

**UNIVERSITY OF  
MANCHESTER  
FACULTY OF MEDICINE,  
DENTISTRY AND  
NURSING**

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**The Selection of Medical Students  
for Entry to the M.B.Ch.B.  
Course in 1998/1999**

A report to the committee on admissions to the M.B.Ch.B course

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*DRAFT – NOT FOR CIRCULATION*

## **Acknowledgements**

This report was prepared at the request of the committee on admissions to the M.B.Ch.B course, which set up a working party, chaired by Dr Lynne Webster.

Aneez Esmail, a member of the working party, was given the task of analysing the results of the selection process of medical students for entry to the MBChB course in 1998/1999.

Martin O'Neil ..... analysed the application forms and

The Admissions Office collected information onto a proforma. Data was entered into a computer program for analysis by a commercial organisation. Anne Durie carried out analysis on admissions under the direction of Aneez Esmail. Chris Roberts, Senior Lecturer in Medical Statistics, provided statistical advice in the School of Epidemiology and Public Health. Lynne Webster and Aneez Esmail wrote the report.

## Executive Summary

This report is based on an analysis of data related to the admissions of medical students to the University of Manchester for the M.B.Ch.B. course in 1998/1999. Its main purpose is to assess whether there is evidence of disadvantage to applicants based on ethnicity, sex or type of school. The suggestion that certain groups of applicants may be disadvantaged, was based on an analysis of UCAS data commissioned by the Council of Deans of Medical Schools (CHMS) and carried out by Professor Chris McManus of University College London. This report, suggested that Manchester was one of the medical schools which may be discriminating against ethnic minority applicants. McManus also highlighted the fact that male applicants and applicants from FE Colleges were disadvantaged when compared to female applicants and applicants from independent schools.

One of the criticisms of the analysis commissioned by CHMS was that it did not take into account the GCSE scores and predicted 'A' level results of applicants. Most medical schools place a large emphasis on GCSE scores and predicted 'A' level results. Evidence of disadvantage could be explained by the fact that ethnic minorities, males and applicants from FE colleges had lower GCSE scores and were predicted to get lower 'A' levels.

In view of the CHMS report we agreed to review the entire admissions process at Manchester both as a learning experience to review what we were doing and to see whether there was scope for improvement in the admissions process. We also sought to assess whether there was any evidence of disadvantage to particular groups of applicants.

Our findings are based on a consideration of the different stages in the admissions process. Recommendations are made in relation to these stages. We also make some recommendations related to the overall admission process, training and resources.

## Offers of admissions to the MBChB course

Our analysis confirms that when the whole admissions process is considered, ethnic minority applicants, males, and applicants from FE colleges may be disadvantaged when applying to Manchester despite controlling for GCSE grades, predicted 'A' level scores. These findings are similar to those identified by McManus.

The odds ratios are: 0.78 (CI 0.58 - 1.04) for ethnic minority applicants compared to white applicants, 0.8 (CI 0.62 - 1.05) for males compared to females and 0.64 (CI 0.34 - 1.18) for applicants from FE colleges compared to applicants who don't attend FE colleges. These odds ratios do not reach statistical significance, because our analyses only covered a one-year period (374 ethnic minority applicants, 651 male applicants and 102 applicants from FE colleges). Total applicants for this period were 1,405. However, the analysis does suggest a potential problem and we have made certain recommendations which should minimise areas of disadvantage and allow us to monitor the situation in future years.

## Assessment of the applicants by the admissions officer.

There is no formal scoring of this stage but broad criteria such as minimum GCSE scores, minimum competence in English, evidence of medical experience and minimum predicted 'A' level scores are used screen out candidates who do not fulfil these criteria. The aim of this stage of the process is to reduce the number of applicants to a manageable level for assessment by admissions tutors in the next stage. We analysed 1262 applicants (missing data 143) of which 972 were passed on for further assessment by the admissions tutors. Analysis of this stage of the process suggests that males applicants and applicants from FE colleges are disadvantaged. GCSE scores and predicted 'A' level scores are still the best predictors of whether applicants pass this stage of the process. The odds ratio are 0.76 (CI 0.50 - 1.14) for males compared to females and 0.45 (CI 0.20 - 1.02) for applicants from FE colleges compared to applicants who did not attend FE colleges.

Our analysis also considered whether the emphasis on predicted 'A' level scores is justified. Although actual 'A' level scores are the gold standard, there appears to be a good correlation between predicted scores and actual scores achieved. There is also no difference in this correlation between ethnic minority and white candidates (previous research by McManus had suggested that teachers underestimated the actual grades of ethnic minority candidates).

There is no obvious reason why males and applicants from FE colleges are potentially disadvantaged but we believe that this stage of the admissions process will benefit from clear criteria and a scoring system similar to that, which operates at the next stage of the admissions process. The number of criteria selected for assessment should be defined explicitly (for example fee paying status, minimum grades in English and overall scores for GCSE grades rather than minimum grades "A's". Clear definition will allow monitoring of this stage in future years.

#### Assessment of applicants by the admissions tutors.

This stage is formally scored and applicants have to achieve a minimum score before they are offered an interview. The admission tutors assessed a total of 972 applicants. After assessment, 657 applicants were invited for interview. 905 applicants were included in the analysis (missing data 67).

Analysis of the assessment process by the admissions tutors suggests that applicants from FE colleges (Odds Ratio 0.6 CI 0.3 - 1.2) and ethnic minority applicants (OR 0.88 CI 0.64 - 1.2) may be disadvantaged. Males are not disadvantaged at this stage. As expected GCSE scores and predicted 'A' level scores are less important as predictors at this stage because applicants have already been selected for assessment on the basis of GCSE scores and predicted 'A' level scores. The results are not significant because of small numbers but suggest the potential for disadvantage.

Our analysis also considered the reliability of the selection process by the Admissions Tutors. The importance of consistency in the assessment by the Admissions Tutors of the candidates written statement and the teacher's report cannot be over – emphasised. Overall, there is poor reliability in the assessment of candidates written statements and teachers reports between the admissions tutors. However, the potential for bias in the selection process at this stage is considerable because the measure is so unreliable.

We have made recommendations as to how this stage could be improved. New tutors need to receive formal training from existing tutors so that the rationale of choices and scoring is explained. A system of monitoring of reliability should also be instituted and reviewed on a yearly basis.

#### Assessment of applicants at interview.

The interview is formally scored and if applicants pass the interview stage, they are offered a place subject to achieving a minimum 'A' level score. 657 applicants were invited for interview and we analysed the outcome for 622 applicants (missing data 35). 470 applicants received an offer of a place subject to achieving a minimum 'A' level score.

Male applicants (OR 0.7 CI 0.49 - 1.01) and ethnic minority applicants (OR 0.7 CI 0.49 - 1.09 ) appear to be disadvantaged at this stage of the process.

Applicants from FE colleges (OR 1.0 CI 0.39 - 2.69) were not disadvantaged and GCSE scores and predicted 'A' level scores were not predictors of success at this stage.

We cannot assess why males and ethnic minority applicants appear to be disadvantaged at this stage. In the interview, applicants are assessed across several dimensions but this is not universally scored (an overall summative assessment is often made). The absence of this data does not allow us to assess why applicants are disadvantaged and we would recommend that the marking scheme that presently exists should be used in all cases. This will enable us to monitor the reasons why some applicants do not pass this stage of the process.

## Recommendations

- 1) In view of the suggested disadvantage of males, ethnic minority applicants and applicants from FE colleges, the admissions committee needs to review and make changes to aspects of the selection process where disadvantage may occur. At the first stage of assessment by the admissions officer, explicit criteria need to be instituted and a formal scoring of applicant's needs to be introduced. Double marking of the written information in the UCAS forms by the admissions tutors should be considered to try and improve reliability and reduce potential areas of disadvantage. The interview needs to be formally scored and Chairperson of the interview panels should ensure that the existing mechanisms are adhered to.
- 2) Administrative systems need to be changed and extra resources need to be identified so that the level of analysis carried out in this report can be repeated on a yearly basis. This will require a systematic (ideally prospective) method of recording data so that an analysis of the data can be carried out more easily. Monitoring is the only mechanism whereby we can be sure that our methods of selection are fair and reliable. A suggested proforma is included which could cover the entire selection process and would enable monitoring to take place. The information contained in the monitoring form could be entered commercially on a yearly basis by a data processing organisation. If the monitoring form is introduced, an analysis plan can be developed and run on an annual basis with the minimum of resources.
- 3) At present Admission Tutors are appointed for 3 yearly periods. To ensure improved consistency we suggest that when new tutors are appointed, existing tutors are given the resources and opportunities to train the new tutors so that they benefit from the experience and knowledge, which can only come from having carried out the job for 3 years. A training weekend with the admissions officer, past and newly appointed tutors and possibly the Chair of the Admissions Committee should be considered.
- 4) Reliability of the scoring by admissions tutors needs to be monitored on a yearly basis. Dimensions, which have poor reliability, need to be modified or dropped. In many cases the rationale for assessing certain dimensions is not clear. This needs to be reviewed in the light of evidence of what the important criteria are on which to make judgements.
- 5) The Admissions Committee should receive a report on a yearly basis outlining the outcomes of the previous years admissions process with an analysis of the outcome by gender, ethnicity and any other factors which may be considered important. For example, at present there is an increasing emphasis on widening opportunity and future analysis may include outcomes of applicants from deprived backgrounds.

- 6) The criteria for selection need to be made explicit and public. They should be available on the web site of the Faculty so that all potential applicants are aware on what criteria they will be assessed. The information on the web should also include information for teacher so that they know what information we expect from them in order to assess applicants. An analysis of outcomes similar to that contained in this report should also be made public. Appendix 1 contains a outline of information that could be included in the Faculty web page.
- 7) The Faculty needs to recognise that the extra monitoring, review and analysis outlined in this report will require extra resources. We suggest the following:
  - i) 6 months Research Assistant (grade II) time to develop and modify the proforma and develop an analysis plan which can be used in future years. This would be a one off investment. (Approx. 12,000)
  - ii) Resources to enable training of future admissions tutors on a three yearly basis (Approx. 1,000 every 3 years)
  - iii) Resources to ensure that data from the proforma are entered for analysis on a yearly basis (Approx. 700 per annum)
  - iv) Extra resources to enable the admissions officer to undertake the new tasks outlined in this report (yearly analysis, writing a report for the admissions committee and formally scoring the initial screening process). In view of the increasing number of applications, an administrative grade C assistant would be sufficient. (Approx. 14,000 per annum)



## Introduction

This report has been prepared following consideration of the report by Professor I C McManus, Professor of Psychology and Medical Education at University College London Medical School on “The selection of UK medical students at British Universities in 1996 and 1997”. The Committee on Admissions discussed Professor McManus’ report at its meeting on Friday 13 November 1998.

McManus analysed the UCAS database for the years 1996 and 1997. This database included details of nearly 93,000 applications made by about 19,000 applicants to 27 medical schools. The 18 core variables McManus used in his analysis were:

|                               |                                                                                                                                                                                                                  |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Educational variables:</i> | mean ‘A’ level grade achieved<br>number of ‘A’ levels taken<br>non-science ‘A’ levels<br>re-sat ‘A’ levels or Highers<br>General Studies ‘A’ level taken<br>General Studies ‘A’ level grade<br>‘AS’ levels taken |
| <i>Application variables:</i> | date of application<br>previous application<br>insurance choice<br>less than five applications for medicine<br>six applications for medicine<br>gap year (only available for 1997 applicants)                    |
| <i>Demographic variables:</i> | sex<br>mature applicant<br>social class<br>ethnic origin<br>secondary school type<br>local applicant                                                                                                             |

McManus looked first at the selection overall at the then 27 medical schools. Using Logistic Regression, McManus’ analysis confirmed that the majority of the variables listed above were ‘predictors’ (in the statistical sense) of selection. The best predictor was found to be average ‘A’ level grade (though this is not known for the majority of applicants until after offers have been made); followed by ethnic origin, date of application, age, resit examinations and sex.

McManus cited the most important conclusions of his analysis as:

*High 'A' level grades are strong predictors of success*

*Previous imbalances for women applicants have disappeared*

*Male applicants are disadvantaged at nearly half of all medical schools*

*Applicants from ethnic minorities are disadvantaged to a variable degree in certain medical schools*

*Applicants applying later in the selection season are disadvantaged*

*Applicants making non-medical ('insurance') choices in their applications and those making less than 5 medical choices are disadvantaged*

*Overall, candidates from Sixth Form Colleges and Colleges of Further Education are disadvantaged*

*Applicants applying to their local medical school have an advantage over those who do not*

There is some evidence overall, but this is significant at only two medical schools, that applicants whose parental occupational background is from a lower socio-economic group are disadvantaged

In addition to the overall analysis for 27 medical schools, McManus' report included a separate analysis of applications to each of the medical schools. A copy of the analysis for The University of Manchester is included at Appendix 1. The analysis, carried out for 1996 and 1997 separately, suggested that the selection processes used at Manchester in those years disadvantaged:

*Male applicants*

*Applicants applying later in the selection season*

*Candidates from Colleges of Further Education (in 1996, but not in 1997)*

*Applicants from ethnic minorities*

*Applicants who resat 'A' levels*

*Applicants who had taken General Studies at 'A' level*

*Applicants who made an 'insurance' choice in their application*

In his report, McManus stressed that the UCAS database did not include important information about applicants which medical schools take account of during the selection process when making decisions about individual applicants. In particular no details were available for that report on GCSEs grades; predicted 'A' levels; or the personal attributes of candidates, as stated in the personal statements and school or college reports, and assessed at interviews.

## Aim of this study

In discussions at its meeting in November, in view of the concerns expressed by the Commission for Racial Equality, the Committee on Admissions focused on the selection of students from minority ethnic groups.

The view was expressed that the disadvantages experienced by students from minority ethnic groups may not be due to the selection policies alone. It was suggested that the disadvantages noted could be related to experience at home, school or college; or explained by differences in achieved and predicted examination results (GCSE or predicted 'A' level grades), or in personal attributes as reported in written applications and assessed at interview.

An extensive study would be required to identify and assess the impact of variations in experiences at home, school and college on the outcome of applications to medical school. However, using data already available within the Medical School, it was possible to carry out a study to assess the impact on the selection process of :

- GCSEs achieved
- predicted 'A' levels
- personal attributes as reported in personal statements and the school or college report
- personal attributes assessed at interview

## Design of this study

This study included applications for entry to the M.B.Ch.B. Course (A106) in 1998/99 only. (Applications for the pre-clinical course (A104) were not included.) In total there were 2445 applications for entry in 1998/99. Only those applying as school leavers were included in the study. However, some categories of school leavers were excluded from the analysis. These were:

- a) overseas students*
- b) Scottish Highers and SYS*
- c) Irish leaving certificate*
- d) applications for deferred entry*

Applying these criteria gave a sample of 1405 applications from school leavers to be included in this monitoring process.

Using a Proforma designed for this study (Appendix 2), the following details were collated from the UCAS forms, administrative systems, and Admissions Tutors' assessments:

- a) ethnic minority status (this analysis has used ethnic minority status as supplied from UCAS)*
- b) gender*
- c) type of school or college attended*
- d) GCSEs attained*
- e) predicted and actual A level scores*
- f) details of the Admissions Tutors assessments of written applications*
- g) interview scores*
- h) offers made, accepted and taken-up*

## **The analysis**

Of the 1405 applications included in the study:

972 (69%) were assessed as satisfying the minimum requirements for entry and passed to the admissions tutors for full assessment

657 (47%) attended for interview

470 (33% were offered places

At each stage in the assessment process detailed above, decisions must be made about which applications go forward and which are rejected. The conclusions of McManus' study suggested that the decisions made during the selection process disadvantage students from minority ethnic groups, males and applicants from FE colleges. The focus of this study is whether this disadvantage is explained by applicants' achieved and predicted examination results, and their personal attributes.

The analysis looks at the three main stages of the assessment process, controlling (as appropriate) for examination results achieved and predicted, score on assessment by admissions tutors and the interview. The three stages of the selection process examined are:

- 1) *selection of candidates written applications for full assessment by the Admissions Tutors*
- 2) *selection for attendance at interview by the admissions officers*
- 3) *the offer of a place following interview.*

At each stage of the selection process the proportion of ethnic minority applicants as compared with white applicants, males compared to females and applicants from FE colleges compared to applicants who did not attend FE colleges were assessed using logistic regression methods. The results have been expressed as an 'odds ratio'. An odds ratio of '1' means applicants had an equal chance of getting through to the next stage of the selection process. An odds ratio less than 1 suggests that a particular group of applicants is disadvantaged compared to its reference group.

## Applications selected for assessment by Admissions Officer

The Admissions Officer reviews all UCAS applications received. The Admissions Officer checks that applicants have met the minimum required standards in terms of GCSEs achieved and 'A' levels predicted. The Admissions Officer also assesses whether minimum criteria in the candidates written statement are satisfied. In some cases the Admissions Officer will make a judgement based on these 'softer' details on the form, such as work experience, but these are not formally assessed at this initial review.

Written applications that satisfy the minimum requirements are passed to one of the two Admissions Tutors to be fully assessed. (A copy of the form the Admissions Tutors record the assessment on is included at Appendix 3).

TABLE 1

### Assessment of applicants by admissions officer and passed to admission tutors

| Variable                                                    | Odds ratio | 95% Confidence Interval |
|-------------------------------------------------------------|------------|-------------------------|
| Gender (male:female)                                        | 0.76       | (0.50 - 1.14)           |
| FE college (attending FE college: not attending FE college) | 0.44       | (0.20 - 1.02)           |
| Ethnicity (ethnic minority: white applicants)               | 1.17       | (0.74 - 1.85)           |
| GCSE score (continuous variable)                            | 3.22       | (2.77 - 3.76)           |
| Predicted 'A' level score (continuous variable)             | 1.22       | (1.16 - 1.30)           |

Table 1 shows that males and applicants from FE colleges were disadvantaged, though the results do not reach statistical significance. Ethnic minority candidates are advantaged at this stage of the process, though once again, the figure does not reach statistical significance. GCSE score and predicted 'A' level score were the most important factors at this stage for determining whether the application was passed onto the admission tutors for further assessment.

## Applicants assessed by Admissions Tutors

The admissions tutors assess all forms passed to them by the admissions officers. In addition to looking at GCSE scores and predicted 'A' level scores, the admissions officers assess the written information provided by the candidate and their teachers. At this stage, the written information is formally scored and if candidates pass a threshold, they are invited for interview.

972 applicants were passed onto the admissions tutors for assessment. We had complete data on 905 cases.

**TABLE 2**

**Assessment of applicants by admission tutors and offered an interview**

| Variable                                                    | Odds ratio | 95% Confidence Interval |
|-------------------------------------------------------------|------------|-------------------------|
| Gender (male:female)                                        | 1.03       | (0.77 - 1.38)           |
| FE college (attending FE college: not attending FE college) | 0.61       | (0.31 - 1.2)            |
| Ethnicity (ethnic minority: white applicants)               | 0.88       | (0.64 - 1.21)           |
| GCSE score (continuous variable)                            | 1.27       | (1.07 - 1.51)           |
| Predicted 'A' level score (continuous variable)             | 1.03       | (0.99 - 1.07)           |

Table 2 shows that applicants from FE colleges and those from ethnic minorities may be disadvantaged at this stage of the process. The figures do not reach statistical significance. One of the reasons as to why applicants from FE colleges are disadvantaged has already been identified - the formal scoring system includes giving applicants additional points for being a prefect. FE colleges do not operate a prefect system. Similarly, in the present form, extra points are awarded for extra curricular activities. Traditionally, amongst applicants who are white and from independent schools, the Duke of Edinburgh award scheme is often cited as evidence of achievement. It is not made clear to applicants that we will also consider other non-traditional activities as acceptable. This will now be made clear if the recommendations for placing the information on the web are accepted by the admissions committee.

## Applicants offered a place after interview

Offers are made after applications have been screened by the Admissions Officer; assessed by one of the two Admissions Tutors; and candidates have been assessed at interview. At the interview, theoretically, no account is taken of the candidates academic status since they have already been assessed as having achieved the minimum standards in terms of GCSE scores and predicted 'A' level scores. The interview is meant to assess the candidates across several dimensions and an overall assessment made. The potential exists to score candidates on each of these dimensions, but this information is not assessed consistently and was therefore not included in the analysis.

657 applicants were passed by the admissions tutors and offered an interview. No information was available about candidates who were invited for interview but did not attend, but the numbers are thought to be very small, probably less than ten.

**TABLE 3**

**Assessment of applicants by interview and offered a place**

| Variable                                                    | Odds ratio | 95% Confidence Interval |
|-------------------------------------------------------------|------------|-------------------------|
| Gender (male:female)                                        | 0.70       | (0.49 - 1.01)           |
| FE college (attending FE college: not attending FE college) | 1.03       | (0.39 - 2.69)           |
| Ethnicity (ethnic minority: white applicants)               | 0.73       | (0.49 - 1.09)           |
| GCSE score (continuous variable)                            | 1.08       | (0.85 - 1.37)           |
| Predicted 'A' level score (continuous variable)             | 1.04       | (1.00 - 1.09)           |

Table 3 shows that male and ethnic minority applicants were disadvantaged at this stage of the process. The precise reasons are not clear, but the potential to investigate this exists if the interviews are formally scored across the five dimensions as is the current recommendation. Although the results do not reach statistical significance, it appears that male and ethnic minority applicants probably face the greatest hurdle at this stage of the application process. The need to monitor this aspect of the process is therefore of greatest urgency since the interview is potentially the most subjective area of the entire admissions process. Earlier evidence suggested that when Manchester did not interview applicants, ethnic minority applicants were not disadvantaged (Esmail 1995).



## The overall admissions process

The preceding analysis has looked at the admissions process at three distinct stages. The overall impact of this process can be judged by looking at all applicants and seeing which groups are disadvantaged. This is summarised in Table 4.

TABLE 4

**Likelihood of being offered a place on the MBChB course controlling for gender, attendance at FE College, ethnicity, GCSE scores and predicted 'A' level score**

| Variable                                                    | Odds ratio | 95% Confidence Interval |
|-------------------------------------------------------------|------------|-------------------------|
| Gender (male:female)                                        | 0.81       | (0.62 - 1.05)           |
| FE college (attending FE college: not attending FE college) | 0.64       | (0.34 - 1.18)           |
| Ethnicity (ethnic minority: white applicants)               | 0.77       | (0.58 - 1.04)           |
| GCSE score (continuous variable)                            | 1.8        | (1.59 - 2.06)           |
| Predicted 'A' level score (continuous variable)             | 1.06       | (1.03 - 1.09)           |

Table 4 shows that males, applicants from FE colleges and those from ethnic minorities are disadvantaged when applying to Manchester. In the analysis of one years applications, the results do not reach statistical significance but the analysis does confirm the main findings of the McManus report which suggested that males, ethnic minority applicants and ethnic minority applicants were disadvantaged when applying to Manchester. Our analysis shows that despite controlling for GCSE grades and predicted 'A' level scores, the disadvantage persists. This means that male applicants, those from ethnic minorities and applicants from FE colleges, even when they have the same GCSE scores and predicted 'A' level grades as females, white candidates and those who did not attend FE colleges, are less likely to be offered a place at Manchester.

## Predicted and Actual 'A' Level Results

It is generally accepted that actual 'A' level scores, as opposed to predicted 'A' level scores, are one of the best predictors of success. However, at the stage places are offered, most applicants 'A' level scores are unknown and predicted 'A' level scores are used as a proxy.

How good is this proxy? On the next page are three scatterplots (Figures A, B and C). These plot predicted against actual 'A' level scores for the whole sample, and for white applicants and applicants from minority ethnic groups separately. Please note that data on predicted and actual 'A' level scores was only available for 1283 of the 1405 applications in this study, and the scatterplot for applicants whose ethnic origin is unknown is not included here.

Pearson correlation coefficients are given beside Figures A, B and C. These are 0.776 for the whole sample, 0.784 for white applicants and 0.745 for applicants from ethnic minority groups. These coefficients are all significant at the 0.000

level.

This analysis confirms that predicted 'A' level scores are good predictors of actual 'A' level scores for white candidates and candidates from ethnic minority groups.

# Comparison of Predicted and Actual 'A' Level Scores

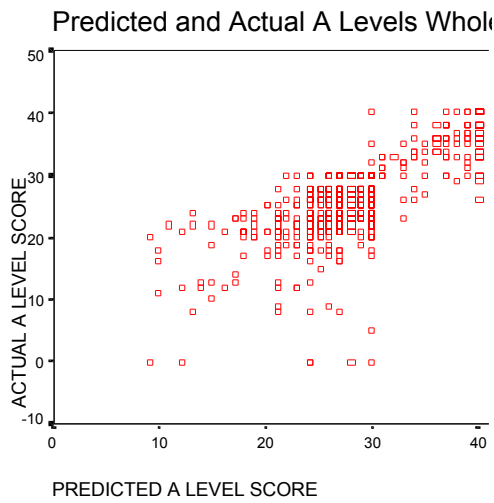


Figure A

**Whole sample**  
(n=1283)

Pearson correlation  
0.776

Significance level  
0.000

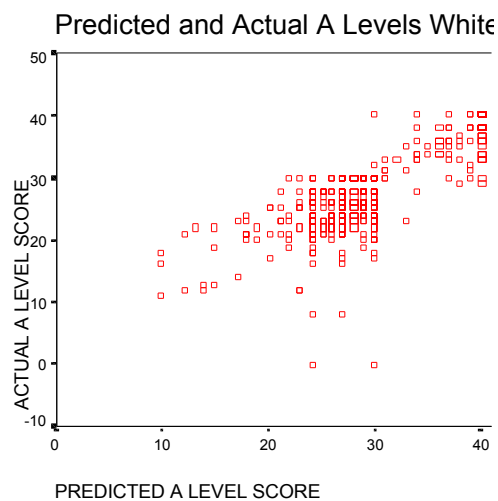


Figure B

**White applicants**  
(n= 847)

Pearson correlation  
0.784

Significance level  
0.000

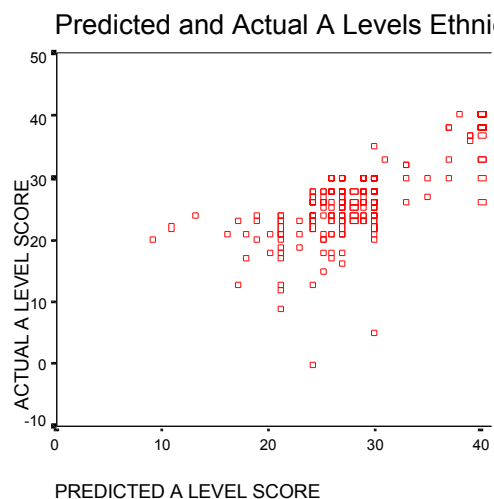


Figure C

**Ethnic minority applicants**  
(n= 352)

Pearson correlation  
0.745

Significance level  
0.000

## Reliability of Assessment of Written Applications by Admissions Tutors

Assessing each applicant's personal statement and school or college report under set headings (Appendix 3) ensures the same factors are considered for each application. Each application is assessed once by one of two Admissions Tutors. It is, therefore, important that the assessment system used is reliable. That is, it will produce comparable results for each application regardless of which Admissions Tutor carries out the assessment.

To look at the reliability of the rating system, each Admissions Tutor assessed and scored the same 100 applications from the 1999/2000 entry. Inter-rater agreement was then tested by calculating a Kappa score for each of the 13 dimensions that the applications are scored on. As Kappa does not take account of the degree of any disagreement between raters, a weighted Kappa was used. The weighting takes account of the degree of any discrepancy between the two raters by treating differences of only one category as less serious than discrepancies of two or three categories.

Kappa has a maximum value of 1.00 when agreement is perfect, a value of zero indicates no agreement, and negative values show worse than chance agreement.

Table 14 overleaf shows the weighted Kappa, the standard error of Kappa and the 95% and 99% confidence intervals for each dimension of the applicants' personal statements and school or college reports. The Kappa values show there is no more than moderate agreement between the scoring of these 100 applications by the two Admissions Tutors.

For applicants personal statements there was greatest agreement on the scores for the amount of work experience in a medically related or caring role (Kappa 0.562). The Kappa scores for all other dimensions of the personal statement were less than 0.40, i.e. fair or poor. It was not possible to calculate Kappa for the dimension 'other information' as one rater had given every application the same score for this dimension. This suggests this dimension may not yield any useful information for the selection process and its inclusion may need to be reviewed.

**TABLE 5****Comparison of Admissions Tutors' Assessments of Students' Applications for Medical School**

Weighted Kappa (using Fleiss and Cohen Weights) for Individual Dimensions of the Personal Statement and School or College Report

| <b>Dimension</b>                          | <b>Kappa</b> | <b>Se Kappa</b> | <b>95% CI</b> | <b>99% CI</b> |
|-------------------------------------------|--------------|-----------------|---------------|---------------|
| <b>Dimensions on Personal Statement</b>   |              |                 |               |               |
| Reasons for choosing medicine             | 0.394        | 0.07            | 0.255-0.532   | 0.211-0.576   |
| Amount of work experience                 | 0.562        | 0.052           | 0.460-0.664   | 0.428-0.696   |
| Positions of responsibility               | 0.296        | 0.088           | 0.123-0.468   | 0.068-0.523   |
| Interests/hobbies                         | 0.272        | 0.063           | 0.148-0.396   | 0.109-0.435   |
| Presentation and style                    | 0.360        | 0.091           | 0.181-0.538   | 0.125-0.594   |
| Other information                         |              |                 |               |               |
| <b>Dimension on school/college report</b> |              |                 |               |               |
| Commitment                                | 0.184        | 0.096           | -0.004-0.372  | -0.063-0.432  |
| Communication skills                      | 0.210        | 0.079           | 0.055-0.365   | 0.006-0.414   |
| Humility/Humanity                         | 0.494        | 0.063           | 0.370-0.618   | 0.331-0.657   |
| Intellectual potential                    | 0.563        | 0.055           | 0.456-0.671   | 0.422-0.705   |
| Leadership qualities                      | 0.609        | 0.080           | 0.453-0.766   | 0.403-0.815   |

There was greater agreement on the rating of dimensions on the school or college reports. Communication skills, intellectual potential and leadership qualities all showed moderate agreement between the two raters.

The Kappa calculations have shown that for this sample of 100 applications there is only poor to moderate agreement between the two Admissions Tutors on scoring on these individual dimensions. This suggests the present scoring system is not reliable.

Generally it is the total score on assessment by the Admissions Tutors, rather than scores on individual dimensions which is used when selecting candidates to attend for interview. It is therefore important to assess the level of agreement between the total scores of the two Admissions Tutors. Analysis of variance (ANOVA) was used to compare the total scores of the two Admissions Tutors. This was also to compare the sub-totals of dimensions used to assess (a) the personal statements and (b) the school or college reports.

Table 6 shows the results of these calculations. ANOVA gives an F value, generally the larger the F value the smaller the probability the difference could occur by chance. The results below show significant differences between the two raters in terms of the total scores on assessment, and the two sub-totals. The difference is particularly large for the assessments of applicants' personal statements.

**TABLE 6**

**Comparison of Totals and Sub-Totals of Assessment Scores by Admissions Tutors Using  
Analysis of Variance**

|                          | <b>Sum of Squares</b> | <b>Df</b> | <b>F</b> | <b>Significance</b> |
|--------------------------|-----------------------|-----------|----------|---------------------|
| Total of all dimensions  | 87.747                | 1         | 10.119   | 0.002               |
| Personal statement       | 423.405               | 1         | 110.141  | 0.000               |
| School of college report | 124.558               | 1         | 24.094   | 0.000               |

These results suggest the current method for assessing written applications would benefit from review. Double marking is routinely used when marking examination papers. The introduction of a system of double assessment of some or all of these applications would reveal discrepancies. Discussion of these discrepancies could help clarify and make explicit what factors are currently applied and the factors that should be applied when assessing the applications. This in turn would improve the reliability of the assessment process.