

The big city by-pass: Origin is important in medical students' preference for future practice in regional cities and large towns

K. M. Weston¹, D. L. Garne¹, J. A. Bushnell¹ & J. N. Hudson²

Abstract

Background: Rural clinical placement during medical training has been identified as important in addressing workforce mal-distribution in Australia. The University of Wollongong (UOW) medical school is unique in Australia in that all students undertake a 12-month continuous longitudinal-integrated-clerkship (LIC) placement in rural or regional NSW, or in the non-capital city urban centre where the university main campus is located. This paper investigates whether origin is important in medical students' intentions and preferences for future practice.

Methods: Between 2010 and 2015, rural clinical school (RCS) students from Australian medical school programmes, including UOW, completed the same survey. The responses from UOW students were compared to other students. The main outcome measures investigated were preference for location of future practice and training, and career preferences. These were investigated with respect to location of origin of students.

Results: UOW students preferred regional city/large town locations for future practice compared to other RCS students. This finding strongly correlated with the non-capital city origin of UOW students. General practice/rural medicine was the career preference for one third of UOW students compared to one quarter of other students. Generalist specialist was the preference for almost half of other students. Skills development experiences and outcomes were similar in both groups.

1 School of Medicine, University of Wollongong

2 University of Adelaide

Correspondence

Kathryn Mary Weston
Associate Professor: Public Health
Graduate Medicine
University of Wollongong
Northfields Avenue
Wollongong, NSW 2522
Australia
Tel: +61 2 4221 5633
Email: kathw@uow.edu.au

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Conclusions: Many students who have experienced a LIC placement in a regional or rural setting during training prefer smaller regional cities, towns or rural locations for future practice. Augmenting the rural clinical experience by affirmative action in preferential selection of students of non-capital city origin can result in more medical graduates wanting to “by-pass” the big cities.

Keywords: future practice; medical students; Australia; rural medicine; longitudinal integrated clerkship.

Introduction

The medical workforce in Australia and New Zealand is mal-distributed (Gorman & Brooks, 2009). Compared to capital cities, the ratio of general practitioners (GPs) to population in rural, regional and remote locations in Australia is low (Australian Bureau of Statistics, 2013). In addition to the impact of an ageing workforce, the shortage of rural, regional and remote GPs has been linked to factors such as professional isolation, workload pressures and restricted opportunities for other family members (Hansen, Pit, Honeyman, & Barclay, 2013).

Strategies to increase the proportion of rural medical practitioners working in rural and regional settings have included the Australian Rural Clinical Schools (RCS) Program and Regional Medical Schools (RMS) programme, initiated in the 1990s and funded through the Australian Government Department of Health and Ageing, with the aim of increasing the interest and intention of medical graduates to work in rural areas (Greenhill, Walker, & Playford, 2015). These rural schools have collaborated through the Australian Federation of Rural Australian Medical Educators (FRAME) to collect demographic, educational, experiential and intentional data from graduates across Australia on exit from their rural clinical school or rural medical school experience (Federation of Rural Medical Educators, 2012). The data collection is a sub-study of the Medical Schools Outcomes Database (MSOD) facilitating data linkage with other medical school entry and exit data (Medical Deans Australia and New Zealand, 2017). These data collection and linkage activities are important in providing detail about rural medical education and the impact of rural and regional educational experiences and informing workforce planning. The nomenclature for terms such as “rural” and “regional” is largely based on a national classification system reflecting population and remoteness (Australian Institute of Health and Welfare, 2017). In this paper, regional locations are non-capital city urban locations with populations of 25,000 to 100,000, although these may elsewhere be termed “large rural centres”. Rural and remote locations have populations less than 25,000 and less than 10,000, respectively. Capital cities or large urban centres are those locations with populations over 100,000.

Medical schools and medical education programmes have been created specifically to address areas of workforce shortage or need. Examples include regional and rural medical education programmes at James Cook University, University of Newcastle and University of Wollongong. Strategies to progress the missions of these and other programmes in contributing to workforce shortage areas include increased intake of students with rural or regional origin and extended clinical placements in rural or regional locations. The FRAME exit survey provides an important snapshot of career interests and intentions of

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medical graduates immediately after completing a degree that included a focus on medical education in rural or regional locations in Australia. The data gathered on exit are critical to linking location of origin and location and type of clinical placement experience during medical education with future longitudinal data collected on locations of internship, registrar and specialty training and eventual location and type of future practice.

The University of Wollongong (UOW) medical school admitted its first students in 2007. Located in Wollongong, New South Wales (NSW), a major urban centre with an estimated resident population of 208,875 (Australian Bureau of Statistics, 2015), UOW has embraced the challenge to grow Australia's regional and rural medical workforce by acknowledging the importance of both rural background and extended regional and/or rural clinical placement experience in developing its 4-year graduate-entry medical programme (Walker, DeWitt, Pallant, & Cunningham, 2012). UOW has committed to a high intake of students from rural backgrounds, well above the intake level mandated by the federal government, as well as to a student intake from regional (non-capital city urban) backgrounds (Australian Government Department of Health, 2017). At selection, preference is given to students of rural/regional origin where applicants are equally qualified. Moreover, its medical school is unique in Australia in that in their senior years, all students undertake a 12-month continuous longitudinal-integrated-clerkship (LIC) placement in regional or rural NSW or in the non-capital-city urban centre where the university main campus is located, in addition to other rural or regional clinical experiences throughout the course. During their LIC placement, students live, learn and work in one of 11 NSW locations, under the supervision of a general practice preceptor, with clinical experiences provided in general practices, hospitals and other local community settings.

This paper describes responses to the FRAME survey for the first six cohorts of UOW graduates and compares the UOW responses to the RCS graduates from other medical schools who completed the same survey. Research has already shown the impact of origin on rural practice. This study seeks to answer the question: Is origin important in medical students' intentions and preferences for future practice in regional as well as rural locations?

Methods

FRAME survey data were collected annually from graduating students who experienced a rural clinical placement and then collated and provided to participating universities at an individual medical programme level and as aggregated annual data. From 2010 to 2015, the RCS students from between 17 and 24 Australian medical programmes were invited to complete the FRAME survey on completion of their university medical course (on exit). Where a medical school had two programmes, such as an undergraduate and graduate programme, the students were surveyed as separate groups.

The first six cohorts of UOW medical graduates completed the FRAME survey on exit from their course in the years 2010 to 2015, inclusive. The survey comprised demographic questions as well as career intentions and training preferences, perceptions of the RCS experience, skills development and outcomes. Most questions followed the format of a statement with Likert scale agreement responses required. Examples of questions about rural experience and development of skills include: *Rural practice is too hard*; *I am confident completing a focused clinical examination*; and *Overall, my clinical school provided*

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an excellent clinical education. The nature of some of the survey questions varied from year to year, reflecting issues considered of interest to FRAME. The results presented in this paper refer predominantly to the responses relating to location of origin and preference for location of future practice and training. Only those questions that were common to all surveys were analysed for this study.

In the exit survey, the participants were asked to identify the type of location where they had lived the longest. In the same survey, they were also asked to nominate their preferred location for future practice and where they would like to undertake their internship training. These questions were asked in each exit survey; however, the options to choose from varied slightly between questions and years. For instance, participants asked where they had lived the longest may have been given separate options of “capital city” or “major urban centre (>100,000 population)” but only given the option of “capital or major city” in terms of their preference for future practice. Thus, it was necessary to create a consistent nomenclature to clearly present the results when comparing location of origin with preference for future practice (Table 1).

A dataset reflecting responses from “other RCS” students was generated by excluding the numbers representing UOW student results and used as a comparison to the UOW respondent data. Data were analysed using descriptive statistics. Where statistical analysis was undertaken, a Fisher’s exact test was used to compare outcomes from UOW graduates with the “other RCS” cohorts of students. The level of significance was set at $p < 0.05$. Data for the response rate for “other RCS” was provided by FRAME staff (S. Liu, personal communication).

Table 1
Nomenclature Used in the FRAME Surveys and This Paper to Describe Locations

Options provided for location where participants had lived longest	Options provided for preferred location for future practice	Nomenclature used in this paper
Capital city	Capital or major city	Capital city/major urban centre (>100,000 population)
Major urban centre (>100,000 population)		Or separately as Capital city or major urban centre (>100,000 population)
Regional city/large town (25,000 to 100,000 population)	Inner regional city or large town in Australia (25,000 to 100,000 population)	Regional city/large town (25,000 to 100,000) population
Outer regional/smaller town (10,000 to 24,999 population)	Smaller town in Australia—outer regional (10,000 to 24,999 population)	Outer regional/smaller town (10,000 to 24,999 population)
Outer regional/smaller town (10,000 to 24,999 population)	Smaller town in Australia—outer regional (10,000 to 24,999 population)	Outer regional/smaller town (10,000 to 24,999 population)
Small rural community (<10,000 population)	Small rural or remote community in Australia	Small rural community (<10,000 population)
Remote centre/area	Very remote centre/area	Remote centre/area

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Results

Survey response rates and cohort numbers

The response rates for UOW students completing the FRAME surveys were very high (87 to 99%), whereas the response rates representing “other RCS” for each year ranged from 37.7% to 78.8% (Table 2). The response rates of “other RCS” students for each medical programme improved over the 6-year period studied.

Table 2
Number of Survey Participants by Year

Year	University of Wollongong survey participants (n, % of cohort for that year)	Other RCS” participants (n, % of cohort for that year)
2010	65 (97.0%)	161 (37.7%)
2011	67 (87.0%)	291 (†)
2012	75 (97.4%)	379 (54.1%)
2013	71 (88.8%)	597 (78.8%)
2014	73 (93.6%)	561 (71.0%)
2015	84 (98.8%)	560 (70.8%)

†Response rate not determined for 2011

There were two areas of difference identified between the two groups of students. The first was gender, with more males in the UOW student group ($46.4 \pm 2.4\%$) than the “other RCS” students ($39.3 \pm 3.1\%$) (Average of data for 2010 to 2015, $p < 0.05$).

Secondly, the two groups differed in the type of location where the student had lived the longest. About one quarter of UOW students indicated they had lived longest in a capital city compared to nearly 50% of “other RCS” students ($p < 0.05$). Further, about one quarter of UOW students (25.4%) had lived longest in a major urban centre (<100,000 population) compared to only 8.3% of “other RCS” students (Figure 1).

Preferred geographical location of future practice once finished training

Graduates were asked to indicate a first preference for practice location on completion of their medical training. The 2010 survey asked the respondents to indicate the geographical location in which they would like to practise, while the subsequent surveys qualified the question by adding “on completing your training”. Figure 2A shows those rating their first preference “capital city/major urban centre”; Figure 2B shows preference for a “regional city/large town”; Figure 2C shows the respondents’ preference for smaller centres (including “outer regional/smaller towns” and “remote centre/areas”). Overall, more UOW students compared to “other RCS” students indicated a preference for a “regional city/large town” location compared to the “other RCS” students. This profile was reversed for preference of “capital city/major urban centre”, with more “other RCS” students preferring this location. The differences between UOW and “other RCS” over

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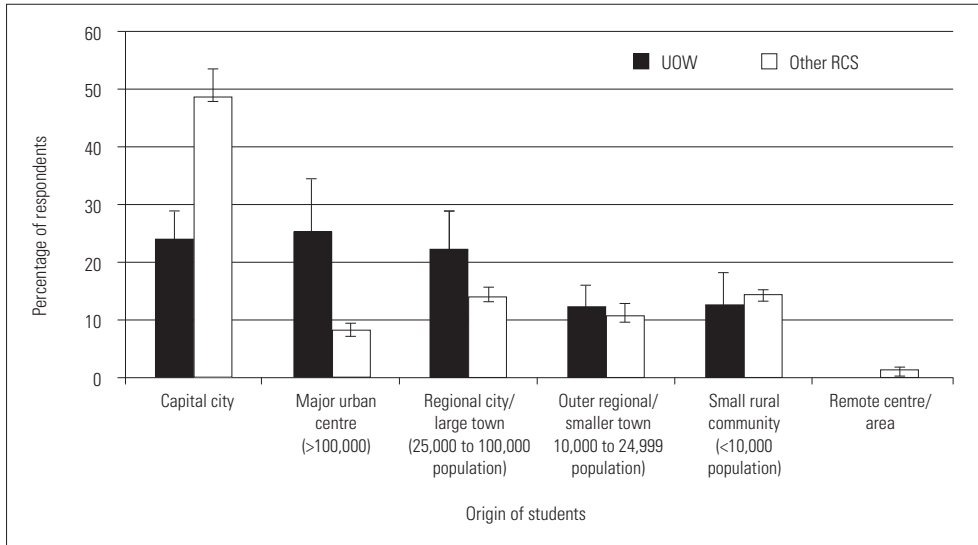


Figure 1. Type of location where students had lived the longest.

the 6 years of data shown in Figures 2A and 2B are statistically significant ($p < 0.05$). The data showing preference for future practice in smaller locations (<25,000 population—Figure 2C) did not reveal any consistent difference between the two groups.

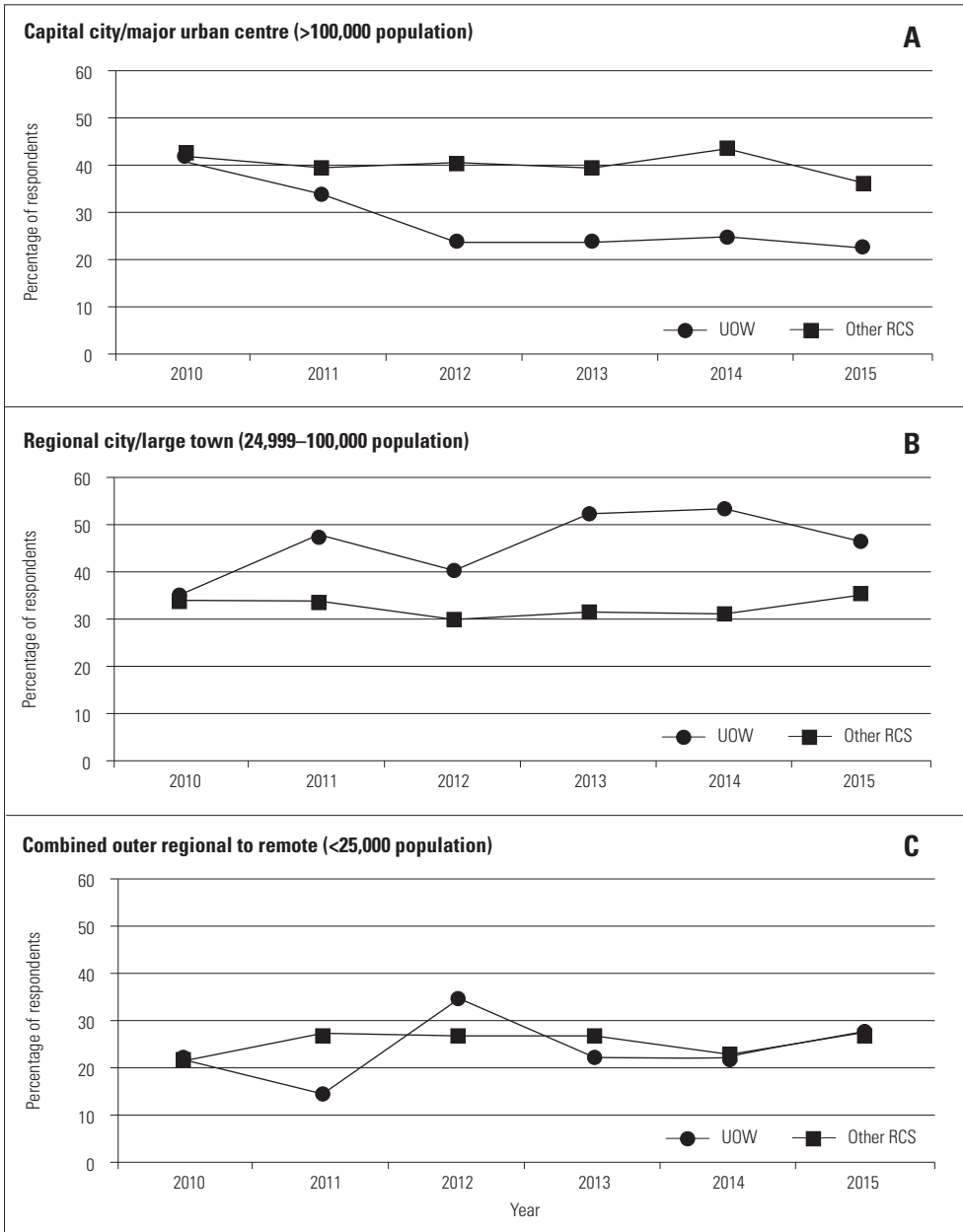
Relationship between origin and future practice preference

The data for origin were compared to proportions preferring regional city/large town for future practice for each survey year (Figure 3). For both groups covering the years 2012 to 2015, inclusive, there was a close relationship between having lived longest in a major urban centre or smaller (i.e., other than a capital city) and preference for future practice in a regional city/large town location (25,000 to 100,000 population).

Intention to train in non-metropolitan location

For the years 2013 to 2015, inclusive, survey respondents were asked if they intended to undertake any training in non-metropolitan areas, using the Australian remoteness classifications of RA2-5, termed non-metropolitan (Australian Bureau of Statistics, 2014). There was no significant difference between the two groups; about half of each group indicated somewhat or strong intention to undertake internship or postgraduate training in a non-metropolitan location (data not shown).

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A—capital city/major urban centre (>100,000 population)

B—Regional city/large town (25,000 to 100,000 population)

C—Combined data for outer regional/ smaller town (10,000 to 24,999 population), plus small rural community (<10,000 population), plus remote centre/area

Figure 2. First preference for location of medical practice on completion of training.

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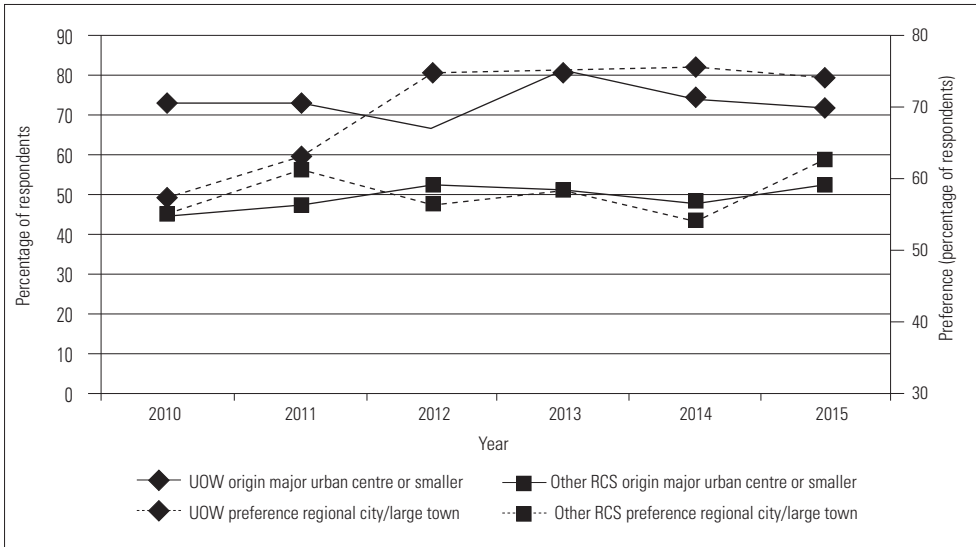


Figure 3. Relationship between having lived longest in a major urban centre or smaller (i.e., other than a capital city) and preference for future practice in a regional city/large town location (25,000 to 100,000 population).

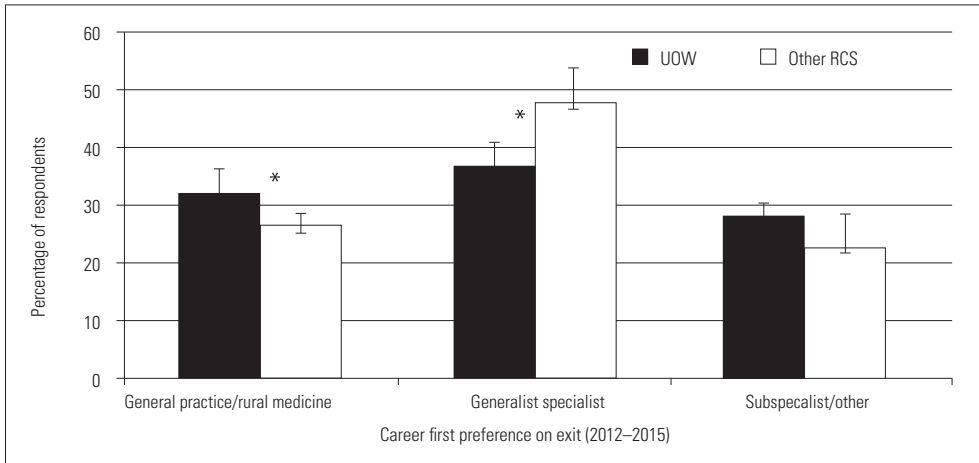
Career preferences

Graduates were asked about their current career preference, i.e., their preference at the time of exit from their medical course for a future specialist or generalist career. For the most recent 4 years (2012 to 2015, inclusive), students were offered options of general practice/rural medicine, generalist specialist or subspecialist/other (Figure 4). The responses were different between UOW and the “other RCS” students. Whereas similar proportions of UOW students were split between the three career preference options provided, there was a higher percentage of “other RCS” students with first preference being generalist specialist compared to general practice/rural medicine or subspecialist. The differences between UOW and “other RCS” for general practice/rural medicine and between UOW and “other RCS” for generalist specialist were statistically significant ($p < 0.05$). The difference in subspecialist/other between the two student groups was not statistically significant.

Skills development and outcomes (combined data for 2014 and 2015) and RCS experience (combined data for 2012–2015)

Each year, graduates were asked to respond to questions concerning rural practice and skills development. In the most recent 2 years, the same 33 questions about skills development were asked each year. Similarly, the same 26 questions were asked each year in relation to outcomes from the rural experience. Data for the “agree” responses (somewhat and strongly agree) were pooled and indicated favourable responses to both skills development and outcomes. There was very little difference (not more than 10% for most questions) between UOW student responses and those from “other RCS” students (data not shown).

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*p < 0.05

Figure 4. Career interest on exit from medical programme (average of data for 2012 to 2015, inclusive).

Discussion

This paper reports graduate intentions of a medical programme that has a positive selection process for students of rural or regional origin, and in which all students undertake a 12-month community-based longitudinal integrated clerkship placement. UOW students showed a clear preference for regional city/large town locations for future practice, a finding that strongly correlated with the non-capital city origin of the students. The career preferences of the two student groups were different. General practice/rural medicine, an area of workforce need, was nominated as the career preference on exit by about one third of UOW students compared to one quarter of “other RCS” students. Generalist specialist was the preference for almost half of the “other RCS” students.

All Australian medical schools have now developed policies to bring rural-origin student numbers in line with targets determined by the Australian Government (Australian Government Department of Health, 2017). The past decade has seen evidence of the impact of RCS and other initiatives, including data describing graduates’ preferences for training places and future practice. Factors impacting these preferences include the combination of rural origin plus a rural clinical placement experience and largely reflect findings from overseas studies (Walker et al., 2012). Influences such as personality (Jones et al., 2013) and resilience (Lawrence, Eley, Walters, Elliott, & Cloninger, 2016) also appear important, suggesting that the situation is complex and multi-factorial. A 2013 study from the University of Sydney suggested that rural clinical training experience through extended placements had a stronger association than rural background in terms of preference for, and acceptance of, rural internship (Clark et al., 2013). Our data clearly demonstrate the influence of non-capital city origin in students’ preference for future practice in regional cities and towns, small towns and rural locations, and justify the higher intake of students from non-capital city origin. While the interest in

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future practice in smaller regional city locations was present for over half of the two groups of students studied, the impact of a 50% higher proportion of students with non-capital city origin (the UOW cohort) was manifest in 20% more students with a preference for future work in regional city/large town locations.

About one quarter of all respondents indicated a preference for future practice in smaller centres with populations less than 25,000 or remote areas with populations less than 10,000. Whether having one quarter of the students who experienced a rural clinical experience eventually working in these less-populated locations will be enough to address shortages remains to be seen, particularly with respect to the need for generalist and sub-specialists. However, if the willingness exists, additional incentives could be targeted in this direction.

Other studies have shown that the duration of clinical experience is an additional predictor of future preference (Kondalsamy-Chennakesavan et al., 2015; Wilkinson, Laven, Pratt, & Beilby, 2003). For instance, Eley, Synnott, Baker and Chater (2012) reported that the longer the exposure to training in a rural context, the greater the potential interest in future rural practice. Length of placement was not routinely collected in the FRAME survey, and more detailed analysis of the impact of this factor in combination with rural origin is required.

Intentions for internship training in non-metropolitan areas were similar between both groups. Walker et al. (2012) showed that over 60% of students who had completed the RCS placement preferred a rural location for internship or basic training. Our data are similar, with about half of respondents in both groups indicating they would like to train in a non-metropolitan area. We recognise that the data presented here would benefit from being linked to actual indicators of workforce distribution rather than intent. Our data relating to location of current registration does not allow distinction between regional areas and capital cities. We have commenced a more detailed longitudinal data collection process to determine actual location of training and post-graduation practice. Our research will also benefit from continued analysis of FRAME exit data. The data presented in this paper shows early trends, representing the first 6 years of a new medical course. While the data for the initial 2 years show some variation, the exit data for the later 4 consecutive years show greater consistency in the relationship between origin and preferred future practice in a regional location. Analysis of data from future years will be important to consolidate our understanding of some of the factors impacting graduates' preferences for practice.

A high proportion of UOW students come from non-capital city backgrounds; all are educated during their medical course in a regional city or small-town location, and all experience short and extended clinical placements in regional, rural and remote locations. Further research is necessary to determine how each of these factors, separately or synergistically, influences students' interest in training locations, future practice locations and career choices. There was little difference in the overall RCS experience or perceptions of skills development between the two groups. Most respondents were very positive about their RCS experience and the skills developed. Because of the high level of satisfaction, it is difficult to determine whether there is any specific aspect of clinical

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placement or curriculum, or aspects of personality (Jones et al., 2013) and resilience (Lawrence et al., 2016), that contribute to the difference in career preference observed. Nevertheless, with three quarters of UOW students, as well as a high proportion of RCS students from other medical courses, preferring smaller regional cities, towns or rural locations for future practice, our data confirm that affirmative action in the selection processes in combination with rural experience during medical education can influence medical graduates to “by-pass” the big cities. This preference is clearly evident at the point of graduation, a finding that should be both exploited and protected, as evidence suggests that positive impacts of rural recruitment and experience diminish over time (McGrail, Russell, & Campbell, 2016).

New graduates who choose to practise away from the big cities need to be supported to make a long-term commitment to those locations. Policy makers have recognised the need for locating junior doctor hospital and specialist training in rural and/or regional areas and for flexible models for supervision to reduce the disruption of having to move to the city for a period of training (Larkins & Evans, 2014). The recent Australian Government announcement of 26 regional training hubs and three new university departments of rural health is a welcome development in providing opportunities for health and medical students to undertake training in rural and regional locations (Gillespie, 2017). We support such efforts to strengthen rural and regional training and develop opportunities for all types of post-graduate training, including specialty training, in regional areas. In this way, graduates, like many country travellers, are able to avoid the “congestion” of a major capital city, conveniently by-passing it in order to experience both their training and future practice in a regional location. It is incumbent on policy makers to ensure the gates are wide open for junior doctors to continue in their preferred direction, undertake pre-vocational and vocational training in their chosen location, and then spend crucial and much-welcomed time in the regional or rural location of their choice, meeting the healthcare needs of those communities.

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