



## Parental backgrounds of Otago medical students

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### Abstract

**Aims** To investigate the background of medical students admitted to the Otago Medical School (OMS) in terms of their parents' occupations, socioeconomic status and education, and to assess how this has been affected by the introduction of substantial tuition fees.

**Methods** A questionnaire was used to collect data on the occupations and education of the parents of all successful New Zealand applicants to the OMS between 1987 and 2000. Trends in the data across the years were examined, and the data compared to the wider New Zealand population. Occupational data were also coded against the 1997 New Zealand Socioeconomic Index of Occupational Status.

**Results** The distribution of data changed very little from 1987 to 2000. Of 2391 students surveyed, 2353 (98.4%) responded to the questionnaire. Of the respondents, 55.2% had at least one parent with a professional occupation at the time they entered the Medical School, 63.2% had at least one university-educated parent, and 13.1% of students had at least one parent who was a doctor.

**Conclusions** In comparison to the wider population, the students surveyed were much more likely to have highly educated, professional parents from higher socioeconomic groups. Although only about one in eight medical students came from medical families, this proportion was much higher than in the wider population. These characteristics changed very little across the 14 years of the study, despite substantial increases in university tuition fees.

Assumptions about who medical students are, and where they come from, colour public opinion and affect political decisions about medical education. It is often assumed that medical students come from privileged backgrounds and, in many if not most cases, from established 'medical' families. Such attitudes have been exacerbated by substantial increases in medical school tuition fees in recent years, which suggest to some that Medicine is now, more than ever, the exclusive preserve of the wealthy. This study seeks to test the assumption of universal privilege in the background of medical students through an investigation of the occupational and socioeconomic status of the parents of entrants to the OMS between 1987 and 2000. The impact of the increasing personal cost of medical education upon the socioeconomic background of medical students is also examined.

### Methods

Between 1987 and 2000, a questionnaire was administered to students as they entered the OMS. The questionnaire has been approved for use by the University of Otago Ethics Committee. While the questionnaire collected information on all students, this paper examines only 'quota' students, who were eligible for entry into the OMS through citizenship or permanent residence in New Zealand. 'Supernumerary' students (international students admitted to the OMS through special agreements) were excluded from the study because they are unlikely to remain in medical practice in New Zealand.

The questionnaire addressed a wide range of demographic variables, including the educational and occupational characteristics of the parents of medical students. Students were asked to state their mothers' and fathers' occupations unless deceased, retired, or unemployed. From 1994, the question on parental occupation was extended to collect information on the occupations of parents when the students were aged 5–12 years and 13–18 years, as well as at the time of entry into medical school, as parental occupations at these age periods may be considered to have varying degrees of influence on career choice. Students were also asked to identify the educational qualifications of their parents. Parental occupation was coded according to the New Zealand Standard Classification of Occupations (NZSCO90)<sup>1</sup> in which occupations are grouped according to skill level requirements. Two non-occupational categories were also used: 'Undefined' when an occupation was not identifiable using the NZSCO90 groups, or when no occupation was given by the student surveyed; and 'Not in workforce' for homemakers, students, the unemployed, beneficiaries and the retired. Due to the 5–12 and 13–18 age periods each covering several years, some students identified more than one occupation per parent within these periods. In such cases, it was generally assumed that the higher skilled group on the NZSCO90 classification should be given precedence. Identifiable occupations were coded ahead of any 'Not in Workforce' or 'Undefined' entries given for the same age period.

The parental occupations at the time of answering the questionnaire were compared with 1991 Census of Population and Dwellings<sup>2</sup> data on New Zealand's resident population aged 35 to 59 years, based on 95% confidence intervals. It was assumed that most medical students would have been born to parents aged between approximately 20 and 40 years. As 89% of the students surveyed were aged between 17 and 22 years at entry into the OMS, most of the parents were expected to fall in the 35 to 59 year age group at this time. The 1991 Census was chosen as representative of all the students over the period of the study. The 1987 Census used the superseded NZSCO68 occupational classifications, while comparison of the 1991 Census data with that from 1996 indicates that proportional changes in occupational groupings were not so large as to significantly alter the conclusions of this study.<sup>3</sup> Occupational data at entry into the Medical School were further compared with the occupational data at ages 5–12 and 13–18, for the period from 1994 to 2000.

The New Zealand Socioeconomic Index of Occupational Status (NZSEI)<sup>4</sup> rates occupations on a continuous scale from 10 (lowest socioeconomic status) to 90 (highest socioeconomic status), based on how each occupation converts education into income. NZSEI ratings were assigned to parental occupations, and compared with the 1991 population, aged 35 to 59 years.

Trends across years in the socioeconomic and occupational data were examined using chi-square test for trend.<sup>5</sup> Data were also collected on parental attendance at university and compared with the 1991 Census group, aged 35 to 59 years.

## Results

Between 1987 and 2000, the OMS admitted 2391 quota medical students, 2353 (98.4%) of whom completed the demographic questionnaire. For both the fathers and mothers of the medical students, all defined occupation groups were significantly different from their equivalent group in the New Zealand population (Table 1). In particular, fathers of medical students were 4.4 times more likely to be in the professionals group than Census males aged 35 to 59 years, while mothers were 2.9 times more likely to be professionals than equivalent Census females. All occupation groups other than 'Legislators, administrators and managers' and 'Professionals' were well below their representation in the Census group, for both the fathers and mothers of the medical students.

Fathers of medical students were 25 times more likely to be medical doctors than Census males, while the students' mothers were 23 times more likely to be doctors than Census females. Overall, at entry to the OMS, 55.2% of students had at least one professional parent, and 13.1% of students had at least one parent who was a doctor.

The data at ages 13–18 years and 5–12 years showed similar patterns, however more mothers were at home at age period 5–12 (36.1% not in workforce). When the

students were aged 13–18 years, 62.4% had at least one professional parent, while at age 5–12, 63.2% had at least one professional parent.

**Table 1. Occupations of the parents of Otago Medical School quota students at the students' entry into Medical School (1987–2000) compared to the occupations of the resident population of New Zealand, aged 35–59 (1991 Census)**

Major Occupation Group (NZSCO90)	Fathers of students				Mothers of students			
	(%)	95% CI	Census males (%)	Ratio	(%)	95% CI	Census females (%)	Ratio
Legislators, administrators and managers	19.7	18.1–21.3	15.7	1.3	9.0	7.8–10.2	6.9	1.3
Professionals - <b>Medical doctors*</b>	42.3 <b>12.5</b>	40.3–44.3 <b>11.1–13.9</b>	9.6 <b>0.5</b>	4.4 <b>25.0</b>	32.1 <b>2.3</b>	30.2–34.0 <b>1.7–2.9</b>	10.9 <b>0.1</b>	2.9 <b>23.0</b>
Technicians and associate professionals	7.7	6.6–8.8	9.4	0.8	10.1	8.9–11.3	5.9	1.7
Clerks/service and sales workers <sup>†§</sup>	3.5	2.8–4.2	8.1	0.4	13.9	12.5–15.3	26.8	0.5
Agriculture and fishery workers	6.5	5.5–7.5	9.7	0.7	2.4	1.8–3.0	4.7	0.5
Trades/machinists/elementary <sup>‡§</sup>	6.6	5.6–7.6	29.1	0.2	1.3	0.8–1.8	8.0	0.2
Not in workforce	9.4	8.2–10.6	17.3	0.5	26.2	24.4–28.0	35.9	0.7
Undefined	4.3	3.5–5.1	1.1	-	5.0	4.1–5.9	1.0	-
<b>Total (n)</b>	<b>2287</b>		<b>483243</b>		<b>2324</b>		<b>485574</b>	
Deceased (n)	66				29			

\* Medical doctors are included in the Professionals major group

† Service and sales workers includes the Armed Forces major group

‡ Trades workers, plant and machinery operators and assemblers, and elementary occupations

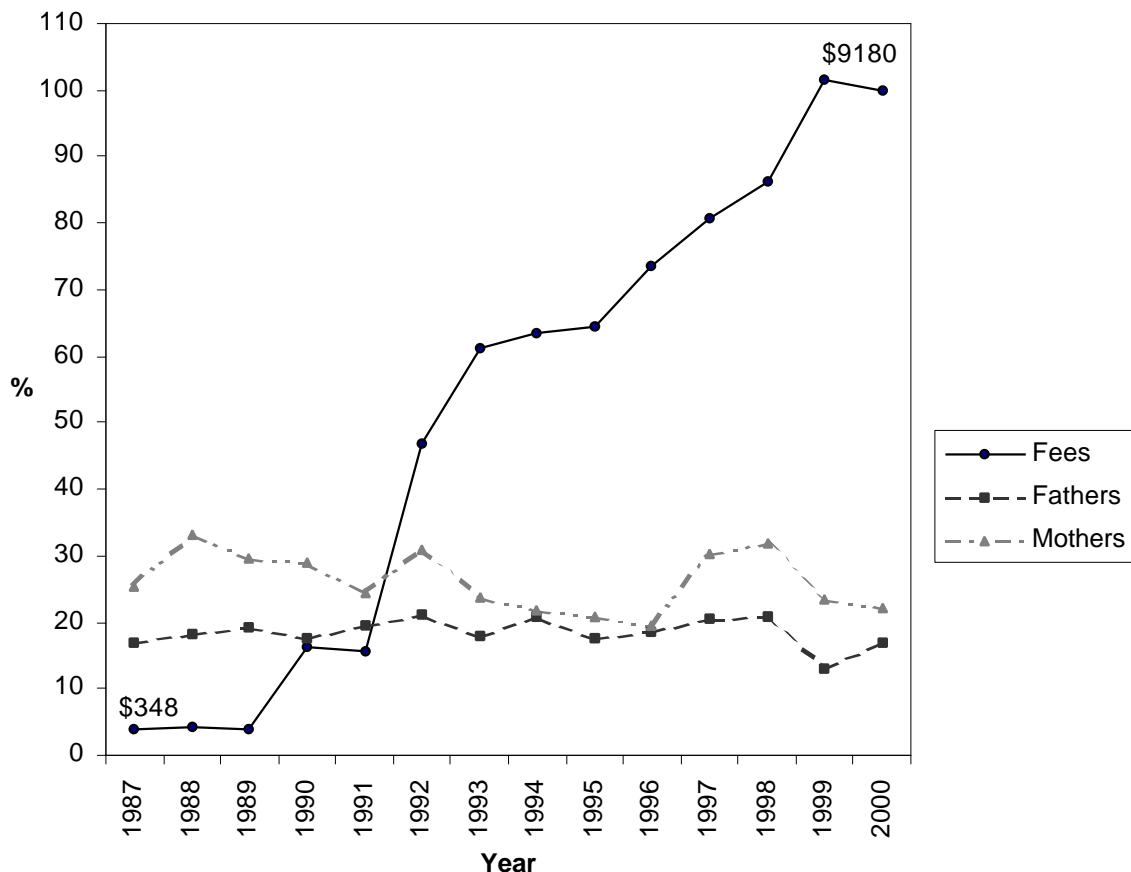
§ NZSCO major groups have been collapsed together due to small numbers in each individual group. Analyses of individual groups were performed separately

The distribution of NZSEI scores for the working parents of the medical students was heavily weighted towards the higher scores compared with the wider New Zealand population. Of the working fathers of the medical students, 23.5% had NZSEI scores above 80, compared with only 2.4% of the 1991 male population aged 35 to 59. Of the employed mothers, 6.6% had NZSEI scores above 80, compared with 0.8% of the wider female population. This is predictable from the occupational data already described, and because the NZSCO90 major group 'Professionals' has the highest NZSEI score.

The socioeconomic distribution of the parents of the medical students changed little over the course of the study, despite substantial increases in tuition fees (Figure 1). Yearly fees for studying Medicine at Otago, adjusted for inflation to 2000,<sup>6</sup> rose from \$348 (\$240 actual) in 1987 to \$9180 in 2000. Neither the proportion of fathers ( $\chi^2_{\text{trend}} = 0.00, p > 0.10$ ) or mothers ( $\chi^2_{\text{trend}} = 0.01, p > 0.10$ ) with NZSEI scores less than 50 showed any trend from 1987 to 2000. The group of parents with NZSEI scores excludes those parents who were not working or whose occupation was unknown,

however this is unlikely to alter the overall socioeconomic stability of the medical class. As may be expected, the individual NZSCO90 occupation groups were also relatively stable from 1987 to 2000. Although some groups did show small trends, these were unrelated to the increase in fees from 1989 to 1999.

**Figure 1. Percentage of identifiably employed fathers and mothers of 1987–2000 entrants to the Otago Medical School with NZSEI scores less than 50, compared to inflation-adjusted medical tuition fees as a percentage of fees in 2000**



Attendance at university of medical students' fathers was 8.9 times higher than for Census males aged 35 to 59 (58.6% vs 6.6%) and 12.1 times higher for medical students' mothers than for Census females (37.8% vs 12.1%). Students with two parents who had attended university comprised 31.6% of those surveyed, while 63.2% had at least one parent who had attended university. University attendance of the parents of the medical students showed a significant increase across the years surveyed for the fathers ( $\chi^2_{\text{trend}} = 11.10$ ,  $p < 0.001$ ) and the mothers ( $\chi^2_{\text{trend}} = 28.07$ ,  $p < 0.001$ ) of the students, however increasing proportions of the New Zealand population aged 35 to 59 years have attended university.<sup>4</sup>

## Discussion

Comparison of the Otago medical class with the wider New Zealand population shows a considerable excess of students from families with professional parents. This is congruent with a study of Auckland School of Medicine entrants from 1972 to 1992,<sup>7</sup> and in accord with the limited number of overseas studies on parental occupations of medical students.<sup>8,9</sup> The data collected on students' early and probably most formative years, at age periods 5–12 and 13–18 years, show an even greater weighting towards professional parents. The high proportion of parents from professional backgrounds is reflected in the NZSEI socioeconomic data and the parental educational data, with the majority of the class coming from highly educated, high socioeconomic status families.

The weighting of the medical class is most likely related to societal structure and expectations. For the children of highly educated professional parents, tertiary study may be perceived as an obvious choice following secondary school. Conversely, lower socioeconomic status in New Zealand has been linked both to lower levels of educational attainment at secondary school,<sup>10</sup> and to a reduced likelihood of attending university.<sup>11</sup> While these factors are beyond the direct control of the Medical School, it would be a concern if admissions procedures used to select students further disadvantaged those from lower socioeconomic backgrounds.

McManus used data from UK medical students in 1966 to link social class distributions to a composite ability score.<sup>12</sup> The upper social classes tended towards higher ability scores and upper social classes I and II (of five) were over-represented amongst the medical students. Moreover, a disproportionate number of students had medical fathers (21.2%), which placed them in social class I by the definition used. Nevertheless, McManus concluded that “the excess of medical students from social class I cannot be satisfactorily explained in terms of either social class differences in intellectual ability, or the excess of medical students from medical families.”<sup>12</sup>

Selection to OMS in the survey period was based for most students solely on academic performance at the tertiary level. While an ‘Educationally Disadvantaged’ category of entry existed, only 0.4% of the students surveyed were admitted under this classification. A predominantly academically-based selection system may exaggerate social differences in educational opportunity. It is interesting that 28.0% of those surveyed in this study reported that they had attended private or integrated schools in their last year of secondary school, compared with 13.5% of full-time equivalent students in New Zealand attending private or integrated schools in 2000.<sup>13</sup> More research would be required to determine the degree to which the pattern of exclusion evident in this study is a university-wide phenomenon, a result of application patterns, and/or a limitation in selection procedures.

The relatively high number of medical parents amongst the students surveyed (13.1% with at least one medical parent) is consistent with similar surveys in New Zealand and the UK.<sup>11,14</sup> While the proportion is very high compared with the general population, only about one in eight medical students comes from a medical family. This result should be considered in the light of the general over-representation of professional parents, although the excess of professional parents does not fully account for the proportionally greater excess of medical parents, nor does the high number of medical parents fully explain the over-representation of professionals. It is

unlikely that the bias towards medical parents occurred due to selection practices at the OMS. Instead, a tendency to emulate parental occupations, and particularly paternal occupation, may be posited for these students. This is consistent with Collins et al, who found that parental occupation has a marked influence on the degree course chosen by children, in both Medicine and other university courses.<sup>15</sup>

The stability of the data is surprising, particularly in the light of marked increases in the fees charged to students from 1987 to 2000. Although the increase in medical tuition fees occurred in the context of generally increasing fees across all tertiary courses, Medicine fees were the second highest at the University of Otago in 2000, after Dentistry, and were 2.5 times higher than most Science fees (\$3740), and 3.1 times higher than most Humanities and Commerce fees (\$2950). Despite this, the socioeconomic distribution of the medical students' parents, and the proportions of parents in each major occupational group changed very little, while the proportions of students with medical parents and university-educated parents did not change in a statistically significant way at all.

With at least five years of full-time, unpaid university study, medical training in New Zealand has always been expensive. In this context, fees may represent less of a barrier to medical education and more of a change in the magnitude of existing financial obstacles. Furthermore, changes in financial support for students in the early 1990s have probably mitigated the effects of fee increases on the demographics of the class. In 1991, student allowances ceased to be a universal entitlement, with the introduction of means-testing against parental income. A 1999 study of students from the Auckland Medical School found that only 17% of students received a student allowance.<sup>15</sup> It seems likely that most of these students would have been from lower socioeconomic backgrounds, comparatively lessening the effect of fee increases for those students. Similarly, the Government loan scheme, while unpopular, at least ensures that all students have the opportunity to meet their course costs, albeit at the price of incurring, in many cases, massive debt for the future. These factors may go some way towards explaining why increases in tuition fees appear to have had little effect on the small proportion of students from lower socioeconomic backgrounds entering the OMS each year.

It may be argued that the socioeconomic status of medical students at entry into medical school is of little relevance given that, as graduates, they will themselves enter into a relatively high-paying professional career. Socioeconomic status for New Zealand individuals is not static, and perhaps there is little benefit to patients in recruiting more students of low socioeconomic status. Nonetheless, it could be suggested that all higher education institutions have a social responsibility to encourage the participation of under-represented social groups. While increased fees might not dissuade the most motivated students, they may nonetheless be discouraging applications from other low socioeconomic status students, providing a barrier to widening participation in the future.

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