Relationship between decile score of secondary school, the size of town of origin and career intentions of New Zealand medical students

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ABSTRACT

INTRODUCTION: New Zealand is facing a general practice workforce crisis, especially in rural communities. Medical school entrants from low decile schools or rural locations may be more likely to choose rural general practice as their career path.

AIM: To determine whether a relationship exists between secondary school decile rating, the size of the town of origin of medical students and their subsequent medical career intentions.

METHODS: University of Auckland medical students from 2006 to 2008 completed an entry questionnaire on a range of variables thought important in workforce determination. Analyses were performed on data from the 346 students who had attended a high school in New Zealand.

RESULTS: There was a close relationship between size of town of origin and decile of secondary school. Most students expressed interests in a wide range of careers, with students from outside major cities making slightly fewer choices on average.

DISCUSSION: There is no strong signal from these data that career speciality choices will be determined by decile of secondary school or size of town of origin. An increase in the proportion of rural students in medical programmes may increase the number of students from lower decile schools, without adding another affirmative action pathway.

KEYWORDS: Education, medical; social class; career choice

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Background

Some of the most important decisions in the shaping of the future medical workforce relate to the selection of medical students. There is a social obligation on universities to facilitate the development of a wide range of medical practitioners to meet the health needs of the population.

It is likely that medical graduates from diverse backgrounds would address priority areas of need and result in the range of doctors needed.[1–3] Diversification also allows equity of access for minority groups. For around 40 years, Maori and Pacific medical student admission schemes have been in place to redress the lack of minority representation within the medical workforce. Around 16% of the current Auckland student body identifies as Maori or Pacific (Medical Programme Directorate, The University of Auckland, personal communication). Since 2004, The University of Auckland has offered places to 20 students of rural origin. Evidence suggests these students will be more likely to return to practise in rural settings.[4,5] In recent years in the United Kingdom, a number of efforts have been made to give students from lower socioeconomic backgrounds the opportunity to become doctors.[6] Few studies have reported on the career pathways and choices of individuals from low socioeconomic communities.

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Recently the Medical Training Board has recommended an increase in medical student numbers in order to move towards self-sufficiency.[7] As a preface to any wider discussion on changes to the current suite of affirmative action pathways into medical school in New Zealand (NZ), this paper studies the relationship between medical student career intention at entry to medical school and secondary school decile rating or size of the town of origin. The hypothesis was that students from low decile schools and/or a rural origin were more likely to signal an interest in general practice and other specialty areas more amenable to practice in rural locales. A recent identification of specific areas of need in socially deprived and rural communities has provided impetus for research into this area.

Methods

Since 2006, all newly-enrolled medical students at The University of Auckland have been invited to take part in the Faculty of Medical Health Sciences Tracking Health Professional Students and Graduates Project. This is a longitudinal investigation of the characteristics and career patterns of students studying to become health professionals. Students complete another survey at graduation. The project will continue to track survey participants post-graduation. The aim of the tracking project is to evaluate the effect of curriculum and selection policies on the shape of the future health workforce in New Zealand. Ethics approval was granted by The University of Auckland's Human Subjects Ethics Committee.

Medical students from the 2006 to 2008 entry cohorts were the subjects in this study. Students nominated the secondary school they had attended for the majority of their schooling.

Every census year, the Ministry of Education compiles a decile score of every school in New Zealand. A decile score indicates the 'extent to which the school draws students from low socioeconomic communities'.[8] The decile score draws on five measures of socioeconomic status. Theoretically, decile 1 schools are those with the highest proportion of students from low socioeconomic communities; decile 10 schools are those with the lowest proportion of these students.[9] Given this differential attrition rate, the number of students in higher decile schools exceeds those in low deciles, particularly in years 12–13,[10] years which are necessary to meet university entrance requirements. The secondary schools at which the MBChB students reported they spent the majority of their schooling were organised into one of three categories: deciles 1–3 (low), 4–8 (middle) or 9–10 (high). The choice of these arbitrary categories was made in an attempt to equalise the numbers in high and non-high students, and also to provide a surrogate marker for socioeconomic status.

Students were asked about their region of origin in New Zealand and the size of town, divided into major city (population >100 000), provincial centre (10 000 – 100 000), or small town (<10 000).

In the survey, students were asked to rank their level of interest in 18 potential career options derived from the broad categories in which one

Figure 1. School decile and admission numbers from 2006 to 2008.

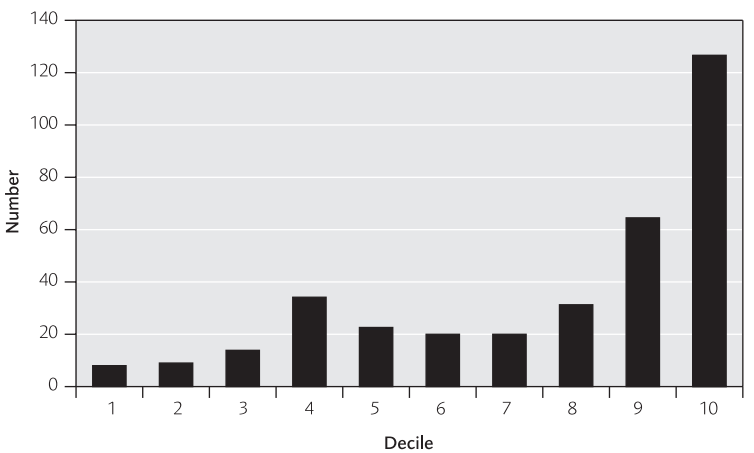


Table 1. Numbers (%) of students from schools in each of the three decile category groups and town of origin (gamma 0.53, p<0.01)

Decile	Small town	Provincial centre	Major city	TOTAL
Low	9 (2.6)	5 (1.4)	15 (4.3)	29 (8.4)
Middle	17 (4.9)	30 (8.7)	81 (23.4)	128 (37.0)
High	13 (3.8)	12 (3.5)	164 (47.4)	189 (54.6)
TOTAL	39 (11.3)	47 (13.6)	260 (75.1)	346 (100%)

could classify practising doctors. Although an open field was also included, in all instances responses could be attributed to one of the 18 options.

The careers in which students indicated an interest in working were analysed by high school decile and by size of town of origin. Odds ratios (OR) and 95% confidence intervals (CI) were calculated; instances where the OR value +/- 95% CI did not cross 1.00 were deemed significant. Other techniques included logistic regression and cross-tabulation. Statistical analyses were prepared using SPSS for Windows Version 16.0.

Results

Data were available from 397 medical students in the entry cohorts 2006 to 2008, which was an 82% return rate. Of this cohort, 51 sets of data were excluded where the secondary school attended by the student was overseas or the New Zealand Correspondence School.

There was a marked preponderance of students from decile 9 and 10 schools (see Figure 1). It should be noted that the number of year 13 students in each decile nationwide is not uniform; in fact decile 9 and 10 students make up 30% of year 13 students in New Zealand (Centre for Medical and Health Sciences Education, personal communication).

The average decile of the schools for students from a major city was 8.1 compared with 6.4 and 6.3 for provincial centre and small town respectively.

By far, the largest number of city-origin students came from Auckland; Hamilton, Wellington and Christchurch were also represented. Over the three-year period of the study, students came from 120 schools throughout New Zealand.

Students made a mean of 9.75 expressions of interest from the possible 18 career choices. In general, students from lower decile schools and/or smaller towns made fewer choices (Tables 2 and 3), although this exceeded the significance level of 0.05 only for town size when analysis of variance was used.

WHAT GAP THIS FILLS

What we already know: Students from impoverished backgrounds are rare in medical student classes. The current retention crisis in New Zealand is untenable, especially in rural communities.

What this study adds: Seventy-two percent of students indicated an interest in general practice on entry to medical school. An increase in the number of medical students from lower socioeconomic and rural areas may have the benefit of an added number of students choosing to practise in certain specialties, including general practice.

When the data of students from small towns and provincial centres were combined, students from major cities made more choices (10.20 (SD 5.4) versus 8.15 (SD 5.9); $p<0.01$) than students from smaller regions. When data of students from low and middle deciles were combined, students from large cities made more choices (10.35 (SD 5.30) versus 8.89 (SD 5.87); $p=0.015$).

To measure the interaction of school decile and town of origin on expressions of interest, logistic regression models were established for each specialty. In each model, the dependent variable was the specialty (interest/no interest) and the independent variables were the school decile and town of origin (where the reference was high decile and large city respectively). Overall, there was no major consistent effect of school decile or town of origin on student career choices (Nagelkerke R^2 <0.06 across all models).

Table 2. Mean number of expressions of interest (SD) for each decile group (one way ANOVA, p=0.051).

Decile	Number of expressions of interest
Low	9.14 (6.10)
Middle	8.83 (5.84)
High	10.35 (5.30)

Table 3. Mean number of expressions of interest (SD) for each town of origin group (one way ANOVA, p=0.011).

Town of origin	Number of expressions of interest
Small town	7.79 (5.86)
Provincial centre	8.45 (5.91)
Major city	10.20 (5.44)

Nonetheless, some differences were seen in the patterns of choice among students from different backgrounds.

The major differences emerged in an analysis comparing students who came from high decile schools in major cities and those in the remaining groups. Students from high decile schools were more likely to signal an interest in most specialties (Figure 5) and they were twice as likely as other students to signal an interest in medicine and surgery and respective subspecialties.

Discussion

There was a strong relationship between the decile of a secondary school and the size of town of origin. The average decile of the schools of 'major city' students was two decile points higher than their provincial/small town counterparts. These variables were associated with a relatively minor effect on intended medical career choices.

The majority of students came from the greater Auckland region and the upper North Island. There was a very wide range of secondary school of origin—this is in contrast to a common view that most students in the Auckland programme come from a limited number of city schools in Auckland. We were encouraged to find over 11% came from areas with a population of 10 000 or less. To put these findings in context, a study from the University of Otago found that 84.5% came from main urban areas, while only 2.9% came from rural areas.[11] This observation may be an indication that the rural entry programmes introduced in 2004 are having the desired effect on diversification.

With the limitation that the decile of a high school can at most be an approximation of the socioeconomic status of an individual student, it was encouraging that 45% of students in the study reported they did not attend decile 9 or 10 schools. Traditionally, medical students have come largely from upper socioeconomic groups.[12] Even though students aiming for medical school are, by and large, capable students, it is still likely that the academic and personal preparation needed during final years of high school and the admissions process unduly favour students from higher decile schools. Both universities now select students after at least one year at university for a number of reasons, one of which is that this may allow capable students who seek entry to medicine to compete on relatively level terms, regardless of socioeconomic status and location of high school.

Thompson and Subich have recently discerned that social status was predictive of 'career decision self-efficacy',[13] and extended upon previous findings that the range and implementation of choices was also affected by social status.[13,14] At the opposite end of the spectrum, students perceiving themselves as having greater economic resources compared with their peers reported more certainty in, and comfort with, career

Figure 2. Location of origin of University of Auckland medical students by regions of New Zealand and size of town.

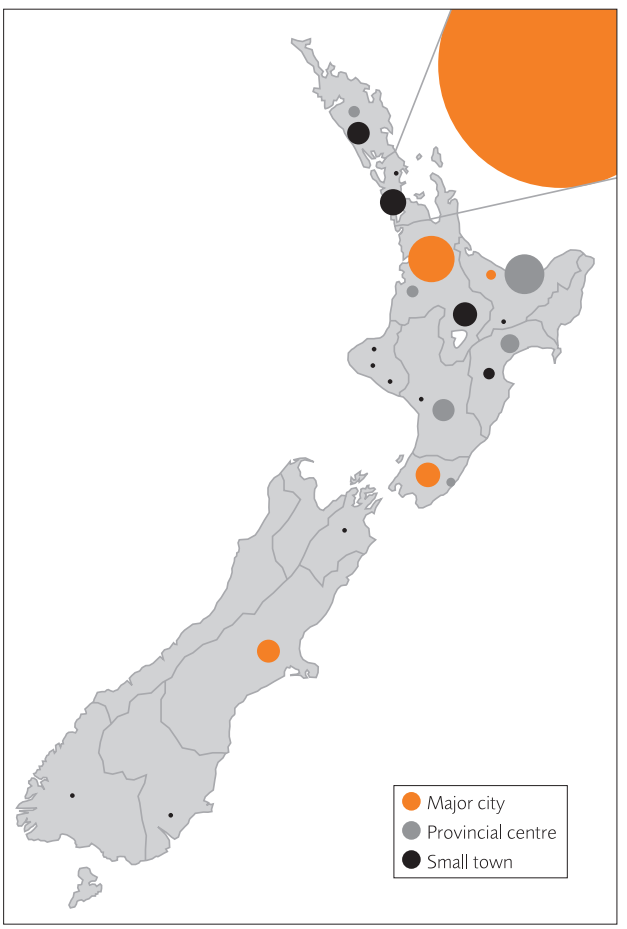
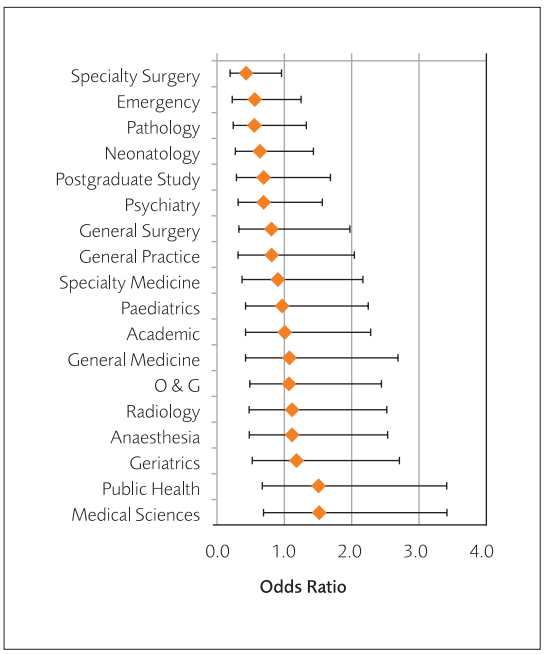


Figure 3. Odds ratio for students from low (left) or middle (right) decile schools choosing a particular specialty compared with those from high decile schools.



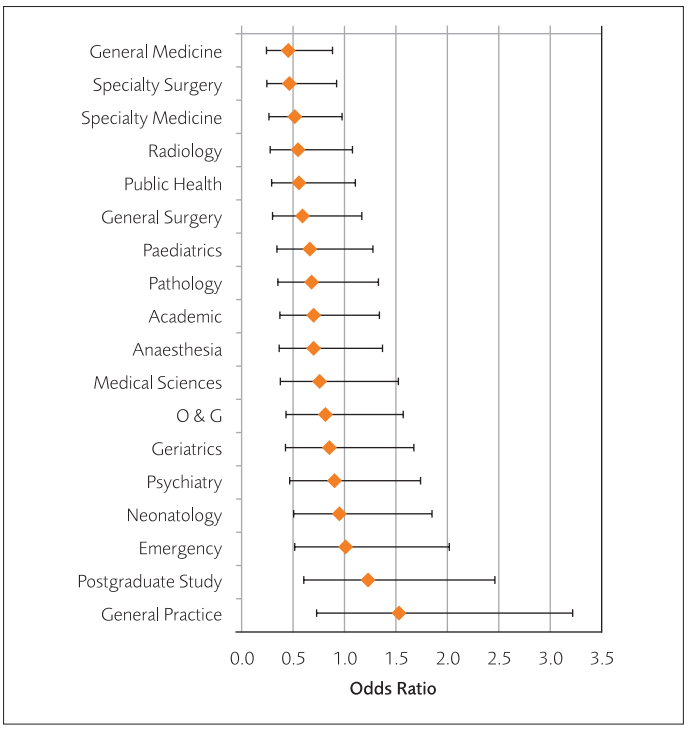
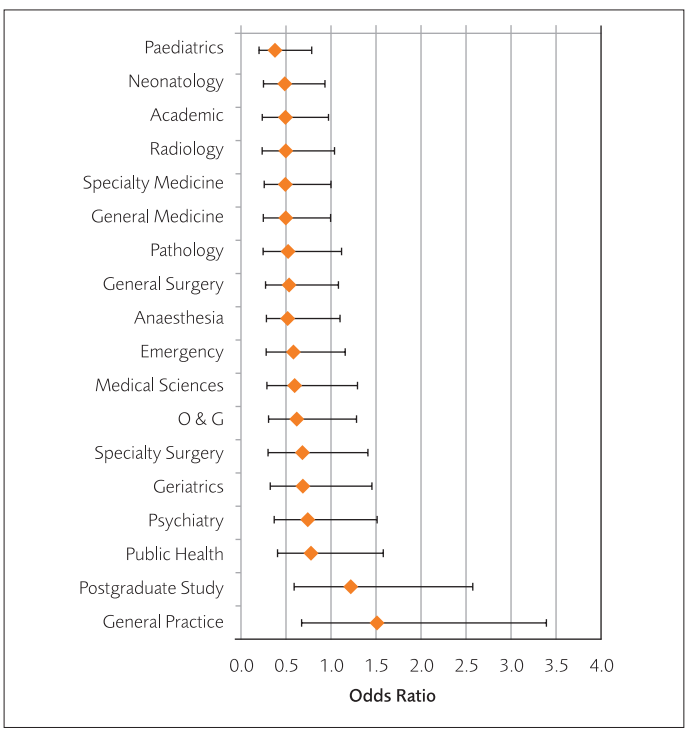


Figure 4. Odds ratio for students from small towns (left) or provincial centres (right) choosing a particular specialty compared with those from major cities.



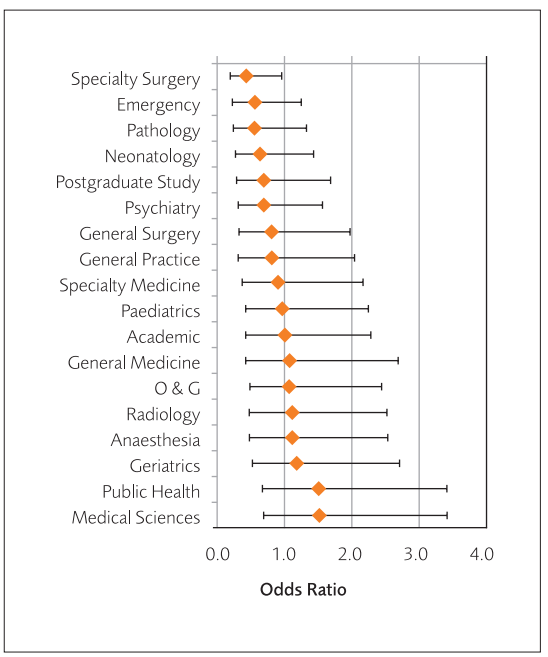
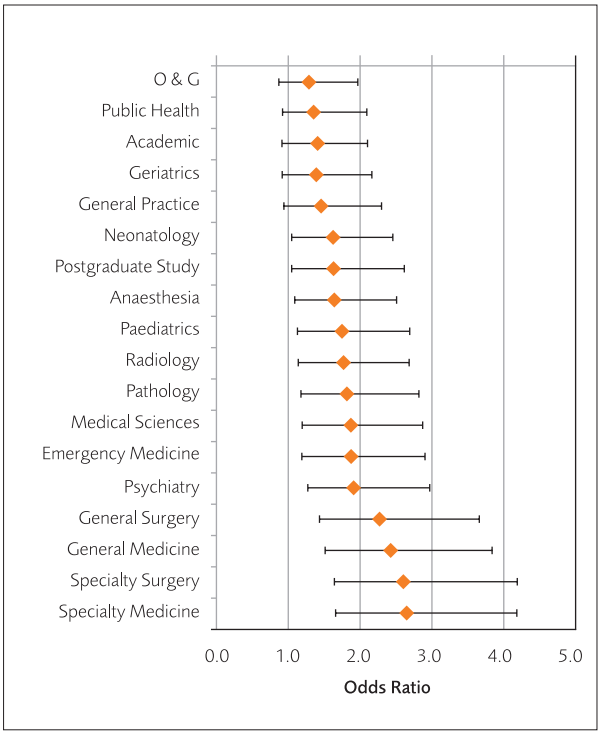


Figure 5. Odds ratio (OR) for students from high decile schools in major cities choosing a particular specialty compared with those from all other areas and deciles.



choices.[13] A different effect was seen with this cohort of students. We found that NZ domestic students entering medical school in Auckland are enthusiastic about the range open to them; on average, students rate an interest in nearly 10 of the 18 options available to them. Students from lower decile schools, provincial centres and small towns made fewer choices. The implication of this finding is not yet clear and there are several possible explanations. There may be a lack of awareness in these groups of the potential careers within medicines, or deliberate strategies used by students from larger towns/higher deciles to keep many options open. An alternative hypothesis is that students from lower deciles or smaller towns may be more definite about what they do and do not want to do in medicine.

Studies have shown that only a minority of students (45%) correctly identified their later actual choice of specialty prior to their first day of lectures.[15] There were few strong and consistent patterns in the intended careers of medical students' intention at entry due to the fact that there were relatively small numbers of students in the survey and a wide range of choices available. However, we found that students from high decile schools in major cities were over twice as likely to signal an interest in medicine and/or surgery and their subspecialties. In five of the 18 specialties, including the clinical specialties of geriatrics, general practice and obstetrics and gynaecology, there was no significant difference in preferences between any of the student groups in this study.

A positive finding was that 250 of the 346 students (72%) indicated an interest in general practice, a priority specialty area in NZ. Areas in NZ with high chronic disease burdens are over-represented by low decile schools and underserved by GPs. In Counties-Manukau, 65.5% of schools are decile 4 or below;[16] there are 280 general practitioners for every 100 000 population, compared with 425 for the same population in Auckland DHB.[17] Vaglum found that students interested in a career in family medicine at entry to medical school were motivated by status/security, more so than for any other career. They postulated that students coming from a lower 'social origin' may be more aware of a change in status and/or security that accompanies being a doctor.[18] This present study, however, does not support this notion—students from all groups signalled an interest in general practice similarly.

Time will allow the testing of the secondary hypotheses generated from this study that students from smaller centres/lower decile schools are more accurate in their predictions of career choices, and that students from high decile city schools are twice as likely to become NZ's future physicians and surgeons.

The students entering the programme now will not be specialists until at least 2020. A strategy of seeking to 'grow our own' health professionals seems appropriate. Zayas opines that professionals practising in their home communities are more cognisant of, and sensitive to, local needs.[19] For us to achieve this will require overcoming the perception that students from lower socioeconomic groups identify medical school as 'culturally alien and "posh"; few consider they have any chance of ever gaining a place'.[20] Selection

processes and pathways must continue to enhance the prospects of a medical career for students from outer metropolitan areas and beyond, and from lower decile schools.

The announcement of an imminent increase in medical student numbers provides both medical schools with the impetus to review and possibly amend admission policies. Given that half of NZ's population live in the upper North Island, recruiting strategies for The University of Auckland might target outer metropolitan, regional and rural schools in this region. Because of the strong relationship between the school decile and rurality identified in this study, an increase in the proportion of students from outside major cities in the rural origin pathway would have the corollary of more students coming from lower decile schools. It might not be necessary to have another specific pathway. Over time, we hope to help shed light on this debate.

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COMPETING INTERESTS
None declared.