Rural Practice and Retention in New Zealand: an examination of domestically and foreign trained doctors

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Abstract

In this paper we examine the problems New Zealand faces with regards to the identified shortage and uneven distribution of medical practitioners across urban and rural areas. In particular, we examine the extent to which the origin of training and location of practice affect the mobility of medical practitioners over the period 2000–2008. We find that foreign trained doctors have a greater propensity to practice in minor urban and rural areas, and in less affluent communities than New Zealand trained doctors. We also find that mobility among doctors is becoming more pronounced in recent years, with doctors generally being more mobile, with movement out of rural areas and doctors leaving practice in New Zealand being areas of particular concern.

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Introduction and background

There are many challenges confronting New Zealand's health sector. For one, New Zealand currently faces a shortage of medical practitioners. Compared to the OECD average, New Zealand has a lower density of practicing physicians, 2.2 per 1000 population, as opposed to the OECD average of 3.1 (Zurn and Dumont, 2008). The unbalanced geographical distribution of the medical workforce, with roughly 80 per cent of registered physicians practicing in urban centres is also of particular concern as the gap in health care provision in rural and urban areas widens. In this regard, there is also an apparent problem of retaining medical practitioners, and this is manifested in two aspects: first, retaining practitioners in rural areas, and second, retaining New Zealand or locally trained medical graduates.

This paper explores the issues surrounding the shortage, distribution and retention of medical practitioners in New Zealand. We start by examining the general characteristics of the health workforce in the country by origin of training, location of practice and area of specialisation, and taking careful note of the role of foreign trained medical practitioners in filling the gaps in health care provision. We also explore the pattern of health workforce mobility within New Zealand, as well as international mobility over the period 2000 to 2008, and to examine the extent to which mobility is a function of background (i.e., country of training) and location of practice. Finally, we assess the feasibility of various strategies that have been proposed to address the specific issues surrounding the health sector identified above.

Data and Methods

Our study uses data from the registry of physicians obtained from the Medical Council of New Zealand. Data are available for several months each year from January 2000 to November 2008. However, since data are not collected in the same months each year, for consistency, we make use of annual data based on the first month the registry is available from 2000 to 2008. This medical registry assigns each doctor a unique identification number, and we are able to track each doctor's practice consistently throughout the nine-year period under study. This registry also provides information on the universities where the doctor's first and any subsequent postgraduate medical qualifications were obtained as well as the year when each qualification was obtained. Information on each doctor's practice address(es) is also available.

In order to distinguish between locally trained and foreign trained physicians, the country where each university is located was determined by looking up the database of medical schools from the Institute for International Medical Education. A Google Search was performed on the universities not listed on the database.

Geocoding with GeoStan v.2.1

Geocoding is a process whereby a physical address is linked to a set of coordinates. Note that the geocoding software, GeoStan v.2.1, (Critchlow, 2001) used is only able to geocode New Zealand addresses. For this reason, overseas addresses in the medical registry had to be excluded and assigned a different code manually. There were 23298 unique addresses from the medical registry after excluding the overseas addresses. Approximately half of the addresses were successfully geocoded without any intervention. The remaining ungeocoded addresses (e.g., those that had the suburb or regions in the wrong address line, spelling errors, etc.) required some manual intervention. Entries without proper street

addresses but with the words hospital/clinic/health centre in the address were looked up in the New Zealand White Pages. A Google Search was performed on those not listed in the White Pages. Other sources used for locating practice addresses were the Ministry of Health and the New Zealand Health Information Service websites. With these interventions, 90 percent of the addresses were successfully geocoded. Of the ungeocoded addresses, 95 percent were post office boxes or private bags. However, their location in terms of the city and/or region were manually determined with the information provided or by looking up the post office boxes and private bags number on the New Zealand Post website. These were assigned separate codes as well.

Each doctor's practice address was geocoded at the census area unit level. This serves two main purposes. First, to establish the deprivation score of the practice addresses, and second, to ascertain whether or not any observed change in practice address over the years constitutes an internal or international migration. Deprivation scores for each census area unit were derived by ranking the census area units by average household income, data for which is available from the 2006 Census of Population and Dwellings (Statistics NZ, 2006), and then assigning a decile number from 1 to 10, where Decile 1 refers to the most affluent communities and Decile 10, the least affluent.

Communities were grouped into three urban-rural classifications, with doctors residing in the ten largest urban centres in New Zealand being classified as practicing in 'Major Urban Centres'. Individuals residing in the 11^{th} to 25^{th} largest communities were classified as practicing in 'Minor-Urban' communities and the remainder were classified as practicing in 'Rural' communities.

Internal vs International migration

For the purposes of this study, a movement from one census area unit to another constitutes internal migration.

When a registered doctor drops off from the New Zealand medical registry, we estimate the age of the doctor based on when the first medical degree was obtained. If the doctor appears to be of retirement age, then we consider this as retirement, but if the doctor appears to be below the typical retirement age, then we assume that this doctor has likely migrated overseas[1].

International migration of doctors should not be confused with the temporary move of New Zealand registered doctors overseas for specialised training. This pursuit of overseas training which could take anywhere from a few months to a few years is common as New Zealand does not have the population to support some specialised training (Medical Reference Group, 2006). Hence, for cases where the registered doctor's practice area changes from a New Zealand address to an overseas address and then back to the *same* New Zealand address, this has not been considered as international migration. If the change is from a New Zealand address to an overseas address and then to a *different* New Zealand address, then this is considered as internal migration.

[1]This was done by differencing the year the doctor ceased practice from the year the doctor received his/her medical qualifications. Assuming that most doctors have earned their first medical qualifications by the age of 30, individuals with less than 30 years of practice would be assumed to be age 59 or below and as such unlikely that they are retiring.

Results

The main focus of this investigation is to examine the extent to which New Zealand trained, as compared to foreign trained doctors choose rural practice and furthermore to examine the extent to which mobility is a function of background (i.e., country of training) and where the individual is practicing. To achieve this, we use the data described above to examine trends in workforce composition, location of practice and mobility.

Table 1 Composition of Doctor workforce, by location of training 2000-2009

Year	NZ Trained	Affluent, English Trained	Trained Elsewhere
2000	65.2%	19.8%	15.0%
2001	65.1%	19.7%	15.2%
2002	64.4%	19.8%	15.8%
2003	64.6%	19.0%	16.4%
2004	64.0%	19.2%	16.7%
2005	63.6%	19.3%	17.1%
2006	63.2%	19.3%	17.5%
2007	62.9%	19.1%	17.9%
2008	62.5%	19.5%	18.0%
2009	62.5%	19.5%	18.1%

We decompose the workforce by location of training to distinguish between those doctors who received their training in New Zealand, affluent English speaking countries (UK,

US, Canada and Australia) and other elsewhere. Through this past decade we observed that the proportion of practitioners receiving their training is gradually falling, and this gap is almost entirely filled by those trained elsewhere (typically Asia and South Africa). The proportion of doctors who received their training in affluent English speaking countries remains constant throughout the past decade.

Table 2 Practice Area, by location of training

Practice Area	NZ Trained	Affluent, English Trained	Trained Elsewhere
General Practitioners	38.6%	39.9%	31.5%
Specialists	61.4%	60.1%	68.6%

Table 2 reveals a clear pattern of doctors trained in New Zealand or other affluent English speaking countries tend to be most likely to be in General Practice, whereas those trained elsewhere have a greater propensity to practice as Specialists.

Table 3 Location of practice, by location of training, all doctors

Practice Location	NZ Trained	Affluent, English Trained	Trained Elsewhere
Major Urban	78.5%	67.0%	71.1%
Minor Urban	12.1%	16.9%	16.2%
Rural	9.4%	16.1%	12.7%

Table 3 shows a pronounced pattern of NZ trained doctors being the most likely to practice in major urban areas and the least likely to practice in rural areas. By contrast, those trained in affluent English speaking countries have a much greater propensity to practice in

minor urban and rural areas. Those trained elsewhere fall somewhere in between, being almost as likely as those from developed English speaking countries to practice in minor urban locations, but less likely to practice in rural communities.

Table 4 Location of practice, by location of training, General Practitioners only

Practice Location	NZ Trained	Affluent, English Trained	Trained Elsewhere
Major Urban	69.3%	54.4%	66.4%
Minor Urban	14.0%	16.9%	12.6%
Rural	16.7%	28.7%	21.0%

Table 4 repeats the analysis displayed in Table 3, but for General Practitioners only. The results reveal a similar pattern, with New Zealand trained doctors being least likely to practice in rural areas and most likely to practice in major urban centres. Those trained in developed English speaking countries are least likely to practice in major urban centres and most likely to practice in rural communities. Those trained elsewhere are least likely to practice in minor urban areas, instead concentrating in major urban and rural communities.

Table 5 Social deprivation of practice area, by location of training

Practice Location	NZ Trained	Affluent, English Trained	Trained Elsewhere
Most Affluent	29.1%	27.4%	27.2%
Moderately Affluent	35.6%	30.9%	32.0%
Least Affluent	35.3%	41.7%	40.9%

Table 5 examines the extent to which doctors locate in affluent or poor communities. The pattern shows that New Zealand trained doctors are most likely to practice in affluent communities and least likely to practice in the poorest communities. This pattern is reversed for doctors trained outside New Zealand, with those trained in affluent English countries and elsewhere being similarly likely to practice in the least affluent communities.

Table 6 Social deprivation of practice area, by location of training General Practitioners only

Practice Location	NZ Trained	Affluent, English Trained	Trained Elsewhere
Most Affluent	23.7%	24.5%	22.7%
Moderately Affluent	36.1%	33.0%	35.0%
Least Affluent	40.2%	42.5%	42.3%

Table 6 indicates that General Practitioners trained in New Zealand, those trained in affluent English speaking countries and those trained elsewhere follow a similar pattern in terms of the affluence of communities in which they practice. However, those trained elsewhere were least likely to practice in the most affluent communities and those trained in affluent English countries were most likely to practice in the least affluent communities. New Zealand trained General Practitioners were most likely to practice in the most affluent communities and least likely to practice in the poorest communities.

Table 7 Internal and International Migration, by year

Year	Internal Migration	Major Urban	Minor Urban	Rural	International Migration
2001	5.79%	5.50%	5.02%	8.65%	0.83%
2002	7.31%	7.38%	7.41%	6.76%	0.99%
2003	7.06%	7.35%	5.78%	6.73%	1.43%
2004	6.08%	6.44%	5.88%	4.02%	1.04%
2005	7.00%	7.14%	4.84%	8.66%	0.77%
2006	8.06%	7.96%	7.92%	8.95%	1.08%
2007	6.93%	6.59%	7.62%	8.34%	1.16%
2008	11.34%	11.38%	10.98%	11.50%	2.77%

Table 7 examines mobility patterns across the period 2001 through 2008. Column 2 captures all internal migration, while columns 3, 4 and 5 look at migration from Major Urban, Minor Urban and Rural communities, respectively. Column 6 reports International Migration. The results suggest an accelerating pattern of mobility throughout the period, with a sizeable spike in internal and international migration in 2008. This suggests that mobility among doctors is becoming more pronounced with doctors generally being more mobile, with movement out of rural areas and doctors leaving practice in New Zealand being areas of particular concern.

Table 8 Internal and International Migration, by location of training

Migration type	NZ Trained	Affluent, English Trained	Trained Elsewhere
Internal Migration	5.66%	6.73%	7.16%
International Migration	0.57%	1.65%	1.90%

Table 8 decomposes the different types of migration by location of training, demonstrating that NZ trained doctors are the least likely to be internal or international migrants. Those trained in developed English speaking countries and particularly those trained elsewhere are most likely to be mobile within New Zealand and are especially likely to be internationally mobile.

Table 9 Internal migration rates by community type and community affluence

	Major Urban	Minor Urban	Rural
More Affluent	6.06%	6.55%	9.15%
Less Affluent	6.32%	4.90%	4.41%

Table 9 demonstrates a surprising pattern with those practicing in poor rural areas being least likely to be internally mobile, while those practicing in affluent rural areas being the most likely to be mobile. While recruitment to poor rural areas remains a challenge, it appears that once individuals locate there, they tend to remain. This may be reflecting a lifestyle and cost of living advantage with housing and living costs tending to be lowest in poor rural communities.

Discussion

This analysis points to a number of important trends in practice patterns among doctors working in New Zealand. First, we observe that those trained outside New Zealand tend to be more likely to practice in rural and poor communities. It should also be pointed out that these are the doctors who are most likely to be geographically mobile, either within New Zealand or internationally. This suggests that relying on internationally trained doctors to fill staffing shortfalls is a strategy that will involve high turnover and on-going recruitment needs.

The time-series internal and international mobility trends tend to point to this becoming an increasingly pronounced area of concern as doctors seem to be more rapidly moving both within and from New Zealand. Successful licensure and practice in New Zealand may open up other opportunities for doctors either within New Zealand or in other countries where remuneration for doctors is more generous.

It is, however, important to note that internal migration from less affluent rural communities is lower than internal migration from all other community types. This suggests that there may be a relatively stable and long-tenured cadre of doctors working in these communities and a smaller group of foreign trained doctors who are more likely to move when opportunities arise. It also suggests that the financial incentives[2] for rural practice have had a positive effect on encouraging retention.

The analysis presented herein supports the Medical Reference Group's (2006) recommendations to improve the distribution and retention of doctors. The low migration rates of doctors out of poor rural communities suggests that a mass exodus of doctors from

[2]In the Ministerial white paper, Creech (1999) outlines a policy change providing a 10% premium for rural GP consultations and 25% travel premium for doctors practicing in designated rural areas.

these communities has not occurred and that for certain doctors, a rural lifestyle may have significant appeal. Furthermore, housing in less affluent rural areas has become comparatively cheaper in New Zealand (as prices have risen dramatically in urban and affluent rural areas) which may make moving more difficult.

In the longer term, we argue that New Zealand Medical schools should aim to train more doctors and that local health authorities offer increased financial incentives (such as bonding schemes and debt relief) to attract domestically trained doctors to rural communities and alleviate some of the need for foreign trained doctors. In the nearer term, New Zealand will need to continue to rely on international medical graduates. The focus needs to be on making sure that recruiters do a good job placing doctors in rural communities where there is a good chance that they will establish strong ties and remain for lengthy periods.

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