

ORIGINAL RESEARCH

Postgraduate medical placements in rural areas: their impact on the rural medical workforce

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ABSTRACT

Introduction: In 1988, the New South Wales (NSW) Department of Health developed the NSW Rural Resident Medical Officer Cadetship Program (Cadetship Program) to help overcome a junior doctor workforce shortage in rural hospitals. A second aim was to increase recruitment to the rural medical workforce on the basis that positive exposure to rural medicine increases the likelihood of choosing to practice in a rural location. The Cadetship Program offers bonded scholarships which provide financial support for residents of NSW studying medicine during the final 2 years of their medical degree. In return, cadets are contracted to complete 2 of their first 3 postgraduate years in the NSW rural hospital network. NSW Rural Doctors Network has managed the Cadetship Program for the NSW Department of Health since 1993, and carried out an evaluation in 2004. The purpose of this evaluation was to track the career choice and practice location of medical students entering the Cadetship Program before 1999, and to comment on the impact of the Program on the rural medical workforce in NSW to date, and its implications for the future workforce.

Methods: The career choice and practice locations of 107 medical students who received cadetships between 1989 and 1998 were tracked. Students who did not graduate from medical school ($n = 3$) or who did not complete their rural service (13) were excluded from the analysis. Career choice was not available for a further nine former cadets and they were also excluded from the analysis. The NSW Rural Doctors Network was the major source of data on career choice and practice location due to its role in administering the Cadetship Program on behalf of the NSW Department of Health. Two brief questionnaires targeting specific groups of cadets were used to fill knowledge gaps about where cadets grew up, what vocational training they undertook, and where they were working in 2004. Where this information was not obtained from cadets first hand, it was sourced from the CD-ROM version of the Medical Directory of Australia.



Results: Forty-three percent of cadets entering the Program before 1999 were working in rural locations in 2004 (compared with 20.5% of medical practitioners nationally), 46% had attended primary school in a rural location and 44% chose to specialise in general practice. Career choice was the major determinant of practice location. Having a rural background did not appear to influence practice location; whereas, those specialising in general practice made up 70% of this cohort of cadets working in rural areas. All general practice trainees were in rural locations compared with only two of the 25 trainee specialists, which reflects the availability of accredited training places in rural Australia.

Conclusions: The Cadetship Program, which ensures junior doctors work for 2 of their first 3 postgraduate years in a rural allocation centre, is an effective link between medical school and rural practice, particularly rural general practice. Providing vocational training opportunities in rural locations is central to this success, and needs to be considered in efforts to expand the rural specialist workforce, and in ensuring rural health capitalises on the increasing number of medical students moving through the education and training system in the next 4-10 years.

Key words: cadetship, career choice, medical education, postgraduate medical placements, practice location, recruitment, rural background, rural medical workforce.

Introduction

There are presently 15 medical schools in Australia, all of which are based in metropolitan locations¹. Students undergo rural placements as part of their medical degree, and approximately a quarter do at least half of their clinical training in rurally-based clinical schools attached to their university². Medical students studying in New South Wales (NSW) make up 28% of the national medical student population (including international students)³. After graduation students apply to their relevant State-based organisation and are assigned to an accredited public teaching hospital to complete a minimum of one year's postgraduate study (which entitles them to full registration)¹. Most doctors apply to the specialist college of their choice for vocational training during their second or third postgraduate year. The majority of postgraduate training is completed in metropolitan teaching hospitals, with the exception of general practice training, which is supplied by regional training providers and occurs mainly in community-based settings. Based on Medicare data, 27% of the general practice workforce in Australia is overseas trained⁴.

Ongoing rural medical workforce shortages, both in Australia and internationally, are giving rise to a number of

investigations concluding that medical students with a rural background, and those experiencing repeated rural placements during training, are more likely to practise medicine (particularly general practice) in rural locations⁵⁻⁷. Longer rural placements prior to and during postgraduate training have also been positively associated with the likelihood of working in rural general practice^{8,9}. Postgraduate placements are perceived to be more effective than at the undergraduate level¹⁰.

Opportunities to gain rural experience during the early postgraduate years are limited in NSW. In 2004, 27 out of 509 postgraduate year (PGY) 1 placements were in the rural hospital network (Wagga Wagga, Orange and Tamworth Base Hospitals)¹¹. In addition, some PGY1 and 2 positions offered by metropolitan teaching hospitals include a rotation, usually 10-13 weeks, to a rural hospital. Programs are also being developed to provide junior doctors with a rural community-based term^{12,13}. However, places on these programs are very limited.

In 1988 the NSW Department of Health developed the NSW Rural Resident Medical Officer Cadetship Program (Cadetship Program) to help overcome a junior doctor workforce shortage in rural hospitals. A second aim was to



increase recruitment to the rural medical workforce on the basis that positive exposure to rural medicine increases the likelihood of choosing to practice in a rural location. The Cadetship Program offers bonded scholarships to provide financial support for medical students (residents of NSW and, from 2005, the Australian Capital Territory) during their final 2 years of undergraduate study. In return, cadets are contracted to complete 2 of their first 3 postgraduate years in the NSW rural hospital network.

The purpose of this study was to track career choice and practice location of medical students entering the Cadetship Program before 1999 and to comment on the impact of the Program on the rural medical workforce in NSW to date, and its implications for the future.

Methods

The Cadetship Program

Medical students apply for a cadetship during the third last year of their medical degree. Applications are assessed on the basis of a strong interest in rural health and an understanding of the issues affecting rural communities. It is not a requirement that applicants have lived in a rural location. The annual intake of cadets (averaging 11 across 16 years) represents approximately 2% of the NSW cohort of medical students each year¹⁴. Approximately 22 cadets work in the NSW rural hospital network each year, which represents just over one-third of all in quota positions¹¹. This proportion is falling as the number of junior doctors working in in-quota positions in the rural hospital network increases (from 35 in 1998 to 58 in 2004; data provided by the NSW Postgraduate Medical Council).

Between 1989 and 2004, 180 medical students accepted a cadetship. Four did not complete their medical degree and withdrew. Of the remaining 176, 111 completed their rural service, 22 were completing rural service and 23 were undergraduates in 2004. Twenty cadets (11%) withdrew

from the Program, 13 before commencing rural service and 7 during rural service.

We have tracked the career choice and practice locations of 107 medical students who received cadetships between 1989 and 1998 (Cohort A, Table 1). Students who did not graduate from medical school ($n = 3$) or who did not complete their rural service (13) were excluded from the analysis. Career choice was not available for a further nine former cadets who were also excluded from the analysis.

Data collection

The NSW Rural Doctors Network was the major source of data on career choice and practice location due to its role in administering the Cadetship Program on behalf of the NSW Department of Health. Two brief questionnaires targeting specific groups of cadets were used to fill knowledge gaps about where cadets grew up, what vocational training they undertook, and where they were working in 2004. Where this information was not obtained from cadets first hand, it was sourced from the CD-ROM version of the Medical Directory of Australia¹⁵.

Geographical information (where cadets grew up and practice location in 2004) was categorised using the Rural Remote and Metropolitan Areas (RRMA) Classification¹⁶. RRMA is a geographic classification system developed and used by the Commonwealth Government to describe remoteness. It is based on population density and distances to large population centres. The classification consists of three groups (metropolitan areas, rural zones and remote zones) and a total of 7 categories. Metropolitan areas include RRMA 1 (capital city) and RRMA 2 (other metropolitan centre, population 100 000 or more). The rural zone includes RRMA 3 (large rural centres, population 25 000-99 999), small rural centres (population 10 000-24 999) and other rural areas (population < 10 000). The remote zone includes RRMA 6 (remote centres, population of 5000 or more; of which there are none in NSW) and RRMA 7 (other remote areas, population less than 5000).



Background was defined by the RRMA classification of the location where cadets spent the majority of their primary schooling. This measure was chosen because Wilkinson et al.¹⁷, in a study of rural South Australian GPs, found that having a primary education in the country was independently associated with rural practice, while secondary education was not. In this article, metropolitan areas are defined as those with a RRMA category of 1 or 2. All other areas are described as rural, including regional (RRMA 3) and remote (RRMA 6-7) locations.

Data were entered into SPSS for windows, release 11.5 (SPSS Inc, Chicago, IL, USA) and analysed using standard statistics (frequencies, χ^2 tests including, where appropriate, Fishers Exact tests, with the significance level set at $p < 0.05$). The small sample size in this study is a limitation in that it increases the likelihood that type II errors will occur.

Results

Career choice and its impact on practice location

Of the 82 former cadets included in this analysis (Table 1), 39 had completed vocational training in 2004 (30 in general practice and nine in other specialties), 34 were trainees (seven in general practice and 27 in other specialties) and nine were non-specialist hospital doctors. A similar number chose general practice ($n = 37$) and other specialties (36). The most popular specialties, in order of preference, were: anaesthetics ($n = 8$), emergency medicine (8), internal medicine (7), psychiatry (4), surgery (4), paediatrics (3), pathology (1) and obstetrics and gynaecology (1).

Just over half of the former cadets (58%) were working in metropolitan areas (Table 2) and practice location was significantly ($p < 0.001$) influenced by career choice. While 44% entered general practice, they made up 70% of those working in rural areas in 2004, compared with cadets in other specialties who comprised 15% and hospital non-

specialists who also comprised 15% (Table 2). All seven GP registrars worked in rural areas compared with only two of 27 trainee specialists. Hospital doctors were twice as likely to work in rural areas (but the overall numbers were small).

The practice location for former cadets working in rural areas in 2004 was closely related to where they completed their rural service. Seventeen of the 22 general practitioners, both specialists, and four of the five hospital non-specialist doctors stayed working in the same geographical region where they completed their rural service.

Career choice and practice location data were also available for 11 of the 13 cadets who withdrew from the cadetship (and who were not included in the main analysis). The majority ($n = 7$) were working as specialists, three were working as hospital non-specialists and one was working in general practice. All but one were working in metropolitan areas.

Overall, one-fifth of this cohort (data available for 93 of the 104 former cadets; Cohort A, Table 1, excluding those who did not graduate) were working interstate, over half in Queensland and Victoria, and the majority (81%) in metropolitan areas.

Background as an influence on choice of career and practice location

Information about where cadets grew up was available for 68 of the 82 former cadets included in the analysis (Table 1). Of those, 30 had a metropolitan background, 31 had a rural background and the remaining 7 grew up overseas (Table 3). Although a relatively high proportion of rural background medical students successfully obtained a cadetship (46%) they appeared no more likely to choose general practice (16 from 30; Table 3), or to work in rural NSW, than those cadets who spent the majority of their primary schooling in metropolitan areas.



Table 1: Characteristics of medical students entering the Cadetship Program before 1999 (Cohort A), and from 1999 to 2004 (Cohort B).

Characteristic	Cohort A (n = 107)	Cohort A suitable for analysis (n = 82)	Cohort B (n = 73)
Sex (% female)	59	60	53
Rural background [†] (%)	4	46	32
University (%):			
Sydney	21	23	33
New South Wales	28	28	21
Newcastle	50	48	38
State other than NSW	1	1	8
Average age (years)	23.6	23.5	25.2
Withdrawn:			
Did not graduate	3	-	1
Before rural service	7	-	6
During rural service	6	-	1

[†]Background is defined as where the majority of primary schooling was undertaken¹⁵.

Table 2: The relationship between practice location (as defined by RRMA classification) and career choice (n = 77)[†]

Career choice	Practice location					Total
	1	2	3	4	5	
GP	10	1	5	3	8	27
GP registrar	0	0	3	1	3	7
Specialist	5	1	3	0	0	9
Trainee specialist	15	10	2	0	0	27
Hospital non-specialist	2	0	5	0	0	7
Total n (%)	32 (42)	12 (16)	18 (23)	4 (5)	11 (14)	

[†]Practice location unknown for 2 of the 82 cadets for whom career choice is known and 3 former cadets (2 general practitioners and 1 hospital non-specialist) were not practising in August 2004.

Table 3: The influence of background[†] on career choice of doctors receiving a cadetship before 1999 (n = 68)

Background	Metropolitan	Rural	Overseas	Total
General practice	14	16	2	32
Specialist practice	15	14	3	32
Hospital non-specialist	1	1	2	4
Total	30	31	7	68

[†]Background is defined as where the majority of primary schooling was undertaken¹⁵.



Table 4: The influence of background[†] on the practice of doctors receiving a cadetship before 1999 (*n* = 67)

Practice location	Metropolitan background	Rural background	Overseas background	Total
Metropolitan (RRMA 1 & 2)	16	19	4	39
Rural (RRMA 3–7)	14	11	3	28
Total	30	30	7	

[†] Background is defined as where the majority of primary schooling was undertaken¹⁵. RRMA, Rural remote and metropolitan areas.

A similar analysis of 67 cadets comparing background and practice location appeared to show no significant impact of where cadets attended primary school on where they were practising in 2004 (Table 4). In fact, cadets who completed their primary schooling in a rural area (RRMA 3-7) were more likely to work in metropolitan areas (*n* = 19) than in rural areas (11). Those from overseas were equally likely to be working in metropolitan or rural locations. Likewise, neither gender nor the university from which cadets graduated appeared to be a significant factor in rural background, career choice or practice location.

Reasons medical students apply for a cadetship

Financial support was the most significant reason medical students applied for a cadetship, along with an interest in rural medicine. Many cadets expressing an interest in rural medicine (particularly general practice) saw the cadetship as: providing a rural focus for studies and developing the experience and skills necessary to work in rural health; a way to experience rural medicine and country life before committing to work there later; a way to develop networks and identify a mentor; providing a greater chance to be accepted into a rural general practice training program. Those medical students wishing to train in specialties other than general practice were more likely to feel isolated and vulnerable when applying for a vocational training program.

Discussion

Medical students joining the Cadetship Program before 1999 were more likely to be female (60%) compared with 31.6%

of medical practitioners nationally in 2002¹⁸, but comparable with most vocational training programs now¹⁹. They were also likely to have a rural background (46%), compared with 16% of the first year medical student population in NSW (2003) and 20.5% nationally¹⁴. In NSW, 24% of the population live in non-metropolitan areas (data source: Australian Bureau of Statistics [ABS], 2001 census). Close to half of the former cadets chose to specialise in general practice, compared with 24.6% of doctors in general practice training programs nationally in 2004¹⁹. In this cohort, having a rural background was not predictive of career choice or practice location.

Importantly, 43% of these former cadets were working in rural locations in 2004, compared with 20.5% of all medical practitioners nationally¹⁸. Only 14% of the cohort of doctors in vocational training in 2002 expressed an interest in rural practice (31% of general practice trainees and 10% of non-general practice trainees)²⁰. This suggests the Cadetship Program is an effective link between medical school and rural practice, particularly rural general practice, for both rural and metropolitan background students.

Career choice appeared to be the only significant determinant of practice location. Those in general practice were much more likely to work in rural areas, and those practising in rural areas were likely to be working within the same geographic region as the hospital where they completed their rural service. These findings are supported by Peach et al.⁹, who demonstrated a relationship between regional internships in Victoria and regional careers in general practice.



The rural service component of the Cadetship gives junior doctors extended experience of rural medicine and rural living and allows them to develop the necessary networks and skills to remain in rural medicine if they choose. Adequate preparation for rural practice during the early postgraduate years is particularly important because it is often during this period that decisions about practice location are made^{20,21}. However, there has been limited research on unpacking the various dimensions of 'adequate preparation'. Where this has occurred it has been in connection with retention of medical practitioners in rural communities. Preparing for small town living²² and community leadership skills²³ have been shown to be important precursors for retention. Cutchin²⁴ adopted the perspective of 'experiential place integration', which he characterised by the three primary principles of security, freedom and identity in place. He concluded that a deep sense of place was associated with finding purpose and meaning in work and therefore with retention in rural practice. Rural pipeline programs rely on this concept by reinforcing a sense of place through focusing on placements and training in rural areas²⁵, mostly at the undergraduate level.

The 'pipeline' metaphor has been used by Norris²⁶ to describe a sequence of rurally orientated programs, coordinated through medical schools, to nurture and mentor students with an interest in rural health to become rural doctors, based on both educational content and experience of rural health. Ideally, this process starts with high school students and extends to vocational training programs. One of the earliest and most widely recognised pipeline programs is the WWAMI program, set up in 1971 at the University of Washington, School of Medicine²⁷. Students entering the program are preferentially selected from rural settings, returned to rural areas for pre-clinical and clinical experience and supported during rural family medicine residency programs.

It is also the concept underlying recent developments in medical education in Australia, including a substantial investment in rural health designed to increase the number of medical students with a rural background, to expand rural

training opportunities at both undergraduate and postgraduate levels, and to retain rural practitioners using targeted incentive packages^{20,28}. The Cadetship Program is one of the few initiatives to support junior doctors between graduation and entry into vocational training programs, which has been the 'weak link' in encouraging graduates to enter the rural medical workforce, along with a lack of accredited specialist training positions in non-metropolitan hospitals.

Nationally 37% of general practice trainees and only 4% of doctors in other specialist training programs had their main training experiences located in a rural area in 2002/20. In this cohort of cadets, all seven trainees in general practices were working in rural areas in 2004, compared with 8% of specialist trainees. Cadets can begin general practice training during the rural service component of their cadetship and general practice registrars can complete all their training through regional training providers without the need to return to a metropolitan setting.

These data highlight the importance of developing more rural access points into training pathways for a range of specialties to encourage junior doctors, particularly those working in rural areas, to take up specialist practice in rural areas. They also support Wearne and Wakerman²⁹ who contend that to solve the rural and remote workforce shortages, appropriate, high-quality training needs to be supplied in rural areas, and specifically for rural areas. A continuum between undergraduate, postgraduate and vocational training in rural areas is being actively sought by some recent cadets keen to specialise and work in rural areas.

A limited number ($n = 30-35$) of accredited advanced training posts in rural areas have been created under the Advanced Specialist Training Posts in Rural Areas Program, operating since 1997/1998³⁰. There has been an increase in the number of rural/remote trainees/training positions - from 741 (13.1% of trainees) in 2001 to 1064 (16.7%) in 2004¹⁹. Much of this increase has been due to the changes in the general practice training pathways and an increase in the



number of rural-based surgical training positions. More recently, the Royal Australian College of Physicians, in conjunction with the Medical Training and Education Council of NSW (MTEC; subsequently merged with the NSW Postgraduate Medical Council to form the NSW Institute of Medical Education and Training), has created pathways for trainees to gain experience in rural areas. It is important that other specialist colleges develop similar initiatives because outcomes of the first 10 years of operation of the Cadetship Program demonstrate the importance of rural-based training pathways for attracting a rural workforce.

Such initiatives are also important to take advantage of the current and future increases in medical student and junior doctor numbers in NSW. The increase in medical students are due to the establishment of the Australian National University medical school, the creation of medical bonded places at all medical schools, and the announced creation of up to four additional medical schools in NSW by 2007. There are also increasing numbers of overseas trained doctors passing the Australian Medical Council examination and arrangements in place allowing Australian-trained international medical graduates (representing 18% of the national population of medical students¹⁴) to work in Australia during their postgraduate years.

From a rural perspective, approximately 100 Medical Rural Bonded Scholarships are awarded nationally each year, with a six-year return of service obligation in rural areas after postgraduate training. A further 246 places are being made available each year to prospective medical students agreeing to work in a district of workforce shortage (includes outer metropolitan as well as rural areas) for 6 years after completing their training³¹. However, a recent study of the general practice workforce in Australia has found that the number of new entrants into the workforce will need to increase from approximately 700, to between 1100 and 1200 per year from 2007 to avoid further shortages⁴. Rural areas are the most likely to experience intensified workforce shortages.

Conclusion

Simply increasing the number of medical students is unlikely to increase the rural workforce. The Cadetship Program, which ensures junior doctors work for 2 of their first 3 postgraduate years in a rural allocation centre, is an effective link between medical school and rural practice, particularly rural general practice. The major limitation of this study is the small sample size. However, it has demonstrated the value of developing vocational training places in rural areas to achieve vertical integration between undergraduate studies and vocational training and to develop a 'sense of place' for those interested in rural health. For the rural workforce to benefit from the increasing number of medical students being trained, pathways must be put in place rapidly to increase the number of medical students having access to rural training posts in all specialties, including general practice. This will have other ramifications in an environment where workforce shortages impact on the capacity to teach medical students.

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