

PEER REVIEW HISTORY

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ARTICLE DETAILS

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| TITLE (PROVISIONAL) | Gender diversity in UK Surgical Specialties: a national observational study |
| AUTHORS | Newman, Thomas; Parry, Matthew; Zakeri, Roxanna; Pegna, Victoria; Nagle, Amy; Bhatti, Farah; Vig, Stella; Green, James |

VERSION 1 – REVIEW

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| REVIEWER | Fleming, Simon Queen Mary University of London, Institute of Health Sciences Education |
| REVIEW RETURNED | 03-Aug-2021 |

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| GENERAL COMMENTS | <p>This paper is very very nearly flawless. I share the authors frustration with a data set that rounds to the nearest 5. As the 5th largest employer in the world, it is sadly not a shock that our data is managed in such a fashion. Rants about NHS data cleaning aside, the only flaw I can find in the paper are the graphs on pp16. It is difficult to identify which line is paired with the legend, If the text could be coloured or in coloured as with the gender parity graph, then this would be ready to go.</p> <p>I feel, at this stage, it needs to be said that is rare as a reviewer to read a paper where one feels a sense of near-annoyance that this paper can't be published any faster!</p> |
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| REVIEWER | Bellini, Maria Irene Imperial College Healthcare NHS Trust, Renal Transplant Directorate |
| REVIEW RETURNED | 15-Aug-2021 |

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| GENERAL COMMENTS | <p>I congratulate the authors on analysing trends on gender representation in surgical specialties. This is a timely topic, especially in view of the recent review by Baroness Helena Kennedy QC, as the authors themselves point out.</p> <p>Below are some suggestions:</p> <ol style="list-style-type: none">1) Introduction: would the authors consider to acknowledge other Women in Surgery initiatives worldwide, just to give a complete overview of what is the situation like in other countries?2) Methods: Could the authors represent through a flowchart all the steps they undertook in the analysis, to provide also a visual information of the study flow?3) Results: as per in the methods, it would be useful for the readers to visualise the data through graphs, as in this way it is easier to immediately catch the message. For example: "In 2020, the specialties with the highest female representation of registrars were Ophthalmology (49.7%), Otolaryngology (48.2%) and |
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| | <p>Paediatric Surgery (45.5%), followed by Plastic Surgery (42.2%), General Surgery (39.8%), Urology (31.6%), Vascular Surgery (25.0%), Neurosurgery (24.7%), Cardiothoracic Surgery (21.3%) and Trauma and Orthopaedics (20.6%). There was a significant difference observed between the surgical specialties ($P < 0.001$). For context, Ophthalmology had a significantly higher female representation of registrars compared to Urology (49.7% vs 31.6%; OR 2.14, 95% CI 1.68-2.72) and Trauma and Orthopaedics had a significantly lower female representation compared to Urology (20.6 vs 31.6%; OR 0.56 95% CI 0.45-0.70; Table 1)." I would recommend to prepare figure representations of the specialty accompanied by the number for these data.</p> <p>4) Discussion: An important point is about the gender gap in money retribution. It has been previously shown that females are paid less, independently from their seniority, compared to males. Would the authors consider to comment also into this aspect? What are the steps the authors would recommend to eliminate gender wage gaps between similar men and women with the same experience?</p> <p>5) We previously addressed a similar topic via means of the ASGBI Women in Surgery Working Group: Bellini MI, Adair A, Fotopoulou C, Graham Y, Hutson A, McNally S, Mohan H, Vig S, Parks R, Papalois V. Changing the norm towards gender equity in surgery: the women in surgery working group of the Association of Surgeons of Great Britain and Ireland's perspective. J R Soc Med. 2019 Aug;112(8):325-329. doi: 10.1177/0141076819854194. The authors might consider some valuable additions, particularly regarding the mentorship and the value of social media to overcome barriers and inequalities.</p> |
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| REVIEWER | Cooney, Carisa Johns Hopkins University School of Medicine, Department of Plastic and Reconstructive Surgery |
| REVIEW RETURNED | 07-Oct-2021 |

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| GENERAL COMMENTS | <p>Thank you for the opportunity to review the original research article titled, "Gender diversity in UK Surgical Specialties: a national observational study." This is a concise and clearly written article that uses UK surgical workforce data to predict when gender parity between men and women will occur within the surgical specialties in the UK. My specific comments follow:</p> <ol style="list-style-type: none"> 1. It would be helpful to include information regarding the gender of medical students feeding into the physician/surgeon trainee pipeline(s) in the Introduction. Without this information it is difficult to tell if the problem is attracting medical students to the surgical specialties or earlier. Given the information on this in the discussion, the gender representation is lower than even achieving a 1:1 ratio. 2. When using the word gender, "man" & "woman" should be the binary terms used since "male" & "female" refer to sex. Please update terminology appropriately. 3. Generally the Discussion would benefit from making better use of the published literature and including more citations. <ol style="list-style-type: none"> a. One relevant citation is a paper we published in 2020: "Women Continue to Be Underrepresented in Surgery: A Study of AMA and ACGME Data from 2000 to 2016" (PMID: 31889693 DOI: 10.1016/j.jsurg.2019.10.001). Please include. b. Can the authors expand on why some specialties' ratios are improving and others are not? Can this be inferred through various |
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| | <p>WinS efforts? Are certain surgical specialties viewed as more more malignant than others?</p> <p>c. Of the 10 paragraph Discussion, 3 paragraphs are spent on the study limitations. While I appreciate the authors' transparency, I am more interested in why they think the gender gap in surgery exists and is in fact worse than 50/50 since medical school entrants are 55/45 or 60/40.</p> <p>d. Would appreciate more specific suggestions for future research directions. Could be based on any published programs that have demonstrated success in attracting women to surgery (e.g., mentoring).</p> <p>4. Can it be made clear that the donor has consented to the sharing of her having had surgery?</p> <p>5. The header row in Table 1 should be more clearly labeled - "N"s are missing specific labels. Don't leave this to inference. The Table explanation could also be more illustrative. Many people will look at tables without reading Results first, please clarify.</p> <p>6. Figure 1: Please use same color-coded legend at left in Figure 1 as in Figure 2. Currently it is unclear since the lines bounce around a bit.</p> <p>I appreciate the authors efforts in performing this study & look forward to their edits/responses.</p> |
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Simon Fleming, Queen Mary University of London

Comments to the Author:

This paper is very very nearly flawless. I share the authors frustration with a data set that rounds to the nearest 5. As the 5th largest employer in the world, it is sadly not a shock that our data is managed in such a fashion. Rants about NHS data cleaning aside, the only flaw I can find in the paper are the graphs on pp16. It is difficult to identify which line is paired with the legend, If the text could be coloured or in coloured as with the gender parity graph, then this would be ready to go.

I feel, at this stage, it needs to be said that is rare as a reviewer to read a paper where one feels a sense of near-annoyance that this paper can't be published any faster!

Many thanks for reviewing our manuscript, Figure 1 has been reformatted with colour-coded labels.

Reviewer: 2

Dr. Maria Irene Bellini, Imperial College Healthcare NHS Trust

Comments to the Author:

I congratulate the authors on analysing trends on gender representation in surgical specialties. This is a timely topic, especially in view of the recent review by Baroness Helena Kennedy QC, as the authors themselves point out.

Many thanks for reviewing our manuscript, we have done our best to address every suggestion Below are some suggestions:

1) Introduction: would the authors consider to acknowledge other Women in Surgery initiatives worldwide, just to give a complete overview of what is the situation like in other countries?

Thank you, a comment on this has been added and other Women in Surgery initiatives are included (lines 132-136)

2) Methods: Could the authors represent through a flowchart all the steps they undertook in the analysis, to provide also a visual information of the study flow?

We have produced a flowchart for the selection for time-to-parity analysis which is now Figure 1.

3) Results: as per in the methods, it would be useful for the readers to visualise the data through graphs, as in this way it is easier to immediately catch the message. For example: "In 2020, the specialties with the highest female representation of registrars were Ophthalmology (49.7%), Otolaryngology (48.2%) and Paediatric Surgery (45.5%), followed by Plastic Surgery (42.2%), General Surgery (39.8%), Urology (31.6%), Vascular Surgery (25.0%), Neurosurgery (24.7%), Cardiothoracic Surgery (21.3%) and Trauma and Orthopaedics (20.6%). There was a significant difference observed between the surgical specialties ($P < 0.001$). For context, Ophthalmology had a significantly higher female representation of registrars compared to Urology (49.7% vs 31.6%; OR 2.14, 95% CI 1.68-2.72) and Trauma and Orthopaedics had a significantly lower female representation compared to Urology (20.6 vs 31.6%; OR 0.56 95% CI 0.45-0.70; Table 1)." I would recommend to prepare figure representations of the specialty accompanied by the number for these data.

Thank you for this suggestion, whilst we understand how this could help, we are concerned that further figures would be repeating information/data that is already displayed in the text, table 1 and figure 2.

The female representation for 2020 can be seen in Figure 2 as these graphs include the data points for 2020. Table 1 also displays this data with specialties listed in descending order by female representation. To make Table 1 easier to read the ORs are colour coded to demonstrate which are greater or lesser than urology and we have updated the figure description to make this clearer.

As Table 1 and Figure 2 are essential we feel that further figures would be repeating information that is already displayed. However, if you or the editors feel this is essential, we would be happy to provide this.

4) Discussion: An important point is about the gender gap in money retribution. It has been previously shown that females are paid less, independently from their seniority, compared to males. Would the authors consider to comment also into this aspect? What are the steps the authors would recommend to eliminate gender wage gaps between similar men and women with the same experience?

We have added a paragraph referring to this in the discussion and cited the mend the gap report on gender pay gap in medicine. (line 132-136)

5) We previously addressed a similar topic via means of the ASGBI Women in Surgery Working Group: Bellini MI, Adair A, Fotopoulou C, Graham Y, Hutson A, McNally S, Mohan H, Vig S, Parks R, Papalois V. Changing the norm towards gender equity in surgery: the women in surgery working group of the Association of Surgeons of Great Britain and Ireland's perspective. *J R Soc Med.* 2019 Aug;112(8):325-329. doi: 10.1177/0141076819854194. The authors might consider some valuable additions, particularly regarding the mentorship and the value of social media to overcome barriers and inequalities.

Thank you for bringing this to our attention, we have included this work as a reference and specifically commented on mentorship and advantages of social media (line 387-391).

Reviewer: 3

Dr. Carisa Cooney, Johns Hopkins University School of Medicine

Comments to the Author:

Thank you for the opportunity to review the original research article titled, "Gender diversity in UK Surgical Specialties: a national observational study." This is a concise and clearly written article that uses UK surgical workforce data to predict when gender parity between men and women will occur within the surgical specialties in the UK. My specific comments follow:

We thank you for taking the time to review our work and are grateful for your suggestions, which we believe have enhanced the article.

1. It would be helpful to include information regarding the gender of medical students feeding into the physician/surgeon trainee pipeline(s) in the Introduction. Without this information it is difficult to tell if the problem is attracting medical students to the surgical specialties or earlier. Given the information on this in the discussion, the gender representation is lower than even achieving a 1:1 ratio.

We agree that this adds to the framing of the issue, we have included this information in the introduction (line 118-122)

2. When using the word gender, "man" & "woman" should be the binary terms used since "male" & "female" refer to sex. Please update terminology appropriately.

This is a very important point, and we apologise that it was not addressed in the original submission. Whilst the terms 'male' and 'female' do refer to sex assignment at birth, in demographic data collection these terms are often used to identify a person's gender.

As the data we analysed and much of the literature use demographic data use the terms 'male' and 'female' for gender, rather than 'man' and 'woman', we will also use these terms. When using the term 'female' to describe surgical consultants or registrars we will therefore mean 'people who responded as female when asked their gender' rather than 'people who were assigned the female sex at birth'.

We have added a description of this under the title Terminology in the Methods section. (Starts line 168)

3. Generally the Discussion would benefit from making better use of the published literature and including more citations.

We have included several additional citations which have hopefully improved our discussion.

a. One relevant citation is a paper we published in 2020: "Women Continue to Be Underrepresented in Surgery: A Study of AMA and ACGME Data from 2000 to 2016" (PMID: 31889693 DOI: 10.1016/j.jsurg.2019.10.001). Please include.

Thank you for bringing this work to our attention, we have now included this citation and specifically comment on it in the discussion (line 312-314).

b. Can the authors expand on why some specialties' ratios are improving and others are not? Can this be inferred through various WinS efforts? Are certain surgical specialties viewed as more malignant than others?

We have commented that the reasons for these changes are unclear but hypothesised that for specialties with lower female representation it is possible that they have even fewer role models, greater implicit bias or more discriminatory cultures than the other specialties

c. Of the 10 paragraph Discussion, 3 paragraphs are spent on the study limitations. While I appreciate the authors' transparency, I am more interested in why they think the gender gap in surgery exists and is in fact worse than 50/50 since medical school entrants are 55/45 or 60/40.

Thank you for this suggestion, we have added 4 extra paragraphs discussing topics related to the gender gap and also stated that it is more pronounced when we consider that female representation in medical student entrants has remained between 55 and 60% for the last 25 years in the UK

d. Would appreciate more specific suggestions for future research directions. Could be based on any published programs that have demonstrated success in attracting women to surgery (e.g., mentoring).

Thank you, we have taken this on board and been more specific in our discussion and conclusion. We have also highlighted a program in the US that influenced women to choose to specialise in orthopaedics and suggested this as a model to draw inspiration from.

4. Can it be made clear that the donor has consented to the sharing of her having had surgery?

Thank you for bringing this to our attention, this has been added and the donor had consented to this prior to submission

5. The header row in Table 1 should be more clearly labeled - "N"s are missing specific labels. Don't leave this to inference. The Table explanation could also be more illustrative. Many people will look at tables without reading Results first, please clarify.

We have made the suggested changes and hopefully this makes the table clearer

6. Figure 1: Please use same color-coded legend at left in Figure 1 as in Figure 2. Currently it is unclear since the lines bounce around a bit.

We agree and have made the necessary changes

I appreciate the authors efforts in performing this study & look forward to their edits/responses.

VERSION 2 – REVIEW

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| REVIEWER | Bellini, Maria Irene Imperial College Healthcare NHS Trust, Renal Transplant Directorate |
| REVIEW RETURNED | 13-Nov-2021 |

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| GENERAL COMMENTS | Thank you for revising the manuscript |
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| REVIEWER | Cooney, Carisa Johns Hopkins University School of Medicine, Department of Plastic and Reconstructive Surgery |
| REVIEW RETURNED | 22-Nov-2021 |

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| GENERAL COMMENTS | The authors have satisfactorily addressed the reviewers comments/concerns. Thank you. |
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