



## Nursing pay by gender distribution in the UK - does the Glass Escalator still exist?

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### ABSTRACT

**Aims and objectives/background:** Nursing is a predominantly female profession. This is reflected in the demographic of nursing around the world. Some authors have noted that despite being a gendered profession men are still advantaged in terms of pay and opportunity. The aim of this study was to examine if the so called glass escalator in which men are advantaged in female professionals still exists.

**Design and method:** Descriptive statistics of the routinely collected national workforce datasets from across the UK central repositories and mining of a bespoke data set that has been curated which focuses on the activity of specialist advanced practice clinical nurses.

**Results:** Even in a gendered occupation such as nursing the advantage of men in terms of pay is apparent with men being over-represented at senior Bands compared to their overall proportion in the UK nursing population. From the bespoke dataset there also seem to be an advantage in term of faster attainment of higher grades from the point of registration.

**Conclusion and relevance to clinical practice:** Reward and remuneration are essential to the workforce. This work reveals a gender differential towards men in higher paid nursing work. The drivers for this are complex and further work is required to determine the factors associated with career progression with men in nursing, and the rate limiting factors with the female workforce.

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### What is already known about the topic?

- Gendered power is highly influential in nursing.
- Gender pay disparity in nursing has been reported over a long period in a number of countries.
- The 'Glass Escalator' is a theory to explain this gender pay disparity put forward by Williams in 1992.

### What this paper adds

- There is still a gender pay disparity/disparity of opportunity for advancement between male and female nurses in the National Health Service across some pay bands in the UK.

- For specialist and advanced practice nurses it appears that males are able to achieve a higher paid role faster than females. If this disparity in pay and opportunity is not addressed inequality will continue to be present.
- Further study is needed to determine the root causes of this inequality and how to overcome it. Higher quality routine data collection on the demographic and population characteristics of this group is required.

### 1. Introduction

The nature of gendered work has been extensively examined over time and in many sectors of employment. While it is a commonly held belief that women in male dominated professions have encountered a 'glass ceiling' in which they find less opportunity for advancement, it was suggested by Williams in 1992 that men in female professions can utilise a 'glass escalator'.

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The glass escalator is a term that refers to men having advantage in terms of opportunity, pay and promotion in that they can achieve promotion or advancement faster within a given field than women. Williams suggested that the advantages that men receive in professions such as nursing, teaching, librarianship and social work, might be due to a societal perception that men are more suited than women to leadership positions (Williams, 1992).

The issue of gendered power is still highly influential in healthcare. It manifests in many forms including pay, seniority and influence. Further studies by the same author suggest that race, sexuality and class are also factors that affect an individual's ability to ride the glass escalator to higher pay and promotion to senior roles (Williams, 2013).

In subsequent work, the observation that men in traditionally female occupations ride the glass escalator to the better paid higher tiers of the occupation has been consistently described over time (Snyder and Green, 2008; US Census Bureau, 2013). In contrast some researchers assert that as a male dominated profession becomes feminised, the workforce experiences a decline in pay and influence because the work of females has less value (Levanon et al., 2009).

Within healthcare, male nurses have long been of interest to researchers in the patriarchy and gender debates of healthcare politics and interactions. There are wider impacts including professional behaviours that have reinforced the gendered position. Savage (1987) found that doctors avoided male nurses due to the threat they posed to the equilibrium of the traditional patriarchal system, or projected qualities on them of assertiveness or confidence that were recognised with equality rather than subordination. However, feminisation and stereotyping of male nurses also appears to occur (Cummings, 1995; Egeland and Brown, 1988; Evans, 1997, 2004a, b; Williams and Heikes, 1993; Fisher, 2009), highlighting that gender and patriarchal systems in healthcare are a complex phenomenon.

In nursing it is well-documented that there is a significant gender imbalance in the workforce. The proportion of male and female Registered Nurses both in the UK and elsewhere does not reflect the population demographics. According to a report in 2015 89.6% of the nursing and midwifery workforce in the UK was made up of women and only 11.4% of male (NHS Digital, 2016). In 2008 the proportion of nurses who were male on the UK Nursing and Midwifery Council register was estimated to be 10%, a figure that had been static since 2004 (Nursing Times, 2008). The UK situation is reflected globally with male nurses in Germany earning more on average than female (Muench and Dietrich, 2017) and a glass ceiling of earnings for women's work is recognised in Korea (Cho et al., 2014). In the USA there is a reported earnings gap in which male nurses out-earn females by an average of \$5000 per year (Muench et al., 2016). This gender imbalance is thus long standing and has not changed significantly in more recent times.

The situation worldwide appears to be similar. In Germany 81.1% of the nursing, emergency medical services and obstetrics staff was female according to 2015 figures (Federal Statistical Office, 2015) while in Canada 93.1% of Nurse Practitioners were female in 2016 (Canadian Institute for Health Information, 2016). In the USA 8.2% of nurses were estimated to be male in 2017 (The Henry J. Kaiser Family Foundation, 2017). An Australian census analysis found that in 2011 90% of nurses were female compared to 91% in 2001 (Australian Bureau of Statistics, 2013). Currently 89.1% of Australian nurses are female showing that there has been little increase in the proportion of male nurses in Australia for over 15 years (Nursing and Midwifery Board of Australia, 2017).

In the UK there have been a number of attempts to address this imbalance such as 'Operation Male Nurse' by Queen's University in Northern Ireland featuring a major advertising campaign combined with pop-up posters and online materials in 2013 (Belfast

Telegraph, 2013), a similar campaign by Edinburgh Napier University in 2016 involving recruitment events, male role model nurses and school pupil visits (The Scotsman, 2017), another scheme to encourage men into nursing by Nottingham University (Nursing Standard, 2017) to offering men-only bursaries to nursing students by Coventry University (Independent Nurse, 2017). The effectiveness of these interventions has not yet been investigated.

While males in nursing may continue to be disproportionately under-represented within the profession compared to the total population, evidence suggests that this has not affected career advancement. Data by Hader (Hader, 2010) suggests that nurses who are men from China, Canada, New Zealand and Saudi Arabia attain management positions more quickly and younger than their female nursing colleagues. An investigation by Muench et al. of Registered Nurses in the USA reported in 2015 found that male Registered Nurses out-earned female Registered Nurses across settings, specialities and positions with no narrowing of the pay gap over time (Muench et al., 2015). A report by the Randstad Care group in 2016 suggested that there was a gender pay gap of 14% in nursing (Randstad Care, 2016).

In the UK 'Agenda for Change' is the grading and pay system for National Health Service (NHS) staff other than doctors, dentists, apprentices and some senior managers. It was initially introduced in 2004 and currently allocates roles into one of 9 'Pay Bands' on the basis of job weight as measured by the NHS Job Evaluation Scheme (NHS Employers, 2017a). In the case of nursing there are some nationally agreed profiles for nursing services such as 'Nurse' at Pay Band 5 (the minimum Band for a registered nurse), 'Nurse Specialist' and 'Nurse Team Leader' at Pay Band 6, 'Nurse Advanced' and 'Nurse Team Manager' at Pay Band 7, 'Modern Matron' at Pay Band 8a, 'Nurse Consultant' at Pay Band 8a to c and 'Nurse Consultant Higher Level' at Pay Band 8c to d or Pay Band 9 (NHS Employers, 2017b).

The purpose of this paper is to examine if there is a gender pay disparity or disparity of opportunity in nursing in the UK. Data were obtained regarding the total number of male and female nurses in the constituent parts of the UK which was then compared with the number of male and female nurses at each Pay Band. Further to this analysis a bespoke data set collected between 2009 and 2017 on specialist and advanced practice nurses was mined for further insight into the issue of gender, pay and career progression. No data is collected on a regular basis regarding the specialist advanced practice workforce by any UK agency or organisation and therefore the situation in terms of gender, pay and progression is largely unknown.

## 2. Aim

The aim of the study was to examine if there was a gender disparity in nursing pay and to determine if the glass escalator still existed for males in nursing.

## 3. Methods

This is a secondary analysis of two groups of data. The approach taken is a combination of descriptive statistics and knowledge discovery through data mining. Knowledge discovery through data mining is a data science approach, an inductive method of discovering patterns in data, not the examination of specific relationships. Knowledge discovery through data mining is a common technique in other areas and, by mining data, it is possible to discover new knowledge which might be otherwise hidden (Witten et al., 2011).

The demographic and pay band data will be analysed with descriptive statistics while the bespoke dataset described in more detail below, will be analysed using knowledge discovery through data mining.

Traditionally in areas such as social sciences this type of study would be conducted by using regression analysis or decompositions. This study takes a different approach because of the volume of data in the bespoke data set and adopts a more inductive, as opposed to reductive, approach.

Data for all nurses employed in the NHS were obtained from the four UK countries central government agencies with responsibility for workforce data. In addition, a curated dataset that has accumulated as the result of stochastic caseload or other workforce activity work which is known as the Cassandra dataset was also mined for insight. This data set consists of detailed anonymised data from over seventy evaluations, census, caseload and other types of nursing workforce modelling (Leary et al., 2018, 2016, Leary and Anionwu, 2014)

## 4. Data

### 4.1. Demographic and pay band data

Limited demographic data is available publicly across the four countries and so specific requests were made to the controllers of each UK country so that data would be consistent and any issues with quality could be identified in advance of analysis. As this data is not consistently publicly available, a detailed description of how it was obtained is included below.

For England data was obtained from the Health and Social Care Information Centre NHS Hospital & Community Health Service workforce statistics dated March 2017 for nurses and health visitors at Pay Bands 1 to 9 plus non-Pay Band grades (equivalent to very senior managers) and determined by headcount (NHS Digital, 2017). Pay bands were used as a proxy for career levels reached as no routinely collected information is collected on educational or practice levels in the UK post qualification as a registered nurse. The nationally agreed starting salary for registered nurses is in Pay Band 5.

The data for Wales was obtained from the Knowledge and Analytical Services, Welsh Government (Welsh Government, 2018) and dated September 2016. This data included nurses, midwives and health visitors at Pay Bands 1 to 9 plus non-Pay Band grades determined by whole time equivalent).

For Northern Ireland data was obtained from the Northern Ireland Department of Health Workforce Statistics service and was dated March 2017 (Northern Ireland Department of Health, 2018) This data included qualified nursing staff and consisted of Pay Bands 5 and above plus non-Pay Band grades. Both headcount and whole-time equivalent data was obtained in this case.

In the case of Scotland data was obtained from the Workforce Team, Public Health & Intelligence, NHS National Services Scotland (NHS National Services Scotland, 2018) and was dated September 2017. This data included qualified nursing staff and consisted of Pay Bands 5 and above but did not include non-Pay Band grades as this data was not available. Both headcount and whole-time equivalent data was obtained in this case.

All data for Pay Bands 1–4 was removed as data supply at these Bands was variable and Registered Nurses in the UK are employed at a minimum Pay Band of 5.

### 4.2. Variables: gender and pay band

#### 4.2.1. Bespoke dataset (Cassandra) of UK nurses working in specialist advanced practice

A bespoke data set named Cassandra of curated data on the work and demographic details of nurses working in specialist advanced practice across the UK collected between 2009 and 2017 (N=17,960) was examined. The data was collected for over 40 specialisms within the UK with groups being self-identifying as

practicing with the speciality. The dataset developed with the specialist advanced practice workforce who then collected data. The dataset is curated by the authors primarily for the purpose of understanding the complexity of advanced nursing work in specialism and the development of models such as stochastic caseload calculations. Examples of specialisms included were prostate cancer (Leary et al., 2016), lung cancer (Khakwani et al., 2016), sickle cell and thalassemia (Leary and Anionwu, 2014) and rheumatology (Oliver and Leary, 2012).

Such modelling techniques are iterative. For the past 13 years, the activity of specialist advanced practice nurses in the United Kingdom has been modelled using an 8-dimensional model captured previously in a relational database and its antecedent data. In this model initially (Leary and Anionwu, 2014), n=4010 whole-time-equivalent clinical nurse specialists detailed activity data (mean 44 events per day) plus subsidiary data from another 8102 specialist nurses such as diaries, annual reports, and service reviews/audits were examined for association patterns. These activities were then matched to the literature (n=6052; peer-reviewed and grey literature) using syntactic pattern techniques such as parsing. Parsing allows the analysis of strings or sets of words, numbers, and symbols; the result is a parse tree, which shows the relationships different items have to each other. These data have been mined, and pattern recognition techniques (Witten et al., 2011) and in particular syntactic pattern recognition or parsing (Duda et al., 2000) to examine common activity and to construct a data capture matrix (Cassandra matrix) in 2 dimensions (intervention that has 2 levels of data collection and context/place of activity) was utilized. This data collection method is now used in the studies described above and forms the basis of the Cassandra dataset which was mined using knowledge discovery through data mining.

No variables are predefined, since analysis reveals patterns in the data but the data included a variety of information on work characteristics, such as part time, specialty, and years to reach band.

## 5. Analysis

### 5.1. Demographic and pay band data

Descriptive statistics were used only to describe the population, no inferential statistical approaches were applied due to the nature of the dataset. Initially the overall percentage of male and female nurses was obtained for each country by headcount or whole time equivalent as appropriate. For example, for England there were 36,432 male nurses at Band 5–9 and non-Pay Band grades out of 321,758 nurses at these Pay Bands in total giving an overall percentage of 11.3% male nurses.

Following this calculation, the percentage of male nurses at each Band was ascertained. For example, again in England, 6087 male nurses were recorded at Pay Band 7 out of a total of 51,287 nurses in total at Pay Band 7 which is equivalent to 11.9% male nurses.

Subsequently the percentage of male and female nurses at each Pay Band and the non-Pay Band grade was compared using descriptive statistics (frequency and proportion) to the overall average to determine if male or female nurses were over- or under-represented compared to the average at each Pay Band.

### 5.2. Bespoke dataset (Cassandra) of UK nurses working in specialist advanced practice

This data was mined using knowledge discovery through data mining using k means clustering. Knowledge discovery through data mining is an interdisciplinary area focusing upon

methodologies for extracting useful knowledge from data (Witten et al., 2011). These techniques are sometimes known as “big data” techniques. K-means clustering is one of the simplest unsupervised learning algorithms classifies groups based on attributes and was selected as opposed to hierarchical clustering as there is no known formal relationship within these data. At its most basic  $n$  (data points) are divided into  $k$  (clusters) for which common traits are detected when  $k < n$  and  $k$  is a positive integer.

In this study  $n$  datapoints = 10344960 (17,960 within a  $24 \times 24$  matrix) Euclidean distance was utilised and a simple K means algorithm using Mathematica v11 (Wolfram, 2017). The algorithm is simple and maximises the sum of squares criterion:

$$J = \sum_{j=1}^K \sum_{n \in S_j} \|x_n - \mu_j\|^2,$$

where  $x_n$  is a vector representing the  $n$ th data point and  $\mu_j$  is the geometric centroid of the data points in  $S_j$ . In general, the algorithm does not achieve a global minimum of  $J$  over the assignments (Wolfram, 2018).

The algorithm consists of a simple re-estimation procedure as follows. Initially, the data points are assigned at random to the  $K$  sets. For step 1, the centroid was computed for each set. In step 2, every point was assigned to the cluster whose centroid is closest to

that point. These two steps were alternated until a stopping criterion was met which was 32 iterations and there is no further change in the assignment of the data points.

This allows for an understanding of the distribution by sex as a key cross referenced by pay band, length of time in post, length of time to reach grade and length of time from registration. In addition to headcount the proportion of part time work (less than 37.5 h per week) was examined as was previous job and grade for a subset where this was available.

### 5.3. Ethical considerations

According to the Health Research Authority decision algorithm (Health Research Authority, 2017), this study was secondary analysis of data only and thus NHS Ethics was not sought.

## 6. Results

### 6.1. Analysis of the demographic and pay band data

#### 6.1.1. Proportion of male and female nurses in the UK

The number and proportion of male and female nurses at each Pay Band in the UK is shown in Table 1. England had the highest proportion of male nurses at 11.3% while Northern Ireland had the lowest at 6.6%.

**Table 1**  
Gender balance of nurses in the constituent countries of the UK. † by headcount and ‡ by whole time equivalent. VSM: very senior manager.

Country/Band	Male (n)	Female (n)	Total	Male (%)	Female (%)
<b>England†</b>					
Band 5	16,523	138,221	154,744	10.7	89.3
Band 6	11,357	86,759	98,116	11.6	88.4
Band 7	6087	45,200	51,287	11.9	88.1
Band 8a	1,553	9,650	11,203	13.9	86.1
Band 8b	436	2,306	2,742	15.9	84.1
Band 8c	156	968	1,124	13.9	86.1
Band 8d	58	281	339	17.1	82.9
Band 9	12	111	123	9.8	90.2
VSM	250	1,850	2,080	12	88.0
Total	36,432	285,326	321,758	11.3	88.7
<b>Wales‡</b>					
Band 5	970.2	9,882.5	10,852.7	8.9	91.1
Band 6	672.6	6,339.8	7,012.4	9.6	90.4
Band 7	418.1	3,284.2	3,702.3	11.3	88.7
Band 8a	81.9	527.6	609.5	13.4	86.6
Band 8b	26.2	128.4	154.6	17	83
Band 8c	13.0	72.0	85.0	15.3	84.7
Band 8d	2.0	31.2	33.2	6.41	93.59
Band 9	0	13.2	13.2	0	100
VSM	10.6	58.9	69.5	15.25	84.75
Total	2,194.6	20,339.9	22,534.5	9.7	90.3
<b>Northern Ireland†</b>					
Band 5	541	9,225	9,766	5.5	94.5
Band 6	226	3,255	3,481	6.5	93.5
Band 7	231	2,054	2,285	10.1	89.9
Band 8a	38	214	252	15.1	84.9
Band 8b	9	93	102	8.8	91.2
Band 8c	5	22	27	18.5	81.5
VSM	8	21	29	27.5	72.5
Total	1,058	14,884	15,924	6.6	93.4
<b>Scotland‡</b>					
Band 5	2,617.6	21,350.2	23,967.8	10.9	89.1
Band 6	1,273.1	8,692.0	9,965.1	12.8	87.2
Band 7	795.0	4,429.6	5,224.6	15.2	84.8
Band 8a	84.8	507.4	592.2	14.3	85.7
Band 8b	30.0	149.1	179.1	16.8	83.2
Band 8c	8.4	29.7	38.1	22.0	78.0
Band 8d	3.0	8.8	11.8	25.4	74.6
Total	4,324.2	36,529.1	40,853.2	10.6	89.4

## 6.2. Proportion of male nurses in the UK by pay band

The proportion of male nurses in each of the constituent countries of the UK both overall and at each Pay Band is shown in Fig. 1.

### a) England

The proportion of males at Pay Bands 5 and 9 was lower than the overall proportion of males in England. Male nurses were proportionally higher at Pay Bands 6–8 with the largest difference being at Pay Band 8d (11.3% males overall, 17.1% males at Pay Band 8d) and 8a (11.3% male nurses overall, 15.9% male nurses at Pay Band 8a). There was also a higher proportion of males at non-Pay Band grades.

#### • Wales

The proportion of males at Pay Bands 5, 6, 8d and 9 was lower than the overall proportion of males in Wales. Males were proportionally higher at Pay Bands 7–8c with the largest difference being at Pay Band 8b (9.7% male nurses overall, 17% male nurses at Pay Band 8b) and 8c (9.7% male nurses overall, 15.3% male nurses at Pay Band 8c). There was also a higher proportion of males at non-Pay Band grades.

#### • Northern Ireland

The proportion of males in nursing roles at Pay Bands 5 and 6 was lower than the overall proportion of male nurses in Northern Ireland. Males were proportionally higher at Pay Bands 7–8c with the largest difference being at Pay Band 8c (6.6% male nurses overall, 18.5% male nurses at Pay Band 8c) and 8a (6.6% male nurses overall, 15.1% male nurses at Pay Band 8a). There was also a higher proportion of male nurses at non-banded grades.

#### • Scotland

The proportion of male nurses at Pay Bands 5 and 9 was lower than the overall proportion of male nurses in Scotland. Male nurses

were proportionally higher at Pay Bands 6–8 with the largest difference being at Pay Band 8b (10.6% male nurses overall, 15.8% male nurses at Pay Band 8b) and 8d (10.6% male nurses overall, 20.1% male nurses at Pay Band 8d).

## 6.3. Analysis of the Cassandra specialist nursing dataset

### 6.3.1. Distribution by gender of the specialist nursing dataset

Males were proportionally lower represented at Pay Bands 4 and 5, equivalent at Pay Band 6 and higher represented at Pay Bands 7–8 (Fig. 2).

### 6.3.2. Part time working by pay band and gender

Women were more likely to be in part time work than males especially at Pay Bands 6–8b where more than twice as many women as men were in part time work (Fig. 3).

### 6.3.3. Number of years to reach pay band post-qualification

In the Cassandra dataset, males tended to attain higher grades earlier than women and this is especially apparent after Pay Band 6 with for example males reaching Pay Band 7 after 6 years compared to 10 years for women and Pay Band 8b after 15 years compared to 22 for women (Fig. 4).

### 6.3.4. Experiencing or accepting a drop in pay band to obtain a desired post in specialist practice

In this subset of the data where career pipeline data was collected (n = 8232) no males accepted a lower pay band to obtain their desired post but females did in bands 6, 7, and 8a (Table 2).

## 7. Discussion

Since the introduction of the Equal Pay Act in 1970 it has been unlawful in the UK for male and female workers to be treated unequally over pay or conditions of employment. The Equality Act of 2010 requires that employers must give male and female employees equal pay to do the same or broadly similar work.

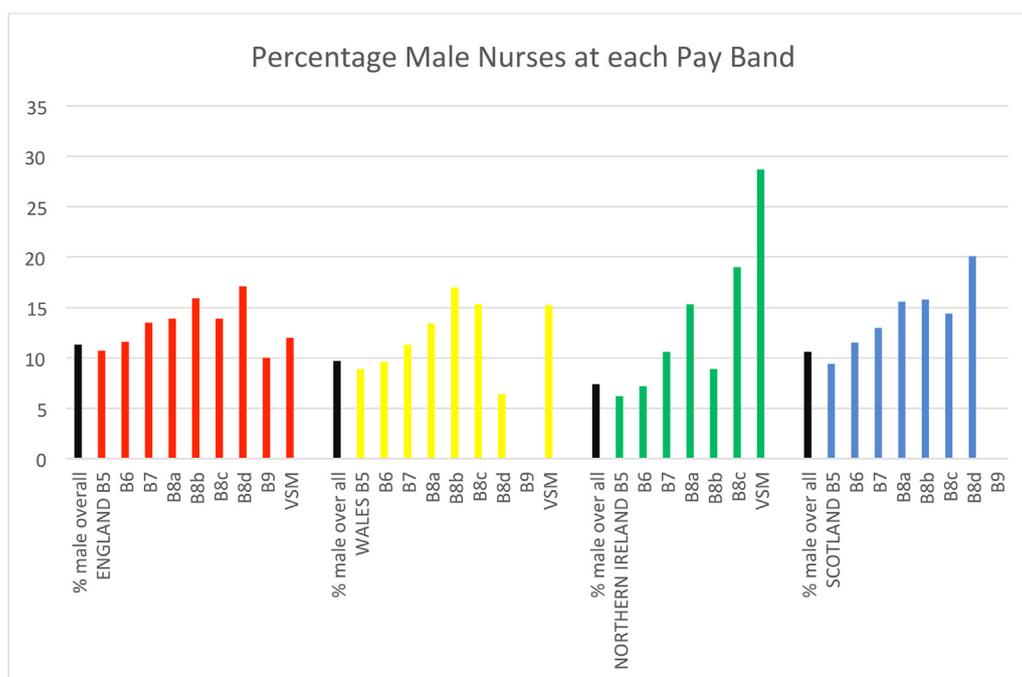


Fig. 1. Percentage of male nurses at each Pay Band in the constituent countries of the UK (England and Northern Ireland by headcount and Wales and Scotland by whole time equivalent). VSM: very senior manager.

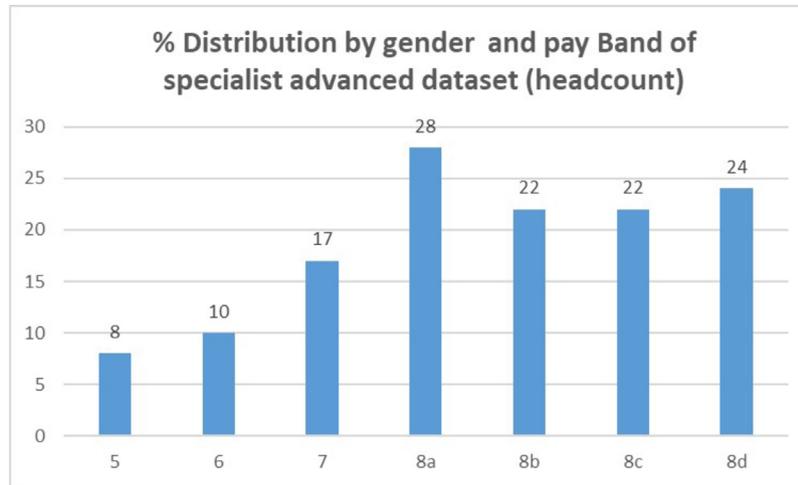


Fig. 2. Distribution by gender and Pay Band of the specialist advanced practice dataset (n = 17,960) by headcount.

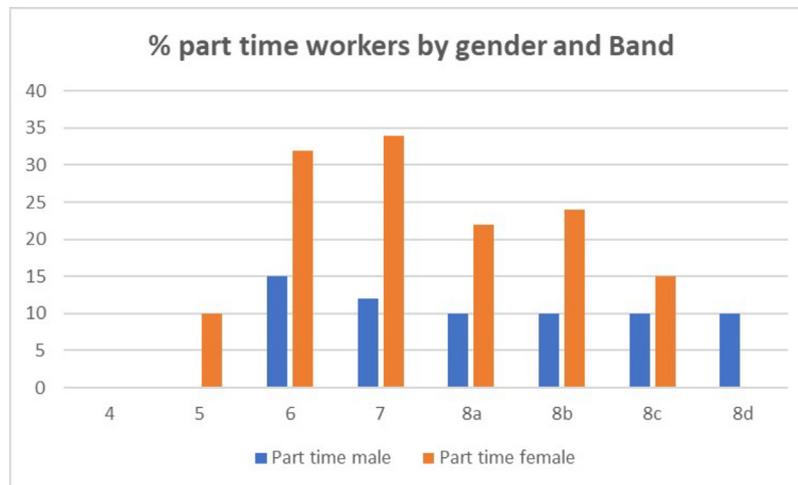


Fig. 3. Part time working by Band and gender of the specialist advanced practice dataset (n = 10,982 by headcount).

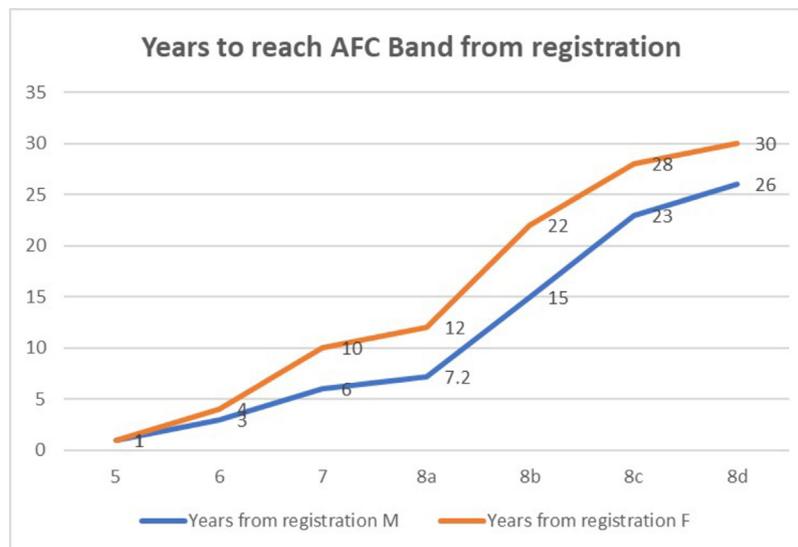


Fig. 4. Number of years to reach Pay Band post-qualification for the specialist advanced practice dataset (n = 9845 by headcount).

**Table 2**  
% of nurses accepting a drop in Pay Band to obtain a desired post by Pay Band.

Pay Band	Male (%)	Female (%)	% Lower Pay Band Male	% Lower Pay Band Female
5	8	92	0	0
6	9	91	0	10
7	16	84	0	12
8a	24	76	0	6
8b	22	78	0	0
8c	22	78	0	0
8d	24	76	0	0

The issue of a gender pay gap is not unique to nursing. A recent report by the Office of National Statistics estimated that the gap between full time male and female UK workers based on median hourly earnings was 9.1% in 2017 and 18.4% for male and female workers overall (Office of National Statistics, 2017).

This gender pay gap can contribute to women's economic hardship and can affect their children and partners. It also has a negative effect on women after they have finished working with the pension gap being reported to be 40% in a recent report (The Fawcett Society, 2016).

In this study there is an apparent disparity in terms of access to higher pay between the genders and the proportion of those at higher pay against the population. The underlying reasons for the gender pay gap and disparity of opportunity are complex and not fully understood. Part-time working and taking time out for child birth and rearing resulting in women having fewer years' service being barriers to women's early careers, unconscious stereotypes that mothers either don't want or are not able to accept promotion and women needing to reduce their working hours due to caring for partners, grandchildren or elderly patients later in their careers. Muench et al. investigated whether factors such as different career aspirations, workplace experience, taking time off for child rearing and physical strength could account for some of the gender earnings gap in nursing in the USA but found that the available evidence did not support any of these issues as a factor though they did suggest that there was some evidence that men and women had different career aspirations (Muench et al., 2016). Some reports suggest that women are less likely to ask for a pay rise than men and less likely to receive a rise (Sandberg, 2013) while others find that women are as likely to ask for a rise but less likely to receive one (Artz et al., 2016). Only 34% of senior managers, directors and senior officials in the UK are women despite women making up 47% of the workforce (Office of National Statistics, 2015).

The results presented in this study clearly demonstrate that within the UK males appear to be over-represented at higher Pay Bands within the UK NHS compared to the population average. All four constituent countries of the UK had a lower proportion of male nurses at Pay Band 5 (the lowest Pay Band for a Registered Nurse) compared to the overall proportion of male Registered Nurses in that country. With the exception of Wales at Pay Band 8d and England at Pay Band 9 male nurses were present at a much higher proportion than average in the overall nursing population at both Pay Band 7 and in particular the various Pay Band 8 grades which cover more senior nursing roles such as Modern Matron and Nurse Consultant.

The data from the bespoke dataset on specialist nurses suggests that for this group of nurses at least men are likely to achieve a higher Pay Band role more rapidly after qualifying than females with an average advantage of almost 5 years. There are also more females than males in part-time nursing work and that some females who were already in permanent positions at a higher rate of pay, were prepared to accept a lower Pay Band role to obtain a post they wished to take up.

There have been several explanations for the tendency of male nurses to utilise the glass escalator. The reasons for males to occupy a higher proportion of senior positions such as the 'patriarchal dividend' by authors such as Connell (Connell, 1996) and Kenway and Fitzgerald (Kenway and Fitzclarence, 1997) or that males in nursing are given a special and privileged minority status (Villeneuve, 1994). Nilssen and Satterlund Larsson (2005) studied the influence of gender in progression to leadership positions. Male leaders used direct communication strategies and assertiveness with a more pro-active approach seeking opportunities away from direct patient care. Contrastingly, the female participants demonstrated a preference for remaining focussed on the clinical care, seeing leadership posts as part of a natural progression rather than something to seek directly. This reinforced the lower value of "caring" in healthcare and female expectations of themselves (Tracey and Nicholl, 2007; Bell et al., 2014). Other studies have looked at the effect of race on men in nursing and concluded that the glass escalator is a racialized concept and that black male nurses experience 'glass barriers' to riding the glass escalator (Wingfield, 2009) though one study has reported that Asian Registered Nurses earn more than their white counterparts in the USA (Moore and Continelli, 2015). Other theories include the secondary benefits of specialization such as higher salaries and prestige in areas of nursing such as mental health, anaesthesiology, intensive care and emergency care all of which are more compatible with male character traits than other areas of nursing and thus more attractive to men (Evans, 1997).

The Glass escalator has been criticised by some authors who suggest the effect of an advantaged "token" workforce can be explained by more generic process in which gendered social belief works in favour of men in any circumstances (Budig, 2002). This is reinforced by the concept of tokenism (Kim, 2018) and the increasingly understanding of complexity in the workplace as a social structure as revisited by Christine Williams in her 2013 paper on the glass escalator (Williams, 2013).

### 7.1. Limitations

The gender distribution by Pay Band study was carried out on the latest available data over 12 months from the four constituent countries of the UK and only covered NHS staff. It does not include nurses working in the private or charitable sectors where the situation may be different. This study does not look at the wider context of the value of gendered work for example human capital theory as information such as actual wage data, hours worked or education was not available.

This study focuses on occupation and gender but does not consider intersectional issues such as ethnicity, social class, organisational contexts or why the work of women is devalued (Kim, 2018). It is also not possible to say how other factors such as unconscious bias affect in this context (Madsen and Andrade, 2018) but these would be an area for further investigation.

The routinely collected NHS workforce data is limited in that it does not record items such as qualifications, length of service or

other population data. It also does not consider issues such as career breaks or maternity leave as such data is not available. This makes modelling with this dataset challenging. A further limitation is that the same data was not collected by each country with some collecting data by headcount, some by whole time equivalent and some by both.

The bespoke data on specialist nurses does not cover non-specialist nurses (for example ward sisters/managers) and was collected at varying times between 2006 and 2017. The participants were self-selecting so may not be a representative sample for each specialism.

High quality workforce data needs to be collected to further study this issue. The routinely nationally collected datasets can compare gender and pay grade to some degree, but they are not sensitive enough to look at subsets of workers i.e. specialists or other roles. They are also not sensitive enough to address many of the intersectionality issues. The routinely collected data does not capture data in areas such as postgraduate education for example. In addition national data is limited to NHS employees. Almost half of all Registered Nurses are employed outside the NHS or in areas such as local authority social care. There is a limited amount of data on the wider nursing workforce collected through other means such as occupational coding in the census, but this data is periodic and high level.

Collection of high-quality workforce data is required to properly monitor not only the gap between male and female workers but also the nuance of gender and role type within nursing.

## 8. Conclusion and relevance to clinical practice

There has been considerable interest in gender pay disparity in general currently in a wide variety of organisations. Equality is vitally important as it is the cornerstone of any fair society where each member has the opportunity to achieve their full potential. From the data presented in this study it appears that the glass escalator is still evident in nursing for males.

Equality must not just be a paper exercise. In order for the NHS to become an inclusive employer of choice it is necessary to improve the recruitment, retention, progression, development and experience of female nurses to address the current gender imbalance and reduce it in the future. It is also important to take these issues into consideration when attempting to address the gender imbalance between the number of male and female nurses to ensure that the recruitment of more male nurses does not further disadvantage female nurses.

## Conflict of interest statement

The authors wish to declare no conflict of interest regarding this publication.

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## References

- Artz, B., Goodall, A.H., Oswald, A.J., 2016. Do Women Ask? Warwick Economics Research Papers Retrieved from. . [https://warwick.ac.uk/fac/soc/economics/research/workingpapers/2016/twerp\\_1127\\_oswald.pdf](https://warwick.ac.uk/fac/soc/economics/research/workingpapers/2016/twerp_1127_oswald.pdf).
- Australian Bureau of Statistics, 2013. Australian Social Trends- Doctors and Nurses Retrieved from. . <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features20April+2013>.
- Belfast Telegraph, 2013. Operation Male Nurse Retrieved from. . <http://www.belfasttelegraph.co.uk/news/health/operation-male-nurse-29479023.html>.
- Bell, A.V., Michalec, B., Arenson, C., 2014. The (stalled) progress of interprofessional collaboration: the role of the gender. *J. Interprof. Care* 28 (2), 98–102.
- Budig, M.J., 2002. Male advantage and the gender composition of jobs: Who rides the glass escalator? *Soc. Probl.* 49 (2), 258–277.
- Canadian Institute for Health Information, 2016. Regulated Nurses, 2016 Retrieved from. . <https://www.cihi.ca/en/regulated-nurses-2016>.
- Cho, J., Lee, T., Jung, H., 2014. Glass ceiling in a stratified labor market: evidence from Korea. *J. Jpn. Int. Econ.* 32, 56–70.
- Connell, R.W., 1996. New directions in gender theory, masculinity research, and gender politics. *Ethos* 61 (3–4), 156–157.
- Cummings, S.H., 1995. Attila the hun versus Attila the hen: gender socialization of the American nurse. *Nurs. Adm. Q.* 19, 2.
- Duda, R.A., Hart, P.E., Stork, D.G., 2000. *Pattern Classification*, 2nd ed. Wiley-Interscience, Hoboken, NJ.
- Egeland, J.W., Brown, J.S., 1988. Sex role stereotyping and role strain of male registered nurses. *Res. Nurs. Health Res.* 11 (4), 257–267.
- Evans, J., 1997. Men in nursing: issues of gender segregation and hidden advantage. *J. Adv. Nurs.* 26 (2), 226–231.
- Evans, J., 2004a. Men nurses: a historical and feminist perspective. *J. Adv. Nurs.* 47 (3), 321–328.
- Evans, J., 2004b. Bodies Matter: Men, Masculinity, and the Gendered Division of Labour in Nursing. *J. Occup. Sci.* 11 (1), 14–22.
- Federal Statistical Office, 2015. Health Personnel by Profession and Gender Retrieved from. . [https://www.destatis.de/EN/FactsFigures/SocietyState/Health/HealthPersonnel/Tables/Professions\\_gender.html](https://www.destatis.de/EN/FactsFigures/SocietyState/Health/HealthPersonnel/Tables/Professions_gender.html).
- Fisher, M.J., 2009. 'Being a Chameleon: labour processes of male nurses performing bodywork. *J. Adv. Nurs.* 65 (12), 2668–2677.
- Hader, R., 2010. Nurse leaders: a closer look. *Nurs. Manage.* 41 (2010), 25–29.
- Health Research Authority, 2017. Is My Study Research? Retrieved from. . <http://www.hra-decisiontools.org.uk/research/>.
- Independent Nurse, 2017. New Bursary Introduced to Increase Number of Male Nurses Retrieved from. . <http://www.independentnurse.co.uk/news/new-bursary-introduced-by-coventry-university-to-increase-number-of-male-nurses/159398/>.
- Kenway, J., Fitzclarence, L., 1997. Masculinity, violence and schooling: challenging poisonous pedagogies. *Gend. Educ.* 9 (1), 117–133.
- Khakwani, A., Hubbard, R.B., Beckett, P., Borthwick, D., Tod, A., Leary, A., White, J., Tata, L.J., 2016. Lung Cancer 96 (June), 33–40. doi:<http://dx.doi.org/10.1016/j.lungcan.2016.03.011> Epub 2016 Mar 26.
- Kim, Y.-M., 2018. Gendered outcomes of the gender composition of jobs and organizations: a multilevel analysis using employer-employee data. *Int. Sociol.* 33 (6), 692–714. doi:<http://dx.doi.org/10.1177/0268580918795554>.
- Leary, A., Anionwu, E.N., 2014. Modelling the complex activity of sickle cell and thalassemia specialist nurses in England. *Clin. Nurse Spec.* 28 (September–October (5)), 277–282 2014.
- Leary, A., Brocksom, J., Endacott, R., et al., 2016. The specialist nursing workforce caring for men with prostate cancer in the UK. *Int. J. Urol. Nurs.* 10 (1), 5–13.
- Leary, A., Mason, I., Punshon, G., 2018. Modelling the inflammatory bowel disease specialist nurse workforce standards by determination of optimum caseloads in the UK. *J. Crohn's Colitis* jyy106 doi:<http://dx.doi.org/10.1093/ecco-jcc/jyy106>.
- Levanon, A., England, P., Allison, P., 2009. Occupational feminization and pay: assessing causal dynamics using 1950–2000 U.S. census data. *Soc. Forces* 88 (December (2)), 865–891 2009.
- Madsen, S.R., Andrade, M.S., 2018. Unconscious gender bias: implications for women's leadership development. *J. Leadersh. Stud.* 12 (1), 62–67. doi:<http://dx.doi.org/10.1002/jls.21566>.
- Moore, J., Continelli, T., 2015. Racial/Ethnic Pay Disparities Among Registered Nurses (RNs) in U.S. Hospitals: An Econometric Regression Decomposition. *Health Services Research.* doi:<http://dx.doi.org/10.1111/1475-6773.12337>.
- Muench, U., Dietrich, H., 2017. The male-female earnings gap for nurses in Germany: a pooled cross-sectional study of the years 2006 and 2012. *Int. J. Nurs. Stud.* doi: <http://dx.doi.org/10.1016/j.ijnurstu.2017.07.006>.
- Muench, U., Sindela, J., Busch, S.H., Buerhaus, P.I., 2015. *JAMA* 313 (12), 1265–1267. doi:<http://dx.doi.org/10.1001/jama.2015.1487>.
- Muench, U., Busch, S.H., Sindelar, J., Buerhaus, P.I., 2016. Exploring explanations for the female-male earnings difference among registered nurses in the United States. *Nurs. Econ.* 34 (5), 214.

- NHS Digital, 2016. National Workforce Dataset and NHS Occupation Codes Retrieved from. . <http://content.digital.nhs.uk/datasets/nwd>.
- NHS Digital, 2017. NHS Workforce Statistics – March 2017, Provisional Statistics Retrieved from. . <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/nhs-workforce-statistics-march-2017-provisional-statistics>.
- NHS Employers, 2017a. About Agenda for Change Retrieved from. . <http://www.nhsemployers.org/your-workforce/pay-and-reward/agenda-for-change/how-agenda-for-change-works>.
- NHS Employers, 2017b. National Profiles for Nursing Services Retrieved from. . [http://www.nhsemployers.org/-/media/Employers/Documents/Pay-and-reward/Nursing\\_Services.pdf?la=en&hash=544C26422C0341E51F2-B016249E59DC548EC1339](http://www.nhsemployers.org/-/media/Employers/Documents/Pay-and-reward/Nursing_Services.pdf?la=en&hash=544C26422C0341E51F2-B016249E59DC548EC1339).
- NHS National Services Scotland, 2018. Workforce Team, Public Health & Intelligence (2018) Personal Correspondence With the Author. .
- Nillssen, K., Satterlund Larsson, U., 2005. Conceptions of gender – a study of female and male head nurses' statements. *J. Nurs. Manag.* 13 (2), 179–186.
- Northern Ireland Department of Health, 2018. Northern Ireland Department of Health Workforce Statistics Service and was Dated March 2017 Personal Correspondence with the Author. .
- Nursing and Midwifery Board of Australia, 2017. Statistics Retrieved from. . <http://www.nursingmidwiferyboard.gov.au/About/Statistics.aspx>.
- Nursing Standard, 2017. The Unconscious Bias that's Keeping Men Out of Nursing Retrieved from. . <https://journals.rcni.com/nursing-standard/the-unconscious-bias-thats-keeping-men-out-of-nursing-ns.32.13.18.s17>.
- Nursing Times, 2008. Why are there so Few Men in Nursing? Retrieved from. . <https://www.nursingtimes.net/why-are-there-so-few-men-in-nursing/849269.article>.
- Office of National Statistics, 2015. Employment by occupation: EMP04 Retrieved from. . <http://www.ons.gov.uk/ons/rel/lms/labour-force-survey-employment-status-by-occupation/index.html>.
- Office of National Statistics, 2017. Annual Survey of Hours and Earnings: 2017 Provisional and 2016 Revised Results Retrieved from. . <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2017provisionaland2016revisedresults#gender-pay-differences>.
- Oliver, S., Leary, A., 2012. Return on investment – workload, value and complexity of the CNS. *Br. J. Nurs.* 21 (1), 32–37.
- Randstad Care, 2016. Assessing the Lack of Senior Opportunities for Women in Nursing Retrieved from. . <https://www.randstad.co.uk/women-in-work/women-in-nursing-UK-report-June-2016.pdf>.
- Sandberg, S., 2013. *Lean In: Women, Work, and the Will to Lead*. Random House, New York.
- Savage, J., 1987. *Nurse, Gender and Sexuality (Nursing Today)*. Butterworth-Heinemann, London.
- Snyder, K., Green, I., 2008. Revisiting the glass escalator: the case of gender segregation in female dominate occupations. *Soc. Probl.* 55 (2), 271–299.
- The Fawcett Society, 2016. Closing the Pension Gap: Understanding Women's Attitudes to Pensions Saving Retrieved from. . <https://www.fawcettsociety.org.uk/Handlers/Download.ashx?IDMF=ac5c417a-4714-4b9f-b3bf-83c466256db1>.
- The Henry J. Kaiser Family Foundation, 2017. Total Number of Professionally Active Nurses, by Gender Retrieved from. . <https://www.kff.org/other/state-indicator/total-number-of-professionally-active-nurses-by-gender/?dataView=0&currentTimeframe=0&sortModel=%7B%22colld%22:%22Location%22,%22sort%22:%22asc%22%7D>.
- The Scotsman, 2017. Why More Men Should Consider Nursing Retrieved from. . <http://www.scotsman.com/news/christine-pollock-why-more-men-should-consider-nursing-1-4539908>.
- Tracey, C., Nicholl, H., 2007. The multifaceted influence of gender in career progress in nursing. *J. Nurs. Manag.* 15 (7), 677–682.
- US Census Bureau, 2013. Men in Nursing Occupations Retrieved from. . [https://www.census.gov/content/dam/Census/library/working-papers/2013/acs/2013\\_Landivar\\_02.pdf](https://www.census.gov/content/dam/Census/library/working-papers/2013/acs/2013_Landivar_02.pdf).
- Villeneuve, M., 1994. Recruiting and retaining men in nursing: a review of the literature. *J. Prof. Nurs.* 10 (4), 217–228.
- Welsh Government, 2018. Knowledge and Analytical Services, Welsh Government Workforce Data 2016 Personal Correspondence With the Author. .
- Williams, C., 1992. The Glass Escalator Hidden Advantages of Men in the Female Professions. *Soc. Probl.* 39, 253–267.
- Williams, C.L., 2013. The glass escalator revisited: gender inequality in neoliberal times. *Gen. Soc.* 27 (5), 609–629.
- Williams, C., Heikes, E., 1993. The importance of researchers gender in the in-depth interview: evidence from case studies of male nurses. *Gen. Soc.* 7 (2), 280–291.
- Wingfield, A.H., 2009. Racializing the glass escalator: reconsidering men's experiences with women's work. *Gender Soc.* 23 (1), 5–26.
- Witten, I.H., Frank, E., Hall, M., 2011. *Data Mining: Practical Machine Learning Tools and Techniques*, 3rd edition Morgan Kaufmann ISBN: 9780123748560.
- Wolfram, 2017. *Mathematica Version 11*. . Accessed March 2018 Champaign, IL <http://www.wolfram.com/mathematica/?source=nav>.
- Wolfram, 2018. K-means Clustering Algorithm Available from: . <http://mathworld.wolfram.com/K-MeansClusteringAlgorithm.html>.