

Selection of medical students — a follow-up study

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Summary

The attributes of 1 026 medical students admitted to university on academic criteria and by interview between 1980 and 1983, and the characteristics of 822 of them who graduated between 1985 and 1988, were analysed. There were 133 students (13%) who failed and were excluded, 99 (10%) repeated 1 or more years of study, 67 (7%) voluntarily withdrew, 42 (4%) completed a B.Sc. degree during their medical training, and 675 graduated in the minimum time. The admitted and graduated students were mainly white (85%), male (67%) and had no academic experience other than matriculation (69%). During the review period the proportion of 'non-whites', women and applicants with university experience increased. Students who voluntarily withdrew had significantly low interview scores; applicants with university experience and applicants who subsequently failed had significantly high interview scores. It is concluded that the interview is useful, that the demographic characteristics of the classes are changing, and that traditional academic standards have been maintained.

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Since 1979 admission of medical students to the Faculty of Medicine of the University of the Witwatersrand has been based on academic performance and two assessments of non-academic attributes, such that the ratio of academic to non-academic criteria is 80:20. Before 1979 academic criteria only were used and the Faculty came to believe that this single criterion was inadequate. In the long term, we hope that the new procedure will produce graduates interested in, and able to contribute to, the full range of medical skills. Whether we will achieve this aim will be known, perhaps, in another 10 - 15 years' time. In the short term, our new procedure has had two aims: (i) to broaden the non-academic and academic attributes of admitted students, and (ii) to ensure that students survive the curriculum.

The first 4 classes admitted under the new scheme have now graduated. This group of students differs from later groups in that assessment of non-academic attributes was done by interview alone, rather than by the present method of interview and biographical questionnaire. Since very few medical schools admit students on the basis of an interview, we feel that the consequences of this approach for our short-term objectives should be reported.

Subjects and methods

The group of students analysed comprised 1 026 students admitted in 1980, 1981, 1982, and 1983, and the 822 students who graduated 6 years later, i.e. in 1985, 1986, 1987, and 1988.

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Three characteristics of these students were analysed. First, their progress through the medical curriculum was assessed. Students can graduate in the minimum time (6 years after admission as 1st-year students) or have delayed graduation or may not graduate at all because of failure and exclusion or because of voluntary withdrawal from the course. Delayed graduation can be a consequence of poor academic performance necessitating repeating one or more years of study or students can take leave of absence to pursue, for a year, other interests. Students who take leave of absence can spend the year studying an intercalated science degree. Thus, admitted students were characterised as having: (i) graduated in the minimum time; (ii) studied for a B.Sc.; (iii) had a year's leave of absence for other reasons; (iv) repeated one or more years of study; (v) voluntarily discontinued their studies; or (vi) failed and not been readmitted.

A second method of characterising these students was by gender, race and type of academic background. These classifications are at present important in the South African socio-politico-economic context. The four race groups from which our students are drawn are whites, blacks, Indians and coloureds. The Faculty also admits students with four types of academic background: (i) current matriculants who have just completed the matriculation examination; (ii) past matriculants who have had some post-matriculation experience (e.g. national service) between matriculation and admission; (iii) foreign matriculants; and (iv) applicants who have had one or more years of university education at the time of admission. Only 97 of the admitted students (9,5%) were past-matriculants or foreign matriculants and for the purposes of this study have been regarded as matriculants. Thus this study recognised two types of academic background: matriculants and applicants with university experience.

The mean interview score of the students who filled each of the 13 possible categories was also calculated. The interview expects to assess evidence of integrity, commitment to and interest in our society, and suitability and motivation to study medicine. Interviews were scored on a 5-point scale of 0, 3, 5, 7 and 10; this ranged from unacceptable to highly acceptable. This interview score was added to a score derived from academic marks, and the combined score was used to determine order of merit for admission.¹

Results

We admit students to the first 4 years of study. Table I shows that 81% of the 1 026 students admitted during the period under review were admitted to 1st year. An additional 12% were admitted to 2nd year, 6,5% to 3rd year and 0,5% to 4th year. Of the 1 026 students admitted, 66% (675) graduated in the minimum time possible. Table I also shows that the proportion of students graduating in the minimum time has increased from 62% for the class admitted in 1980 to 69% for the class admitted in 1983.

The average interview score for each of the admitted classes did not differ significantly. However, the average interview score of students who graduated in the minimum time was significantly lower than that for all admitted students ($t = 2,22; P < 0,05$).

Of the 1 026 students admitted, 351 had delayed graduation or did not graduate. Table II shows causes of delayed gradua-

TABLE I. STUDENTS ADMITTED BETWEEN 1980 AND 1983

Yr of admission	Yr of study of admission				Total admitted	Yr of graduation	Graduated in minimum time	% admitted who graduated in minimum time	Total graduated	Interview score
	1st	2nd	3rd	4th						
1980	205	39	8	2	254	1985	157	62	193	6,4 ± 4,8
1981	211	22	29	1	263	1986	172	65	214	5,9 ± 3,6
1982	211	13	25	2	251	1987	169	67	199	5,8 ± 3,7
1983	201	51	5	1	258	1988	177	69	216	6,1 ± 3,4
Total	828	125	67	6	1026		675	66	822	
%	80,7	12,2	6,5	0,6					80,1	
Interview score					6,4 ± 3,6		6,0 ± 3,8			

TABLE II. CAUSES OF DELAYED GRADUATION FOR STUDENTS ADMITTED BETWEEN 1980 AND 1983

Yr of admission	Expected yr of graduation	No. of students not graduating in minimum time	B.Sc.	Reasons for delayed graduation					Fail and repeat
				Leave of absence	Discontinued	Repeat	Fail		
1980	1985	97	3	2	20	36	36	72	
1981	1986	91	11	4	18	20	38	58	
1982	1987	82	13	1	10	22	36	58	
1983	1988	81	13	5	19	21	23	44	
Total		351	40	12	67	99	133	232	
%		34	11	3	19	28	38	66	
Interview score		6,7 ± 3,5	6,3 ± 2,9	5,9 ± 4,0	6,0 ± 3,2	6,8 ± 3,5	7,1 ± 3,5	7,0 ± 3,6	

tion. The number of students who studied for a B.Sc., took leave of absence for other reasons or voluntarily discontinued their studies was remarkably constant each year and accounted for 34% of delayed graduations. An additional 28% of delayed graduations were caused by students who repeated one or more years of study. On average 13% of admitted students (133 out of 1026) failed and these students accounted for 38% of the group of 351 students who did not graduate in the minimum time. Table II also shows that the number of students not graduating in the minimum time has decreased from 97 in the class admitted in 1980 to 81 in the 1983 class. The average interview score of the 89 students who took leave of absence or discontinued was significantly lower than that of the 231 students who failed or repeated.

During the years 1985 - 1988, 147 students graduated in more than the minimum time (Table III). These students were either admitted before 1980 or between 1980 and 1982. As no interviews were conducted before 1980, no meaningful interview score can be calculated for these students. Table III shows, however, that 66% of these students had delayed graduation because they repeated one or more years of study. An additional 42 students (29%) took a B.Sc. degree.

Tables IV, V, VI, and VII show the gender, racial and academic characteristics of the students who were admitted and graduated in the period reviewed. Table IV shows the attributes of all 1026 admitted students. The admitted students were mainly white (81%) male (66%) and matriculants (71%). However, the number of black and coloured students admitted was 2,5 times greater in 1983 than in 1980, and the number of women admitted increased 1,5 times during this period. No significant differences between interview scores could be detected for any of these groups of students except that university-experienced applicants had a higher interview score than did matriculants ($t = 2,08; P < 0,05$).

TABLE III. CAUSES OF DELAYED GRADUATION FOR STUDENTS ADMITTED BEFORE 1980 AND BETWEEN 1980 AND 1982

Yr of graduation	No. of additional graduates	Reasons for delayed graduation		
		B.Sc.	Leave of absence	Repeat
1985	36	10	4	22
1986	42	5	0	37
1987	30	10	2	18
1988	39	17	2	20
Total	147	42	8	97
%		29	5	66

Table V shows the gender, racial, and academic characteristics of students who graduated in the minimum time. As can be expected, this group is also predominantly white (86%), male (66%) and were matriculants (67%). However, the proportion of women graduating in the minimum time by 1988 was 1,5 times higher than in 1985, and the number of black and coloured students graduating in the minimum time was 9 times higher in 1988 than in 1985. The only significant difference in interview scores was between university-experienced students and matriculants. University students had a significantly higher average interview score ($t = 2,5; P < 0,05$).

Table VI shows the attributes of all 822 students who graduated in the period 1985 - 1988. As before, these students were mainly white (85%), male (67%) and matriculants (69%). However, by 1988 the number of blacks and coloureds who graduated had increased 7-fold compared with 1985. For the reasons expressed earlier, no meaningful interview scores could

TABLE IV. ATTRIBUTES OF ADMITTED STUDENTS

Yr of admission	Gender		Race				Academic status		Total
	M	F	White	Indian	Black	Coloured	University	Matriculant	
1980	183	71	208	31	6	9	68	186	254
1981	172	91	224	14	18	7	69	194	263
1982	173	78	204	32	11	4	68	183	251
1983	152	106	196	29	20	13	94	164	258
Total	680	346	832	106	55	33	299	727	1026
% of total	66	34	81,1	10,3	5,4	3,2	29	71	100
Interview score	6,1 ± 3,8	6,0 ± 3,9	6,3 ± 3,8	6,6 ± 3,6	6,5 ± 3,8	6,8 ± 3,6	6,8 ± 3,3	6,3 ± 3,9	6,4 ± 3,6

TABLE V. ATTRIBUTES OF STUDENTS WHO GRADUATED IN THE MINIMUM TIME

Yr of graduation	Gender		Race				Academic status		Total
	M	F	White	Indian	Black	Coloured	University	Matriculant	
1985	108	49	140	15	1	1	41	116	157
1986	106	66	157	10	4	1	56	116	172
1987	122	47	146	19	3	1	57	112	169
1988	106	71	140	19	12	6	71	106	177
Total	442	233	583	63	20	9	225	450	675
% of total	65,5	34,5	86	9,3	3	1,3	33,3	66,7	100
Interview score	6,2 ± 3,7	6,0 ± 3,9	6,5 ± 3,9	5,7 ± 3,4	6,6 ± 3,5	7,0 ± 3,4	6,7 ± 3,3	6,0 ± 3,9	6,0 ± 3,8

TABLE VI. ATTRIBUTES OF ALL GRADUATES

Yr of graduation	Gender		Race				Academic status		Total
	M	F	White	Indian	Black	Coloured	University	Matriculant	
1985	134	59	169	21	2	1	52	141	193
1986	135	79	184	18	9	3	69	145	214
1987	146	53	170	21	6	2	62	137	199
1988	137	79	172	22	14	8	76	140	216
Total	552	270	695	82	31	14	259	563	822
% of total	67,2	32,9	84,5	9,9	3,8	1,7	31,5	68,5	100

TABLE VII. GENDER AND ACADEMIC ATTRIBUTES OF STUDENTS ADMITTED IN THE PERIOD 1980 - 1983

Criterion	Race				Total
	White	Indian	Black	Coloured	
Male	538	82	35	25	680
Female	294	24	20	8	346
Total	832	106	55	33	1026
University	221	46	27	5	299
Matriculant	611	60	28	28	727
Total	832	106	55	33	1026

be calculated for this group of students. Table VII shows the gender and academic attributes of students in each of the four race groups.

Discussion

The ultimate aim of our admissions process is to graduate a class of students well qualified to serve the community in a variety of different ways. The Faculty has felt that this aim

can be achieved by admitting students who are excellent in attributes other than academic merit. In addition the Faculty has aimed to admit students of mixed academic background, and has also aimed to constitute a class of men and women drawn from all races. Furthermore, admitted students should meet the academic requirements of the curriculum comfortably.

The data presented here indicate that our short-term aims are being achieved. Our classes are increasingly moving away from the white/male/matriculant stereotype towards a more equitable distribution of attributes. Applicants with university

TABLE VIII. ATTRIBUTES OF STUDENTS ADMITTED IN THE PERIOD 1980 - 1983

Progress	Gender		Race				Academic status		Total
	M	F	White	Indian	Black	Coloured	University	Matriculant	
Graduation in minimum time	442	233	583	63	20	9	225	450	675
B.Sc.	32	8	38	2	0	0	4	36	40
Leave of absence	8	4	12	0	0	0	4	8	12
Discontinued	41	26	57	7	1	2	16	51	67
Repeat	72	27	59	20	11	9	30	69	99
Fail	85	48	83	14	23	13	20	113	133
Total	680	346	832	106	55	33	299	727	1026

experience formed an increasing proportion of admitted students. In addition, while 28% of the students admitted in 1980 were women, in 1983 41% of admitted students were women. Similarly, 18% of students admitted in 1980 were not white, while in 1983 this proportion had increased to 24%, largely because of increased admission of black and coloured applicants. This increase occurred despite the requirement that Ministerial permission had to be given for each black and coloured student admitted. Without this requirement, which was dropped in 1984, the increase in blacks and coloureds might have been greater. Moreover the failure rate of admitted students has decreased from 14% for the class admitted in 1980 to 9% for the class admitted in 1983. Thus the characteristics of admitted classes are reflected in graduating classes.

There are several reasons for these changes. First, it was expected, and indeed predicted, that use of assessment of non-academic attributes would enhance the admission of academically disadvantaged students, especially blacks and coloureds. Our data support this idea. Although analysis of interview scores showed that on average there was no bias towards either gender or towards any race, the analysis also showed that students who subsequently failed or repeated had significantly higher interview scores. As many blacks and coloureds admitted during the period under review repeated or failed (Table VIII), it follows that some of the increase in number of admitted blacks and coloureds can be attributed to the interview. A corollary of this, however, is that if the interview is assessing motivation and commitment, then these attributes do not protect students who are weak academically from failure.

The suggestion that weak academic ability may be compensated for by a good interview score would also account for the significant difference in interview scores between all admitted students and those graduating in the minimum time (Table I). On the other hand, the significantly higher interview score obtained by applicants with university experience, which probably reflects greater maturity and motivation rather than weak academic ability, can account for the small relative increase in admission of such students.

Another explanation for the changing characteristics of admitted classes could be that they simply reflect a change in the proportion of blacks, coloureds, women and university-experienced candidates who apply for admission. This explanation could account for the increased number of women admitted, but does not account for the other changes. The number of black and coloured applicants, for example, did not increase as rapidly as the number of black and coloured admissions between 1980 and 1983.

Analysis also shows that students we admitted have a high pass rate. On average 66% of admitted students graduated in the minimum time possible. An additional 4% of students gained a B.Sc. degree. Another 10% of admitted students eventually graduated despite repeating one or more years of study. Thus 80% of admitted students eventually graduated. Of the remaining 20% of students (200 out of 1026) that did not graduate, 133 failed to meet academic requirements and were excluded. These 133 failing students represent a true academic failure rate of 13%. The other 67 students who voluntarily discontinued their studies for non-academic reasons can be regarded as failures of the admissions process in that they appear not to have had a strong commitment to a career in medicine and might have been excluded at interview. The significantly low average interview score achieved by the 'discontinued' group suggests that at interview their commitment and motivation was assessed as being low.

Perhaps the most encouraging aspect of our data is that the proportion of admitted students who graduated in the minimum time increased by 11% between 1980 and 1983. The data show that this increase is a result of a decreasing failure rate: the proportion of students taking a B.Sc., leave of absence, repeating, and discontinuing has remained constant. This decreasing failure rate has occurred despite the admission of students with disadvantaged educations and despite admission using non-academic criteria. It can be argued that increasing competition for places, and hence a generally increasing level of academic ability, could account for the improving pass rate. This idea cannot, however, be substantiated. In 1980 the mean academic rating was $68,3 \pm 6,2$, in 1981 it was $68,6 \pm 4,8$, in 1982 $69,5 \pm 5,4$ and in 1983 $70,0 \pm 5,7$. Thus, although the average value did increase between 1980 and 1983, the increase of 1,7 rating points was not statistically significant.

It appears therefore that both short-term aims of our admissions procedure are being achieved. The distribution of races and genders is more equitable, the range of academic skills is broader, attributes other than academic performance are being taken into account, and pass rates are improving. In our context these changes are significant. A task that lies ahead is to broaden the curriculum to accommodate the wide range of attributes our students have.

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