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Influence of gender and other factors on medical student specialty interest

Veronica Boyle, Boaz Shulruf, Phillipa Poole

Abstract

Aim Medical schools must select and educate to meet anticipated health needs. Factors influencing career choice include those of the student and their background as well as subsequent experience. Women have comprised over 50% of medical classes for over 20 years.

This study describes gender patterns of current specialty interest among medical students at the University of Auckland, and models the predictive effect of gender compared to other career influencing factors.

Method The study analysed career intention survey data from 711 graduating medical students (response rate, 79%) from 2006 to 2011.

Results Interest level was highest for medicine, followed by subspecialty surgery, general practice and paediatrics. There were differences by gender for most specialties, but not for general practice. Women were more likely than men to be interested in Obstetrics and Gynaecology, Paediatrics, Geriatrics, Public Health or General Medicine, and less interested in Surgery, Anaesthesia, Emergency Medicine or post graduate study. Each specialty had a different pattern of influencing factors with the most important factor being the experience on a clinical attachment.

Conclusion Factors in career choice are complex and vary by gender and specialty. General practice levels of interest are too low for workforce needs. Predictive models need to be validated in longer term studies but may help guide selection and curriculum design.

Selection into medical school in New Zealand, (NZ) starts a journey of at least 12 years to becoming a vocationally-trained medical specialist. Choosing a career is a complex and iterative process determined by both an individual's background and experiences.¹

As a group, medical students must have the propensity to fill all the specialties in the health system, so future health needs are met. Some of the current challenges in workforce planning relate to insufficient interest in careers in general practice and psychiatry.² External factors reported to contribute are perceived status,³ nature of work or income relative to other specialties.^{4,5}

For over 20 years, women have made up over 50% of medical students.⁶ Concerns continue to be expressed about the impact of feminisation of the medical workforce on productivity,⁷ status of the profession⁸ or on women themselves while they remain concentrated in certain areas of work, such as general practice, or at lower levels of the profession.⁹

In New Zealand in 2012, women made up 41.3% of the workforce but only 30% of specialists, with only 9% of doctors working in surgical specialties being female.¹⁰ This variation in specialty by gender is often attributed to a women's desire for flexibility, given that the majority of female doctors are primary care-givers.¹¹ Yet, this may not be the complete story.

In a study of NZ internal medicine specialists, flexibility was more important to women than men, interest in the career was the most important factor for both genders.¹²

Gendered experiences as a medical student may influence specialty interest. Female medical students have reported difficulty imagining themselves in a specialty where they experienced isolation, or lacked role models or practical experience from participation.¹³

Furthermore, mentoring relationships are strongly influenced by gender¹⁴ with female doctors less satisfied with professional mentoring, due to a difference in preferred mentoring styles between men and women, and a lack of senior female mentors.¹⁵

This study aimed to describe gender patterns of current specialty interest among final year medical students at the University of Auckland, and to clarify the predictive effect of gender compared to other influencing factors on specialty choice.

Given the importance of primary care in the New Zealand health care system and the tendency for female doctors to eventually work in general practice we focused on factors that predict an interest in that specialty.

Methods

Subjects were medical students enrolled in the University of Auckland Faculty of Medical and Health Sciences Health Professional Students and Graduates Tracking Project (FMHS Tracking Project) that has been described previously.¹⁶ Ethical approval was granted by The University of Auckland Human Participants Ethics Committee.

This study used data from participants from 2006-2011 who completed a questionnaire at the end of their final year of medical school. In this they rated their level of interest in 18 different specialties as 'no interest', 'some interest' or 'strong interest'. 'No interest' and 'some interest' were combined for the purposes of analysis. Students also rated the importance of a range of influencing factors on their career choice and reported upon their family and financial status (see Table 1).

The results were analysed using SPSS (IBM, New York). Odds ratios were used to compare probability of strong interest in a specialty by gender while controlling for the other variables in Table 1.

Models of influencing factors for each specialty were created using logistic regression (maximum likelihood, forward stepwise model). R^2 refers to the percentage of variance in the outcome explained by the independent variables in the model. An $R^2 > 0.25$ was taken to be meaningful.

Table 1. Variables included from the Exit questionnaire

Influencing factors on specialty interest (rated as positive, no influence or negative) Experiences during clinical attachments Experiences of lectures and other formal teaching Area of need in health care Family members and/or friends who work in the field The extent of student debt Income Medical role models Flexibility
Family status Single Married/living with partner Dependent Children
Kind of community where intending to work in the long term? City Rural/Regional Undecided

Results

There were responses from 738 students for an overall response rate of 82%. Gender was not known for 27 students (anonymised responses), leaving a total of 711 eligible students across six years (79%). Women made up 57% of the sample, with a slightly higher proportion of women than men responding (81% vs 77%).

The greatest level of strong interest was seen for internal medical specialties (subspecialty medicine and general medicine) followed by subspecialty surgery, general practice, and paediatrics (see Figure 1.).

The proportions exceed 100% as, on average, students at exit indicated a strong interest in 3.27 specialty careers.

There were 220 students with a strong interest in general practice. They had on average 2.8 other strong interests with only 20 students reporting a strong interest in general practice alone.

For women, subspecialty medicine held the highest level of interest whereas for men, this was subspecialty surgery (see Figure 2).

Women were significantly more likely than men to have a strong interest in obstetrics and gynaecology, geriatrics, public health, neonatology, general paediatrics and general medicine (Table 2). Women were less likely than men to be interested in subspecialty surgery, anaesthetics, academic research, general surgery, post graduate study and emergency medicine.

There was no significant gender difference in interest in medical sciences, subspecialty medicine, general practice, pathology, psychiatry and radiology.

Figure 1. Number of graduating medical students with a strong interest in each specialty area

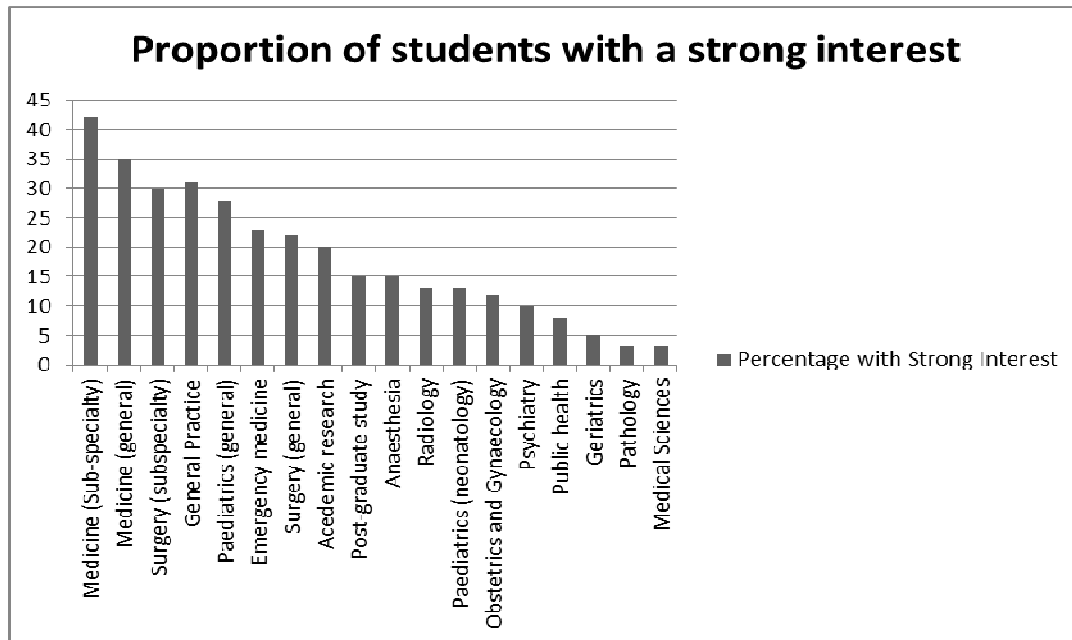


Figure 2. Proportions of graduating medical students with a strong interest in each specialty, by gender

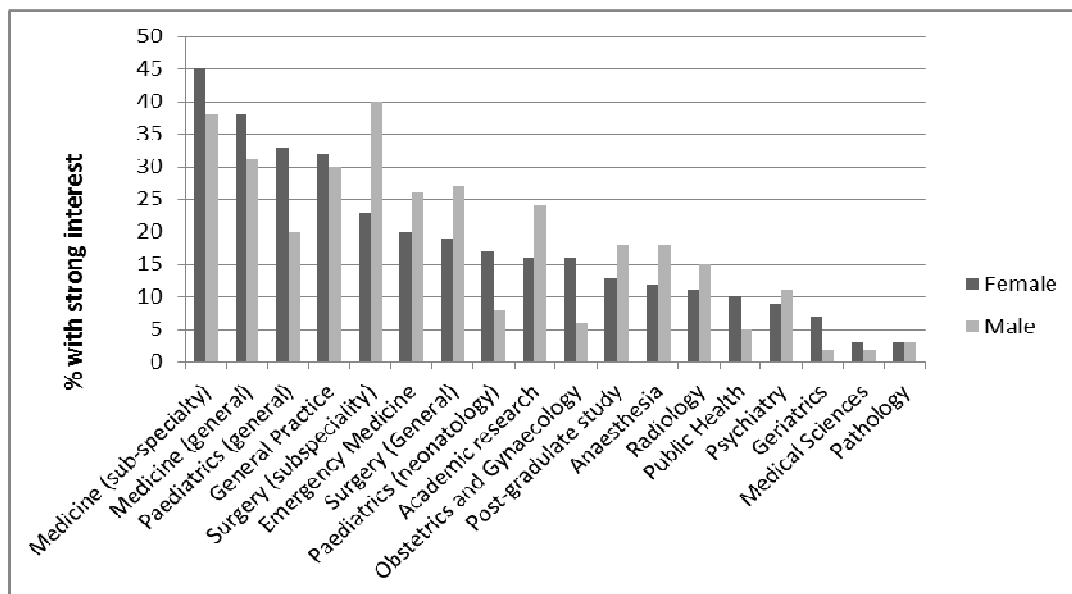


Table 2. Likelihood of interest compared between women and men

Specialty	Odds Ratio (95% CI)
Women are more likely than men to have a strong interest	
Obstetrics and Gynaecology	3.4 (1.9–5.9)
Geriatrics	3.0 (1.3–7.0)
Public Health	2.3 (1.2–4.3)
Paediatrics (neonates)	2.3 (1.4–3.7)
Paediatrics (general)	2.0 (1.4–2.8)
Medicine (general)	1.4 (1.0–1.9)
No significant difference in interest	
Medical sciences	1.5 (0.6–3.8)
Medicine (subspeciality)	1.3 (1.0–1.8)
General Practice	1.1 (0.8–1.5)
Pathology	1.1 (0.4–2.5)
Psychiatry	0.8 (0.5–1.3)
Radiology	0.7 (0.5–1.1)
Men are more likely than women to have a strong interest	
Emergency Medicine	0.7 (0.5–0.9)
Postgraduate study	0.7 (0.4–0.9)
Surgery (General)	0.6 (0.4–0.9)
Academic research	0.6 (0.4–0.9)
Anaesthesia	0.6 (0.4–0.9)
Surgery (subspeciality)	0.5 (0.3–0.6)

Table 3 shows the models (with an $R^2 > 0.25$) that predicted a strong interest in a specialty. This builds on Table 2 by showing the relative impact of gender and other variables.

The best fitting model was that for subspecialty surgery ($R^2 = 0.48$). In addition to the positive effect of a clinical attachment (OR = 2.930), intending to work in the city (0.438) and having a family member or friend work in the area (0.579) were positive predictors of a strong interest. Being female (-0.724), supported by student allowance (-0.433) and valuing flexibility (-1.207) were negative predictors.

The only other model with an $R^2 > 0.4$ was general practice. A positive clinical attachment was associated with an OR of 2.358; the other positive contributors were flexibility (1.384), intending to work in a rural area (1.298), dependent children (0.719), money (0.498) and family status (0.349). Intending to work in the city and positive effect of medical role models were negative predictors (-1.034 and -1.467 respectively).

The model for general practice had the most variables (eight), and that for obstetrics and gynaecology the least (two, $R^2 = 0.327$). Other than a positive experience on a clinical attachment (2.740) the only other predictor of strong interest was being female (1.177).

In this analysis, female gender was a positive predictor of interest in obstetrics and gynaecology (1.177), geriatrics (0.866), neonatology (0.567), paediatrics (0.466), subspecialty medicine (0.164) and general medicine (0.132). It was a negative predictor in subspecialty surgery (-0.724), general surgery (-0.493) and anaesthetics (-0.490).

No model significantly predicted a strong interest in radiology, public health, post-graduate study, medical sciences, emergency medicine or academic research. With the exception of emergency medicine, numbers in these specialties were small. The strongest predictor for every specialty was a positive experience on a clinical attachment.

Table 3. Models of interest by specialty, starting with the best model

Specialty	Odds Ratio
Subspecialty surgery (R² = 0.48)	
Positive clinical attachment	2.9
Family/Friend work in area	0.6
Intend to work in the city	0.4
Support by student allowance	-0.4
<i>Female</i>	-0.7
Flexibility	-1.2
General Practice (R² = 0.447)	
Positive clinical attachment	2.4
Flexibility	1.4
Intend to work in a rural area	1.3
Dependent children	0.7
Income	0.5
Family status	0.4
Intend to work in the city	-1.0
Medical role models	-1.5
Psychiatry (R² = 0.381)	
Positive clinical attachment	3.6
Area of need	0.7
Family/friend work in area	-1.2
General surgery (R² = 0.365)	
Positive clinical attachment	2.6
Income	0.6
<i>Female</i>	-0.5
Flexibility	-1.5
Paediatrics (R² = 0.363)	
Positive clinical attachment	3.0
<i>Female</i>	0.5
Level of debt	-0.7
Dependent children	-1.5
Geriatrics (R² = 0.356)	
Positive clinical attachment	3.4
Family/Friend work in area	1.4
<i>Female</i>	0.9
Subspecialty Medicine (R² = 0.335)	
Positive clinical attachment	2.2
Intend to work in the city	0.4
<i>Female</i>	0.2
Support by scholarship	-0.3
Support by student loan	-0.5
Support by partner income	-1.2
Obstetrics and Gynaecology (R² = 0.327)	
Positive clinical attachment	2.7
<i>Female</i>	1.2
Neonatology (R² = 0.326)	
Positive clinical attachment	2.8

Specialty	Odds Ratio
<i>Female</i>	0.6
Support by savings	0.4
Anaesthetics ($R^2 = 0.315$)	
Positive clinical attachment	2.9
Support by part-time employment	0.3
<i>Female</i>	-4.9
General Medicine ($R^2 = 0.295$)	
Positive clinical attachment	2.3
Family/Friend work in area	1.0
<i>Female</i>	0.1
Support by scholarship	-0.4
Support by student loan	-0.6
Dependent children	-1.4

Discussion

Our study of over 700 contemporary NZ medical students confirms the persistence of historical preferences for some specialties including by gender.

We found women were more likely to be interested in obstetrics and gynaecology, paediatrics, geriatrics, public health and general medicine.

Men were more likely to be interested in surgical specialties, anaesthetics, academic research and post-graduate study. We were particularly interested in levels of student interest in general practice, as it is largest NZ workforce, containing a disproportionately high number of women, yet is the most threatened, especially in rural areas.

While it is estimated that 50% of the medical workforce of the future will be needed in primary care to cope with the increased health care requirements of an aging¹⁷ population we found only 30% of students with a strong interest in general practice, and no gender difference. Furthermore, only 3% of students had a strong interest in general practice alone, which is more predictive of a subsequent GP career.¹⁸

On the other hand, students had a strong interest in at least three careers, suggesting there is still some ‘plasticity’ in choice, with a gradual narrowing down to what doctors finally decide to become. Recent Medical Council of New Zealand workforce surveys support the notion of a later switch from other specialties towards general practice, particularly for women.

Of all female doctors in training only 13% are training in internal medicine while 36.4% are training in general practice. Women made up 59% of those training in general practice in 2012.¹⁰ Our data confirmed the finding of others of a positive relationship between intention to work in a rural area, and interest in general practice.¹⁹

Factors that influence the decision to choose one specialty over another may be considered broadly as student or curriculum factors. Through the use of predictive models, our study was able to shed light on some of these career influences. Even though the survey questions were broad, we were able to produce moderately good predictive models for 11 of the 18 specialties.

A major new finding is that the important factors in career choice are not the same for each specialty. While some student factors featured commonly such as gender, location of future practice, and student loans, career flexibility was a positive predictive factor in only two specialties; general practice and psychiatry, in which women and men were equally likely to have a strong interest.

Women were more likely to be interested in paediatrics or obstetrics and gynaecology; careers with demanding training programmes and unpredictable work schedules. In contrast, women were far less likely than men to be interested in anaesthesia, which has a relatively short training programme and a more predictable work pattern. Explanations for these findings are that at exit from medical school students have yet to experience the demands of working as a junior doctor, or the full impact of caregiving requirements on training and work.

In support of this is that our findings suggest men may favour flexibility as much as women at this stage of their careers. For the few students with children, this was a positive predictor of interest in general practice, and negative for general medicine or paediatrics.

Another finding was how strongly clinical attachments influenced career choice, compared with student factors, including gender. Role models by themselves did not seem to account for this effect, so we presume it is the nature of the work itself, including factors such as intellectual stimulation and variety.²⁰

Our findings support the need for medical students and junior doctors to be engaged in a range of meaningful clinical experiences not only for their learning but to help in career planning. We were, however, concerned to find a negative impact of role models upon interest in general practice. It is not clear whether the role models were in general practice or among other specialists.

A study of medical schools in the United States found the level of interest in primary care correlated with the attitudes from specialists outside of primary care.²¹ A recent study of medical students in Christchurch found that hospital specialists did not greatly influence medical students attitudes to primary care unless they were a mentor.²²

The difference in these findings may be explained by more personal experience of general practice before entering medical school in NZ compared to the United States. The Christchurch study concurs with our findings that experience during a clinical attachment strongly influences future career choice. Future research may determine the key features in a positive clinical attachment, in a career sense, as well as how negative role models affect choices.

Our findings suggest an interaction among gender and other factors in career choice. This may vary by setting and even by culture. For example, in a UK study, female students were less likely to choose surgery as they had not sufficiently seen, heard, done, or imagined this during surgical placements.¹³

In Taiwan, female and male medical students perceived that genders were treated differently.²³ Both reported the same career influencing factors yet ended up with different specialty interests. In contrast, amongst Swedish medical students, the only specialty with a significant difference in interest between women and men was

obstetrics and gynaecology. There was no significant difference between genders in influencing factors such as interest, degree of patient contact, technical skills or combining work and family.²⁴

The strengths of the study are its size, response rate, and internal consistency. The main weakness is that this survey was taken during the final year at medical school with analysis based on specialty intention, not actual practice. Longer term tracking is planned to validate these predictions.

Moreover, recent versions of the survey ask students to nominate their first choice of career, which will better guide workforce planning, as it is a better predictor. Demographic variables such as age or ethnicity were not included in the exit survey nor were background history such as growing up in the city or a rural area or having a prior degree. These might be areas for future study.

Conclusions

Our study reveals something of the complex interplay among curriculum and student factors in career determination. There is a need to be aware of both when looking at selection and curriculum policies during medical school and beyond. Those in a position to offer career advice, training or jobs to NZ's future specialists need to understand the steps and factors in career decision making, and how these may differ by specialty and gender. Gender differences are more than a desire for flexibility.

Experience on a clinical attachment is the most important influencing factor at this stage in a doctor's career. All clinical teachers and the health education system more broadly must be mindful of how formative clinical attachments are in the student's minds, and be cognisant of their own critical roles in developing the NZ medical workforce as a whole, not just in their own specialty.

Having a greater availability of general practice placements during the early postgraduate years may help confirm this as the first career choice, not one kept in reserve for after other specialties are tried.

Competing interests: Nil.

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Influence of gender and other factors on medical student specialty interest

Veronica Boyle, Boaz Shulruf, Phillipa Poole

This paper investigates the factors that influence specialty interest in final year medical students at the University of Auckland. Specialty interest differed between women and men; but both genders were equally interested in general practice. While factors influencing career choice differed by specialty, a positive clinical attachment was the most important influencing factor for all specialties.

Electrophysiology assessment and radiofrequency ablation of arrhythmias in adult patients with congenital heart defects: the Christchurch experience

Kim Frankish, Matthew Daly, Judy Greenslade, Sharron Denekamp, Anna Chapman, John Lainchbury, Iain Melton, Darren Hooks, Ian Crozier

Babies born with congenital cardiac anomalies “hole in the heart or blue babies” are now routinely saved by cardiac surgery and live to become productive adults. However many develop heart rhythm disturbances that can be severely disabling. Conventional drug treatments are rarely effective for these heart rhythm disturbances. However most can be effectively and safely treated by cauterising the critical parts of the heart causing the rhythm disturbance.

Prognostic value and long-term variation of high sensitivity troponin T in clinically stable haemodialysis patients

Stefanie Honegger Bloch, David Semple, Karishma Sidhu, Ralph Stewart, Helen Pilmore

High sensitivity troponin is more sensitive for predicting cardiac events but has not been looked at extensively in patients with kidney failure. We found that levels are higher in patients on dialysis with very high levels being a strong predictor of mortality.

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