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Equity with equality? Contextualising everyone can widen participation in medical school admissions

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ABSTRACT

Widening participation outcomes in admissions to UK medical schools have not changed 2007–2018, partly due to inequity in selection. This study models the effects of changing selection, using a novel method of contextualising applicants, on widening participation. We studied 1084 English school leaver applicants to a single medical school over two years, using data from their public exams taken 2 years pre-application (GCSE) and recent admissions test (UCAT). Widening participation was defined by postcode. We modelled two shortlists for a pre-determined number of 500; one ranked on UCAT total score, and the other on a metric that contextualised applicants' GCSE grades against their schools' average GCSE performance. There was a significant difference in the postcode-defined widening participation characteristics of the two shortlists; 46% by contextualisation and 32.2% by UCAT (Chisquare $p < 0.00001$). As widening participation covers 42% of postcodes, the "contextualise everyone" method achieves equity. Conventionally, contextual admissions identify individuals belonging to under-represented groups and gives them preferential treatment. Changing the rules for everyone, by using a relative attainment instead of simple absolute attainment metric, benefits from treating applicants equally; and could promote equity through widening participation.

ARTICLE HISTORY

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KEYWORDS

Selection; widening participation; admission; inequality; equity

Introduction

Equity in access to higher education has been seen as a social good, and promoted by governments worldwide historically, with roots in the early twentieth century (Harris and Sir 2010; Milburn 2012; Bowes et al. 2013; Vignoles 2013; Shah et al. 2015). Inequity in access to Higher Education (HE) is arguably most prominent in highly selective and over-subscribed subjects, such as medicine. Widening participation (WP) to medicine has been a policy goal for the UK, agreed by government, higher education institutions, the medical profession and the third sector for more than 20 years.



The socioeconomic gap in participation in medicine can largely be traced to unbalanced patterns in entry level attainment; disadvantaged pupils do not perform as well academically as their more advantaged peers, for multiple reasons and complex interactions (Feinstein 2003; Gorard, 2010; Goodman and Gregg 2010; Sullivan et al. 2013; Dickerson and Popli 2016). As academic prior attainment is the dominant criterion for selection to medical school, widening participation efforts in medicine have largely concentrated on these disadvantaged groups and treated them more favourably than other groups, generally by conferring some type of admissions bonus. Ironically, while seeking to achieve more equitable outcomes, this approach clearly engages in unequal treatment of different groups of applicants.

Every UK medical school has a widening participation program, and most have facilitated routes of entry for students from disadvantaged backgrounds. While these efforts have succeeded in some areas, such as gender balance and ethnic

Practice points

- Equity and representation of disadvantaged groups in society are important in medical selection.
- Current methods involve allocation of individual applicants to groups and allowing favourable treatment of some groups over others. This conflicts with the idea of equal treatment of all applicants.
- Changes in the metrics of prior academic attainment used in selection can achieve greater equity, while still treating all applicants equally.
- We propose that this approach could be more equitable than the current practices, which are already under legal challenge in some countries.

minority recruitment, they have not been successful in other areas. Using POLAR quintiles as a measure of disadvantage (see below, Methods, Analysis Methodology), it is clear that little has changed in the distribution of both applicants and entrants to medicine over a twelve year period, 2007–18 (Figure 1a, b). Applicants from the most advantaged postcodes (Q5) dominate both categories, comprising 32% of applicants and 43% of entrants over this period. In contrast, applicants from the most disadvantaged postcodes (Q1) comprise 6% of applicants and 4% of entrants. In an equal world, there would have been 20% from each quintiles on both measures.

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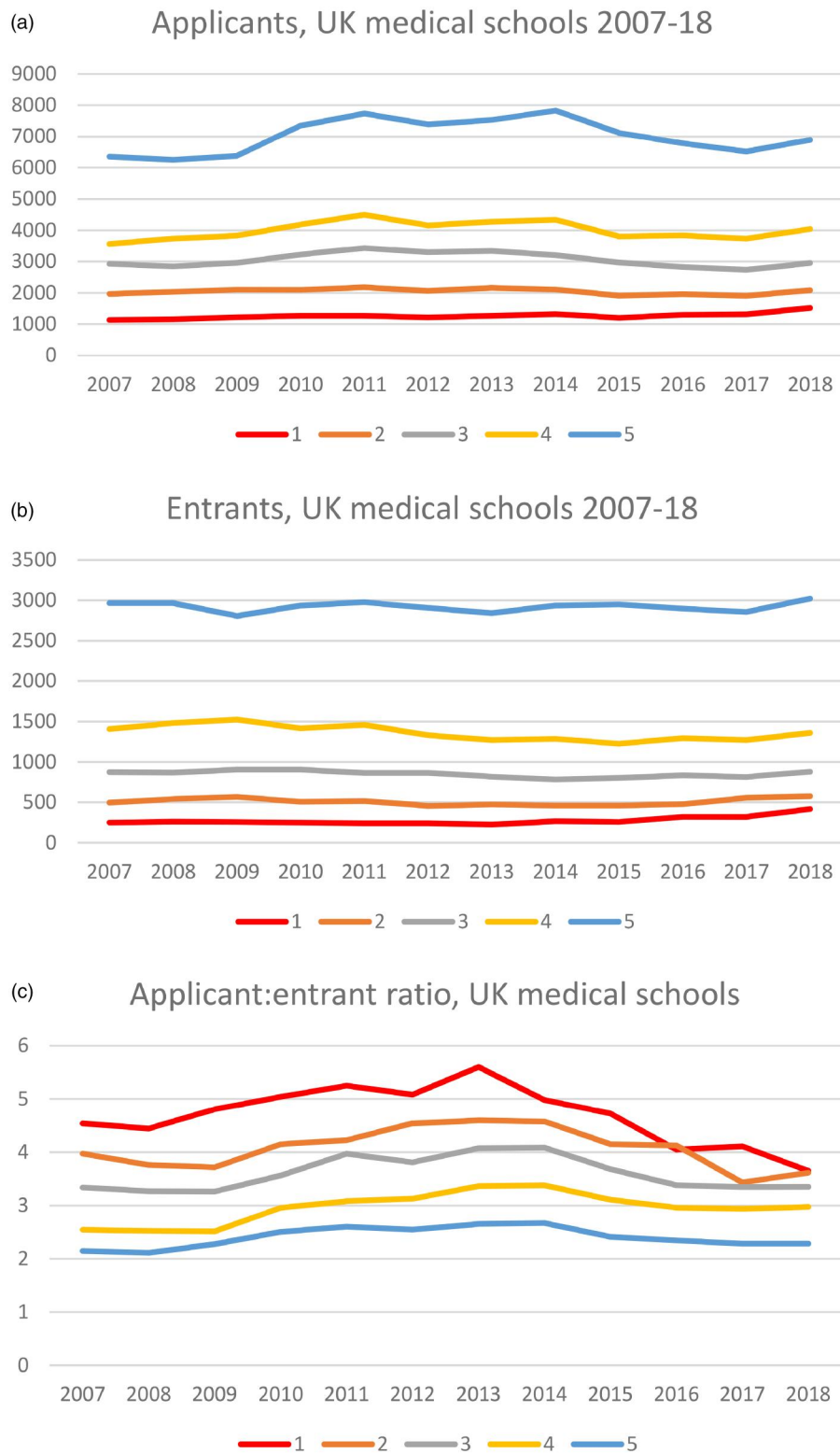


Figure 1. UK medical schools admissions outcomes 2007-18, by postcode POLAR quintiles of applicants. (Q1 = most disadvantaged, Q5 = least disadvantaged). a) Number of applicants to UK medical schools. b) Number of entering students to UK medical schools. c) Applicant:entrant ratios

Although there are clearly different numbers of applicants from each quintile, the inequity in entrant numbers is not purely a supply side problem. Figure 1c shows the applicant:entrant ratio across this period, which is a reversal of the previous figures, with the highest ratio for Q1 and the lowest ratio for Q5. Therefore, even allowing for applicant numbers, only 1 in 4.8 applications from Q1 succeeded; for Q5 this was 1 in 2.4, or exactly twice the number. Given this difference, where applicants from most-advantaged areas have double the chances compared to those from

most disadvantaged areas, there is likely to be a systematic inequity within the selection process; which mirrors the general situation in higher education (all subjects) (Universities Central Admissions Service. 2019). As this inequity has persisted for the past 12 years, despite the best efforts of the sector, we propose that new thinking is required. We aimed to develop an admissions procedure that could produce more equitable outcomes, without the use of admissions bonuses, with equal treatment applied to all applicants.

Study context

In the UK, discourses around disadvantage, widening participation and fairness in higher education are mainly around issues of class, rather than race, caste or rurality; and focused through the country's specific secondary school education system. Secondary school students in the UK (except Scotland) face a set of public examinations (General Certificate of Secondary Education, GCSE) at age 16 in, typically, 6–10 individual subjects. Academically successful students usually progress, narrowing down to more advanced study of 3–4 subjects and sit public exams at age 18, just before leaving school (Advanced, or A levels). The majority of medical school applications take place around 15 months after taking GCSE, and before sitting A levels, at the beginning of the final year of schooling. Most applicants therefore present with GCSE results, and after selection, are offered places conditional on achieving high grades in their upcoming A level exams (The pass grades for A Levels are, from highest to lowest, A*, A, B, C, D and E; typically, AAA or A*AA is required to enter UK medical standard entry medicine).

The selection process is divided into three phases which are under the control of medical schools, followed by a fourth phase, which is not.

1. Screening for minimum qualifications and requirements
2. Shortlisting for interview
3. Interview and offer
4. Offer holders' decisions

Shortlisting is the most significant phase in terms of number of students excluded from selection. Most UK medical schools select fewer than 50% of applicants for interview. Current shortlisting practices are based on actual and predicted academic attainment, and on admissions tests. There is a great deal of evidence that predicted attainment for A level students is variable, inaccurate and biased against disadvantaged students (Wyness 2016). There is also evidence that at the higher end of GCSE attainment, where small advantages are meaningful in this very competitive selection environment, disadvantaged students are also under-represented (Department of Education 2019).

Admissions tests do not help redress this; The Universities Clinical Aptitude Test (UCAT) was initially promoted as being helpful to under-represented groups, but there was no favourable effect for groups based on socio-economic disadvantage or ethnicity (Tiffin et al. 2012). The 2007–18 data outlined previously shows that despite the use of UCAT in the majority of medical schools over this period, there has been no significant change in widening participation.

Most UK medical schools use contextual admissions. Contextual admissions encompass mechanisms that consider variation in learners' opportunities and circumstances, in parallel with their academic record (Mountford-Zimdars et al. 2019). In practice, medical schools identify applicants who meet certain social, educational and economic criteria, and categorise them as "widening participation" (WP) applicants. Criteria vary somewhat between schools, but generally include markers of disadvantage, such as POLAR4 postcode of residence, eligibility for free school meals, attendance at lower performing schools, and parents in receipt of means-tested state benefits. WP applicants are

then conferred an admissions bonus, which generally involves accepting lower academic prior attainment, and/or guaranteed interviews and/or making a lower conditional A level offer. The current concept of contextual admissions, although aimed at justice and equity, involves treating applicants unequally, by selecting particular groups for preferential treatment. Despite admirable individual cases, contextual admissions, as currently administered, has not progressed towards equity in medical admissions (see above), and therefore is not only unequal but also ineffective.

This study examines an approach to contextual admissions that draws on publicly available school performance data to view English applicants' achieved academic grades relative to the context of their school's average performance. For most applicants, who are applying before A level results, this would be their GCSE attainment. Attainment relative to school average could be considered a more accurate predictor of academic potential than absolute attainment alone, given the importance of school context (see discussion, below). Because there is likely to be a higher proportion of disadvantaged learners (by any definition, including the postcode-defined criteria used in this study) in poorer performing schools, we anticipated that this approach to contextualisation would result in a larger proportion of disadvantaged learners being selected for interview than if applicants were ranked on absolute attainment alone. Importantly, the selection is blind to their WP status.

Methods

All applicants from England applying before A level results to a single medical school over two admission cycles, 2019–20 and 2020–21, who met the minimum requirements for entry were used for this study ($n = 1084$). Data was obtained from their application to the Universities Central Admissions Service (UCAS), including full GCSE results, school (where GCSE was taken) and UCAT test results, and their home postcode. The minimum requirements were GCSE pass at grade 9–6 (or A* to B) in five subjects including English and Maths, and three sciences or double science with one other subject. Applicants *also* had to be taking relevant subjects at A level or equivalent.

Two shortlists were constructed from combined applicant data, predicated on the estimated capacity for interviewing approximately 500 places for this group of applicants over the two years.

1. UCAT shortlist,
Applicants were ranked by their UCAT total results and the top 515 selected (as there were tied scores which did not allow an exact 500).
2. Contextualised shortlist

Applicants' Attainment 8 score were calculated from their achieved GCSE grades. This period spanned the new GCSE grading system, so all alphabetical grades were converted into numeric grades using the recommended tariff (Office for Qualifications and Examinations Regulation (Ofqual 2018). The school where each applicant sat their GCSE was identified, and a lookup chart constructed to download the Attainment 8 score, averaged over 3 years, from publicly available data (Office for Students Transforming opportunity in Higher Education; an analysis

of 2020-21 and 2024-25 access and participation plans 2020). Attainment 8 is an average score for the individual or the school based on 8 GCSE results, including English and Maths (see discussion) and some defined subjects (Selection Alliance. 2019). For independent schools, their GCSE data were individually accessed through their websites and an Attainment 8 score was calculated, using the results of the year that the applicant sat the exam, or if this was not available, the most recent GCSE results (see discussion below). Applicants were ranked by the contextual metric, which was a simple ratio of applicant's Attainment 8/applicant's school Attainment 8.

Analysis Methodology

Both shortlists were analysed for widening participation (WP) applicants. WP was defined according to postcode of applicant residence. We used a definition which is used by other higher education institutions around London; residence in any of quintiles 1 and 2 of Participation of Local Areas in Higher Education (POLAR4) database or Index of Multiple Deprivation (IMD) or Income Deprivation affecting Children Index (IDACI) databases, or categories 4 and 5 of the (CACI) ACORN database. This WP definition, referred to in this article as Kent WP, covers 42% of UK postcodes and is thought to be more appropriate for institutions with a high number of London-based applicants. POLAR 4 measures the progression of young people in an area to higher education, and due to high educational achievement in London relative to other parts of the country, there are few POLAR4 Q1 postcodes in London. However, there is extensive economic disadvantage in London, which can be captured by the other economic databases used in the Kent WP definition (Shah, et al. 2015).

Apart from the simple proportions of WP applicants in the two shortlists, we also used metrics that are currently used by the Office for Students (OfS), which is the governmental body responsible for Higher Education in England; and by the Sutton Trust, and the Medical Schools Council, which are important stakeholders in widening participation. Using applicants from quintile 5 of POLAR4 for comparison, as they are traditionally the most over represented group, we have presented the Q5:Q1 gap as a simple ratio, and also as a rate gap (Q5 shortlisted/total Q5 applicants)/(Q1 shortlisted/total Q1 applicants). Statistical analysis is by Chi Square test of proportions, with Yates correction. The research (null) hypothesis was that there was no significant difference in WP applicants shortlisted by the two methods.

Results

The UCAT shortlist, allowing for ties, was 515 students with a total score of 2550 or greater. The shortlisted group was 32.2% WP. The Q5:Q1 ratio was 4.7:1 and the Q5:Q1 rate gap was 1.25:1 in favour of Q5 (meaning that a Q5 candidate with a 51% chance of being shortlisted, had a 25% better chance than a Q1 applicant, with only 41%). The average Attainment 8 was 76.74 (range 54-90, SD 6.65), equivalent to an average GCSE grade of 7.78.

The contextualise everyone shortlist was 500 students with a best 8/Attainment 8 metric greater than 1.35. This group was 46% WP ($p < 0.00001$, Chi Square). The Q5:Q1

ratio was 2.8:1 ($p = 0.01$, Chi square) and the Q5:Q1 rate gap was 0.73:1 in favour of Q1. For the first time, we have evaluated a selection metric that actually favoured Q1 applicants over Q5. The average Attainment 8 was 75.1 (range 53-90, SD 6.49), equivalent to an average GCSE grade of 7.63. This is a statistically significant difference from the UCAT shortlist ($p = .001$, t-test). (Figure 2)

These figures are more meaningful when considered against the current situation and future targets (Figure 2b, c). The 2017 medicine entry cohort were 15.1% Q1 + Q2 and the Q5:Q1 ratio was 8.9:1 (Selection Alliance. 2019). The Q5:Q1 entry rate gap for that cohort was expressed as a ratio, 2.36:1 in favour of Q5. The Q5:Q1 ratio target for English higher education as a whole is 3.7:1 for 2024-5 (Office for Students Transforming opportunity in Higher Education; an analysis of 2020-21 and 2024-25 access and participation plans, 2020). The Selecting for Excellence report target for medicine is 20% Q1 + Q2 by 2023 (White, 2019). The UCAT shortlist fails to meet all these targets; the contextualised shortlist would meet all the targets by a large margin, if the WP profiles were maintained through the interview and offer stage. To our knowledge, the reversal of the entry rate gap, if maintained through the later stages of selection by the contextualise everyone shortlisting policy, would be unique in achieving full equity and meets the "ambitious" entry rate gap targets set by OfS for 2038-39 (Key performance measures KPM1 and KPM2) (Office for Students Transforming opportunity in Higher Education; an analysis of 2020-21 and 2024-25 access and participation plans 2020).

The two shortlists differ considerably. Only 45% of applicants who appear in one shortlist also appear in the other. The 1024 applicants attended 811 different schools.

Discussion

We have used Attainment 8, averaged over a 3-year period as the schooling metric, against which the applicant's individual attainment is compared. Attainment 8 is the basic variable used in the Progress 8 metric, which has funding implications for secondary schools in England (but not in other countries of the UK). It is checked and audited by the Department of Education, and therefore represents reliable data. However, most independent schools, which are not funded in this way, generally enter their students in a variety of GCSE assessments that do not count towards the school's average Attainment 8 score, therefore lowering the school's Attainment 8, and inadvertently advantaging their students in our system. We therefore manually estimated independent schools' Attainment 8 score from their publicly advertised GCSE results.

Our contextual metric is a simple ratio. We are aware that this has theoretical limitations and is subject to a ceiling effect. If an applicant's school average attainment is near the maximum possible, there is not much room for an applicant to outperform the school average to our cutoff ratio level. In practice, we did not see this. For other schools with different applicant profiles, different contextual metrics might be tried.

We have used shortlisting by a UCAT cutoff chosen to select a target number of interviewees, as a comparison with our contextual method. We recognise that this is a simplification of the processes used by many UK medical

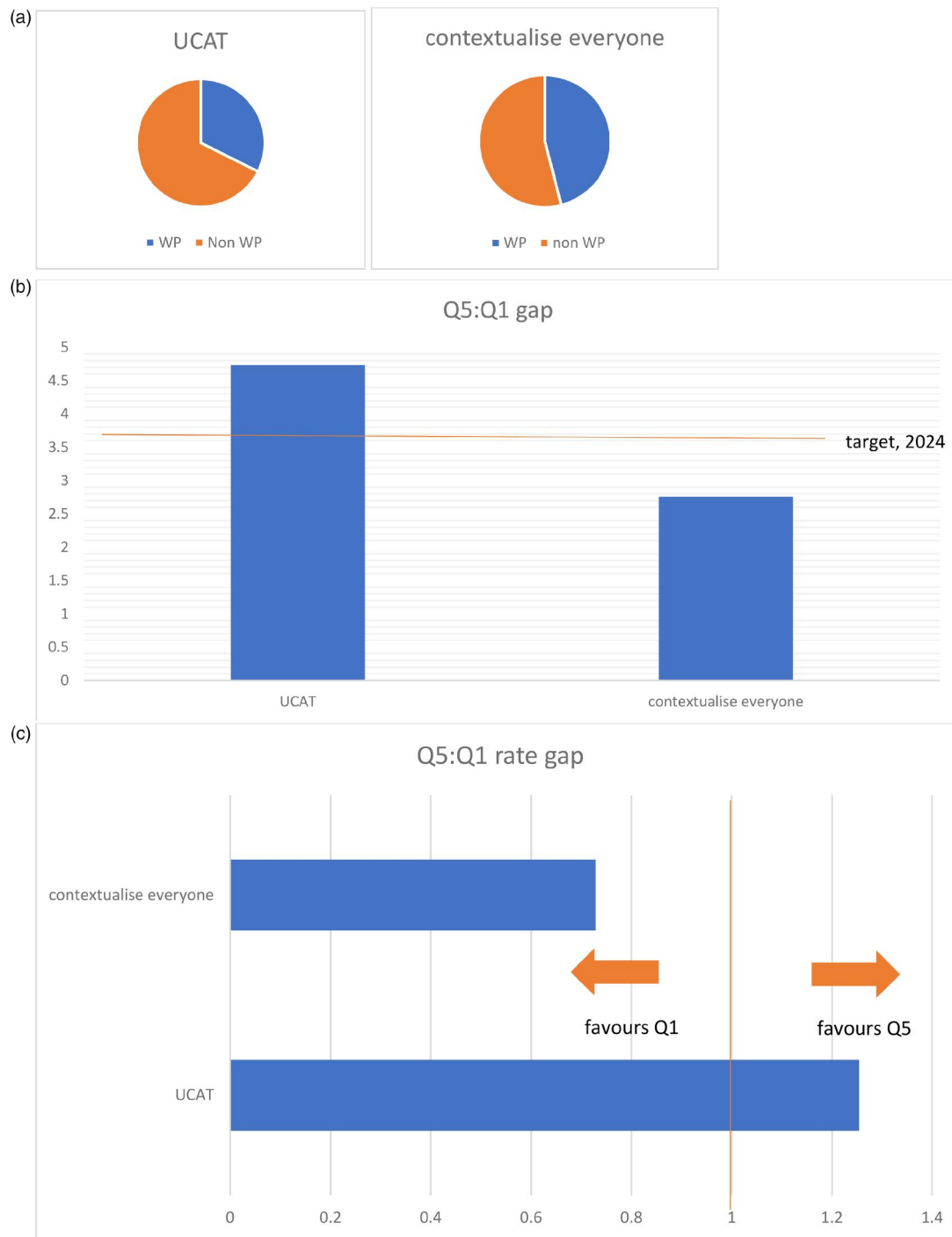


Figure 2. a) Comparison of UCAT and contextualise everyone shortlists for Kent WP indicator (32.2%, 46%). b) Comparison of UCAT and contextualise everyone shortlists for POLAR Q5:Q1 ratio (4.7,2.8), with 2024 target (3.7) for comparison; c) Comparison of UCAT and contextualise everyone shortlists for POLAR Q5:Q1 rate ratios (1.25, 0.73). A rate ratio of 1 represents equity.

schools, but it does remain the central and dominant rationale behind most schools’ shortlisting policy. We did not find that using UCAT in this way (described as a “strong” use of UCAT (Tiffin et al. 2012)) favoured WP applicants, rejecting a larger percentage than it selected, and this might account for the slow progress in WP during the years in which UCAT has grown in importance as a selection method (Selection Alliance 2019; White 2019).

Although we have cast UCAT cutoff and contextualising everyone as contrasting methods of shortlisting, they are, of course, not incompatible. In practice, both can be used sequentially, for example, with a UCAT cutoff followed by contextualisation. This combination might allow a variety of equal-but-different admissions practices to co-exist in

the sector, allowing diversity of entry, reflecting the values and strengths of each school.

This study has contextualised individual applicants against the degree of educational (dis)advantage, and has not examined any other measure that might indicate a wider degree of socio-economic (dis)advantage, such as free school meals, care leavers, parental income, highest education level of a parent or parental occupation. Although the two types of disadvantage are linked, this study design was intentional; because there are strong and consistent data on subsequent performance of educationally disadvantaged students on university level courses, but no corresponding data on performance of socio-economically disadvantaged students.

Although prior A-level attainment remains the strongest predictor of final achievement on medical programmes, other factors, particularly school context, also contributes to the prediction of success (McManus et al. 2013; Thiele et al. 2016; Kumwenda et al. 2018). Specifically, medical students who come from lower performing state secondary schools generally outperform their peers from independent and grammar schools in terms of achievement during their medical degree (Kumwenda et al. 2018). This inverse performance effect underlies the ‘distance travelled’ concept which recognises the variation in students’ circumstances and opportunities to reach a particular academic level (Cleland et al. 2018).

A few studies specifically look at average school academic attainment before admission (Stringer et al. 2017; Mwandigha et al. 2018). Students who enter medicine from more challenging, lower attainment school backgrounds outperform students from more advantaged, better schools, even when the advantaged students had higher absolute attainment at the point of entry. This observation has been used to justify conventional contextual admissions, in which discounted conditional offers are made to disadvantaged students. We were discontent with the conventional binary approach to contextualisation. We noted that school performance is a continuous variable and not binary (Mwandigha et al. 2018). We could see no good reason to treat schooling as just two binary categories, disadvantage and not. We therefore adopted the idea of contextualising everyone according to schooling.

Some critics of widening participation have raised concerns that the academic standard of medical school entrants would be compromised by widening participation initiatives. We did see a statistically significant difference between the shortlisted cohorts. However, that difference was only a single grade in a single GCSE subject, with 8 subjects contributing to the metric. In contrast, WP initiatives often give bonuses of one or two grades at A level (over 3 subjects) to selected applicants.

We conclude that contextualising everyone on the basis of relative educational attainment in school has the advantage of applying an evidence-based rule fairly to all

applicants. It is based on reliable publicly available data and does not rely on self-report. It is not “political” in the sense that it does not seek to identify disadvantage according to controversial criteria, such as favouring applicants from particular social backgrounds or ethnic groups. Importantly, it represents an alternative to the politicisation of medical school admissions that has repeated several times through history, from Germany and Austria in the 1930s, Malaysia in the recent past, and present-day India and the United States. It is definitely not affirmative action, as it does not explicitly seek to redress social inequity or injustice by treating any group of applicants differently from another, even if it achieves positive outcomes in those contexts.

Using relative attainment for admissions has been considered before, for example in the University of Texas, which instituted a “race blind” policy of guaranteeing admission to the top 10% ranking students of each and every Texas public high school, to reverse the inequity of school districts with very different resources and provisions (Texas Education Agency 2021). A similar policy at the University of California did not achieve racial diversity goals in the more selective university campuses, such as UC Berkeley or UCLA, largely because it only conferred eligibility; and therefore led to a subsequent admissions process in which “Eligibility by Local Context” applicants had to compete with standard applicants, according to the different criteria set by different UC campuses (University of California 2023). The University of Oxford has used a version of relative attainment for pre-A level medical applicants, contextualising the number of A*/9 GCSE grades against the average number of A*/9 grades achieved by their schools (32), but has not reported on its effects. To our knowledge, our study is the first report to quantify the effect of relative attainment in selection decisions in the UK, or in medical admissions.

We have found strong indicators of acceptability for the concept of contextualising everyone. The first author has presented the concept, using Figure 3 to prospective applicants and parents at open days, to clinicians and to secondary school teachers’ audiences, and to medical education

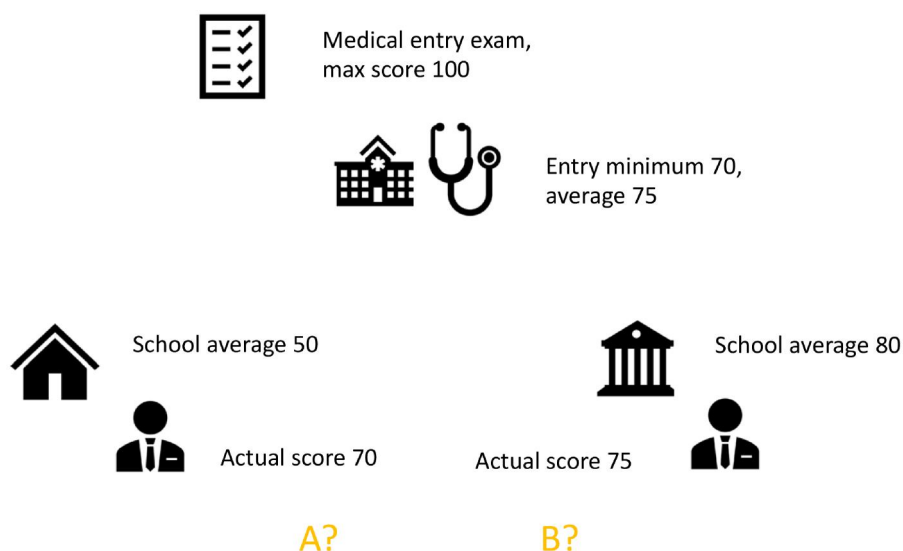


Figure 3. Contextualisation question; let us simplify medical school entry to a single exam marked out of 100, in which the minimum standard is defined as a score of 70, but the average performance of successful applicants is 75. Student A has a score of 70, while student B has a score of 75. Which candidate should be offered the single remaining place to interview for admission to medical school, bearing in mind the average performance of their school in this exam? Please vote for a or B.

conference audiences, totalling several hundred people. Simplifying the admissions problem to a single examination, we have asked the audience to choose between two applicants, who both achieved above the required threshold. The results of our quick polls show >95% preference for applicant A, who has the slightly lower attainment, from a school with a very low average; in preference to applicant B who had a higher score, but from a high achieving school. The most telling comment, from a member of the admissions staff, was “we would all like to admit A, but we end up admitting B”.

Conclusion

Contextualising everyone shortlists a very different group, less than half of whom would appear in the more conventional (UCAT selected) shortlist. Contextualising everyone is considerably more friendly to the widening participation agenda, and prior evidence indicates that it selects students who will perform well on the medical course (Mwandigha et al. 2018). In the context of slow progress in widening participation in medicine, an approach using relative attainment rather than absolute attainment in selection decisions at the shortlist stage, has the potential to markedly change the profile of the admission cohort to medical school, without lowering their academic performance. We propose a new approach that treats all applicants equally, and potentially achieves greater equity in outcomes.

Ethical approval

Data relating to widening participation status was handled according to research ethics approval Ref 0381516 from the Faculty of Social Sciences Research Ethics Advisory Group, University of Kent. As Kent and Medway Medical School is a new institution, it has not yet convened its own Research Ethics committee.

Disclosure statement

No potential conflict of interest was reported by the author(s). All authors had final approval of the submitted manuscript and agree to be accountable for the accuracy and integrity and all other aspects of the work. There are no relevant financial or non-financial interests to declare for any of the authors.

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Data sharing statement

Admissions data can be sensitive, and even when de-identified, can be traced to individuals. This is particularly problematic in this study, which uses postcode-based measures of widening participation, so the postcodes of individual applicants may be matched to known identities. Other problematic areas include school data, as this also might lead to identification of individual applicants. For this reason, the authors would agree to share the data upon reasonable request by reputable parties, but we are reluctant to have the data openly available in public repositories.

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