Who are New Zealand's doctors? Gender, migration and changing living arrangements

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Executive summary

- Studies of the changing nature of medical workforce often focus on gender and migration separately. In addition, the living arrangements of doctors are rarely considered. This study focuses on three main questions: 1) In the period 1986 to 2006, how has the mix of doctors changed in terms of sex and whether born in New Zealand?, 2) How have the living arrangements for doctors changed over this time period?, and 3) If in a couple, how have the educational and employment status of partners changed?

- Internationally there is a growing demand for health services. Skilled health workers, including doctors, have a high degree of international mobility and New Zealand stands out internationally in terms of the high flows of doctors in and out of the country.

- Through changes in training of doctors in New Zealand and through migration flows, there have been major shifts in the composition of the medical workforce in New Zealand since the mid 1980s. Two of importance have been the strong increase in the number of female doctors as well as a significant rise in the number of foreign-born medical staff. In total, women as a proportion of all doctors rose from 22% in 1986 to 40% in 2006. Equally, foreign born doctors rose from 36% in 1986 to 52% in 2006.

- However, determining who is a 'local' or a 'foreign' doctor is not straightforward. There are at least five types of doctor working in New Zealand: 1) New Zealand born domestic school-leavers who have trained in New Zealand medical schools; 2) overseas born domestic school-leavers who have trained in New Zealand; 3) international graduates who have then gained a New Zealand medical qualification; 4)

permanent resident overseas trained doctors, and 5) temporary resident overseas trained doctors.

- For doctors who were born overseas, the main birthplace is the United Kingdom and Ireland. Yet, country of birth is increasingly a poor indicator of ethnicity. Of those doctors who migrate to New Zealand, nearly a fifth record Asian ethnicity. However, many of these Asian migrant doctors come from non-Asian countries, including Pacific nations and from Africa.

- Equally, ethnicity can give little indication of country of birth. For example, in 2006 7% of Maori doctors were born overseas so, based on one type of measure, these people would be counted as 'foreign' doctors.

- In terms of ethnic measures, Maori and Pacific doctors remain under-represented and Asian doctors are over-represented relative to population.

- Most of the overseas doctors coming to New Zealand come as temporary workers, rather than permanent residents. Yet, a significant number of foreign-born doctors are long-term New Zealand residents.

- The rise in the number of female doctors is due to both migration and shifts in the gender balance of local training. In New Zealand in 1994 under half of locally trained medical graduates were female, but by 2006 it had risen to over 60%. There has also been a strong rise in the number of Asian students, especially Asian females, training to be doctors in New Zealand.

- While having more female doctors is, overall, very positive the change does create some challenges. For example, many women work shorter hours than their male colleagues, so in order to have the same level of coverage there is a need for more doctors.

- Most studies of doctors consider them as individuals. In this paper, we also consider their living arrangements both as migrants and once in New Zealand. If women are the principal skilled/business stream migrant applicant then just over half are proposing to migrate independently. For men less than a third aim to come to New Zealand independently.

- However, there are some significant differences by country. The pattern of female doctors coming independently but male doctors with a partner shows up strongly amongst doctors applying from Great Britain. From South Africa, India and the US both male and female doctors tend to come as couples, while from Malaysia it is common for both male and female doctors to come independently.

- While historically a high number of male doctors have been partnered, census data indicate that in the 1980s fewer of the small number of female doctors had partners. In 1986 82% of male doctors were partnered and this had risen slightly to 84% in

2006. For female doctors the rise has been stronger, but from a lower base. Of the 22% of doctors who were female in 1986, 62% of them were partnered. By 2006, of the 40% of doctors who were female, 70% were partnered. This is still lower than the rate for male doctors in 2006

- Census data also shows that people with medical backgrounds have some tendency to partner with each other. But these relationships are changing, as more women become doctors. In 1986 just under 14 percent of male doctors had a nurse or midwife as a partner. In this year nearly 9 percent of partners of male doctors were also doctors. By 2006 the proportion of partners of male doctors who were also doctors had risen to 16 percent, higher than the 9 percent who were nurses. For female doctors the changes are more dramatic. In 1986, of the female doctors who had a partner, 42 percent had a doctor as a partner. By 2006, while the number of female doctors had increased substantially and while still many had a doctor partner, the percentage with a doctor partner had dropped to under a third.

- Of doctor couples, 45% were both born overseas. Some of these couples are likely to have migrated to New Zealand together. Just under a third of doctor couples were both born in New Zealand. But in over a third of doctor couples one partner was born in New Zealand and one overseas. Cross-national partnering is becoming more important overall and so it is not surprising to see this pattern amongst a very mobile group.

- Finally, education is also being concentrated in couples. The data on education levels of couples shows that well qualified couples where one or both are doctors have a greater propensity to live in main urban areas. This suggests that location decisions of doctors, both nationally and internationally, may often be being made by couples both seeking careers rather than just individuals looking for opportunities. The findings of this paper suggest that researchers and policy makers may need to consider family migration issues more than they have in the past for doctors as well as for other migrant groups.

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Background

In New Zealand, as in all industrialised countries, demand for health services has been increasing. This demand is predicted to continue growing (Cox and Hope 2006, Workforce Taskforce 2007). In part, this relates to an ageing of the population. But it is also driven by a wide range of factors including: increases in incomes and, with this, health expectations; advances in medicine; as well as a growth in lifestyle related illnesses such as those related to obesity. While the health sector requires both capital and labour, ultimately it is labour intensive and gains in labour productivity are difficult to achieve. Therefore, increases in demand for health services create a growing need for health professionals, including doctors. This demand is being created throughout the world, including both in developing and developed countries. Concerns about current and possible future shortages have prompted a number of reviews of the health workforce in New Zealand (for a summary, Dumont and Zurn 2007 and Workforce Taskforce 2007). These reviews have shown that there has been an overall shortage of medical practitioners, as indicated by the use of locums and reliance on overseas-trained doctors. The reviews have also identified a 'maldistribution' of the available medical workforce, with rural and non-metropolitan areas finding it increasingly difficult to recruit and retain doctors. In addition, it has been shown that Māori and Pacific peoples, as well as those from lower socioeconomic backgrounds, are under-represented in the medical profession in New Zealand.[1] [2] Finally, some of these reviews have suggested that New Zealand needs to train more medical practitioners locally to meet the demand.[3] However, the OECD note that despite repeated calls for 'self-sufficiency', New Zealand trains proportionally fewer medical graduates than OECD countries on average and has very few foreign medical students (Dumont and Zurn 2007).

However, even local training does not guarantee local working as skilled health workers have a high degree of international mobility. Part of this mobility is portrayed as a 'brain drain' (Pang, Lansang and Haines 2002).[4] New Zealand is caught up in these flows, with the OECD noting that doctors leave New Zealand to seek better opportunities overseas, but also doctors in other countries seek opportunities in New Zealand (Dumont and Zurn

[1] While official investigations into the demographic composition of the medical workforce focus on under-representation of Māori and Pacific peoples, in late 2007 it was noted that '[y]oung white male doctors once the bastion of the medical establishment' are now under-represented in medical schools and that these schools have considered using quotas to attract them (Boland 2007). Ministry of Education data on completions of medical degrees suggest that just under half of total graduates were European males in 1994 but this had reduced to about a fifth by 2006.

[2] If doctors are to represent the full diversity of society it is important they are drawn from all socio-economic backgrounds.

[3] In the UK, a major source of foreign-born doctors for New Zealand, there have also been concerns expressed about increasing the number of locally trained doctors and targets set by governments were exceeded in early 2000s (BBC 2004). In early 2008 it was suggested there was a 'glut' of junior doctors in the UK (Hill 2008).

[4] There are some debates about a 'beneficial brain drain' hypothesis. This suggests that skilled migration can be good for a sending country because the incentives it creates for obtaining training increase that country's net supply of skilled labour and it can also create a stream of remittances (for example, see Kangasniemi, Winters and Commander 2007).

2007).[5] The OECD demonstrate that the health workforce in New Zealand cannot be considered without taking into account migration and show that New Zealand has the highest proportion of migrant doctors in the OECD and one of the highest for nurses. Their data show that foreign-born doctors made up 52% of the New Zealand doctor workforce with foreign-trained doctors forming 36% of this workforce in 2005-06. For nurses the figures are 29% and 24% respectively. The OECD also suggests that New Zealand doctors have the second highest expatriation rates in the OECD (30%) and that this outward flow is also high for New Zealand nurses (23%). The OECD notes that there is no specific immigration policy for health professionals, but state that the permanent and temporary routes make it relatively easy for doctors and nurses who can get their qualification recognised to migrate to New Zealand. The New Zealand media have focussed on number of foreign doctors working in hospitals with, for example, Chisholm (2007) noting that an estimated 41% of doctors working in New Zealand hospitals were trained overseas, with a significant number coming from Asia.[6]

While some doctors are moving between industrialised countries, in a number of industrialised countries concern has been expressed about attracting doctors from areas of high need, yet low doctor density, such as sub-Saharan Africa and parts of Asia (Crush *et al* 2006, Labonte *et al* 2006). There is also concern expressed about the migration of other medical staff, particularly nurses, from other relatively poor economies, notably countries such as the Philippines (Buchan 2006). Stilwell *et al* (2004) state that African and Asian nurses fill the gaps in the health sectors in countries such as the UK and US and suggest that this will continue in the near future.

While external migration of doctors is an issue confronting many nations, internal migration can also be of concern. A number of drivers are working to concentrate both medical services and associated human capital in large urban areas. For instance, in the US, Mare and Schwartz (2006) have shown that over the past 40 years in the US the similarity of husbands' and wives' educational attainments has increased markedly. This not only has implications for income inequality but may influence the ability to attract doctors to rural areas or smaller urban locations. If doctors' partners are increasingly well educated, and seeking careers, then this could result in well educated 'power couples' increasingly seeking out large urban areas to live in.[7] Overall, rural areas and small cities may experience reduced inflows of human capital relative to the past and thus face development and service delivery difficulties.

[5] The OECD report touches on many important issues, including the 'ageing' of the New Zealand medical workforce. This workforce ageing, while very important, is not addressed in this paper.

[6] The situation is similar in Australia. Hugo, Callister and Badkar (2008) show that in 2006 the overseas-born made up just over a quarter of Australia's total workforce (25.3 %) but almost a third (32.3 percent) of overall health and medical workers and about half of GPs (51%) and dentists. The authors note there are an especially large number of doctors on temporary visas in rural and remote areas of Australia.

[7] Costa and Kahn (2000) suggest that 'power couples' have co-location problems. An alternative explanation is that college educated individuals, married or married, are attracted to the amenities and high returns to education found in large cities and that, as a result, the formation of 'power couples' through marriage of educated singles is more likely to occur in larger than smaller metropolitan areas (Pollak and Compton 2004). Either way, however, there will be a concentration of human capital in large urban areas.

Many countries facing shortages of doctors in rural areas endeavour to attract foreign doctors to these areas. For example, in 1999 the New Zealand government announced a policy which aimed to give the immigrant doctors training and registration in return for accepting remote GP postings (Jobsletter 1999).

As already discussed, increasing local training has been seen as a way of reducing doctor shortages. But a number of studies indicate that, with high levels of migration, defining 'local' is becoming more complex. For instance in an Australian context, Hawthorne, Hawthorne and Crotty (2007, drawing on the work of Dobson and Birrell 2005) note that first generation migrants and refugees are now well-represented in Australian medical courses. By the mid 1990s a quarter of all 'domestic' students were in fact Asia-born (six times their representation in the overall population).[8] By 2004, Hawthorne *et al* note that close to a third of Australian medical students were overseas-born (30.2%), with primary birthplaces the UK (3.0%), Malaysia (2.5%), China (2.2%), Hong Kong (2.2%), India (2.2%), Sri Lanka (2.1%), Taiwan (1.9%), New Zealand (1.6%) and South Africa (1.3%). In addition, increasingly 'foreign' students can become 'local' through migration policies that allow them to stay on in the host country after training. Docquier and Bhargava (2007) point to doctors living in OECD countries who, based on country of birth, seem to be foreign doctors but when the site of medical training is considered are found to have trained within industrialised countries and therefore could be seen as 'local' doctors. This means there are at least five types of doctor working in New Zealand:

1. New Zealand born domestic school-leavers who have trained in New Zealand medical schools
2. overseas born domestic school-leavers who have trained in New Zealand
3. international graduates who have then gained a New Zealand medical qualification,
4. and permanent resident overseas trained doctors
5. temporary resident overseas trained doctors

Case studies illustrate even more the complexity of these movements, with a study of Victorian rural doctors providing an example of a doctor who was born in South Asia, worked in South Africa, moved to the UK, Canada, then New Zealand and finally shifted to Australia (Hawthorne, Hawthorne and Crotty 2007).

One aspect of locally trained doctors that has changed significantly over recent decades has been the rise in the number of women undertaking medical training. Ministry of Education data on completions of medical training in New Zealand show that in 1994 47% of graduates were female but that by 2006 this had risen to just over 60%. This type of change has taken place in most industrialised countries, including the US (Goldin

[8] We are unable to repeat this analysis in New Zealand as universities do not collect information on a student's country of birth. However, Ministry of Education qualification completion data for health related studies at the two New Zealand universities with medical schools shows a very strong increase in the proportion of domestic students who record an Asian ethnicity (data available from authors). This suggests the patterns observed in Australia are occurring in New Zealand as well, however we are unable to report on the proportions that were born in New Zealand and born overseas.

2006). In the US, Goldin shows that the strong growth in the number of female medical students began in the early 1970s. In addition, female doctors come to New Zealand as migrants (Badkar, Callister and Krishnan 2006). Between 2003/04 and 2005/06 females made up between 37% and 44% of health professionals (excluding nurses) migrating to New Zealand (ibid).[9] In terms of health professionals (NZSCO minor group) there are some differences in the gender balance by country of origin.[10] In relation to the largest suppliers of these professionals in the period 2003/04 to 2005/06, the highest ratios of females to male health professional migrants was from Great Britain (48% female), while lower ratios within country specific streams were seen from South Africa (34% female), United States (32% female) and India (19% female).

This increase in female participation in education where women have historically been under-represented in, as well as the increase in the proportion of migrant doctors who are female, clearly has many positive features. Apart from obvious gender equity issues, women who wish to consult with a female doctor now have more choice. But inevitably a change of the size of the gender transition that has taken place in tertiary education in New Zealand will have other impacts on society, including the labour market.

New Zealand census data and other research show that in many circumstances female doctors work shorter hours than males. Overall, in 2006 6% of male doctors worked under 30 hours per week (part time), while 28% worked 60 or more hours. In contrast, 21% of female doctors worked part time, while 17% worked 60 or more hours per week.[11] [12] In terms of rural GPs, Goodyear-Smith and Janes (2006) found far more male GPs (76%) than female GPs (37%) worked full time. If female doctors keep following patterns of, on average, working shorter hours than their male colleagues, then this means that New Zealand requires more trained doctors to fill any given level of need. In addition, having colleagues who do work shorter may change overall work norms. This may mean that overall doctors, including male colleagues, will be less willing to work long hours than in the past, perhaps one reason for the strikes in 2005 about working hours for trainee doctors. But the growth of the number of female doctors may increasingly make it difficult to recruit doctors into small towns and rural areas. Both New Zealand and Australian research suggests, for a variety of reasons, female doctors are less willing to work in rural areas (Janes *et al.* 2004, Health Workforce Queensland & Australian Rural and Remote Workforce Agencies Group 2006, Tolhurst 2003). Yet,

[9] In comparison, in this time period just under 90% of nurses migrating to New Zealand were female.
[10] The New Zealand Standard Classification of Occupations (NZSCO) is a skills-based, hierarchical classification system that categorises the type of work that is performed in a job. Occupational groupings are differentiated from each other according to the responsibilities, tasks, training required, and experience common to that group.
http://www.dol.govt.nz/publications/jvm/shortage2007/shortage2007_16.asp
[11] The New Zealand a survey of the 2006 medical workforce showed that average hours worked by women were less than men, but also showed a slight reduction in hours worked by both men and women between 2000 and 2006 (New Zealand Medical Council 2008).
[12] See appendix A for more detailed census data on working hours of male and female doctors.

research undertaken in New Zealand shows that when age structures are considered an increasing proportion of rural GPs are female (Goodyear-Smith and Janes 2006).[13]

Women are also making some different choices about medical speciality and this is likely to have long-term impacts on the medical labour market. For example, the New Zealand Medical Council (2008) shows all New Zealand vocational trainees in breast medicine, family planning and reproductive health, and sexual health medicine were women. Women also outnumbered men in training in obstetrics and gynaecology (63 %), paediatrics (72 %), palliative medicine (63 %), pathology (61 %), public health medicine (78 %), radiation oncology (73 %) and otolaryngology, head and neck surgery (56 %). In contrast, there are areas with few women training. For example, less than a quarter (23 %) of vocational trainees in surgical areas were women.

Various factors influence where doctors will work. But for couples choice of partner need to be considered in relation to the geographic location of doctors, especially rural doctors as well as those working in small urban areas. In the past it may have been that rural male GPs were typically married to a schoolteacher or nurse who could also work in rural areas or small towns. Now the potential male, or increasingly female GP, may have a partner who is a specialist doctor, lawyer or other professional who needs to work in a large urban area. Yet, also there is the potential for some medical couples to work together in smaller areas. For example Goodyear-Smith and Janes (2006) discuss husband and wife teams, sometimes both doctors sometimes a doctor and a nurse, working in rural practices in New Zealand.

The rural doctor example suggests that it can be important to consider doctors as individuals but also, at times, as part of couples. For example, migration flows show that like many other professionals couples where both are doctors, or perhaps one is a nurse or other health professional, are making moves both across borders and within countries.

When considering migration of medical staff, both flows and stocks need to be considered. For example, doctors from some countries may be more mobile than others, so while they come into New Zealand many may not stay long. This is illustrated by New Zealand Medical Council (2008) data that shows that doctors from Asian countries have the highest rate for staying in New Zealand, followed by South Africa and then European (other than the UK) doctors. More than 50 percent of doctors from Asian countries are retained 6 years after registration. The retention rate of South African doctors drops below 50 percent only after 5 years. Doctors from the United States and Canada have the lowest retention rate, with less than 30 percent at 1 year after registration and less than 10 percent as early as 4 years after registration. Doctors from the United Kingdom also have lower than average retention rates. Fewer than 30 percent of these doctors are retained 2 years after registration, and the rate drops below 20 percent after 6 years.

[13] Seventy-three percent of rural GPs were aged over 40, with an even higher majority of males in the over 40 age group (78%), and no female GPs over age 60. The researchers note that this indicates a predominantly aging male workforce.

As further background to this study, the OECD (Dumont and Zurn 2007) noted that in 1980 in New Zealand there were 1.6 active doctors per 1,000 population. By 2004 there were 2.2. However, the growth was lower than the OECD average and New Zealand has fewer doctors relative to the population than most OECD countries.[14] Potentially connected with this, New Zealand trains proportionally fewer students than OECD average. In addition, in terms of one route of attracting overseas doctors, the OECD shows that New Zealand has very few foreign medical students.

In light of many of these trends, the 2007 Workforce Taskforce inquiry into the New Zealand medical workforce recommended that more effort was needed to promote the recruitment and retention of medical trainees and that the number of medical graduates produced by the New Zealand training system be increased. It also recommended that all medical practitioners acquire a broad general foundation, which includes community and regional hospital experience, before entering vocational training. Also of importance was that there was a need to identify and address factors, both educational and non-educational, that influence the choice of students and trainees for general practice as a career.

Research questions

Studies of the changing nature of medical workforce often focus on gender and migration separately. In addition, the living arrangements of doctors are rarely considered. This study uses both migration and census data to focus on three main questions.

- In the last two decades (1986 to 2006), how has the mix of doctors changed in terms of sex and whether born in New Zealand overall, and what are the differences across the main urban areas, other urban areas and rural areas?

- How have the living arrangements for doctors changed over this time period?

- If in a couple, how have the educational and employment status of partners changed over this time period?

Methods

This study is based primarily on census data from 1986, 1991, 1996, 2001 and 2006. Census data are snapshot in each period but as such show broad trends over time. The census population reported is the usually resident population. The OECD (2007) note that temporary migration means more short term stays of health workers in New Zealand, particularly doctors. Some of these doctors may record themselves as temporary visitors not be counted in resident population census data.

[14] But the OECD note that New Zealand has a higher proportion of nurses relative to the population than the OECD average.

The other main data source is immigration data collected by the Department of Labour. Detailed immigration data is collected through the Department of Labour's Application Management System (AMS). This database contains information on whether the applicant was principal or secondary applicant, sex, age, and for the principal applicant information is collected on their occupation and region (in New Zealand) at the time of their application.[15]

In terms of where doctors come from there are four potential states doctors can be in. These are: Born in New Zealand / trained in New Zealand; born in New Zealand /trained overseas; born overseas /trained in New Zealand; and born overseas / trained overseas. In terms of training, it can be more complicated as a doctor may undertake some training in New Zealand and some of their training overseas. The meaning of being 'born overseas' or in New Zealand is also complicated. For example, a person may have had New Zealand citizen parents who were living overseas at the time the child was born and that child may have lived most of their lives in New Zealand. Equally, a person may have been born overseas but have spent most of the childhood as well as adult life in New Zealand. There are also the New Zealand born and trained doctors who have spent some time living overseas and have returned.

In undertaking this study, it was evident early on that there were potentially small numbers in some part of the analysis. In terms of protecting confidentiality, this strongly limits the level of variables that can be analysed. We therefore present a series of broad cross tabulation tables. The main variables used are age, sex, overseas versus New Zealand born, and education and occupation of partners. In some of the analysis, doctors are divided into two groups, general practitioners and 'other doctors'. Many of the 'other doctors' are specialists, often working in hospitals. The geographic variables used are main urban area, other urban area and rural areas.[16] These variables relate to where doctors live rather than where they work. In general doctors will live in the broad geographic area they work in, but some will commute so as to work in a different area to which they live in. For example, a doctor may live in a small rural town but commute into a large urban area each day. Ethnicity was not a key variable studied, but is mentioned in one section. In part this relates to problems of developing time series. But more importantly, when cross tabulations are produced that include sex and age and place of birth there is quickly the potential for confidentiality problems.

Determining whether someone lives in a couple is relatively easy. However, subsequently analysing census based couple data presents some technical problems. One is how to understand gender variables within same sex couples. These couples are excluded from the analysis but given the small numbers this exclusion is unlikely to change the overall pattern.

Finally there is always a question about accuracy of some census data. An analysis of census responses by Statistics New Zealand staff shows odd responses, such as a person

[15] Where applicable, depending on the immigration policy

[16] For definitions of these geographic areas see: http://www.stats.govt.nz/urban-rural-profiles/defining-urban-rural-nz/default.htm

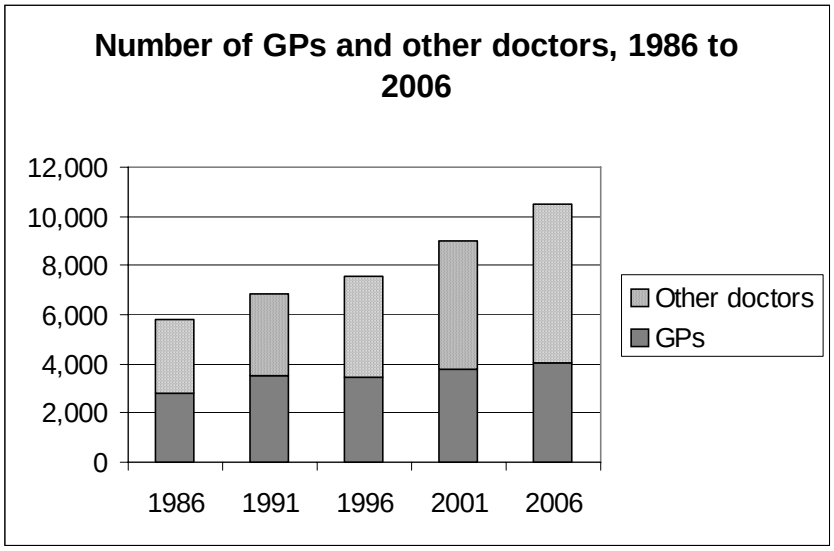
noting they are a 'brain surgeon' but noting that they have no formal qualifications. It is difficult to determine whether the response is correct, or if it is a false declaration of occupation or if has the education section been filled in incorrectly. In addition, even where bona fide doctors are filling in their forms, like other census respondents some do not answer all questions.

Results

Individuals

Figure 1 uses census data to show the growth in the number of doctors from 1986 to 2006. This figure indicates that the ratio of 'other doctors' to GPs has also been changing over time. The data show that in 1986 there were 10% more 'other doctors' than GPs, but by 2006 this difference had risen to 61 %.

Figure 1

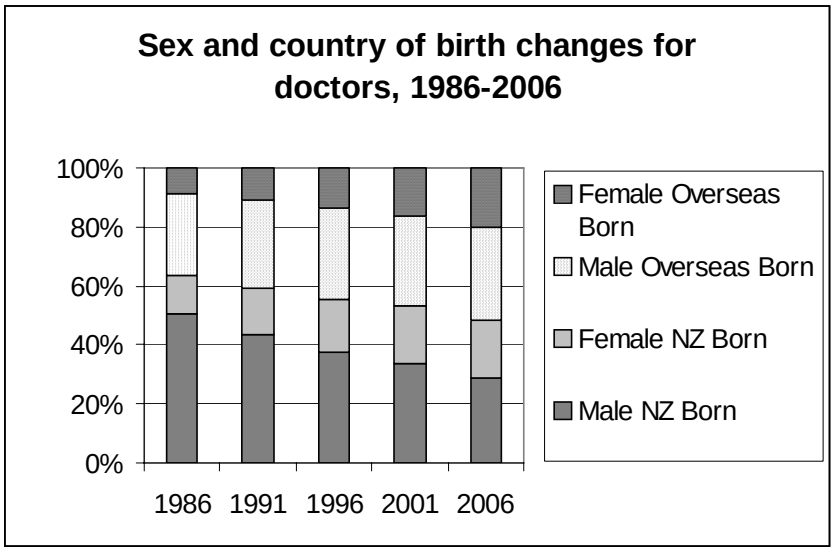


Source: Statistics New Zealand

Figure 2 shows the changing mix of doctors in New Zealand by both sex and country of birth. It shows changes in both dimensions over the time period 1986 to 2006, with a net result being a decrease in the proportion of New Zealand born male doctors. In total, women as a proportion of all doctors rose from 22% in 1986 to 40% in 2006. Equally, foreign born doctors rose from 36% in 1986 to 52% in 2006.[17]

[17] Data from Newell shows that in 1981 17% of doctors were female.

Figure 2



Source: Statistics New Zealand

As discussed in the methods section, being born overseas is a crude measure. Table 1 gives an idea of how long those doctors recorded by the census as having been born overseas have been in New Zealand. It shows a significant proportion have been in New Zealand for a long period, that is twenty years or more, but this proportion has been reducing. Equally, a significant number have been in New Zealand for a relatively short time, under five years, but this too has been declining. The strong growth has been the proportion in New Zealand between ten and nineteen years, rising from 18% in 1996 to 28% in 2006.

Table 1: Length of time in years in New Zealand for foreign born doctors, 1996 to 2006*

	Under 5	5-9	10-19	20+	Total
1996	32	17	18	33	100
2001	24	23	21	32	100
2006	22	18	32	28	100

*Earlier data are not available
Source: Statistics New Zealand

Table 2 shows relatively little difference between foreign born women and men. Not surprisingly, those in the younger age groups have the highest proportion living in New Zealand for a relatively short time. But the fact that 16% of overseas born male and female doctors who were under 40 had lived in New Zealand 20 or more years suggests they have been long term residents. Table 2 also shows the proportion of the total population who lived in New Zealand for the specified time periods. It indicates that a smaller proportion of foreign born doctors have been long term residents of New Zealand compared with the total population.

Table 2: Length of time in New Zealand for foreign-born doctors, % in each time span, 2006

	Under 5		5-9 Years		10-19 Years		20 Years or More	
	Male	Female	Male	Female	Male	Female	Male	Female
Under 40	35	35	21	23	27	27	16	16
40-59	14	15	16	18	39	39	30	29
60+	7	0	5	4	11	8	77	79
Total	20	25	16	20	32	32	31	24
Total pop*	27	22	15	16	19	20	39	37

To be reasonably comparable to the doctors data this is for the age group 25-70.
Source: Statistics New Zealand

Table 1 & 2 suggest some caution in the use of the terms 'foreign-born' doctors versus 'New Zealand born' as many foreign born doctors have a long experience of living and working in New Zealand.

As Figure 2 indicates, the proportion of doctors who are female has been growing. Table 3 breaks down further the growth of female doctors. As shown, women as a proportion of total doctors increased from 22% to 40% in 2006.[18] As a proportion of all GPs, the rise was from 20% to 41%. For 'Other doctors' the increase in the proportion of women was very similar, from 24% to 39%. Table 3 gives a first indication that the rise in the proportion of women has been evenly spread across GPs and other doctors and across New Zealand and foreign-born doctors.

Table 3: Women as a % of doctors, 1986 to 2006

	1986	1991	1996	2001	2006
NZ born GPs	17	24	32	37	41
Overseas born GPs	24	27	33	37	40
NZ born other doctors	24	30	33	35	39
Overseas born other doctors	24	28	28	34	39
Total	22	27	32	35	40

Source: Statistics New Zealand

As discussed earlier, doctors can come into New Zealand as permanent migrants via the Skilled/Business stream or can come in on temporary work permits.[19] While there is some double counting with the applications data for temporary work permits, overall around six times as many doctors applied to come into New Zealand over the 2002/3 to 2006/07 period as temporary migrants when compared with permanent migrants.[20] [21] In

[18] New Zealand Medical Council data show that in 1984 16.1% of GPs were female but by 2003 this had reached 39.1%. These patterns are broadly similar to the census data http://www.nzhis.govt.nz/stats/genpracstats.html

[19] They could also be sponsored through the Family Sponsored Stream. However our analysis is limited to SBS and temporary work permits.

[20] See appendix for tables.

[21] This is because the database counts the number of applications for temporary work permit holders, not the actual number of people. Therefore if a person renews their work permit in one reporting period they would be counted twice.

this whole time period 1,014 medical doctors were approved as principal applicants for residence through the Skilled /Business stream as against 6,145 through temporary work permits. Through the Skilled/Business stream overall, 38% were female, while amongst the temporary work category applicants, 40% were female. These proportions are very much in line with the census based stocks of foreign doctors (Table 3)

While for the remainder of this analysis "other doctors" are treated as a group, Table 4 shows that there are major differences in the rise of women in particular specialities. The area with the highest number, and proportion, of women in 2006 was resident medical officer (sometimes referred to as 'junior doctors'). This generally reflects age structures, as this is a starting position for doctors in hospitals.

Table 4: Women as % of all doctors, 1981-2006

	1981	1986	1991	1996	2001	2006	Size of group in 2006	% of group
Anaesthetist	23	24	25	21	24	29	429	4.1
General Practitioner	15	20	25	32	37	41	4,014	38.2
Gynaecologist and Obstetrician	9	13	16	33	47	45	87	0.8
Physician	14	21	25	25	31	39	1,641	15.6
Radiologist, Radiation Oncologist	18	22	34	46	48	36	270	2.6
Resident Medical Officer	25	29	38	39	40	48	3,369	32.1
Surgeon	7	1	2	5	8	9	696	6.6
Grand Total	17	22	27	32	35	40	10,506	100.0

Source: Newell and Statistics New Zealand

Table 5 switches back to flows of doctors approved as principal applicants for residence through the Skilled/Business stream. It shows that while the mix is broadly similar to the stock of doctors, there is a greater proportion of resident medical officers (reflecting recruitment of younger doctors).

Table 5: Number of doctors approved as principal applicants for residence through the Skilled/Business stream, 2002/03 to 2006/07

NZSCO unit group	NZSCO occupation	2002/03	2003/04	2004/05	2005/06	2006/07	Grand Total	% of total
Medical Doctors	Anaesthetist	7	14	29	4	8	62	6.1
	General Practitioner	9	43	68	49	52	221	21.8
	Gynaecologist and Obstetrician	1	6	2	3	3	15	1.5
	Physician	16	29	58	31	46	180	17.8
	Radiologist, Radiation Oncologist	7	12	10	8	10	47	4.6
	Resident Medical Officer	23	51	130	112	122	438	43.2
	Surgeon	6	5	18	14	8	51	5.0
Total		69	160	315	221	249	1,014	100

Source: Department of Labour

Table 6 returns to census data and focuses specifically on age. While this level of detail is not applied to the rest of the analysis, Table 5 shows a five yearly age distribution of all doctors. The data ranges from 62% of the small group of doctors aged 20-24 being female to 11% of the equally small group of doctors over the age of 65 years. This suggests that unless young women exit medicine at a far faster rate then men, or that migration changes the balance of women and men in a major way, as the predominantly male older doctors retire the overall proportion of doctors who are female will increase.

Table 6: Women as a % of doctors in each age group, 1981-2006

	1981	1986	1991	1996	2001	2006	Total size of group in 2006
20-24 yrs	34	36	55	52	53	62	489
25-29 yrs	26	32	42	48	49	55	1,218
30-34 yrs	16	27	34	40	46	48	1,134
35-39 yrs	15	21	28	36	40	45	1,374
40-44 yrs	15	16	20	29	37	41	1,656
45-49 yrs	12	15	17	22	30	39	1,725
50-54 yrs	12	15	17	17	23	32	1,197
55-59 yrs	12	13	15	14	20	23	780
60-64 yrs	7	10	11	12	16	18	492
65-69 yrs	7	3	8	8	10	11	246
70 + yrs	5	6	5	9	8	11	171

Source: Newell and Statistics New Zealand

While the remainder of the geographic analysis is based around broad urban and rural areas, Table 7 uses census data to show the proportion of doctors in each DHB who were born overseas. Table 7 shows a significant variation in this measure. In terms of GPs, the highest proportion of foreign doctors in a DHB area was Taranaki at 65% and the lowest South Canterbury at 39%. In relation to 'other medical doctors', the highest proportion

was in Southland (72%) and the lowest in Capital and Coast at 43%. Confidentiality issues prevent a deeper analysis of these DHB based data.

Table 7: % of doctors born overseas in each DHB area, 2006, (ranked by % of GPs born overseas)

	General Practitioner	Other medical doctor
Wairarapa	68	76
Taranaki	65	59
Whanganui	64	74
Counties Manukau	63	72
Northland	59	64
Midcentral	59	61
Waikato	59	61
West Coast	58	64
Southland	55	72
Hawke's Bay	53	46
Waitemata	53	61
Lakes	49	60
Bay of Plenty	49	53
Otago	47	54
Nelson Marlborough	46	47
Canterbury	45	47
Capital and Coast	44	43
Auckland	44	48
Tairawhiti	44	69
Hutt	40	50
South Canterbury	39	63
Total	50	53

Source: Statistics New Zealand

Doctors approved through the Skilled/Business stream are more likely to work in the Auckland and Waikato regions. This is not a surprising trend as a large proportion of skilled migrants tend to settle in these and the other main centres (Merwood 2006). These migration data did not show any gender differences around where doctors work in New Zealand (see table A9 in appendix A).

Tables 8 & 9 uses our chosen three main geographic areas to show the growth of the numbers and percentage of women and men in each area. Table 8 shows that numbers have grown in all categories except ‘other urban area male’. This growth includes a very strong growth in the number of women in rural areas.

Table 8: Number of male and female doctors in each main geographic area, 1986 to 2006

	1986	1991	1996	2001	2006	% growth 86-2006
Main urban area female	1,107	1,614	2,088	2,766	3,612	226
Main urban area male	3,786	4,158	4,332	4,989	5,400	43
Other urban area female	99	141	147	186	213	115
Other urban area male	522	549	504	468	429	-18
Rural area female	81	111	168	237	315	289
Rural area male	231	294	342	378	501	117
	5,826	6,867	7,581	9,024	10,470	80

Source: Statistics New Zealand

When the distribution across geographic areas by sex is considered (Table 9), the major decline is in the category " main urban area male". So from two thirds of all doctors being male and living in a main urban area, this has declined to just over half being male and living in a main urban area.

Table 9: % of male and female doctors in each main geographic area, 1986 to 2006

	1986	1991	1996	2001	2006
Main urban area female	19	24	28	31	34
Main urban area male	65	61	57	55	52
Other urban area female	2	2	2	2	2
Other urban area male	9	8	7	5	4
Rural area female	1	2	2	3	3
Rural area male	4	4	5	4	5
	100	100	100	100	100

Source: Statistics New Zealand

Moving back to the issue of foreign-born doctors, Table 10 breaks doctors down into GPs and "other doctors", as well as showing broad age groups and sex. The table shows relatively little difference in the proportion of foreign-born doctors in each cell. The one cell that stands out is older GPs, but the numbers are small and have little impact. So age, sex and broad type of doctor impact little when considering foreign doctors.

Table 10: % of doctors who were foreign born, 2006

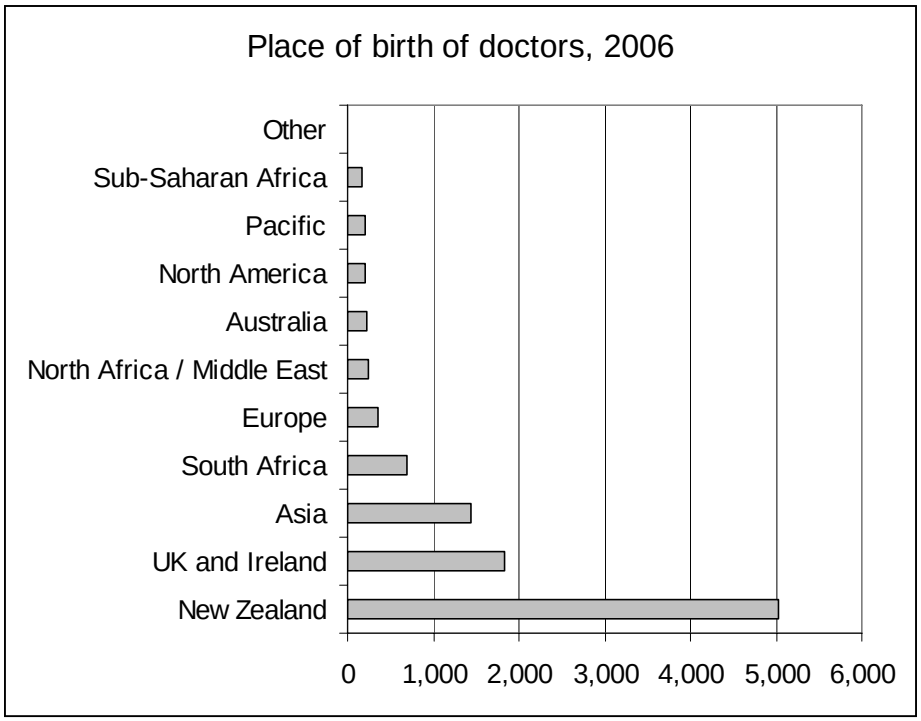
		Male	Female	Total	Total
GPs	Under 40	52	46	48	1,080
	40-59	51	51	50	2,508
	60+	46	67	52	420
	Total	50	49	50	4,011
Other doctors	Under 40	53	51	51	3,141
	40-59	56	55	55	2,826
	60+	43	52	43	489
	Total	53	52	52	6,459
Total	Under 40	52	49	51	4,227
	40-59	53	52	53	5,331
	60+	45	58	49	912
	Total	52	51	52	10,470

Source: Statistics New Zealand

Figure 3 shows the main birthplaces of doctors. After New Zealand, the main birthplace is the United Kingdom and Ireland. This is followed by Asia and then South Africa. The figure indicates that New Zealand has attracted only a small number of doctors from areas considered to be in need of retaining their own doctors, such as sub-Saharan Africa.[22]

[22] One exception might be the Philippines. While they train for export, there are increasing concerns about impacts on primary health care available in that country.

Figure 3



Source: Statistics New Zealand

While the flow data for both permanent and temporary migration of doctors shows that around 40% of applicants are female, when nationalities are considered there are some differences. Just under half of applicants from Great Britain and Ireland were female, but only 20% of permanent and 13% of temporary applicants from India were female (Table 11).

Table 11: Top 5 nationalities of medical doctors approved as principal applicants for residence through the Skilled/Business stream and number of approved medical doctor work applications - top 6 nationalities, by gender, 2002/03 to 2006/06 combined

Skilled/Business Stream				Temporary work category			
Nationality	Sex		Women as % of total	Nationality	Sex		Women as % of total
Great Britain	Female	193		Great Britain	Female	1,511	
	Male	233	45.3		Male	1,570	49.0
South Africa	Female	61		South Africa	Female	202	
	Male	99	38.1		Male	358	36.1
Malaysia	Female	35		Malaysia	Female	128	
	Male	49	41.7		Male	142	47.4
India	Female	13		India	Female	38	
	Male	50	20.6		Male	266	12.5
USA	Female	17		USA	Female	187	
	Male	47	26.6		Male	464	28.7
Other	Female	61		Other	Female	292	
	Male	156	28.1		Male	752	28.0
				Ireland	Female	110	
					Male	125	46.8
Total		1,014				6,145	

Source: Department of Labour

Table 12 is based on census data and shows the main birthplace by age of doctor in 2006. It indicates while there is relatively little difference in age group in terms of country of birth, in the younger age group the proportion born in Asia is marginally higher.

Table 12: Main birthplace by age of doctor (% of total in each age group), 2006 [23]

	New Zealand	Australia	Pacific Islands	United Kingdom and Ireland	Europe	North America	Asia	Other	Total n=
Under 40	49	2	2	16	3	2	17	9	4,221
40-59	47	2	2	19	4	2	11	13	5,301
60+	52	3	1	19	3	2	13	7	912

Source: Statistics New Zealand

[23] In contrast in 2001 there were 588 NZ born GPs working in Australia and 454 specialists (Hawthorne, Hawthorne and Crotty 2007: 8). In comparison, the New Zealand 2006 census shows 162 Australian born GPs working in New Zealand and 72 specialists. In total numbers the flows are in favour of New Zealand doctors going to Australia, but when relative population sizes are considered the flows are more even. The Australian data show that 64% of New Zealand born doctors working in Australia were under 45 in 2001, as against 55% for total Australian doctors.

Ethnicity (using total counts) is considered in Table 13. As background to this table, overall in 2006 40% of doctors were under 40 years of age. But when ethnicity is considered, 66% of Pacific doctors and 59% of Maori, but only 38% of European doctors were under 40 years of age. Given the patterns shown earlier that a greater proportion of younger doctors are female, this helps explain why a higher proportion of Maori and Pacific Island doctors are female. In the under 40 age group there is little difference the proportion of doctors that were female in 2006 amongst Maori (50%), European (53%) and Pacific Island doctors (52%).

Table 13: Number and % of total doctors in each ethnic group, total counts, 2006

	Male	Female	Total	% female	% in each ethnic group-Males	% in each ethnic group-Females
European	4,281	2,994	7,275	41	68	72
Mäori	162	153	315	49	3	4
Pacific Peoples	75	75	150	50	1	2
Asian	1,161	723	1,884	38	18	17
Middle Eastern/Latin American/African	207	90	297	30	3	2
Other Ethnicity	666	327	990	33	11	8
Not Elsewhere Included	45	18	66	27	1	0
Total	6,330	4,140	10,470	40	100	100

Source: Statistics New Zealand

Table 13 indicates that Maori and Pacific doctors are under-represented relative to the population, while Asian doctors are over-represented. While there have been some concerns expressed as the small number of 'white' male doctors in medical school (Borland, 2007), due to their greater numbers in older age groups, European males formed 41% of total doctors in 2006. However, as the retirement of older doctors takes place, even without further migration the ethnic and gender and ethnic composition of the medical workforce is likely to change rapidly.

A number of New Zealand studies indicate that country of birth does not always correlate with the ethnicity that may be expected from that area. In particular, it is known that a significant number of professionals migrating from the Pacific record Asian ethnicities.[24] These 'Pacific Asians' are generally people migrating from Fiji, but there is also migration of people recording Asian from other areas of the Pacific. Table 14 shows that Asians make up 18% of New Zealand doctors. For those doctors born in New Zealand, this figure is 5%, but for those born in the Pacific it is just under half. Of particular interest is that nearly a fifth of doctors from Sub-Saharan African record Asian ethnicity. Some of these will be doctors who are the children of an earlier Asian migration to Africa: this emphasises that mobility is a complex issue. Equally, ethnicity may be misleading in relation to country of birth. As an example, in 2006 7% of doctors

[24] Given that people can record more than one ethnic group, some of these people record other ethnicities in addition to an Asian ethnicity.

recording Maori ethnicity were born overseas. If doctors born overseas are classified as 'foreign', then these Maori doctors would not have been counted as 'local' doctors.

Table 14: % of doctors born in each main area who recorded Asian ethnicity, Total counts, 2006

	% Asian
Born in New Zealand	5
Australia	4
Pacific	49
UK and Ireland	3
Europe	1
Asia	94
North America	4
North Africa	4
South Africa	9
Sub-Saharan	19
Total	18
Total Asians n=	1,884

Source: Statistics New Zealand

Couples

The analysis now turns to the living arrangements of doctors including, if they are part of a couple, the employment status of their partner. Table 15 shows the proportion of male and female doctors who were partnered in 1986 and then twenty years later in 2006. For male doctors there has been little change with the rate at 82% in 1986 and 84% in 2006. For female doctors there has been a stronger rise, but from a lower base. Of the 22% of doctors who were female in 1986, 62% of them were partnered (77% for GPs, 52% for specialists). By 2006, of the 40% of doctors who were female, 70% were partnered. However, this is still well under the male partnering rate for 2006.

Table 15: Proportion of male and female doctors who were partnered, 1986 and 2006

	1986	2006
Proportion of male doctors partnered	82	84
Proportion of female doctors partnered	62	70

Source: Statistics New Zealand

To give some national comparison, in 2006 78% of all men aged 25-70 were partnered and 75% of women in this age group.

Table 16 shows a geographic breakdown of partnering amongst the stock of doctors living in New Zealand in 2006. Table 16 shows that both male and female doctors who lived in rural areas were the most likely to be partnered. Female doctors in main urban areas were the least likely to be partnered.

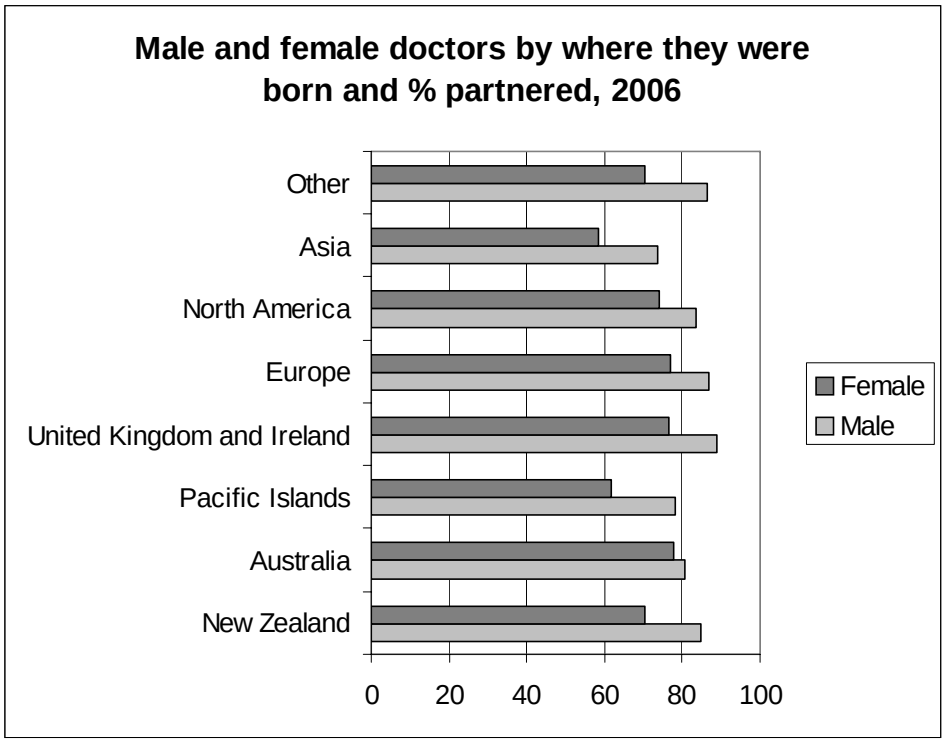
Table 16: % of male and female doctors who were partnered in each main geographic area, 2006

	Male	Female	Total
Main urban area	83	69	77
Other urban area	87	70	82
Rural	90	85	88
Total	84	70	79

Source: Statistics New Zealand

Figure 4 shows partnering rates for men and women by country of birth. The partnering rates for men were higher in 2006 for each area. However, in 2006 the lowest rates for partnering for both male and female doctors are amongst doctors born in Asia. The second lowest rates are for those from the Pacific, but as already shown many of these doctors reported Asian ethnicity.

Figure 4



Source: Statistics New Zealand

As already discussed, in relation to the doctors shown in Figure 4 only some have recently come to New Zealand. When medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants is analysed by gender some important patterns emerge (Table 17). If women are the principal applicant then just over half are proposing to migrate independently. For men less than a third aim to come to New Zealand independently. This indicates that when looking at migration decisions as well as location decisions by doctors, gender of the principal applicant can be an important factor.

Table 17: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *all nationalities*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	208	52%	211	31%	419	38%
With secondary applicants	194	48%	476	69%	670	62%

Source: Department of Labour

However, again there are some significant differences by country (see Tables A4 to A8 in appendix A for country specific tables). This pattern of women coming independently but men with a partner shows up strongly amongst doctors applying from Great Britain. From South Africa, India and the US both men and women tend to come as couples, while from Malaysia it is common for both male and female doctors to come independently.

Table 18 shows selected occupations of the partners of male and female doctors in 1986 and 2006. This table primarily tests the idea that in the past a significant proportion of male doctors had a nurse or teacher as a partner but that pattern will have declined over time. But Table 18 also examines the changing partnering choices for female doctors. The category not in paid work includes parents at home looking after children. It is not known what occupation these people would have been in should they have been employed. For example, amongst those women not in paid work there will be some who had trained and worked as nurses in the past.

A number of patterns stand out in Table 18. First, in both 1986 and 2006 a greater proportion of partners of male doctors were not in paid work than partners of female doctors. Second, in 1986 a small but significant proportion of male doctors did have a nurse as a partner. But in this year nearly 9% of partners were also doctors. By 2006 the proportion of partners of male doctors who were also doctors had risen to be higher than nurses.[25] For female doctors the changes are more dramatic. In 1986, of the smaller proportion of female doctors who had a partner, 42% had a doctor as a partner. By 2006 this had reduced to 29%. However, this is still significantly higher than for male doctors. Also not surprising given the very small number of male nurses, only a few female doctors have nurse partners. Overall, the data indicate a significant proportion of doctors have a partner who also works in the medical field (not shown are the other health professions such as dentist, pharmacists etc).

[25] As a comparison, in 2006 only 2% of partnered female nurses had a doctor as a partner. In part this reflects differences in size of the two groups with considerably more nurses than doctors in New Zealand.

Table 18: Selected occupations of partners of male and female doctors, 1986 and 2006

	Male doctors		Female doctors	
	1986	2006	1986	2006
Not in paid work	30.9	28.9	6.3	12.9
GPs	4.7	7.5	18.3	10.2
Other doctors	4.1	8.1	23.8	18.3
Total doctors	8.8	15.6	42.1	28.5
Nurses and midwives	13.5	9.1	0.8	0.9
Lawyers	0.4	1.6	4.2	2.4
Teachers	4.7	4.1	3.8	2.6
Total specified	3,438	4,791	720	2,619

Note: These data are slightly different from above data due to how not specified are handled
Source: Statistics New Zealand

When wider occupational groups are considered, a significant proportion of doctors, both male and female, have partners who work in managerial and professional occupations as well as the broad technical and associate professional group. However, a difference between male and female doctors is that more male doctors have 'clerks' as partners. When considering doctors with doctor partners, both male and female doctors (GPs and 'other doctors') are more likely to have an 'other doctor' if they are living in main urban areas. This is likely to reflect the concentration of specialists in large urban areas.

Some of the differences between male and female doctors can be seen in Tables 19 & 20. They show the top 15 occupations of the partners of male and female doctors in 2006. A number of differences stand out. First, while a significant proportion of women and men have a doctor as a partner, for males having a nurse as a partner remains important. The tables also suggest that female doctors do not have such a concentration of partners as do males in particular occupations (including not in paid work).

Table 19: Top 15 occupational groups of partners of male doctors, 2006

	Number
Not in paid work	1,386
Registered Nurse	366
General Practitioner	357
Resident Medical Officer	234
Office Manager	180
General Clerk	135
Information Clerk and Other Receptionist	123
Secretary	105
General Manager	87
Physician	78
University and Higher Education Lecturer and/or Tutor	78
Secondary School Teacher	78
Barrister and Solicitor	66
Primary School Teacher	63
Physiotherapist	63

Source: Statistics New Zealand

Table 20: Top 15 occupational groups of partners of female doctors, 2006

	Number
Not in paid work	339
General Practitioner	267
Resident Medical Officer	216
Physician	111
General Manager	90
Surgeon	87
University and Higher Education Lecturer and/or Tutor	75
Barrister and Solicitor	54
Accountant	51
Computer Applications Engineer	48
Secondary School Teacher	45
Anaesthetist	42
Administration Manager	39
Chief Executive and/or Managing Director	30
Sales and/or Marketing Manager	30

Source: Statistics New Zealand

Table 21 compares the number and proportion of couples where both were doctors or a doctor and nurse relationship in 1986 and 2006. It shows that when compared with the total number of individual doctors, the proportion where both were doctors has increased (from 5% to 7%) and the proportion where the male was a doctor and the partner a nurse halved (from 8% to 4%). However, overall while important a relatively small proportion of doctors are in couple relationships with another doctors.

Table 21: Number of doctor-doctor and doctor-nurse couples, 1986 and 2006

		Number	%
1986	Both doctors	303	5.2
	Male doctor, female nurse	465	8.0
	Female doctor, male nurse	6	0.1
	Total number of individual doctors	5,826	100
2006	Both doctors	747	7.1
	Male doctor, female nurse	438	4.2
	Female doctor, male nurse	24	0.2
	Total number of individual doctors	10,470	100

Source: Statistics New Zealand

Table 22 focuses just on couples where both partners are doctors and considers the birthplace of both partners. The highest proportion of couples (45%) were both born overseas. Some of these couples are likely to have migrated to New Zealand together. But just under a third of couples were both born in New Zealand. A greater number of doctor couples have a New Zealand born male partner and overseas born female partner than vice-versa. When compared with total couples in New Zealand, doctor couples are far more likely have both partners born overseas. Cross-national partnering is becoming

more important overall and so it is not surprising to see this pattern amongst a very mobile group.[26]

Table 22: Birthplace of both partners for doctor couples and all New Zealand couples, 2006

		Both doctors	%	All couples	%
NZ Born male	NZ Born female	219	30	510,657	63
NZ Born male	OS Born female	108	15	72,489	9
OS Born male	NZ Born female	69	10	72,327	9
OS Born male	OS Born female	327	45	156,834	19
Total specified		723	100	812,307	100

Source: Statistics New Zealand

The following tables focus on changes in highest level of education of the partners of male and female doctors. Only those male and female doctors who stated in their census form that they had a degree or higher qualification were included in this analysis. As background to these tables, between 1986 and 2006 there has been a very strong increase in the proportion of New Zealanders who have gained a tertiary qualification. However, as already noted the increase has been particularly strong for women.

Tables 23 and 24 show the educational qualifications of the female partners of male doctors. The tables show this for our three main geographic areas. In both years, only a very small proportion of partners had no formal qualifications. The biggest change is in the proportion of male doctors who have a partner who also holds a degree. In 1986 a third of male doctors had a partner with a degree, but by 2006 this had nearly doubled to 61%. Also of interest, is that the strongest rise in the dual degree couples was in main urban areas. In 1986, in relation to male doctor couples there was no concentration of higher education in main urban areas. However by 2006 some concentration was evident. In 2006 63% of partners of male doctors living in urban areas held a degree or higher qualification, compared with just under half living in rural areas.

Table 23: % of female partners of male doctors in each highest qualification group, 1986

Female qualifications	Main urban	Other urban	Rural and other	Total
No Qualification	4	6	9	4
School	11	10	7	11
Other tertiary	51	55	51	51
University degree	34	29	35	34
Total	100	100	100	100
N=	2,733	399	165	3,300

Source: Statistics New Zealand

[26] With cross country partnering also comes cross country separations, which for families with dependent children can lead to many challenges (Baker 2008).

Table 24: % of female partners of male doctors in each highest qualification group, 2006

Female qualifications	Main Urban	Other urban	Rural and other	Total
No Qualification	1	3	2	1
School	10	14	15	11
Other tertiary	27	39	37	29
University degree	63	46	48	61
Total	100	100	100	100
N=	3,846	306	372	4,527

Source: Statistics New Zealand

Tables 25 and 26 show a quite different pattern in partnering by qualification group. Of the much smaller number of partnered female doctors in 1986, 81% had male partners who held a degree or higher qualification. While few female doctors lived in rural areas at this time, if they did have a partner, they had a lower proportion with a degree or higher qualification than those who lived main urban and other urban areas. By 2006, while the number of partnered female doctors had increased considerably, the proportion whose partner held a degree had actually declined slightly. The growth in qualifications held was in school qualifications or other tertiary qualifications. However, while there was this decline in the proportion holding a degree or higher qualification, overall in 2006 a higher proportion of female doctors than male doctors had well qualified partners. Overall, like male doctors, for female doctors in couples there is a concentration of education in main urban areas.

Table 25: % of male partners of female doctors in each highest qualification group, 1986

Female qualifications	Main urban	Other urban	Rural and other	Total
No Qualification	1	0	7	1
School	5	5	20	5
Other tertiary	11	23	13	12
University degree	83	73	60	81
Total	100	100	100	100
N=	579	66	45	690

Source: Statistics New Zealand

Table 26: % of male partners of female doctors in each highest qualification group, 2006

Female qualifications	Main Urban	Other urban	Rural and other	Total
No Qualification	1	0	3	1
School	8	15	17	10
Other tertiary	12	18	21	13
University degree	79	64	59	77
Total	100	100	100	100
Total specified	2,052	117	213	2,382

Source: Statistics New Zealand

The data on education levels of couples supports the hypothesis that well qualified couples have a greater propensity to live in main urban areas. This again suggests that location decisions of doctors, both nationally and internationally, may often be being made by couples rather than just individuals.

Conclusion

Hardly a day goes past without some media report about shortages of doctors, with the shortage being faced either nationally or in some part of New Zealand. A number of drivers, particularly ageing of the population, suggest that the demand for doctors will continue to grow. Yet, New Zealand is not alone in facing a shortage of doctors. Doctors are internationally very mobile. One result of this mobility is that New Zealand doctors seek opportunities overseas, either short or long term. However, this mobility also means that overseas doctors also migrate to New Zealand, again either short or long term.

Both through changes in training of doctors in New Zealand and through migration flows, there have been major shifts in the composition of the medical workforce in New Zealand since the mid 1980s. Two of importance have been the strong increase in the number of female doctors as well as a significant rise in the number of foreign-born medical staff. The increase in the number of locally trained female doctors reflects a very strong rise in female enrolments and completions with now significantly more women than men graduating from New Zealand medical schools. Equally, both migration and changes in the composition of those training in New Zealand has changed the ethnic mix of doctors. In particular there has been a strong rise in the number of students of Asian ethnicity training to be doctors in New Zealand.

Having more female doctors is, overall, very positive. But the change does create some challenges. Because many women work shorter hours than their male colleagues and therefore, to have the same level of coverage there is a need for more doctors to be trained or recruited. In addition, women tend to be attracted to particular areas of medicine and there may be a need to make areas such as surgery more attractive to women.

The main birthplace of migrant doctors is the United Kingdom and Ireland. This is followed by Asia and then South Africa. However, country of birth is increasingly a poor indicator of ethnicity. Of those doctors who migrate to New Zealand, nearly a fifth record Asian ethnicity, but many of these Asian migrant doctors come from non-Asian countries, including Pacific nations and from Africa.

Migrant doctors are also a critical component of the New Zealand medical workforce. Overseas doctors can arrive either as permanent migrants or for temporary work. However, some permanent migrants may not stay long and some temporary workers transition to be permanent migrants. While some foreign-born doctors are relatively new to New Zealand, a significant number have been living and working in New Zealand for a long period. One concern about medical migration is that high-income countries are attracting doctors from poor areas, including Sub-Saharan Africa. However, relatively

few doctors come directly from this region. Of those doctors who migrate to New Zealand from this area, nearly a fifth record Asian ethnicity. Some of these will be doctors who are the children of an earlier Asian migration to Africa and this emphasises that mobility is a complex issue.

Most studies of doctors consider them as individuals. In this paper, we also consider their living arrangements including the education and labour force status of partners. When the number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants is analysed by gender some important patterns emerge. If women are the principal applicant then just over half are proposing to migrate independently. For men fewer than a third aim to come to New Zealand independently. This indicates that when looking at migration and location decisions by doctors, gender of the principal applicant can be important.

While historically a high number of male doctors have been partnered, census data indicate that in the 1980s fewer of the small number of female doctors had partners. However, by 2006 there were not only significantly more female doctors but the proportion partnered has also increased.

People with medical backgrounds have some tendency to form couples. But these relationships are changing, as more women become doctors rather than training as they might have in the past as a nurse.

The data on doctor couples suggests that while many migrate to New Zealand together, there are many couples where just one partner is overseas born. This suggests that some New Zealand trained doctors are meeting their partners while travelling or working overseas, while others will be forming relationships with migrant doctors in New Zealand. Cross-national partnering is becoming more important overall and so it is not surprising to see this pattern amongst a very mobile group. This also suggests that studies of diasporas, whether New Zealand's or some other country's cannot be considered on the basis of individuals. Families matter.

The census data indicate that education is also being concentrated in couples where one or both are doctors. Also of interest, is the strongest rise in the dual degree couples was in main urban areas. The data on education levels of couples supports the hypothesis that well qualified couples have a greater propensity to live in main urban areas. This suggests that location decisions of doctors, nationally and internationally, may often be made by couples both seeking careers rather than just individuals looking for opportunities. All these findings suggest that researchers and policy makers need to consider family migration issues more than they have in the past for doctors as well as for other migrants.

Finally, this paper focuses on doctors. Many other health workers, including nurses, are also very mobile. As a next step in understanding changing composition of New Zealand's health workers, it is proposed to undertake research on the nursing workforce as well as other health caregivers.

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Appendix A

A1: % of male and female doctors who worked under 30 or 60 or more hours per week, 2006

			NZ Born		Overseas born	
			Under 30	60+	Under 30	60+
GPs	Under 40	Male	6	26	6	21
		Female	34	17	30	14
	40+	Male	9	26	7	24
		Female	36	9	30	8
Other doctors	Under 40	Male	2	38	2	32
		Female	10	26	7	26
	40+	Male	7	38	6	28
		Female	21	11	17	15

Source: Statistics New Zealand

A2: Number and gender ratio of medical doctors approved as principal applicants for residence through the Skilled/Business stream by gender, 2002/03 – 2006/07

gender	2002/03	2003/04	2004/05	2005/06	2006/07	Grand Total
Female	26	58	127	70	99	380
Male	43	102	188	151	150	634
Total	69	160	315	221	249	1,014
Women as a %	37.7	36.3	40.3	31.7	39.8	37.5

Source: Department of Labour

A3: Number of approved medical doctor work applications by gender, 2002/03 to 2006/07

	Female	Male	Total
2002/03	185	271	456
2003/04	618	844	1,462
2004/05	569	839	1,408
2005/06	608	862	1,470
2006/07	488	861	1,349
Total	2,468	3,677	6,145

Source: Department of Labour

A4: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *Great Britain*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	114	57	77	32	191	43
With secondary applicants	85	43	164	68	249	57

Source: Department of Labour

A5: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *South Africa*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	19	31	26	25	45	27
With secondary applicants	43	69	76	75	119	73

Source: Department of Labour

A6: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *Malaysia*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	33	85	43	84	76	84
With secondary applicants	6	15	8	16	14	16

Source: Department of Labour

A7: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *India*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	3	21	11	21	14	21
With secondary applicants	11	79	42	79	53	79

Source: Department of Labour

A8: Number and percentage of medical doctors approved for residence through the Skilled/Business stream independently and with secondary applicants by gender, 2002/03 to 2006/07 combined – *USA*

	Female Principal Applicant		Male Principal Applicant		Total	
	n	%	n	%	n	%
Independent	5	29	12	25	17	26
With secondary applicants	12	71	36	75	48	74

Source: Department of Labour

A9: New Zealand regions (of job offer) where medical doctors worked at the time of residence, 2002/03 to 2006/07 combined, by gender

	Female		Male		total	
	n	%	n	%	n	%
Auckland	42	11	63	10	105	10
Bay of Plenty	29	8	44	7	73	7
Canterbury	45	12	58	9	103	10
Waikato	41	11	71	11	112	11
Wellington	27	7	51	8	78	8
Other*	196	52	347	55	543	54
Total	380	100	634	100	1014	100

*included n=262 or 26% 'blank' fields – as they may not have had a job therefore job region not recorded.
Source: Department of Labour

A10: New Zealand regions (top 10) where medical doctors worked at the time of temporary work permit approval, 2002/03 to 2006/07 combined, by gender

NZ region	Female	Male	F:M ratio
Auckland	346	596	0.58
Bay of Plenty	212	349	0.61
Canterbury	511	483	1.06
Hawkes Bay	160	226	0.71
Manawatu	150	198	0.76
Northland	113	173	0.65
Otago	131	180	0.73
Southland	80	167	0.48
Waikato	250	389	0.64
Wellington	227	364	0.62
Other	288	552	0.52
Total	2,468	3,677	0.67

Source: Department of Labour