

# **Equality, diversity and inclusion in recruitment to Public Health specialty training in the United Kingdom**

A report commissioned by the UK Recruitment Executive Group of Health  
Education England and the Faculty of Public Health

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# Executive Summary

Public Health is a profession that seeks a more equal and more equitable world. The Public Health specialty training scheme is the primary route to becoming a senior Public Health professional in the United Kingdom. Over recent years recruitment into Public Health specialty training has become increasingly competitive. The recruitment process in 2022 received more than 1000 applications for approximately 70 places.

Established in 2009, the current multi-stage recruitment process involves eligibility checking, psychometric assessment and interview. Previous academic analysis has shown the process to be effective in selecting candidates likely to perform well in training.

While care has been taken to design and maintain a recruitment process that attempts to be impartial, Health Education England's Public Health Recruitment Executive Group has been increasingly concerned about the risk of differential attainment – a phenomenon observed in many clinical specialties and at many different levels, where some groups appear systematically disadvantaged in their ability to progress.

After identifying trends suggesting differential attainment from routine monitoring, the Recruitment Executive Group invited Imperial College London to independently analyse four years of application data to determine the extent to which differential attainment may be present and, if present, how it may be mitigated.

The applicant pool for Public Health is highly diverse. There was no evidence to suggest that interviewers were unfairly discriminating against minoritised groups. There was no evidence that first language or socioeconomic status was associated with success. The main point-of-loss for some candidate groups appears to be within the psychometric testing stage. Candidates from ethnic minority backgrounds, those who are older, those from international medical graduate backgrounds and backgrounds other than medicine are materially under-represented by the end of the process. After statistical adjustment these patterns remain, leading to the conclusion that differential attainment is present in the process.

This report presents a range of options for the Recruitment Executive Group in mitigating future differential attainment to enable Public Health to deliver on its mission to create a fairer world.

## Abbreviations

AC	Assessment Centre
BOTM	Background other than medicine
FPH	Faculty of Public Health
HEE	Health Education England
IMG	International Medical Graduate
RANRA	Rust Advanced Numerical Reasoning Assessment - one of the three psychometric tests used as the Assessment Centre
REG	Recruitment Executive Group
SC	Selection Centre
SJT	Situational Judgement Test - one of the three psychometric tests used as the Assessment Centre
WG	Watson Glaser test of critical thinking - one of the three psychometric tests used as the Assessment Centre

## About the authors

Fran Bury (FB) is a Public Health registrar training in London, and a member of the Faculty of Public Health's Equality and Diversity Special Interest Group. Prior to entering Public Health specialty training she worked in the private sector and local government and then ran the operations for a children's charity in North London.

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# Introduction

## Background

Public Health is a medical specialty rooted in identifying and dismantling structural barriers and the inequity they drive. In this way, Public Health as a profession has been outwardly progressive in advocating for greater equality, diversity and inclusion (EDI) over decades. Over recent years racism and injustice have been increasingly in the spotlight: a subject of widespread societal concern and criticism.

Institutions (including the medical and public policy professions as a whole) are being challenged more than ever before to demonstrate how equal, diverse and inclusive they really are. A measure of this is the extent to which their workforce truly reflects the populations they serve.

In 2020, The BMJ published a news item reporting widespread ethnic disparities among applicants deemed appointable for specialty training. Three-quarters of White colleagues were deemed to be appointable in 2018 across specialties, compared to 53% of those from ethnic minority backgrounds (Iacobucci, 2020). In this article, it was suggested Public Health recruitment resulted in the lowest proportion of ethnic minority applicants being deemed appointable: 15% compared to over 50% among the larger specialty training programmes.

The same report also suggested that Public Health exhibited the greatest ethnicity gap: with 36% of White candidates deemed appointable, meaning White applicants were 2.4x more likely to be deemed appointable than ethnic minority candidates. It has not been possible to determine the raw data source for this analysis. And while drawing precise conclusions from these findings is fraught with complexity, the analysis poses a valid question: is there differential attainment in Public Health specialty recruitment?

## Context

### Governance and accountability

The UK Public Health Recruitment Executive Group (REG) is a committee of Health Education England that reports to the Medical and Dental Recruitment and Selection (MDRS) Board. The REG is responsible for overseeing the recruitment process for Public Health across the four nations of the United Kingdom. The REG is led by two Consultant-level Co-Chairs: a regional Head of School and a Training Programme Director. Its membership includes representatives of Health Education East Midlands (the lead organisation for Public Health recruitment across the four nations), the UK Faculty of Public Health, Consultant leads for the components of the recruitment process and specialty registrar representatives.

## Recruitment cycle and monitoring

For those outside the specialty, it is important to note that Public Health specialty training differs from most other medical specialties. The Consultant workforce in Public Health comprises a mixture of staff from medical backgrounds as well as *backgrounds other than medicine* (BOTM). Today, this is mirrored in the eligibility for training as Public Health specialty training attracts applicants from medical as well as BOTM backgrounds, with differing eligibility criteria applied. As such, any recruitment process cannot assume a clinical background or indeed assess on the basis of presumed clinical competence as is the case in most other specialities (including those who rely on the Multi-Specialty Recruitment Assessment, [MSRA](#)).

The Public Health specialty recruitment cycle for candidates begins in November of each year, with a three-stage recruitment process culminating the following March, when offers are made for prospective registrars to start their training five months later in August. For the REG, the recruitment cycle is an all-year programme with substantial planning and logistics work beginning almost as soon as the preceding cycle has completed. For the purposes of this report, recruitment cycles are referred to by their August intake year, meaning that the cycle that began in 2019 leading to appointments made for 2020, is referred to as the 2020 cycle.

A more detailed description of the recruitment process is included later in this report. However, the quality assurance of the recruitment cycle has been reported every year in a late Spring-time wash-up meeting since the current multi-stage process was introduced in 2009. Demographic and equalities monitoring has been subject to scrutiny throughout that period. The current recruitment design was successfully validated against postgraduate progression in terms of annual appraisal and postgraduate examinations (Pashayan et al., 2016). However no similar process beyond routine monitoring had been devised in relation to differential attainment. This routine monitoring has demonstrated an association of non-White ethnicity and older age with lower overall performance although single-year cohorts have until now precluded more robust analyses. While a number of explanatory hypotheses have been proposed, there was insufficient analytical capacity to test these properly. Efforts have been made over the period to prevent differential attainment: unconscious bias training and a number of other safeguards have been implemented following concerns that the interview panels might be unduly favouring certain applicants.

## Differential attainment

The UK General Medical Council defines *differential attainment* as the gap between attainment levels of different groups of doctors, which exists in multiple contexts including recruitment, examination, progression (General Medical Council, 2022). The GMC defines differential attainment to be inherently unfair.

Commonly, the term *discrimination*, implies a process that is unfair. However, in one sense discrimination is a technical process of differentiating one group from another and ultimately the

goal of all selection processes. While it is clear that discrimination relating to a protected characteristic (within the Equality Act 2010, and associated Public Sector Equality Duty) is absolutely unacceptable, the extent to which some elements of professional values and behaviour are culturally underpinned can present challenges when trying to determine what outputs of a selection process are intended (versus unintended), and acceptable (versus unacceptable).

For example, professional attitudes differ around the world in relation to punctuality. Therefore, it is possible to debate the fairness of evaluating an applicant's attitude towards punctuality through a situational judgment test.<sup>a</sup> Likewise, in a professional environment where communication capability is important, the extent to which English language proficiency (or lack thereof) is intentionally or acceptably assessed can be questioned.

Differential attainment in medical training has been observed across many clinical specialties, although research has traditionally focused on postgraduate examinations and progression (McManus & Wakeford, 2014; Patterson et al., 2018; Tiffin & Paton, 2021). Much of the evidence in medicine has focused on three groups: white UK medical graduates, non-White UK medical graduates and international medical graduates (IMG) with clear trends showing poorer progression statistics for the latter two groups when compared to the former.

Yet evidence is increasingly showing that differential attainment in respect of ethnicity occurs early, even during undergraduate training (Gupta et al., 2021). While beliefs persist that such disadvantage is attributable to biased examiners and selectors (Woolf, 2020), differential attainment is observed on machine marked assessments too (Woolf et al., 2013).

Comparatively less has been reported on recruitment processes in UK medical specialty recruitment.

### Terms of reference and reporting

It was in the context described so far, that the REG commissioned Imperial College London in late 2021 to independently:

1. Investigate the extent to which differential attainment may be present in the recruitment process for Public Health specialty training; and
2. Make recommendations to mitigate any adverse impacts identified.

By this time, the REG had already introduced enhanced EDI monitoring for the 2021 cycle recognising the need for better data to understand the problem. This report's senior author made recommendations for that data collection process in his position as a member of REG and Technical Co-Lead for the Assessment Centre process in 2020.

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<sup>a</sup> Situational judgment tests are used widely in the selection of applicants in postgraduate medical recruitment in the United Kingdom. Clinical assessments commonly involve providing a candidate with a scenario after which they are invited to rank or select actions / responses (Koczwara et al., 2012).

This technical report and accompanying peer-reviewed publications form the outputs of this commission.

Neither Health Education England (and its committees) nor the Faculty of Public Health had any role in the analysis, reporting, recommendations or decision to submit findings presented in this report or associated peer-reviewed publications. Owing to the timelines involved in peer-review, the REG were given access to the findings ahead of public release.

This report is the work of the named authors who independently analysed the data and present their recommendations.



# Recruitment into Public Health Specialty Training

## The Public Health Specialty Training recruitment process

Since the introduction of the current multi-stage process in 2009, Public Health recruitment has extended from an England and Wales system, to incorporate Scotland, Northern Ireland, Defence and Dental Public Health. As part of the preparation for the 2009 launch, detailed work was undertaken to define the job description and person specification of the Specialty Registrar. The intent was that the newly designed recruitment process would enable HEE to select the strongest candidates into specialty training.

Candidates applying for specialty training in Public Health are assessed at three points to determine whether they meet the person specification<sup>b</sup> and are appointable:

- **Eligibility checking** - candidates are required to demonstrate they meet the eligibility criteria as set out in the person specification:
  - Medical route: have completed a primary medical qualification, be eligible for full registration with, and hold a current licence to practise from, the UK General Medical Council (GMC), have a minimum of two years of postgraduate medical experience (equivalent to the UK Foundation Programme) and have evidence of having achieved foundation competencies in the last three years.
  - BOTM route: have completed an undergraduate degree (1st or 2:1 or equivalent) OR a higher certified degree (e.g. MSc, PhD), have at least 48 months of full time work experience at the time of application, of which at least 24 months must be in an area relevant to population health practice. The 24 months should be at Band 6 or above of Agenda for Change or equivalent, and a minimum of three months at Band 6 or above should have been in the last three years.

All candidates who meet these criteria are then invited to the Assessment Centre

- **Assessment Centre** - candidates sit three psychometric tests over a period of approximately three hours:
  - [Watson Glaser II Critical Thinking Appraisal \(WGCTA II\)](#): a test of critical thinking widely used across the world in recruitment to professional roles.
  - [Rust Advanced Numerical Reasoning Assessment \(RANRA\)](#): a test of numerical reasoning developed specifically for the UK market
  - [Situational Judgement Test \(SJT\)](#): developed specifically for the Public Health Specialty Training programme, this tests four characteristics from the person specification (managing others and team involvement; professional integrity;

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<sup>b</sup> Person specification for 2023 recruitment round can be found at <https://specialtytraining.hee.nhs.uk/portals/1/Content/Person%20Specifications/Public%20Health/PUBLIC%20HEALTH%20-%20ST1%202023.pdf>

coping with pressure; organisation and planning).

In order to pass the Assessment Centre, candidates must achieve a standardised pass score on all three tests.

For the 2022 cycle, to be invited to the Selection Centre, candidates must rank in the top 216 following Assessment Centre (or, for candidates eligible via the Disability Confident Scheme, pass all three tests). The number of places at Selection Centre is broadly stable around 216 both prior to and since the pandemic, but a reserve list is also sometimes called upon if candidates at or above 216 withdraw. Rank is calculated based on an overall Assessment Centre score, with Watson Glaser and RANRA weighted 25% each, and the SJT weighted at 50%.

- **Selection Centre** - until 2020 this was an in-person event held in Loughborough, and assessed candidates via a written exercise, a group exercise and six mini-interviews taking approximately three hours. Since 2021, due to the COVID-19 pandemic, the Selection Centre-equivalent has been held online, and the components reduced to a single multi-question interview taking place over approximately 40 minutes.

At the end of the Selection Centre process, candidates are deemed appointable if they pass a threshold score normally considered as 60% of the marks available in the Selection Centre.

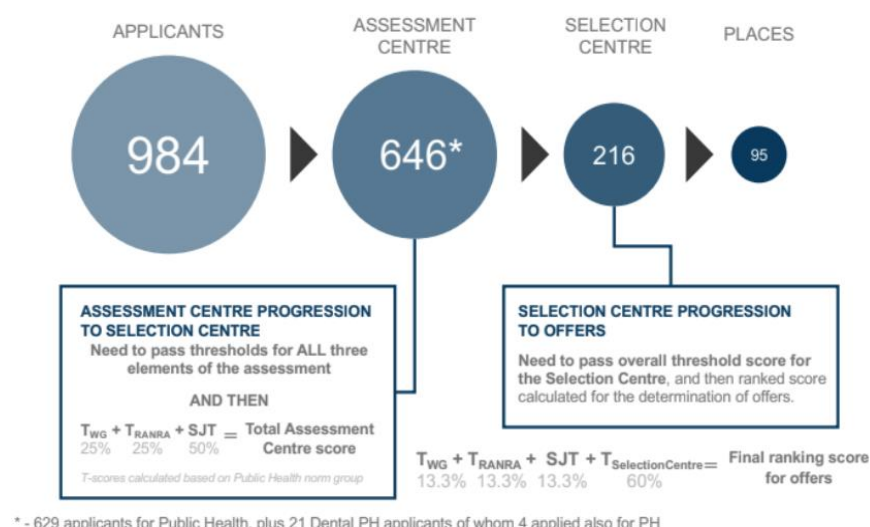
Those deemed appointable at Selection Centre are again ranked for a final recruitment score comprising 60% of their score coming from Selection Centre, and 13.3% from each of the Assessment Centre tests.

Posts are then offered to candidates, reflecting their location preferences as stated in their application, starting with the top-ranked candidate and working down the list until all posts have been filled.

The high-level process is summarised visually with approximate numbers (Figure 1).

As the number of applicants has grown (now exceeding 1000 candidates in the 2022 cycle), the system has increasingly acted as a funnel with scrutiny increasing as candidates progress. Accordingly, candidates are only deemed appointable after successfully completing all three of these recruitment stages. It is likely that this bottleneck (constraining the numerator) and a very large number of applicants applying but removed at earlier stages of the process (contributing to the denominator) is part of the reason for the much lower percentages of candidates deemed appointable (from both White and minority ethnic groups) cited in The BMJ analysis.

**Figure 1. Funnel overview of the Public Health Specialty Training recruitment process, extract from monitoring report (2021).**



Existing actions undertaken to reduce the risk of differential attainment in the process

Since its establishment, the REG has monitored the recruitment process and attempted to identify groups which may be under-represented through the process.

In the first years after the establishment of the national recruitment process, the REG commissioned an academic to assess the predictive validity of the new process, assessing scores in recruitment against measures of progress through training. This analysis showed that higher scores in the various parts of the recruitment process were associated with higher odds of passing professional exams in training, and making satisfactory progress through training (assessed by Annual Review of Competence Progression (ARCP) outcomes) (Pashayan et al., 2016). Related (and unpublished) analysis by the private company who co-designed the 2009 process suggested that the process demonstrated lower differential attainment than the regional processes it replaced (Work Psychology Group, 2021).

There are various ways in which the REG, in designing and running the recruitment process, has attempted to reduce the risk of differential attainment (Table 1).

**Table 1. Existing measures to reduce the risk of differential attainment in the recruitment process**

<b>Stage</b>	<b>Measures</b>
<b>Application process</b>	Public Health training is open to candidates from a wide range of professional backgrounds, potentially increasing the diversity of the pool of applicants. Since 2020 and inclusion on the UK Shortage Occupation List, the recruitment into specialty training has been open to those requiring visa sponsorship to work in the UK.
<b>Eligibility checking</b>	Eligibility checkers are blinded to candidates' name, age and sex. However, they can identify country of primary qualification, location of work experience and may be able to deduce age from other information provided. All eligibility checkers are trained to ensure consistency in who is deemed eligible. All applications are judged by two people independently, and a process exists for resolving disagreements when these arise.
<b>Assessment Centre</b>	Tests are the same for all candidates, regardless of professional background. When introduced, all three tests were tested against existing measures (prior to the introduction of a single national recruitment process) and found to result in lower levels of differential attainment. Situational Judgement Tests are developed through a rigorous process involving subject matter experts, and tested and piloted before being used.
<b>Selection Centre</b>	Interviewers are blinded to applicant's background. Interviewers are required to have undertaken Equality and Diversity training and Unconscious Bias training. As far as possible, a diverse pool of interviewers is recruited. Each part of the process is marked by two or three assessors. Prior to the pandemic at least 10 people assessed each candidate. Since the switch to interview format, two people assessed each candidate in 2021 and three people in 2022.
<b>Process overall</b>	The recruitment process combines scores from a range of different types of test, covering a range of competencies, to create a balanced overall score.

In 2020, ahead of the 2021 recruitment cycle, two additional voluntary questions were incorporated into the initial application process designed to facilitate subsequent analysis for possible residual confounders. The questions were designed to approximate language and socioeconomic status.

The two questions posed were:

**1. What is your main language?**

*Sourced from UK Census 2011 (Office for National Statistics, 2009)*

**2. What is the highest level of qualifications achieved by either of your parent(s) or guardian(s) by the time you were 18?**

*Sourced from Cabinet Office paper on measuring proxies of socioeconomic status (HM Government, 2018)*

Furthermore, we also reviewed all medical applicants to identify whether they were UK trained or non-UK trained (international medical graduate, IMG).

It is important to note that some medically qualified persons apply through the BOTM route due to them not being able to fulfil the medical eligibility criteria – whether to do with recent clinical competence or because they are not registered or eligible for a licence to practise in the UK. This number is likely to be small, but the exact number is unknown. These candidates are categorised in the following analyses as BOTM applicants.

## Methods

Data extracts were provided to the analytical team by Health Education East Midlands. These were partially redacted to fulfil data protection requirements on data minimisation. Four datasets were provided, including applicant-level demographic and performance data across the four years from 2018 to 2021 inclusive. Data were stored securely in-line with local information governance requirements, and analyses were undertaken using STATA 17.0 for Mac.

The complexity of the recruitment process and potentially multiple (dependent variable) endpoints necessitated a hypothesis-driven approach. Accordingly, and *ex ante*, a pre-specified descriptive analysis and the following four hypotheses were selected following engagement with key stakeholders:

H1. Lower success rates among non-White candidates reflected poorer performance by International Medical Graduates

H2. Lower success rates among non-White candidates reflected a smaller proportion of non-White candidates having English as a first language than White candidates

H3. Lower success rates among non-White and older candidates are confounded or mediated by professional background

H4. Older candidates may have applied multiple times in the past and been unsuccessful - *could not be tested as data on the number of attempts made by candidates is not collected.*

The recruitment cycle interviews (termed 'Selection Centre') completed just as the pandemic manifested in 2020. In-person interviews were not possible in 2021, meaning that the method of selection changed. Accordingly, comparisons between the process up to 2020 and in 2021 and beyond are not directly comparable. The 2021 recruitment cycle also collected the enhanced equalities data. Therefore, two analytical cohorts were designated: the first covering the three years 2018-2020 and the second, a single year snapshot of 2021.

The extracts were cleaned, collated and compiled into two cohorts for the analytical processes.

# Findings

## Preface

This report is underpinned by the peer-reviewed scientific papers that accompany it. Full methods statements are included in those papers.

Please note that there are a very large number of potential endpoints that can be used to characterise progression in this process.

## Cohort sizes

There were 2430 applications to specialty training in the three years 2018 to 2020 inclusive (Table 2). For the second cohort (2021, involving the enhanced equalities monitoring), there were 984 applicants (Table 3).

**Table 2. Descriptive breakdown of cohort by group, 2018-2020.**

	Application year 2018		Application year 2019		Application year 2020		Total applications made N
	n	(%)	n	(%)	n	(%)	
Total [%]	732	[30.1]	769	[31.7]	929	[38.2]	2430
Sex [%]							
- Male	238	(32.5)	232	(30.2)	296	(31.9)	766
- Female	478	(65.3)	507	(65.9)	605	(65.1)	1590
- Not disclosed	16	(2.2)	30	(3.9)	28	(3.0)	74
Age group [%]							
- ≤29	229	(31.3)	218	(28.3)	261	(28.1)	708
- 30-34	211	(28.8)	207	(26.9)	275	(28.5)	693
- 35-39	159	(21.7)	171	(22.2)	184	(21.2)	514
- 40-44	73	(10.0)	84	(10.9)	101	(10.6)	258
- 45+	60	(8.2)	70	(9.1)	77	(8.5)	207
- Not disclosed	-		19	(2.5)	31	(2.1)	50
Ethnicity [%]							
- White British	346	(47.3)	390	(50.7)	455	(49.0)	1191
- White Other	84	(11.5)	66	(8.6)	81	(8.7)	231
- Black	84	(11.5)	80	(11.7)	112	(12.1)	286
- Asian	119	(16.3)	113	(14.7)	155	(16.7)	387
- Mixed	37	(5.1)	25	(3.3)	43	(4.6)	105
- Chinese	8	(1.1)	16	(2.1)	13	(1.4)	37
- Other	11	(1.5)	19	(2.5)	18	(1.9)	48
- Not disclosed	43	(5.9)	50	(6.5)	52	(5.6)	145
Professional background [%]							
- Medical	328	(44.8)	332	(43.2)	378	(40.7)	1392
- BOTM	404	(55.2)	437	(56.8)	551	(59.3)	1038
- Not disclosed	-						

**Table 3. Descriptive breakdown of cohort by group, 2021.**

Application year 2021		
	n	(%)
Total	984	
Sex [%]		
- Male	315	(32.0)
- Female	641	(65.1)
- Not disclosed	28	(2.8)
Age group [%]		
- ≤29	306	(31.1)
- 30-34	269	(27.3)
- 35-39	165	(16.8)
- 40-44	115	(11.7)
- 45+	77	(7.8)
- Not disclosed	52	(5.3)
Ethnicity [%]		
- White British	438	(44.5)
- White Other	90	(9.1)
- Black	123	(12.5)
- Asian	170	(17.3)
- Mixed	57	(5.8)
- Chinese	13	(1.3)
- Other	38	(3.9)
- Not disclosed	55	(5.6)
Professional background [%]		
- UK Medical	290	(29.5)
- IMG	155	(15.8)
- BOTM	539	(54.8)
- Not disclosed	-	
Highest parental qualification		
- No degree	315	(32.0)
- Degree	591	(60.1)
- Not disclosed	78	(7.9)
Main language		
- English	672	(68.3)
- Not English	72	(7.3)
- Not disclosed	240	(24.4)



## Analysis 1: Overall success rates by demographic group (2021)

To begin the analysis, we start high-level and examine the process from end-to-end. In this analysis we use the term success rate:<sup>c</sup>

$$\text{success rate} = \frac{[\text{candidates offered a post}]}{[\text{total candidates applied}] - [\text{candidates who withdrew their application}]}$$

In this analysis, we present the data broken down by demographic and professional characteristics (Table 4). In 2021, the overall success rate was 15%

Graphs showing success rates for each group in 2018-2021 and 2021 are reported later (Appendix A).

**Analysis 1 identified suggests differential attainment, as the following groups were less likely to be successful in recruitment to Public Health specialty training:**

- **Older candidates**
- **Non-white candidates, especially those from Black, Asian and Chinese backgrounds**
- **International medical graduates and those from a background other than medicine**
- **Candidates who do not speak English as a first language**

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<sup>c</sup> While mathematically not technically a 'rate', the term success rate is used as it appropriately describes the measurement intended.

**Table 4. Success rates by demographic group (2021 cohort)**

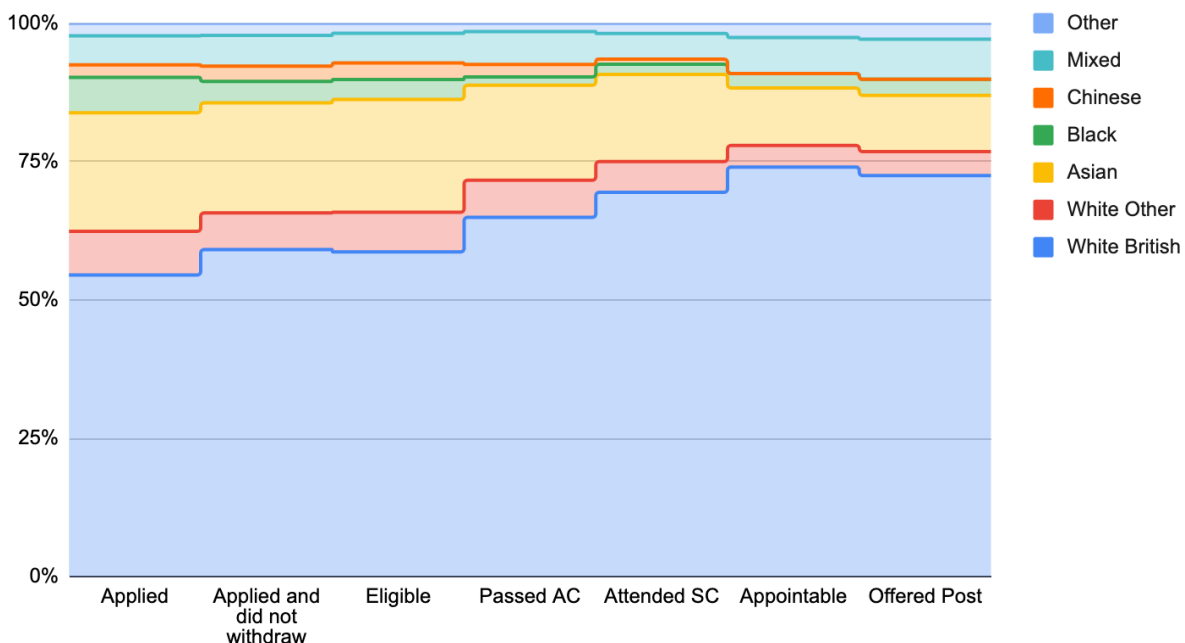
<b>Demographic characteristic</b>	<b>Pattern seen in recruitment in 2021</b>	<b>Was there evidence of differential attainment in 2021?</b>
<b>Sex</b>	64% of successful candidates are female	<b>No.</b> Male and female candidates are equally likely to be successful: <ul style="list-style-type: none"> <li>- Male: 17%</li> <li>- Female: 14%</li> </ul> <p>(<math>p=0.29</math>, no statistically significant difference)</p>
<b>Age</b>	83% of successful candidates are under 35 years old	<b>Yes. Success rate declines with increasing age</b> <ul style="list-style-type: none"> <li>- Under 30: 25%</li> <li>- 30-34: 17%</li> <li>- 35-39: 10%</li> <li>- 40-44: 3%</li> <li>- Over 45: 5%</li> </ul>
<b>Ethnicity</b>	79% of successful candidates are White	<b>Yes. Success rates varies by ethnicity</b> <ul style="list-style-type: none"> <li>- White British: 22%</li> <li>- White Other: 16%</li> <li>- Asian: 6%</li> <li>- Black: 4%</li> <li>- Chinese: 9%</li> <li>- Mixed: 21%</li> <li>- Other: 13%</li> </ul> <p>Overall, the “Mixed” category performs similarly to “White British”</p>
<b>Professional background</b>	60% of successful candidates are UK Medical graduates, 3% are IMG and 36% BOTM	<b>Yes. Success rates vary by professional background</b> <ul style="list-style-type: none"> <li>- UK Medical graduates: 36%</li> <li>- IMG: 4%</li> <li>- BOTM: 9%</li> </ul>
<b>Primary language</b>	96% of successful candidates reported English as their primary language (NB. data were not available for 24% of candidates)	<b>Yes. Success rates vary by first language</b> <ul style="list-style-type: none"> <li>- English: 17%</li> <li>- Not English: 8%</li> </ul>
<b>Highest educational qualification of either parent (SES proxy)</b>	68% of successful candidates had one or more parent with a degree level qualification	<b>No.</b> Success rates did not vary by parental education level <ul style="list-style-type: none"> <li>- No qualifications: 15%</li> <li>- Qualifications below degree level: 14%</li> <li>- Degree level or above: 16%</li> </ul>

## Analysis 2. Staged progression “pipeline”

On the back of findings that differential attainment appears to be present, we took a stage-by-stage approach to identify at which point(s) the differential attainment may be arising.

A pipeline visualisation is used to present the demographic proportions at each point, running from left to right. An example of this using ethnic groups for UK medical graduates only is presented (Figure 2). Note that the numbers in each column fall from left to right, as some candidates fail to progress to the next stage of recruitment.

**Figure 2. Recruitment “pipeline” for UK Medical Graduates, by ethnicity (2021 cohort)**



This initial analysis suggests that differential attainment by ethnic group appears to be operating even within the sub-cohort of UK medical graduates, with White British candidates forming an increasing share of the candidates left in the recruitment process at each stage except being deemed eligible and being offered a post. Concurrently there is a notable reduction in the share of Black candidates at the Assessment Centre, and in Asian candidates being deemed appointable.

Full pipeline diagrams can be found in Appendix B. These cover the 2021 cohort only, but similar patterns are observed for the 2018-2020 cohort, for those characteristics for which data are available.

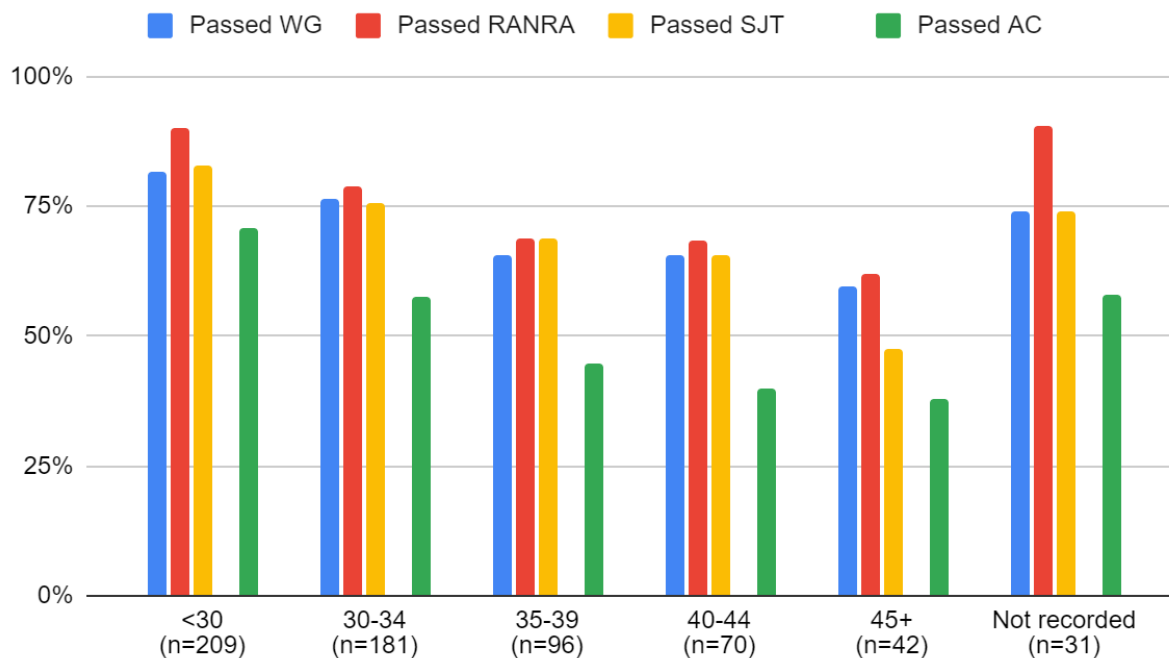
**Analysis 2 identified that different groups are affected at different stages of the process, but that the greatest impact is seen at the Assessment Centre stage. The largest variation in likelihood to progress by age, ethnicity and professional background occurs at this stage.**

### Analysis 3. Assessment Centre performance

Having identified that the most significant differential attainment by age, ethnicity and professional background is observed in the Assessment Centre, we were interested to explore which constituent tests, or combination of tests, might be driving the differential attainment.

As with success rates, performance on each psychometric test, and overall pass rates, were examined by demographic group (Figure 3).

**Figure 3. Assessment Centre performance by age (2021 cohort)**



The full analysis can be found in Appendix C.

**Analysis 3 determined that similar patterns of performance were observed across all three psychometric tests. Groups which tend to have higher pass rates on one test also tend to have higher pass rates on the other two. Black and Asian candidates, older candidates, those who do not speak English as a first language and those from IMG and BOTM backgrounds have lower overall success rates at the Assessment Centre.**

## Analysis 4. Multivariable analysis for assessment and selection

Multivariable logistic regression was undertaken for each of the cohorts against two endpoints (dependent variables, see below). Odds ratios (OR) and adjusted odds ratios (AOR) with accompanying 95% confidence intervals (CI) were calculated for each demographic group at two key stages of the process:

- Passing the Assessment Centre.  
*Note: that this is about passing the AC, not about ranking in the top 216 candidates to progress.*
- Being deemed appointable at the Selection Centre.  
*Note: that this is about passing the SC, not about ranking in the top 70+ places to secure an offer of a post.*

For the purposes of presenting these data, where  $p < 0.05$  the OR is presented, while findings that did not achieve statistical significance ( $\alpha = 0.05$ ) are described as “NS” or not significant.

We found few differences between the OR and AOR calculated, suggesting that each of the demographic characteristic variables is influencing success rates independently, and there is comparatively little confounding (at least among the variables included) taking place (Table 5).

**Table 5. Summary results from multivariable analysis<sup>d</sup>**

Demographic characteristic	Passing the Assessment Centre		Deemed appointable at Selection Centre	
	2018-2020	2021	2018-2020	2021
Sex	NS	NS	NS	NS
Age	With increasing age, reduced odds of success	With increasing age, reduced odds of success	Candidates 45+ reduced odds of success	NS
Ethnicity	Black OR=0.10 Asian OR=0.24	Black OR=0.17 Asian OR=0.36 Chinese OR=0.27	White Other OR=0.56	Asian OR=0.2
Background	BOTM OR=0.38	IMG OR=0.06 BOTM OR=0.2	NS	NS
First language	N/A	NS	N/A	NS
Parental education	N/A	NS	N/A	NS

Statistical note: The OR can be interpreted as  $[1.00 - (OR)]$  = reduction in probability of achieving the specified endpoint ]. Therefore for an OR of 0.10, it means the group had a 90% lower probability of passing AC or being deemed appointable at SC.

**Analysis 4 identified statistically significantly lower probability of passing the Assessment Centre for the following groups:**

- Older candidates, with each older age band having lower likelihood of success than the last
- Black and Asian candidates
- Chinese candidates (2021 analysis only) – *note small numbers*
- International medical graduates and candidates from a background other than medicine

**The analysis also identified statistically significantly lower likelihood of being deemed appointable at Selection Centre for the following groups:**

- Candidates aged over 45 (2018-2020 analysis)
- White Other candidates (2018-2020 analysis)
- Asian candidates (2021 analysis) – *note small numbers*

<sup>d</sup> NS = No statistically significant differences found; N/A = this data was not collected in this period.

Reported odds ratios are unadjusted.

Reference groups were:

- Age: under 30
- Ethnicity: White British
- Background: UK Medical Graduates
- First language: English

## Summary of findings from Public Health recruitment data

The analyses outlined above were used to test the three hypotheses (H) formulated at the start of our research:

*H1. Lower success rates among non-White candidates reflect poorer performance by International Medical Graduates*

- **International Medical Graduates have the lowest success rate of the three professional groups.**
- **However, within the UK Medical Graduate group, which has the highest overall success rate, non-White candidates have lower success rates**

*H2. Lower success rates among non-White candidates reflect a smaller proportion of non-White candidates having English as a first language than White candidates*

- **Candidates who speak a language other than English as their first language have lower success rates than those who speak English as their first language**
- **However, within the group of candidates who speak English as a first language, non-White candidates have lower success rates**

*H3. Lower success rates among non-White and older candidates are confounded or mediated by professional background*

- **For example, UK Medical Graduates tend to be younger than BOTM candidates, and tend to have higher success rates, so professional background could be confounding the relationship between age and success.**
- **However, analysis within each professional group shows the same patterns of lower success rates for non-White candidates and candidates aged over 35.**

None of the hypotheses can either fully or collectively explain the differential attainment observed in these analyses.

**Put together, the analyses provide evidence that some demographic groups, especially older candidates, Black and Asian candidates and candidates who are not UK medical graduates, are less likely to be successful in recruitment to Public Health specialty training.**

**This attainment gap is most marked at the Assessment Centre stage of the process, and persists in multivariable analysis, suggesting that age, ethnicity and professional background each are independently associated with a candidate's likelihood of success.**

## Discussion

The analyses enable us to describe patterns of differential attainment. However, the findings cannot explain the drivers of such patterns. To try to understand this, and what options might be practicable and effective, we undertook a rapid literature review, with particular focus on psychometric testing.

We focused on psychometric testing because:

- The most marked differential attainment in the Public Health specialty training recruitment process is apparent the Assessment Centre, both in proportional and numerical terms.
- More intuitive explanations for differential attainment, such as bias by interviewers, do not appear to explain the patterns observed.

The published literature reveals similar patterns of attainment by age and ethnicity to those observed in Public Health specialty training recruitment. The Assessment Centre is provided by Pearson Vue, a commercial testing and certification provider operating internationally. Pearson Vue's own literature on the Watson Glaser Critical Thinking Assessment reports that language, age and especially ethnicity have been previously associated with differential group performance on the test, but argues that following up the cohorts, there was no difference between groups when predicting progression in-role (Pearson, 2020). Similar patterns are observed in other cognitive ability tests (Hough et al., 2001). In associated technical documentation, it is recommended that local implementation organisers validate attainment in their own cohorts (Watson & Glaser, 2010).

Equivalent evaluation evidence for the RANRA test was not available, although suggestion is made in the technical guidance that local implementors give due to consideration for candidates with English as a second language, as the RANRA test is predicated on proficient English (Rust, 2006).

The Situational Judgment Test for Public Health is a bespoke assessment with development led by Work Psychology Group who validate items co-developed with Public Health specialists on a rolling basis. Annual reporting is provided back to the REG which includes analysis of group performance. There has been a consistent pattern of differential performance by ethnicity and professional group in those reports.

In summary, the evidence from the literature available on cognitive testing suggests that ethnic and age differences are at best not unusual and, at worst, commonplace (Hough et al., 2001). The causes of differential attainment in psychometric testing are unknown, although a number of hypotheses have been proposed:

- Differential **access to networks** of people who can support preparation for the recruitment process
- Differential **familiarity with psychometric testing** generally, and the specific tests used



(Hinton, 2014)

- **Test taker perception** (candidates perform better on tests which they perceive to have higher criterion validity) (Hough et al., 2001)
- Test taker concern or **stereotype threat** (poorer performance by candidates who belong to groups who are not expected to perform well on tests) (Steele, 1997)
- **Structural racism** as experienced throughout the life-course (in education and more broadly)

Of interest, tests focusing on other domains have been shown to have different patterns of differential attainment. For example, tests of emotional intelligence, interpersonal skills and performance on real job tasks, have been found to show less differential attainment or even favour minoritised groups and older candidates (Hough et al., 2001).

A number of approaches have been taken in other recruitment settings to try to overcome historic differential attainment:

- The Royal College of Midwives has developed their programme [Turning the Tide](#) which offers mentoring and interview preparation for non-White midwives to support their career progression
- A commercial recruitment specialising in improving workplace diversity, Rare Recruitment has developed a process for [contextualising the academic achievements of graduates from less traditional backgrounds](#), enabling them to access elite graduate schemes, for example in law firms.
- Rare Recruitment also offers [internships and coaching](#) to support non-White candidates to prepare for the selection processes of specific employers, including Civil Service Fast Stream. Such schemes produce substantial improvements in the likelihood of candidates being successful (Rare Recruitment, 2012)

While this is the largest and most comprehensive analysis to date on these data, there are inherent limitations to this analytical process. Even with the aggregation of multiple years' data, the findings are limited by comparatively small group sizes for minoritised groups. The analytical mitigation was to aggregate ethnic groups which consequently risks masking underlying differences between more precise ethnic groups.

The enhanced equalities monitoring questions were introduced in the 2021 recruitment cycle (and have been retained for 2022 onwards). However, we note no positive findings for either of the two new questions. Like the other negative findings, the possibility of a type II error cannot be discounted (where the absence of a finding does not mean the absence of an effect).

The risks of misclassification have already been highlighted. The findings of differential attainment for IMG are stark and consistent with patterns observed elsewhere. It is likely that there are IMGs and possibly UK trained doctors misclassified as BOTM and future data collection should focus on capturing this variable more accurately.

Finally, because the numbers reduce as the process advances, the statistical power to identify issues at the Selection Centre stage is less than that at earlier stages of the process. While we are confident that differential attainment appears more attributable to the Assessment Centre than the Selection Centre, we also cannot rule out differential attainment occurring at the Selection Centre. The implication of this is that attention should continue on ensuring an EDI-informed approach among assessors.

## Options for action

These analyses point to the need for action to be taken to ensure the Public Health specialty training recruitment process is fair for all applicants, and to ensure that Public Health as a discipline does not lose excellent candidates because of the design of the selection process.

Possible options for action should be considered in the context of the following points:

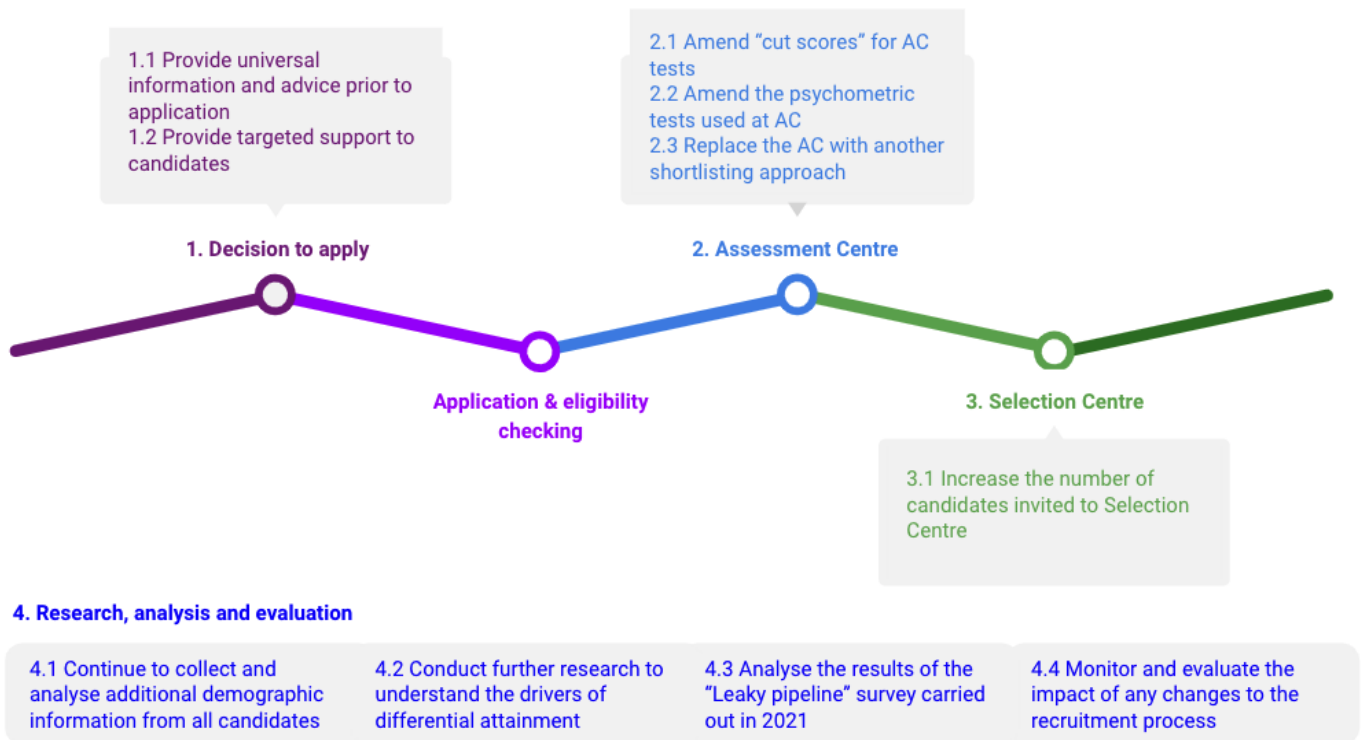
- **Pragmatism** is vital. It is not sufficient to criticise an existing process if no better process can be selected to replace it.
- The recruitment process involves hundreds of applicants each year meaning that solutions need to be **scalable**.
- That the specialty recruitment process is part of a **wider system** and does not exist in isolation; while the REG has the power to determine the process end-to-end through the recruitment, we must recognise that options may need to be considered pre-application and across a range of organisations and institutions and outside the HEE's sphere of control.

There are two further complications:

- Continued evidential uncertainty about the root causes of the differential attainment.
- The absence of ready-made solutions which could be adopted by the REG.

In light of this uncertainty, a range of options are presented chronologically (Figure 4) for consideration (Table 6). Not all may be practical or desirable, and the risks associated with different options are not explicitly explored. However, in the context of this report's analyses, doing nothing is unlikely to remain an option.

**Figure 4. Stages of the recruitment process and areas for action**



**Table 6. Options appraisal**

Areas for action	Options for action include...
<b>1. The decision to apply</b>	
1.1 Provide universal information and advice prior to application	<ul style="list-style-type: none"> <li>▪ Advertise and operate a national webinar prior to application deadline, or for all those who have applied, to explain the recruitment process and answer any questions.</li> <li>▪ Provide all candidates with more information about the Assessment Centre tests, including sample questions and model answers with rationale.</li> <li>▪ Review where training posts are advertised to increase awareness of the recruitment opportunity</li> </ul>
1.2 Provide targeted support to candidates	<ul style="list-style-type: none"> <li>▪ Develop a package of support focused specifically on the recruitment process available to members of groups known to be disadvantaged by the current process. For example, Black and Asian candidates who were deemed eligible but not appointable in Year 1, could be offered additional support before re-applying in Year 2.</li> <li>▪ Provide general coaching and / or mentoring support available to members of groups known to be disadvantaged by the current process.</li> </ul>
<b>2. Assessment Centre</b>	
2.1 Amend “cut scores” for Assessment Centre tests	<ul style="list-style-type: none"> <li>▪ Lower the cut scores (pass marks) for Assessment Centre tests would increase the number of candidates eligible to attend the Selection Centre (Pearson, 2020). However, this is likely to have a limited impact on differential attainment unless the number of Selection Centre slots were increased, since there are already more candidates who pass the Assessment Centre than can be invited to the Selection Centre, so only those with the highest ranking proceed.<sup>e</sup></li> <li>▪ Implement different cut scores for different groups, to reflect established differences in performance such as those identified in Pearson’s assessment of the Watson Glaser test.</li> </ul>
2.2 Amend, replace or eliminate the psychometric tests used at Assessment Centre	<ul style="list-style-type: none"> <li>▪ Identify psychometric tests that measure the same domains (critical thinking, numerical reasoning and situational judgement) but show lower differential attainment than those currently used, and either piloting them alongside existing tests or replacing existing tests</li> <li>▪ Include psychometric tests that measure different domains that have been shown to have different patterns of differential attainment compared with those currently used e.g. tests of social and emotional intelligence</li> <li>▪ Identify tests used by other organisations e.g. Civil Service Fast Stream which has moved away from using generic psychometric</li> </ul>

<sup>e</sup> Sensitivity analysis was undertaken to assess the potential impact of changes to both cut scores and the weighting of the different psychometric tests, and none of the changes trialled were found to significantly reduce differential attainment by ethnicity, although there were some improvements for older candidates and those from a background other than medicine. This appeared to be a by-product of the mismatch between candidates passing AC and the limited 216 places at SC.

	tests and is likely to be monitoring the effect of this change on differential attainment. It may be that these organisations are willing to share the tests with HEE for use for Public Health recruitment.
2.3 Replace the Assessment Centre with another shortlisting approach	<ul style="list-style-type: none"> <li>Identify alternative ways to reduce the number of candidates to the 216 who can be accommodated at the Selection Centre. It should be noted that other approaches, such as scoring CVs, would be fundamentally different from the existing approach, which aims to measure only potential to benefit from training, and not prior experience in Public Health.</li> </ul>
<b>3. Selection Centre</b>	
3.1 Increase the number of candidates invited to Selection Centre	<ul style="list-style-type: none"> <li>Differential attainment is lower at the Selection Centre than the Assessment Centre, suggesting that allowing more candidates to reach the Selection Centre stage could reduce differential attainment. However, there would be cost and logistical implications for any increase in Selection Centre places, and at present Assessment Centre scores are still used in the final ranking of candidates, so could continue to disadvantage some groups of candidates.</li> </ul>
<b>4. Research, analysis and evaluation</b>	
4.1 Continue to collect and analyse additional demographic information from all candidates	<ul style="list-style-type: none"> <li>Continue to collect information on parental education and main language, and ensure data on disability (which is already collected) is available for future analysis of differential attainment</li> <li>Improve monitoring to capture those with medical qualifications applying through the Background Other Than Medicine route, to determine whether these candidates have a distinct profile alongside the other professional background groups, and country of Primary Medical Qualification for any candidates with medical degrees.</li> </ul>
4.2 Conduct further research to understand the drivers of differential attainment	<ul style="list-style-type: none"> <li>Seek input from subject matter experts to identify opportunities to reduce differential attainment in the recruitment process. This might include other recruiters e.g. Civil Service Fast Stream, or experts within recruitment consultancies</li> </ul>
4.3 Analyse the results of the “Leaky pipeline” survey carried out in 2021	<ul style="list-style-type: none"> <li>The “Leaky pipeline” survey of current Registrars was undertaken by the Faculty of Public Health’s Equality and Diversity Special Interest Group in 2021 but has not yet been analysed. It focused on experiences of applying for Specialty Training and may include insights which could be used to inform the development of the recruitment process to reduce differential attainment</li> </ul>
4.4 Monitor and evaluate the impact of any changes to the recruitment process	<ul style="list-style-type: none"> <li>Consider piloting new approaches before adopting them permanently</li> <li>Ensure resources are available to monitor the impact of any changes to the recruitment process</li> </ul>

## Recommendations for the Recruitment Executive Group

This report has identified that specific groups appear to be disadvantaged by the current recruitment process. The reasons for this differential attainment are complex and not fully understood. Any changes implemented need to recognise this uncertainty. Any such changes also need to recognise that the current system has many features designed to reduce the risk of differential attainment, and has been demonstrated to be effective at predicting success in key milestones during training.

We recommend action should be taken in three key areas, in parallel:

### Recommendation 1

Undertake a comprehensive review of the job analysis, person specification and selection process

We recommend that an external organisation with expertise in recruitment processes and equality and diversity considerations should be commissioned to review each of the key components of the recruitment process. This should involve refreshing the job analysis (last reviewed in 2009), updating the person specification accordingly, and then reviewing the selection process.

We do not expect that updating the job analysis alone will have an impact on differential attainment. However, this is a necessary foundation upon which any new or modified selection process should be built. This work is vital in being able to determine what questions may be deemed acceptable in the Situational Judgment Test component in particular.

Given the findings of the review, particular care should be given to designing a process which reduces the likelihood of differential attainment by ethnicity or age.

### Recommendation 2

Initiate shorter-term actions to mitigate the risks associated with the current process

While the more comprehensive review work is being undertaken, there are a number of shorter-term actions that can be pursued to mitigate the risks associated with the current process. These should include the following options (outlined in more detail in Table 5):

- Provide universal information and advice around the point of application: whether prior to applications closing, following the point of application, or again at various points within the process.
- Explore opportunities to provide targeted support to candidates from disadvantaged groups. This may require piloting and evaluating how such candidates can be

identified and subsequently supported. It may be that the Faculty of Public Health is best placed to co-ordinate this.

### Recommendation 3

Continue monitoring, evaluation and research to better understand, support and refine the process

Any options pursued by the REG should be accompanied by continuing monitoring and evaluation to assess their impact on differential attainment, as well as identifying any unintended consequences. This evaluation should be built in from the start, and should include the following options:

- Continue to collect and analyse additional demographic information from all candidates
- Conduct further research to understand the drivers of differential attainment
- Analyse the results of the “Leaky pipeline” survey carried out in 2021
- Monitor and evaluate the impact of any changes to the recruitment process

## Conclusion

Our findings provide strong evidence that differential attainment is present in the current Public Health specialty training recruitment process. While we acknowledge the strengths of the system in providing a scalable, multi-point assessment of candidate potential which correlates well with future performance, we must recognise its deficiencies.

The existing process appears to select strong candidates. Yet at the same time, it appears to disadvantage candidates from several groups: those from minority backgrounds, those who are older, and those from international medical graduate backgrounds and backgrounds other than medicine.

Future improvements must take care to avoid losing the positives in attempts to mitigate the negatives. However, action is needed to create a more level playing field and ensure that the Public Health specialty can deliver on its commitment to a fairer and more equal future.



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# Appendices

## Appendix A. Detailed results from Analysis 1: Success rates

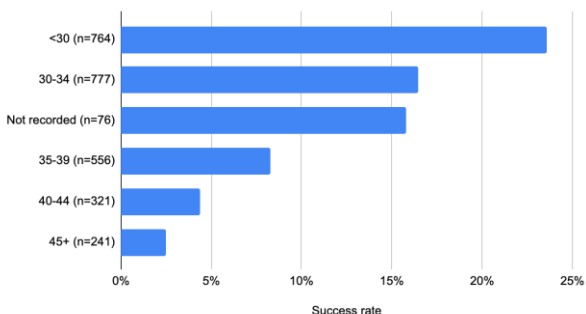
Success rates were calculated as follows:

$$\text{success rate} = \frac{[\text{candidates offered a post}]}{[\text{total candidates applied}] - [\text{candidates who withdrew their application}]}$$

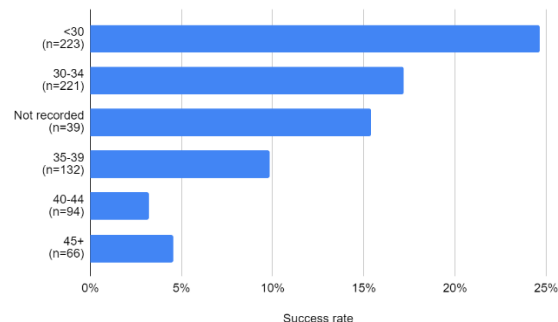
In 2021, 984 candidates applied, 775 did not withdraw and 118 were offered posts, giving an overall success rate of 15%.

### Success rates by age

Success rate by age (UK Public Health Recruitment, 2018-2021)

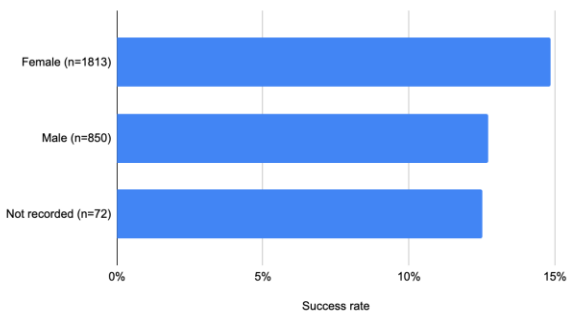


Success rate by age (UK Public Health Recruitment, 2021)

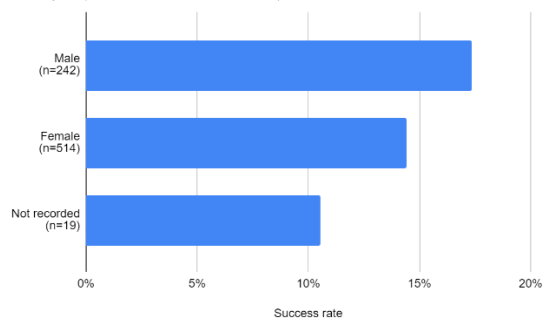


### Success rates by sex

Success rate by sex (UK Public Health Recruitment, 2018-2021)

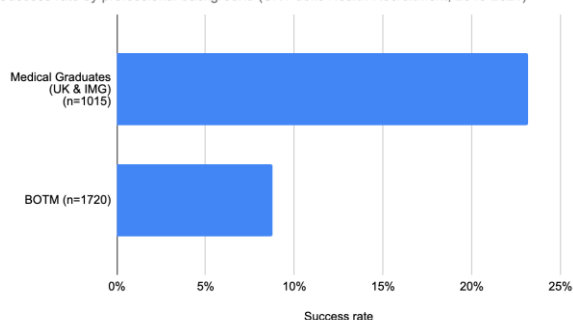


Success rate by sex (UK Public Health Recruitment, 2021)

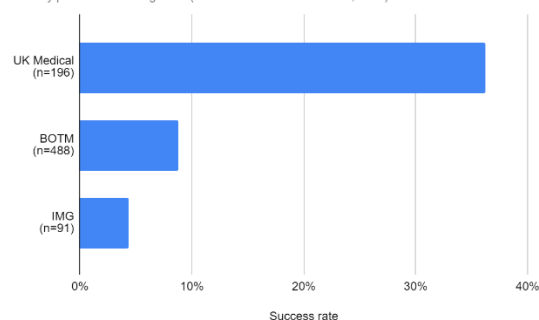


## Success rates by professional background

Success rate by professional background (UK Public Health Recruitment, 2018-2021)

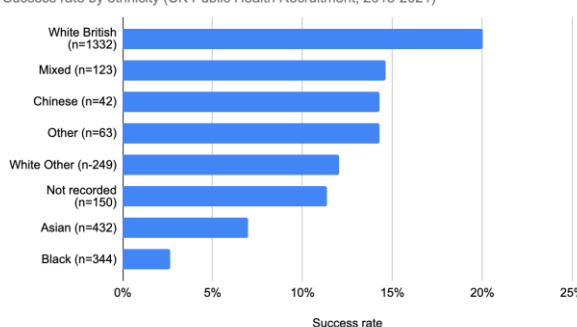


Success rate by professional background (UK Public Health Recruitment, 2021)

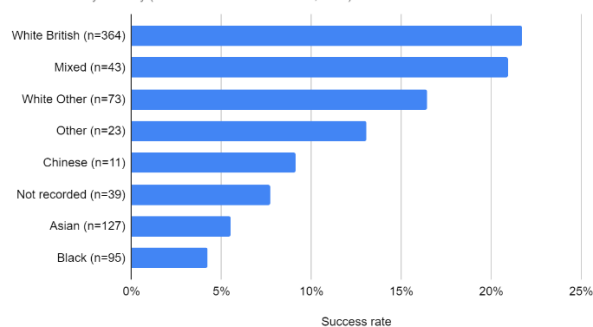


## Success rates by ethnicity

Success rate by ethnicity (UK Public Health Recruitment, 2018-2021)

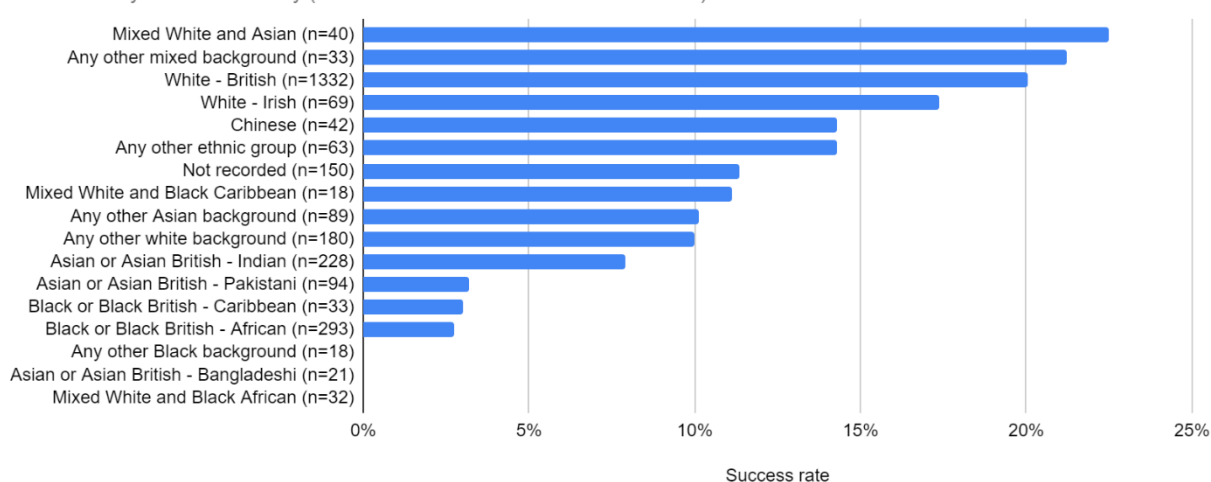


Success rate by ethnicity (UK Public Health Recruitment, 2021)

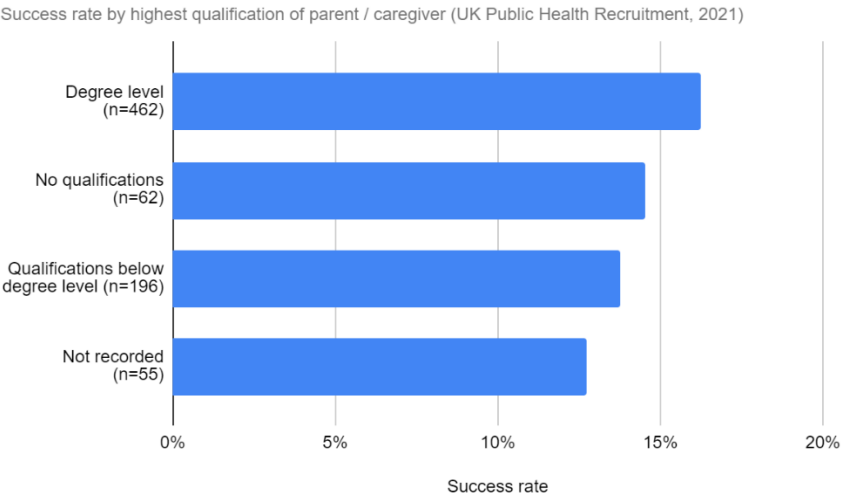


All four cohorts were analysed together by reported ethnicity, rather than the condensed categories used elsewhere in this report. Between 2018 and 2021, no candidates from Bangladeshi (n=21), Mixed White and Black African (n=32) or Any Other Black (n=18) backgrounds were successful in public health specialty training recruitment:

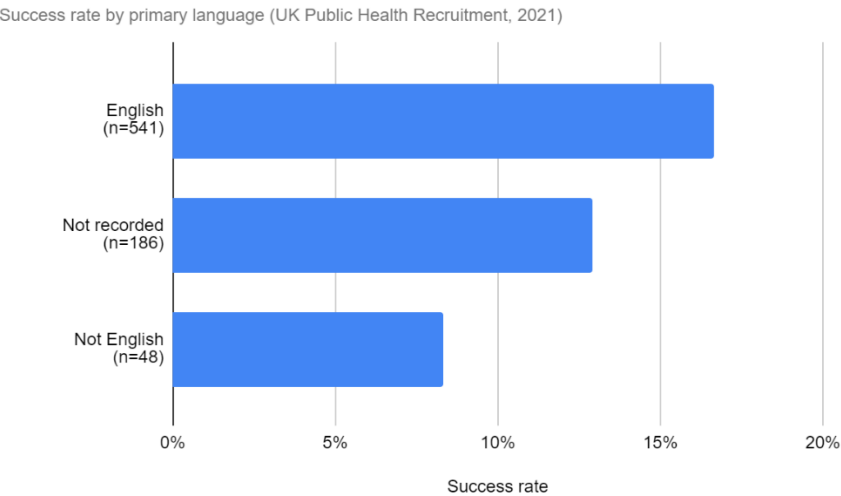
Success rate by detailed ethnicity (UK Public Health Recruitment 2018-2021)



Success rates by parental education (proxy for socio-economic status) (2021 only)

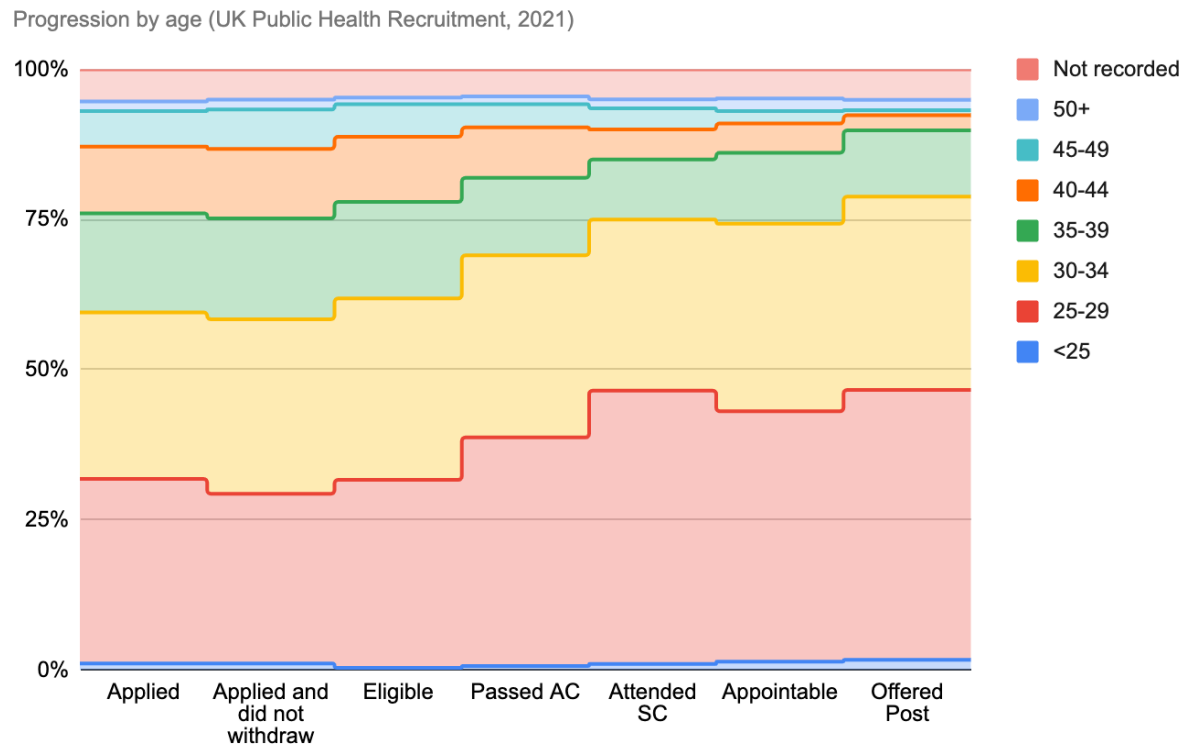


Success rates by first language (2021 only)

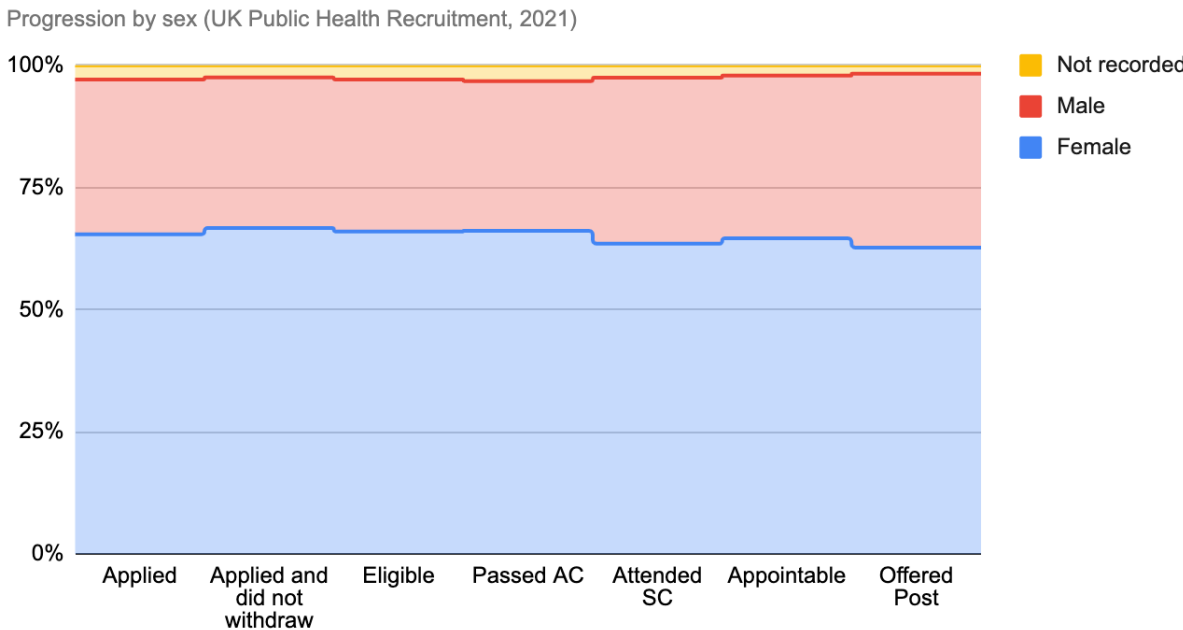


Appendix B. Detailed results from Analysis 2: Staged progression pipeline

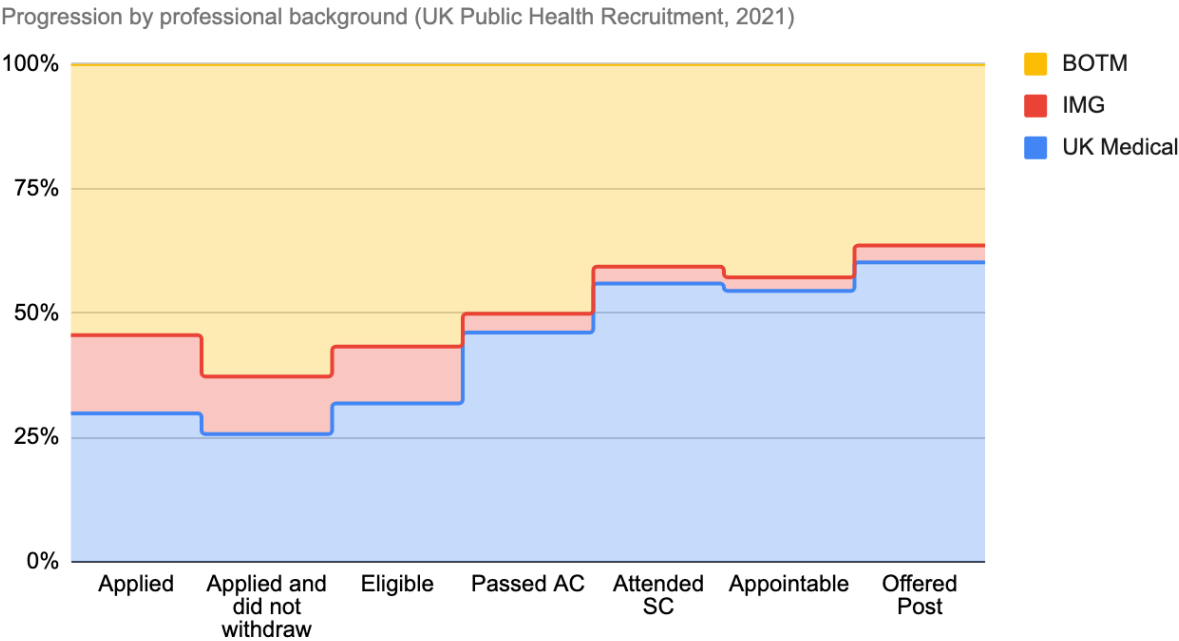
Pipeline diagram by age



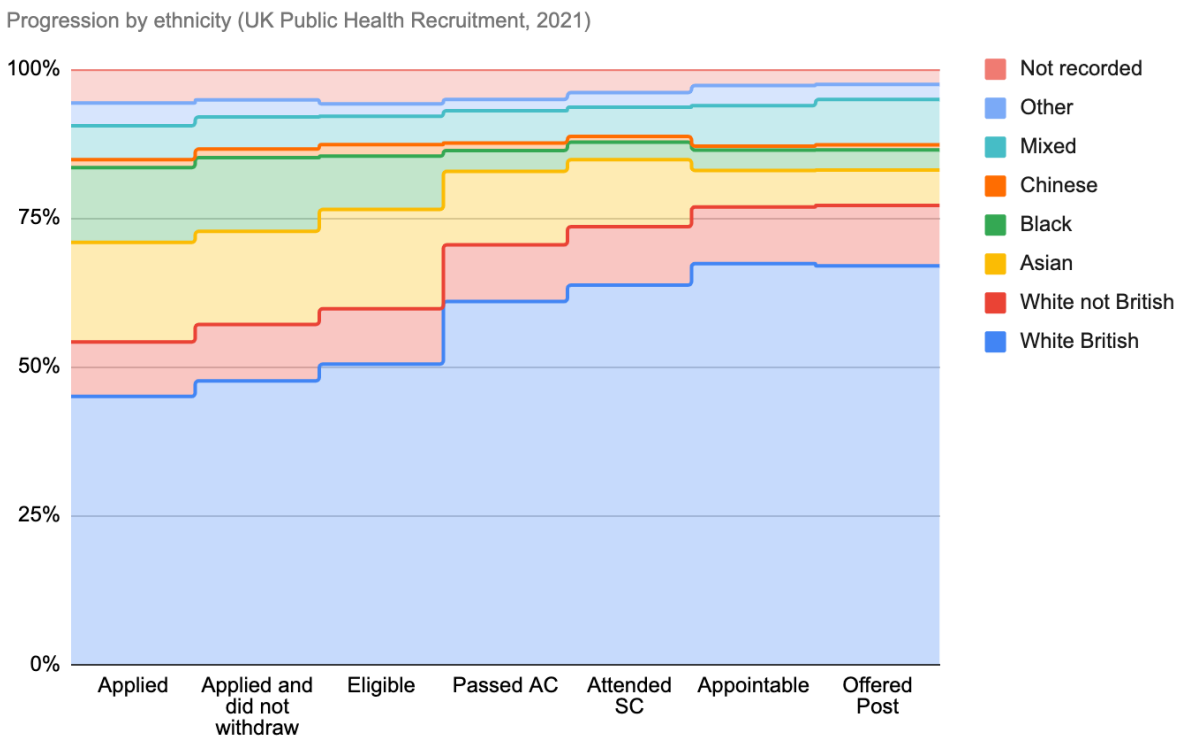
Pipeline diagram by sex



Pipeline diagram by professional background

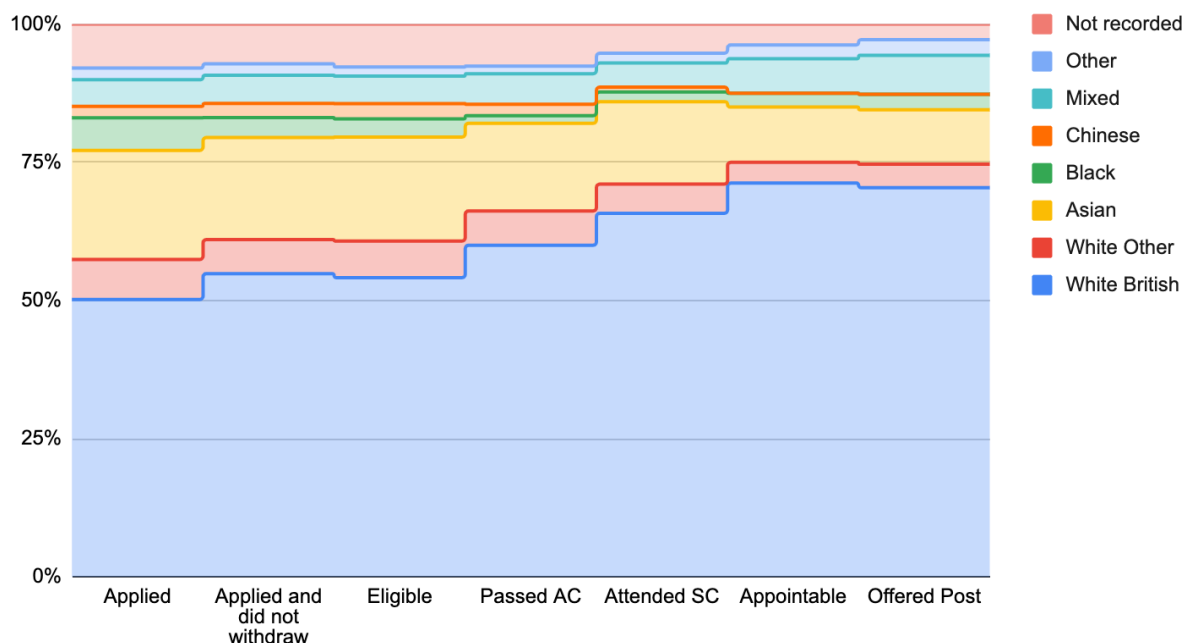


Pipeline diagram by ethnicity

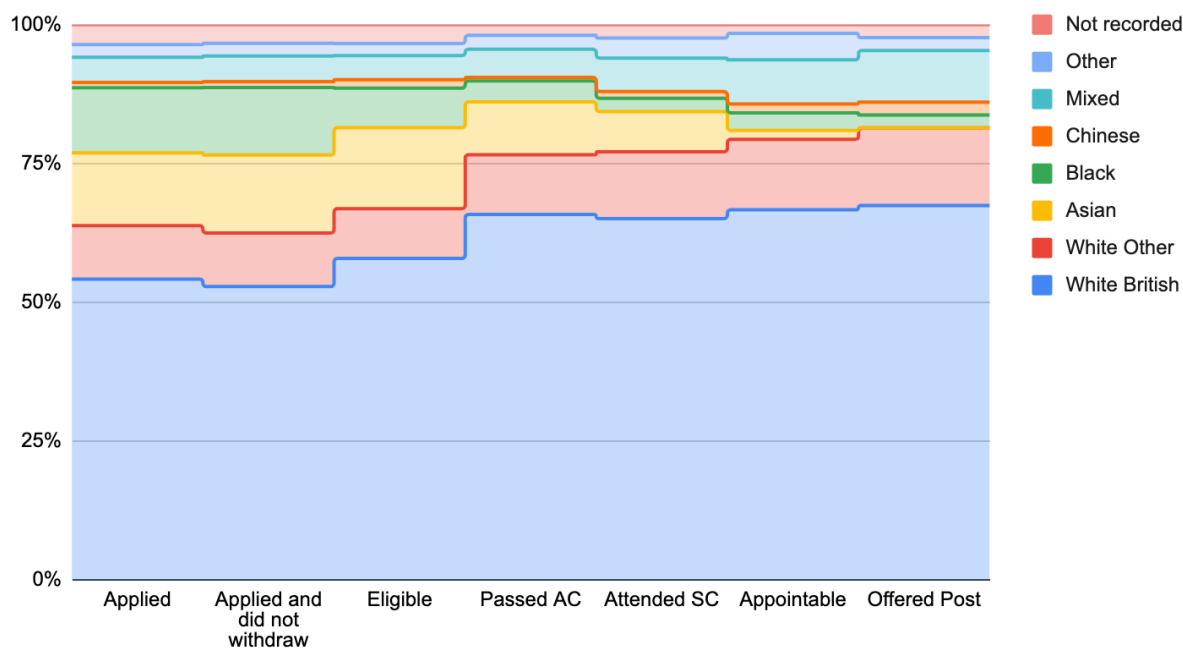


## Pipeline diagrams by ethnicity and professional background

Progression by ethnicity - UK Medical graduates only (UK Public Health Recruitment, 2021)



Progression by ethnicity - BOTM only (UK Public Health Recruitment, 2021)

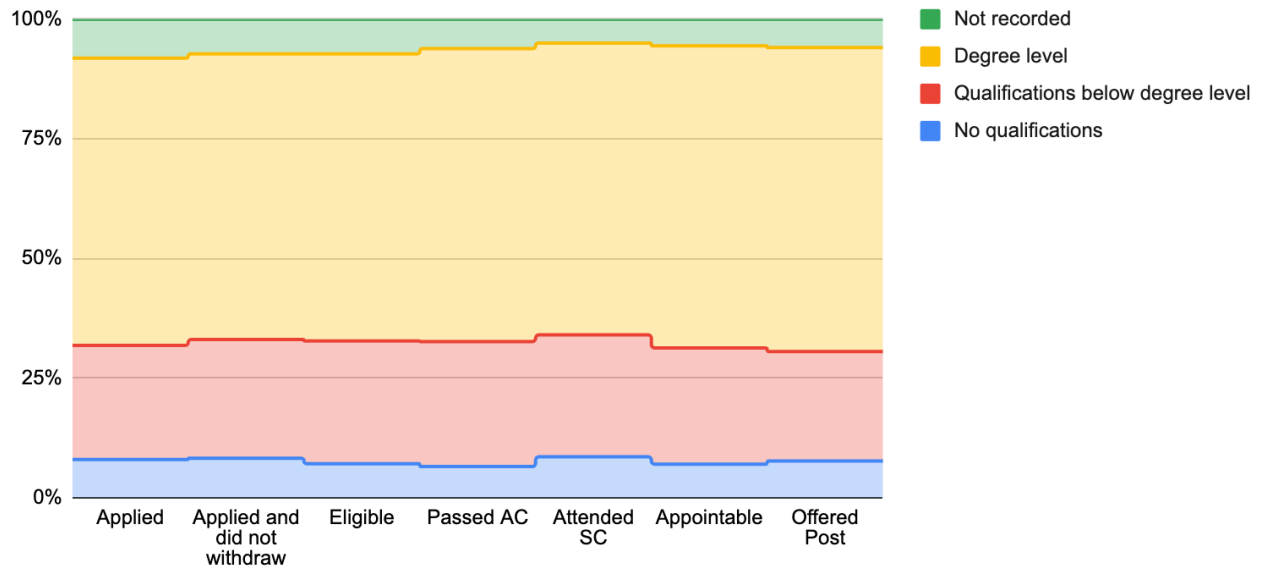


NB the diagram for International Medical Graduates is not presented here as the number of successful candidates is too small to be able to draw meaningful conclusions, and the small numbers mean candidates would be potentially identifiable.



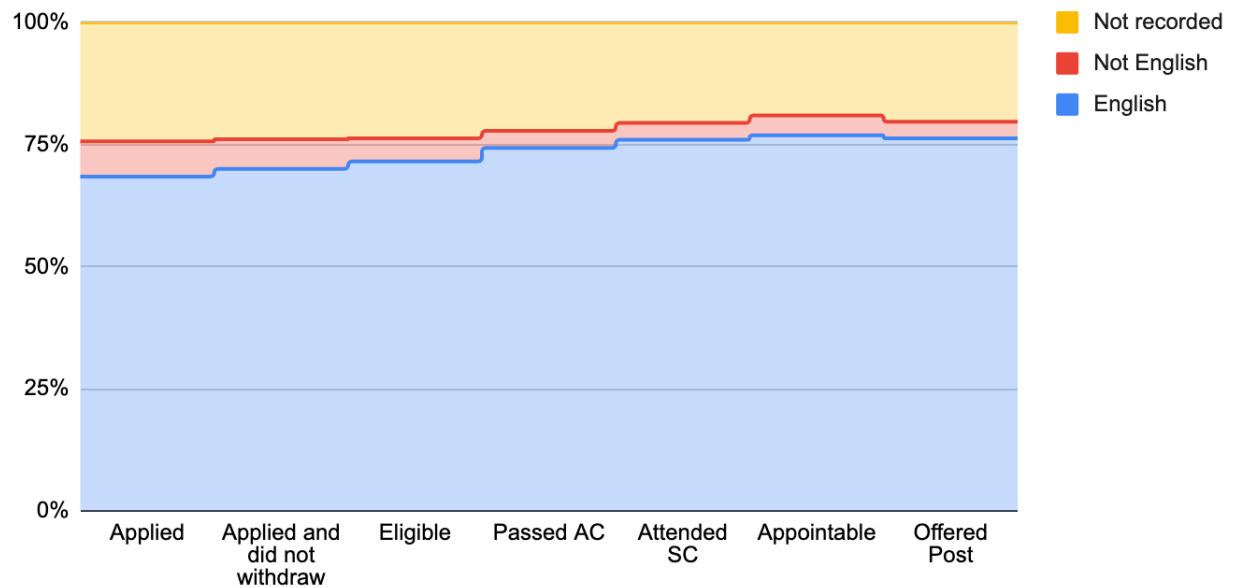
## Pipeline diagram by parental education

Progression by parental education (UK Public Health Recruitment, 2021)

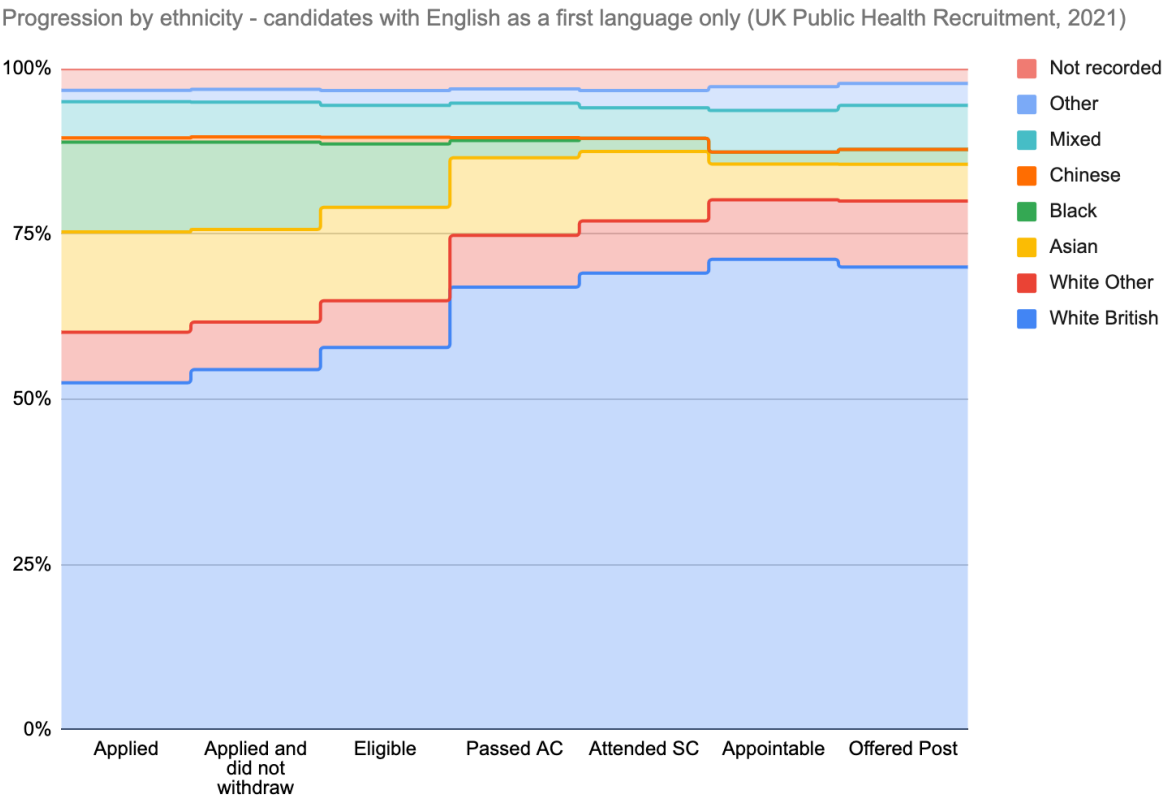


## Pipeline diagram by first language

Progression by first language (UK Public Health Recruitment, 2021)



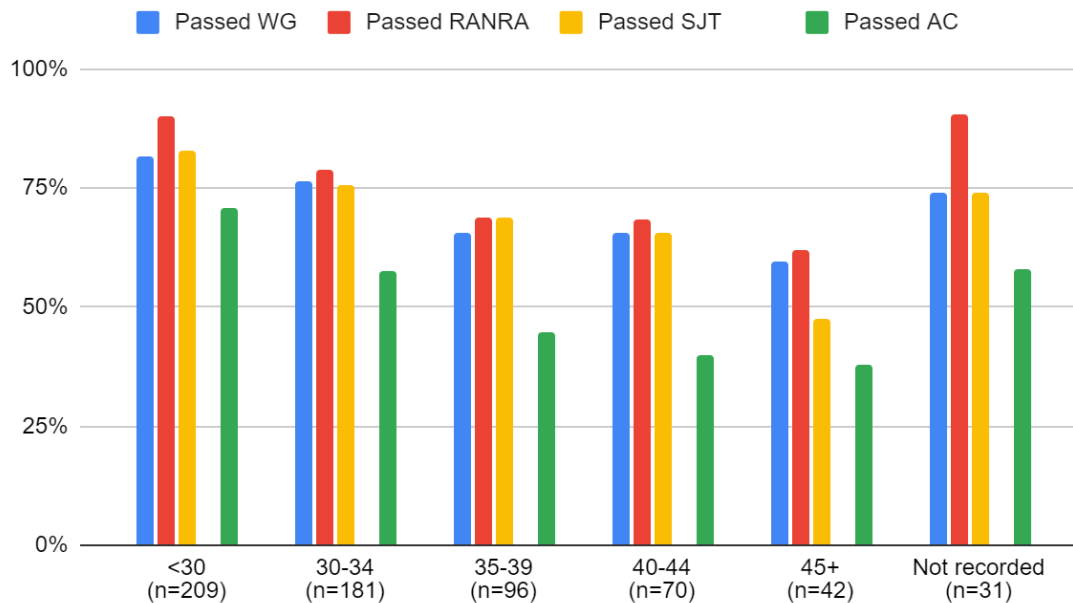
Pipeline diagram by ethnicity and first language



## Appendix C. Detailed results from Analysis 3: Assessment Centre performance

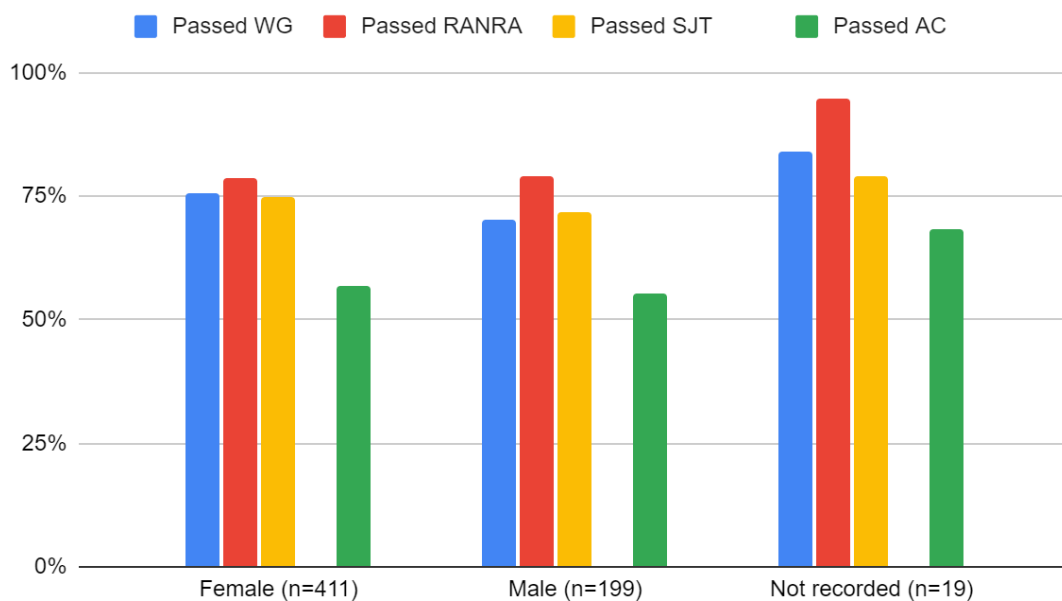
### Assessment Centre performance by age

Assessment Centre Performance by age (UK Public Health Recruitment, 2021)



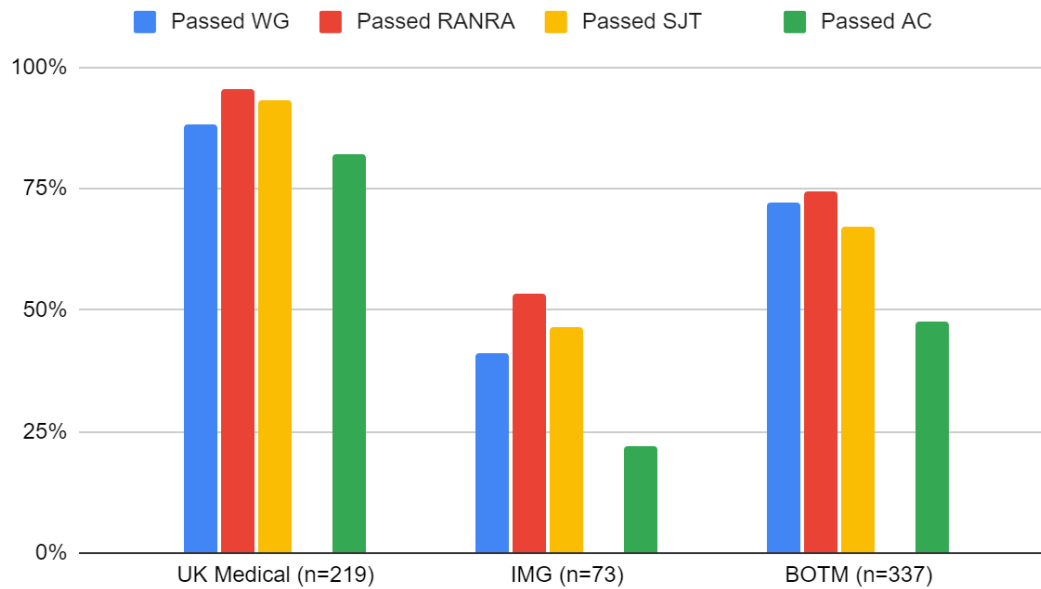
### Assessment Centre performance by sex

Assessment Centre performance by sex (UK Public Health Recruitment, 2021)



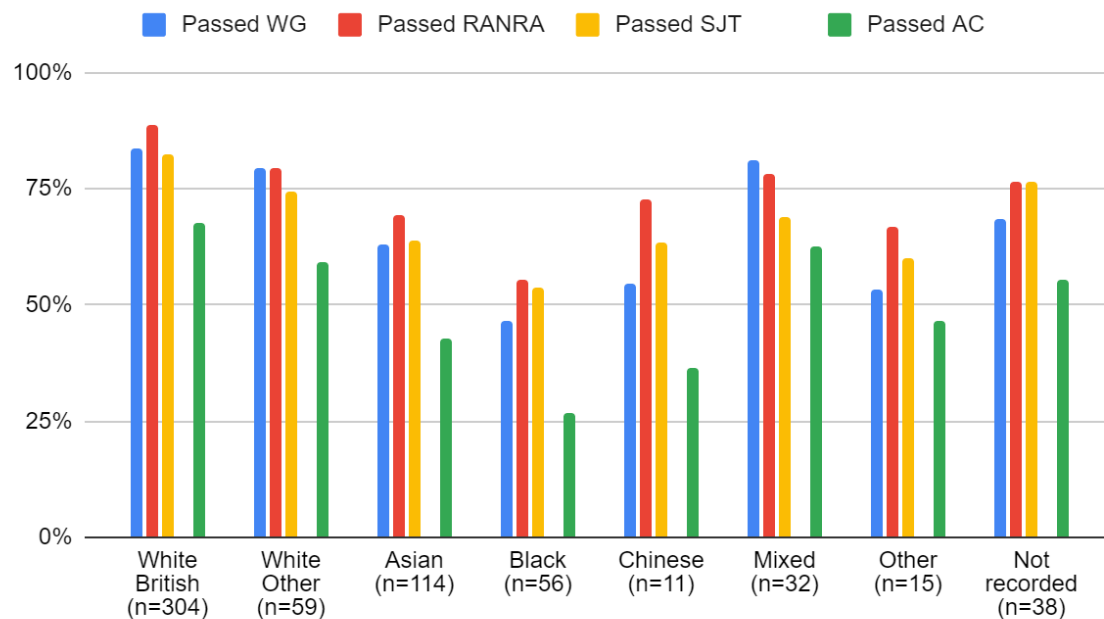
## Assessment Centre performance by professional background

Assessment Centre performance by professional background (UK Public Health Recruitment, 2021)



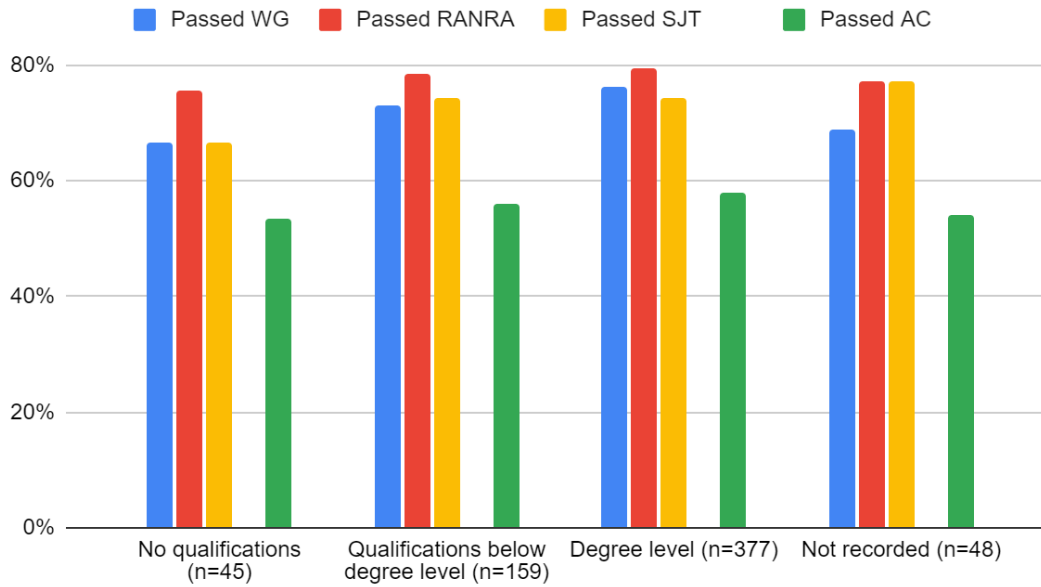
## Assessment Centre performance by ethnicity

Assessment Centre performance by ethnicity (UK Public Health Recruitment, 2021)



## Assessment Centre performance by parental education

Assessment Centre performance by parental education level (UK Public Health Recruitment, 2021)



## Assessment Centre performance by first language

Assessment Centre performance by first language (UK Public Health Recruitment, 2021)

