered before being applied to surgical training and careers. While demographic-based quotas offer a rapid fix for representation, it has been suggested that they impose unintended consequences on the individuals and organisations involved (Gardner and Harris, 2020). Heilman et al (1987) described the psychological effects of telling women in leadership positions they were selected based on their sex; feelings of devalued leadership performance, less interest in remaining a leader and less personal achievement for their positive outcomes. Crocker et al (1998) reinforced evidence for the negative effects this system can have on perceptions of self-worth and achievement. Members of the Orthopaedic Training Association expressed concern that similar diversity initiatives can reduce opportunities for doctors who are not part of a traditionally under-represented group, introducing unnecessary bias (Ortega et al, 2021). The argument for quotas stems from a wholly positive ambition to achieve maximal representation, provide opportunity to disadvantaged groups and individuals, and to catalyse social change. However, some of the negative unintended effects are at odds with these ambitions. The authors believe that surgical leaders must continue to perform their due diligence and research before using such methods in selection processes. The authors support a system that selects on individual merit, dissolving a culture of bias and discrimination, with an ambition to level the playing field.

In the study by Moon (2021), cardiothoracic surgery was perceived as the least diverse surgical specialty alongside orthopaedics and neurosurgery. A national observational study indicated that these are the three least gender diverse specialities in surgery in the UK, with poor female representation in the respective consultant bodies (Newman et al, 2022). The authors believe that leaders in these specialities have a responsibility and opportunity to recruit and inspire further diversity within their respective fields. It is vital that the value of both diversity and inclusion is respected in this process, as there is a difference between merely adding greater numbers of surgeons from underrepresented groups and truly giving them equal growth opportunities.

Concerns from the free comments emphasised the fuelling of common stereotypes as a barrier to diversity within some surgical specialities. It is difficult to draw conclusions, but leaders in these specialties have a responsibility to address any existing unhealthy cultures and biases. It was particularly interesting that, despite these concerns, participants were still most likely to pursue a career in trauma and orthopaedics, contradicting the ideology that a lack of diversity is a significant deterrent for application. However, the authors appreciate that there is a vast array of other factors that influence and dissuade doctors from pursuing a surgical career. Nevertheless, these data provide an interesting insight into the minds of future surgeons.

This study has recognised limitations. The methodology permits a self-selection bias, as taking part in the survey was optional. There is an inherent bias in surveying a cohort that attended a single teaching series. The majority of participants were from the London training deanery, Asian/Asian British and 51.8% were men (Table 1). This cohort is not demographically representative of the current junior surgical trainee workforce (NHS Digital, 2020), so the external validity of applying this to the current aspiring surgeon population in the UK must be considered. Furthermore, participants may have elected to complete the survey because of the personal impact of diversity-related issues. The results must be interpreted in the context of participants' varying definitions of diversity. More detailed discussion surrounding age and religion within surgery remains vital but go beyond the scope of this article.

## Conclusions

Exploring aspiring surgeons' definitions of diversity revealed differing emphasis on its various components. More work is needed to improve individual understanding of diversity, highlighting areas outside the commonly identified aspects of race, gender and ethnicity. The cohort expressed the importance of diversity within surgery, but the results highlighted concerns regarding the lack of community representation in the field and described significant barriers to achieving diversity. Furthermore, there was concern that lack of diversity may create barriers to individual progression within the speciality. The majority agreed that specific quotas should be used when selecting surgical leadership and faculty, although this sparks a contentious and interesting ongoing debate. Going forward, the surgical community must eradicate unrecognised bias and maximise diversity to attract, support and motivate the next generation of surgeons, for the benefit of the health service.

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The authors declare that there are no conflicts of interest.

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## Key points

- Inequalities in diversity, equity and inclusion within healthcare are well documented.
- Varying understanding on the components of diversity is evident among aspiring higher surgical trainees in the UK.
- Junior doctors' concerns regarding lack of diversity in surgery are prevalent and several perceived barriers have been identified.
- There is a difference between merely adding greater numbers of surgeons from underrepresented groups and truly giving them equal growth opportunities.
- Surgery must strive to maximise diversity to attract, support and motivate the next generation of surgeons.

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## Appendix 1. Questionnaire

### Diversity in surgery

The purpose of this questionnaire is to understand your views on diversity and thoughts on how it can be improved within surgery and understanding the barriers to it.

By filling in this questionnaire, you are consenting for the data to be anonymised, analysed and used for research purposes. The data will not be shared to third parties.

Please contact us if you have any queries: [fun.orthopaedics@gmail.com](mailto:fun.orthopaedics@gmail.com)

1. Which specialty are you most likely/ would you like to pursue?

- Maxillofacial surgery
- Cardiothoracics
- Plastics
- Vascular
- Trauma and orthopaedics
- Ear, nose, throat
- Neurosurgery
- General surgery
- Urology
- Paediatrics

2. Which deanery are you currently/ will you be based in?

- East Midlands
- East of England
- Kent, Surrey & Sussex
- London - North Central & East
- London - North West
- London - South
- North East of England
- North West of England
- Northern Ireland
- Other
- Scotland
- South West
- Thames Valley
- Wales
- Wessex
- West Midlands
- Yorkshire & Humber

3. What is your current grade?

- CT1/ST1
- CT2/ST2
- F1
- F2
- Trust Registrar
- Trust SHO / Junior Clinical Fellow

4. How much exposure have you had to surgery? (In weeks, months, years) (Free text answers)

5. What is your gender?

- Male
- Female
- Non-binary
- Prefer not to say

**Appendix (Continued)**

6. What is your ethnicity?

- Arab
- Asian or Asian British
- Berber - North African
- Black, African or Caribbean or Black British
- Chinese
- Coptic, white / brown north african, egyptian? never known the answer to this one.
- Egyptian
- Hispanic-Latin American
- Latin
- Mixed
- Mixed Irish and Asian
- Mixed race- Indian, black, white Caribbean
- North African
- other white
- Prefer not to say
- South East Asian
- White - British, Irish or any other White background

7. How would you describe your religious beliefs?

- Agnostic
- Bahai
- Bhuddist
- Christian inc. Catholicism, Church of England, Protestant & all other Christian denominations
- Hindu
- Muslim
- No religion
- Prefer not to say
- Sikh

8. What is your sexuality?

- Asexual
- Bisexual
- Gay / Lesbian
- Prefer not to say
- Straight / Heterosexual

9. How do you define diversity? (tick all that apply)

- Race
- Gender
- Ethnicity
- Sexual Orientation
- Age
- Disability
- Pregnancy/ Maternity
- Religious beliefs
- Training background
- Communication style
- Geographical location
- Marital Status
- Political preference

10. How diverse is surgery? (1-10) 1= NOT diverse at all, 10=EXTREMELY diverse

11. Do you self-identify as an underrepresented minority within surgery? (1-10) 1= I feel VERY-under-represented, 10= I am NOT under-represented at all

12. Do you think the surgical field encourages diversity?

- Yes
- No

### Appendix (Continued)

13. Do you think the surgical field creates a welcoming environment for members of all races, genders, beliefs, and sexual orientations?  
Yes  
No
14. Do you think the surgical field is representative of the community in which it provides care for?  
Yes  
No
15. Should surgery prioritise inclusion of women and underrepresented minorities in selection of leadership and faculty?  
Yes  
No
16. Should surgery prioritise inclusion of women and underrepresented minorities in orthopaedic instructional course lectures, symposia, and/or as moderators?  
Yes  
No
17. Should surgery require a certain number or percentage of diverse individuals as part of leadership and faculty?  
Yes  
No
18. How much emphasis on diversity is there in surgery? (1-10)  
1= NO emphasis at all, 10= TOO MUCH emphasis
19. How important do you think diversity is in surgery? (1-10)  
1= NOT important at all, 10=EXTREMELY important
20. Which THREE specialties do you think are the MOST diverse?  
Maxillofacial surgery  
Cardiothoracics  
Plastics  
Vascular  
Trauma and orthopaedics  
Ear, nose and throat  
Neurosurgery  
General surgery  
Urology  
Paediatrics
21. Which THREE specialties do you think are the LEAST diverse?  
Maxillofacial surgery  
Cardiothoracics  
Plastics  
Vascular  
Trauma and orthopaedics  
Ear, nose and throat  
Neurosurgery  
General surgery  
Urology  
Paediatrics
22. How can surgery increase diversity in membership, faculty, and leadership positions?  
(free text answer)
23. What do you perceive to be barriers to diversity among surgery? (free text answer)