Medical Education

Widening Participation To The Medical Course At Queens University Belfast

McKinley A, Stevenson M and Steele K

ABSTRACT

The United Kingdom Clinical Aptitude Test (UKCAT) was introduced to assist in identification of applicants from all levels of society with the appropriate characteristics to become good doctors. Evidence that the UKCAT has achieved such widened participation (WP) in applicants to medical school remains elusive.

One of the limitations to WP investigation has been that data on socioeconomic status of applicants to medical schools has been obtained through voluntary submission on application to UKCAT and up to 30% of applications offered either none or only limited information. In this study of local applicants (451 from Northern Ireland) to Queens University Belfast (QUB) for 2012, socioeconomic data was ascertained through post code analysis. These data were utilized to investigate the relationship between affluence, application to the medical school and UKCAT score.

Our study has shown that for NI applicants to QUB medical school, postcode /socioeconomic back ground accounts for only 3 percent of UK CAT score variation. We have also shown that our admissions process is largely independent of socioeconomic background.

However we have demonstrated that the socioeconomic profile of applicants from Northern Ireland to QUB medical school is such that even if every applicant to QUB in 2012 were offered a place in the medical school the number of applicants from least affluent areas would increase by only 9. In conclusion efforts to achieve meaningful WP must be directed at raising aspirations for a career in Medicine within the community.

Key Words QUB Medical School application, UKCAT, Widening Participation,

INTRODUCTION

The Further and Higher Education Act 1992 was introduced to improve social mobility. However despite political pressure and sustained efforts to promote widening participation (WP) in medical schools, little has changed since the 1980's when it was noted that only 5% of medical school entrants had parents from a non-professional background[1]. In 2006 the UK CAT (Clinical Aptitude Test) was introduced with the dual aim of selecting medical students on the basis of aptitude rather than academic ability and to encourage WP. However published data from UKCAT in 2013 confirms that only 3.2% of all medical school entrants were from Social Class 5[2]. Locally in addition to utilizing UK CAT as part of the Admissions process, Queens University Belfast (QUB) has promoted WP by offering Post graduate students the opportunity to apply to the medical school.

A number of studies have investigated the lack of representation of students from lower social class and ethnic minorities at medical schools but they are limited by reliance on volunteered socioeconomic data which because of stigmatization is often limited[3, 4]. In this study socioeconomic data was available for all applicants to the QUB medical school from Northern Ireland through the Northern Ireland Statistics and Research Agency (NISRA) website[5].

Currently admission to QUB medical school involves scoring of previous academic performance combined with a score for UK CAT performance following which the highest scoring applicants are offered a Multiple Mini Interview (MMI). Given QUB's intention to widen participation for local applicants from lower socioeconomic groups in Northern Ireland we hypothesised that, unlike GCSE's[6], the UK CAT score would have no relationship with Social Class. If this hypothesis was upheld then by increasing the weighting for UK CAT and reducing the weighting for academic achievement there may be the potential to increase the number of applicants from lower socioeconomic groups.

METHODS

Following Ethical Committee approval[8] details of all applicants from Northern Ireland to the QUB medical school for 2012 entry, including postcode, individual identity number, previous academic achievement and UKCAT scores were obtained. Using these data, applicants were allocated between two groups. Group 1 comprised those students who

Centre for Medical Education, QUB.

andrew.mckinley@belfasttrust.hscni.net

Corresponding Author: Dr Andrew McKinley

TABLE 1

*MDI Quintile by Interview Status for all applicants to QUB medical school resident in
Northern Ireland for 2012 (Total applicants 462)*

MDI Quintile	1	2	3	4	5	Total
Group 1 Interview	129 (37%)	71 (20%)	74 (21%)	50 (14%)	22 (6%)	346
Group 2 No interview	36 (31%)	21 (18%)	34 (29%)	16 (14%)	9 (7%)	116
Total	165 (36%)	92 (20%)	108 (23%)	66 (14%)	31 (7%)	462

Note: Most quintiles are based on SOA rank such that Q1 = SOA rank 713-890, Q2 = SOA rank 535-712 and so on. In a small number of cases SOA rank was unavailable so these cases were categorised by Ward Rank such that Q1 = Ward Rank 467-582 and so on. Q1 represents the most affluent quintile and Q5 the most deprived quintile in Northern Ireland. The MDI categorisation is based on the full deprivation measure which includes issues to do with access to services and crime.

were ranked highest using academic assessment based on previous academic achievement combined with the candidates UK CAT score and were admitted to the second stage for a Multiple Mini Interview. Group 2 were applicants who scored least well in the selection process and were excluded from the process.

For both groups the Northern Ireland Statistics and Research Agency (NISRA) website[5] was used to obtain a Multiple Deprivation Index (MDI) from each applicant's postcode. These data, based on a number of markers for deprivation including income and employment, are obtained from 2010 census information and the population is ranked into 890 groups or Super Output areas (SOA), each representing approximately 2000 individuals (1=least affluent area,890 most affluent)[5]. Through interrogation of the NISRA website an MDI between 1 and 890 was determined for each applicant. The MDIs of SOA were divided into five equal groups as determined by MDI rank.

Statistical analysis considered the relationship between MDI and UK CAT score for all applicants using the chi-squared for trend test.

For interviewed applicants (Group 1) and for unsuccessful applicants (Group 2) the correlation between MDI and MMI rank was investigated using Spearman's Rank Coefficient of Correlation. Finally a Mann-Whitney test and chi-squared tests for differences in MDI rank between successful and unsuccessful candidates was carried out.

RESULTS

In total there were 951 applicants for admission to QUB medical school for 2012 entry and of these 462 were resident in Northern Ireland. The number and percentage of applicants in each MDI group is shown in Table 1. Of the 462 applicants, 346 fulfilled the cognitive criteria of previous academic achievement and UK CAT score and were permitted to progress to stage 2 (MMI) of the QUB medical school admissions process. The number and percentage of applicants in each MDI group is shown in Table 1 below. There were 116 applicants who did not achieve the QUB cognitive entry score and were excluded from the admission process.

A chi-squared for trend test was applied to the data in Table 1. This resulted in a test statistic of 1.54 and a two-sided P-value of 0.21. We therefore conclude that while there clearly is a greater propensity to apply to QUB medical school if you hail from a more affluent area, if someone does apply, the chance of being offered an interview is roughly equal across all MDI quintiles.

For 448 of the 462 applicants from NI to QUB Medical school in 2012 we determined the correlation between UKCAT categorical score (seven categories) and MDI SOA rank Spearman's rank correlation. Result: $r_s = 0.177$ (P<0.001) which is statistically significant but still only represents a situation where 3% of the variation in UKCAT score can be possibly attributed to social background.   .

For 335 of the 346 successful applicants we correlated MDI rank with MMI score again using Spearman's rank correlation. Result: $r_s = 0.121$ (P=0.026) which is just statistically significant and in fact just 1.5% of the variation (estimated from adjusted R-square) in MMI score can be attributed to deprivation.

A Mann-Whitney test for differences in MDI rank between successful and unsuccessful candidates gave a P-value of 0.25 which reinforced the conclusion of no difference in MDI rank between the successful applicants and those who were unsuccessful and excluded from interview. Further analysis of MDI rank for those applicants offered MMI versus those excluded using chi-squared tests reveals a linear trend P-value of 0.21 as shown in Table 2.

TABLE 2

Chi-Square tests Interview vs No Interview for QUB medical school applicants resident in Northern Ireland 2012

	Value	df	Asymp.Sig
Pearson Chi-Square	3.818[a]	4	0.431
Likelihood Ratio	3.731	4	0.444
Linear by Linear Association	1.543	1	0.214
N of Valid Cases	462		

[a] 0 cells (0.0%) have expected outcomes less than 5. The minimum expected count is 7.78

DISCUSSION

Results show that the original hypothesis was largely correct. Although a P value of 0.001 is demonstrated for the relationship between MDI SAO rank and UKCAT score this must be seen in the context that only 3% of the variation in this score is attributable to socioeconomic status. As with all observational studies none of this can be assumed to be causal. There is no doubt that the schools which students from poorer backgrounds attend are less familiar with, and consequently less equipped to coach and encourage students who have an aptitude towards medicine. The socioeconomic status for applicants to QUB medical school who are resident in Northern Ireland does not appear to have a major influence on their performance in the UK CAT assessment. This information provides an independent and objective confirmation of the UKCAT Consortiums aspiration to increase diversity.

Unfortunately, despite the above finding, the study reveals that our hypothesis of increasing the loading of UKCAT score in the QUB selection process to widen participation and redress the imbalance regarding underrepresentation of more deprived students has not been effective. Even if all the applicants from Northern Ireland for 2012 entry who did not fulfill the cognitive score required for interview were offered a place in the medical school this would not change the socioeconomic bias significantly. Table 1 shows these data and though a smaller group (116) the percentage of applicants for each social class is very similar to that of the complete cohort of applicants (with a predominance of affluent MDI Bands 1 and 2 applicants (56%) and smaller percentage in the more deprived MDI Bands 4 and 5 (21%). In summary if all the 116 excluded applicants to QUB medical school from Northern Ireland in 2012 were offered admission the number of students from the most deprived MDI Band 5 in the medical school would increase by only 9.

It is reassuring to note that numbers of applicants to QUB medical school from the least affluent areas, ((MDI zones 4 and 5), whether information is derived from UKCAT application or postcode analysis as in this study, do compare favorably to national data[7]. An influential paper in 2012 noted 5.5% of applicants or 4.5% of entrants were from lower social classes[3]. The percentage of Northern Irish applicants to QUB medical school from Social Classes 4 and 5 was 11.7% using UKCAT data[7] whereas in this study, information from postcode analysis (bands 4 and 5) shows a higher figure of 21%.

The study also suggests that the QUB MMI process is largely unaffected by socioeconomic status as comparison of MDI rank with MMI score gives a P value which is only just statistically significant. As this is a relatively large sample size, MMI score is just significantly correlated to deprivation in the direction we might have anticipated but represents only 1.5% in score variation. Further analysis by Chi-square tests for MDI rank comparing applicants offered an interview with those who were excluded again gives a P value of 0.21as

Table 2 demonstrates.

When the MDI from Super Output area data for the full cohort of applicants to QUB medical school (Table 1) was analysed the distribution is as expected with a significant proportion of applicants from the more affluent MDI groups1 and 2 (56%). An unexplained finding is the slight increase in applicants from band 3 (534 – 357), 23% when compared with applicants from bands 2 and 4, 20% and 14% respectively. It is not immediately obvious why these groups are slightly over represented when compared to other medical schools[7] although it is possible that the number of post graduate applicants to QUB may be influencing the data. Post graduate applicants with residency in the popular student areas of Belfast (multiple rental properties and a preponderance of lower income groups) may have increased the number of applicants with MDI in the 3-5 band range. Unfortunately the data provided from QUB did not contain date of birth details which may have been useful to identify postgraduate applicants.

It is interesting to speculate the relationship between Social Class as obtained from occupation and income analysis and MDI obtained from a range of 52 deprivation indicators, which in addition to income includes health, education, proximity to services and crime. The difference between the number of applicants in each socioeconomic group between the data obtained from UKCAT sources and the data obtained in this study using post code analysis is informative at both local and national levels. Socioeconomic information submitted is voluntary and published studies[3,4] have documented a similar percentage of applications with missing or incomplete data (approximately 30%). Intuitively applicants from lower socioeconomic groups may be reluctant to provide socioeconomic information. In this study because the socioeconomic detail is obtained through the NISRA website and is derived from post code all the information is available for every applicant.

Finally, in terms of our hypothesis to widen participation and particularly increase the number of medical students at QUB from lower socioeconomic groups in Northern Ireland. It is possible that an initial, raising aspirations program directed at secondary schools with few applicants to medical school may be effective. If subsequently combined with an increase in weighting for UK CAT, given its relatively weak association with socio-economic deprivation and accompanied by a reduction in emphasis on GCSE's, where better results are associated with affluence[6], then QUB may be more successful in improving WP at the medical school.

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