

How can greater consistency in selection between medical schools be encouraged? A mixed-methods programme of research that examines and develops the evidence base

Professor Jennifer Cleland¹

Professor Fiona Patterson²

Professor Jon Dowell³

Dr Sandra Nicholson⁴

¹Division of Medical and Dental Education (DMDE), Foresterhill, University of Aberdeen, AB15 9NR

²Department of Psychology, Downing Street, Cambridge, CB2 3EB; Work Psychology Group, 27 Brunel Parkway, Pride Park, Derby, Derbyshire, DE24 8HR

³University of Dundee, Mackenzie Building, Kirsty Semple Way, Dundee, DD2 4BF

⁴Queen Mary University of London, Garrod Building, Whitechapel, London E1 2AD



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Team Biographies

Professor Jennifer Cleland is Lead for Medical Education Research in the Division of Medical and Dental Education at the University of Aberdeen. Professor Cleland was the project lead with overall responsibility for the original research proposal, carrying out the case study interviews, management and analysis of the survey, direction and writing of the final report.

Professor Jon Dowell is Convener, Medical Admissions Committee, at the University of Dundee. Professor Dowell was a co-applicant and contributor to the original research proposal, and was involved in the analysis of the survey, and writing of the final report.

Dr Sandra Nicholson is lead for the Academic Unit for Community-Based Medical Education at Barts and the London School of Medicine and Dentistry, at Queen Mary, University of London. Dr Nicholson was a co-applicant and contributor to the original research proposal, and was involved in the analysis of the case study interviews, the survey analysis, and writing of the final report.

Professor Fiona Patterson is Principal Researcher at the University of Cambridge, Department of Psychology, Visiting Professor at City University London, Department of Psychology, and Founding Director of Work Psychology Group, a research-led occupational psychology consultancy. Professor Patterson was a co-applicant and contributor to the original research proposal. She led on the review of published evidence, and writing of the final report.

Project Research Staff

Fran Cousans is Consultant Psychologist at Work Psychology Group. Fran was involved in the management of review and survey processes, reviewing published evidence, writing the review section of the final report, analysing the numerical survey data, and finalising the overall report.

Our thanks also to Dr Alec Knight, Consultant Psychologist at Work Psychology Group, who contributed to the review process.

Executive Summary

This work was commissioned to identify a coherent and evidence-based (as far as currently feasible) “Selection Framework” suitable for all UK medical schools, the use of which would enable evidence-based best practice, greater transparency, and fairness in selection for medicine. This aim was addressed via: a literature review of selection approaches including contextual data and values-based recruitment (VBR); case studies illustrating selection policy and practice; and an online survey of Admissions Deans.

The literature review indicated that the strength of evidence supporting the use of candidate academic attainment in medical school selection remains strong. There is a relatively clear picture of evidence of effectiveness, or at least emerging effectiveness, in terms of predictive validity and fairness for structured interviews/MMIs, admissions testing, SJTs and selection centres (SC). The strength of evidence for continuing to use personal statements is low. SJTs and MMIs seem to be the most valid predictors of what could broadly be called “values”. The somewhat better predictive validity of combined academic attainment and UKCAT is the only evidence of effectiveness of combining tools although this is common practice.

This evidence is not the whole picture – there is a gap between what is known to be effective, or at least promising, in medical schools selection (as per the above) and what is enacted in practice. This gap seems to be due to a number of factors: beliefs (e.g., a genuine lack of knowledge and/or “faith” in the evidence; “our way works for us”); practical barriers to change (e.g., lack of resources, caution about risking reputation); and awareness that there is essentially no evidence for the “on-the-job” predictive validity of any of the tools available, let alone how to best to combine them in practice. These tensions are illustrated by our case study data.

Despite data that shows persistent under-representation of lower socio-economic groups within the UK, most of our respondents believe that their selection processes and organisational culture encourage widening access (WA). However, while there is much WA-related “activity”, the broad evidence is that this is making little difference. Defining who is a WA student is fraught with difficulty and hence there remains a dearth of quality research related to WA student progression. The picture in relation to widening access and the use of contextual data is even more complex. A range of indicators are used, most of which are problematic in one way or another.

In conclusion, there is insufficient evidence to recommend a single selection strategy for all UK medical schools at present. However, there is sufficient evidence to state that medical school selection processes should be moving towards a combination of academic attainment, admission tests and MMIs. Clear guidance of WA and use of contextual data would be welcome by medical schools.

Crucially, to make any meaningful progress in WA and selection, it is important that institutions agree on means as well as ends and act in a united way to increase the likelihood of good practice, fairness and transparency. Other recommendations for policy, practice and research are presented in Section 10 of this report.

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1. Introduction

The intention of assessment for selection to medical school is to predict who will be a competent doctor. In other words, the aim is to identify those individuals who will be successful in the roles of medical student, doctor in training, and fully-qualified doctor before training commences. Conceptually, a key issue is whether Universities are aiming to select individuals who will make successful students or those who will make competent clinicians (McManus, 2003): the former is not necessarily a precursor of the latter (Ferguson et al, 2014).

Historically, selection to medicine selected primarily on academic ability. However, there has been increasing recognition that high academic ability alone is an insufficient marker for identifying applicants suitable for medical training and practice. Other non-academic attributes, qualities and values are also important (Patterson & Ferguson, 2010; Prideaux, 2011; Monroe et al, 2014) and these must be assessed at the stage of selection to medical school. A description of the selection methods used widely by UK medical schools is provided in Table 1, followed by an overview of the three most commonly used admissions tests in Table 2.

Table 1. Description of Selection Methods Commonly used by UK Medical Schools

Selection Method	Description
Academic Records	Details of candidates' academic qualifications to date, including A Levels, Highers, GCSEs, etc.
Admissions Tests	Assess candidates' ability to acquire the knowledge and skills required for success at medical school. These take various formats, three of which are used in the UK (See Table 2).
Personal Statements	A statement written by the candidate, usually explaining their motivation for applying to medical school and outlining their skills and achievements.
References	Letters of recommendation for the candidates' suitability for a career in medicine, usually from academic supervisors/teachers.
Situational Judgement Tests (SJTs)	A measurement method that presents candidates with role-related situations and possible responses to these situations. SJTs are designed to assess an applicant's judgement regarding situations encountered in medicine.
Personality and Emotional Intelligence Assessments	Questionnaires which assess candidates' preferences and traits.
Selection Centres	A multi-trait, multi-method selection process whereby a number of the candidates' competencies are assessed using a number of methods.
Interviews and Multiple-Mini Interviews (MMIs)	Interviews may be one-to-one or panel, where the candidate is interviewed by a number of interviewers to assess their non-cognitive attributes.

Table 2. Overview of UKCAT, BMAT and GAMSAT, Comparing each Test in terms of Cost, Ease of Access to Applicants, Aims and Content¹.

Test	Time	Cost	Ease of Access	Description from website	Skills/ Attributes Assessed
UK Clinical Aptitude Test for Medicine and Dentistry (UKCAT)	2 hours	£65- £80 (EU) £100 (non-EU)	Runs in 138 sites across UK and mobile test centres in remote areas	“Focuses on exploring the cognitive powers of candidates and other attributes considered to be valuable for health care professionals.”	Verbal Reasoning - assesses ability to critically evaluate information that is presented in a written form. Quantitative Reasoning - ability to critically evaluate information presented in a numerical form. Abstract Reasoning - the use of convergent and divergent thinking to infer relationships from information. Decision Analysis - the ability to make sound decisions and judgements using complex information. Situational Judgement - capacity to understand real world situations and to identify critical factors and appropriate behaviour in dealing with them.
The BioMedical Admissions Test (BMAT)	2 hours	£44 (EU), £74 (non-EU)	Runs in 50 sites across the UK	“A test of skills and knowledge that learners are expected to have already.”	Aptitude and Skills - problem-solving, understanding arguments, data analysis and inference. Scientific Knowledge and Applications - ability to apply scientific knowledge from school science and mathematics. Writing Task - ability to select, develop and organise ideas, and to communicate them in writing, concisely and effectively.
The Graduate Medical School Admissions Test (GAMSAT)	5.5 hours (incl. 1 hour break)	£234 (UK only)	Runs in six sites across the UK	“Evaluates the nature and extent of abilities and skills gained through prior experience and learning, including the mastery and use of concepts in basic science as well as the acquisition of more general skills in problem solving, critical thinking and writing.”	Reasoning in the Humanities and Social Sciences - the interpretation and understanding of ideas in social and cultural contexts. Written Communication - ability to produce and develop ideas in writing. Reasoning in the Biological and Physical Sciences - chemistry, biology and physics.

¹ Note that if an applicant selected three medical schools each of which used a different selection test, the direct cost of sitting all three tests would be in excess of £300. The indirect costs of travelling to test centres is difficult to calculate but likely to be significant.

Faced with limited student places and large numbers of applicants, educational attainment remains relied upon as the first hurdle in the selection process. This has implications for widening access (WA) to medicine: pupils at fee-paying or independent schools achieve better grades at A Level than those at state schools (e.g., Chowdry & Goodman, 2013; Gorard et al 2006; Howard, 2002; Langlands, 2005; Sacker, Schoon & Bartley, 2002). (Of interest is the fact that school attainment does not appear predictive of performance in terms of degree outcome in higher education generally: for example, a report by the Higher Education Funding Council for England found that degree outcomes are not affected by the average performance of the school that a student attended (HEFCE, 2014), and the evidence to date in medicine indicates that students from secondary schools with greater average attainment at A-level (irrespective of public or private sector) perform less well in the early years of medical school (McManus et al, 2013b). The influence of school attainment on later performance at medical school or post-medical school [e.g., on College examinations, career choice or progression] is as yet unknown.

There is much variation in how the selection approaches presented in Table 1 are used by different UK medical schools. A GMC review indicated 26 different approaches used across the (then) 32 UK medical schools, although most of these were a variation on the use of a combination of prior attainment, admission tests and interviews (individual or MMI). However, the weighing of each approach differed significantly by medical school, with no obvious rationale or evidence-base. This was clearly indicated in Admissions Deans' interviews undertaken for the General Medical Council (GMC) by our team in 2012 (Cleland et al, 2012).

Why is there such variance? Data from the GMC study and Cleland and Nicholson's work for SEEG examining medical schools' attitudes to WA and implementing national policies, which often parallels their choices in selection methods, reveals a variety of barriers faced by medical schools, hesitancy and lack of expertise in assessing evidence, as well as a paucity of enablers of change (Cleland et al, in press Medical Education; Cleland & Nicholson, in press). However, the knowledge landscape has progressed and so has the openness of medical schools to guidance (as demonstrated by changes in individual schools' selection process since the publication of the GMC report). We believe the time is right for more explicit guidance to help medical schools select the best doctors of tomorrow. Developing guidance requires a more nuanced examination of the barriers and enablers that discourage or persuade medical schools to adopt evidence-based selection strategies and take a consistent approach to selection.

Key Messages

Historically undergraduate courses in medicine have tended to select primarily on academic ability. However, it cannot be assumed that those with high academic ability alone can be turned into effective clinicians via education and training - other attributes and qualities, and the right values need to be present from the start. It is important to assess all of the necessary skills and abilities at the point of selection into medical school, using appropriate selection methods.

2. Aims and Objectives

The aim of this work was to inform the development of a coherent and evidence-based (as far as currently feasible) "Selection Framework" suitable for all UK medical schools, the use of which would enable evidence-based best practice, greater consistency and fairness in selection for medicine.

To achieve this required three separate projects, each of which will be described in more detail later in this report:

- 1 A review of the research literature, to identify and review international developments in selection for medicine. This focused on synthesising the evidence for approaches for which there has been most activity in the last two years, including contextual data and values-based recruitment (VBR).
- 2 An exploratory case study approach to illustrate medical school selection policy and practice in the UK.
- 3 An online survey of Admissions Deans and staff from all UK medical school, designed to build knowledge and achieve agreement in terms of developing best evidence selection for medicine.

Together, this programme of work aimed to build knowledge and achieve agreement in terms of developing best evidence selection for medicine and make recommendations for future practice to the MSC and SEEG.

3. Review of Selection Methods for Medical School Admission

3.1 Introduction

The aim of this stage of the project is to identify and synthesize the most recent evidence on the effectiveness of different methods used by medical schools to select students.

Rather than limiting information-seeking to studies using one particular methodology (such as would be the case with a classic Cochrane-style systematic review), our knowledge of the field indicated it would be appropriate to review all relevant literature, irrespective of study methodology. This allowed us to indicate not just what aspects of suitability to be a medical student and doctor are measured by each selection approach, but also where other indicators may be required.

This review, including gathering as-yet unpublished data updates the information reported in the Cleland et al (2012) GMC report. The current review used the same search terms and methodological processes as this earlier project but also included papers published from September 2012 to August 2014. Thus we report here on English-language studies published between January 1997 (see Dearing, 1997) and August 2014.

The search strategy used is outlined in the Appendix. Full details of the methodology used for a systematic review and outcomes are reported in Patterson et al (in submission) and on request from the authors.

We had planned to report here on solely the most promising selection approaches, as advocated by Cleland et al (2012): prior attainment, admissions tests including situational judgement tests (SJTs), multiple-mini interviews and selection centres. However, our preliminary work on this project indicated that it was critical to incorporate all selection approaches currently used in the UK provide a full picture of the topic. Thus, we include here overviews of the literature on:

- a) Prior attainment
- b) Admissions tests including situational judgement tests (SJTs)
- c) Interviews and Multiple-mini interviews (MMIs)
- d) Selection centres (SCs)
- e) Personal statements

Two additional searches were carried out to identify and explore the use of, and evidence for a) **values-based recruitment (VBR)** and b) **contextual data** in selection processes. This brought in the wider academic and “grey” literature, including some important recent reports.

Evaluation criteria with which to judge the effectiveness and efficiency of selection methods have been reviewed consistently in the research literature over several decades (see Arnold et al, 2010; Patterson 2012). We report here on the broad domain of accuracy and effectiveness (reliability, validity, ongoing evaluation and validation, susceptibility to coaching, fairness and WA, legality) in relation to each selection method listed above.

3.2 Results

3.2.1 Academic Records/Prior attainment

Research evidence is generally highly concordant and supports the predictive validity of academic records in medical student selection (Albishri, Aly & Alnema, 2012; Bhatti & Anwar, 2012; Cohen-Schotanus et al, 2006; Ferguson et al, 2014; Ferguson, James & Madeley, 2002; Kreiter & Kreiter, 2007; Lumb & Vail, 2004; Luqman, 2013; McManus et al, 2003; Poole et al, 2012; Puddey & Mercer, 2014; Simson et al, 2014; Wilkinson et al, 2008). McManus and colleagues (2013b) describe how prior educational attainment forms the academic backbone of selection, progression through medical school and beyond. International evidence also suggests that candidates admitted on the basis of their academic record had lower levels of dropout than those who were not (McManus et al, 2011; Urlings-Strop et al, 2013). A minority of studies (Al-Rukban et al, 2010; 2013; Husbands et al, 2014; Tektas et al, 2013) reported that academic records were not predictive of medical school performance. A number of papers describe a small but significant incremental validity gain through using candidates' educational achievement alongside admissions tests compared to the use of traditional academic indicators alone (Ferguson et al, 2003; McManus et al, 2013b; Sartania et al, 2014; Trost, Nuaels & Klieme, 1998).

In summary, a high level of consensus exists among researchers that academic records provide useful information to inform medical student selection. Research generally suggests that prior academic attainment has predictive power, meaning those with stronger academic records are more likely to succeed in medical school. However, there is concern that the discriminatory power of prior academic attainment may be diminishing as increasing numbers of medical school applicants have top grades. There is also a lack of long-term follow-up data, to provide evidence that medical school applicants with higher grades go on to become better doctors. Moreover, Milburn (2012) notes that over-reliance on A Level results may create a distorted social intake to universities, and recruiting medical students solely on the basis of academic attainment may neglect important non-cognitive factors required for success in medical school and beyond.

3.2.2. Admissions Tests

There is mixed evidence on the predictive validity of admissions tests in medical student selection. Some researchers have presented evidence to support the reliability and criterion, incremental or predictive validity for admissions tests including the MCAT (Callahan et al, 2010; Dunleavy et al, 2013; Elam et al, 2002; Peskun, Detsky & Shandling, 2007), GAMSAT (Puddey & Mercer, 2014), UMAT (Edwards, Friedman & Pearce, 2013; Poole et al, 2012), HPAT (Halpenny et al, 2010), UKCAT (Husbands et al, 2014; McManus et al, 2013a; Sartania et al, 2014; Wright & Bradley, 2010), BMAT (Bell, 2005, Emery et al, 2011), Qudraat (Albishri et al, 2012), and a surgical admissions test for practical skills for admission to a Otolaryngology residency programme in the USA (Moore et al, 2014). Other researchers are sceptical of the reliability or effectiveness of the MCAT (Donnon, Paolucci & Violato, 2007), UKCAT (Yates & James, 2010), GAMSAT (Wilkinson et al, 2008), UMAT (Griffin, Yeomans & Wilson, 2013; Laurence et al, 2013; Poole & Shulruf, 2013; Puddey et al, 2014; Simpson et al, 2014; Wilkinson et al, 2011), BMAT (McManus et al, 2013b, McManus et al, 2011), and an unspecified admissions test (Al-Rukban et al, 2010). Some evidence suggests that students selected using an admissions test may be more able and better motivated to study medicine than

those selected using a process not including an admissions test (Kraft et al, 2013). Finally, one paper (McManus et al, 2011) reported a nuanced finding that section two (science knowledge and applications) of the BMAT was predictive of medical school performance, while section one (aptitude and skills) was not.

In summary, mixed evidence also exists on the fairness of admissions tests, with some research suggesting that certain groups score more highly on admissions tests than other groups, while other research suggests that this is not the case. For example, there is mixed evidence on the equity of admissions tests for different groups of medical school applicants (e.g., sex, age, language status, and socio-economic status) (Aldous et al, 1997; Callahan et al, 2010; Emery et al, 2011; Griffin et al, 2008; Lambe, Waters & Bristow, 2012; McManus et al, 2013b; Tiffin et al, 2014; Winegarden et al, 2012). Other evidence suggests that admissions tests are equitable with respect to candidate background, were affected relatively little by candidate coaching, and remained stable over time (McManus et al, 2013b; Emery et al 2011, Tiffin et al, 2014; Griffin & Wilson, 2010; O'Flynn, Fitzgerald & Mills, 2013), with the possible exception of the UMAT (Griffin et al, 2013).

The three admissions tests used in the UK are very different. UKCAT focuses exclusively on aptitude and currently a recently created SJT, while BMAT and GAMSAT assess pre-existing knowledge, of somewhat different types. Of the three admissions tests used in the UK, UKCAT has the most published evidence related to both predictive validity and fairness, BMAT the next largest body of work. GAMSAT has the least published evidence and those studies which we did identify were carried out in Australia not in the UK context. This may be, at least to some extent, an artefact of the relatively small number of graduate entry programmes in the UK.

3.2.2b. Situational Judgement Tests

Despite some concern about their susceptibility to coaching (Rostom, Watson & Leaver, 2013), overall there is a good level of consensus among researchers that situational judgement tests (SJTs) are a reliable and valid selection method across a range of occupations, including selection of medical students (Cabera & Nguyen, 2001; Christians, Edwards & Bradley, 2010; Hansel et al, 2010; Libbrecht et al, 2014; Lievens, 2013; Lievens, Buyse & Sackett, 2005; Lievens, Peeters & Schollaert, 2008; Patterson et al, 2009).

Six studies were identified examining the appropriateness of SJTs as a component of a wider selection process (Ahmed, Rhydderch & Matthews, 2012; Clevenger et al, 2001; Lievens et al, 2008; O'Connell et al, 2007; Patterson et al, 2009; Patterson et al, 2009). The weight of evidence across the studies reviewed suggests that SJTs can usefully be incorporated into selection procedures across numerous occupational groups.

In summary, there is a good level of consensus among researchers that SJTs, when properly constructed, can form a reliable, valid, cost effective and acceptable element of medical school selection systems. SJTs are a complex selection instrument, with a wide range of options available in relation to item formats, instructions and scoring. When these options are calibrated appropriately, research evidence points to the strength of SJTs in medical student selection for assessing non-cognitive attributes.

3.2.3. Interviews and Multiple-Mini Interviews (MMIs)

Despite some evidence to the contrary (Ann-Courneya, 2005; Donnon & Paolucci, 2008; Donnon, Oddone-Paolucci & Violato, 2009; Elam, Studts & Johnson, 1997; Kleshinski, Shriner & Khuder, 2008; Patrick et al, 2001; Peskun et al, 2007; Puddey & Mercer, 2014; Rahbar et al, 2001; Simpson et al, 2014; Van Susteren et al, 1999), the balance of evidence suggests that traditional interviews are generally not robust methods for selecting medical students, and lack predictive validity (Basco et al, 2008; Basco et al, 2004; Baco et al, 2000; Benbassat & Baumal, 2007; Case et al, 2014; Fan et al, 2010; Kreiter et al, 2004; Prideaux et al, 2011; Streyfeller et al, 2009; Trost et al, 1998; Wilkinson et al, 2008) with Edwards and colleagues (2013) finding that poorer interview performance was associated with greater medical school GPA. The mixed findings on the effectiveness of interviews may reflect the broad range of traditional interview methods, from relatively unstructured individual interviews, to highly structured panel interviews. However, Eva and Macala (2014) found no difference in the reliability of interviewer ratings between unstructured and structured multiple-mini interview (MMI) stations, although behavioural indicator stations differentiated between candidates more reliably than did other station types.

The findings from research on MMIs tend to be more directionally consistent than research on traditional interviews: for example, the psychometric properties of MMIs are usually reported to be adequate (Campagna-Vaillancourt et al, 2014; Dore et al, 2010; Eva et al, 2004; Hofmeister et al, 2008; O'Brien et al, 2011; Roberts et al, 2008). However, Hissbach and colleagues (2014) found that rater bias had a greater effect on applicant scores than systematic differences in candidate performance. There is little clarity about what is being measured within the different approaches described and tightly standardised face-to-face interviews may not be comparable with scenario based MMI stations utilising standardised actors.

Consistent evidence is emerging of the predictive validity of MMIs, when exploring the correlation between performance on MMIs and subsequent performance on both undergraduate and postgraduate Objective Structured Clinical Examinations (Eva et al, 2004; 2009; Hofmesiter, Lockyer & Crutcher, 2009; Reiter et al, 2007; Roberts et al, 2008; Rosenfeld et al, 2008) and other examinations (Hopson et al, 2014; Pau et al, 2013).

In summary, interviews are among the most widely used selection method for medical school admissions. Evidence suggests that traditional interviews lack the reliability and validity that would be expected of a selection instrument in a high stakes selection setting. Evidence also suggests that the MMI offers improved reliability and validity over traditional interview approaches. Further study is warranted in relation to the reliability of the MMI method, and its predictive validity, particularly with respect to which attributes can be assessed reliably (e.g., communication, critical thinking, empathy, etc.). More evidence is required as to the appropriateness of criteria that can be assessed in interviews, informed by validation studies.

The use of MMIs has spread rapidly in recent years as they can be designed to be a reliable selection method. However, issues surrounding the construct validity of MMIs remain problematic: it is critically important that schools understand what they are seeking to measure, and actually are measuring, when introducing and using this approach.

3.2.4. Selection Centres

Provisional evidence has been presented that SC methods may be reliable and internally valid for assessing applicants' aptitude for medicine (Gafni et al, 2012; ten cate & Smal, 2002; Ziv et al, 2008) and have predictive validity for performance in postgraduate speciality training (Gale et al, 2010; Lievens & Patterson, 2001; Patterson et al, 2013; Randall et al, 2006a, Randall et al, 2006b;).

In summary, research on the utility of SCs for medical student selection was relatively sparse. Evidence on predictive validity for postgraduate selection is stronger, so further evidence is required to explore their use in medical school selection, as this appears a promising approach if logistic issues can be addressed.

3.2.5. Personal Statements

Evidence is mixed on the predictive validity of personal statements. Although some evidence has been found for the predictive validity of personal statements for medical school drop-out rates (Urlings-Strop et al, 2013), performance on internal medicine (Peskun et al, 2007), and clinical aspects of training (Ferguson et al, 2003), others have reported that personal statements have low reliability compared to other common selection instruments (Oosterveld & ten Cate, 2004) and were not predictive of subsequent success at a medical school (Ferguson et al, 2000).

In summary, evidence on the effectiveness of personal statements in medical student selection is mixed at best. Some evidence exists to support the predictive validity of personal statements. However, a large volume of research evidence suggests that the selection method lacks reliability and validity. Personal statements remain widely used in medical school selection worldwide, despite concerns that the effectiveness of the selection method is influenced by numerous extraneous factors. The content of personal statements may also unfairly cloud the judgement of individuals making selection decisions.

3.3. Summary

In Table 3, we summarise our review regarding the "evidential weight" and relevance for each of the selection methods reviewed in this section of the report, in terms of: essentially validity, which is currently largely measured as success at medical school, reliability and process/fairness (in respect of WA and susceptibility to coaching).

This summary is an interpretation of the literature and should be viewed with caution, as no direct research evidence is currently available in many of these areas. However, we believe this overview will be of use to those involved in medical school admissions.

Table 3. Interpretation of the Wider Literature Relating to Various Selection Methods.

	Effectiveness		Process/ Fairness	
	Reliability	Validity	Potential to Enhance Widening Access/ Diversity	Potential for Susceptibility to Coaching
Traditional Interviews	Low	Low	Low	High
MMIs	Moderate to high	Moderate	Moderate	Low to moderate
Admissions Testing	High	Various	Various	Low to moderate
Academic Records	High	High	Low	Not applicable
Personal Statements	Low	Low	Low	High
SJTs	High	Moderate to high	Moderate to high	Low to moderate
Selection Centres	Moderate to high	Moderate to high	Unknown	Unknown

Key Messages

This review has identified some clear messages about the comparative reliability, validity and effectiveness of various selection methods for medical school admission.

The academic attainment of candidates remains a common feature of most selection policies and the strength of evidence for continuing to do so remains strong.

The strength of evidence paints a relatively clear picture regarding structured interviews/MMIs, admissions testing and SJTs being effective across several criteria. Selection centres appear worth exploring further.

In terms of assessing different types of factors, the data suggests that SJTs and MMIs are the most valid predictors of inter- and intra-personal (non-academic) attributes such as empathy and integrity.

The picture at this point in time is less clear for admissions tests generally but there is emerging evidence UKCAT and BMAT can enhance predictive validity and improve fairness.

The strength of evidence for continuing to use personal statements is low.

There is very little research on the incremental predictive validity of combining selection tools, although this is common practice.

4. Review of Values-Based Recruitment (VBR) for Medical Schools Admissions

4.1 Introduction

The report of the Mid Staffordshire NHS Foundation Trust Public Inquiry (Francis, 2013) highlighted the critical role that the workforce plays in ensuring the provision of high quality and safe healthcare services and, in particular, the significance of staff values and behaviours on the level of care and patient experience. As such, it is necessary to ensure that selection systems for healthcare roles measure whether applicants have the appropriate values to work in the context of care.

In order to address this requirement, values-based recruitment (VBR) has been identified as a core objective in the NHS Health Education England (HEE) Mandate (April 2013 to March 2015). This mandate recommends that VBR is integrated into NHS funded training programmes and employment. Therefore it is critical that medical schools in the UK (which are funded by the NHS) select students in line with the values of the NHS constitution (<http://www.nhs.uk/NHSEngland/thenhs/about/Pages/nhscoreprinciples.aspx>), and the GMC's Good Medical Practice (GMP) guidelines, to ensure that future doctors have the appropriate values to provide high level and safe patient care, and to work within the NHS. A full systematic search and review of this topic is reported in Patterson et al (in press).

4.1.1 Defining Values

Values are a set of *enduring beliefs* which a person holds about what is good or desirable in life. Each individual holds numerous values, and a particular value may be very important to one person but unimportant to another (Schwartz, 2012). Whilst values tend to be relatively stable over time they can change or adapt based on an individual's experiences or environment (Rokeach, 1973).

Values are evaluative - they guide individuals' judgments about appropriate behaviour both for oneself and for others. *Values are also general* – they transcend specific situations. *Values are motivational goals that influence behaviour* - but simply holding a value does not mean an individual will always behave in a way which is consistent with that value: other factors that influence behaviour include knowledge, skills, experience, personality & motivation. Additionally, because values are ordered by importance, one will tend to act according to the more important value when two values are in conflict.

Research suggests that values develop initially through social interactions with role models such as parents and teachers. Because values are learned, there tend to be similarities in value patterns within cultures, as shared values are passed from generation to generation (Meglino & Ravlin, 1998; Oishi, Schimmack, Diener & Suh, 1998). Values are shaped during adolescence, however they are generally quite stable in adulthood (Kapes & Strickler, 1975; Rokeach, 1972). Nonetheless, because values are learned initially through social interactions, being exposed to a new social environment can facilitate changes in one's values structure, which is why socialisation efforts can sometimes change the values of newcomers to become more like those of the organisation (Cable & Parsons, 2001). Not all individuals respond equally to socialisation however, suggesting that some individuals are less willing to make changes in their values structures than others (Weiss, 1978).

Although values share similarities with personality traits, the two are conceptually distinct. Personality relates to enduring dispositions, whereas values relate to enduring goals. While personality generally represents the behaviours that come most naturally, values reflect effort (a choice) to behave in a certain way (Parks & Guay, 2009; 2012). This is an important distinction when considering assessment tools and measures (see Table 4).

4.2 Results

A range of sources were used in the review. These included databases, journals, government reports, web searches and expert contacts. Twenty-four relevant papers were identified and reviewed, spanning from January 1997 to August 2014. Please see Patterson et al (in press) and the Appendix for full details of the search methodology and search terms.

A key objective of this section of the literature review was to explore the evidence base underpinning the effectiveness of VBR and how this relates to important outcomes in the medical context, especially with regard to demonstrating care and compassion towards patients. The research provides several important insights regarding the impact of value congruence between employees and organisations. As may be anticipated due to the fact that VBR is a relatively new focus within selection both more broadly and in the medical context specifically, there was limited published research evidence relating to VBR directly. However, while the terminology of VBR is new, the concept of fitting a person's values to a working environment is not. For example, there is much existing research on person-organisation or person-job fit predicting increased employee satisfaction.

The majority of the literature retrieved describes the impact of value congruence on other outcomes (largely from the employee perspective) such as job satisfaction and employee turnover (e.g., Amos & Weathington, 2008; Kristof-Brown, 2002; Meglino & Ravlin, 1998; Verquer et al, 2003), with very little research focusing on job performance or specific behavioural outcomes. For example, the majority of studies explore the impact of value congruence between employees' organisational commitment (affective, normative and continuance) and intended turnover (i.e., intentions to quit). These findings are of relevance regarding selection in the medical profession, as Ostroff et al (2005) reported that value incongruence between the employee and their organisation (i.e., the NHS) was likely to lead to frustration, difficulty in working effectively with others and a lack of role clarity from the perspective of the employee. As such, if a trainee doctor's values are incongruent with those of the NHS (where they will ultimately be working), their clinical performance may be compromised.

'Humanity values' have been identified as important for doctors (and may therefore be considered during selection into medical school). These are defined by Finegan (2000) as courtesy, consideration, co-operation, fairness, forgiveness and integrity, and link to the NHS's core values (Compassion; Working Together for Patients; Respect and Dignity; Commitment to Quality of Care; Improving Lives; Everyone Counts), and GMP domains (Knowledge, Skills and Performance; Safety and Quality; Communication, Partnership and Teamwork; Maintaining Trust). Providing evidence that these values are enacted in the NHS constitution, Dixon-Woods et al (2013) interviewed over

300 healthcare workers in the NHS and found that virtually all valued the ideal of providing a safe, high quality service and good patient experience.

Taken together, these findings suggest that the values of the NHS and GMP domains are necessary values for individuals wishing to work in the NHS to hold, in order to provide compassionate, safe care and to remain engaged and committed to their work in the NHS organisation.

Despite limited published research on VBR in the medical profession, medicine remains at the forefront of VBR compared to other healthcare professions. Indeed, Rankin (2013) states that VBR processes may help to identify practitioners who are better prepared to provide person-centred care.

4.3 The Role of Medical School Admissions Deans in VBR

A number of studies reported the importance of recruiters' own values in the selection decision-making process. In the case of medical schools this would pertain to the Admissions Dean and similar roles. The challenges of implementing VBR across a large organisation such as medical schools are perhaps highlighted by the outcomes of a study that investigated person-organisation fit (value congruence) amongst newly appointed employees placed in different departments within large companies in the Netherlands (van Vianen, 2000). This study revealed that recruiters from different branches within the organisation differed in their perceptions of the organisational culture, particularly with regard to values associated with human relations and innovation. As such, when measuring values, if the methods/tools used are based on criteria that require agreement between members of the organisation, this may be a challenge in complex organisations where multiple structures and hierarchies exist (van Vianen, 2000), such as within medical schools. Therefore, medical Admissions Deans and others responsible for making decisions during VBR will have a significant impact on the 'type' of student selected. Where variation exists amongst recruiters with regard to their own value congruence with the NHS's values of high quality, compassionate care, it is important to ensure that those responsible for recruitment (particularly when interviewing) represent the values that the medical school and the NHS are seeking to attract.

4.4 Measurement Tools for VBR

The research evidence would imply that assessing values in recruitment is more challenging than assessing abilities and skills (e.g., cognitive and technical ability). Nonetheless, the diversity of measurement tools claiming to be of use for VBR is noteworthy, and research providing a more detailed evaluation of the measures is required to determine the relative effectiveness and efficiency of each approach. However, provisional evidence suggests that some methods may align better with VBR than others, as outlined in Table 4.

Table 4. Overview of the Appropriateness of Selection Methods for VBR

Selection Method	Evidence for Effectiveness
Personal statements	Whilst candidate acceptability is high, susceptibility to coaching is also high. No evidence of validity.
References	Use of references remains widespread despite little research supporting validity or reliability.
Situational judgement tests	Evidence of predictive validity when designed appropriately. Whilst SJTs can be relatively costly to design, SJTs are machine-markable & can be delivered on-line, producing cost savings in high volume selection.
Personality testing	Evidence of predictive validity when designed appropriately. Susceptibility to coaching can be a concern. Personality tests compliment interviews to guide focused questioning & are useful in attraction /self-assessment.
Traditional interviews	Across most evaluation criteria, traditional interviews perform poorly.
Structured interviews, e.g., competency-based, situational, multiple-mini interviews (MMIs)	Interviews based on a thorough role analysis, using standardised questions with trained interviewers & appropriate scoring can be reliable and valid. Probing questions may be used to explore values. Candidates prefer interviews to other methods although they are relatively resource intensive.
Group interviews	Whilst group interviews appear more cost efficient in terms of assessor time, evidence for reliability, validity & fairness is lacking.
Selection centres using work samples, e.g., group exercises, written/in-tray task, presentations, interactive exercises	When designed appropriately (using a multi-trait, multi-method approach), SCs are valid predictors of job performance. Candidates are positive towards SCs as they have multiple opportunities to perform. SCs are relatively expensive to design & implement.

4.5 Summary

Although the concept of, and evidence base for, VBR remains in the early stages, it is apparent that the value of providing high quality, safe and compassionate care (as advocated by the NHS constitution and the GMP domains) may be necessary for individuals wishing to work in healthcare. As such, medical schools should assess for these values during their selection process using selection methods appropriate for VBR, and ensuring that recruiters appropriately represent these values.

Key Messages

There is a limited literature on the use of VBR in the medical context. However, certain values that align with the NHS institution's core values, and GMP guidelines, including consideration, patient care and 'humanity' have been identified as being important for doctors.

Given that medical schools are selecting and training people to work in the NHS, it is important to ensure that the values of the NHS are appropriately represented and measured during selection into medical school.

More research is required to determine the relative effectiveness and efficiency of selection methods for use in VBR. However, provisional evidence suggests that structured interviews, MMIs, SJTs, and selection centres may be effective methods for VBR when designed appropriately. Personality testing may also be used to compliment interviews in VBR.

5. Review of the use of Contextual Data in Medical School Admissions

5.1 Introduction

Increasing the demographic variability of medical students remains a major policy issue in the UK. In the context of university admission, widening access (WA) refers to the policy that students from disadvantaged backgrounds, mature students, disabled students and those from ethnic minority groups should be encouraged into higher education (HE). One way of doing this is by actively encouraging participation from under-represented groups, addressing perceived barriers and compensating for educational inequalities and disadvantage in terms of individual participation in HE to increase social mobility, and allow opportunities for progression in terms of occupation or income.

A second rationale for WA to medicine is to improve healthcare provision, by ensuring doctors are representative of society (British Medical Association, 2009, p.8). This assumes that increasing the diversity of the medical workforce will improve healthcare, based on the assumption that “like would treat like” (James et al, 2008), and that a diverse medical workforce may ‘bridge the gap’ between the healthcare system and individuals who feel disenfranchised from the system due to distrust or cultural and linguistic barriers (Girotti, Park & Tekian, in press).

Cleland et al’s (2012) GMC report examined the activities undertaken by UK medical schools to widen access, and reviewed the available evidence on the effectiveness of WA initiatives used by medical schools to promote fair access. This section of the rapid review aims to build upon the key messages of this earlier report by bringing together the literature on the use of contextual data in medical school admissions.

Box 1: Defining Contextual Data

The Admissions to Higher Education Steering Group (2009), the Panel on Fair Access to the Professions (2009) and, more recently, University Challenge: How Higher Education Can Advance Social Mobility (2012) call for all UK Universities to take into account the educational and social context of applicants’ prior achievements when making their admissions decisions. The British Government has encouraged universities to make greater use of “appropriate contextual criteria” in their admissions procedures (Williamson, 2004, p.10), to level the playing field and to recognise that the link between potential and prior achievement requires more than just looking at A levels/Highers.

The use of contextual data means evaluating an application to university in its educational or socio-economic context, such as acknowledging the type of school attended. Approaches to applying contextual data may include ‘flagging’ (identifying applicants who meet one criterion), ‘triangulation’ (identifying applicants who meet several criteria) and ‘flagging and adjusting’ (making changes to the ‘raw’ grade score of an applicant based on them meeting one or more criteria).

The risks of not contextualising admissions to university include the possibility that students with genuine potential who are likely to do well in HE may be missed, the possibility of restricting the pool of potential students, and making existing inequalities worse by benefiting groups who already have access to good prospects.

A range of sources were used in the review. These included one database, a number of journals, government reports, web searches and expert contacts. This search aimed to examine the available evidence on and recommendations for the use of contextual data in WA initiatives. Eight relevant papers were identified and reviewed, spanning from January 2012 to August 2014. Please see the Appendix for full details of the search methodology and search terms. Recent Medical School Annual Returns (MSAR) and websites were also reviewed for information on the use of contextual data in medical admissions.

5.2 Results

The literature contains a distinct lack of research studies examining the use, and outcome, of contextual data in medical schools admissions. We were unable to identify any published studies or grey literature assessing the predictive validity of contextual markers used at the admissions stage with retention and performance at medical school and beyond, compared to “traditional” medical students. Those studies which have focused on this question have tended to study groups of students who received extra support such as an extended programme, a foundation year or mentoring and extra tuition, making it difficult to tease out how these students would have performed without additional help (e.g., Garlick & Brown, 2008; Girotti et al, in press; Mathers et al, 2011). However, in a study drawing on data from across the higher education section, HEFCE (2014) found that state school students tend to do better in their degree studies than students from independent schools with the same prior educational attainment. This may suggest that those applicants from state schools who are able to gain the required academic attainment to meet the criteria for medical school admissions are different from those coming from independent school, perhaps in terms of factors such as resilience (this suggestion is supported by as yet unpublished data from Medhi & Cleland). In short, there is a lack of evidence for the effectiveness of contextual data in selecting good medical students and doctors.

This lack of evidence may explain, at least to some extent, the diversity of contextual data currently used by UK medical schools, from school locality, to home postcode, to taking part in a widening participation activity, to being the first in family to go to university. We have included in this section a table setting out an overview of categorisations of types of contextual data, and the potential issues associated with each (Table 5). This is a summary of a table presented in the Supporting Professionalism in Admission (SPA) contextualised admissions report (2013), and provides an overview of categorisations of types of contextual data, and the potential issues associated with each.

There are also practical obstacles to using contextual data. For example, which contextual markers are robust, for whom? It is becoming increasingly difficult for universities to find and use comparable contextual data that can be applied fairly to all applicants, as differences in the education systems in regions of the UK widen (BIS 2012, 2013; National Statistics Scotland, 2013; DELENI, 2103; HEFCW, 2009). Resource is another possible obstacles: CFE and Edge Hill University (2013) noted that lack of buy-in at senior level, the amount of time, resources, expertise and data systems required to effectively apply contextual data as part of the admissions process, and difficulties in the availability and coverage of data are all possible problems in implementing the use of contextual data.

Table 5. Overview of the Types of Contextual Data that may be used by University Admissions Tutors, and Possible Issues²

Type and Description	Possible Problems
<p>Area/ Community Focused Socio-economic data, area-based deprivation indicators, measures of participation. Postcode data allows analysis of the area in which applicants live against a range of data related to socio-economic indicators of relative disadvantage or rates of higher education participation.</p>	<p>Area-based measures are not necessarily indicative of specific individuals' circumstances, e.g., Taylor et al (2013) found that 6% of students from independent schools were located in low participation neighbourhoods (LPNs). Populations within neighbourhoods do not necessarily share the same characteristics.</p>
<p>School or College Focused Types of establishment, rates of higher education progression or levels of disadvantage within the school/college population. Enables consideration of individual applicants in the light of the circumstances in which their attainment is achieved.</p>	<p>School performance is often related to the school type (e.g., independent schools are overrepresented amongst the highest performing schools). Issues arise in regards to whether applicants correctly report their educational establishment in their UCAS application as well as the question how to treat applicants who have changed schools. The data may be hard to interpret e.g., some applicants may overachieve in underachieving schools, some 'disadvantaged' schools may achieve good performance and some schools may manage the curriculum to influence their results. Comparing individual pupil attainment against a school's average may indicate higher performance levels than their peers.</p>
<p>Individual Focused Factors particular to the individual, including family history of higher education, low income household, care status.</p>	<p>Aims to identify a person's constraints and opportunities. This is mainly self-declared data and is thus susceptible to misinformation/misunderstanding and can be difficult to verify. Classification may be problematic and non-response can affect coverage of the data. Data available at the point of admission may not be available to researchers after a certain point and is not available to providers as part of admissions decision making.</p>
<p>Outreach Focused Identification of attendance on a targeted widening participation activity.</p>	<p>Individuals' circumstances may be assessed at the pre-entry stage for inclusion in outreach programmes. This helps to reaffirm the providers' commitment to widening access, and outreach data can be linked to applicants. There are small numbers in these types of programmes and they are not open to all (usually there is a local focus). Validating participation and completion in targeted programmes can be problematic (relies on institutional widening participation teams to input). Targeting of different outreach provision could be inconsistent. Communication may be an issue: outreach policies and programmes may change over time.</p>

² Adapted from Moore, Mountford-Zimdars & Wiggans (2013)

Moreover, medical schools are reluctant to take risks. There are issues with balancing the needs of competing admissions priorities, including student number control and league table rankings. There may be a fear of being seen to be dropping standards. Likewise, SPA's (2013) report outlined the possibility that some universities may be concerned that an offer with reduced entry grades may negatively affect applicant perceptions of the quality of the provision. However, at the same time, there is an oft-voiced need for reliable contextual data, particularly in relation to graduate entrants to medicine. Although this quote is not specific to medicine, it sums up the issues aptly: *"Graduate admissions are concerned about access and social mobility however there is almost no information, guidance or even research we are aware of on appropriate contextual factors to use when considering graduate applicants"* (SPA, 2013, p.4).

With reference to our overview of values-based recruitment (VBR), the SPA (2013) report states that contextual data and the indicators used in admissions should be "strategically aligned to what providers wish to achieve in using them... Such strategic alignment would also aid the evaluation of the effectiveness of the use of indicators." This suggests that the use of contextual data must be part of a bigger strategic plan of widening access to medicine: in other words schools need to be clear as to what they wish to accomplish by supporting WA to medicine. Only once this is clarified, can they map out their approach to doing so.

5.3 Summary

There is little research examining the use, and outcome, of contextual data in medical schools admissions. This lack of evidence may explain, at least to some extent, the diversity of contextual data currently used by UK medical schools. There are also practical and reputational obstacles to using contextual data.

Key Messages

There are many possible markers of contextual data that may be used in the process of WA to medical school, each with their own advantages and disadvantages. However, there is little evidence or understanding of which markers are "best", and how these should be used.

As with other selection methods, accuracy and effectiveness, cost and efficiency, practicalities of implementation, and stakeholder acceptance and feedback should be considered when deciding which indicators of contextual data should be used in selection.

Medical schools must identify precisely what they wish to achieve by using contextual data to WA to medicine.

More research is required on short, medium and long term use of contextual data and its effects.

6. Survey – Selection Approaches

6.1 Introduction

The aims of this part of the project were to:

- Elucidate Admissions Deans' knowledge, attitudes and preferences in terms of what they are measuring in their current selection processes, and potential ways forward.
- Explore further what contextual variables (e.g., at the level of individuals, medical school, and locality) might influence acceptance and implementation of a "selection framework".

It became clear early in the project that the timing (over the summer months) was a barrier to repeated online exercises. Thus, we adjusted our original approach of a multi-stage consensus exercise to that of a one-off online survey, tailoring the survey content to ensure the above aims were addressed without the need for repeated demands on Admissions Deans and staff.

As planned, we offered respondents a comprehensive list of barriers to, and a separate list of facilitators for, changing selection processes. These lists were generated from the rapid reviews (see earlier), the case study interviews (see earlier) and data from Admissions Deans already held by the applicants (i.e., from the GMC and SEEG 2013 projects). We asked Admissions Deans to rate these in terms of importance on Likert scales. Free text responses were used throughout the survey, linked to each section, so respondents would, for example, explain their reasons for ranking, and have the opportunity to add their own thoughts and views to the process. Also as planned, we asked about the following: what criteria/characteristics/ attributes admissions Deans consider they are measuring during their current selection processes; what priority they give each criterion; and perhaps what they might like to measure but currently do not (and reasons for such gaps).

Fifty-six individuals were invited to complete the questionnaire, 46 of whom responded. Two respondents did not disclose the name of their medical school and were therefore removed from analysis, leaving a total of 44 respondents (79% of invited individuals). At least one response was received from 32 of a possible 33 UK medical schools (97%). Respondents included Directors of Admissions (seven respondents, 16%), Admissions/Academic Leads (seven respondents, 16%), Admissions Tutors (two respondents, 5%), and Admissions Managers (two respondents, 5%). Respondents' time in post ranged from three months to 14 years (mean= 4.15 years).

Thematic analysis was used to categorise open comments. Metrics (e.g., two out of 10 people said) are not typically presented for the qualitative data: rather the free text comments are used to give context and insight into the forced choice responses, and to highlight where the numerical and free choice data gives conflicting messages. Free choice comments are indicated in the text by quotation marks and italics, or where stated.

The numerical data is presented descriptively. Where Likert scales were used, non-parametric statistical tests are presented (medians and inter-quartile range [IQR]).

We do not report directly on how prior academic performance or attainment is used in the selection process of the respondents' medical school. Open responses referring to the use prior attainment in relation to other aspects of selection are incorporated throughout this section of the report.

6.2 Personal Qualities

First, respondents were asked how important they think it is to assess a number of pre-defined personal qualities during selection into medical school using a Likert scale (1= not important, 6= very important). The content of this list was decided with reference to the qualities of a doctor set out in Good Medical Practice (GMC, 2013), cross-referenced to Tomorrow's Doctors 3 (GMC, 2013).

Thirty-nine respondents answered these questions and their responses are summarised in Table 6. Reassuringly given the origins of this list, all the personal qualities on the list were rated by respondents to be important in medical school selection. The personal qualities of prior academic attainment, academic potential, empathy and sensitivity, verbal communication skills, professional and personal integrity, and self-awareness were considered most important. Scientific knowledge was considered by respondents to be slightly less important than the other personal qualities (perhaps as it is a more 'trainable' quality).

Table 6. Descriptive Statistics for Responses to the Importance of Assessing the Personal Qualities Advocated in Good Medical Practice and Tomorrow's Doctors

Personal Quality	Median Response	IQR
Prior academic achievement	6	1
Academic potential	6	1
Ability to critically evaluate and apply information	5	2
Scientific knowledge	4	2
Empathy and sensitivity	6	1
Decision making skills	5	1
Verbal communication skills	6	1
Written communication skills	5	1
Problem solving/ conceptual thinking	5	1
Professional and personal integrity	6	0
Legal and ethical awareness	5	2
Self-awareness	6	1
Ability to work with others effectively as a team leader	5	2
Ability to work with others effectively as a team member	5	2
Knowledge of the role of a doctor within the UK NHS	5	1

The open comments indicated that a number of other personal qualities considered important to assess at the point of selection. These included resilience, personal organisation skills, "professionalism" and "character". There was a clear emphasis on values/character and an equally clear message that participants did not think there were adequate tools available at present to assess these as part of the selection process, presumably so applicants without the desired personal qualities could be rejected early on (but see VBR section of this report and the recommendations):

"I do not feel that we have an adequate assessment of resilience, in the sense of ability to cope when things go badly."

"I wish we could assess conscientiousness and organisational skills - as many of the students who cause problems seem to lack these qualities! Similarly with probity & integrity - we catch some out who have been less than truthful in their personal statement, but there is not a systematic assessment of these values."

Key Messages

A large range of personal qualities were considered important to assess at the point of selection to medical school.

Participants did not think that there are adequate tools available at present to assess these as part of the selection process.

6.3 Admissions Tests

Respondents from within five medical schools did not agree internally on whether, and/or which admissions test was used. These medical schools were removed from analysis. Of the remaining 27 medical schools, 22 (81%, 27 respondents) indicated that they use an admissions test, and five medical schools (19%, five respondents) indicated that they do not. Of these:

- Seventeen medical schools reported using UKCAT (77%, 22 respondents)
- Five medical schools reported using BMAT (23%, five respondents)
- No included responses (see earlier) stated that their medical school used GAMSAT. Publically available data indicates that GAMSAT is used by a small number of schools for selection to graduate entry courses, or for graduate entrants to five or six year courses

6.3.1 How are Admissions Tests used “On the Ground”?

A highly diverse range of uses was described by those who provided free-text comments (n=35) in this section of the survey. Note that these comments may have come from respondents who did not indicate clearly in the forced-choice questions whether or not their school used an admission test (and hence were excluded from the quantitative data reporting).

Ten respondents described some form of weighting process where the test outcome was weighted with the outcomes of other selection tools (“*Weighted as part of a range of tools.*”) The weighting systems were quite subtle, usually using not just total scores but sub-scale/sub-test scores also. Thirteen described using some form of cut off (e.g., if test score is greater than x, the applicant goes forward in the selection process). “*As a hurdle to pass to the next stage only.*” Two described using the admissions test outcome when making decisions about borderline candidates. “*Used only to deselect if score below a certain level.*”

Some of the free-text responses implied that admissions test scores were not used beyond interview selection, while others specified that the admissions test score was part of the final decision weighting. In summary, the open comments indicated a complex and evolving picture in terms of admissions test use, with similarities irrespective of test used and signs of increasingly subtle uses emerging.

There was a clear message that one of the advantages of using an admissions test as part of the selection process could allow minimum academic criteria to be lowered, hence increasing access. On the other hand, there remain concerns about the predictive validity of admissions tests, and the open comments indicated that concerns of this nature pertain to any new selection tool.

6.3.2 What does an Admissions Test Assess?

Respondents were asked to indicate, from the pre-defined list (see earlier), which personal qualities they believe are assessed by the admissions test. Overall, the most common personal qualities considered to be measured by an admissions test were: ability to critically evaluate and apply information, decision making skills and problem solving/ conceptual thinking (Table 7). Table 7 also shows a breakdown of qualities assessed by test. It is difficult to compare across tests given the small number of responses for BMAT but the findings indicate that the UKCAT is considered to test the qualities of problem solving/conceptual thinking and decision making skills by a larger proportion of respondents than is BMAT. On the other hand, a larger proportion of BMAT users (albeit it very small numbers of respondents) consider BMAT to assess scientific knowledge, empathy and sensitivity, verbal and written communication skills, professional and personal integrity, legal and ethical awareness.

Table 7. Which Personal Qualities are Assessed by Admissions Tests?³

Personal Quality	All Respondents	By Individual Admissions Test	
	Considered to be assessed by Admissions Tests Overall (% of respondents)	Considered to be assessed by UKCAT (% of respondents)	Considered to be assessed by BMAT (% of respondents)
Academic potential	9 (33%)	6 (27%)	3 (60%)
Ability to critically evaluate and apply information	25 (93%)	20 (91%)	5 (100%)
Scientific knowledge	6 (22%)	1 (5%)	5 (100%)
Empathy and sensitivity	3 (11%)	3 (14%)	5 (100%)
Decision making skills	22 (81%)	19 (86%)	3 (60%)
Verbal communication skills	7 (26%)	7 (32%)	5 (100%)
Written communication skills	7 (26%)	3 (14%)	4 (80%)
Problem solving/ conceptual thinking	22 (81%)	19 (86%)	3 (60%)
Professional and personal integrity	3 (11%)	3 (14%)	5 (100%)
Legal and ethical awareness	3 (11%)	3 (14%)	5 (100%)

6.3.3 How Confident are Respondents on the Fairness and Defensibility of Admissions Tests?

Respondents were asked to rate their confidence in an admissions test as *fair*, *defensible* and *not a barrier* to medical education to those from lower income and under-represented backgrounds (the last being a specific indicator of fairness) using a Likert scale (1= no confidence, 7= complete confidence). Both UKCAT and BMAT scored well on fairness (median= 6, IQR= 1; median= 6, IQR= 1.5 respectively), defensibility (median= 6, IQR= 1; median= 7, IQR= 0.5 respectively) and not being a barrier (median= 6, IQR= 1.25; median= 6, IQR= 2.5 respectively).

³ Qualities which one or fewer respondents considered the selection method to assess are not listed in the table. Please see Table 1 for a full list of the personal qualities.

Key Messages

The data suggests that the majority of medical schools use admissions tests but how they use them differs substantially.

There were commonalities but also differences between various admissions tests currently used in the UK in terms of which qualities respondents believed each test measures. Both UKCAT and BMAT users were generally highly confident in the test's fairness and defensibility.

Perceived lack of predictive validity data for the use of admissions tests in medical school selection is a concern for some of those involved in admissions.

6.4 Personal Statements

Respondents from two medical schools did not agree internally on whether a personal statement is used in selection, and therefore these medical schools were removed from analysis. Of the remaining 30 medical schools, 21 (70%, 25 respondents) indicated that they used personal statements, and nine medical schools (30%, 12 respondents) indicated that they did not do so in the selection process.

6.4.1 How are Personal Statements used “On the Ground”?

From 26 open comments, 12 people reported that personal statements were rated and then these ratings contributed to selection for interview. In other words, the personal statement ratings were weighted with other information (such as admissions test outcomes) to decide who was interviewed.

“Weighted, the primary means of selection for interview.”

“All applicants who meet or exceed the minimum academic and UKCAT requirements have their personal statements assessed.”

Three mentioned screening out applicants based on negative factors in the personal statement.
“Solely reviewed as the last step before making offers. Review is only to identify any negative aspects that may warrant further enquiry.”

Two people said that their schools used the personal statements to create widening access flags. Four stated the personal statement is used within interviews, a further two said the personal statement is used within a multiple-mini interview (MMI) station, or within the interview:

“Only used at interview as a prompt for questions.”

“A starting point for discussion in one of our MMI stations. The main function of this is to check on its validity. Provided there are no concerns over its validity, the personal statement does not contribute directly to the selection process.”

Many comments suggested that the weight given to the personal statement was falling (e.g., “We are planning on removing personal statements from our selection process” but equally there was a strong sense from the qualitative comments that the role of the personal statement was to gather character references or information on values. There was a strong sense that this was a crucial element that we simply do not have adequate tools to assess at present (but see earlier).

6.4.2 What does a Personal Statement Assess?

Respondents were asked to indicate, from the pre-defined list, which personal qualities they believe are assessed by the personal statement (see Table 8). Overall, the most common of these were: motivation to study medicine, knowledge of the role of a doctor in the UK NHS, and self-awareness.

Table 8. Which Personal Qualities are Assessed by the Personal Statement?⁴

Personal Quality	Considered to be assessed by the Personal Statement (% of respondents)
Motivation to study medicine	21 (84%)
Prior academic achievement	4 (16%)
Academic potential	3 (12%)
Empathy and sensitivity	13 (52%)
Verbal communication skills	6 (24%)
Written communication skills	9 (36%)
Professional and personal integrity	14 (56%)
Legal and ethical awareness	6 (24%)
Self-awareness	15 (60%)
Ability to work with others effectively as a team leader	13 (52%)
Ability to work with others effectively as a team member	12 (48%)
Knowledge of the role of a doctor within the UK NHS	18 (72%)

6.4.3. Confidence in Personal Statements

Respondents were asked to rate their confidence in the personal statement as *fair, defensible* and *not a barrier* to medical education to those from lower income and under-represented backgrounds using a Likert scale (1= no confidence, 7= complete confidence). Respondents reported a medium level of confidence (median= 3, IQR= 2.5) in the personal statement as a fair tool, with a notable number of respondents (9; 36%) rating 1 or 2. In terms of the defensibility of the personal statement as a selection tool, most respondents reported a low level of confidence (median= 2, IQR = 2.5), with, again, a notable number of respondents (13; 52%) rating 1 or 2. Respondents reported a medium level of confidence that the personal statement is not a barrier to medical education for students from lower income and other under-represented backgrounds (median= 4, IQR= 3), with a number of (5; 20%) 1s and 2s.

⁴ Qualities which one or fewer respondents considered the selection method to assess are not listed in the table. Please see Table 11 for a full list of the personal qualities.

Key Messages

The majority of medical schools still use personal statements, though the weight it is given appears to be reducing.

How the personal statement is used within the selection process varies widely.

Respondents believe that the personal statement assesses a wide range of personal qualities, including values/character, which are not assessed by any other selection tool, but the PS does not assess all desirable personal qualities.

There are low levels of confidence regarding the personal statement's fairness and defensibility.

6.5 Interviews and Multiple Mini Interviews (MMIs)

Respondents from two medical schools did not agree internally whether an interview is used in selection, and were therefore removed from analysis. This may have been an artefact of some schools using interviews for certain groups of applicants but not all applicants.

Respondents from 30 medical schools indicated that they use interviews. Respondents were then asked whether they use a structured interview or a multiple-mini interview (MMI). Respondents from two more medical schools did not agree internally which kind of interview is used, and thus were removed from analysis. This left a total of 28 medical schools (33 respondents), of which 15 reported using structured interviews (54%, 17 respondents) and 13 reported using MMIs (46%, 16 respondents).

6.5.1 How are Interviews used "On the Ground"?

Thirty-seven respondents provided free text comments. They described using traditional, structured and multiple-mini (MMI) interviews. Two indicates that their school was planning to move from individual interview to MMI.

How interviews were used varied. Of the 37 comments, 19 indicated that the final offer decision was 100% interview based.

"Once they've made it to interview, the outcome depends entirely on the interview score"

Five respondents stated that the interview score contributed 50% or less to the decision metric, with two of these applying a 'compensatory system' where excellence in one area (or WA) might offset interview score.

"Interview score for the graduate applicants makes up 30% of the overall score in our selection/scoring system."

"Interview score is worth 50% overall admission score and is added to the academic and UKCAT scores to determine who is offered a place."

Ten respondents were not clear how the interview score was weighted or used in selection decision making.

6.5.2 What does an Interview Assess?

Respondents were asked to indicate from the pre-defined list, which personal qualities they believe are assessed by the interview (see Table 9). Overall, the most common of these were: verbal communication skills empathy and sensitivity, and motivation to study medicine. Professional and personal integrity, and legal and ethical awareness were also commonly believed to be assessed by interviews. There were no notable differences across types of interview in terms of the personal qualities considered assessed by the interview.

6.5.3 Confidence in Interviews

Respondents were asked to rate their confidence in the interview as *fair, defensible* and *not a barrier* to medical education to those from lower income and under-represented backgrounds using a Likert scale (1= no confidence, 7= complete confidence). Both structured interviews and MMIs scored well on *fairness* (median= 6, IQR= 1; median= 6, IQR= 1 respectively), *defensibility* (median= 6, IQR= 1.5; median= 6, IQR= 1.75 respectively), *and not being a barrier* (median=6, IQR= 1; median= 5.5, IQR= 1 respectively). In summary, there were no notable differences between users of structured interviews and MMIs with regard to confidence in the interview's fairness, defensibility and that it is not a barrier to medical education for students from lower income and other under-represented backgrounds.

Table 9. Which Personal Qualities are Assessed by Interviews?⁵

Personal Quality	All Respondents	By Interview Type	
	Considered to be Assessed by Interviews Overall (% of respondents)	Considered to be Assessed by Structured Interviews (% of respondents)	Considered to be Assessed by MMIs (% of respondents)
Motivation to study medicine	31 (94%)	16 (94%)	15 (94%)
Prior academic achievement	2 (6%)	2 (12%)	0
Academic potential	5 (15%)	4 (24%)	1 (6%)
Ability to critically evaluate and apply information	23 (70%)	11 (65%)	12 (75%)
Scientific knowledge	5 (15%)	4 (24%)	1 (6%)
Empathy and sensitivity	32 (97%)	16 (94%)	16 (100%)
Decision making skills	19 (58%)	9 (53%)	10 (63%)
Verbal communication skills	33 (100%)	17 (100%)	16 (100%)
Written communication skills	5 (15%)	3 (18%)	2 (13%)
Problem solving/ conceptual thinking	25 (76%)	13 (76%)	12 (75%)
Professional and personal integrity	28 (85%)	13 (76%)	15 (94%)
Legal and ethical awareness	28 (85%)	14 (82%)	14 (88%)
Self-awareness	25 (76%)	13 (76%)	12 (75%)
Ability to work with others effectively as a team leader	22 (67%)	13 (76%)	9 (56%)
Ability to work with others effectively as a team member	25 (76%)	14 (82%)	11 (69%)
Knowledge of the role of a doctor within the UK NHS	26 (79%)	14 (82%)	12 (75%)

⁵ Qualities which one or fewer respondents considered the selection method to assess are not listed in the table. Please see Table 1 for a full list of the personal qualities.

Key Messages

Of the medical schools analysed approximately equal numbers reported using structured interviews and MMIs.

How the interview was used within the selection process varied from weighted with other information (academic performance and admissions test typically) to being the last hurdle in a process (and hence everything hangs on interview performance).

Both interview formats were believed by respondents to measure a wide range of personal qualities, with high levels of agreement between respondents regarding which personal qualities the interviews assess.

Overall, confidence was high regarding the interview's (either structured or MMI) fairness, defensibility and it not being a barrier to medical education for students from lower income and other under-represented backgrounds.

6.6 Selection Centres

Note that we did not provide a definition of what a selection centre is within the survey (see Table 1). Bearing in mind this caveat, three medical schools (10%, five respondents) indicated that they used a selection centre (SC) approach to selection.

6.6.1 How are Selection Centres used “On the ground”?

There were no open comments as to how SCs were used currently. However, what was of interest in the open comments was the number of participants who expressed the wish to move towards a SC approach. The reasons for this were two-fold: to process more applicants than was currently feasible due to logistical constraints and to allow a more extended assessment to enable assessment of personal (non-academic) characteristics, both of which could be achieved through a “shared” SC.

“I would like to subject every eligible applicant to the same assessment method, rather than selecting a sub-group (shortlisted by academic record, admissions test or other means), simply because of logistical constraints.”

“I would consider using a selection centre and test applicants over a period of a couple of days.”

6.6.2 What Does a Selection Centre Assess?

Respondents were asked to indicate, from the pre-defined list, which personal qualities they believe are assessed by the SC (see Table 9). Overall, the most common of these were: problem solving/ conceptual thinking, professional and personal integrity, verbal communication skills.

6.6.3 Confidence in Selection Centres

Respondents were asked to rate their confidence in the selection centre as fair, defensible and not a barrier to medical education to those from lower income and under-represented backgrounds using a Likert scale (1= no confidence, 7= complete confidence). One respondent did not answer the questions regarding their confidence in the SC, leaving a total of four respondents. As these numbers are small, the data must be interpreted with caution.

Respondents reported a medium level of confidence (median= 3.5, IQR= 5.75) in the SC as a fair tool, but with responses ranging from 1 (no confidence) to 7 (complete confidence). This exact pattern of results was repeated when respondents were asked to rate their confidence that the SC is not a barrier to medical education for students from lower income and other under-represented backgrounds, and to rate their confidence that the SC is a defensible selection tool.

Table 9. Which Personal Qualities are Assessed by the Selection Centre?⁶

Personal Quality	Considered to be assessed by the SC (% of respondents)
Motivation to study medicine	2 (40%)
Academic potential	1 (20%)
Ability to critically evaluate and apply information	1 (20%)
Empathy and sensitivity	3 (60%)
Decision making skills	1 (20%)
Verbal communication skills	4 (80%)
Written communication skills	3 (60%)
Problem solving/ conceptual thinking	4 (80%)
Professional and personal integrity	4 (80%)
Legal and ethical awareness	2 (40%)
Self-awareness	2 (40%)
Ability to work with others effectively as a team leader	2 (40%)
Ability to work with others effectively as a team member	2 (40%)
Knowledge of the role of a doctor within the UK NHS	2 (40%)

Key Messages

A small minority of medical schools report using SCs in their selection process.

There was notable variation in the personal qualities respondents believed that the SC assesses.

There was notable variation in terms of confidence regarding the SC's fairness, defensibility and it not being a barrier to medical education for students from lower income and other under-represented backgrounds.

The SC approach was attractive to those not using it, both as a means of processing more applicants and doing so more thoroughly than with current selection approaches.

6.7 Summary

Table 10 provides an overview of which selection methods are perceived to measure each personal quality provided to respondents. As mentioned earlier, the content of this list was decided with reference to the qualities of a doctor set out in Good Medical Practice (GMC, 2013), cross-referenced to Tomorrow's Doctors 3 (GMC, 2013).

Table 10 indicates that a number of personal qualities are considered to be measured by a number of selection approaches. For example, personal statements are mostly commonly considered to assess motivation for medicine, but so do interviews and MMIs. On the other hand, written communication skills are not considered by many people to be assessed by the personal statement (perhaps reflecting understanding that most applicants get a lot of help writing this).

⁶ Qualities which one respondent considered the selection method to assess are listed in the table due to the small number of medical schools using SCs.

Table 10. Overview of Personal Qualities Perceived to be Measured by Admissions Tests,

Personal Quality	Admissions Tests	Personal Statements	Interviews
Motivation to study medicine			
Prior academic achievement			
Academic potential			
Ability to critically evaluate and apply information			
Scientific Knowledge			
Empathy and sensitivity			
Decision making skills			
Verbal communication skills			
Written communication skills			
Problem solving/conceptual thinking			
Professional and personal integrity			
Legal and ethical awareness			
Self-awareness			
Ability to work with others effectively as a team leader			
Ability to work with others effectively as a team member			
Knowledge of the role of a doctor within the UK NHS			

Personal Statements and Interviews

No fill	0% respondents
	<25% respondents
	25-49% respondents
	50-74% respondents
	>75% respondents

Key:

6.8 Selection in an Ideal World

Respondents were also asked whether they would use the same selection tools in the same way in an ‘ideal world’. Twenty-five respondents (64%) indicated that they would **not** use the same selection tools in the same way while 14 respondents (36%) would do so. There were comments on this topic from 24 respondents. This qualitative data indicated that for those currently using structured interview, a key change would be to move to an MMI:

“Ability to interview all applicants in MMI formats.”

For those already using an MMI, change was mentioned in terms of MMI content change.

Quite a number of respondents mentioned variants of selection centres/shared assessments so more applicants could be processed, over longer periods of time:

“I would like to subject every eligible applicant to the same assessment method, rather than selecting a sub-group (shortlisted by academic record, aptitude test or other means), simply because of logistical constraints.”

As discussed earlier, the other rationale for changing to a shared SC was to allow a more extended assessment to enable assessment of personal (non-academic) characteristics:

“I would like to have a more intensive interview process, perhaps lasting over 2 to 3 days.”

However, there was much caution about change in the open comments (see later).

Key Messages

The data suggested that admissions tests and interviews (structured and MMI formats) were the most widely used selection tools, and that respondents also had the highest levels of confidence in these selection tools. Both were seen to measure a wide range of personal qualities with interviews (both formats) believed to measure more personal qualities than admissions tests.

The data indicated that the majority of medical schools used personal statements in their selection process but reported low levels of confidence in terms of both fairness and defensibility.

Approximately two-thirds of respondents would not use the same selection tools in the same way if they were able to change their selection process.

7. Survey - Widening Access and Contextual Data

7.1 Widening Access

“Widening participation involves taking away places from those with the greatest economic and social capital - and, by extension, the greatest capacity for complaint, appeal and use of media, MPs, etc. to make their cases - and giving them to those with the least voice and influence. Approaching this piecemeal leaves individual universities open to fatuous but well-orchestrated attacks for “social engineering”, “dumbing-down”, etc., as well as possible legal challenges. To make any meaningful progress, it is important that institutions agree on means as well as ends and act in a united way.”

We start this section with an open comment from the survey, one which exemplifies the issues associated with widening access (WA). While it is clear from the numerical and qualitative data related to WA that guidance on how to support WA to medicine would be welcome by medical schools, other concerns must be tackled for this to be impactful. We explore the issues below.

In the quantitative component of the survey, respondents were asked to indicate on a Likert scale the extent to which they agreed with a number of statements regarding widening access (WA) in medical schools admission (1= strongly disagree, 6= strongly agree). Thirty-nine respondents answered these questions, and their responses are summarised in Table 11. Responses varied widely but we have attempted to pull out common messages below.

Most respondents generally agreed that their medical school had a culture and tradition of supporting WA, and that the local selection processes supported WA to medicine. In contrast, there was strong agreement that poor careers advice and guidance from secondary schools is a barrier to widening access to medicine.

Overall, respondents tended to agree with the statement that “the use of contextual data lacks transparency and is hence indefensible” but there was wide variation in responses. While they tended to disagree with the statement “there is insufficient evidence to defend the use of contextual data in medical school admissions”, again responses were very mixed. Respondents were much more in agreement that medical schools need clear guidance as to what contextual data to use, and how to use this information in the selection process and national guidance should be defensible. They were equally clear that the use of contextual data in the selection process must actually be helpful in terms of widening access. This is uncertain currently, particularly for graduates:

“There is no clear definition of what constitutes a widening-participation student. The (vague) definitions that do exist only apply to school-leavers... Useful school performance data is not available for English/Welsh applicants, making contextual assessment of qualifications difficult, if not impossible.”

Respondents wished for a: “decent adversity marker to allow for a contextual twist.” There was strong agreement that more guidance should be available to medical schools on how to identify WA students so that contextual data could then be used appropriately:

“It would be really useful if there were central guidance on which data should be used to identify students from a WP background.”

Table 11. Descriptive Statistics for Respondents' Agreement with Statements relating to Widening Access (WA)

Statement	Median (IQR)	No. of Respondents Disagreeing or Strongly Disagreeing	No. of Respondents Agreeing or Strongly Agreeing
My medical school has a tradition of supporting widening access to medicine	6(1)	3 (8%)	30 (77%)
Secondary schools do not encourage and support students from widening access backgrounds to apply to medical school	4 (2)	8 (21%)	15 (38%)
The use of contextual data lacks transparency and is hence indefensible	4 (2)	11 (28%)	9 (23%)
Lower entry standards for some groups will reduce standards, and hence the reputation of my medical school	2 (2)	20 (51%)	4 (10%)
Poor careers advice and guidance from secondary schools is a barrier to widening access to medicine	5 (2)	2 (5%)	27 (69%)
Reporting on our approach to supporting admissions for students from lower socio-economic groups (MSAR) is a useful way of "taking stock"	5 (2)	3 (8%)	20 (51%)
The selection process itself disadvantages applicants from widening access backgrounds	4 (2)	15 (38%)	8 (21%)
In widening access applicants, there is no way of teasing out if not meeting the selection criteria is due to lack of opportunity or lack of competence	4 (3)	10 (26%)	16 (41%)
Widening access students are likely to perform poorly in medical school assessments	2 (2)	25 (64%)	2 (5%)
All widening access students should complete a Foundation/premedical year	2 (2)	29 (74%)	3 (8%)
There is sufficient evidence to support the contention that widening access to medicine will benefit patient care (i.e., in terms of like treating like)	4(2)	8 (21%)	17 (44%)
Widening access students require ongoing support throughout their time at medical school	4 (1)	9 (23%)	9 (23%)
There is insufficient evidence to defend the use of contextual data in medical school admissions	2 (3)	21 (54%)	12 (31%)
The use of contextual data in the selection process is helpful in terms of widening access	4 (1)	5 (13%)	17 (44%)
There is no defensible approach to selecting applicants without the required prior academic achievement into medical school	3 (3)	12 (31%)	10 (26%)
Medical schools need clear guidance as to what contextual data to use, and how to use this	5 (1)	2 (5%)	25 (64%)

information in the selection process			
Widening access students will be more likely to drop out and/or fail	2 (2)	20 (51%)	6 (15%)
Taking a risk on a student who does not achieve the selection standards disadvantages “traditional” applicants	3 (2)	9 (23%)	12 (31%)
The selection processes used at my medical school support WA to medicine	5 (2)	2 (5%)	28 (72%)
There is a lack of evidence as to what happens to WA students in terms of achievement/career path	5 (1)	2 (5%)	26 (67%)
My university has a culture of supporting widening access to higher education	6 (1)	2 (5%)	33 (85%)

In the quantitative data, there was general disagreement that WA students would perform poorly compared to traditional entrants, in terms of performance on medical school assessments, failing or dropping out, and there was little agreement that a Foundation/ premedical year was necessary for WA students. However, while this seems unambiguous, the qualitative data painted a different picture. Free text data confirmed some schools ambiguity on whether applicants should be considered with lower academic criteria not least because some medical schools were under considerable pressure from their universities to maintain tariff scores:

“Lower entry standards for some groups will reduce standards and hence the reputation of my medical school... Taking a risk on a student who does not achieve selection standards disadvantages ‘traditional’ applicants.”

“The medical school is discouraged from using contextual data to admit WP students, not because this lowers standards but because it reduces the average admission score which impacts directly on income, and reduces scores in some ranking tables, which impacts on reputation.”

Widening access is clearly regarded as a risk in terms of reducing standards, ranking and income. Unless these issues can be addressed, with the best will in the world, even clear and evidence-based contextual data guidance is likely to be used, at best, conservatively “on the ground”.

Key Messages

Specific guidance in how best to widen access was wanted.

Issues to do with widening access were seen as a particular issue for graduate entrants.

However, unless defensibility and ranking issues (league tables, reputation, income) are addressed, any guidance is likely to be adopted conservatively.

7.2 Contextual Data

Respondents were also asked whether their medical school uses contextual data at any point during the selection process. Respondents from two medical schools did not agree internally, and thus were removed from analysis. Of the remaining 30 medical schools, 22 (73%, 24 respondents) indicated that their medical school does use contextual data in their selection process, and eight (27%, 10 respondents) indicated that they do not do so.

Respondents whose medical school uses contextual data were asked which indicators are used, and the results are summarised in Table 11. The contextual data indicators used differed widely, and, interestingly, respondents within the same medical schools did not always agree which indicators were used. However some patterns could be identified. Locality indicators (postcode and low participation neighbourhood) were commonly used, as was the school’s academic performance. The most widely used “individual” indicator was having been in care.

Table 11. Current use of Contextual Data

Contextual Data Indicator	Number Respondents Whose Medical School Uses Indicator
Postcode	20 (59%)
Low participation neighbourhood	15 (44%)
In care	17 (50%)
Parent education level	9 (27%)
Parent profession	2 (6%)
Household income	8 (24%)
Non-selective state school attendance	9 (27%)
School part of an initiative	11 (32%)
School’s academic performance	19 (56%)
Receiving benefits	5 (15%)
Free schools meals	12 (35%)
Mature student	3 (9%)

Reflecting upon the qualitative comments, there was no clear picture regarding the use of contextual data. A number of respondents described applying contextual data purely prior to interview while others said that it was factored into multiple points within the overall process. Very little detail was provided to explain how or on what basis it was applied.

“They have a guaranteed interview and there are lower grade requirements for selection and for the offer (ABB).

“Currently summer school attendance or time in care each guarantee an interview, subject to baseline academic criteria being met. Low school performance adds 5% to the selection for interview score. Postcode, Free School Meals are flagged and used in borderline decisions.”

“Different minimum academic criteria for WA applicants and different assessment/scoring system”

There were many comments related to the advantages and disadvantages of using contextual data in medical school admissions. Advantages were to do with fairness/equity and contributing to the

WA agenda. Despite concerns regarding accuracy of or flaws in the metrics, respondents thought applying contextual data could help raise aspiration, enhance entry chances and select those with higher overall potential or bring more 'balance' to the entrant pool.

"Fairer, only way we can make any progress in this area. Hopefully can start to offer some encouragement to schools and pupils to break the shackles a bit."

"Our evidence implies that once accepted, students admitted using contextual data do as well as those from other backgrounds. They do need help and support after entry"

"There are many advantages not least natural justice. Students with academic potential from the state system often seem more grounded and more able to think for themselves, there is evidence they do as well if not better."

The disadvantages of using contextual data also drew a large number of open comments. A number of respondents were concerned that these tools were too 'blunt' and therefore likely to 'miss the target' or disadvantage those worthy but just missing the WA flag level. Concerns were raised regarding the perception of positive discrimination as a deterrent. Specific weaknesses with postcode areas, school type (e.g. WA bursary recipients) and school metrics were mentioned:

"LACK OF EVIDENCE! Lack of consistency across schools."

"Tools used are not specific/sensitive/accurate enough"

"Socio-economic indicators are unreliable and data provided in applications is usually incomplete. Information such as eligibility for pupil premium, parents' participation in HE (usually withheld by applicants), carer status, etc. should be made available for all applicants."

Twenty-four respondents answered a question asking whether or not they would like more guidance on how best to use contextual data in the selection process. The majority indicated that they would like more guidance on this issue (21, 88%).

"It would be really useful if there were central guidance on which data should be used to identify students from a WP background."

Key Messages

Most medical schools did use contextual data in their admissions process.

There was little consistency as to what markers were used or how they were used.

Schools would like more guidance on how best to use contextual data in the selection process.

Facilitating social justice for those medical applicants from disadvantaged backgrounds comes at a price to medical schools. Ensuring that medical schools collaborate and adhere to evidence-based guidance may increase the likelihood of good practice, fairness and transparency.

8. Selection – Looking Forward

In this section, we explored barriers and facilitators to change.

8.1 Barriers and Facilitators to Change

Respondents were also asked to indicate what they perceive to be possible barriers and possible facilitators to change in the selection process from a pre-defined list of barriers and facilitators derived from the case study data (see earlier), and data from previous projects carried out by the same team for the GMC and the Selecting for Excellence Group (SEEG).

Forty-four respondents provided responses to this question. Their responses are summarised in Tables 12 and 13.

Table 12. Potential Barriers to Change

Barrier to Change	Number of 'Yes' Responses
Lack of support from within the medical school	9 (20%)
Lack of support from wider (i.e., beyond medical school) institution	11 (25%)
Weak evidence base for best practice in selection into medical school	26 (59%)
Lack of internal resource (e.g., staffing)	24 (55%)
Unconvinced of the applicability of existing evidence to UK medical school selection	11 (25%)
None of the above	3 (7%)

The data suggests that, in terms of the options provided, lack of support from their institution (but not the medical school itself) and a lack of conviction about the robustness of the evidence base for selection to medicine were the greatest barriers to change.

Interestingly, very few respondents indicated that there were other barriers to change, which at face value seems to validate the options provided. However, there were many free text comments relating to barriers to change. These often referred to a lack of robust evidence for medical school selection processes:

“Using the assessment pentagram, what evidence is there of their (selection tools) reliability, validity, educational impact, acceptability and feasibility.”

“It is not clear what constitutes best practice in selection processes. If people are convinced by the evidence, they are much more likely to be willing to change.”

These indicate that many respondents do not believe there is a good evidence base for the medical schools admissions process in terms of the robustness of the current tools. The other issue which relates to evidence base is lack of consensus on what must be assessed (i.e., what are the essential qualities of a doctor?):

“Awaiting consensus on the values/attributes to be tested, evidence for the feasibility of this and then developing the best tool(s).”

Specific concerns were raised regarding the introduction of untested approaches and situational judgement tests (SJTs) in particular (can SJTs do what they claim and can they be shown to be immune coaching?). On the other hand, respondents had found the GMC report by this team useful in terms of setting out the evidence suggesting that if the evidence is collated in the one place, it may be used although interpreted through the lens of the individual medical school’s ethos and norms:

“I have used the MSC / GMC report to help inform changes or proposed changes in our selection processes.”

Second, some of the comments link to traditional attitudes as a barrier to change:

“Old fashioned attitudes towards what type of person makes a suitable medical student/ doctor.”

“The background culture of assuming all is at least 'OK' with medical education and that investing in developments and evaluating new ideas does not merit serious effort.”

Issues with league tables and reputation also were referred to in the open comments. It seemed that medical schools, or our respondents, were loath to take risks in case the reputation and the standing of their school suffered as a result:

“Plus, med schools often un-keen to be out on a limb.”

“League tables: Currently our UCAS tariff is influencing our league table positions. Obviously if pressure is on us to solve this, the easiest option is to recruit academic high achievers.”

Finally, reflecting the quantitative data, many open comments indicated that medical school admissions are not sufficiently resourced to enable change.

“We haven't been through a process to look at the ideal as we have always been constrained by time and resources.”

Table 13 presents an overview of responses to questions about potential facilitators of change.

Table 13. Potential Facilitators of Change

Facilitator of Change	Number of ‘Yes’ Responses
An individual with vision and influence (a “Champion” for change)	31 (70%)
A wish, on the behalf of the medical school, to be seen as a “front runner” or trend setter	20 (45%)
Working in partnership with other medical schools	16 (36%)
Securing additional resource (e.g., staff time)	18 (41%)
None of the above	2 (5%)

The data suggests that, in relation to facilitators to change, the most important factors were the presence of a local “champion” for change. However, just under half of respondents also indicated that a wish on the behalf of the medical school to be seen as a leader in terms of selection, and additional resource, were also important to change. Again, very few respondents indicated that there were other barriers to change, possibly validating the options provided.

Respondents were asked about one specific facilitator of change: whether or not they would use a framework of evidence-based “best” practice for medical school selection. Thirty-nine respondents answered the question, of which 37 (95%) indicated that they would, and two respondents (5%) indicated that they would not. However, the free-choice comments indicated that reactions were very mixed to this suggestion, from positive, through to guarded, to indicating that this was a controversial route. These open responses tended towards reserving judgement on this approach, and hinged on either concern that there was not a sufficiently robust evidence to enable this (see earlier) to comments emphasising that medical schools value their independence:

“Possibly but only if it were in line with the admissions policies of the university as a whole”

“Differences between medical schools should be encouraged and celebrated rather than a one track entrance route.”

“There still needs to be some allowance for individual medical schools’ ethos so that the priorities given to particular attributes can vary a little.... Given the wide range of types of medical graduates that is needed (a graduate who would make a good psychiatrist is unlikely to make a good orthopaedic surgeon, and vice versa), it is vital that we do not make the population of medical students excessively homogeneous.”

This last quote is of interest as it highlights not just the desire for individuality but also concern about what are we selecting for?

Key Messages

Many barriers to change exist. These ranged from a perception that there was insufficient evidence to guide selection processes to a lack of conviction that change was required.

In terms of “workable” or desirable change, respondents supported the move from individual interview to MMI, and from local efforts to collaborative selection centres, so a wider field of applicants could be interviewed in more depth.

Respondents were not enthusiastic about a “selection framework”, citing reasons such as lack of evidence and celebrating the individuality of both schools and the qualities of doctors working in different specialities.

Local issues such as lack of resource and the need for a “champion” for change were also relevant to change, or not changing selection processes.

8.2 Case Studies

We carried out six case study interviews with Heads of Admissions of six medical schools that had introduced, or were planning to introduce, a significant change to their selection strategy. The interviews took place between July–September 2014. The purpose of these interviews was to explore how these changes came about, and what factors facilitated a successful implementation or represented barriers to innovation. The results of a thematic framework method (Ritchie & Spencer, 1994) analysis of this data highlighted “facilitators” and “barriers”, which are often opposites of each other:

Table 14. Barriers and facilitators to change identified from the case study interviews.

Facilitators	Barriers
Opportunities or incentives for change	Content with status quo
Appraisal of the evidence	Dismissive or ignore evidence
Local champion for change	No champion pushing change
Collaboration and/or available expertise	Wishing to “go it alone”
Involving stakeholders	Stakeholders uninvolved/hostile
Powerful support	Powerful dissuaders
Selector Training	No appropriate or insufficient training
Available resources	Lack resources/see change as prohibitive in terms of resources
Positive piloting	Negative experience of alternatives

These themes, and further original data from the case study interviews with Heads of Admissions who had planned or were planning change were then used to generate two hypothesised vignettes (Barter & Renold 2000; Finch, 1987; Hughes, 1998). These present contrasts: one is a successful implementation of change, while the second describes a failed implementation.

8.2.1 Happy Days Medical School

For change to happen stakeholders need to be dissatisfied with their current selection processes. This is often reflected in the sense that the current process has become indefensible; there are increasing complaints and issues, and vulnerability that the institution will be seen as “too much of an outlier”. Positive precipitating factors encourage change and, when these and a sense of dissatisfaction occur together, change is more likely. Opportunities to do things differently such as starting up a new course, a change in personnel or encouragement from external bodies helps an institution consider change but the successful implementation of this change requires further consideration.

Case Study 1: Happy Days Medical School

Happy Days Medical School had an opportunity to take on extra medical student numbers. At the same time, their Admissions Team secured a new academic lead who was keen to trial a more statistically-reliable interview process than their current semi-structured interviews. She had experience of using MMIs at her previous institution and set about, with support from the administrative team, arranging internal school meetings to discuss the benefits and processes involved in introducing MMIs for the next Happy Days Medical School admissions cycle. There was also an opportunity to do so in collaboration with another medical school which meant they could share materials for stations. The Dean for Education was most supportive of these proposals, and asked the University for additional funding to support training for selectors and the purchase of mini ipads to use within both the MMIs and other assessments.

The Admissions Lead encouraged stakeholder involvement at all stages. She convened several meetings to discuss this initiative before rolling it out, involved staff stakeholders to get involved by developing stations, sought feedback from interviewers and candidates on the MMI process. The pilot demonstrated both the feasibility of the process and its high level of acceptability to applicants and interviewers.

The Admissions Team lead was careful to plan a full evaluation of the process so that, in the immediate term, she could report back at the end of the admissions cycle and, in the long term, she could compare the MMI outcomes with student (successful candidate) progress data, to fully evaluate the initiative. Happy Days Medical School piloted a station within the MMI that aimed to assess the candidates' decision making capacity and part of the longer term evaluation was to specifically compare the results of this station with the candidates' UKCAT SJT.

8.2.2 Stuck-in-a-Rut Medical School

Medicine has a strong institutional culture that is resistant to change. Such a pervasive antipathy to change is also fostered within selection to medical school by anecdotal backing for current systems and beliefs that evidence is lacking for alternative methods of selection. The fictitious Stuck-in-a-Rut Medical School displays many cultural aspects that are direct opposites of those that Happy Days Medical School possesses that ensured successful change.

Case Study 2: Stuck-in-a-Rut Medical School

Stuck-in-a-Rut Medical School had no real appetite or drive for changing the way they selected their students and had no champion to lead any such change. The School did, however, feel under pressure by external authorities to demonstrate that they had reviewed their selection policies in the light of recent evidence.

However the evidence was viewed dismissively and counter-arguments for maintaining the status quo were used. These included arguing that students accepted under the current system go on to become perfectly good doctors, and those students rejected by other schools using more recently adopted selection tools often get accepted by other medical schools anyway, who also go on to make perfectly good doctors. Much of this counter argument was anecdotal but formed the basis for very strongly held personal views, particularly of Stuck-in-a-Rut Medical School's powerful university academia. The university senate governing body argued that each medical school, and theirs in particular, wishes to select their own type of students, including the "maverick student" who will have the potential to go on to lead medical research, possibly becoming a Nobel prize winner. They believed that selection processes that aim to produce consistency, transparency and fairness risk reducing the diversity of the student cohort.

Furthermore, Stuck-in-a-Rut Medical School's selectors were concerned about the cost of implementing new selection tools and the time required for such training. Similarly, they felt that all applicants would have to be assessed using the same approach and Stuck-in-a-Rut Medical School did not feel it had sufficient resources to manage such numbers. Collaborating with another medical school was not seen as an option to address this barrier because of Stuck-in-a-Rut's belief that they looked for something unique in applicants. Their conclusion was that there simply wasn't sufficient robust evidence for introducing such a far-reaching change with significant resource implications when their graduating medical students make good doctors.

9. Conclusion

In this project, we used a pragmatic philosophic approach (e.g., Morgan, 2007) to underpin a mixed-methods programme of research (e.g., Creswell & Plano Clark, 2010), the aim of which was to build knowledge in the field of medical school selection and widening access. Our ultimate aim was to identify a coherent and evidence-based (as far as currently feasible) “Selection Framework” suitable for all UK medical schools to consider, the use of which would enable evidence-based best practice, greater transparency and fairness in selection for medicine.

The conclusions and recommendations below are drawn from “evidence” (from the literature search) triangulated with perception/opinion (from the survey and interviews), and with reference to other ongoing work.

The data indicates that the strength of evidence supporting the use of candidate academic attainment remains strong. In terms of other selection methods, there is a relatively clear picture regarding structured interviews/MMIs, admissions testing, SJTs and selection centres (SC) being effective across several criteria. Of the evidence currently available, SJTs and MMIs seem to be the most valid predictors of what could broadly be called “values”. However, personality tests may also be useful, but further evidence in exploring how best to assess values is required, as testing values in recruitment is a relatively new area of research. Furthermore, it is important all SJTs and MMIs are not equivalent: both methods SJTs and MMIs seem to be the most valid predictors of what could broadly be called “values”. However, all SJTs and MMIs are not equal: they are both complex selection instruments with a wide range of options available in relation to item formats, instructions and scoring. In other words, the MMI of Medical School A might be more effective, in terms of predictive validity and fairness, than that of School B, and both might be better than that of School C, depending on their design. Selection centres were popular with respondents but their understanding of what these encompass was very narrow (more like an MMI than a multi-trait assessment involving a number of methods).

The evidence for predictive validity and greater fairness of the admissions tests used for undergraduate selection in the UK appears to be emerging. They are also clearly considered useful by those involved in admissions in terms of differentiating between applicants but our survey data also indicated that respondents had quite loose ideas of what admissions tests actually measured. Their perceptions of what the test that they used measured did not always match up to the description on the test website.

The strength of evidence for continuing to use personal statements is low and our respondents had low confidence about it being fair and defensible. However, the survey data showed that our respondents were generally reluctant to drop this tool due to conviction that something may be lost and in the absence of anything clearly better. However, many schools are in the process of reducing the weight afforded to personal statements and primarily incorporating them within an interview process.

When exploring the design of a selection system as a whole, there is very little research or conceptual work addressing the way tools are combined (hurdles or weighted factors), despite this being universal practice.

An overview of the selection tools typically used across UK medical schools – admissions tests, personal statements and interviews/MMI indicates that our respondents think some (desirable) personal qualities are assessed by a number of tools, whereas others seem largely neglected in current selection processes.

This evidence is not the whole picture – there is a gap between what is known to be effective, or at least promising, in medical schools selection (as per the above) and what is enacted in practice. Stepping back and looking at the findings as a whole, this gap seems to be due to a number of factors. These range from beliefs such as: a genuine lack of knowledge and/or “faith” in the evidence; “our way works for us”; a strong desire not to be dictated to by external bodies; a sense of “it ain’t broken so why fix it”; and not wishing to be “out on a limb”. These beliefs operate not just at the level of the individual involved in medical admissions but also at senior levels where investment in this area might not be seen as a priority. It is likely that these are connected: if there is no champion for change, then requests to change will not be disseminated upwards, or sold with conviction. There are practical barriers to change, ranging from lack of resources (e.g., change requires staff time), to caution about risking reputation and standing (e.g., league tables). Finally, and linking back to the above, while most people seem to accept that a range of selection of tools are required to assess academic and non-academic characteristics of applicants, there is an awareness that there is essentially no evidence for the “on-the-job” predictive validity of any of the tools available, let alone how to best to combine them in practice. These tensions are illustrated by our case study data, where we compare two fictitious medical schools (see Section 8).

Despite data that shows persistent under-representation of lower socio-economic groups within the UK, most of our respondents believe that their selection processes encourage widening access (WA) and that they operate within a culture that supports WA. While there is no doubt that a lot of medical schools engage in much WA-related “activity” (from outreach and inreach, to the use of contextual data and additional support), the broad evidence is that, other than Foundation years, this is making little difference. Other, currently unpublished work carried out on behalf of UKCAT, suggests that there is wide variation between medical schools in terms of the proportion of ‘WA type’ (IMD lower 40%, NS-SEC 4 or 5) applicants and how they fare within selection processes. This variation suggests there are some solutions available if only they can be identified and understood.

Within this area, defining WA students at an individual level appears fraught with difficulty and hence there remains a dearth of quality research related to WA student progression. Findings appear mixed as studies do not separate entrants from WA backgrounds who entered based upon achieving standard acceptance, discounted entrance and those on bespoke or extended WA courses.

The picture in relation to widening access and the use of contextual data is even more complex. There is a palpable tension between expectations that medical schools must engage in activities to widen access (this would encompass the use of contextual data) and how they do so effectively. A range of indicators are used, most of which are problematic in one way or another. This is one area where medical schools do crave clear and unambiguous guidance, not least so they can defend their actions. It is equally clear from the literature that any guidance could not be based on robust existing “evidence”: rather this is would have to be a political driver for change.

Facilitating social justice for those medical applicants from disadvantaged backgrounds comes at a price to medical schools. Whilst only a relatively small number agreed that admitting WA students would reduce the reputational standing of their school on a forced choice question, free text data indicated ambiguity as to whether or not applicants should be considered with lower academic criteria. This ambiguity was related to two factors. The first concerned whether or not WA students required additional support, which currently would not be resourced. Second was the pressure from the universities for medical schools to maintain tariff scores, which impact on league tables, and hence, reputation.

10. Recommendations

10.1 Selection

There is insufficient evidence to recommend a single selection strategy at present. However, there is sufficient evidence to state that medical school selection processes should be moving towards a combination of academic attainment, admission tests and MMIs.

Given that not all MMIs are equal, ongoing quality assurance is essential to assess if MMIs are effective across criteria such as predictive validity and fairness. A collaborative approach to MMIs (such as a consortium of a number of medical schools working together) may be a good way of using resource effectively as well as giving opportunities for assessing effectiveness.

More longitudinal research is required to investigate the predictive validity of all commonly-used admissions tests in the later years of medical school and “on the job”, ideally on a wide scale.

Research is urgently required to examine the predictive validity of different weightings of admissions procedures on selection, and widening access.

10.2 Widening Access

All schools are actively engaged in widening access efforts but these are not making a notable impact on the demographic profile of medical students.

There is currently too little incentive or even a perverse disincentive for medical schools to change or even critically assess their approach to widening access: until there are robust levers encouraging measurable change, schools will carry on doing their own thing irrespective of its limited impact.

A range of contextual data markers and metrics are used across medical schools: irrespective of marker(s), all schools are struggling with their use and defensibility at the individual level. This is one area where clear guidance would be most welcome, particularly in relation to graduate entrants, but very hard to provide. Truly innovative ideas appear to be needed in this area.

If “local” approaches to widening access are making little difference, there may be a case for a more centralised or regional initiatives, shared information, and/or “structural” change such as incorporating WA markers into the UCAS form. In the interim this may be achievable via a common online process that builds upon (and replaces) bespoke school-specific systems.

Crucially, to make any meaningful progress in widening access and selection, it is important that institutions agree on means as well as ends and act in a united way. Ensuring that medical schools collaborate and adhere to evidence-based guidance may increase the likelihood of good practice, fairness and transparency. Thus, our final recommendation is that a collaborative approach to selection and widening access to medicine is required, akin to the Medical Schools Council Assessment Alliance. Partnership would enable large-scale, longitudinal studies of effectiveness of particular selection tools and combinations of tools, and a chance to start making a measureable difference in terms of widening access. This coupled with follow up via the proposed UKMED data base will provide a forum for long awaited studies capable of informing change in an evidence-based manner.

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12. Appendix: Search terms for literature reviews and case study methods

12.1 Medical School Selection Methods Literature Review Methodology

The search was limited to English-language studies published between January 1997 and July 2014, and also included relevant unpublished studies and salient papers that were not returned from the literature search. Databases searched included; a) EBSCO, b) EMBASE, c) Educational Resources Information Center (ERIC), d) SCOPUS, e) Web of Knowledge (WoK).

Search terms for the selection methods literature review

Medical school	Assessment center
Medical student	Interview
Medical education	Situational judgement test
Selection	SJT
Admission	Personality
Criteria	Curriculum vitae
Test	CV
Interview	Emotional Intelligence
Predictive	EI
Psychometric	Biodata
Personality	Application form
Selection centre	Reference
Selection center	
Assessment centre	

12.2 Values-Based Recruitment Literature Review Methodology

VBR is a relatively new concept within medicine, and so a search of the published literature using this terminology was unlikely to yield a large volume of appropriate evidence. Consequently, the search was widened to other contexts and a range of sources were used to assist in the reviews. These included databases, journals, government reports, web searches and expert contacts. The search date was limited to 16 years and covered the years 1998 to 2014. Many of the terms are broad (and identified by a *). These were included as additional filters rather than primary search terms (using advanced options), although the initial search assisted with this filtering. Search terms/key words were identified by their relation to the aims. These are not an exhaustive list of search terms, but were a starting point given the nature of this rapid review.

Search terms for the VBR literature review

Values based recruitment	Ideals*
Values based assessment	Evaluation*
Selection methods*	Doctor*
Person-organisation fit	Nurse*
Professional attributes*	NHS employees*
National Health Service*	Professional standards*
Healthcare*	Morals*
Principles*	Ethics*

12.3 Contextual Data Literature Review Methodology

The aim was to review the recent literature on the use of contextual data for WA into medical school. The search was limited to English-language articles published between 2012 and July 2014. The search included databases and articles identified by the authors, who are active researchers in the field.

Search Terms for the Contextual Data Literature Review

Medical school
Medical student
University
Selection
Admission
Contextual data
Widening access
Widening participation
Socioeconomic class
Socioeconomic group
Ethnicity

12.4 Case Study Methodology

We will took an exploratory case study methodology to explore selection policy and practice developments and reforms. We gathered data from six UK medical schools using contrasting approaches to selection –those with established use of a selection centre approach, a MMI, SJTs, and a school not using any form of interview and/or weighting personal statements strongly.

The case study approach allowed an in-depth exploration of complex issues in their real-life settings and an opportunity to learn about issues such as how the change from traditional selection methods to the use of a selection centre or MMIs was planned and managed.

The interviews ranged from 40 minutes to 70 minutes in length. They were recorded with the participant's permission, then transcribed before analysis. The analysis was inductive: our aim was to pull out common patterns and messages then use these to develop vignettes (Barter & Renold, 2000; Finch, 1987; Hughes, 1998). These vignettes provided a way of checking themes elucidated earlier, in the literature reviews, and informed the development of the survey questions. We present two vignettes in this document to give a flavour of contrasting situations drawn from the project data set as a whole.