BETTER DATA FOR FAIRER EMPLOYMENT:
STATISTICS' ROLE IN TACKLING THE GENDER PAY GAP
The Royal Statistical Society's 10 Proposed Reforms

The Royal Statistical Society (RSS) is one of the world's most distinguished and renowned learned societies. Founded in 1834, the RSS is a society for statistics, a professional body for statisticians and data scientists, and a charity which shows how statistics, data and evidence can be used for the public good.

Today, the RSS has around 10,000 members in over 90 countries around the world. We are the 2018-19 Professional Association of the Year, awarded by MemCom, as well as the winner of MemCom's campaigning award.
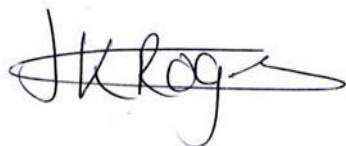
Introduction

In 2017-18, the UK mandated, for the first time, all sizeable employers to collect and then publish data showing their gender pay gaps. At the RSS, we warmly welcomed this very positive initiative. It has provided a vivid demonstration of statistics' power and potential, as well as their ability to stimulate both informed debate and meaningful change.

There was much to commend in how the system worked in its first year. However, after conducting a detailed examination of how it operated in practice, we believe there is real scope to refine the system in the future. We could then have both a higher standard of gender pay reporting in the UK and, equally importantly, a better template which other countries might then choose to adopt in the years ahead.

In particular, the implementation of our 10 recommendations, outlined in this report, could create a system that would be simpler for all employers to understand, harder for anyone to 'game' and generate clearer results which (among other things) would make it easier for employers' progress to be assessed.

This issue will remain high on RSS's agenda over the coming months, when we will seek to take our proposals to a wide range of relevant policy-makers both in Government and on the Opposition benches in Parliament - and beyond. I hope the RSS, through these recommendations, can play an important role in improving gender pay gap reporting and, in the process, show how statistics can help to highlight and address iniquities in the UK and, indeed, elsewhere.

Jennifer Rogers, RSS Vice-President (External Affairs)

RECOMMENDATIONS 1-3: A CLEARER, MORE CONSISTENT SYSTEM

1. Gender pay data should be presented in a clearer and unambiguous format - always in pounds and pence, not percentages.

In the first year of gender pay gap reporting, the relevant UK government website displayed the data primarily as a percentage and, for secondary references, in pounds and pence.

This can be seen by looking at practical examples from two organisations which reported similarly sized, but very different, gender pay gaps in 2017-18. The figures for the Financial Conduct Authority and Nestlé Purina UK Ltd were displayed as follows:

Financial Conduct Authority

a) Women's median hourly rate was 20.9% lower than men's.

b) In other words, for every £1 that the median man earned, the median woman earned 79p.

Nestlé Purina UK Ltd

a) Women's median hourly rate was 21% higher than men's.

b) In other words, for every £1 that the median man earned, the median woman earned £1.21.

For two key reasons, we believe the second of these approaches - in the form of option b - is clearer, more helpful and more intuitive. First, if an organisation says that its gender pay gap is 21%, they need to provide extra information as to whether that is in favour of men or women. But if you adopt the convention of defining the median man as earning £1 then it is immediately obvious that an organisation which pays the median woman £0.79 is favouring men overall, while an organisation paying the median woman £1.21 is favouring women overall.[i]

Secondly, we believe the adoption of option b would lead to less ambiguity and more consistent results. We are seeking to solve the problems which can stem from the fact that, at present, employers are being asked to calculate the median gender pay gap in percentage terms and, statistically, this can be done in one of four different and equally credible ways. While the government has chosen to support and recommend one of these four options, it is clear that some organisations are actually calculating their gender pay gaps using the other methods - leading to inconsistent results.

If our recommendation was adopted, there would be a clearer and simpler system with much less room for confusion. Organisations would simply be asked to submit the hourly

earnings of the median woman, on the basis that the median man earns £1. In the cases above, for instance, it would have immediately been clear that in 2017-18 the Financial Conduct Authority had a significant pay gap which was disadvantaging women while Nestlé Purina UK Ltd was one of the relatively few organisations with an equally sizeable pay gap in women's favour.

To its credit, the government is beginning to move in the right direction, with the data now being presented primarily in terms of pounds and pence and only secondarily as percentages. However, we believe that clarity could be further increased, and ambiguity reduced, if percentages were no longer used and all reporting was done solely on a pounds/pence basis.

2. Improve government guidance to employers, especially over the calculation of the median gender pay gap.

Once gender pay reporting was first required, in 2017-18, it soon became apparent that numerous organisations had entered their data incorrectly. In some respects, this was entirely understandable as the system was in its first year of operation and many employers lack in-house statistical expertise. (See Recommendation 10.) It is also clear, though, that the government's instructions to employers could have been written with far greater lucidity, to make them much more readily comprehensible and less liable to misinterpretation.

In particular, the instructions about how to calculate the median gender pay, in terms of hourly pay, were ambiguous. The key section instructed employers to "Find the hourly pay rate that is in the middle of the range - this gives you the median hourly pay rate for men".[ii] A similar section was included in respect of women. But such text did nothing to prevent the data from being submitted with the median being calculated, simplistically, as the middle point between the minimum and maximum values.

The following example shows how this can produce misleading results.

If an organisation has five women employees, earning between £10 and £50 an hour, it would be easy for their hourly median pay to be reported as £30 per hour. Similarly, if the same organisation has seven male employees, also earning £10 to £50 per hour, their hourly median pay might be reported as, again, £30. These figures would suggest that the employer has no gender pay gap, with both its male and female employees receiving the same hourly median pay.

Statistically speaking, however, the instructions to employers should not refer to "the middle of the range" but "the person standing in the middle of the line". This is best illustrated through the below graphic, which demonstrates that such an approach can show very different results including, in this case, a previously hidden (and significant) gender pay gap:

Illustration 1

Although the government's current guidance on this subject is, again, undoubtedly better than before, it also includes links to the websites of some relevant organisations (such as the Equalities & Human Rights Commission) which still contain ambiguous information on this important point.

To prevent such ambiguity in the future, we recommend that both the government and each of its relevant agencies should revise their instructions to employers on how to calculate the median gender gap in hourly pay. We believe the use of graphics could help in this process, but the wording definitely needs to be made more precise. For instance, the following form of words might help to explain how the median should actually be found:

> "If all company employees were lined up in a female line and a male line, in order of pay from highest to lowest, the median gender pay gap compares the pay difference between the female and the male standing in the middle of their respective lines."

If we had, for example, 11 employees (either male or female), the median pay would be the pay of the sixth person in the line formed by all 11 employees standing in order of their pay. If we had 12 employees, the median pay would be the mean of the sixth and seventh employees.

3. Similarly, improve the government guidance to employers over the use of income quartiles.

It was also noticeable that, in the first year of gender pay gap reporting, some employers misinterpreted the government's guidance on the creation of quartiles - in particular, the instruction to "divide this into four equal parts".[iii] For example, if we use the case of the organisation featured above, in Illustration 1, it would be easy to interpret the government's instruction as meaning that the range of £10 to £50 per hour should be

divided into four equal parts, in the form of (i) £10-£20, (ii) £20-£30, (iii) £30-£40 and (iv) £40-£50 per hour. Indeed, this is effectively what happened in the first year of reporting, when Eastleigh Borough Council (for instance) published its income quartiles on such a basis, instead of ensuring that it had equal numbers of employees in each quartile - which was the government's actual intention.

Some re-wording and, again, the use of graphics could help to ensure that more organisations input their data correctly in the future and, in doing so, both improve the comparability between employers and enhance the overall accuracy of the UK's gender pay gap reporting. To return to the fictitious employer with 12 staff, previously cited in Recommendation 2, its income quartiles could perhaps best be illustrated as follows:
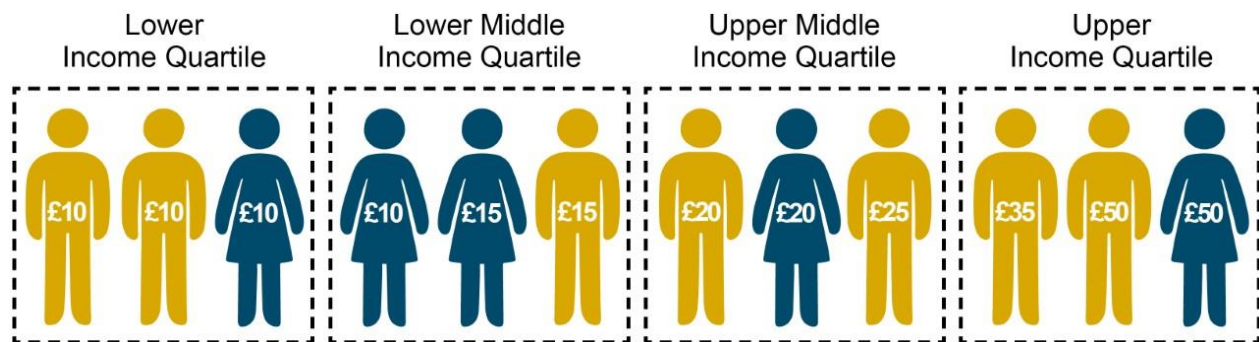

Illustration 2

We would urge the government to ensure that such illustrations, and their accompanying wording, are developed by those with real expertise in explaining statistical concepts to non-statistical audiences (including, for example, relevant Chartered Statisticians).

RECOMMENDATIONS 4-5: INCREASED ACCURACY, VIA FREE ONLINE TOOLS

4. Provide free online calculators to help increase the accuracy of gender pay gap reporting.

It should be possible to reduce the burdens on employers by providing them with free online tools which they could use to calculate, and then submit, their gender pay gap data. Such tools can be developed quite simply and quickly.[iv] The government has the resources to ensure that this work is done to the highest standards and then provided free-of-charge and promoted as widely as possible.

We duly recommend that it creates or commissions such tools as a matter of priority.

Clearly, however, we would want any such tools to reflect the recommendations that are made elsewhere in this report, on subjects such as the built-in 'sanity checks' which represent our next recommendation.

5. Ensure that online gender pay calculators have built-in 'sanity checks', to ensure accurate reporting and prevent statistically implausible entries.

A range of anomalies will inevitably appear when large amounts of data are being collected from employers right across the UK, as in the case of gender pay reporting. However, many of the entries submitted during the first round of reporting contained figures which were self-evidently wrong, rather than merely anomalous. For example, one employer stated that its gender pay gap was 121%, which equates to its median female employee earning -£0.21 for every £1 earned by her median male counterpart. The adoption of Recommendation 1 would reduce the likelihood of such a bizarre figure being submitted. But such mis-reporting could also be reduced by the government's website including new 'sanity checks' which might, for instance, automatically question any employer seeking to report that its median female employee was earning either less than £0.50 or more than £2 for every £1 earned by the median man (or *vice versa*).

RECOMMENDATIONS 6-7: PROTECTING THE SYSTEM'S INTEGRITY

6. The gender pay gap should be calculated by quartile as well, to make it harder for the system to be 'gamed'.

As organisations are already required to split their employees into income quartiles, as previously noted, we believe it is reasonable to ask them to calculate the median gender pay gap within each quartile.

This could make it harder for the system to be 'gamed' by any unscrupulous employer while the additional statistical burden would be modest.

The need for quartile calculations is demonstrated by the following case of an organisation which *appears* to be a near-perfect employer, in terms of gender pay (Illustration 3).

Not only does it have an exact gender balance in terms of its employees (with 12 male and 12 female staff) but there are equal numbers of men and women (three of each) in every income quartile. Above all, the organisation has no gender pay gap, based on the current reporting requirements: for every £1 earned by the median man, the median woman also earns £1.

On closer inspection, though, the organisation is actually performing less well and, in fact, seems to be discriminating against its female employees. But this becomes apparent only if (as we recommend) the median gender pay gap within each income quartile is calculated and published. As the following illustration and figures show, the employer is actually paying men more than women within each quartile, despite the employer's median man and median woman earning exactly the same.

This organisation *appears* to have no gender pay gap.
For every £1 earned by the median man, the median woman earns £1.
However, the reality is more complex.

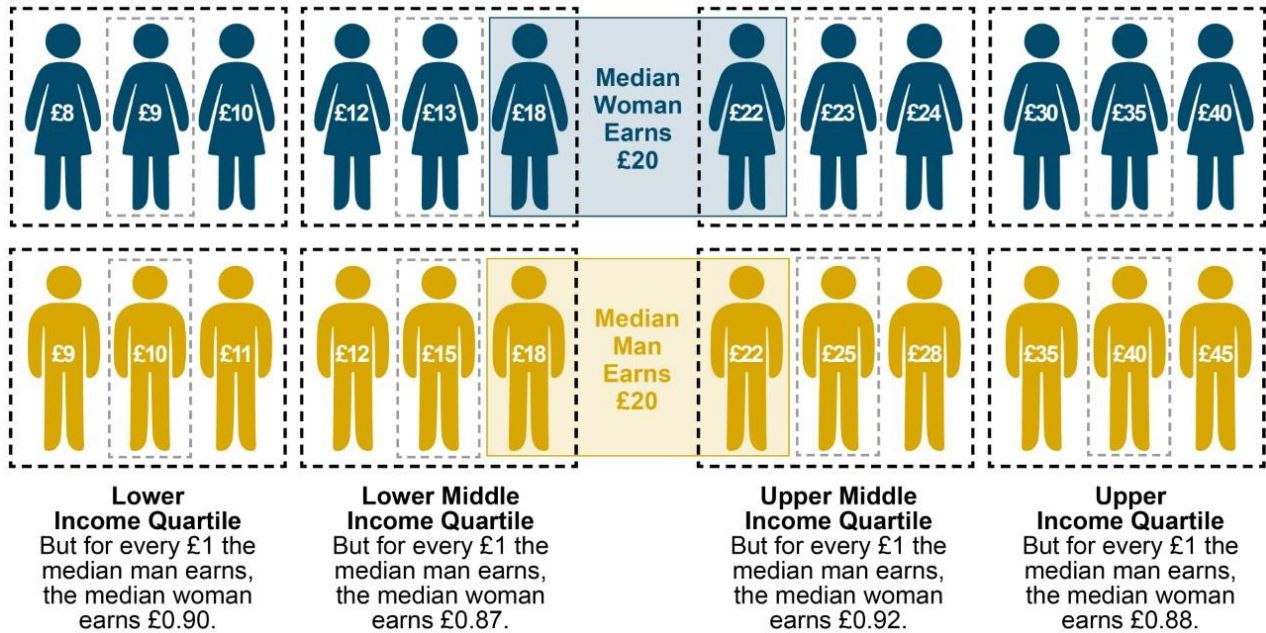| Lower Income Quartile	Lower Middle Income Quartile	Upper Middle Income Quartile	Upper Income Quartile
But for every £1 the median man earns, the median woman earns £0.90.	But for every £1 the median man earns, the median woman earns £0.87.	But for every £1 the median man earns, the median woman earns £0.92.	But for every £1 the median man earns, the median woman earns £0.88.

Illustration 3

Such a situation could easily arise in practice if an organisation decided to narrow or eliminate its pay gap by 'gaming' the system which, as this illustration shows, is perfectly possible as things currently stand. All the employer has to do is ensure that the median man and median woman are paid the same. Above and below those two people, it does not matter what happens because of the current system's vulnerability to being 'gamed'. The introduction of a quartile-based reporting system would give the system greater rigour and make it harder for any employer to present its performance in a misleadingly favourable light.

Indeed, Sills & Beveridge LLP introduced such a system in the first year of gender pay gap reporting and the RSS is delighted to commend them for their prescience in having done so.[v]

7. Publish each employer's annual results, side-by-side, to make it easy for trends and progress to be assessed.

Inevitably, the first year of gender pay gap reporting involved results being published on a stand-alone basis. In future, though, comparative data could also be published. We believe this opportunity should be taken so that data and charts for the latest year are displayed alongside their predecessors. This approach would enable everyone to see how an employer's record had changed from one year to the next.

The use of the quartile-based approach that we have advocated (in Recommendation 6) would help to ensure that such year-on-year comparisons do not mislead their readers.

This is important as, if only median hourly earnings were published on a comparative basis, it would be possible for an unprincipled employer to portray its record in an unjustifiably favourable light. For instance, it might be able to show that it had increased its median woman's hourly earnings from £0.90 to £1, which would look impressive. However, the gender splits by income quartiles might tell a very different and much less positive story. It could show, for example, that the proportion of women in the lower income quartile had fallen from, say, 75% to 45%. This would rightly 'ring alarm bells' as the equalisation of the median hourly earnings might, in this case, have been achieved by the employer dismissing or outsourcing many of its lowest paid women. The implementation of our full set of recommendations would make such an approach far harder to hide and, therefore, much less likely to be adopted in the first place.

RECOMMENDATIONS 8-9: SAFEGUARDING SMALLER EMPLOYERS

8. Organisations which employ fewer than 100 women (or men) should be flagged.

The laws of chance mean that organisations - particularly smaller ones - can appear to have sizeable gender pay gaps even when, in fact, they aren't operating in a discriminatory way.

The problem is especially acute in the cases of organisations which employ relatively few women, when it can be hard to draw conclusions about whether their pay gap is down to chance or due to some form of discrimination. In particular, some smaller companies could find themselves unjustly accused of discriminating against women when they have merely been victims of chance. The largest uncertainties occur when the number of women (or, indeed, men) within an organisation falls below 100 - regardless of the employer's overall size.

Consequently, we believe that organisations which employ fewer than 100 women (or men) should be clearly flagged in the government's gender pay gap database, which covers those with 250-plus staff. Two important benefits could stem from such an approach. First, any such employer should be given greater benefit of the doubt when its pay gap was being considered. Secondly, it would be helpful for policy-makers to know how many organisations with over 250 staff are employing fewer than 100 women (or men). The larger the employer's overall size, the greater the likelihood that it will appear to be discriminating against women (or men) if its workforce is so gender-imbalanced. The gender pay gap reporting system could therefore help to highlight, in a non-bureaucratic manner, other relevant employment problems, such as discrimination at the recruitment stage in the kind of organisation that has just been described.

9. Keep the current reporting threshold at 250 employees.

When it introduced gender pay gap reporting, the government decided that the system should cover only organisations with 250 or more employees. However, there have since been suggestions that this threshold should be reduced. For example, the Parliamentary Select Committee on Business, Energy & Industrial Strategy recommended, in its report on *Gender Pay Gap Reporting* (August 2018), that the threshold should remain at its current level in 2019 but then be reduced to just 50.[vi]

For the reasons outlined above, in support of Recommendation 8, we disagree with the Committee's proposal. Any such move could create a real risk of smaller employers being unjustly accused of gender-based pay discrimination when, in reality, the difference between their men's and women's earnings could be down purely to chance. The RSS would be happy to take part in a review of the current 250 threshold to establish whether a modest reduction in its level might be possible. But we believe that a cut to 50 would be irresponsible and lead to unreliable data and, hence, damage a system that we should be seeking instead to improve, as this report makes clear.

RECOMMENDATION 10: STATISTICAL SKILLS FOR H.R. PROFESSIONALS

10. Improve statistical skills among human resources professionals.

With the introduction of gender pay gap reporting, the government is, in effect, asking human resources professionals to take on some important statistical tasks. The burden is particularly onerous in organisations which do not employ any statisticians, on whom their HR colleagues can draw. Accordingly, the RSS believes the government should consider how it can help employers to have the necessary statistical skills at their disposal - for example, through engaging consultant statisticians or developing in-house skills via appropriate training courses for members of their HR teams. The RSS would, of course, be happy to advise and assist the government in this task.

Acknowledgements

The Royal Statistical Society is deeply indebted to an RSS Fellow and Chartered Statistician, Nigel Marriott, for his invaluable contribution to this report. He kindly provided the compelling statistical evidence and forward-thinking research which laid the foundations for our recommendations. In short, this report could not have been produced without Nigel being so generous with his time, advice and expertise. The RSS would also like to thank everyone else (and, especially, Carrie Gracie) who has contributed either ideas or inspiration as we have developed these detailed but very practical proposals. We look forward to sharing our recommendations with policy-makers and, more importantly, to getting them adopted and put into practice. The RSS is convinced that their implementation could play an important role in accelerating the pace of progress in the United Kingdom and, at the same time, create a better template for (we hope) widespread adoption elsewhere.

Endnotes

[i] From Nigel Marriott's Blog. Pay Gap#4 - 12 ways to improve confidence in gender pay gap data: https://marriott-stats.com/nigels-blog/gender-pay-gap-data-and-12-ways-to-improve-it/

[ii] Government guidelines to companies with over 250 employees, *Report Your Gender Pay Gap Data*: https://www.gov.uk/report-gender-pay-gap-data

[iii] ACAS (Advisory, Conciliation and Arbitration Service) and Government Equalities Office joint guidance on *Managing Gender Pay Reporting* (p. 14): http://www.acas.org.uk/media/pdf/9/p/Managing_gender_pay_reporting_07.02.19.pdf

[iv] For example, see Nigel Marriott's Blog: Pay Gap#4 - 12 ways to improve confidence in gender pay gap data: https://marriott-stats.com/nigels-blog/gender-pay-gap-data-and-12-ways-to-improve-it/

[v] See: https://www.sillslegal.co.uk/wp-content/uploads/2018/04/Gender-Pay-Report-2017.pdf

[vi] Business, Energy and Industrial Strategy Select Committee, *Gender Pay Gap Reporting*, 2nd August 2018, paragraph 38 / recommendation 11.