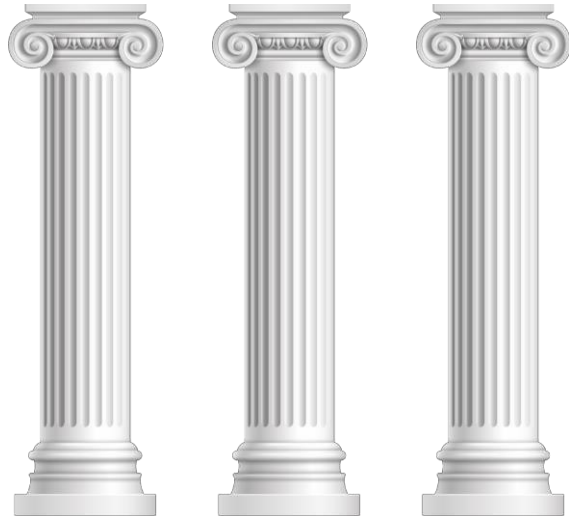*Business & Management*

What does your gender pay gap tell you?

11 SEPTEMBER 2019

The webinar will begin shortly…

Business & Management
60 minute webinar: What does your gender pay gap tell you?
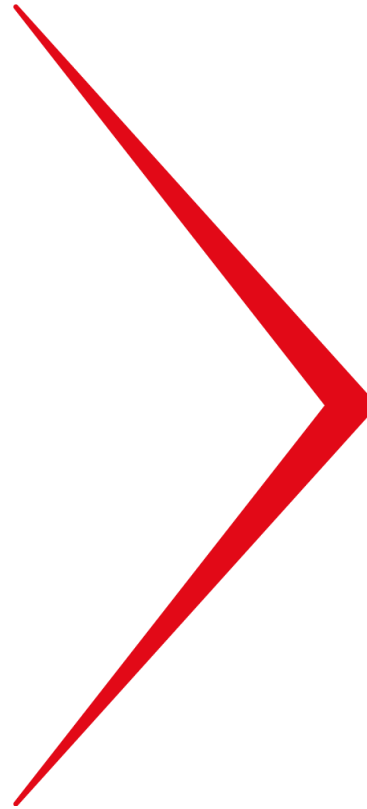
Nigel Marriott

What does your gender pay gap tell you?

NIGEL MARRIOTT CSTAT

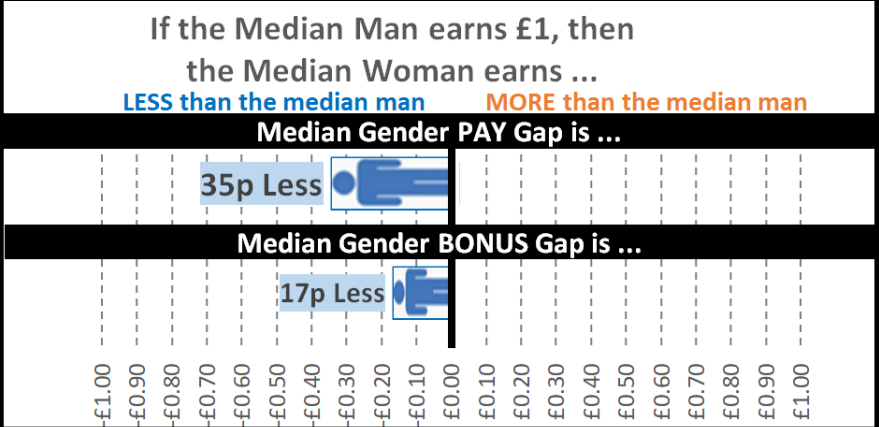**INDEPENDENT STATISTICIAN**

WWW.MARRIOTT-STATS.COM
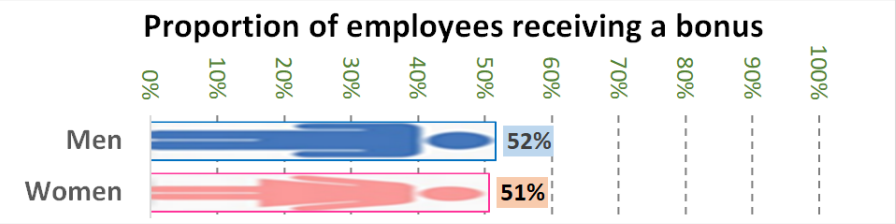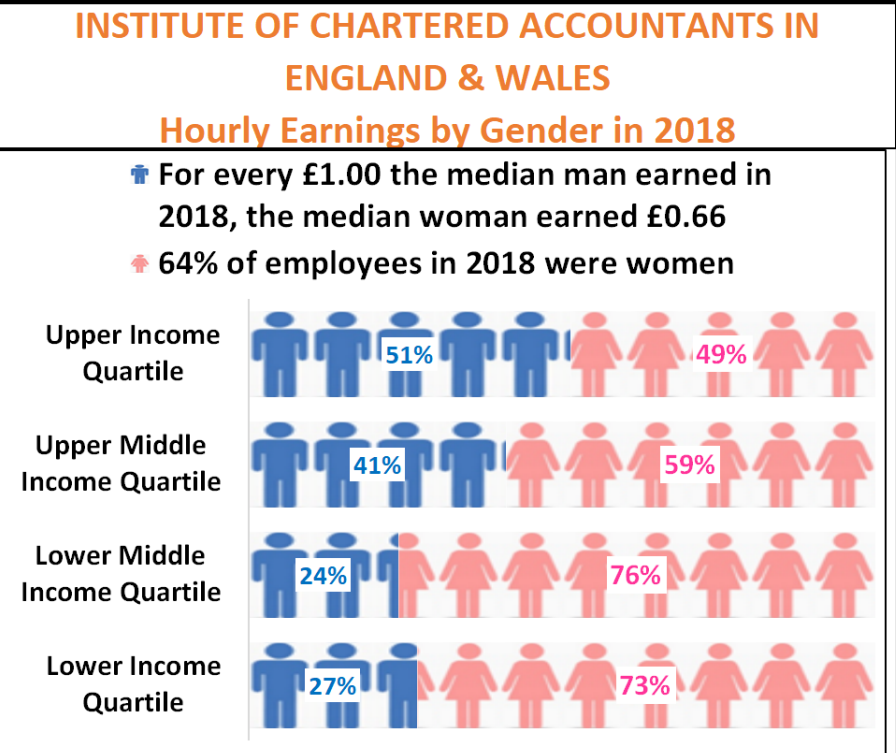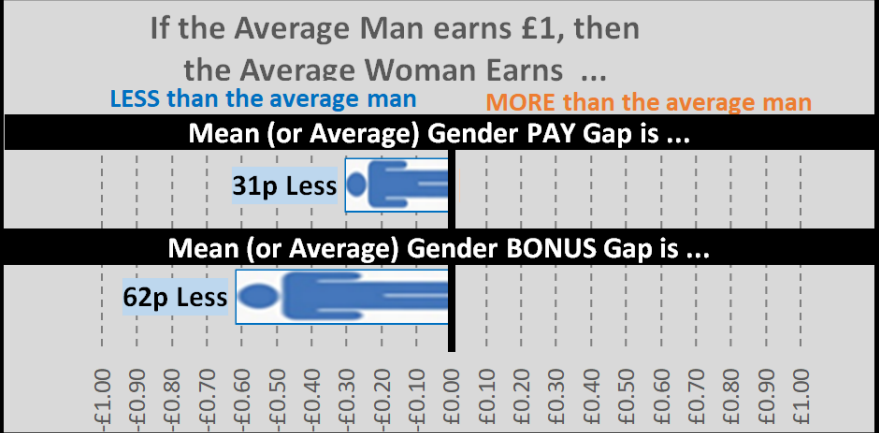
What is this webinar about?

UK Gender Pay Gap Report Summary - INSTITUTE OF CHARTERED ACCOUNTANTS IN ENGLAND & WALES

INSTITUTE OF CHARTERED ACCOUNTANTS IN ENGLAN... ▼ ▲ *<<< Select/flick an organisation*

Year of Snapshot Date 2018 ▲ ▼ *<<< Flick through years*

Employer Name INSTITUTE OF CHARTERED ACCOUNTANTS

Employer Narrative https://www.icaew.com/-/media/corporat

Employer Size 500 to 999 Employees

GPG Data Submitted On Time? Yes 66 days before

If the Median Man earns £1, then the Median Woman earns ...
LESS than the median man | MORE than the median man

Median Gender PAY Gap is ...
35p Less

Median Gender BONUS Gap is ...
17p Less

Statisticians recommend you pay more attention to the median pay gap figures over the mean (or average) pay gaps since averages can be easily disto...

If the Average Man earns £1, then the Average Woman Earns ...
LESS than the average man | MORE than the average man

Mean (or Average) Gender PAY Gap is ...
31p Less

Mean (or Average) Gender BONUS Gap is ...
62p Less

INSTITUTE OF CHARTERED ACCOUNTANTS IN ENGLAND & WALES
Hourly Earnings by Gender in 2018

For every £1.00 the median man earned in 2018, the median woman earned £0.66

64% of employees in 2018 were women

Upper Income Quartile: 51% / 49%
Upper Middle Income Quartile: 41% / 59%
Lower Middle Income Quartile: 24% / 76%
Lower Income Quartile: 27% / 73%

Proportion of employees receiving a bonus
Men 52%
Women 51%

All data sourced from https://gender-pay-gap.service.gov.uk/
Struggling to interpret these numbers? Click here for help.

All charts prepared by Nigel Marriott, Independent Statistician
www.marriott-stats.com *@MarriottNigel*

- **Today we go beyond the statutory gender pay gap data!**
- You can find this on **www.gender-pay-gap.service.gov.uk**
- This particular format for displaying the data can be found on my blog here. **www.marriott-stats.com/nigels-blog/gender-pay-gap-data-2018/**

What does your gender pay gap tell you?

1. Is your gender pay gap data correct?

2. Two better ways of presenting gender pay gap data.

3. Your gender pay gap data tells you nothing whatsoever about equal pay.

4. Is your gender pay gap data too unreliable to draw conclusions?

5. Identifying the Key Drivers of your gender pay gap.

- Visit https://marriott-stats.com/nigels-blog/category/diversity/ to read more of my thoughts about pay gaps (gender, ethnicity, disability, etc).
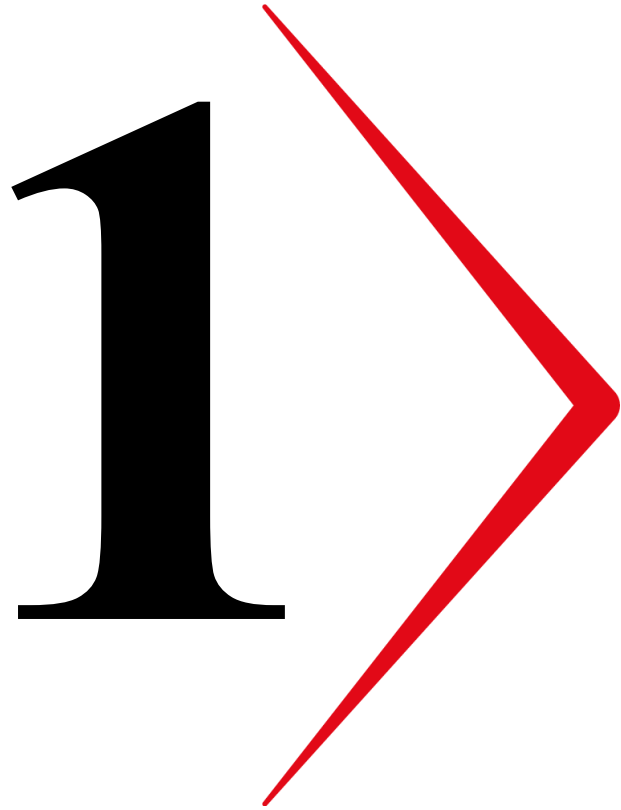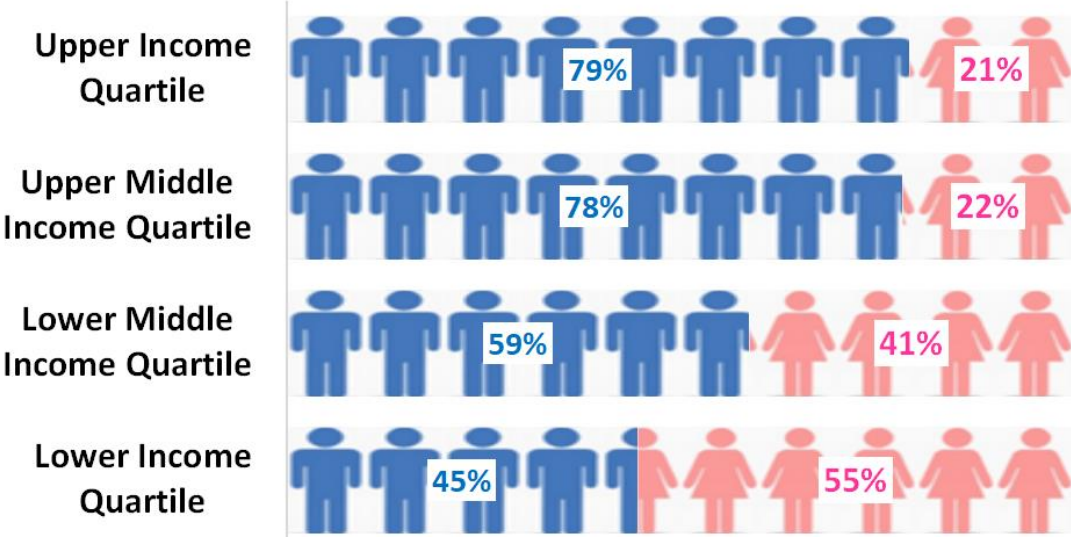
1 *Is your gender pay gap data correct?*

Who Submitted Incorrect GPG Data in Cleveland?

A **Cleveland Police**
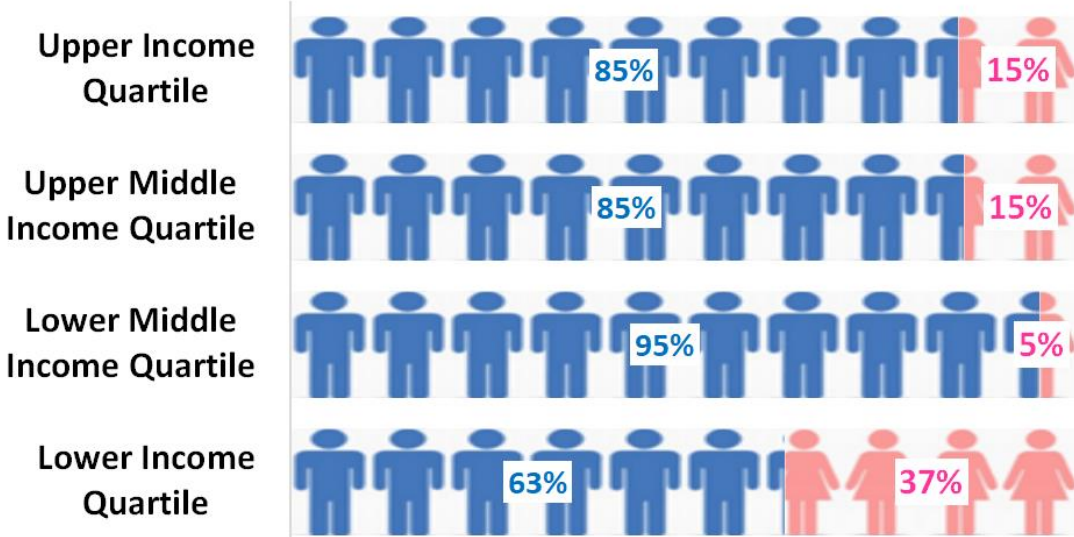**Hourly Earnings by Gender in 2018**

- For every £1.00 the median man earned in 2018, the median woman earned £1.00
- 35% of employees in 2018 were women

Upper Income Quartile	79% / 21%
Upper Middle Income Quartile	78% / 22%
Lower Middle Income Quartile	59% / 41%
Lower Income Quartile	45% / 55%

B **Cleveland Fire Brigade**
Hourly Earnings by Gender in 2018

- For every £1.00 the median man earned in 2018, the median woman earned £0.96
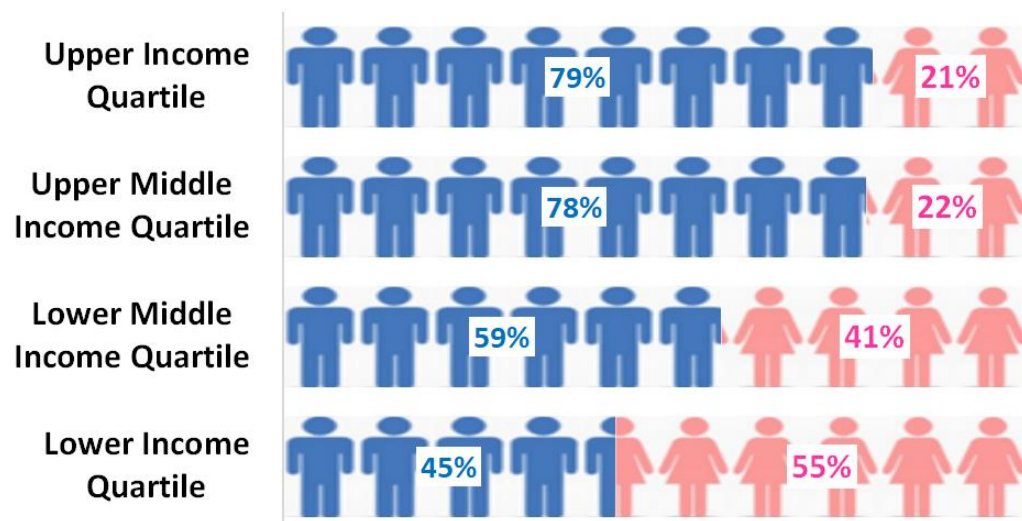- 18% of employees in 2018 were women

Upper Income Quartile	85% / 15%
Upper Middle Income Quartile	85% / 15%
Lower Middle Income Quartile	95% / 5%
Lower Income Quartile	63% / 37%

How Cleveland Police Force got it Wrong


Cleveland Police
Hourly Earnings by Gender in 2018

👔 For every £1.00 the median man earned in 2018, the median woman earned £1.00

👚 35% of employees in 2018 were women

|	
Upper Income Quartile	79% 21%
Upper Middle Income Quartile	78% 22%
Lower Middle Income Quartile	59% 41%
Lower Income Quartile	45% 55%

- They read the guidance issued by the Equalities & Human Rights Commission literally.

- They didn't know that the EHRC's guidance on how to calculate the median hourly earnings for men & women was unforgiveably misleading and ambiguous.

- "*Median is the middle hourly pay rate, when you arrange your pay rates in order from lowest to highest*".

The Misunderstood Median
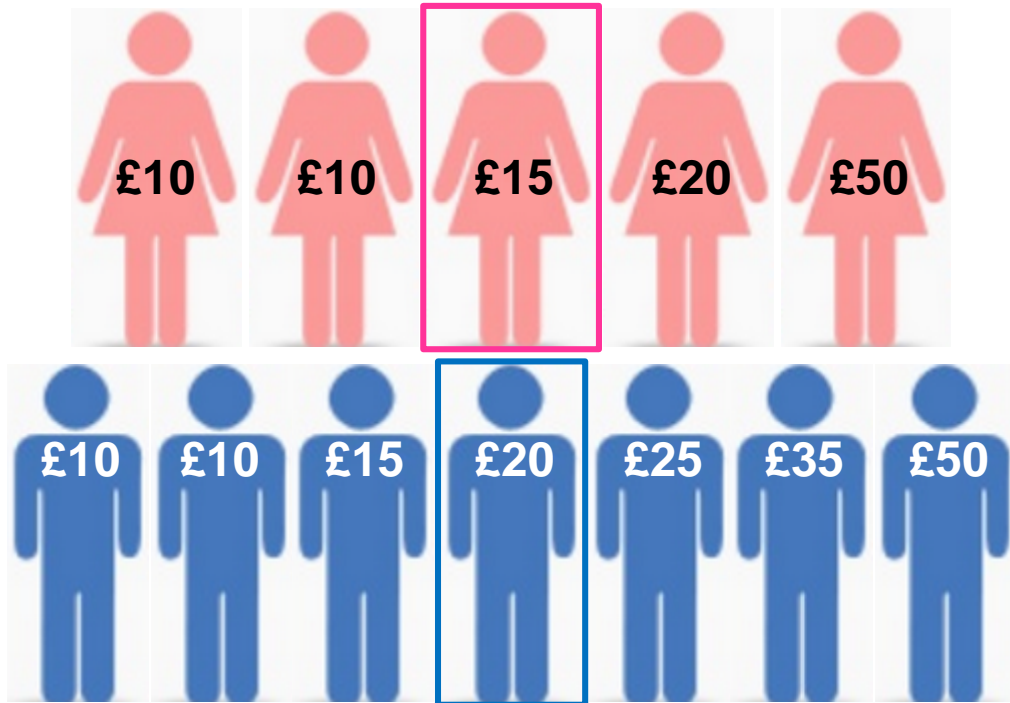
- The median is NOT the "middle value"!

- This can be incorrectly interpreted as the middle of the range e.g. £30 is the middle of the range £10 to £50.

- It is the middle ranked value i.e. the person standing in the middle of the line when they are sorted from high to low on a variable like Hourly Earnings.

Quarters tell you if the Median Pay Gap is Wrong

£10 £10 £15 £20 £50

£10 £10 £15 £20 £25 £35 £50
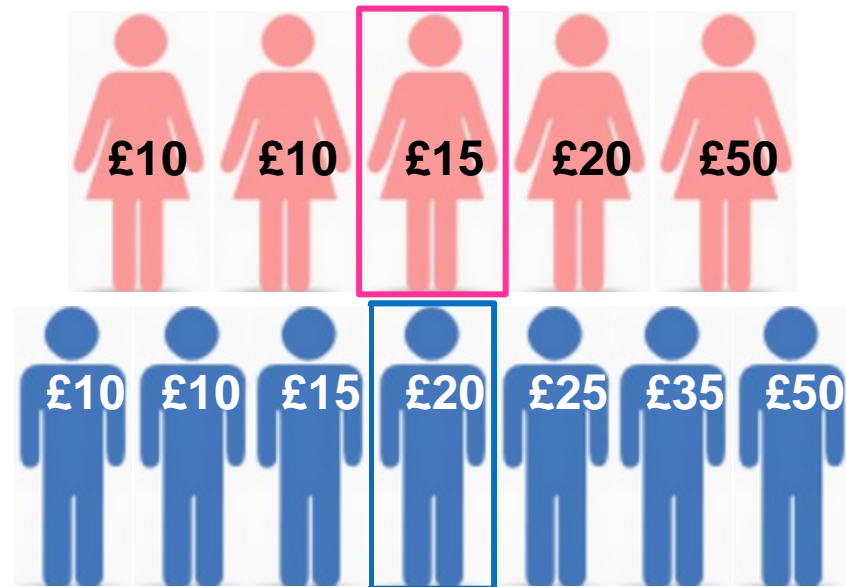
- With one exception (which does not apply to Cleveland Police), it mathematically impossible to have no Median Pay Gap if the **Gender Balance** (**Male:Female Split**) of your **High Earners** (**Upper + Upper Middle Income Quartile**) differs from your **Low Earners** (**Lower Middle + Lower Income Quartiles**)

Lower Income Quartile

£10 £10 £10

Lower Middle Income Quartile

£10 £15 £15

Upper Middle Income Quartile

£20 £20 £25

Upper Income Quartile

£35 £50 £50
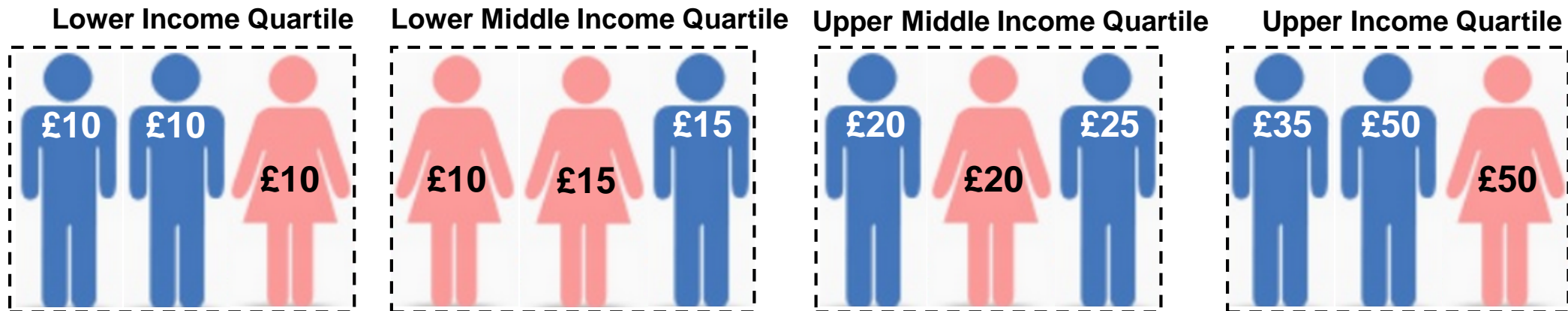
Cleveland Police has a Gender Imbalance between its High & Low Earners = Median Gender Pay Gap

**Cleveland Police
Hourly Earnings by Gender in 2018**

👨 For every £1.00 the median man earned in 2018, the median woman earned £1.00

👩 35% of employees in 2018 were women

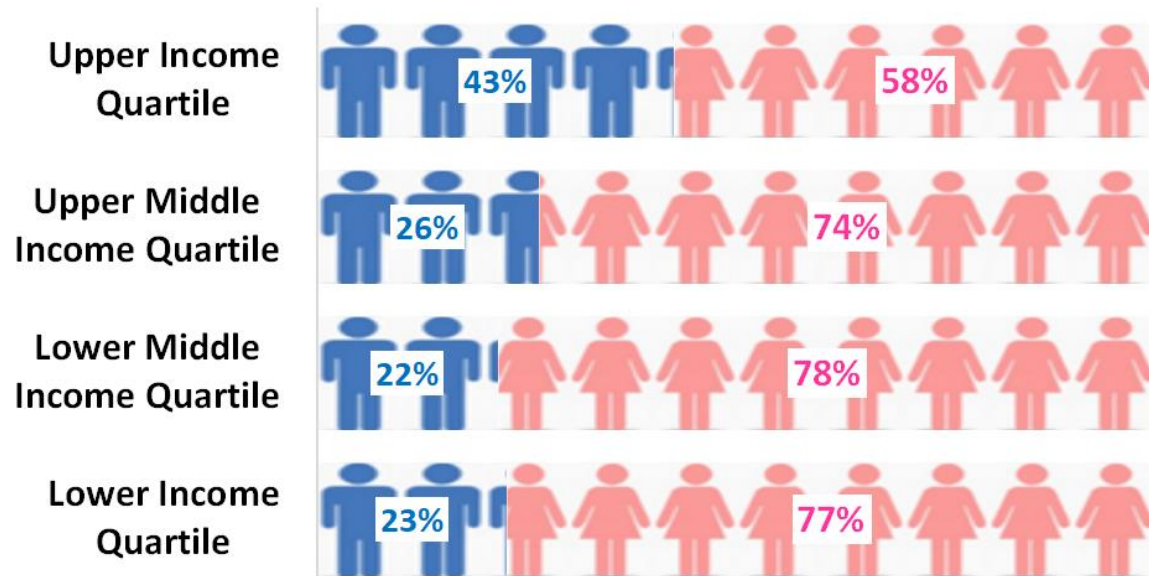|	
Upper Income Quartile	79% 21%
Upper Middle Income Quartile	78% 22%
Lower Middle Income Quartile	59% 41%
Lower Income Quartile	45% 55%
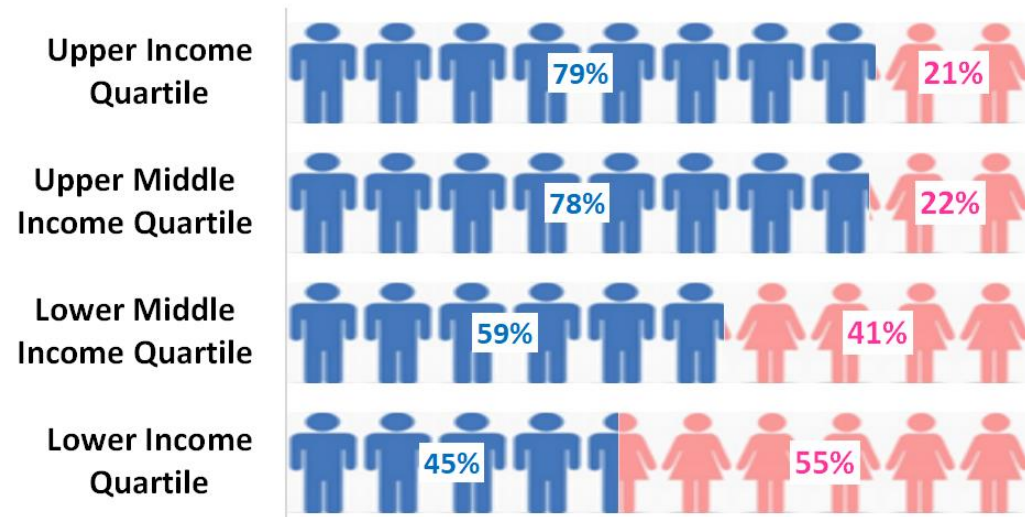
- Assume Cleveland Police has 400 staff in total (139 female, 261 male) i.e. treat the percentages shown as numbers.

- If men stand in a line according to hourly earnings, **the 131st is the median man**.
  - He must be in the Upper Middle Quartile

- Ditto for women, **the 70th woman is the median woman.**
  - She must be in the Lower Middle Quartile

- Therefore there must be a Median Pay Gap!

Minimum Wage Employers are the Exception to the Gender Imbalance by High & Low Earners Rule

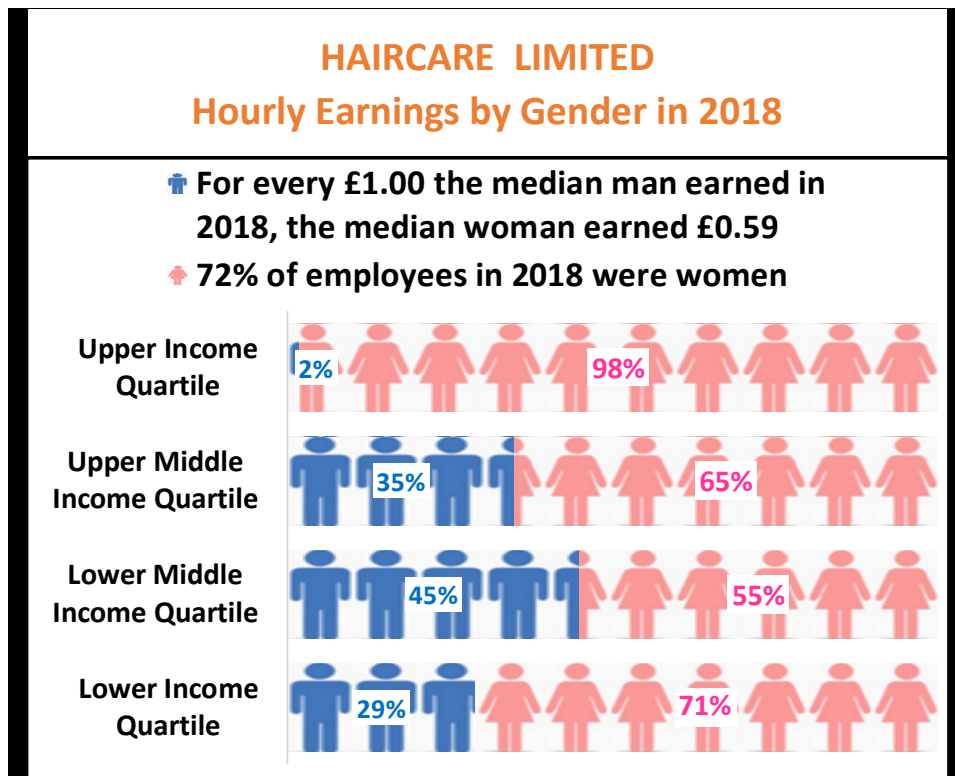## Lees Cleaning Contractors LLP
Hourly Earnings by Gender in 2018

For every £1.00 the median man earned in 2018, the median woman earned £1.00

72% of employees in 2018 were women

Upper Income Quartile	43% 58%
Upper Middle Income Quartile	26% 74%
Lower Middle Income Quartile	22% 78%
Lower Income Quartile	23% 77%

- Cleaning companies (and care homes & cafes) employ a lot of staff on the same pay scale, often the minimum wage.

- When 90% of staff earn virtually the same hourly rate, by definition, the median man and median woman will earn the same and thus there is no median gender pay gap.

- The top quartile though can differ.

Quartiles also Point out Simple Calculation Errors

HAIRCARE LIMITED
Hourly Earnings by Gender in 2018

👤 For every £1.00 the median man earned in 2018, the median woman earned £0.59

👤 72% of employees in 2018 were women

|	
Upper Income Quartile	2% ... 98%
Upper Middle Income Quartile	35% ... 65%
Lower Middle Income Quartile	45% ... 55%
Lower Income Quartile	29% ... 71%

- Since High Earners are more female than Low Earners, the median woman should be earning more than the median man yet this company claims it's the other way around.

- Most likely they've done the wrong calculation e.g. suppose median man earns £12/hr & median women £17/hr, they could calculate -

  - **(12-17) / 12 = -41.7% (Correct = £1.41 = 17/12)**
  - (12-17) / 17 = -29.4% (incorrect)
  - (17-12) / 12 = +41.7% (incorrectly submitted?)
 - (17-12) / 17 = +29.4% (incorrect)

2 ❯ *Two Better Ways of Presenting Gender Pay Gap Data*

Start with the Frequency Distribution by plotting a Histogram

Frequency Distribution of Employee Hourly Earnings

(Women (n=323), Men (n=341))
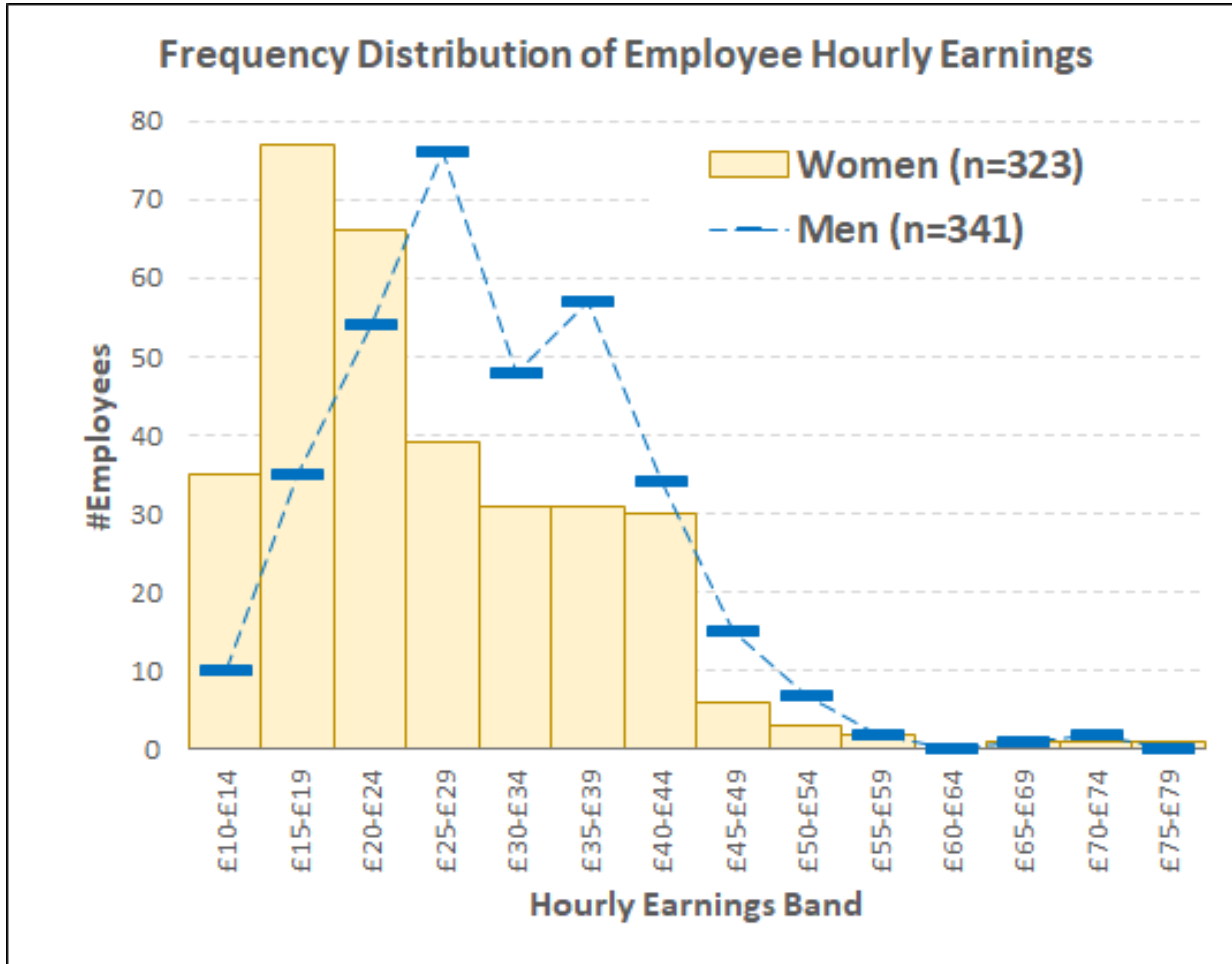
- Whenever we start to analyse a new data set, good practice is always to summarise the data in the form of charts and tables.

- The standard bar/column chart in Excel (or histogram) is often used to plot frequency distributions.

- Whilst it gives us an idea of the shape of the data, it is not easy to figure out the key statistics.

Frequency Distribution of Employee Hourly Earnings
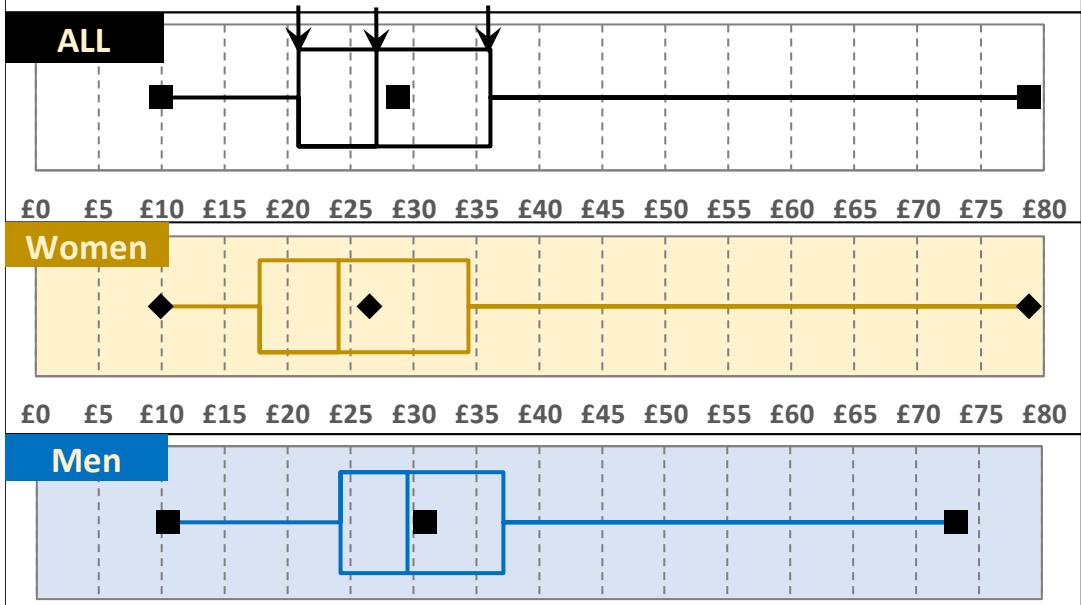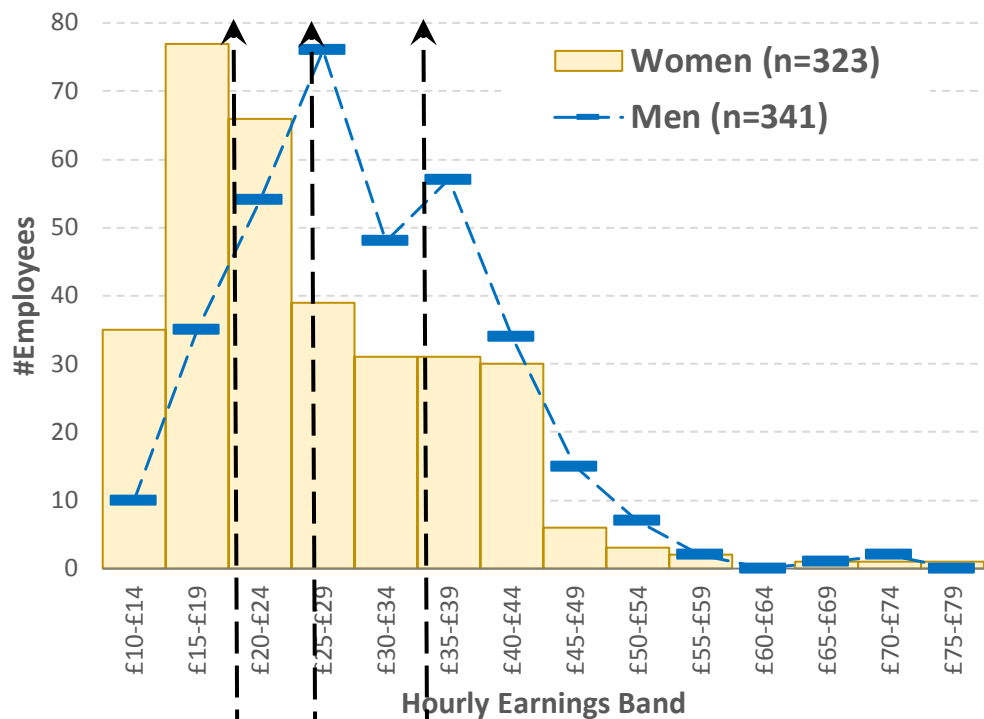
Why the Box Plot gives you more

- The box plot is preferred by many statisticians since in addition to giving you the basic shape of your data, it also gives you the following statistics:
  - Mean & Median
  - Lower & Upper Quartile
  - Minimum & Maximum
  - OR some high & low percentile along with outliers.

You can now produce Box Plots in Excel!

Box & Whisker Plot of Hourly Pay Rates

- The box plot on the previous slide is actually a hack of the XY Scatter Plot feature in Excel and is not easy to do.

- Fortunately, in Excel 2016 and later versions, Microsoft has finally included a Box Plot option

- Click ***Insert > Recommended Charts > All Charts > Box & Whisker***

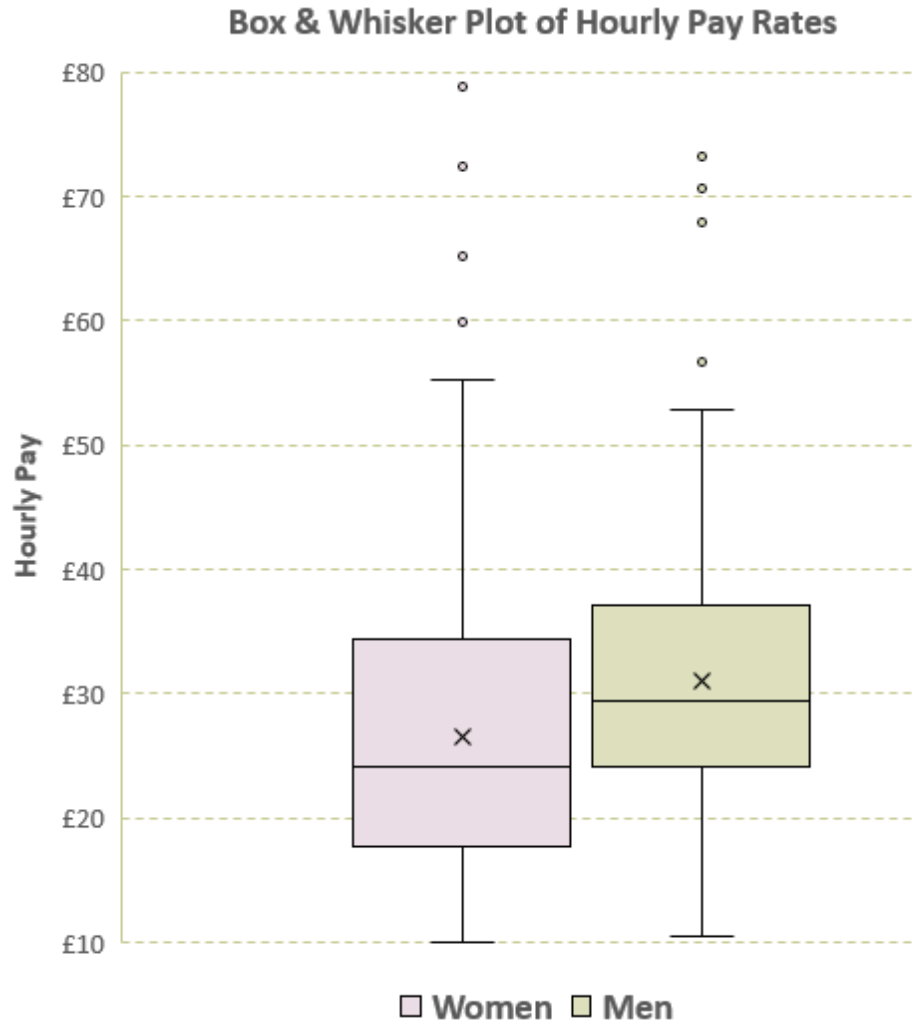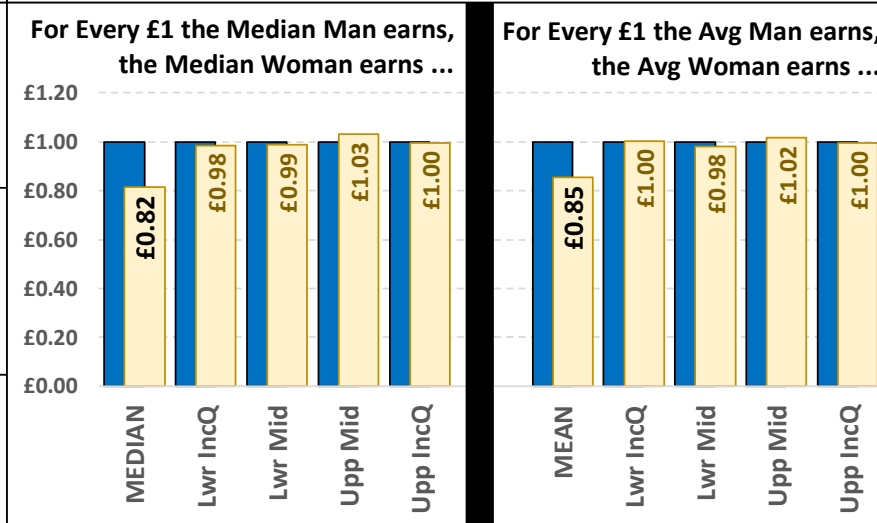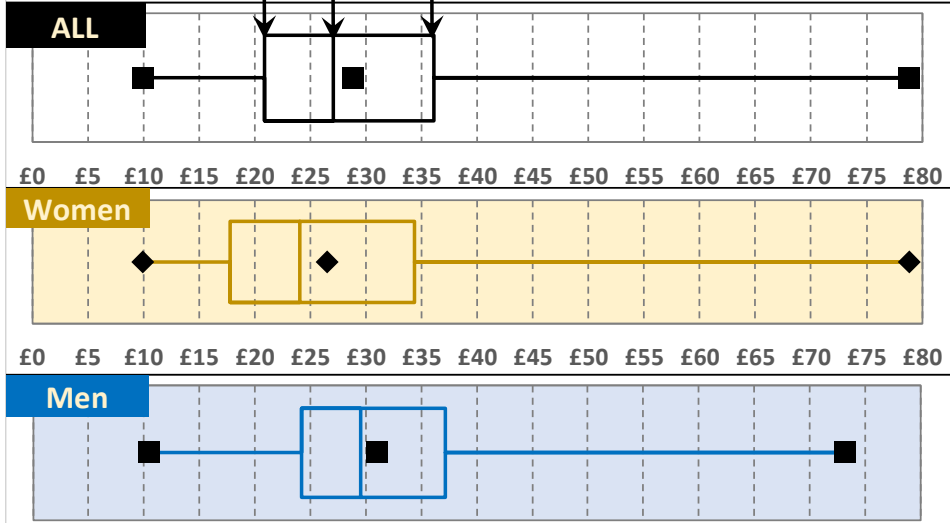- The chart here is the same as the previous slide with slight differences e.g. the stalks/whiskers are not necessarily maxima & minima.

Frequency Distribution of Employee Hourly Earnings

Women (n=323)
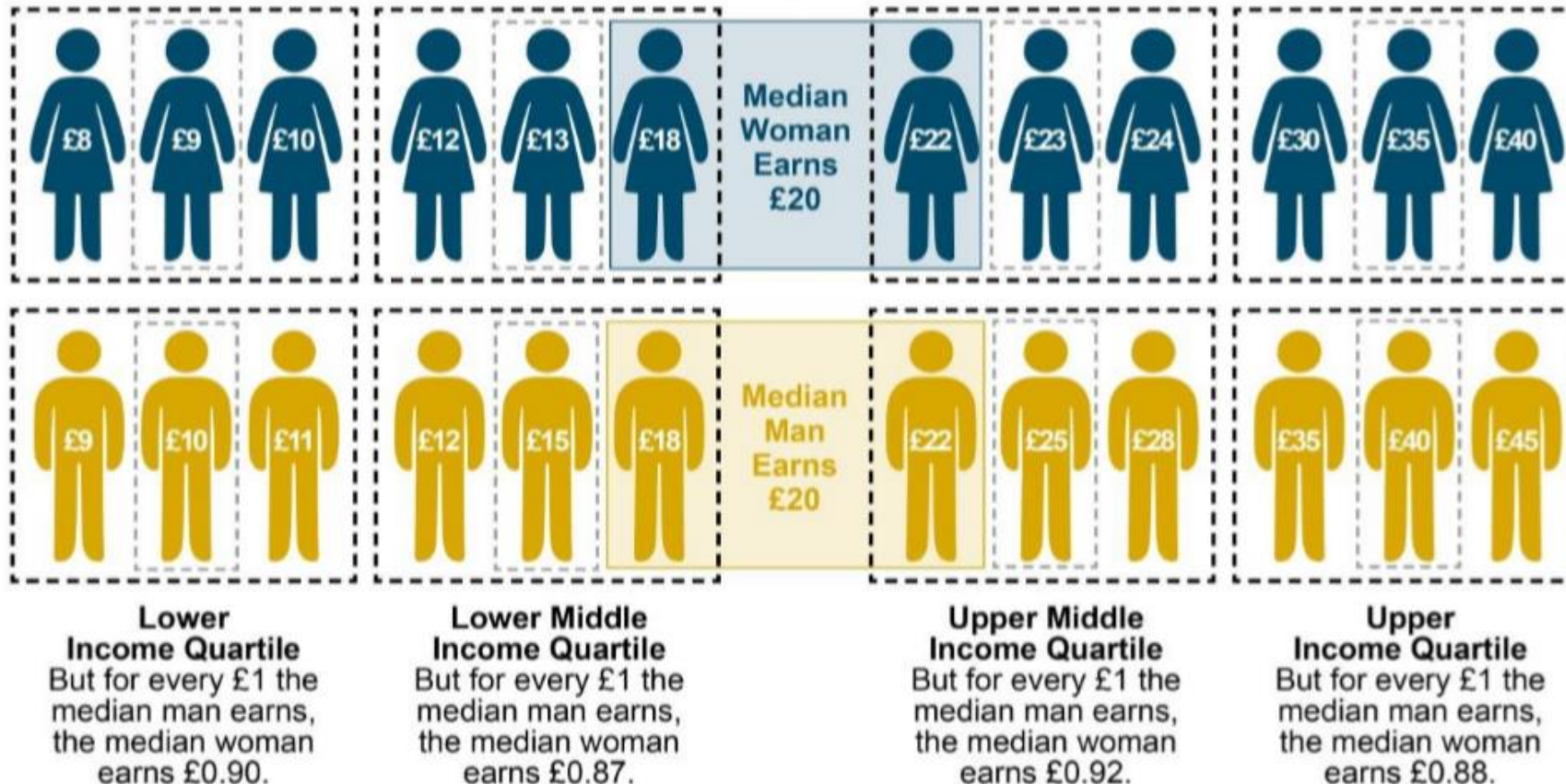Men (n=341)

#Employees

Hourly Earnings Band: £10-£14, £15-£19, £20-£24, £25-£29, £30-£34, £35-£39, £40-£44, £45-£49, £50-£54, £55-£59, £60-£64, £65-£69, £70-£74, £75-£79

Income Quartile Breakdown & Pay Gap

	All Staff		Lower Inc Q £10.00-£20.84	Lwr Mid Inc Q £20.85-£27.07	Upp Mid Inc Q £27.08-£36.11	Upper Inc Q £36.12-£78.88
Blue	n=341 (51%)		n=49 (30%)	n=80 (48%)	n=113 (68%)	n=99 (60%)
Yellow	n=322 (49%)		n=117 (70%)	n=86 (52%)	n=53 (32%)	n=66 (40%)

ALL
£0 £5 £10 £15 £20 £25 £30 £35 £40 £45 £50 £55 £60 £65 £70 £75 £80

Women
£0 £5 £10 £15 £20 £25 £30 £35 £40 £45 £50 £55 £60 £65 £70 £75 £80

Men

For Every £1 the Median Man earns, the Median Woman earns …

MEDIAN	Lwr IncQ	Lwr Mid	Upp Mid	Upp IncQ
£0.82	£0.98	£0.99	£1.03	£1.00

For Every £1 the Avg Man earns, the Avg Woman earns …

MEAN	Lwr IncQ	Lwr Mid	Upp Mid	Upp IncQ
£0.85	£1.00	£0.98	£1.02	£1.00

- Left hand side show histogram and box plots.

- These give you the income quartiles.

- Right hand side is the statutory data with the addition of median pay gaps for each quartile.

Why I & the Royal Statistical Society Recommend Calculating Pay Gaps for each Income Quartile

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.

£8 £9 £10 £12 £13 £18 Median Woman Earns £20 £22 £23 £24 £30 £35 £40

£9 £10 £11 £12 £15 £18 Median Man Earns £20 £22 £25 £28 £35 £40 £45

Lower Income Quartile
But for every £1 the median man earns, the median woman earns £0.90.

Lower Middle Income Quartile
But for every £1 the median man earns, the median woman earns £0.87.

Upper Middle Income Quartile
But for every £1 the median man earns, the median woman earns £0.92.

Upper Income Quartile
But for every £1 the median man earns, the median woman earns £0.88.

- Makes it harder to game the system.
- Can highlight potential Equal Pay issues?
- **WH Smiths, Cleveland Fire Brigade, Aldermore Bank** already do this in their reports.

3 >

Your Gender Pay Gap data tells you nothing whatsoever about Equal Pay

Confusion between Equal Pay & Gender Pay Gap is Widespread

Kamala Harris ✔ @KamalaHarris · May 26
This week I released a plan that would force corporations to prove they are not engaging in pay discrimination. The **gender pay gap** won't quickly close on its own unless we take action. Corporations must be held accountable.

💬 893   ↺ 1K   ♡ 4.9K   ↑

Equal Pay Coalition
@EqualPayON   Follow
The Equal Pay Coalition is made up of organizations across Ontario, Canada fighting to close the gender pay gap.

UN Women ✔ @UN_Women · May 28
"When women enter the formal labour market, their paid work & their role as workers is often seen as subsidiary or supplementary to their principle role of 'homemakers.'" An experts take on the **gender pay gap**:

Take Five: At the current rate of progress, no equal pay until 2069
Across the world, women still get paid 23 per cent less than men for work of equal value. Chidi King, Director of the Equality Department of the Inte...
🔗 unwomen.org

Equal Pay = Paying Men & Women the Same for the Same Work

Gender Pay Gap = Difference Between the Median Man and the Median Women

You can break the law on Equal Pay by paying women 20% MORE for doing the same job as men & still have a Gender Pay Gap where the Median Woman earns 20% LESS than the Median Man.

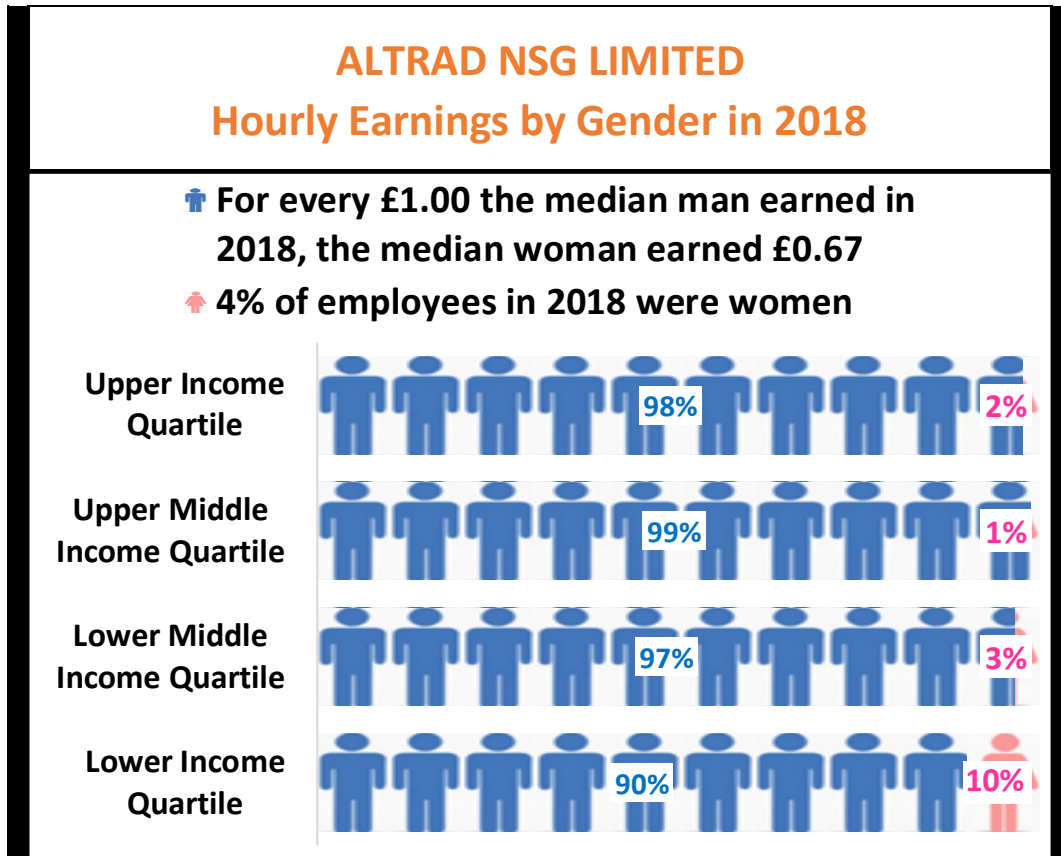# *Gender Pay Gap nothing to do with Equal Pay!*
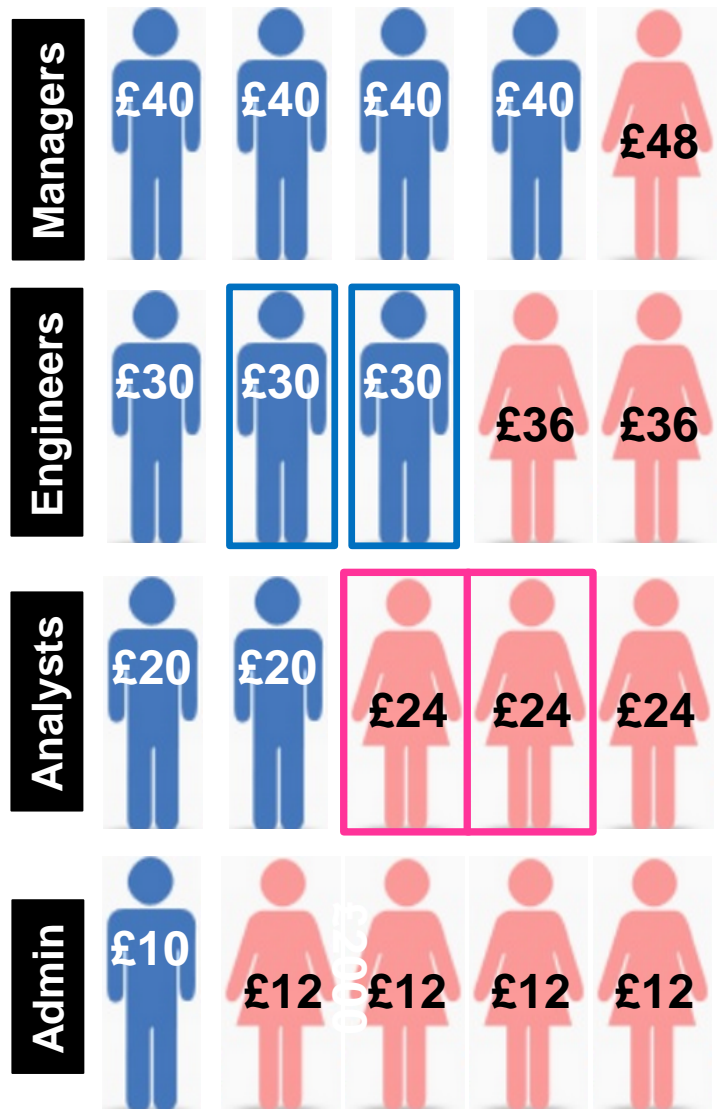
- The median man earns £30ph compared to £24ph for the median woman.

- To eliminate a gender pay gap, **you must first have a similar gender balance across all 4 income quartiles in the first place**.

- It is of course possible for unequal pay to occur but this can only be done through comparing the same or similar jobs.

- If roles are gender dominated, then GPG analysis might highlight different roles being paid differently when perhaps they shouldn't be.

# 4 〉 *Is your gender pay gap data too unreliable to draw conclusions?*

Beware of Small Sample Sizes!

ALTRAD NSG LIMITED
Hourly Earnings by Gender in 2018

👨 **For every £1.00 the median man earned in 2018, the median woman earned £0.67**
🌷 **4% of employees in 2018 were women**

Upper Income Quartile	98%	2%
Upper Middle Income Quartile	99%	1%
Lower Middle Income Quartile	97%	3%
Lower Income Quartile	90%	10%

- This company ticked the 250-499 employees box.

- Assume they have 300 employees in total.

- Then 4% of 300 = 12 are women.

- Can you make a valid comparison between the median man and median woman?

- No because if 2 women leave and 3 arrive, the median woman's earnings could change enormously.

A Guide to 95% Confidence Intervals for Pay Gaps

Perfectly Equal Simulation Ltd
(300 employees 5:3 Male:Female)
5000 Simulated Gender Pay Gaps

For every £1 the Median Man earns, the Median Woman earns ...
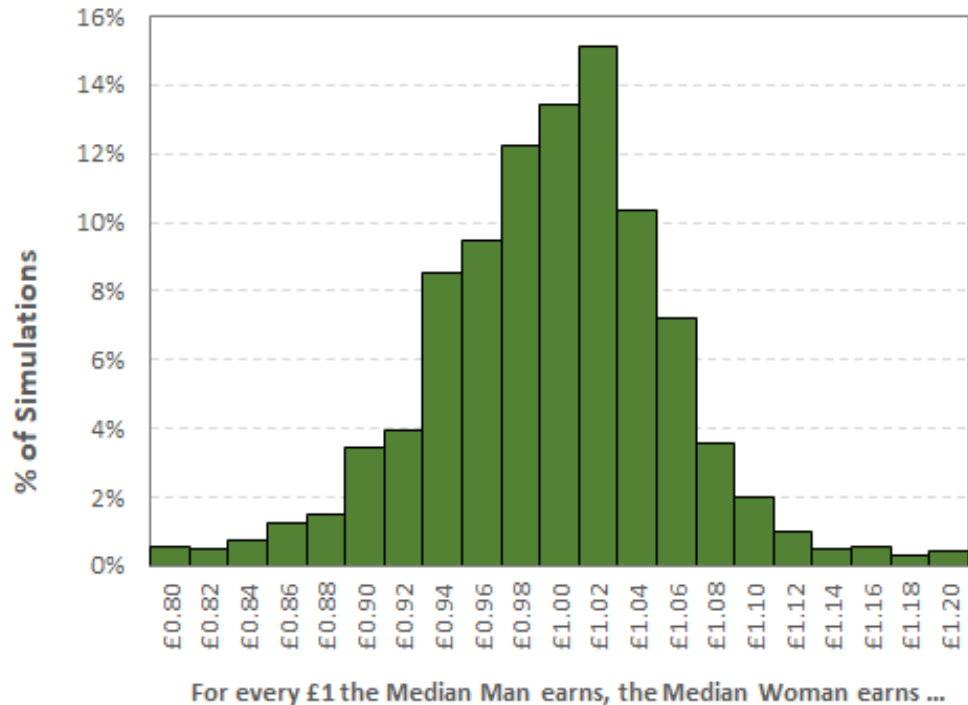
- Assume a fictional employer with 300 employees does not discriminate at all when interviewing, recruiting and promoting staff.

- However, the nature of the work they do means that they receive 3 applications from women for every 5 men that apply.

- Using a standard simulation model which allows for random variation in applications and promotions, the distribution of the median woman's earnings is shown here.

- 95% of the time, the median woman earns between £0.81 & £1.17.

When should you be cautious about pay gaps?

| Perfectly Equal Simulation Ltd - For Every £1 a man earns, a woman earns			
# Employees	Prop Women	95% Conf Int	
		LCI	UCI
300	1 in 2	£0.87	£1.15
300	3 in 8	£0.81	£1.17
300	1 in 5	£0.70	£1.25
300	1 in 10	£0.65	£1.45
2700	1 in 2	£0.96	£1.04
2700	3 in 8	£0.96	£1.04
2700	1 in 5	£0.96	£1.06
2700	1 in 10	£0.95	£1.06

- For large employers, gaps greater than 5p are significant even in gender-dominant employers.

- For small employers, very large margin of errors have to be allowed for especially for gender-dominant employers.

- My recommendation is that you seek advice from a statistician when you have less than 50 men or women.

- Note this situation will be exacerbated if you are analysing ethnicity & disability pay gaps where the sample size of some groups is likely to be less than 20.

5 > *Identifying the Key Drivers of your Gender Pay Gap*

Key Driver Modelling by a Statistician

- In an ideal world, analysts working on pay gap data would be trained statisticians capable of building a multivariate statistical model that would explain employee pay as a function of a number of factors e.g.

    - Pay Band

    - Number of years of service

    - Location

    - Department / Job Function

    - Qualifications

- Once you've taken these factors into account, if the residual errors still show a gender difference, you may have found an equal pay issue.
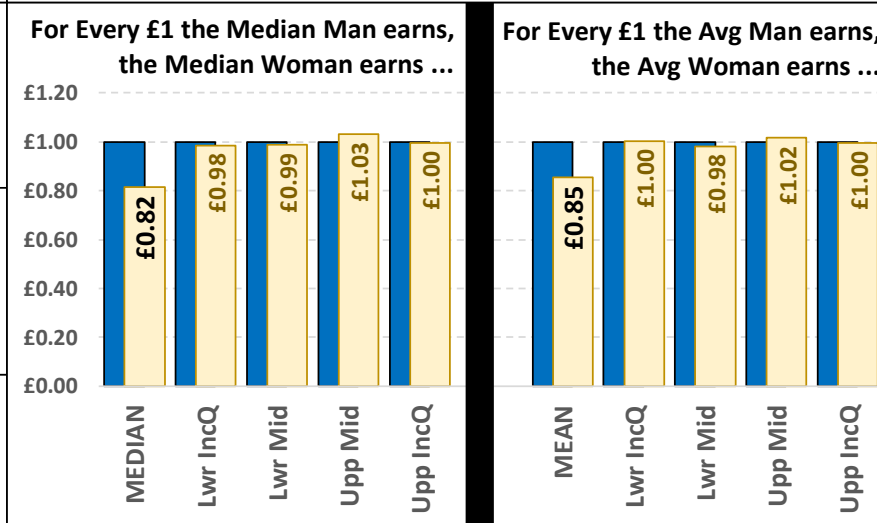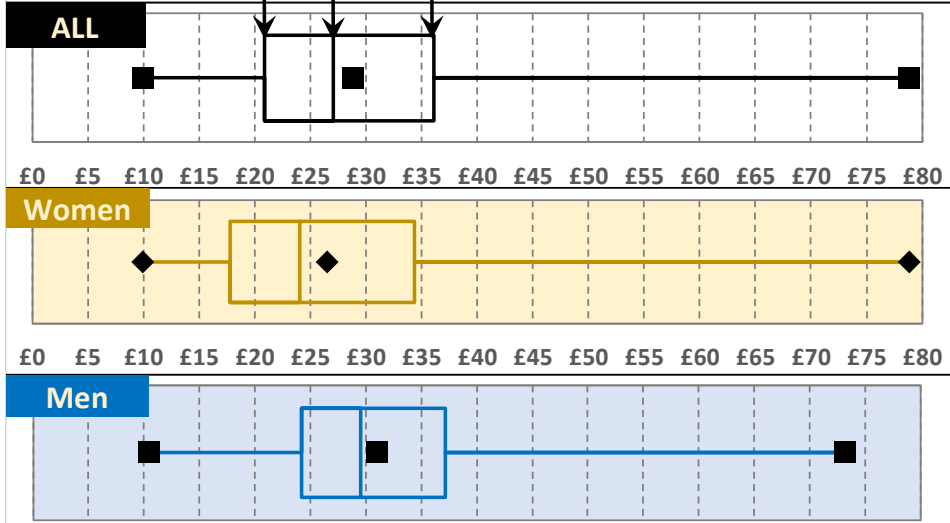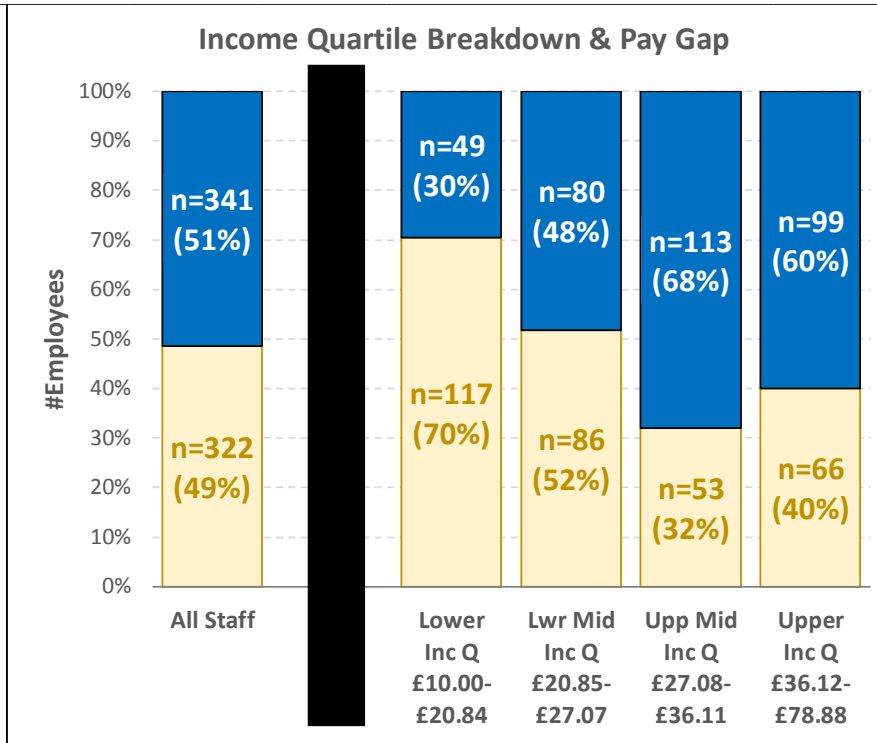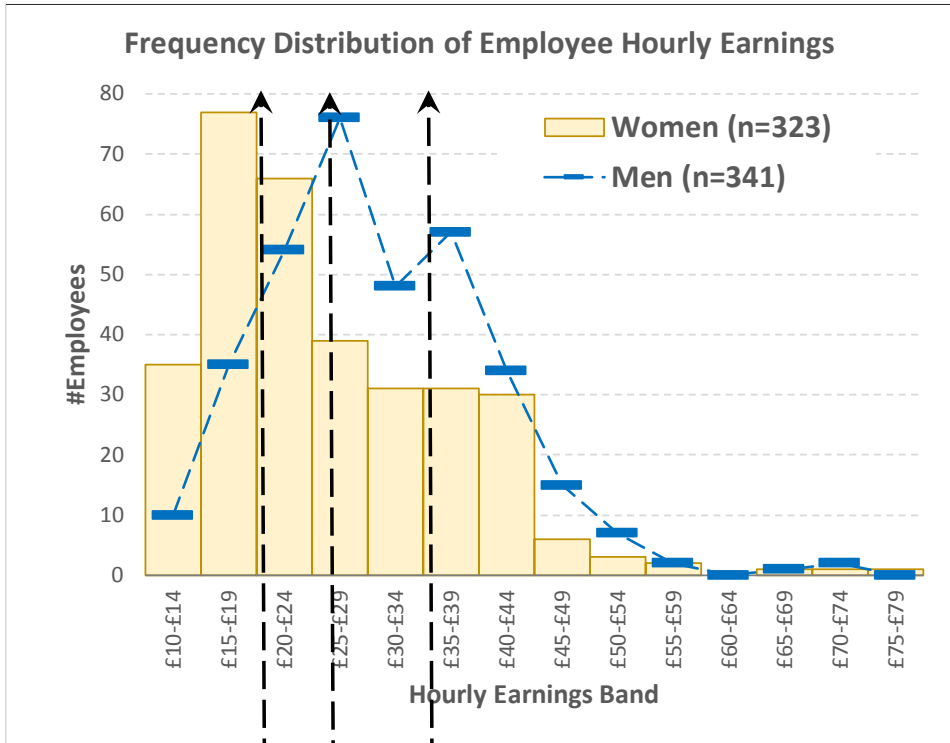
- A simpler way is to do a What-If analysis instead.

- "What if we could achieve the overall gender balance of 49:51 in specific roles? Which would have the largest effect on the overall gender pay gap?"

Results of our What-If Analysis

The Situation Today								
Job Function		**# of Staff**			**Gender Balance**		**Hourly Average**	
Pay Band	**Role**	**ALL**	**Women**	**Men**	**%Women**	**%Men**	**Women**	**Men**	**GPG Pin£**
£10-19	**Admin**	157	112	45	71%	29%	£16.02	£15.76	£0.02
£20-29	**Analysts**	235	105	130	45%	55%	£24.27	£25.59	-£0.05
£30-44	**Engineers**	186	73	113	39%	61%	£37.53	£37.09	£0.01
£30-49	**Managers**	66	25	41	38%	62%	£39.48	£40.65	-£0.03
£50+	**Senior Mgmt**	20	8	12	40%	60%	£61.47	£57.12	£0.08
	ALL	**664**	**323**	**341**	**49%**	**51%**	**£26.50**	**£31.02**	**-£0.15**

Possible Situation in the Future								
Job Function		**Equalised Gender Balance across all roles looks like this**					**Effect of Equalising 1 Role at a time on overall GPG**		
Pay Band	**Role**	**ALL**	**Women**	**Men**	**%Women**	**%Men**	**Women**	**Men**	**GPG Pin£**
£10-19	**Admin**	157	76	81	48%	52%	£27.82	£29.57	**-£0.06**
£20-29	**Analysts**	235	114	121	49%	51%	£26.44	£31.17	**-£0.15**
£30-44	**Engineers**	186	90	96	48%	52%	£27.06	£30.71	**-£0.12**
£30-49	**Managers**	66	32	34	48%	52%	£26.78	£30.82	**-£0.13**
£50+	**Senior Mgmt**	20	10	10	50%	50%	£26.72	£30.87	**-£0.13**

- Suppose there are 5 roles as shown.

- Today, there is no real pay gap within each role but the gender balance differs.

- If a 49:51 balance can be achieved in one role at a time, which one closes the overall mean pay gap the most?

- Answer is Admin roles.

6 > *How to find out more about gender pay gaps*

Timeline - April 2018 to August 2018

April 2018 – Publication of first round gender pay gap data for all 10,500 employers with 250+ employees based on April 2017 payroll. You can search and download this data from **www.gender-pay-gap.service.gov.uk**

May 2018 – I decide to start blogging about GPG data as I am always on the lookout for publicly available data of topical interest to be used in my training courses **www.marriott-stats.com/nigels-blog/category/diversity**

June 2018 – I realise GPG data contains numerous errors and estimate **1 in 10 employers have made errors in their submitted GPG data**. In addition to blogging, some specialist magazines in the HR field publish some of my articles about these issues.

August 2018 – I publish a blog post "***12 ways to improve public confidence in gender pay gap data***" and approach the RSS about how to bring these concerns to the attention to government bodies responsible for GPG regulation. We begin a collaboration to produce a report in the RSS' name.

Timeline - April 2019 to August 2019

April 2019 – RSS publishes its report "*10 Proposed Reforms to Gender Pay Gap Reporting*" to coincide with the 2nd round of GPG data published by 10,500+ employers in the UK based on April 2018 payroll data. RSS Policy Team led by Iain Wilton approach 30+ parliamentarians with their report.

June 2019 – The RSS nominates me to testify to the **Treasury Select Committee** in Parliament about the "*Effectiveness of Gender Pay Gap Reporting*".

July 2019 – It is now clear there political will for ethnicity pay gap reporting. For statistical, data & ethical reasons, **I am opposed to replicating the GPG process for ethnicity** and will seek RSS support to push for an alternative EPG process.

August 2019 – **Significance** publishes my article "*Gender Pay Gaps – A Median Sized Problem*" which explores RSS recommendations #2 & #6 in more depth.

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9 October

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21 October

The Macpherson Report – lessons for the private sector
20 November

Practical Excel tips
2 December

Free 20 minute webinars – 12.30pm

Five key questions all boards should ask about fraud
16 October

Top tips on powerful presentations
6 November

Free 10 minute webinar – 12.30pm

Networking for serious thinkers
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Game of Zones – Managing virtual teams
19 September

PD Leake – Acting in the public interest: accounting for the vulnerable
15 October

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26 November

E-Learning lecture – 9.00am

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THANK YOU FOR ATTENDING

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