

# Ethnic and gender variations in university applicants to United Kingdom medical and dental schools

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**Aim** To explore ethnic and gender variations amongst applicants to undergraduate United Kingdom medical and dental schools.

**Method** Retrospective analyses of University and College Admissions Services (UCAS) data on all students applying to study pre-clinical medicine and dentistry, during the academic years 1994/5, 1995/6 and 1996/7. Information for each medical and dental applicant included age, gender, social class and ethnic group.

**Results** Of all applicants, just over half (50.2%) were male, though a greater proportion of applicants to dentistry were male (54.1%) than for medicine (49.3%) (OR=1.21, 95% CI=1.15, 1.28). Over one third (36.4%) of all students were from minority ethnic groups, a larger proportion of which were dental students (48.3%) than were medical students (33.8%) (OR=1.83, 95% CI=1.73, 1.94). There were also marked differences between medicine and dentistry when the ethnic groups were examined separately. The largest number of applicants from minority ethnic groups came from the Indian community, and this group increased in size annually by 4.1% ( $P<0.05$ ) for medicine, and 29% ( $P<0.05$ ) for dentistry.

**Conclusions** Significant inter-ethnic and gender differences are observed amongst applicants to medicine and dentistry. Dentistry appears to be relatively more attractive to minority ethnic applicants.

Access to higher education for all sections of society is a central aim of the UK government's education strategy. Higher education institutions have achieved a great deal in the last few years in terms of widening the profile of the student population.<sup>1</sup> This widening of access and the increase in students entering Higher Education (HE) has created far more inclusive activity than previously.<sup>1-2</sup> For example, women now account for a majority of HE students, whereas twenty years ago they represented one-third.<sup>1-2</sup> Students from ethnic minority backgrounds, taken together, are well represented (although some groups, such as Moslem women and young black Caribbean men, are still significantly under-represented).<sup>1-2</sup> And there is now a well-established tradition of participation in HE by mature students.<sup>1-2</sup>

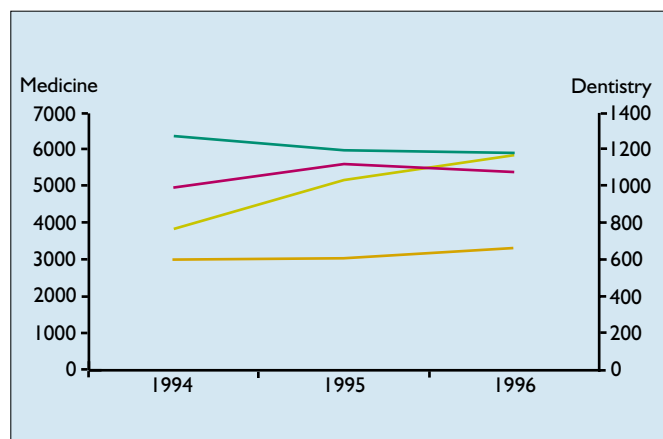
The debate with regard to ethnic and gender variation in applicants to HE has focused upon the disadvantages they may encounter in successfully gaining entry to their chosen course. McManus (1998), in a recent investigation of bias among applicants to medical schools, showed that even when academic achievement

is taken into account minority ethnic candidates are less likely to be accepted.<sup>3</sup> He also noted that older applicants and those from lower socioeconomic groups are also disadvantaged.<sup>3</sup> These findings add to the ongoing debate on the selection process into medical schools.<sup>4-6</sup> It is clear that the perceived or real challenges faced by medical schools in their selection criteria may result in significant policy changes.

This research initiative has attempted to explore if dentistry is different for those who apply and enter its schools compared to medicine. If important differences exist, dentistry and medicine should be treated differently and these differences should be considered before any funding or policy changes are adopted by HE institutions. Exploration of such differences is now possible as detailed socio-demographic data are collected on successful applicants to universities and colleges of further education. Ethnic monitoring was introduced to the data collected by the University and College Admissions Services (UCAS) in 1994. The aim of this paper is to explore ethnic and gender variations amongst applicants to undergraduate medical and dental schools, in the UK, for the academic years 1994/5, 1995/6 and 1996/7.

## Materials and methods

Universities and Colleges Admission Service (UCAS) is the UK central organisation through which applications are processed for entry to full-time university undergraduate courses. Each applicant was permitted to make up to eight applications (but are advised to select only 5 and most comply with this), and the profile of applicants for different subjects varies. University and College Admissions Services (UCAS) provided data on all students applying to study pre-clinical medicine and dentistry, during the academic



**Fig. 1** Numbers of applicants to study medicine (left axis) and dentistry (right axis) for white and minority ethnic groups, 1994/5 to 1997. Green, white applicants to medicine; red, white applicants to dentistry; yellow, minority applicants to dentistry; orange, minority applicants to medicine.

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**Table 1** Number of students applying to study medicine and dentistry by ethnic group, 1994/5 to 1996/7.

Ethnic group	Medicine		Dentistry		Total
	Males	Females	Males	Females	
White	8,456 (60.8%)	9,763 (68.4%)	1,630 (48.1%)	1,540 (53.5%)	21,389 (62.1%)
Indian	1,767 (12.7%)	1,357 (9.5%)	851 (25.1%)	553 (19.2%)	4,528 (13.1%)
Pakistani	1,102 (7.9%)	844 (5.9%)	395 (11.6%)	230 (8.0%)	2,571 (7.5%)
Other Asian	812 (5.8%)	665 (4.7%)	198 (5.8%)	197 (6.8%)	1,872 (5.4%)
Other	402 (2.9%)	420 (2.9%)	103 (3.0%)	110 (3.8%)	1,035 (3.0%)
Black African	333 (2.4%)	371 (2.6%)	34 (1.0%)	58 (2.0%)	796 (2.3%)
Chinese	282 (2.0%)	202 (1.4%)	40 (1.2%)	46 (1.6%)	570 (1.7%)
Bangladeshi	272 (2.0%)	209 (1.5%)	44 (1.3%)	37 (1.3%)	562 (1.6%)
Black Caribbean	62 (0.4%)	91 (0.6%)	15 (0.4%)	31 (1.1%)	199 (0.6%)
Black Other	48 (0.3%)	63 (0.4%)	6 (0.2%)	15 (0.5%)	132 (0.4%)
Unknown	362 (2.6%)	294 (2.1%)	76 (2.2%)	62 (2.2%)	794 (2.3%)
Total	13,898 (100.0%)	14,279 (100.0%)	3,392 (100.0%)	2,879 (100.0%)	34,448 (100.0%)

years 1994/5, 1995/6 and 1996/7. Information for each medical and dental applicant included age, gender, social class and ethnic group. Social class was ascertained from the professional background of the head of the applicant's household. Candidates were classified as white or belonging to a minority ethnic group. They had identified themselves on the UCAS form as: white, Indian, Pakistani, Bangladeshi, black Caribbean, black African, black other, Chinese, Asian other, or just other. Due to small numbers, the three black communities were combined to a single black category, as too were Asian other and other, to simply other.

Trends in the number of applicants were examined separately for medicine and dentistry, and results contrasted. The  $\chi^2$  test for linear trend was used to assess the statistical significance of temporal changes or change in socio-demographic profiles of applicants. Statistical significance was assumed at the 95% level. Odds Ratios (OR) with 95% confidence intervals (CI) were evaluated and reported to illustrate differences between subgroups of students.

## Results

Nearly thirty-five thousand men and women applied through UCAS to study medicine and dentistry during the three-year study period, of which only 45% would succeed.<sup>7</sup>

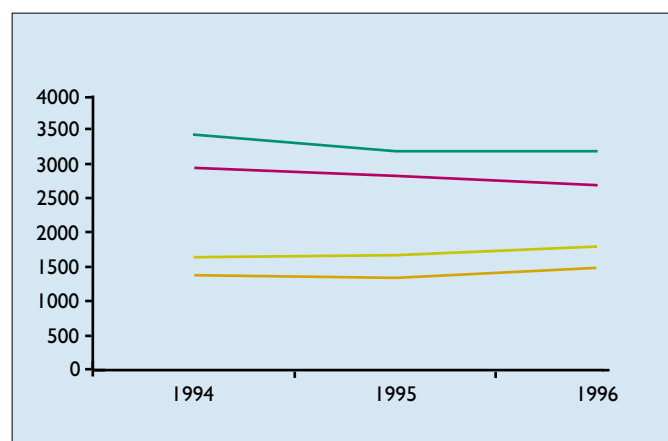
### Socio-demographic trends in medical and dental school applicants through UCAS

Of all applicants, just over half (50.2%) were male, though a greater proportion of applicants to dentistry (54.1%) were male compared to medicine (49.3%) (OR=1.21, 95% CI=1.15, 1.28). Over one third

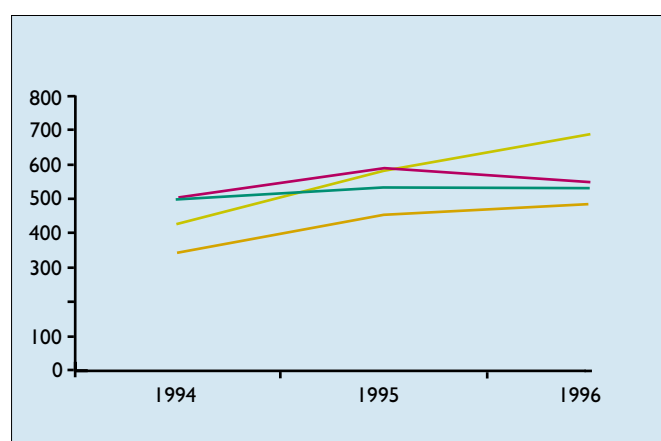
(36.4%) of all students were from minority ethnic groups (Table 1), a larger proportion of which were dental students (48.3%) than were medical students (33.8%) (OR=1.83, 95% CI=1.73, 1.94). The number of minority ethnic applicants rose from 33.9% in 1994/5 to 39.1% by 1996/7, with the majority of the increase occurring in dentistry (Figure 1). In contrast, amongst white applicants the numbers fell slightly in medicine (Figure 2) and rose slightly (for women only) in dentistry (Figure 3). The increase in minority ethnic applicants was significant for medicine only due to the fall in the number of white applicants (OR=1.18, 95% CI=1.11, 1.26), but was more significant in dentistry despite an increase in white applicants also (OR=1.41, 95% CI=1.24, 1.60). There were no significant gender differences in the number of minority ethnic applicants to medicine

**Table 2** Number of students commencing pre-clinical medicine and dentistry by ethnic group, 1994/5 to 1996/7.

Ethnic Group	Medicine		Dentistry		Total	
	Number	%	Number	%	Number	%
Bangladeshi	142	1.1%	18	0.7%	160	1.0%
Black	153	1.2%	34	1.3%	187	1.2%
Chinese	218	1.7%	40	1.6%	258	1.7%
Indian	1,318	10.1%	459	18.2%	1,777	11.4%
Other	859	6.6%	199	7.9%	1,058	6.8%
Pakistani	506	3.9%	144	5.7%	650	4.2%
White	9,680	74.1%	1,575	62.5%	11,255	72.2%
Unknown	193	1.5%	50	2.0%	243	1.6%
Total	13,069	100.0%	2,519	100.0%	15,588	100.0%



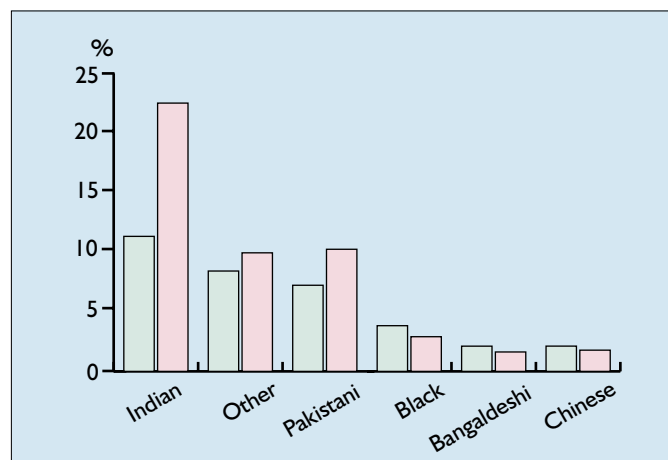
**Fig. 2** Numbers of applicants to study medicine for white and minority ethnic groups by gender, 1994/5 to 1996/7. Green, female white applicants; red, male white applicants; yellow, male minority applicants; orange, female minority applicants.



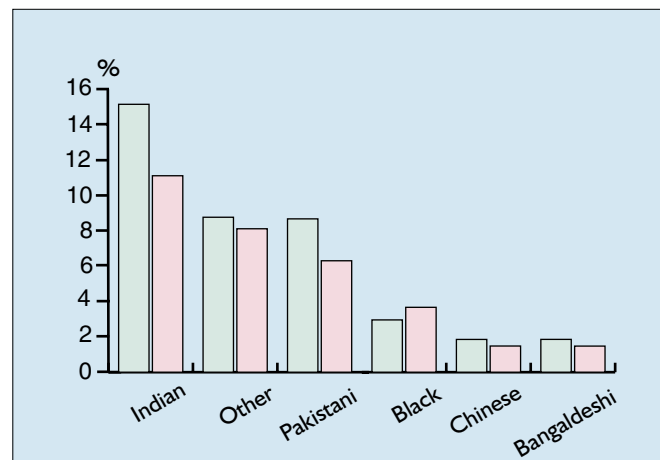
**Fig. 3** Numbers of applicants to study dentistry for white and minority ethnic groups by gender, 1994/5 to 1996/7. Green, female white applicants; red, male white applicants; yellow, male minority applicants; orange, female minority applicants.

**Table 3 Odds Ratios of male to female applicants by ethnic group compared to white applicants, for medicine and dentistry, 1994/5 to 1996/7.**

Ethnic Group	Medicine		Dentistry		Total	
	OR (95% CI)	Applicants	OR (95% CI)	Applicants	OR (95% CI)	Applicants
Bangladeshi	1.50 (1.14, 1.79)	3,124	1.12 (0.71, 1.68)	1,404	1.44 (1.12, 1.69)	4,528
Black	0.97 (0.82, 1.08)	2,299	0.50 (0.26, 0.68)	608	0.89 (0.71, 1.00)	2,907
Chinese	1.61 (0.93, 1.83)	1,946	0.82 (0.50, 1.25)	625	1.46 (1.12, 1.70)	2,571
Indian	1.50 (1.35, 1.51)	968	1.45 (1.18, 1.27)	159	1.54 (1.38, 1.53)	1,127
Other	1.29 (1.19, 1.38)	484	0.93 (0.71, 1.09)	86	1.22 (1.13, 1.30)	570
Pakistani	1.51 (1.36, 1.56)	481	1.62 (1.24, 1.42)	81	1.56 (1.40, 1.57)	562
Unknown	1.42 (1.12, 1.70)	656	1.16 (0.81, 1.54)	138	1.38 (1.10, 1.61)	794



**Fig. 4 The proportion of applicants to study medicine and dentistry for each minority ethnic group by subject, 1994/5 to 1996/7. Green, medicine; pink, dentistry.**



**Fig. 5 The proportion of applicants to study medicine and dentistry for each ethnic group by gender, 1994/5 to 1996/7. Green, males; pink, females.**

or dentistry over the study period, although the number of males generally rose more than the number of females (Figures 2 and 3).

#### Role of ethnic background and gender

The largest minority ethnic group of applicants were Indian (23.1%), the smaller being black-other (0.32%) and black-Caribbean (0.58%), although combined the number of black applicants (3.3%) exceeded the number of Chinese (1.7%) and Bangladeshi (1.6%) applicants (Table 1, Figure 4). There were more female (65.9%) than male (58.3%) applicants from the white group, though this pattern was reversed for all minority ethnic groups except the black community (Figure 5). Table 2 provides the number of students commencing pre-clinical medicine and dentistry by ethnic group. The Odds Ratios of male to female applicants for minority ethnic groups compared to the white group are summarized in Table 3.

Absolute increases in minority ethnic applicants to medical school were observed for South Asian males at a rate of 3.3% per annum ( $P < 0.005$ ), and for black males or females at 7.3% ( $P < 0.05$ ). These rises in the number of medical applicants from minority ethnic communities were concurrent with a reduction in male white applicants, occurring at an annual rate of 4.4% ( $P < 0.001$ ). By contrast, there were no significant changes in the number of white applicants to dental school for the same period, but absolute numbers rose for all minority ethnic groups. This was particularly noted amongst South Asian males and black females with an increase of 33% ( $P < 0.05$ ) and 23% per annum ( $P < 0.05$ ) respectively.

There were also marked differences between medicine and dentistry when the ethnic groups were examined separately. The largest number of applicants from minority ethnic groups came from the Indian community, and this group increased in size annually by 4.1% ( $P < 0.05$ ) for medicine, and 29% ( $P < 0.05$ ) for dentistry. The

largest rise in applicants occurred amongst Pakistani men and women applying to dentistry, with an annual increase of 33% ( $P < 0.01$ ) over the study period — there was no corresponding change for Pakistani applicants to medical school. All these increases were similar amongst males and females. The Bangladeshi community, however, experienced increased representation amongst male applicants only, for both medicine and dentistry, with 30% and 61% growth respectively. There were no significant changes for female Bangladeshis applying to study medicine or dentistry, though overall numbers were small. All other potential changes within the remaining minority ethnic groups were either too subtle or masked by there being too few applicants within each group.

#### Discussion

These findings show significant inter-ethnic and gender differences amongst minority ethnic groups applying through UCAS to study medicine and dentistry. The availability of the data and ethnic background of applicants has also showed clear differences between medicine and dentistry.

In understanding the ethnic and gender variations in medical and dental applicants it is important to note the size of the minority ethnic groups in the United Kingdom and their educational attainments. The former is determined by the 1991 census, which provided the information on the size of minority ethnic groups.<sup>8</sup> It showed that the ethnic composition of Great Britain in 1991 consisted of 94.5% white and 5.5% from minority ethnic groups.<sup>8</sup> The latter were mainly Indian (1.5%), Pakistani (0.9%), black-Caribbean (0.9%) and Bangladeshi and Chinese (which combined both formed 0.3% of the population).<sup>8</sup> However, it should be noted that during the past decade there has been significant changes in both the size, composition and social status of these

groups.<sup>8</sup> During the 1990s there has been an increase in the number of refugees, some of them with high educational attainments and abilities. Despite these changes, it would appear that both medicine and especially dentistry are attracting a greater proportion of minority ethnic applicants than their relative size in the general population.

The minority ethnic groups themselves display a radical diversity in their educational attainment levels. On the one hand some groups have a high proportion of non-English speakers, whilst others have higher qualification levels than the white population. Indeed, these extremes sometimes exist in the same ethnic groups.<sup>9</sup> The 4th National Survey of minority ethnic groups in the UK provided the most reliable and comprehensive picture of the population.<sup>9</sup> The survey showed that most migrants entered the country without qualifications but that there were significant variations; the black-Caribbean, Pakistanis and Bangladeshis were poorly qualified, though more than a third of Indians and Chinese had a higher qualification.<sup>9</sup> This may in part explain the high proportion of Indian applicants that are applying to and entering medical and dental schools, as young people whose parents have a higher qualification are more likely to apply to HE institutions.

The National Survey also highlighted that South Asian women were likely to be less qualified than men, while the opposite was the case for the black-Caribbean and Chinese.<sup>9</sup> The encouraging trend in the present study was the observation that in dentistry there was a rise in both male and female Pakistani applicants. However, the Bangladeshi community experienced increased representation amongst male applicants only, for both medicine and dentistry, with 30% and 61% growth respectively. This may also be explained in part by noting the intergenerational differences in educational attainment observed in the National Survey. The second generation (25–44 year-olds who were born in Britain or came as children), had made significant progress.<sup>9</sup> Of all groups, the black-Caribbean (especially the men) made the greatest advance at both the middle and higher levels, though less at the degree level. However, the proportion without a qualification continued almost at its previous high level. The Bangladeshis had not made any progress.<sup>9</sup> In the new generation (16–24-year-olds) fewer were without qualification, irrespective of ethnic group. However, Pakistanis and Bangladeshis continue to be the groups with the largest proportion of those without qualifications.<sup>9</sup> Therefore, the lack of female role models may have an impact on these groups.

Although there are differences in medicine and dentistry, there

are also similarities, for example, the trend in the largest ethnic groups applying (Tables 1 and 2), with the white group the largest, followed by the Indian and then Pakistani. Table 2 also showed that although the relative minority ethnic group order (in magnitude) occurs in both medicine and dentistry, the latter has a greater proportion; Indian (medicine 10.1%; dentistry 18.2%), Pakistani (3.9%; 7%) followed by the Chinese (1.7%; 1.6%).

In conclusion, significant inter-ethnic gender differences are observed amongst applicants to medicine and dentistry. However, dentistry appears to be relatively more attractive to applicants from minority ethnic groups, who display some clear distinctive characteristics in contrast to medical school applicants. The implications of these findings for future medical and dental manpower estimates are uncertain.

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