# - Mind The Gap –
## A Statistician's Encounter with Gender Pay Gap Reporting

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Business & Industry Section
19th October 2022**

**www.marriott-stats.com**

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# Pay Gap Reporting in the UK

## 1 - Strengths

**Accountability**

## 2 - Weaknesses

**League Tables**

## 3 - Opportunities

**Pay Quarter Breakdowns**

## 4 - Threats

**Gaming & Discrimination**

## Statisticians! HR Needs You!

# Look out for labels referring to a related blog

- All of my blogs about the statistics of diversity & pay gaps are listed here.
  - ❑ **https://bit.ly/2NJb9VR**

- The link groups my blogs by **theme.**
  - ❑ Each blog in this list has an ID number like B7, A4, etc
  - ❑ The letter refers to the theme and the number refers to the order under the theme.

**See C2**

- Many slides have a label like this.
  - ❑ These refer to a specific blog from the themed list where more information can be found.
  - ❑ e.g. "**See C2**" means click on the 2nd blog listed under theme C.

**All slides show the link to the list here  >>>**

**https://bit.ly/2NJb9VR**

# What is a Gender Pay Gap?

www.marriott-stats.com

**Q – When you hear the term "gender pay gap" which of the following do you think that is referring to?**

**A** — Women as a whole being paid less on average than men as a whole

**B** — Women being paid less than men for doing the same job

## VOTE NOW!

https://bit.ly/2NJb9VR

# YouGov Survey September 2018

**Q – When you hear the term "gender pay gap" which of the following do you think that is referring to?**

**A** Women as a whole being paid less on average than men as a whole

**B** Women being paid less than men for doing the same job

## See M3 for YouGov data and report

6% of Respondents selected Don't Know
90% claimed to have heard of gender pay gap
83% claimed to understand the meaning of the term "very well" or "quite well"

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**A** ✓ **Women as a whole being paid less on average than men as a whole**

**B** ✗ **Women being paid less than men for doing the same job**

## Most Brits have the wrong idea of what the gender pay gap is

When you hear the term "gender pay gap", which of the following do you think that is referring to? %

**See M3**

- ■ Women as a whole being paid less on average than men as a whole (CORRECT)
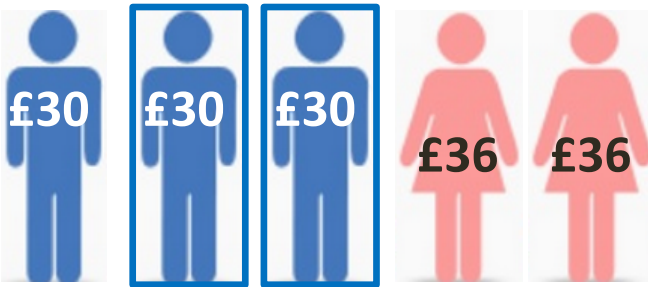- ■ Women being paid less than men for doing the same job (INCORRECT)

| | General population | Among those who say they have heard of the gender pay gap | Among those who say they think they understand "very well" or "quite well" what the gender pay gap is |
|---|---|---|---|
| CORRECT | 30 | 31 | 32 |
| INCORRECT | 64 | 67 | 67 |

**YouGov** | yougov.com

August 14-15, 2018

https://bit.ly/2NJb9VR

# The Gender Pay Gap has nothing to do with Equal Pay!



**Managers:** £40, £40, £40, £40, £48

**Engineers:** £30, £30, £30, £36, £36

**Analysts:** £20, £20, £24, £24, £24

**Admin:** £10, £12, £12, £12, £12

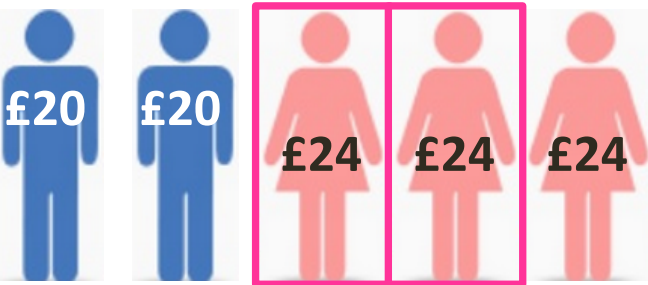## See B2

- The median woman **(£24ph**) is paid **20% LESS** than the median man (**£30ph**)
- This is the **Gender Pay Gap**

- Within each role, the median woman is paid **20% MORE** than the median man.
- This is **Unequal Pay**

- This is **Simpsons Paradox** at work

## See B8 for a real life example

https://bit.ly/2NJb9VR

# Confusion about the distinction between Unequal Pay & the Gender Pay Gap is widespread

**Kamala Harris** ✔ @KamalaHarris · May 26  From 2019, See D4

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       ⬆

**Fawcett Society** ✔ @fawcettsociety · Oct 29  See B2

📢 JUST IN: #EqualPayDay2019 falls on \*\*November 14th\*\*. Progress to close the gender pay gap is dismally slow and at this rate it will take 60 years to eradicate it.  As we approach the 50th anniversary of the Equal Pay Act women have waited long enough.

# If Compliance with Equal Pay laws is your goal, do NOT use Gender Pay Gap Reporting!  Use something like Iceland's IST85 Auditable Management Standard

See F5

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https://bit.ly/2NJb9VR

## 1 - Strengths

### Accountability

# Employers are Accountable for their Pay Gaps …

- **PUBLIC** Data for 10,500+ employers with headcount of 250+
  - ❑ 6 sets of statistics
  - ❑ Data is downloadable from **GEO** (& My) website   **See A1**
  - ❑ Published on employers website in accessible area

- Accompanied by employers' **NARRATIVE** which
  - ❑ Diagnoses the **Key Drivers** of their pay gaps.
  - ❑ Identifies the **Reasons** why those drivers exist.
  - ❑ Details their **Action Plans** to tackle their pay gap.
  - ❑ Reports progress on **What Worked** and what didn't work.
  - ❑ Signed off by **Senior Person** (CEO or other director)

- **ENFORCED** by **EHRC** (Equality & Human Rights Commission)
  - ❑ EHRC are not the regulator, just the enforcer.
  - ❑ GEO (Government Equalities Office) are the gatekeepers of the Equality Act 2010 regulations.

## … in theory …

https://bit.ly/2NJb9VR

# … but in practice …
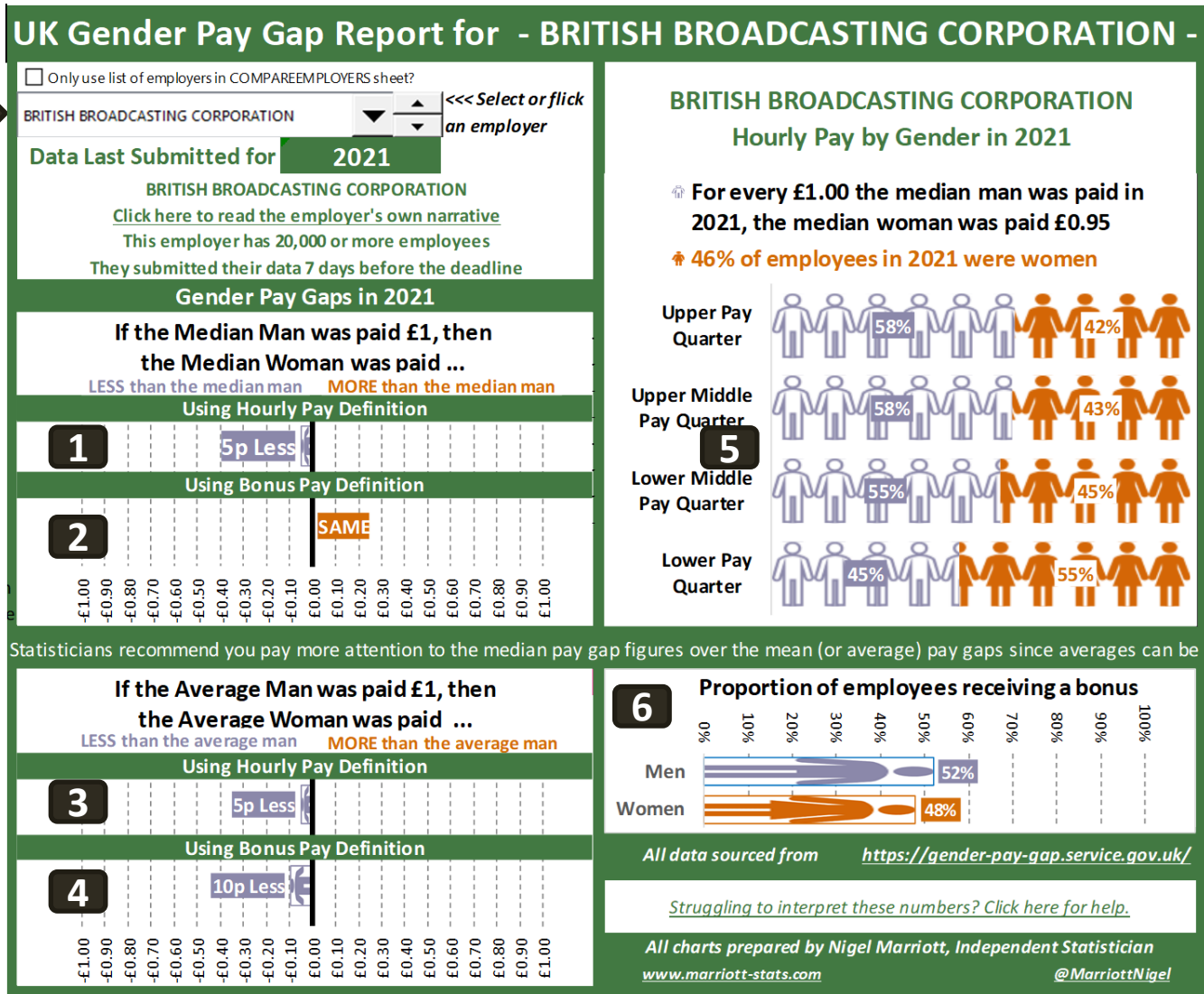
- **PUBLIC** Data for 10,500+ employers with headcount of 250+
  - ☐ 6 sets of statistics
  - ☐ [I estimate 5-20% of employers submit erroneous data] website **See C1**
  - ☐ [I estimate 5-20% of employers submit erroneous data] sible area

- Accompanied by employers' **NARRATIVE** which
  - ☐ Diagnoses the **Key Drivers** of their pay gaps.
  - ☐ [Compliance is poor and many narratives just describe the numbers with no diagnoses and actions]
  - ☐
  - ☐
  - ☐ Signed off by **Senior Person** (CEO or other director)

- **ENFORCED** b[Limited enforcement powers]
  - ☐ EHRC are
  - ☐ GEO (Gov
    Equality Act

**Compliance is poor and many narratives just describe the numbers with no diagnoses and actions**

**Limited enforcement powers
When enforcement was suspended in 2020 for COVID, 1/3 of employers failed to report data**

## Can Statisticians make a difference?

**https://bit.ly/2NJb9VR**

# Employers must Submit their Data to www.gender-pay-gap.service.gov.uk



See A1 to download this template

UK Gender Pay Gap Report for - BRITISH BROADCASTING CORPORATION -

☐ Only use list of employers in COMPAREEMPLOYERS sheet?

BRITISH BROADCASTING CORPORATION  ▼ ▲ <<< *Select or flick an employer*

**Data Last Submitted for** 2021

BRITISH BROADCASTING CORPORATION
Click here to read the employer's own narrative
This employer has 20,000 or more employees
They submitted their data 7 days before the deadline

## Gender Pay Gaps in 2021

**If the Median Man was paid £1, then the Median Woman was paid ...**
LESS than the median man    MORE than the median man

### Using Hourly Pay Definition
**1** 5p Less

### Using Bonus Pay Definition
**2** SAME

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

**If the Average Man was paid £1, then the Average Woman was paid ...**
LESS than the average man    MORE than the average man

### Using Hourly Pay Definition
**3** 5p Less

### Using Bonus Pay Definition
**4** 10p Less

BRITISH BROADCASTING CORPORATION
**Hourly Pay by Gender in 2021**

👨 For every £1.00 the median man was paid in 2021, the median woman was paid £0.95

👩 46% of employees in 2021 were women

| | Men | Women |
|---|---|---|
| Upper Pay Quarter | 58% | 42% |
| Upper Middle Pay Quarter | 58% | 43% |
| Lower Middle Pay Quarter | 55% | 45% |
| Lower Pay Quarter | 45% | 55% |

**5**

**6** Proportion of employees receiving a bonus

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Men 52%
Women 48%

*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

https://bit.ly/2NJb9VR

## 2 - Weaknesses

## League Tables

**Q** – Two employers A & B from the same industry and location and with similar reputations are advertising a job vacancy for a Senior Statistician with similar job descriptions. Which employer would be your preference given the information below?

**A** For every £1 paid to the median man, the median woman is paid £1

**B** For every £1 paid to the median man, the median woman is paid 80p

## VOTE NOW!

**Q** – Two employers A & B from the same industry and location and with similar reputations are advertising a job vacancy for a Senior Statistician with similar job descriptions.  Which employer would be your preference given the information below?

**A** For every £1 paid to the median man, the median woman is paid £1
10% of employees are women

**B** For every £1 paid to the median man, the median woman is paid 80p
50% of employees are women

## VOTE NOW!

https://bit.ly/2NJb9VR

# Which Employer Sounds Better? Scenario 3

Q – Two employers A & B from the same industry and location and with similar reputations are advertising a job vacancy for a Senior Statistician with similar job descriptions. Which employer would be your preference given the information below?

**A**

For every £1 paid to the median man, the median woman is paid £1
10% of employees are women
Salary offered is £42,000

**B**

For every £1 paid to the median man, the median woman is paid 80p
50% of employees are women
Salary offered is £40,000

Pay Gap & Diversity Data is Multivariate not Univariate.
Prioritising the Median Gender Pay Gap (Univariate) leads to a "One Number League Table" mentality.

https://bit.ly/2NJb9VR

**n=8297**

UK Private Sector Pay Gap By Female Representation 2021
For Every £1 paid to Average Man, the Average Woman is paid ...

% of Employers

- £1.03 +
- 98p-£1.02
- 90 - 97p
- 80p - 89p
- 0p - 79p

% of Employees that are Women (#Employers in Brackets)

0% - 9% (n = 399)
10% - 19% (n = 1185)
20% - 29% (n = 1205)
30% - 39% (n = 1102)
40% - 49% (n = 1189)
50% - 59% (n = 1114)
60% - 69% (n = 881)
70% - 79% (n = 604)
80% - 89% (n = 476)
90% - 100% (n = 142)
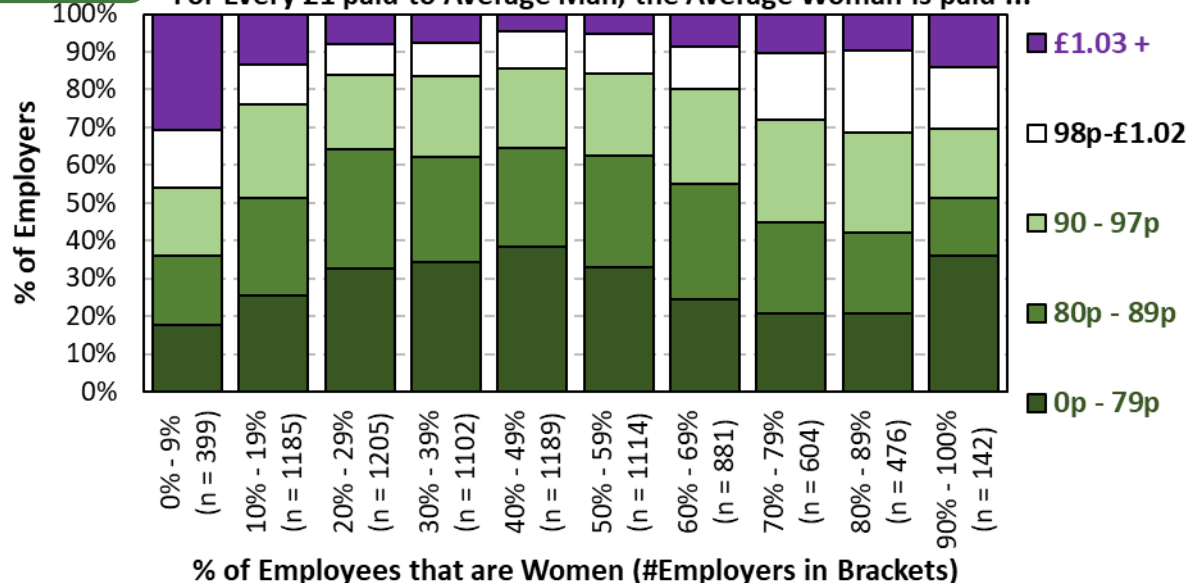
**n=1807**

UK Public Sector Pay Gap By Female Representation 2021
For Every £1 paid to Average Man, the Average Woman is paid ...

% of Employers

- £1.03 +
- 98p-£1.02
- 90 - 97p
- 80p - 89p
- 0p - 79p

% of Employees that are Women (#Employers in Brackets)

0% - 9% (n = 0)
10% - 19% (n = 26)
20% - 29% (n = 17)
30% - 39% (n = 24)
40% - 49% (n = 137)
50% - 59% (n = 268)
60% - 69% (n = 399)
70% - 79% (n = 516)
80% - 89% (n = 321)
90% - 100% (n = 99)
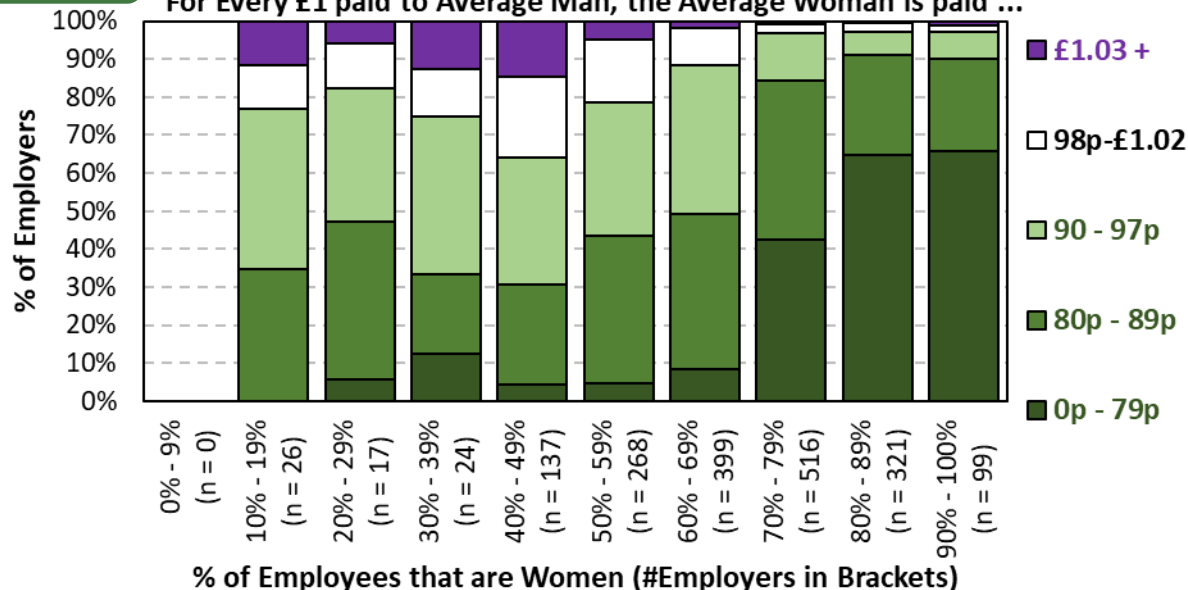
UK Workforce 16-64 is 52:48 M:F or 53:47 excl NHS

See B12

**Pay Gaps favouring women are more likely at male dominated employers**

See D13 about implications for Disability & other Minorities

https://bit.ly/2NJb9VR

# How did we end up with League Table Mentality?

- When Parliament mandated pay gap reporting in 2010, they didn't know or say how it should be done.
- A decision was taken to copy the ONS (Office of National Statistics) method.
  - ❑ ONS have been calculating national pay gaps since 2004. **See B9**
  - ❑ They use a random sample of 1mn PAYE records from April of each year

# Definitions of Hourly & Bonus Pay are Very Complicated!

- Many employers have to spend time on matching their payroll systems to the regulations and errors are common.
- It makes production of the calculations lengthy and exhausting thus leaving little energy for analysis so default is to focus on median gender pay gap.

**By copying ONS who focus on the median gender pay gap, the League Table/Comparison mindset was baked into the Gender Pay Gap Regulations**

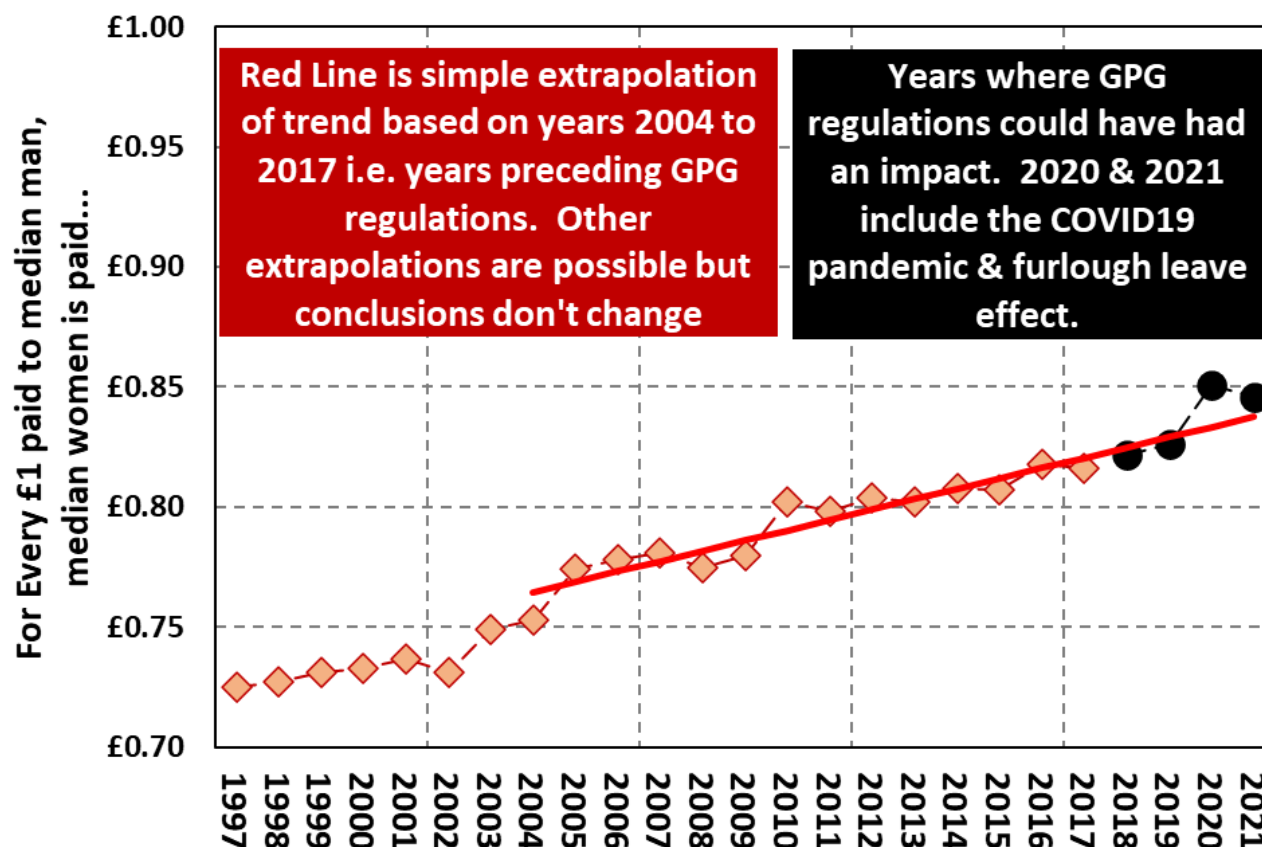**See D9 for how I would simplify the regulations**

https://bit.ly/2NJb9VR

**Employer GPG Reporting is just Within-Employer Pay Gap
ONS UK Pay Gap includes Between-Employer Pay Gaps**

## Did GPG Regulations Affect the Gender Pay Gap?
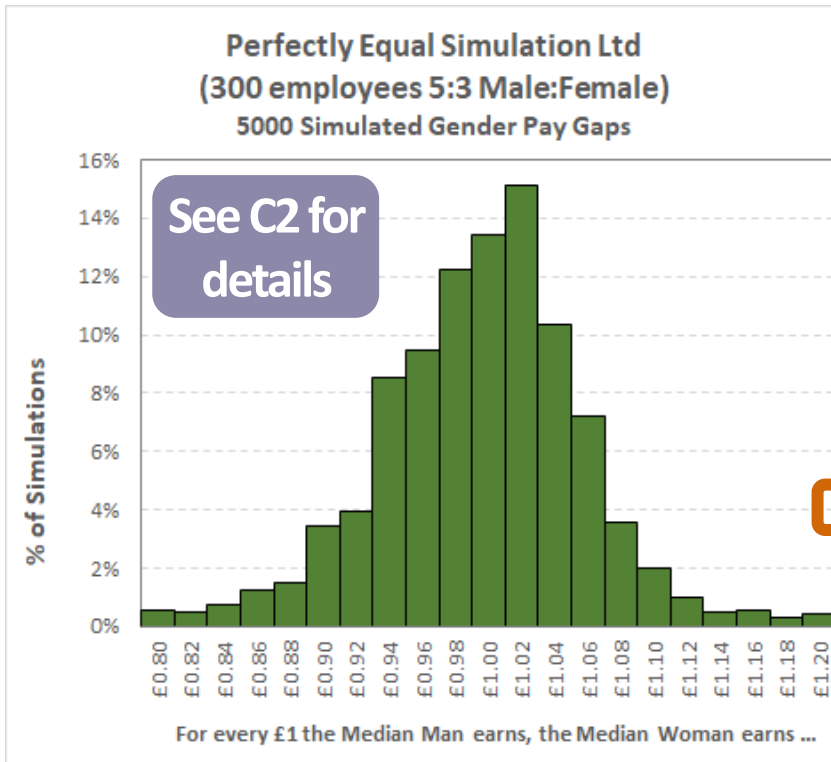### (Source - ONS ASHE All Employees Hourly Pay)

Red Line is simple extrapolation of trend based on years 2004 to 2017 i.e. years preceding GPG regulations. Other extrapolations are possible but conclusions don't change

Years where GPG regulations could have had an impact. 2020 & 2021 include the COVID19 pandemic & furlough leave effect.

For Every £1 paid to median man, median women is paid...

£1.00
£0.95
£0.90
£0.85
£0.80
£0.75
£0.70

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

See B9 for more about ONS Gender & Ethnicity Pay Gaps

https://bit.ly/2NJb9VR

# HR Needs Help with Sample Sizes, especially Ethnicity!

50% of the 10.5k reporting employers have 250-499 employees,
25% have 500-999 employees & the remainder with 1000+ employees

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



See C2 for details

For every £1 the Median Man earns, the Median 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 |

**Perfectly Equal Simulation Ltd - For Every £1 a man earns, a woman earns**

If you simulate random draws from 2 Log-Normal distributions with Stdev 50-100% of Mean Pay & where Mean Male Pay = Mean Female Pay, you will get this

**Highlighted is rare for gender, common for ethnicity/disability**    See D10

https://bit.ly/2NJb9VR

# 3 - Opportunities

## Pay Quarter Breakdowns

www.marriott-stats.com

**A**

**Cleveland Fire Brigade**
**Hourly Pay by Gender in 2018**

For every £1.00 the median man was paid in 2018, the median woman was paid £0.96
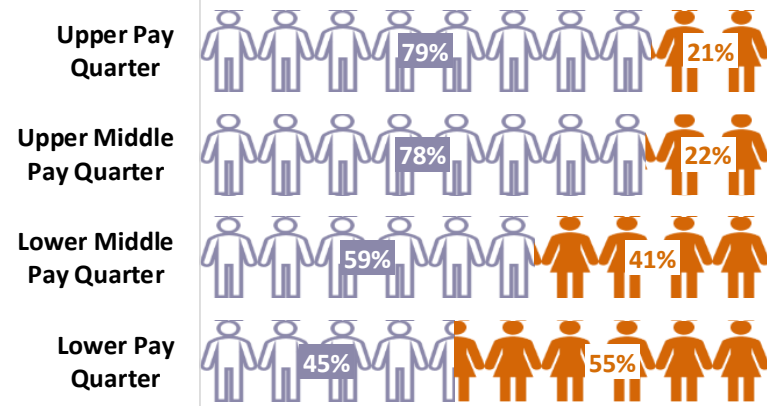
18% of employees in 2018 were women
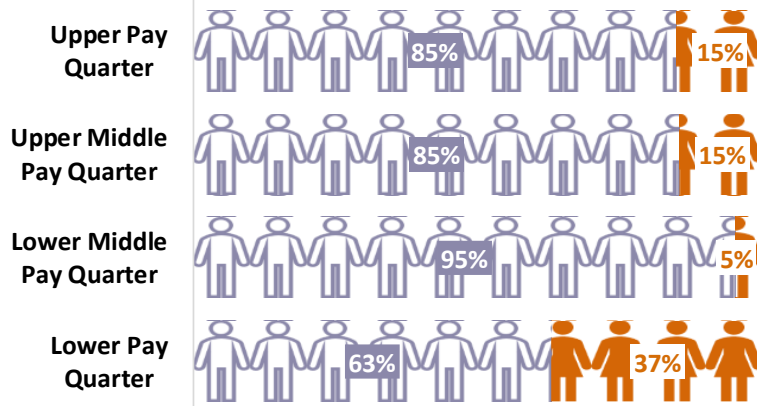
| | |
|---|---|
| Upper Pay Quarter | 85% / 15% |
| Upper Middle Pay Quarter | 85% / 15% |
| Lower Middle Pay Quarter | 95% / 5% |
| Lower Pay Quarter | 63% / 37% |

**B**

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

For every £1.00 the median man was paid in 2018, the median woman was paid £1.00

35% of employees in 2018 were women

| | |
|---|---|
| Upper Pay Quarter | 79% / 21% |
| Upper Middle Pay Quarter | 78% / 22% |
| Lower Middle Pay Quarter | 59% / 41% |
| Lower Pay Quarter | 45% / 55% |

## VOTE NOW!

## See C4 for full details

https://bit.ly/2NJb9VR

Average Woman is paid the same as the Average Man here

Average Woman is paid 27% less than the Average Man here

See B6

**CHEADLE ROYAL HEALTHCARE LIMITED**
**Hourly Pay by Gender in 2021**

**For every £1.00 the median man was paid in 2021, the median woman was paid £1.00**

**74% of employees in 2021 were women**

| | |
|---|---|
| Upper Pay Quarter | 24% 76% |
| Upper Middle Pay Quarter | 27% 73% |
| Lower Middle Pay Quarter | 29% 71% |
| Lower Pay Quarter | 22% 78% |
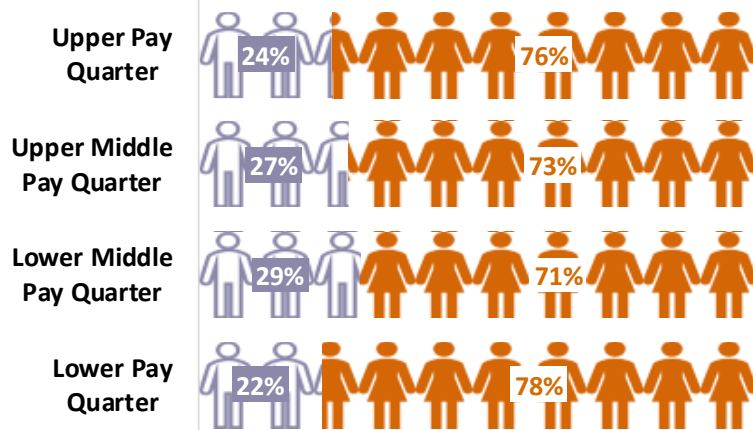
**GUS SERVICES UK LIMITED**
**Hourly Pay by Gender in 2021**

**For every £1.00 the median man was paid in 2021, the median woman was paid £1.00**

**50% of employees in 2021 were women**

| | |
|---|---|
| Upper Pay Quarter | 61% 39% |
| Upper Middle Pay Quarter | 40% 60% |
| Lower Middle Pay Quarter | 52% 48% |
| Lower Pay Quarter | 49% 51% |

i.e. Probability of an employee being a woman is **independent** of the pay quarter (and by extension the pay scale)

I call this an example of a **Glass Ceiling** employer
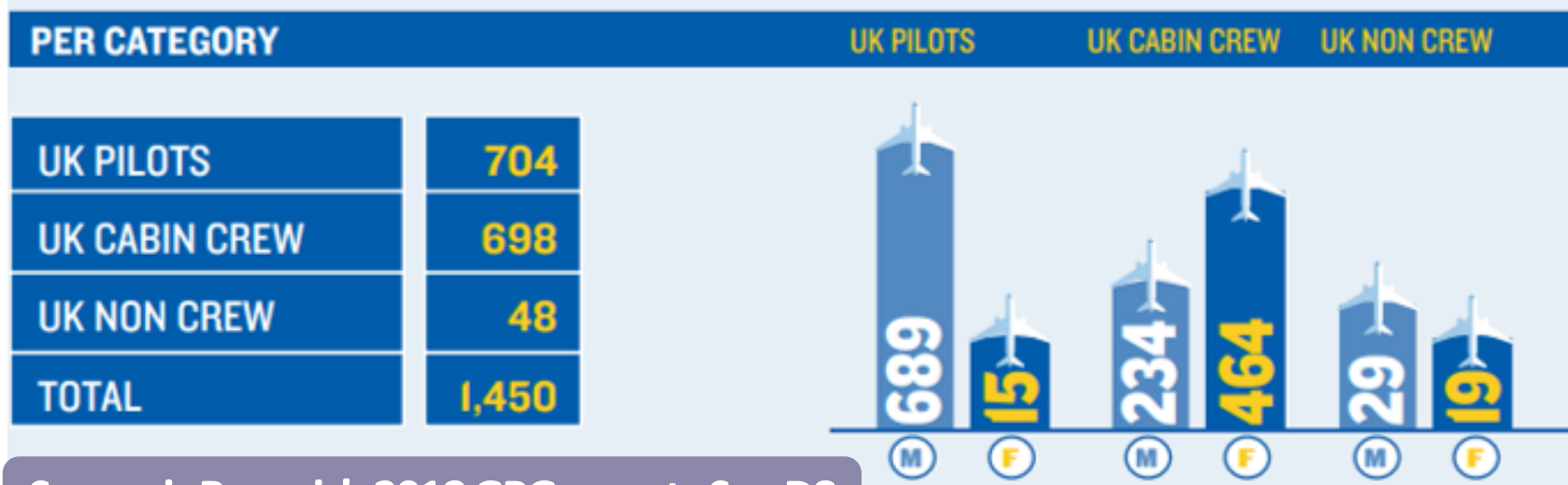
https://bit.ly/2NJb9VR

# Pay Gap Analysis is Logistic Regression

- If no pay gap is the same as saying the probability of an employee being in the top pay half is the same as the probability of an employee being a woman in the bottom pay half, can we extend this concept?

- I like to say an employer which has no gender pay gap whatsoever will have the **same gender ratio** wherever I look in the organisation e.g.
  - ❑ Pay quarters, pay bands, pay scales, Seniority
  - ❑ Location, Division, Department, Function
  - ❑ Perm/Temp, Full Time/Part Time, WFH/Onsite
  - ❑ Ethnicity, Age, Children, Disability, Marital Status

- In other words, if I build a **Logistic Regression Model** to explain the probability of an employee being a women as a function of all the above factors, none will be significant.
  - ❑ If a factor is significant, that could indicate a bias in how decisions are made in job planning, recruitment, promotion, etc.
  - ❑ With ethnicity, it will be Multinomial Logistic Regression

- HR cannot do this on their own, they need help from **Statisticians!**

**https://bit.ly/2NJb9VR**

# Ryanair Gender Pay Gap Report is My Favourite

| PER CATEGORY | | UK PILOTS | UK CABIN CREW | UK NON CREW |
|---|---|---|---|---|

| UK PILOTS | 704 |
|---|---|
| UK CABIN CREW | 698 |
| UK NON CREW | 48 |
| TOTAL | 1,450 |

UK PILOTS: 689 (M), 15 (F)
UK CABIN CREW: 234 (M), 464 (F)
UK NON CREW: 29 (M), 19 (F)

Source is Ryanair's 2018 GPG report.  See D8

## Ryanair had the largest verified gender pay gap of any employer in the UK in 2018

Two things immediately stand out from these numbers alone

1. The reason for the large pay gap today is clear & obvious

2. It will take a very long time to close the gap if ever

https://bit.ly/2NJb9VR

# Two Employers with Same Pay Quarter Breakdowns but very different Median Gender Pay Gaps

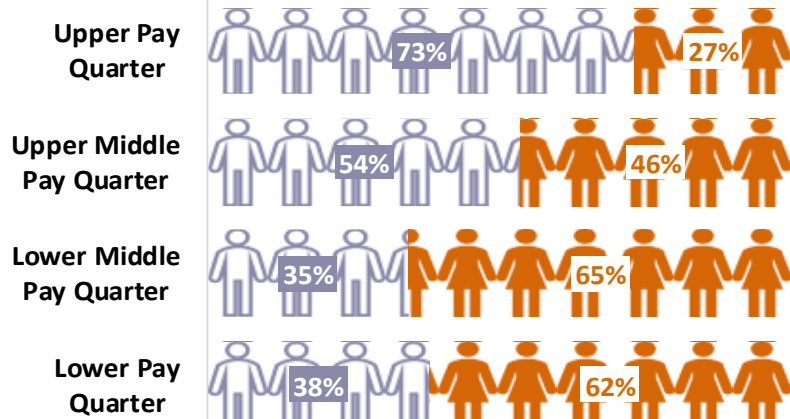The larger pay gap at Hitachi is almost certainly due to a larger PAY RATIO

**HITACHI CAPITAL (UK) PLC**
**Hourly Pay by Gender in 2020**

**See E5**

**Staffordshire Police Headquarters**
**Hourly Pay by Gender in 2020**

♙ **For every £1.00 the median man was paid in 2020, the median woman was paid £0.68**

♟ **50% of employees in 2020 were women**

| | |
|---|---|
| **Upper Pay Quarter** | 73%  27% |
| **Upper Middle Pay Quarter** | 54%  46% |
| **Lower Middle Pay Quarter** | 35%  65% |
| **Lower Pay Quarter** | 38%  62% |

♙ **For every £1.00 the median man was paid in 2020, the median woman was paid £0.83**

♟ **47% of employees in 2020 were women**

| | |
|---|---|
| **Upper Pay Quarter** | 71%  29% |
| **Upper Middle Pay Quarter** | 62%  38% |
| **Lower Middle Pay Quarter** | 40%  60% |
| **Lower Pay Quarter** | 41%  59% |

Assume the %s are number of employees i.e. each has 400 employees in total. To close their pay gaps, both need to move 26 or 27 women from the lower pay half to the upper pay half with 26/27 men going the other way. How long will this take assuming unchanged #employees & no discrimination?

https://bit.ly/2NJb9VR

# Time to Close Pay Gap - Hitachi Capital Demonstration

- Assume Hitachi are targeting 100 men & 100 women in each Pay Half

| Start of Year | | | | Leaving | | | | Joining | | | | Enf of Year | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year 1 | M | F | | Year 1 | M | F | | Year 1 | M | F | | Year 1 | M | F |
| Upper | 127 | 73 | | Upper | 12.7 | 7.3 | | Upper | 10 | 10 | | Upper | 124.3 | 75.7 |
| Lower | 73 | 127 | | Lower | 7.3 | 12.7 | | Lower | 10 | 10 | | Lower | 75.7 | 124.3 |
| Swap | -27.0 | 27.0 | | Swap Number Falls by 10% = %Turnover | | | | | | | | Swap | -24.3 | 24.3 |

See E5

| Start of Year | | | | Leaving | | | | Joining | | | | End of Year | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year 2 | M | F | | Year 1 | M | F | | Year 1 | M | F | | Year 2 | M | F |
| Upper | 124.3 | 75.7 | | Upper | 12.4 | 7.6 | | Upper | 10 | 10 | | Upper | 121.9 | 78.1 |
| Lower | 75.7 | 124.3 | | Lower | 7.57 | 12.4 | | Lower | 10 | 10 | | Lower | 78.1 | 121.9 |
| Swap | -24.3 | 24.3 | | Swap Number Falls by 10% = %Turnover | | | | | | | | Swap | -21.9 | 21.9 |

- How long will it take for the Swap Number of **27** to fall below **1**?
  - ❑ Expected Number of Years **= [ LN( 1 ) – LN( SN[0] ) ] / LN( 1 – t )**
  - ❑ Where **SN[0]** = initial swap number of **27** and **t** = annual turnover = **0.1**
- Answer is **31.3** years on average.
  - ❑ This is a simple method with no randomness allowed.

See E3

  - ❑ What if we allow random variation in numbers leaving and joining?

https://bit.ly/2NJb9VR

- You can download my simulation using link E3 and check what I have done.
- Strictly speaking it only simulates a single pay half which will be **37%** Women in Round 0 with an ultimate goal of **50%** women (T2) and an intermediate goal of **45%** women (T1).
- Every employee has an equal probability of 10% that they will leave & a random number generator decides whether they do leave.
- All those leaving are replaced.
- The replacements are on average 50% women but actual numbers of men and women is a random draw from a Binomial Distribution.
- All of these assumptions equate to an assumption of no discrimination by gender
- 90% of simulations took between **9 & 47** years to reach 50% female with average of **22.5** years.

See E3 for details

**Box Plot**

**#Recruitment Rounds to Thresholds 1 & 2**

N = 200 Staff
T0 = 3/8 F
T1 = 9/20 F
T2 = 1/2 F

T1        T2
**Thresholds for %Employees Female**

https://bit.ly/2NJb9VR

## 4 - Threats

**Gaming & Discrimination**

30
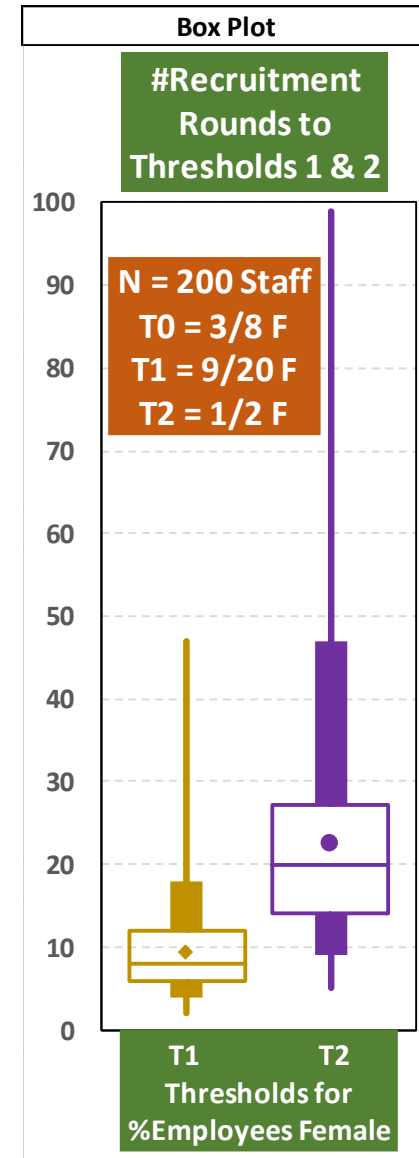
# Threat 1 is Gaming or Creative Pay Gapping

- Continuous Improvement is the only genuine way to eliminate a pay gap
  - ❑ **E.g. DMAIC (Define, Measure, Analyse, Improve, Control)**

  **See E1**

- Unfortunately there are 10 ways to eliminate a pay gap using statistical shenanigans that can be quick and easy to implement.
  - ❑ **I call these methods Creative Pay Gapping**

  **See E4**

| The 10 Tools of a Creative Pay Gapper | |
|---|---|
| Be Literal! | Be non-Binary! |
| Equality Now! | Partner Up! |
| Competitive Remuneration! | Wish you were here! |
| Be Lean! | Have an Easter Break! |
| Crack & Pack like Americans! | Recruiting Now! |

- Spotting these quick fixes is not always easy.

https://bit.ly/2NJb9VR

31

# Pay Gap Reporting is replete with Simpson Paradox

**West London based HQ and R&D**
**n=810 employees**

**+**

**Manufacturing plant**
**n=355 employees**

**NOVARTIS PHARMACEUTICALS UK LIMITED**
**Hourly Pay by Gender in 2019**

👫 **For every £1.00 the median man was paid in 2019, the median woman was paid £0.90**
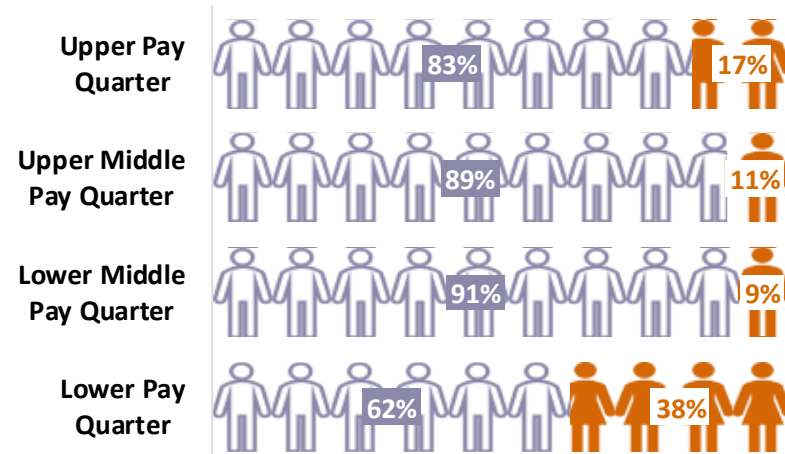
⚲ **61% of employees in 2019 were women**

| | |
|---|---|
| Upper Pay Quarter | 49% ... 51% |
| Upper Middle Pay Quarter | 45% ... 55% |
| Lower Middle Pay Quarter | 42% ... 58% |
| Lower Pay Quarter | 22% ... 78% |
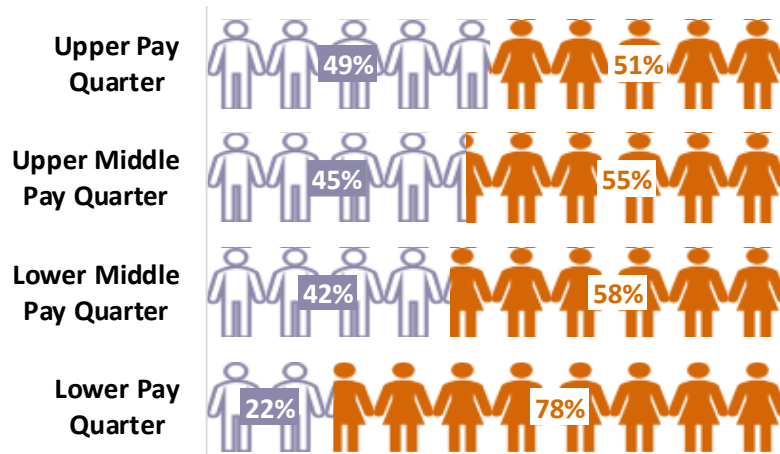
**NOVARTIS GRIMSBY LIMITED**
**Hourly Pay by Gender in 2019**

👫 **For every £1.00 the median man was paid in 2019, the median woman was paid £0.88**

⚲ **19% of employees in 2019 were women**

| | |
|---|---|
| Upper Pay Quarter | 83% ... 17% |
| Upper Middle Pay Quarter | 89% ... 11% |
| Lower Middle Pay Quarter | 91% ... 9% |
| Lower Pay Quarter | 62% ... 38% |

In their 2019 narrative, Novartis UK stated when all 3 UK legal entities were combined, the median woman was paid **£1.11** for every £1 paid to the median man

See B8 for full details. I expect to see many more variants of this with ethnicity pay gap reporting

https://bit.ly/2NJb9VR

# Threat 2 is Discrimination

- Under the Equality Act 2010, discrimination is discrimination regardless of the protected characteristic.
  - ❑ So called "Positive Discrimination" is illegal.

- Direct discrimination is when an individual is discriminated against on the grounds of their personal characteristics.
  - ❑ See the Wunderman Thompson example on next slide. **See B5**
  - ❑ See also Samira Ahmed case (link B5) and Stacy Macken V BNP Paribas

- Indirect discrimination occurs when a statistical disparity occurs between 2 groups of employees defined by their protected characteristics.
  - ❑ Suppose an employer is "positively discriminating" by ensuring say 60% of new hires are women in an industry that is 50% female.
  - ❑ A statistician can detect this and testify that the null hypothesis that P(New recruit is female) = 50% can be rejected.
  - ❑ Burden of proof could then shift to the employer to justify the practice and if they can't they lose the case.

**See M1 for link to a Supreme Court example**

https://bit.ly/2NJb9VR

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- Bayfield & Jenner were two male Creative Directors at this advertising agency dismissed on grounds of redundancy in November 2018.
  - ❑ In an earlier round of redundancies at start of 2018, they were ranked near the top of the redundancy pool in terms of performance.

- In March 2018, JWT (now Wunderman Thompson) published their 1$^{st}$ gender pay gap report which showed the median woman was paid 55p for every £1 paid to the median man.
  - ❑ 51% of employees were women with similar pay quarter breakdown and swap numbers as Hitachi.

- On 16$^{th}$ May 2018, JWT held a public meeting about their plans to address their gender pay gap and the slides were made public.
  - ❑ Bayfield & Jenner were not at the meeting but became concerned about one slide (NEXT SLIDE) and asked for a meeting with HR.
  - ❑ After an intense meeting, a week later they were marked for redundancy and placed bottom of the candidate pool.
  - ❑ The court found no evidence to justify this and JWT were found to have discriminated and victimised on grounds of sex and unfair dismissal.

**https://bit.ly/2NJb9VR**

63. There was however significant controversy about the following slides and the verbal commentary underneath:

> WHITE, BRITISH, PRIVILEGED, STRAIGHT, MEN
> CREATING  TRADITIONAL ABOVE THE LINE ADVERTISING

"One thing we all agree on is that the reputation JWR once earnt: as being full of "White, British, Privileged… etc…"

> ~~WHITE, BRITISH, PRIVILEGED, STRAIGHT, MEN~~
> ~~CREATING  TRADITIONAL ABOVE THE LINE ADVERTISING~~

"… has to be obliterated."

A later slide repeated the above, the commentary saying "*Remember the earlier slide about JWT's lurking reputation.  The boys club element is one factor amongst a whole lot of other parts that need addressing too…*"

64. This, and other agencies presentations at the conference gained industry press coverage. – one example is an article headline - "*Inside JWTs plan to address its 'terrible' gender pay gap & 'boys' club' reputation*" (466).

65. On 18 May 2018 Mr Bayfield sent an email to Ms Bruges, cc'ing Mr Jenner, stating:  *I found out recently JWT did a talk off site where it vowed to obliterate white middle class straight people from its creative department.  There are a lot of very worried people down here*".   Ms Bruges responded later that day, saying

# Statisticians! HR Needs You!

# Backup Material

www.marriott-stats.com

**The Equality Act 2010 Gender Pay Gap Regulations (2017) state the Gender Pay Gap must be based on Hourly Pay …**

**Hourly Pay**

**INCLUDES**

Basic Pay
Allowances
Piecework
Paid Leave
Shift Premium
Pro-Rated Bonuses
*(if in relevant pay period)*

**<<< Includes
&
Excludes >>>**

**See E4**

**EXCLUDES**

Business Expenses
Overtime
Redundancy Pay
In lieu of Paid Leave
Non-Monetary stuff
Bonuses (not in relevant pay period)

**… received during a RELEVANT PAY PERIOD which includes the specified Snapshot Date of 31st March or 5th April …**

**… for FULL PAY RELEVANT employees only …**

**i.e. EXCLUDE any RELEVANT EMPLOYEE receiving reduced pay as a result of being on leave of any kind**

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## ... and repeat to calculate the Gender Bonus Gap based on Bonus Pay received in 12 months to Snapshot Date ...

**Annual Bonus Pay**

### INCLUDES

Profit sharing
Commissions
Incentives
Long service awards

<<< Includes
&
Excludes >>>

### EXCLUDES

Non-monetary stuff
Benefits in kind

## ... for Relevant Employees only

**Relevant Employees**

### INCLUDES

Employees
Workers
Great Britain
Men & Women

<<< Includes
&
Excludes >>>

### EXCLUDES

Agency Staff
Partners
Northern Ireland
Overseas
Unknown Gender
Non-Binary

www.marriott-stats.com

# How Cleveland Police Force got it Wrong

- 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 unforgivably misleading and ambiguous.

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

**B**

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

👥 **For every £1.00 the median man was paid in 2018, the median woman was paid £1.00**

♀ **35% of employees in 2018 were women**

| | |
|---|---|
| **Upper Pay Quarter** | 79% 21% |
| **Upper Middle Pay Quarter** | 78% 22% |
| **Lower Middle Pay Quarter** | 59% 41% |
| **Lower Pay Quarter** | 45% 55% |

**See C4 & E4 point 1**

## How to measure Unequal Pay (aka Pay Inequality)

In addition to pay gap analysis, employers should be measuring unequal pay or pay inequality as well. There are two types of indirect methods which are relatively easy to do but lack precision. The direct method is more precise but requires more work

**Indirect Internal**

Group your employees based on job characteristics e.g. job title, pay band, site, status, etc. Within each group, calculate average pay for men & women and see if discrepancies exist. This is a blunt instrument for measuring pay inequality.

**Indirect External**

Use an external company who will take the job characteristics information you supply for each employee and give an expected salary for each employee based on market surveys. This is still a blunt instrument.
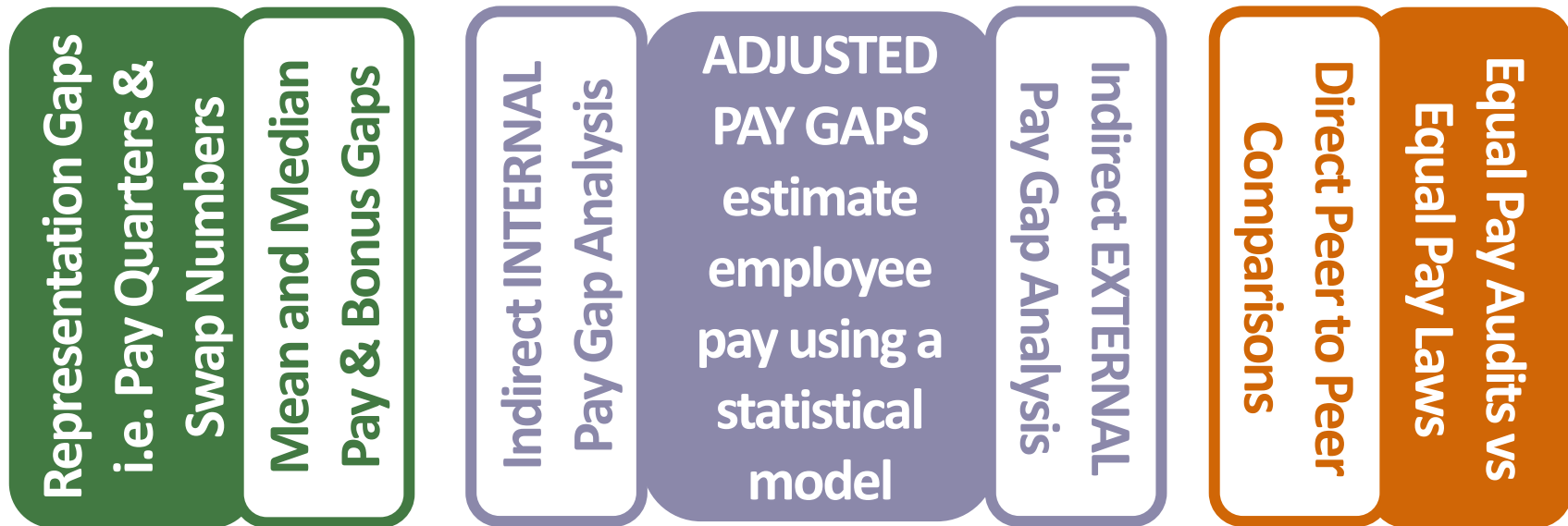
**Direct Peer to Peer**

Take a sample of pairs of employees who may or not be doing work of equal value. Carry out in-depth audit of how pay was set and record any issues uncovered. Iceland's IST85 requires 3-yearly audits of pay setting processes.

# What are Adjusted Pay Gaps?

- Adjusted Pay Gaps sit in the middle of a spectrum of possible analyses.
  - ❑ At one end, we analyse **Representation Gaps**.
  - ❑ At the other end, we carry out **Equal Pay Audits**.

| Representation Gaps i.e. Pay Quarters & Swap Numbers | Mean and Median Pay & Bonus Gaps | Indirect INTERNAL Pay Gap Analysis | ADJUSTED PAY GAPS estimate employee pay using a statistical model | Indirect EXTERNAL Pay Gap Analysis | Direct Peer to Peer Comparisons | Equal Pay Audits vs Equal Pay Laws |
|---|---|---|---|---|---|---|

- It's a more sophisticated version of indirect pay gap analysis (whether internal or external.
  - ❑ It builds a statistical model built using Multivariate Regression to estimate what each employee should be paid based on the known characteristics of their job.