The ethnicity pay gap in the English NHS

John Appleby, Laura Schlepper, Eilís Keeble

nuffieldtrust

About the report

This report examines differences in basic pay between ethnic minority staff and White staff employed by the NHS in England based on data from the NHS electronic staff record for one month (December 2017). As well as drawing on previous analyses on the ethnicity pay gap among doctors and the gender pay gap by ethnicity, it explores pay differences across the entire NHS workforce and alternative ways of comparing staff groups – by occupation, pay system and pay band.

Contents

Summary

Key findings

- For the 89% of NHS staff in England paid under the terms and conditions of Agenda for Change, there is no significant pay gap between White staff and ethnic minority staff as a whole.

- However, the picture is much more varied when comparing White staff with specific ethnic groups for staff paid under Agenda for Change conditions of service, with the pay gap ranging from 6% in favour of White staff compared to Mixed heritage staff, to over 15% in favour of Chinese staff.

- Across all NHS staff, doctors, and particularly consultants, exert a disproportionate effect on aggregate pay differences as their pay tends to be much higher than other staff groups, and also because of their very different ethnic composition.

- While there is an overall pay gap of 5.2% in favour of ethnic minority staff across the English NHS, this disguises a much more mixed picture about pay inequalities within the health service. For example, Black/British men earn less on average than any other group in the NHS.

- There is considerable variation in pay gaps between ethnic groups across all NHS staff – from 34% in favour of Chinese staff compared to White staff, to 4.6% in favour of White staff compared to Black/Black British staff.

- For four major staff groups – staff supporting doctors and nurses (such as secretaries and ward clerks), nurses and health visitors, managers and senior managers, and consultants – pay gaps favoured White staff.

This report examines differences in basic pay between ethnic minority staff and White staff employed by the NHS in England based on data from the NHS electronic staff record for one month (December 2017). As well as drawing on previous analyses on the ethnicity pay gap among doctors[1] and the gender pay gap by ethnicity[2], it explores pay differences across the entire NHS workforce and alternative ways of comparing staff groups – by occupation, pay system and pay band.

It finds that for the vast majority of NHS staff in England, who are paid under the terms and conditions of Agenda for Change, there is no significant pay gap between White staff and ethnic minority staff. The picture becomes much more varied, however, when comparing White staff with specific ethnic groups.

The pay of doctors and consultants and staff such as senior managers, which is not covered by Agenda for Change, has a disproportionate impact on aggregate pay differences across all NHS staff. Their pay is usually higher than other staff groups and they also have a very different ethnic composition. So while we did find an overall pay gap of 5.2% in favour of ethnic minority staff (as a single group) across the English NHS, that doesn't reveal the full story about pay inequalities within the health service. We need to distinguish between different ethnic groups and analyse the pay gap at lower levels.

The intersection of gender and ethnicity also showed variation, with pay gaps generally favouring men among all groups except for Black/Black British staff, where there was a 3% gap favouring Black/Black British women.

It is clear overall, however, that while Asian/Asian British, Chinese and Any Other Ethnic minority earn more on average (than White staff), the same cannot be said for Black/Black British staff – especially Black/Black British men, who earn less on average than any other group in the NHS.

Our initial analysis of the drivers in the overall pay gap in favour of ethnic minority staff (based on average, not median basic pay) suggest that it is the particular ethnic composition of different staff groups in association with the particular pay differences overall between staff groups relative to White staff that is the major explanation. Gender distribution relative to White staff

adds a little to this, while age and primary area of work tends to pull the pay gap back a bit. Nevertheless, there remains much that is unexplained (at least statistically).

But differences in pay – across all staff, within occupational groups or pay bands – will be driven by a number of factors we have not been able to examine statistically. Some differences may be warranted, arising for example from free choices of career or the particular age profile of staff at a point in time. But others will be unwarranted – the result of direct discrimination, the lack of access to educational opportunities or institutional barriers to promotion for example. And some differences – such as those due to different age profiles between groups – may naturally resolve themselves over time.

An important policy discussion concerns which pay gap(s) are important. Does the fact that, for example, Asian/Asian British staff overall enjoy a pay difference of nearly 7% in their favour over White staff mean that policy should focus on reducing that gap? Or does the fact that, when compared *within* occupations, pay gaps are consistently in favour of White staff compared to Asian/Asian British staff suggest a somewhat different gap-closing focus?

The descriptive and statistical analysis in this report – while important in quantifying and partly explaining differences in pay – highlights some of the complexities for policy in this area and the need for qualitative work to more clearly identify warranted and unwarranted pay differences. Important too is a clear understanding of the root causes of pay differences – some of which will stretch back to early life, educational and career opportunities, but also extend into individual and organisational attitudes, behaviours, employment and career progression opportunities within the NHS.

Background

From its adoption of the Whitley Council system to determine pay and terms of conditions of its staff in 1948, the NHS has come a long way in developing fairer and more appropriate ways of setting remuneration for its employees. The publication of the Agenda for Change white paper in 1999 set out reasons to overhaul the Whitley system, to provide a consistent set of pay bands and job evaluations that cut across occupational groups and aimed to provide equal pay for work of equal value. An important goal of Agenda for Change was to ensure the NHS had a pay system that addressed unwarranted differences in the pay of men and women in the NHS.

Now, around 89% of NHS staff in England are included in the Agenda for Change system. The pay and terms of conditions of remaining staff – largely senior managers and doctors – are determined through other locally and nationally negotiated contracts.

Legislation has also developed to tackle discrimination and promote equality in the workplace. Most recently, in early 2018, came the requirement that all organisations employing more than 250 people should publish headline details of their gender pay gap – a requirement of the 2017 amendment to the 2010 Equality Act. This data revealed that there is a gender pay gap of 8.6% in favour of men, and that this varies by staff group, age and ethnicity, with occupational segregation being the main driver of pay inequalities.[3] But despite the same Act covering ethnicity as a 'protected characteristic', there is – as yet – no such requirement to report pay gaps based on ethnicity.

However, following the government's launch in October 2016 of the Race at Work Charter[4], a related website on a variety of data on ethnicity, including pay[5] and an update[6] of Baroness McGregor-Smith's review[7] on race equality in the workplace, the government have consulted on the possibility of making ethnicity pay gap reporting compulsory – though since the close of the consultation in January 2019 there has been no formal government response.[8]

For the NHS – collectively the largest employer in the country and with over 225,000 ethnic minority staff – pay equality is an important issue. But while the 2016 (and subsequent annual updates) NHS Workforce Race Equality Standards report highlighted race inequality in recruitment, career progression and promotion in the health service, how much the issue affects pay remains less clear.[9]

As a contribution to the better understanding of pay differences between NHS staff groups, we have analysed over 1.2 million NHS staff records in England to examine the ethnicity pay gap in more detail – looking at differences in median pay between ethnic minorities and White staff, and variations in pay by staff group, Agenda for Change pay bands, and gender.

This analysis is based on a special extract from the NHS Electronic Staff Record held by NHS Digital, covering over 1.2 million NHS staff in all but two NHS trusts in England for one specific month (December 2017). While there may have been some changes in the pay gap in the intervening three years, given the analysis here that it is the ethnic composition of various staff and pay groups that drives the size of the gap and that these compositions change slowly over time, the broad picture reported here is unlikely to have changed significantly.

Methodology

Data

Analyses were based on a special extract from the NHS Electronic Staff Record (ESR) held by NHS Digital.[10] The ESR is a payroll and human resources system used by all but two NHS trusts in England and covers over 1.2 million directly employed staff. Pay data were for December 2017 and included monthly basic and non-basic pay, as well as total earnings.

Pay data was rounded to the nearest £100. The data were anonymous, with 98.4% (1,186,823) of records aggregated on the basis of the seven non-pay characteristics included in the data extract (i.e. where staff group, grade, primary area of work, age group, gender, ethnicity and specialty group matched). Aggregated groups varied in size from two to over 6,500. Records were disaggregated based on headcount figures, and pay data then averaged across those staff in each aggregation. Disaggregation resulted in 1,206,138 individual records.

All analyses were based on median basic pay paid per one full-time equivalent (FTE) post in the month (of December 2017). Analyses were based on 95.6% of staff records (a total of 1,152,818); 53,320 records were excluded due to unknown ethnic origin. Some indicative analysis using total (basic and non-basic) pay, plus basic pay per head (to explore differences in pay due to differences in hours worked between men and women) were also carried out.

The pay data does not cover contracted staff – in particular general practitioners, dentists and their staff.

Definitions

In this report, the ethnicity pay gap is defined as the difference between median pay of ethnic minority groups and median pay of White staff,

expressed as a percentage of the median pay of White staff. The median pay is the middle value of the pay distribution, such that 50% of people earn more than this and 50% earn less. It takes account of the skewed distribution of pay and is a better measure of average pay than the mean, since a small proportion of staff earn very high pay, which drives the mean upwards and gives this group undue weight.

Statistical techniques

Where differences in pay were found to be statistically insignificant (using a cut off for the probability of no actual difference of 5%) these are indicated in charts and text.

The statistical approach used to investigate factors explaining (but not, it should be noted, necessarily justifying) pay differences is described in Appendix 1.

Findings

Proportion of staff by ethnic identity

The English NHS has an ethnically diverse workforce, with one-fifth of staff identifying as an ethnic minority – around 50% higher than the proportion of ethnic minorities in the population as a whole. As at December 2017 (and based on 95.6% of staff records that included information on ethnic origin), White staff made up 80.5% of the workforce, followed by Asian and Asian British staff (9.5%), Black and Black British staff (5.8%), staff from Any Other Ethnic group (2.1%), staff with Mixed Ethnic background (1.6%), and Chinese staff (0.5%). Overall, 225,218 staff were from minority ethnic groups.

Figure 1: Proportion of staff by ethnic identity – English NHS (December 2017)
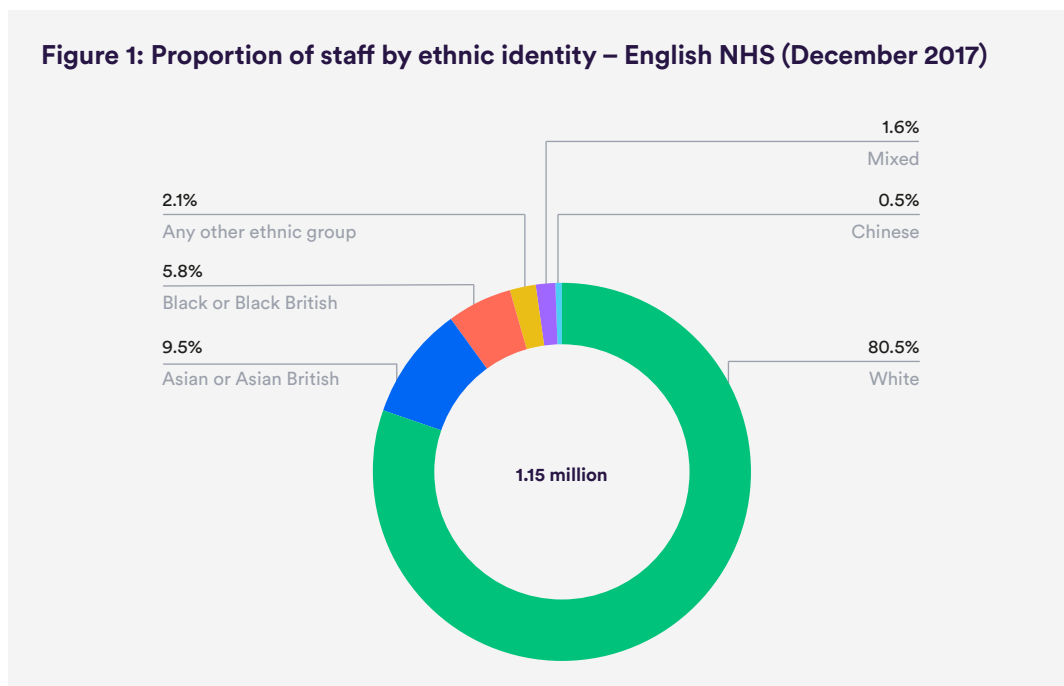
Source: NHS Digital. Figure excludes those without stated ethnicity (53,320 records).
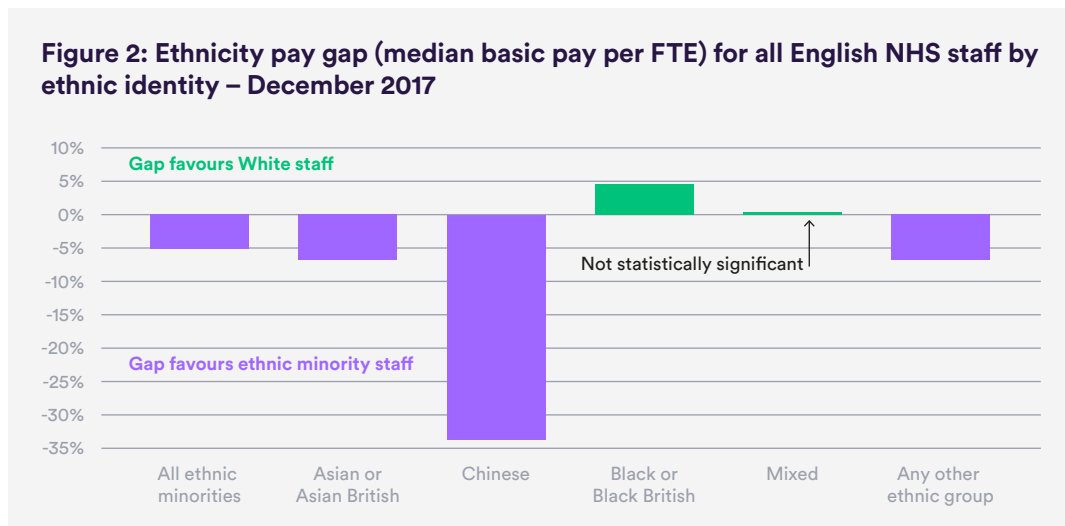
The overall ethnicity pay gap

The Equality and Human Rights Commission defines the ethnicity pay gap as the difference between the median pay of ethnic minorities and White people, expressed as a percentage of White people's earnings.[11]

For staff across the English NHS, the estimated median basic full-time equivalent (FTE) pay gap between ethnic minorities and White staff for December 2017 was 5.2% in favour of ethnic minorities – equivalent to an earnings gap of £114 a month (approximately £1,400 per year).
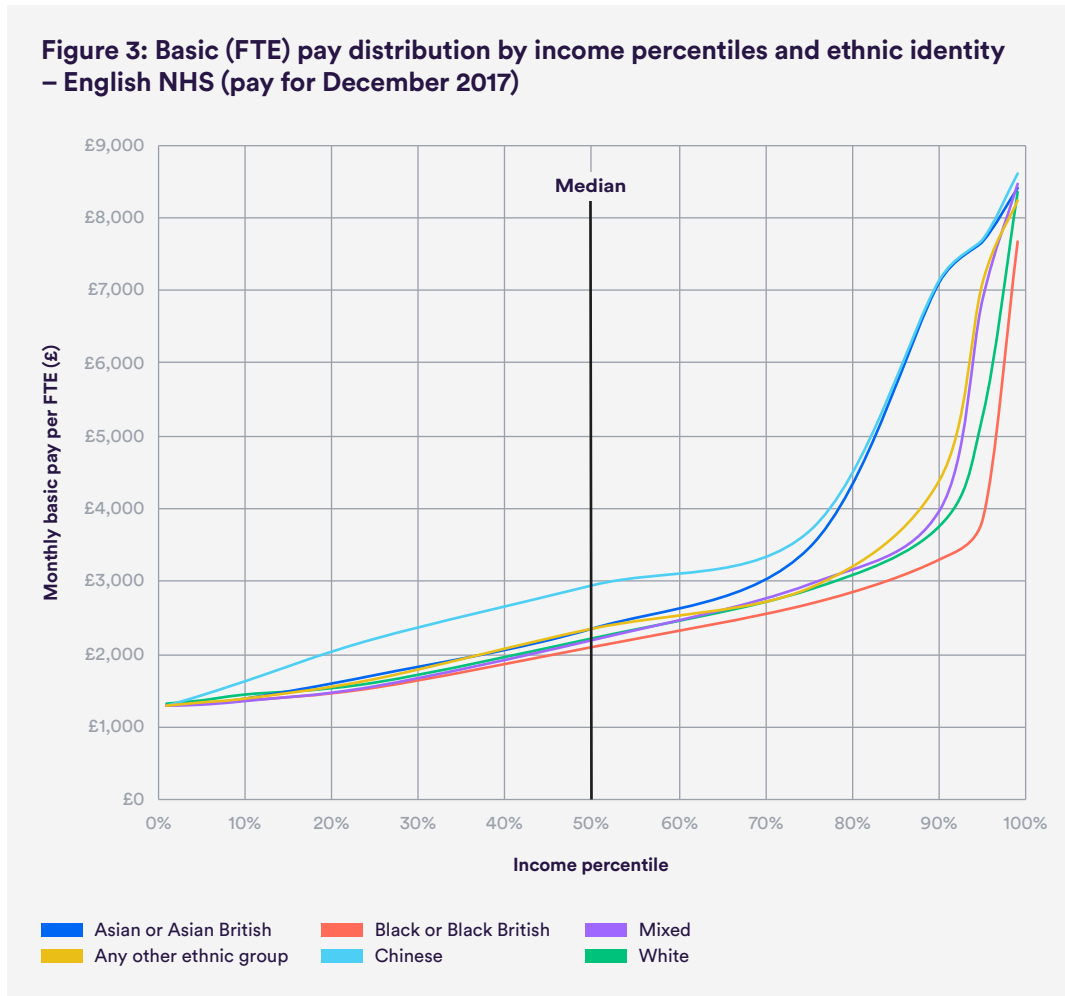
This gap is an aggregate estimate for all ethnic minorities – a breakdown by ethnic group reveals a more nuanced picture (see Figure 2).

The group with the largest pay advantage over White staff were Chinese staff (33.7% – equivalent to £743 per month), followed by Any Other Ethnic group (6.8%) and Asian/Asian British staff (6.7%) around £150 per month).

Black/Black British staff earned less on average than White staff (with a gap of 4.6% in favour of White staff), while there was a statistically insignificant pay gap for staff of Mixed Ethnic background.

Figure 2: Ethnicity pay gap (median basic pay per FTE) for all English NHS staff by ethnic identity – December 2017

These gaps based on the median basic pay only reveal a small aspect of the pay differences between staff groups, however. Pay across staff groups is not distributed evenly – as Figure 3 shows. For some groups, Asian and Asian British for example, the pay distribution is skewed towards higher pay.

Figure 3: Basic (FTE) pay distribution by income percentiles and ethnic identity – English NHS (pay for December 2017)

Note: Income percentiles indicate the value of income below which a certain percentage of staff fall. For example, an income value of £2,100 for Chinese staff at the 20th percentile means that 20% of Chinese staff earn £2,100 or less and, conversely, 80% of Chinese staff earn more than £2,100.

The distributions are plotted against percentile points, which indicate the value of income below which a certain percentage of staff fall. Most NHS staff received a basic monthly income between £1,300 and £4,000, with median earnings ranging from around £2,100 for Black/Black British staff to £2,950 for Chinese staff.

Chinese staff had the highest earnings across the pay scale, with Asian and Chinese staff especially concentrated among the higher end.

Black staff had the lowest earnings, with only a very small group of high earners. While more than 10% of all Asian and Chinese staff earned over £7,000 per month, fewer than 2% of Black staff earned that much.

One conclusion to be drawn from these distributions is that the concentration of Asian/Asian British among the high earners is reducing the pay gap with White staff compared to all ethnic minority staff.

## How the pay gap varies by personal and job characteristics

These are aggregate measures across the whole workforce, but what about pay gaps within different staff groups?

There are a number of ways of grouping staff. The ESR includes information on occupation – manager, nurse, support staff, consultant and so on. Staff can also be grouped by pay arrangements, in particular those paid under Agenda for Change (around 89% of all staff) which bands pay regardless of profession or occupation (and includes, for example, most nurses and administrative staff). Staff can also be grouped by their primary area of work. These include broad clinical areas – such as medicine, psychiatry and dentistry – as well as estates, corporate and facilities.
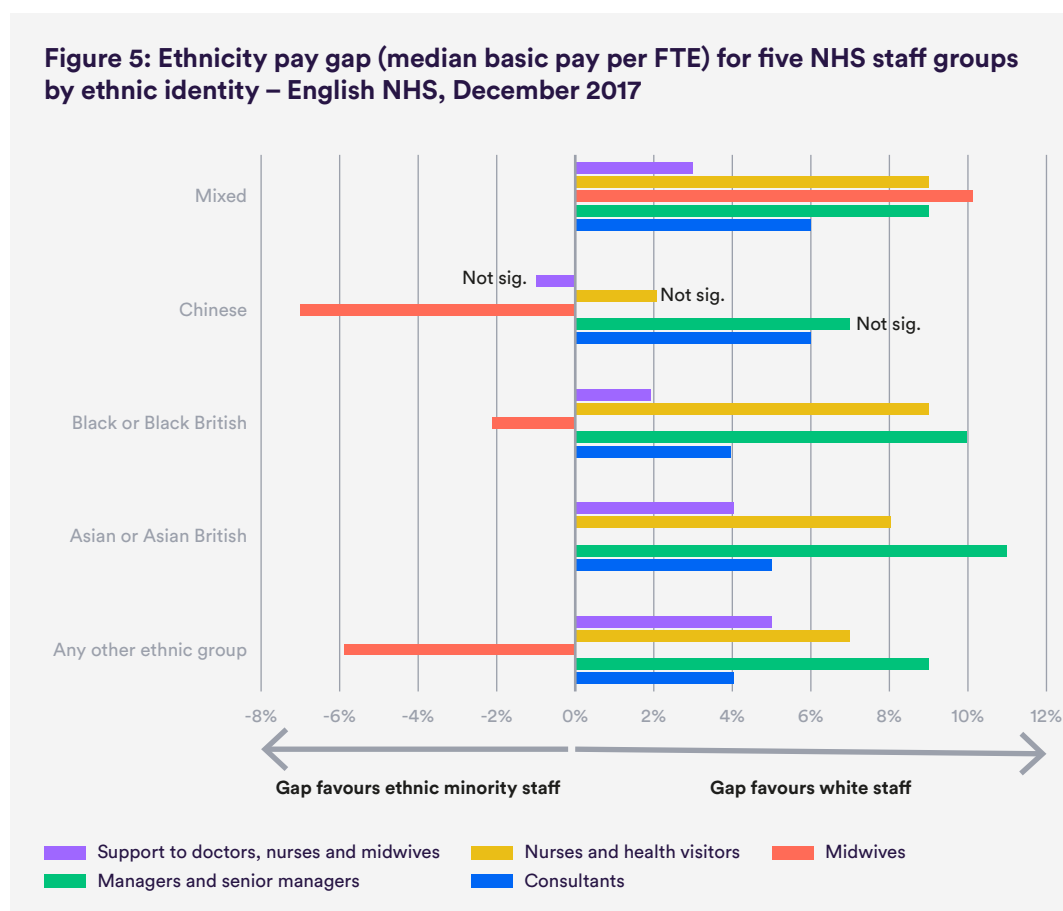
So, while comparing pay across all NHS staff by ethnic group provides one view of the pay gap, other comparisons – within occupations or within primary area of work for example – provide another view that can reveal different pay gaps.

We know that staff numbers vary considerably for different ethnic groups and occupation – and this will have a bearing on pay and, in turn, on pay differences between groups. Chinese and Asian/Asian British staff make up 30% of consultants (who have an overall median pay of around £7,500), but make up just 10% of the overall NHS workforce, for example (see Figure 4).

And of all Asian/British Asian NHS staff, 25% are doctors – consultants, foundation year or other grades. For Chinese staff this figure is 37%, but for Black/Black British staff it is just 6%. And relative to the overall workforce, White, Mixed and Black/Black British staff are disproportionately represented among support staff – which is one of the lowest paid staff groups, with an overall median pay of around £1,500 per month.

Figure 4: Proportion of ethnic groups by occupation across the English NHS – December 2017
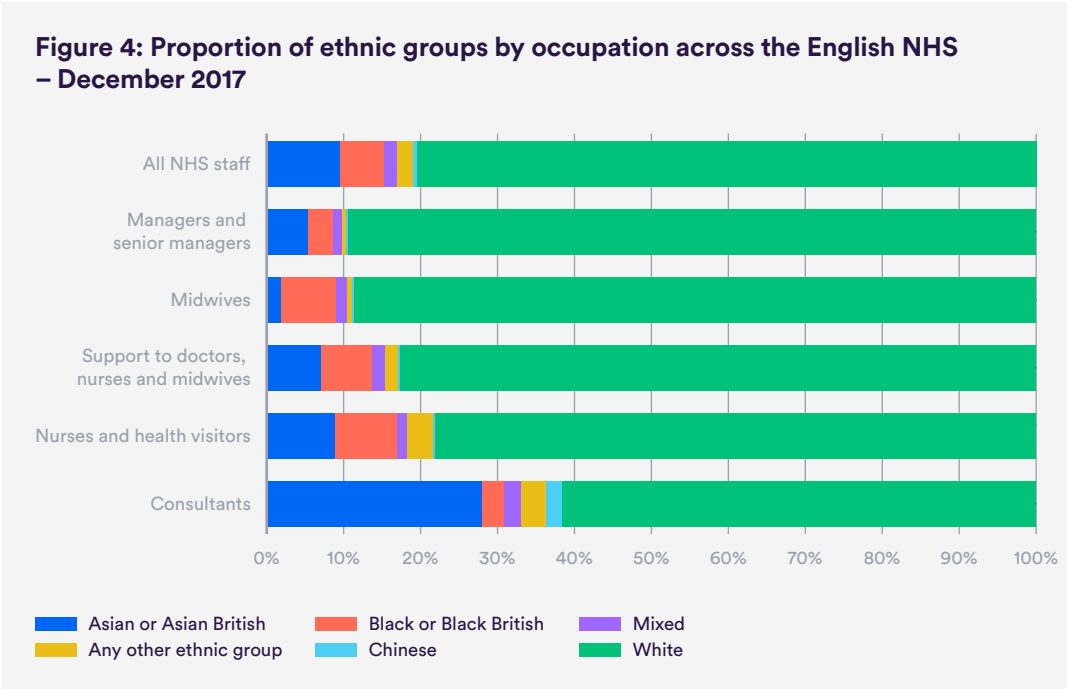
In terms of pay gaps, across all 22 broad staff groups classified in the NHS, only four had an overall ethnicity gap in favour of ethnic minorities, whereas 11 staff groups had a gap in favour of White staff. For seven staff groups, there was no overall difference in pay. (Due to small subgroup sizes for some of the staff groups, we have focused on five different groups that together account for 60% of all NHS staff.)

Figure 5: Ethnicity pay gap (median basic pay per FTE) for five NHS staff groups by ethnic identity – English NHS, December 2017


When comparing pay gaps of staff within their broad occupational peer groups (rather than across these groups), for most of these five staff groups, the pay gap is in favour of White staff (see Figure 5 above), ranging from -1 to 5% for support staff, 4 to 6% for consultants, 2 to 9% for nurses and health visitors, and 7 to 11% for managers and senior managers.

For midwives, the pay gap favours Chinese (7%), Black/Black British (2%) and Any Other Ethnic group (6%) over White staff, whereas those from a Mixed Ethnic background face a pay disadvantage of 10% against White staff.

Ethnicity pay gap among doctors

While small relative to total numbers of NHS staff, doctors are unusual in so far as their pay tends to be much higher than other staff groups and because of their very different ethnic composition. As a group therefore, they can exert a disproportionate effect on aggregate pay differences – either by gender or, in this case, ethnicity. In England, while a higher proportion of NHS staff identify as one of a number of minority ethnic groups compared to the population as a whole (20% versus 15% – based on the 2011 Census), for NHS doctors (excluding GPs), the proportion of ethnic minority staff varies from 37% for foundation year 1 doctors to 60% for specialty doctors (Figure 6).

Figure 6: Ethnicity profile of NHS doctors in England
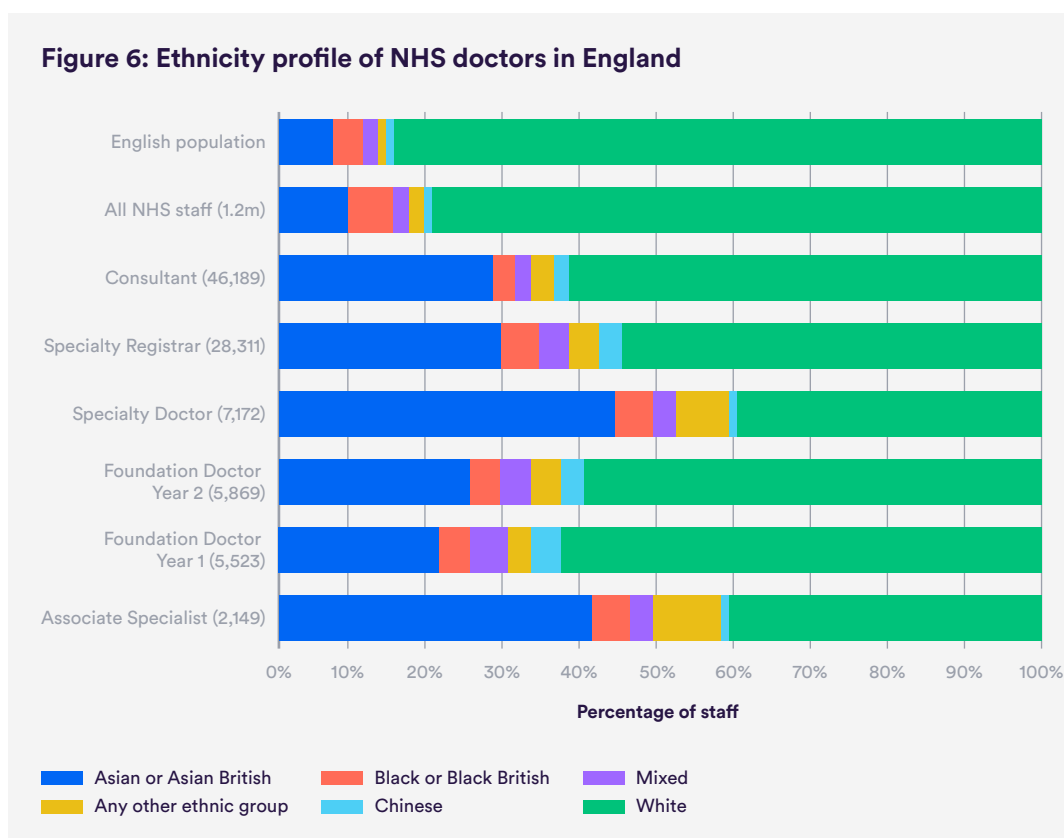
So how does the pay of NHS doctors vary by ethnic group? Figure 7 shows that for nearly all grades and types of doctors the gap in median basic pay is very small, ranging from close to zero for foundation year 2 doctors to 1%, favouring ethnic minority associate specialist doctors.

While the lack of a (or at least relatively insignificant) pay gap for most doctor grades is encouraging, there is, however, a larger (and statistically significant) basic pay gap among consultants: 4.9% higher salary for White compared to ethnic minority consultants. This is equivalent to additional basic pay in December 2017 of £387 (or, scaled up, an annual gap of around £4,638) for White consultants.

Figure 7: Absolute and percentage basic pay gaps between White and ethnic minority doctors (based on December 2017 pay)
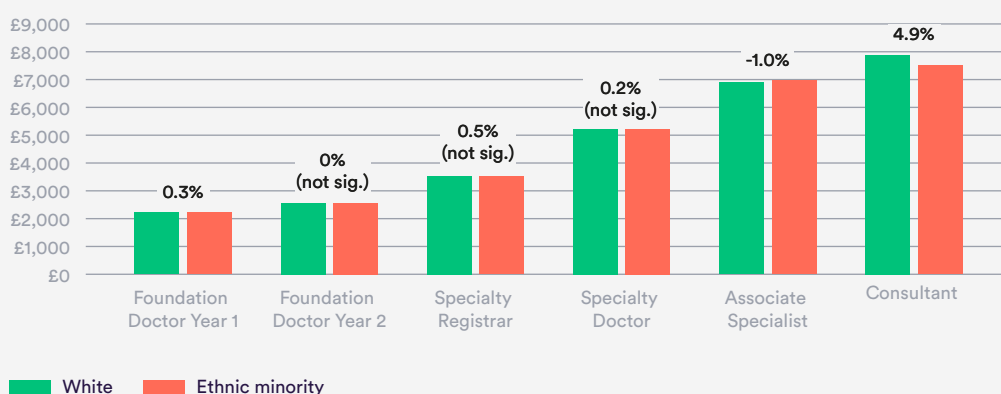
A more detailed breakdown shows that median basic pay for white consultants is higher compared to all other ethnic groups – varying from around 3.5% higher compared to Black/Black British consultants, to over 6% higher compared to consultants of mixed ethnic backgrounds, with all gaps being statistically significant (Figure 8).

Figure 8: Absolute and percentage difference in median basic pay between White and ethnic minority consultants (based on December 2017 pay)
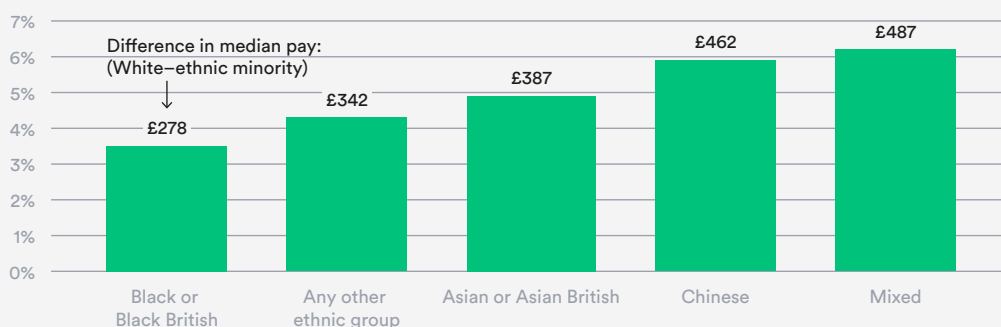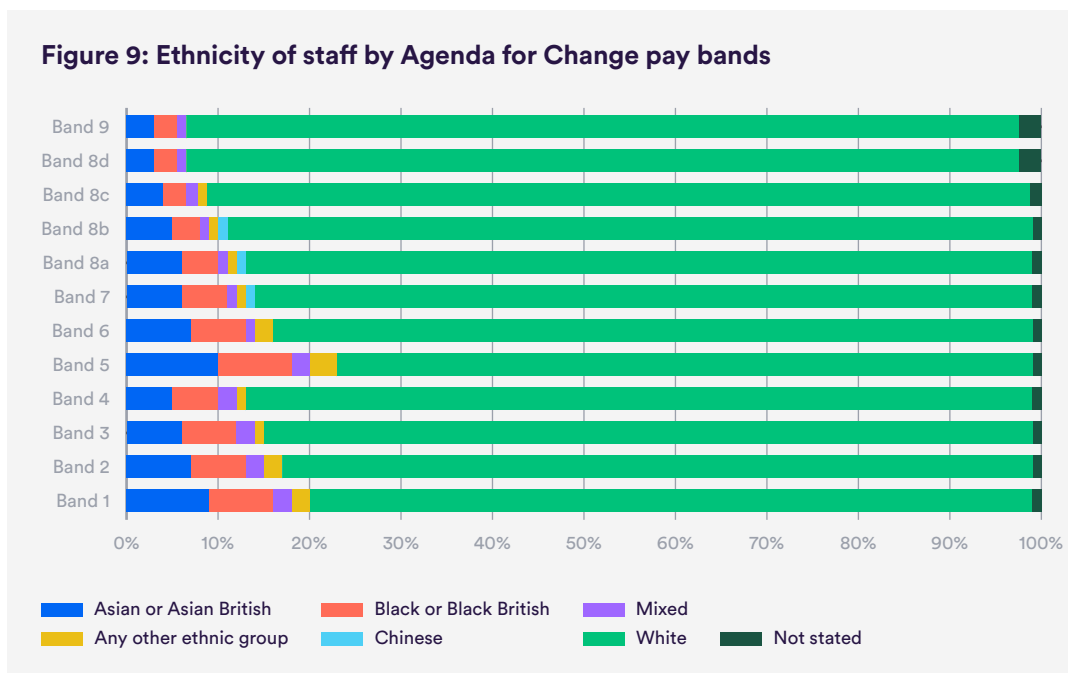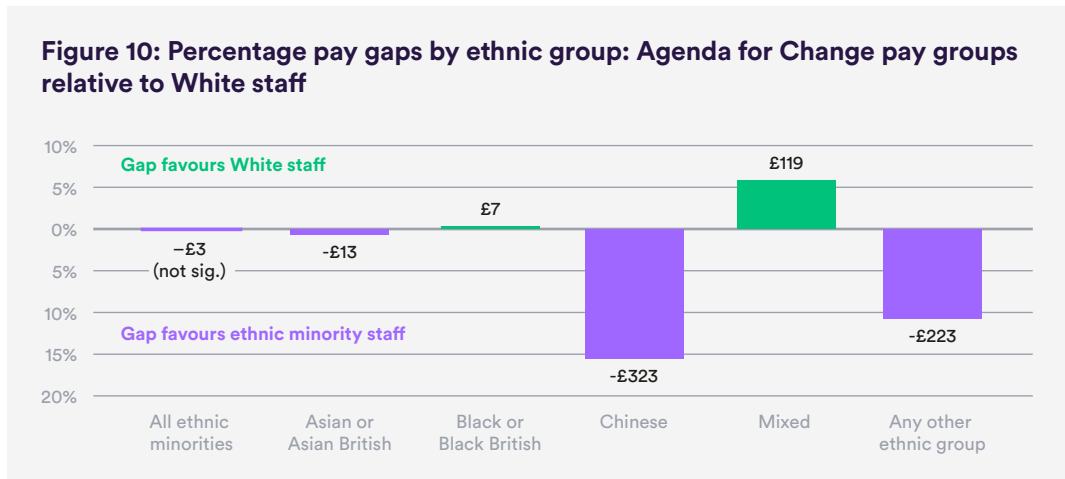
Pay gaps across Agenda for Change staff groups

While around 11% of NHS staff – such as doctors and senior managers – are paid on the basis of nationally negotiated or local agreed contracts, the remaining 89% of staff are paid under the terms and conditions of Agenda for Change (AfC).

AfC was a massive undertaking to overhaul pay and career progression across the NHS that was first published as a white paper in 1999 and implemented in England in 2004. Its broad aim was to bring fairness in terms and conditions '...regardless of age, disability, race, nationality, ethnic or national origin, gender, religion, beliefs, sexual orientation, domestic circumstances, social and employment status, HIV status, gender reassignment, political affiliation or trade union membership.'[12]
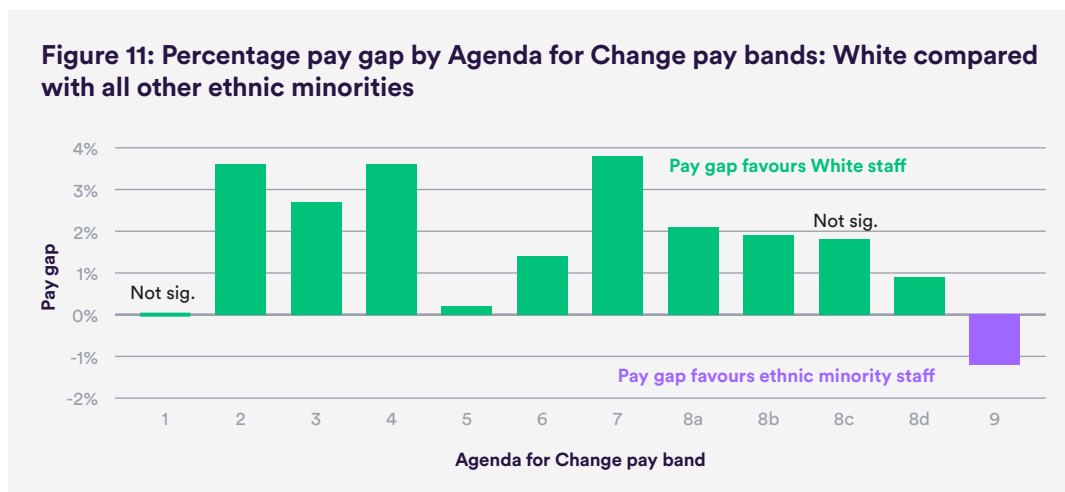
And despite lower proportions of ethnic minority staff in higher AfC pay bands (Figure 9), the overall pay gap between White and all ethnic minority staff is an insignificant 0.1% in favour of ethnic minority staff (Figure 10).

Figure 9: Ethnicity of staff by Agenda for Change pay bands

But as Figure 10 also shows, there are variations in the median pay gap by ethnic group.

Figure 10: Percentage pay gaps by ethnic group: Agenda for Change pay groups relative to White staff

Comparing median basic pay between White and all other minority ethnic staff by AfC pay band reveals a different picture, with just the highest paid band (9) in favour of ethnic minority staff (see Figure 11).

Figure 11: Percentage pay gap by Agenda for Change pay bands: White compared with all other ethnic minorities


Ethnicity and gender

We've previously said there is an overall gender pay gap of 8.6% in favour of men in the English NHS. But what did we find about the gender pay gap within different ethnic groups?[13]

For most ethnic groups, the gap is again in favour of men (see Figure 12). This is greatest among Chinese and Asian/Asian British staff (at 20.9% – representing a difference in monthly pay of £727 and £612 respectively), followed by those of Mixed Ethnicity (14.1%), White people (6.0%), and Any Other Ethnic group (2.1%). All these pay differences are statistically significant.

Only for Black/Black British staff is the gender pay gap in favour of women (2.7%).

Figure 12: Gender pay gap (median basic pay per FTE) for different ethnic groups: English NHS, December 2017
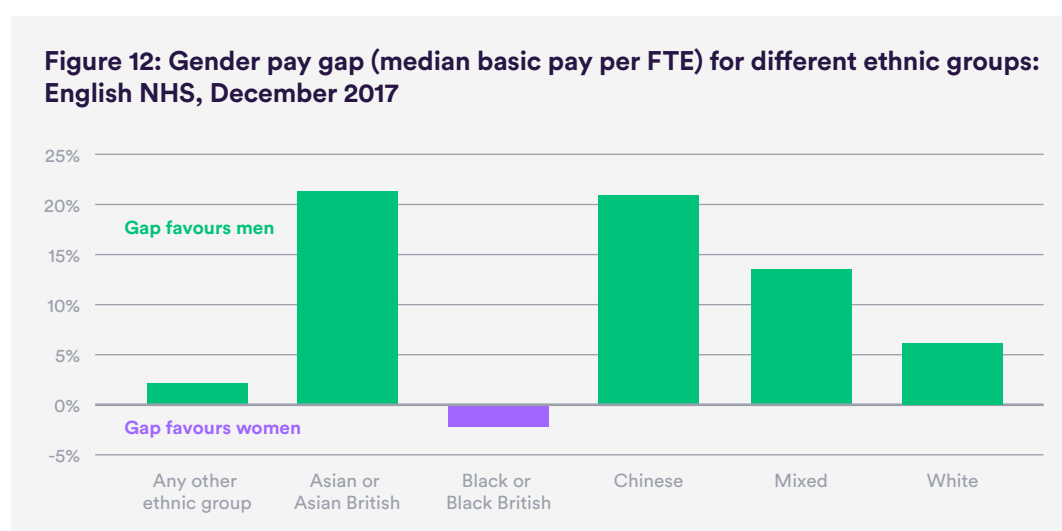
Combined with the other ethnicity pay gap findings that we've revealed, it becomes clear that Chinese and Asian/Asian British men are, on average, among the top earners within the NHS.

However, Black/Black British men are the most disadvantaged group, closely followed by Black/Black British women.
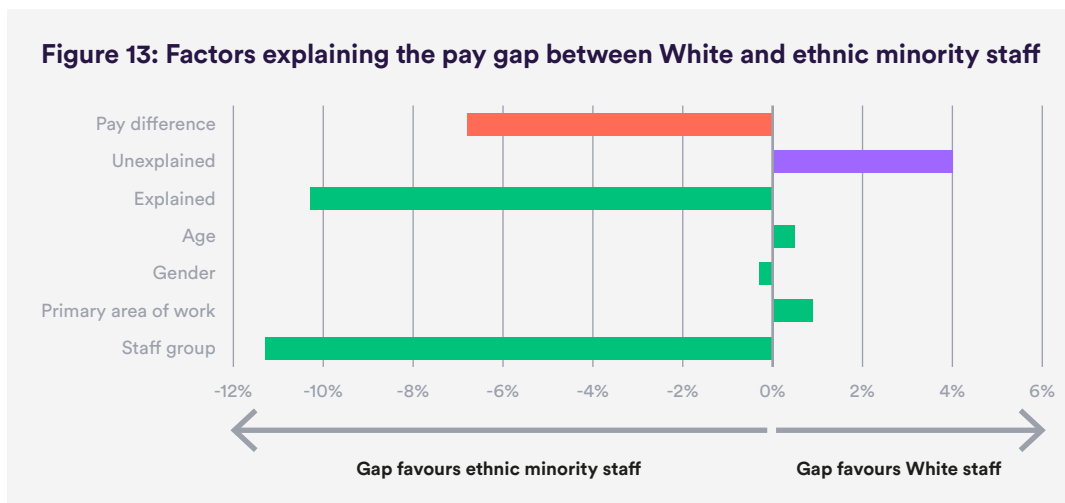
Drivers of the pay gap

Other (statistical) research[14] looking at the causes of pay differences across ethnic groups in the economy as a whole suggest a number of explanations.[15] For example, the concentration of certain groups in particular (high/low paid) occupations, differences in the age profile between groups (groups with younger profiles tending to be paid less), variations in educational attainments (with lower attainments linked to lower pay), first/second and subsequent

immigrant generations (reflecting a range of personal characteristics, from the quality of spoken and written English to educational opportunities).[16,17]

Our analysis of the overall pay gap across all NHS staff in favour of ethnic minority staff also highlights some similar factors. A statistical analysis separating out potential drivers of the pay gap, and based on (somewhat limited) information available from the electronic staff record, reveals that it is the particular ethnic composition of different staff groups in association with the particular pay differences overall between staff groups relative to White staff that is the major explanation for the (average) pay gap of around 7% (see Figure 13).

In addition, gender distributions relative to White staff adds a little to this, while age and primary area of work tends to pull the pay gap back a bit. Nevertheless, there remains much that is unexplained (at least statistically). Details of the statistical methods are in Appendix 2.

Figure 13: Factors explaining the pay gap between White and ethnic minority staff

But as our estimates of the pay gap between White and ethnic minority NHS staff illustrates, there are many different pay gaps depending on the choice of comparison. While across all NHS staff there is a pay gap favouring ethnic minority staff of 5.2%, estimates based on comparisons across different ethnic groups reveals a different picture, with, for example, a pay gap favouring Chinese staff of 34%, but a gap of 5% favouring White staff for Black/Black British staff. And although for the majority of staff paid under Agenda for Change there is effectively no difference in the median basic pay between

White and ethnic minority staff, within all pay bands only the highest favours ethnic minority staff.

Furthermore, the statistical analysis leaves open the question not only of what lies behind the explanation that the overall pay gap is driven by the composition of NHS staff groups, but also whether this particular pay difference is the only difference of personal and policy importance. Does the fact that, for example, Asian/Asian British staff overall enjoy a pay difference of nearly 7% in their favour over White staff mean that policy should focus on reducing that gap? Or does the fact that, when compared *within* occupations, pay gaps are consistently in favour of White staff compared to Asian/Asian British staff suggest a somewhat different gap-closing focus?

What next?

The overall pay gap of 5.2% in favour of ethnic minority NHS staff disguises a much more mixed picture about pay inequalities within the NHS – much of which seems due to the concentration of Asian/Asian British and Chinese staff in relatively highly paid occupations – in particular the consultant staff group. To get the full story, we need to distinguish between different ethnic groups and analyse the pay gap at lower levels, for example, by staff group and within pay bands for Agenda for Change staff.

It is clear overall, however, that while Asian/Asian British, Chinese and Any Other Ethnic minority groups earn more on average (than White staff), the same cannot be said for Black/Black British staff – especially Black/British men, who earn less on average than any other group in the NHS.

Differences in pay – across all staff, within occupational groups or pay bands – will be driven by a number of factors. Some differences may be warranted, arising from free choices of career or the particular age profile of staff at a point in time for example. But others will be unwarranted – the result of direct discrimination, the lack of access to educational opportunities or institutional barriers to promotion for example. And some differences – such as those due to different age profiles between groups – may naturally resolve themselves over time.

More in-depth analysis is needed to investigate warranted and unwarranted pay differences and to decompose and quantify the relative contributions of different reasons leading to the overall pay gap across all staff. Moreover, rather than looking at the effect of gender or ethnicity in isolation, exploring the combined impact of gender and ethnicity on pay and position in the workforce will lead to a deeper understanding of pay inequalities and actions to address these.

Just as the Secretary of State's review (led by Professor Jane Dacre)[18] has explored reasons for the gender pay gap among doctors, our initial analysis of the ethnicity pay gap in the NHS also suggests further investigation is needed.

That analysis suggests a number of strands of work that could be pursued, such as the following:

Update and expand descriptive and decomposition analysis

Our descriptive analysis of the ethnicity pay gap was based on one month's pay data (December 2017) and looked only at basic pay. Updating this work on a regular basis would clarify how stable the results obtained are and start to establish trends. Expanding to other sources of pay (such as overtime payments) would also add a further perspective on the extent of pay differences.

The decomposition analysis – isolating factors which contributed to pay differences – could also be expanded to look at factors associated with pay gaps of different ethnic groups. It may also be possible to include other explanatory variables from the electronic staff record in the statistical analysis such as region and type of trust.

Routine public reporting by NHS organisation of ethnicity pay gaps

Currently, there is a legal requirement for organisations employing over 250 people to routinely report gender pay gaps but no requirement for ethnicity pay gaps.[19] While the Workforce Race Equality Standards have routinely reported on a number of equality indicators for NHS organisations – from ethnic composition of trust boards to bullying and harassment at work– the value of, and approach to, also reporting on the ethnicity pay gap could be explored.[20]

Which pay gaps are important, and which should be the focus of policy action?

As this analysis has shown, there are different comparisons that can be made in calculating pay gaps – between ethnic groups overall, within ethnic groups, within occupations/staff groups – which produce different estimates (and direction) for pay gaps. While all the permutations and combinations of comparisons provide useful insights, some (e.g. comparisons within occupational groups or pay systems) may make more personal and policy sense than others (such as an overall comparison between White and all other ethnic groups combined). However, such choices are not completely amenable to quantitative analysis, rather, requiring some agreement on values and priorities.

The setting up of the NHS Race and Health Observatory provides a valuable new opportunity to explore these (and other issues) and to coordinate and promote the generation of further research on pay differences in the NHS.[21]

Appendix 1: About the data

This analysis is based on a special extract from the NHS Electronic Staff Record (ESR) held by NHS Digital, and covering staff in all but two NHS trusts in England and for one specific month (December 2017). 53,320 records (4.4%) were excluded from ethnicity pay analyses due to unknown ethnic origin.

Pay data included basic and non-basic pay, as well as total earnings. All pay figures are rounded to the nearest £100. The data is provisional and may change. The data is also anonymous, with 98.4% (1,186,823) of records aggregated on the basis of the seven non-pay characteristics included in the data extract (i.e. where staff group, grade, primary area of work, age group, gender, ethnicity and specialty group matched). Aggregated groups vary in size from two to over 6,500.

Median pay figures were calculated on a disaggregated data set, where the pay data was averaged across those staff in each aggregation. This will have affected the median figures estimated. It is not possible with the data supplied by NHS Digital to calculate the size of this difference from the actual median (based on actual staff-level data within each aggregated block). However, given the method of aggregation (on seven non-pay characteristics, including pay grade), it is not thought the difference between the estimated median and the true median is substantial.

Ethnic categorisation

1 White

- – White British
- – White Irish
- – Any Other White Background

2 Black/Black British

- – African
- – Caribbean
- – Any Other Black Background

3 Asian/Asian British

- – Bangladeshi
- – Indian
- – Pakistani
- – Any Other Asian Background

4 Chinese

5 Mixed

- – White & Asian
- – White & Black African
- – White & Black Caribbean
- – Any Other Mixed Background

6 Any Other Ethnic Group

Appendix 2: Blinder-Oaxaca decomposition

The Blinder-Oaxaca decomposition is based on ordinary least squares (OLS) regression modelling of the relationship between pay and factors that determine pay ("predictors"), estimated separately for men and women.[22] It is important to note that the regression is based on the mean; hence the decomposition provides information on the average gender pay gap, and does not take into account different distributions of the gap among people of the same group.

Although the decomposition is based on regression analysis, it differs from the usual approach to regression in important ways. In regression modelling, the analysis takes the outcome of interest (pay, in this case), and seeks to understand what factors impact on pay and by how much, taking all factors and their interactions together. With decomposition analysis, the outcome of interest is the difference between two groups.

The factors that determine pay are modelled separately for men and women. Then the difference between them is estimated and partitioned into two aspects:

1   an explained part, which is the proportion of the pay differences that arises because men and women hold, on average, different job and personal characteristics.

2   a remaining part that cannot be explained by these group differences, which may be gender discrimination, or may result from unobserved factors. This part of the pay gap would exist even if women had, on average, the same characteristics as men.

The standard method is based on the assumption that men receive non-discriminatory pay and that similar characteristics should result in similar

pay. The decomposition then estimates women's mean pay if they had the same financial returns to their characteristics as men, and estimates whether women should earn more or less than men depending on whether they have, on average, lower or higher levels of a given characteristic compared to men.

Application

The regression models included the log of basic pay per FTE as the dependent variable and following explanatory variables: age in five-year bands, staff group, primary area of work and ethnicity.

The distribution of pay was positively skewed – that is, the majority of people were grouped towards the lower end of the pay scale with few people earning higher salaries. Thus, pay was log transformed to help normalise the distribution.

All independent variables were categorical and were included as indicator variables. One factor was omitted from each variable to avoid perfect multi-collinearity; this factor was the base category to which the other groups were compared to. The base categories for each variable were:

- Age: Under 25
- Ethnicity: White
- Primary area of work: Facilities
- Staff group: Hotel, property and estates

Staff with missing data on basic pay, ethnicity or primary area of work were not included in the analyses, resulting in a total of 1,143,507 available records used (94.8%).

The Blinder-Oaxaca decomposition was performed as described and implemented by Jann (2008)[23] using Stata and Jann's 'oaxaca' implementation. The command 'oaxaca' first calculates the regression estimates for men and women and tells us how much of the pay differences are explained and unexplained. Moreover, it is possible to estimate the contribution of individual predictors or sets of predictors.

A twofold decomposition was computed using men's pay structure as the non-discriminatory benchmark and estimating women's mean pay if they had the same financial returns to their characteristics as men. In other words, it is assumed that similar characteristics should result in similar pay and that men's financial returns to these characteristics are non-discriminatory, whereas women are discriminated against.

The corresponding equations are as follows.

The linear regression models for men and women, respectively, can be expressed as:

$$\overline{\ln(pay_M)} = \bar{X}_M \hat{\beta}_M + \varepsilon_M$$

$$\overline{\ln(pay_F)} = \bar{X}_F \hat{\beta}_F + \varepsilon_F$$

where $\overline{\ln(pay)}$ is the estimated mean log of pay, $\bar{X}$ is the mean value for individual predictors (e.g. age or occupation), $\hat{\beta}$ is the vector for coefficients (i.e. the estimated effect of individual predictors on pay), and ε is the random error term.

The gender pay gap, which is the difference in mean log pay for men and women, is equal to

$$\overline{\ln(pay_M)} - \overline{\ln(pay_F)} = \bar{X}_M \hat{\beta}_M - \bar{X}_F \hat{\beta}_F$$

The method then decomposes this difference into an explained and an unexplained component.

The corresponding equation is:

$$\underbrace{\overline{\ln(pay_M)} - \overline{\ln(pay_F)}}_{\text{Gender pay gap}} = \underbrace{(\bar{X}_M - \bar{X}_F)\hat{\beta}_M}_{\substack{\text{Explained} \\ \text{component}}} + \underbrace{\bar{X}_F(\hat{\beta}_M - \hat{\beta}_F)}_{\substack{\text{Unexplained} \\ \text{component}}}$$

where $(\bar{X}_M - \bar{X}_F)$ is the part of the pay difference that is explained by group differences in the distribution of the predictors X ("explained component") and $(\hat{\beta}_M - \hat{\beta}_F)$ is the part of the gap due to differences in the coefficients $\hat{\beta}$ ("unexplained component"). Thereby, men's pay structure is used as the non-discriminatory benchmark, that is, male coefficient estimates $(\hat{\beta}_M)$ are used as weights for the differences in the predictors X and the female distributions of the predictors $(\bar{X}_F)$ are used as weights for the differences in the coefficients β.

Limitations

Because the decomposition is based on ordinary least squares regression, it estimates the pay gap based on mean pay for the average man and the average woman. Hence, it does not take into account that the extent of the gap, and the extent to which it can be explained may be different for different groups along the pay distribution. Those at the lower end of the pay distribution may have different characteristics than those at the top and may also face different barriers and challenges.

Appendix 3: Limitations

Median pay figures were calculated on a disaggregated data set, where the pay data was averaged across those staff in each aggregation. This will have affected the median figures estimated. It is not possible with the data supplied by NHS Digital to calculate the size of this difference from the actual median (based on actual staff-level data within each aggregated block).

However, given the method of aggregation (on seven non-pay characteristics, including pay grade) it is not thought the difference between the estimated median and the true median is substantial.

References

1   www.nuffieldtrust.org.uk/news-item/
what-is-the-ethnicity-pay-gap-among-nhs-doctors

2   www.nuffieldtrust.org.uk/news-item/
the-gender-pay-gap-in-the-english-nhs-how-does-it-vary-by-ethnicity

3   www.nuffieldtrust.org.uk/research/the-gender-pay-gap-in-the-english-nhs-
analysis-of-some-of-the-underlying-causes

4   https://race.bitc.org.uk/issues/racecharter

5   www.ethnicity-facts-figures.service.gov.uk

6   https://assets.publishing.service.gov.uk/government/uploads/system/
uploads/attachment_data/file/746970/BITC_Race_At_Work_Report.pdf

7   https://assets.publishing.service.gov.uk/government/uploads/system/
uploads/attachment_data/file/594336/race-in-workplace-mcgregor-smith-
review.pdf

8   www.gov.uk/government/consultations/ethnicity-pay-reporting

9   www.england.nhs.uk/wp-content/uploads/2017/03/workforce-race-equality-
standard-data-report-2016.pdf

10 Extract from the NHS Electronic Staff Record: Special
data request from NHS Digital https://digital.nhs.uk/
data-and-information/find-data-and-publications/
supplementary-information/2018-supplementary-information-files

11 www.equalityhumanrights.com/sites/default/files/research-report-108-the-
ethnicity-pay-gap.pdf

12 www.nhsemployers.org/-/media/Employers/
Documents/Pay-and-reward/AfC-Handbook-Version-2.
pdf?la=en&hash=71CEB30BF3286D25E65F4F0B649994F79867FAF0

13 www.nuffieldtrust.org.uk/news-item/the-gender-pay-gap-in-the-english-nhs

14 https://journals.sagepub.com/doi/pdf/10.1177/0950017012445095 Bryni M, Guvelli A (2012) Understanding the ethnic pay gap in Britain Work, employment and society 26(4) 574–587

15 www.equalityhumanrights.com/sites/default/files/research-report-108-the-ethnicity-pay-gap.pdf Longhi S, Brynin M (2017) The ethnicity pay gap Equality and Human Rights Commission Research report 108 | Pay gaps research

16 ONS (2020) Ethnicity pay gaps: 2019 www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/ethnicitypaygapsingreatbritain/2019

17 www.bankofengland.co.uk/-/media/boe/files/working-paper/2020/understanding-pay-gaps.pdf Amadxarif Z, Angeli M, Haldance AG, Zemaityte G (2020) Understanding pay gaps. Staff Working Paper No. 877 Bank of England

18 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/944246/Gender_pay_gap_in_medicine_review.pdf

19 www.gov.uk/government/collections/gender-pay-gap-reporting

20 www.england.nhs.uk/wp-content/uploads/2020/01/wres-2019-data-report.pdf

21 www.nhsconfed.org/news/2020/05/race-health-observatory

22 Blinder, A. S. 1973. Wage discimination: Reduced form and structural estimates. Journal of Human Resources 8: 436–455.

   Oaxaca, R. 1973. Male–female wage differentials in urban labor markets. International Economic Review 14: 693–709.

23 Jann, B. (2008). The Blinder-Oaxaca decomposition for linear regression models. The Stata Journal, 8(4): 453—479.

Nuffield Trust is an independent health think tank. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.

nuffieldtrust