



Australian and International Journal of Rural Education

Exploring Medical Students' Rural Intention on Course Entry

Keith McNaught

Curtin University

keith.mcnaught@curtin.edu.au

Colette Rhoding

Curtin University

colette.rhoding@curtin.edu.au

Abstract

Understanding the rural intentions of medical students has the potential to improve the effective allocation of rural clinical placements, the demand for which regularly exceeds availability. Longitudinal studies on students' rural intentions have been published but a refined understanding of the spectrum of intentions is absent in the literature. To fully understand students' rural intentions, and the factors influencing those intentions, comprehensive research, at all stages of a student's academic career, is required.

The project used for this article, identifies a group with neutral intention and explores the influence of a range of demographic factors and variety of rural experience for their potential to move students towards high rural intention. The study also identifies trends in student perceptions of potential locations for rural practice in Western Australia. This more detailed approach is offered as a basis for a future model to inform the allocation of scarce rural placement opportunities, known to be significant in converting rural intention into practice.

The project responds to increasingly frequent calls for changes to policy and practice regarding the allocation of rural clinical placements to better realise their value in improving the maldistribution of Australia's medical workforce. The study suggests that a greater range of indicators, beyond being of rural origin, can lead to neutral or high rural intention. The results of this study suggest a model that incorporates these additional elements and tracks their development over time would be a valuable component in initiatives aimed at building positive rural intention.

Keywords: *Rural, remote, rural education, rural intention, clinical placements, students, medical*

Introduction

Despite decades of substantial financial investment and extensive research (KBC Australia, 2020), recruiting and retaining medical professionals in rural, regional, and remote areas remains a significant problem in Western Australia, and Australia generally. Rural intention is defined as a student's interest in rural practice as a future career option and is known to influence student decision making throughout their higher education, from applying to specific medical programs to post-graduation rural practice choices (Woolley et al., 2019). Research has also established that students' rural intentions are mutable and responsive to experiences delivered during their course of study (Playford et al., 2021; Kent et al., 2018).

Rural training interventions are a key feature of Australian universities' efforts to grow the rural medical workforce (Johnson et al., 2018). The opportunity for rural clinical experience is known to be an important factor in converting medical students' rural intention into rural practice (Kondalsamy-Chennakesavan et al., 2015). At the Curtin Medical School, these initiatives include a week-long wheatbelt program, a Kalgoorlie Immersion Program, seminars led by rural practitioners and rural clinical placements. However, medical schools consistently face the challenge of best distributing limited rural clinical training opportunities and Curtin Medical School is no exception. A more systematic approach could identify those students for whom these initiatives might be the most valuable and likely to eventuate into rural practice in the future.

Past research has discussed rural intention from a polarised binary perspective, in which students either have rural intention or do not (Playford et al., 2021; Kent et al., 2018). Less is known about students who have neutral rural intention. This study reports on data from a single cross-sectional study, exploring the range of rural intention of a group of Curtin Medical School first year medical school students in their first week of study. It identifies a group of students lacking specific geographical intention at commencement and categorises this group as having neutral intention. Strong intentions are more likely to remain stable over time and be less responsive to interventions (Conner and Norman, 2022), suggesting that the medical students with neutral rural intentions are the students most likely to be influenced by rural medical education initiatives. The study further explores whether significant trends could be distinguished between the students with low, neutral or high rural intention by looking at a range of sociodemographic factors, perspectives and past experiences.

For the purposes of this article, the term 'rural origin student' is defined in accordance with the Rural Health Multidisciplinary Training Program as a student who has resided in a rural Australian Statistical Geography Standard remoteness area (defined as areas 2-5) for at least 10 years cumulatively or any five years consecutively (Australian Government Department of Health and Aged Care, 2021). The Australian Statistical Geography Standard determines five levels of remoteness for areas in Australia—Major Cities, Inner Regional, Outer Regional, Remote or Very Remote (Australian Bureau of Statistics, 2023). The remoteness areas 2-5 have an overarching definition of 'rural'.

Literature Review

High rural intention at the commencement of medical studies is known to be a significant factor supporting student interest in rural placement opportunities and leading to rural practice (Herd et al., 2017; Playford et al., 2017). Research has also shown that rural intention at commencement appears insufficient as an independent factor to convert intention to rural practice (Playford & Puddey, 2017). It is well acknowledged that the effect of rural intention is enhanced when concurrent with rural origin (Herd et al., 2017; Playford et al., 2021) and that there exists a strong association between rural intention at commencement and rural training interventions, such as rural clinical placements, in converting rural intention into rural practice (Playford et al., 2021).

The effect is contested, however, of rural training interventions on the rural intention of urban students who expressed no rural intention at the beginning of their medical degree. One study found that rural training interventions were particularly effective for altering rural intention among urban students who had not previously identified as having rural intention (Playford et al., 2021). This contrasts with a finding that providing rural training for students with urban backgrounds did not significantly impact the likelihood of rural practice, though the authors acknowledged the existence of an insignificant trend in the data (Kondalsamy-Chennakesavan et al., 2015).

The mutability of students' rural intention is another factor discussed by several studies. The stability of students' rural intention in most medical students appears to be high. In two studies, rural intention was found to be stable in 82% (Playford et al., 2021) and 71% of students (Kent et al., 2018). However, for a minority of students, rural intention is mutable from the commencement of medical studies to graduation and responsive to experiences delivered during the course of study (Playford et al., 2021; Kent et al., 2018). One study found that, for the students whose rural intentions were mutable, the shift in rural intention was stronger towards a rural career than away from it (Kent et al., 2018). Finally, it was found that the rural intention evident at the end of a student's study is the most predictive of rural practice (Playford et al., 2021).

The review identified several issues with previous research on the subject of rural intentions at commencement of medical school. Firstly, research exploring the factors contributing to the development of rural intention prior to entry to medical school is limited and focuses primarily on rural residential experience (rural origin) (McGrail et al., 2016), potentially neglecting other contributing factors. Secondly, previous research has relied primarily on data from the commencement surveys, delivered as part of the Medical School Outcomes Database longitudinal study. Changes to the Medical School Outcomes Database data collection processes in 2014 terminated the use of commencement surveys (Herd et al., 2017), which will undoubtedly have a significant impact on future research on the topic. This poses a particular issue in accessing data from large study samples across Australia. Thirdly, few projects differentiate between data from undergraduate and graduate medicate programs, blurring the effect of age and experience on students' rural intentions. Finally, the terms used to discuss changes in students' rural intention, such as 'switch' (Playford et al., 2021) and 'change' (Kent et al., 2018), suggest a binary perspective where students are seen as 'having' or 'not having' rural intention, neglecting the possibility that a spectrum of intentions exists and might be informative for understanding rural intentions. In general, strong intentions are more likely to remain stable over time and be less responsive to interventions (Conner and Norman, 2022). With this in mind, there is a clear argument for identifying the group of students with the most mutable intentions, for whom a clinical placement may be most transformative.

Demand for rural clinical placement opportunities exceeds the number of places available (KBC Australia, 2020). Given this, and that the key goal of rural clinical placements is to build the future rural workforce (KBC Australia, 2020), medical schools need to allocate students to placements in ways that maximise effectiveness of this scarce resource. The evidence that rural origin students who complete an extended rural clinical placement are the most likely to practice rurally after graduation (Woolley et al, 2021), provides one key factor in selecting students for rural placement opportunities. Whilst applicants for rural clinical placements may express their desire to work rurally in the future to increase their chance of gaining a place (White et al, 2012), the identification of rural intention throughout the course is essential to enable the most effective allocation of the scarce number of extended rural placements.

Methods

This project utilised a hard-copy survey. The survey questions (see Appendix A) were developed in the interest of determining if a range of qualitative data, obtained from a student survey, could be used to identify a spectrum of rural intention at commencement of medical school.

The locations listed in the survey were selected as representative destinations for rural clinical placements offered to medical students through the Rural Clinical School Western Australia. In addition, the list included a range of locations from the categories defined by the Modified Monash Model, which measures a location's access to services and defines locations from Modified Monash category MM 1, a major city, to MM 7, a very remote location (Department of Health and Aged Care, 2021).

Prior to submission for ethics approval, the survey was trialled by two volunteers, a colleague of the authors at the Curtin Medical School and a member of the public from outside the discipline. The trials did not result in any modification to the survey instrument.

The survey was delivered in a lecture environment in the first week of Semester 1, 2020. The survey participants were year one students, the fourth intake of medical students in the Curtin University Undergraduate Bachelor of Medicine, Bachelor of Surgery (MBBS) program. Of the 83 students present on the day, all 83 voluntarily completed the survey and 81 gave written permission for their responses to be included in the project. The students were given 25 minutes to complete the survey, composed of 15 questions. The survey included a mixture of multiple-choice, closed and open questions. This research was approved by Curtin University HRE 2019-0762.

The survey was preceded by a series of communications designed to ensure that the students were assured of confidentiality, and that participation in the research project was voluntary and without consequence to their studies or prospects in the Curtin Medical School program. The communications also attempted to mitigate the influence of social desirability bias specifically by informing the students that there was 'no right answer' to the questions. The survey required students to provide or withhold permission for their responses to be used in this project. The Year One Coordinator, who had no connection to the research project, was chosen intentionally for these communications to avoid the potential for any form of bias or coercion.

The completed surveys were de-identified and the closed question responses subjected to cross-tabulation analysis to identify trends in students' responses. Several questions included an option that allowed students to respond in their own words where the set response choices failed to reflect their thinking on the question.

All open responses were analysed separately using an inductive thematic analysis approach (Fereday & Muir-Cochrane, 2006). This analysis was conducted manually and the aggregated data were organised into topics. To ensure analytical rigour and avoid potential bias, the process was replicated by a second investigator 'sight unseen' and the findings of the two researchers were compared and discussed until agreement was reached. In the single instance where a dispute could not be resolved, the topic was discarded.

A total of nine topics were identified. One topic, the influence of attending public versus private high school, was discarded due to the potential for privacy issues in such a small cohort study. The remaining eight topics were aggregated into three overarching themes, which were used to calculate the students' rural intention score. Two themes, preferences regarding living and working rurally and perspective on rural placements, were derived from the quantitative data. The third theme, students' perspectives on rural life and work, was derived from a mixture of quantitative and qualitative data.

The rural intention scores were established through a process of positive-neutral-negative sentiment analysis (Liu, 2012) of data from eight questions in the survey (Qs #1, 3, 7, 8, 9, 10, 11 and 12 (see Appendix A), chosen for their potential to demonstrate the desire to live and work in a rural setting, the willingness to live and work in a rural setting, and the students' perspectives (including those gained from previous rural experiences) on living and working in a rural setting. Seven of the questions received minus one point for negative response, zero points for a neutral response, and one point for a positive response. Question #12 (relating to the length of rural placement the student would consider undertaking) was allocated two points, as research shows that an extended rural placement experience is strongly associated with rural practice (Hays, 2017). Question #8 (which asked students to identify locations that appealed as a location to work as a doctor) was calculated by allocating one point per rural location that was rated as appealing, zero point per rural location that was unknown to the student (considered a neutral response) and minus one point for each location that was rated as unappealing. The final score

for this question was utilised twice in the final score, as it was felt that the question reflected the students' willingness and perspective. This data also shows the desirability of various locations for rural practice in Western Australia. Of the survey questions that were excluded from the above calculations, one (Q.2) was excluded due to potential privacy issues, one (Q.4) was used to collect supporting demographic data and five (Qs. 5, 6, 13, 14 and 15) were used to cross-validate accuracy of responses by being subjected to the same sentiment analysis.

The total possible score for each student, resulting from eight questions, was between -10 and +10, though the range of resultant scores was -8 to +8. These scores were used to establish three points of rural intention, with a score between -8 and -1 considered low rural intention, 0 to 3 points considered neutral rural intention, and 4 to 8 points high rural intention. Whilst there were a greater number of possible scores to gain a 'low rural intention' categorisation, in the validation process, all final 'low' scores were deemed to be accurately representative.

The accuracy of the rural intention scores was further strengthened through comparison of the scores against the results of a closed question on rural intention, conducted manually against the classification of 10% of the students chosen at random. After adjusting for confounders such as personal concerns or restraints about living rurally, such as pre-existing health conditions or partnership concerns, this analysis supported the accuracy of the rural intention scores.

Results

Eighty-one students participated in the project: 33 (41%) were identified as low rural intention, 26 (32%) as neutral rural intention, and 22 (27%) as high rural intention. Applicants to Curtin Medical School know that the faculty is focussed on building a future rural workforce in Western Australia. This logically inclines applicants, in their admission interviews, to focus positively on future rural work. However, this survey demonstrates that, in their first semester of study, a significant percentage have low rural intention.

The data offer several insights into the demographic features of the three groups, identifying minor trends between increased rural intention and students who are female, older and born in Australia. A stronger trend was identified between increased rural intention and students who self-reported as rural origin.

Table 1: Sociodemographic Factors in Students who were Classified as Having Low, Neutral or High Rural Intention.

	Whole group		Low rural intention		Neutral rural intention		High rural intention	
	N		n		n		n	
Gender								
Male	34	42%	15	44%	12	35%	7	21%
Female	47	58%	18	38%	14	30%	15	32%
Age								
17-18yo	49	60%	21	43%	18	37%	10	20%
19-20yo	23	28%	9	39%	5	22%	9	39%
21+yo	9	11%	3	33%	3	33%	3	33%
Country of origin								
Australia	54	67%	21	39%	17	31%	16	30%
Overseas	27	33%	12	44%	9	33%	6	22%
Origin/background								
Rural origin	22	27%	5	23%	7	32%	10	45%
Urban origin	59	73%	28	47%	19	32%	12	20%

The data showed that, for Australian-born students in this cohort, students born in Western Australia are more likely to be classified as having neutral or high rural intention, suggesting that 'local' birthplace might be an influential factor in developing rural intention.

Table 2: Distribution of Australian-born Students (N = 54), Based on Self-Identified State of Origin.

	Whole group		Low rural intention		Neutral rural intention		High rural intention	
	N		n		n		n	
Western Australia								
	37	69%	10	24%	12	34%	15	41%
Other state or territory								
	17	31%	11	65%	5	29%	1	6%

The survey sought to identify whether a positive correlation existed between students' past rural experience (outside the definition of rural origin) and their rural intention. The data indicate the influence of other rural experiences may have a positive effect on rural intention. Formative

experiences mentioned by the students included “working in an Aboriginal Medical Centre”, road trips to the Outback and family camping trips in rural Australia as formative experiences.

Table 3: Students who Identified a Formative Rural Experience that Impacted their View of Rural Life or Work.

	Whole group		Low rural intention		Neutral rural intention		High rural intention	
	N		n		n		n	
All rural experiences	44	54%	9	20%	17	39%	18	41%
Rural experiences other than rural residential experience	31	38%	8	26%	11	35%	12	39%
Controlled for rural origin students	25	31%	7	28%	10	40%	8	32%

The survey asked students to identify what they thought would be the worst aspect of a rural placement. The most common issue for all groups related to fears about being away from family and friends, and the possibility of experiencing loneliness while on placement. Students identified as having neutral or high rural intention were less likely to comment on this issue than students of low rural intention.

Table 4: Students who Indicated that Loneliness or Isolation from Family and Friends Might be of Concern on a Rural Placement.

	Whole group		Low rural intention		Neutral rural intention		High rural intention	
	N		n		n		n	
	55	68%	27	82%	14	54%	14	64%

The survey also asked students to rate specific West Australian locations for appeal as places in which to live and work. Perth, the only metropolitan area on the list of eight locations, attracted the highest rating from all three groups of students.

Table 5: Locations Selected by Students as 'Appealing to Live or Work in'.

	Whole group		Low rural intention		Neutral rural intention		High rural intention	
	N		n		n		n	
Perth	76	94%	31	94%	25	96%	20	91%
Margaret River	48	59%	13	39%	16	62%	19	86%
Albany	48	59%	12	36%	19	73%	17	77%
Broome	37	46%	5	15%	14	54%	18	82%
Esperance	33	41%	5	15%	12	46%	16	73%
Geraldton	32	40%	5	15%	11	42%	16	73%
Kalgoorlie	21	26%	1	3%	8	31%	12	55%
Wyndham	7	9%	1	3%	2	8%	4	18%
Merredin	4	5%	0	0%	2	8%	2	9%

There was a significant preference for coastal towns, with six of the seven coastal locations—Perth, Margaret River, Albany, Broome, Esperance, and Geraldton—attracting higher ratings than either of the two inland locations—Kalgoorlie and Merredin. In the open responses on this topic, a number of students specifically identified a preference for coastal locations due to the climate and the potential for leisure activities and hobbies associated with the ocean.

Students identified as neutral and high rural intention rated remote locations—Broome, Esperance, Kalgoorlie, Wyndham and Merredin - substantially higher than the students identified as low rural intention. The data also showed a notable divergence in perspectives between the three groups of students in relation to particularly remote or hard to staff locations. Compared to the low rural intention students, the neutral and high rural intention students gave remote coastal locations—Broome, Wyndham and Esperance—and hard-to-staff locations—Kalgoorlie and Merredin—a much higher rating.

Discussion

By attempting to identify students with neutral rural intention, the survey identifies several factors that could be brought into play in initiatives during students' studies to build rural intention.

Firstly, analysis of the open responses, which provided greater scope for expression of students' interests, perceptions and ambitions, identified that neutral and high rural intention participants are more likely to have an adventurous personality than low rural intention participants. Comments included: *"It will be interesting to experience new things and meet new people"*, *"It may give me a different perspective on my life and how I perceive others"*. Many short comments referred to experiencing a *"new way of life"*, a *"growing opportunity"* and a chance to *"improve my independence... and adaptability"*. It is also interesting to note that the students classified as having neutral rural intention were the least likely of the three groups to view loneliness or separation from friends and family as a potential negative factor associated with a rural placement, further suggesting a more adventurous outlook. If, as research suggests, personality has the potential to influence a student's interest in, and ability to cope with, rural training and rural practice (Eley et al., 2017), having an adventurous personality may improve a student's response to the unique challenges of rural learning experiences and, ultimately, rural practice.

Secondly, analysis of the students' responses identified that many students were not familiar with eight of the nine locations listed—only Perth, the major capital city, was familiar to all students. This issue could be exacerbated in medical programs, where entry is highly competitive (Razack et al, 2015) and students are likely to accept the need to relocate inter-city or interstate in order to secure an offer to study (Soutar & Turner, 2002). It is logical that relocating from the city or state of their youth decreases the students' familiarity with the regional and rural areas around their new domicile. The effect may also be emphasized in states with a high proportion of remote locations, such as Western Australia. Initiatives to build awareness of regional and rural locations could help students see them as real alternatives for practice and offers an opportunity to address the persistent workforce imbalance in these locations.

Thirdly, the findings suggest that a range of rural experiences, beyond the Rural Health Multidisciplinary Training definition of 'rural origin', may be influential in developing students' rural intention. The survey asked students to identify previous rural experiences they believed to have impacted their view of rural Australia, and analysis of their responses showed that students who reported formative rural experiences were more likely to be identified as having neutral or high intention. Additionally, students who had lived rurally, but of a timeframe insufficient to meet the official definition of 'rural origin', were more likely to be identified as having neutral or high intention. Currently, rural origin is the measure for evaluating the relevance of students' rural experience (KBC Australia, 2020); the results of this study, however, suggest that a greater variety of significant rural experiences may need to be investigated for their impact in developing rural intention.

Thirdly, the findings identified a common preoccupation, across the three groups of rural intention, with the fear of loneliness or isolation from family and friends during rural placements. This is consistent with research showing that fear of isolation or loneliness are issues for medical students considering rural placements (Rural Health Workforce, 2015), though previous research has commonly failed to differentiate between students in undergraduate and post-graduate medical programs. Given that Australians between the ages of 18-24 report the highest feelings of loneliness of any age group in the broader community (Australian Institute of Health and Welfare, 2021), it is quite possible that youth and inexperience exacerbates undergraduate medical students' concerns about, and experience of, loneliness and isolation while on rural clinical placement. In short, some undergraduate students who identify as low rural intention may be reflecting a lack of personal confidence about their capacity to be away from their family and friends. Research exploring these issues specifically in an undergraduate cohort could not be located, but may be instructive for future training and planning.

Finally, rural clinical placements have been shown to be one of the most effective means of fostering students' rural intention (Campbell et al., 2019) and they offer significant learning experiences for all students, whether they ultimately practice in a rural or urban setting. Students who undertake a rural clinical placement will better understand rural communities, varied perceptions around health, and the limited services which exist in many rural locations (Smith et al., 2018). It may also be that a rural clinical placement offers a transformative experience (Prout et al., 2014) sufficient to change a student's intention from urban to rural and alter a rural intention mindset (Playford et al., 2021).

However, while there is inherent value in a rural clinical placement for students who are unlikely to work rurally themselves in the future, the number of available rural clinical placements is limited (Playford et al., 2021), and student demand typically exceeds availability (KBC Australia, 2020). Strategies are needed to better understand students' rural intentions (Playford et al., 2021) and maximise the value of rural clinical placements in fostering those intentions.

Conclusion

Longitudinal studies on students' rural intentions have been published but a refined understanding of the spectrum of intentions is absent in the literature. To fully understand students' rural intentions, and the factors influencing those intentions, comprehensive research, at all stages of a student's academic career, is required. This project identifies a range of additional factors that could be used to measure, understand and foster student rural intention. Plotting three points of rural intention, and measuring students' intention over time and in response to a variety of experiences, would provide a level of detail which is currently lacking.

This project sought to determine if the rural intention of medical students could be placed on a spectrum, rather than viewed from the usual binary perspective of those who have, or do not have, rural intention. In offering this basis for a more refined model of students' rural intentions, this project responds to increasingly frequent calls for changes to policy and practice regarding the allocation of rural clinical placements. Rural clinical placements are in high demand among students and demand regularly exceeds availability. There is a moral and ethical issue in the strategic provision of significant rural training experiences to better realise their value in improving the maldistribution of Australia's medical workforce.

Acknowledgements

We wish to acknowledge the contribution made by Gina Sjepcevich, Research Officer for Curtin Medical School.

References

- Australian Bureau of Statistics. (2023). *Australian Statistical Geography Standard (ASGS)*.
<https://www.abs.gov.au/statistics/statistical-geography/australian-statistical-geography-standard-asgs>
- Australian Government Department of Health and Aged Care. (2021). *Rural Health Multidisciplinary Training (RHMT) program framework 2019–2020*.
<https://www.health.gov.au/resources/publications/rural-health-multidisciplinary-training-rhmt-program-framework-2019-2020?language=en>
- Australian Institute of Health and Welfare. (2021). *Social isolation and loneliness*.
<https://www.aihw.gov.au/reports/australias-welfare/social-isolation-and-loneliness-covid-pandemic>
- Campbell, D.G., McGrail, M.R., O'Sullivan, B., & Russell, D.J. (2019). Outcomes of a 1-year longitudinal integrated medical clerkship in small rural Victorian communities. *Rural Remote Health*, 19(2):4987. <https://doi.org/10.22605/RRH4987>
- Conner, M., & Norman, P. (2022). Understanding the intention-behavior gap: The role of intention strength. *Frontiers in Psychology*, 13, 923464. <https://doi.org/10.3389/fpsyg.2022.923464>
- Department of Health and Aged Care. (2021). *Modified Monash Model*.
<https://www.health.gov.au/health-topics/rural-health-workforce/classifications/mmm>
- Eley, D. S., Leung, J. K., Campbell, N., & Cloninger, C. R. (2017). Tolerance of ambiguity, perfectionism and resilience are associated with personality profiles of medical students oriented to rural practice. *Medical Teacher*, 39(5), 512–519.
<https://doi.org/10.1080/0142159X.2017.1297530>

- Fereday, J. and Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 80-92. <https://doi.org/10.1177/160940690600500107>
- Hays, R. (2017). The career preferences of students who choose longer duration rural clinical placements. *Investigación en Educación Médica*, 6(21), 3-7. <https://doi.org/10.1016/j.riem.2016.05.011>
- Herd, M. S., Bulsara, M. K., Jones, M. P., & Mak, D. B. (2017). Preferred practice location at medical school commencement strongly determines graduates' rural preferences and work locations. *Australian Journal of Rural Health*, 25(1), 15-21. <https://doi.org/10.1111/ajr.12301>
- Johnson, G.E., Wright, F.C. & Foster, K. (2018). The impact of rural outreach programs on medical students' future rural intentions and working locations: a systematic review. *BMC Medical Education*, 18 (196). <https://doi.org/10.1186/s12909-018-1287-y>
- KBC Australia. (2020). Independent Evaluation of the Rural Health Multidisciplinary Training Program: Final Report to the Commonwealth Department of Health. <https://kbconsult.com.au/project/evaluation-rural-health-mtp/>
- Kent, M., Verstappen, A. C., Wilkinson, T., & Poole, P. (2018). Keeping them interested: a national study of factors that change medical student interest in working rurally. *Rural and Remote Health*, 18(4), 4872. <https://doi.org/10.22605/RRH4872>
- Kondalsamy-Chennakesavan, S., Eley, D., Ranmuthugala, G., Chater, A. B., Toombs, M.R., Darshan, D., & Nicholson, G.C. (2015). Determinants of rural practice: Positive interaction between rural background and rural undergraduate training. *The Medical Journal of Australia*, 202(1), p.41-45. <https://doi.org/10.5694/mja14.00236>
- Liu, B. (2012). *Sentiment Analysis and Opinion Mining*. Morgan & Claypool Publishers.
- McGrail, M. R., Russell, D. J., & Campbell, D. G. (2016). Vocational training of general practitioners in rural locations is critical for the Australian rural medical workforce. *The Medical Journal of Australia*, 205(5). <https://doi.org/10.5694/mja16.00063>
- Playford, D., Ngo, H., Gupta, S., & Puddey, I. B. (2017). Opting for rural practice: the influence of medical student origin, intention and immersion experience. *The Medical Journal of Australia*, 207(4), 154–158. <https://doi.org/10.5694/mja16.01322>
- Playford, D, Ngo, H, & Puddey, I. (2021). Intention mutability and translation of rural intention into actual rural medical practice. *Medical Education*. 55: 496-504. <https://doi.org/10.1111/medu.14404>
- Playford, D. and Puddey, I.B. (2017). Interest in rural clinical school is not enough: Participation is necessary to predict an ultimate rural practice location. *Australian Journal of Rural Health*, 25: 210-218. <https://doi.org/10.1111/ajr.12324>
- Prout, S., Lin, I., Nattabi, B., & Green, C. (2014). 'I could never have learned this in a lecture': Transformative learning in rural health education. *Advances in Health Sciences Education*, 19(2):147-159. <https://doi.org/10.1007/s10459-013-9467-3>

- Razack, S., Hodges, B., Steinert, Y., & Maguire, M. (2015). Seeking inclusion in an exclusive process: discourses of medical school student selection. *Medical Education*, 49(1):36-47. <https://doi.org/10.1111/medu.12547>
- Rural Health Workforce. (2015). Training for the future: How are rural placements perceived and how do we give our students what they are looking for? [Paper presentation]. Rural Medicine Australia 2015, Adelaide Australia. <https://nrhsn.org.au/wp-content/uploads/2022/11/Training-for-the-Future-1.pdf>
- Soutar, G. N., & Turner, J. P. (2002). Students' preferences for university: A conjoint analysis. *International Journal of Educational Management.*, 16(1): 40-45. <https://doi.org/10.1108/09513540210415523>
- Smith, T., Cross, M., Waller, S., Chambers, H., Farthing, A., Barraclough, F., Pitm S.W., Sutton, K., Muyambi, K., King, S., & Anderson, J. (2018). Ruralization of students' horizons: Insights into Australian health professional students' rural and remote placements. *Journal of Multidisciplinary Healthcare*, 11:85-97. <https://doi.org/10.2147/JMDH.S150623>
- White, J., Brownell, K., Lemay, J.F., & Lockyer, J. (2012). "What do they want me to say?" The hidden curriculum at work in the medical school selection process: a qualitative study. *BMC Medical Education*, 12:17. <https://doi.org/10.1186/1472-6920-12-17>
- Woolley, T., Larkins, S., & Sen Gupta, T. (2019). Career choices of the first seven cohorts of JCU MBBS graduates: producing generalists for regional, rural and remote northern Australia. *Rural and Remote Health* 19: 4438. <https://doi.org/10.22605/RRH4438>
- Woolley, T., Sen Gupta, T., Stewart, R. A., & Hollins, A. (2021). A return-on-investment analysis of impacts on James Cook University medical students and rural workforce resulting from participation in extended rural placements. *Rural and Remote Health*, 21(4), 6597. <https://www.rrh.org.au/journal/article/6597>

Appendix A

Understanding the ‘rural intentions’ of first-year medical students

Student name: _____

Student number: _____

The purpose of this survey is to help us understand your current thinking about rural placements, as you commence your studies.

A rural placement is a full-time study experience in a clinical setting. These placements vary in time duration, from short (e.g. a week) to extended (e.g. a year-long placement).

There are no ‘correct answers’ in this survey. This survey has no bearing on your future clinical placement locations or studies.

Providing consent for your survey to be used for research purposes:

I have received information regarding the use of this survey for research purposes and had an opportunity to ask questions. I believe I understand the purpose, extent and possible risks of my involvement in this project and I voluntarily consent to take part.

1. Which phrase best describes you:
 - a. I’d rather live in a city than in the country
 - b. I’d rather live in the country than in a city
2. Which phrase best describes you:
 - a. I completed most of my secondary schooling in a city
 - b. I completed most of my secondary schooling in a city, as a boarder
 - c. I completed most of my secondary schooling in the country
 - d. I completed most of my secondary schooling in the country, as a boarder.

Other:
3. Which phrase best describes you:
 - a. I grew up in the city but like the idea of working in the country
 - b. I grew up in the city and like the idea of working in a city
 - c. I grew up in the country but like the idea of working a city
 - d. I grew up in the country and like the idea of working in the country

Other:
4. Please indicate each place of residence, your age at the start of each residence, and the length of time you lived there.
 - a) As a child, until the age of 12:

Place	State	Country	Length of time (months or years)

b) From the ages of 13 – 18:

Place	State	Country	Length of time (months or years)

c) As an adult:

Place	State	Country	Length of time (months or years)

5. Have you ever had a significant rural experience that impacted your view of rural Australia? Indicate all that are relevant:
 - a. No
 - b. Yes, visiting family/friends who were living in a rural location. Please explain:
 - c. Yes, had a memorable holiday(s) in a rural location. Please explain:
 - d. Yes, had a memorable experience passing through a rural location. Please explain:
 - e. Other, please explain:
6. Where do you intend to work as a doctor?
 - a. In Australia
 - b. Country other than Australia: please indicate
 - c. In Western Australia
 - d. If outside Western Australia: please indicate
 - e. Unsure at this stage
7. What is your preferred location to work as a doctor?
 - a. Major city (more than 110,000 people)
 - b. Regional centre (25,000 – 100,000)
 - c. Town (10,000 – 24,999)
 - d. Small community (less than 10,000)

e. Other: please indicate

8. Please rate the following West Australian locations that appeal as a location to work as a doctor. Please tick ✓ your choices:

Location	Appeals to me to live and work there	Does not appeal to me to live and work there	Not familiar with this location
Albany			
Broome			
Esperance			
Geraldton			
Kalgoorlie			
Margaret River			
Merredin			
Perth			
Wyndham			

Other locations that appeal as a location to work as a doctor:

9. Please state the main reasons you rated particular locations as appealing.
10. What impact do you think rural placements might have on you?
11. In what ways do you think rural placements might impact on where you work as a doctor in the future?
12. What would be the length of time you'd be willing to spend on rural placement?

None	
Up to 2 weeks	
2-4 weeks	
Up to 3 months	
Up to 6 months	
An extended placement up to 1 year	

13. What you think might be the best aspect(s) of a rural placement during your studies?
14. What do you think might be the worst aspect(s) of a rural placement during your studies?
15. Is there anything else that came to mind when you were completing this survey, which you would like to add?