BMJ Open

Evaluating the importance of rural internships to subsequent medical workforce distribution outcomes: an Australian cohort study

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To cite: McGrail MR, Fox J, Martin P. Evaluating the importance of rural internships to subsequent medical workforce distribution outcomes: an Australian cohort study. *BMJ Open* 2024;**14**:e084784. doi:10.1136/bmjopen-2024-084784

► Prepublication history for this paper is available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2024-084784).

Received 29 January 2024
Accepted 30 September 2024

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ABSTRACT

Objective To evaluate the importance of rural internships to observed medical workforce distribution outcomes up to 8 years post-medical school.

Design and setting Cohort study of medical graduates of The University of Queensland (UQ), Australia.

Participants UQ graduates who were medical interns in Queensland's public health system between 2014 and 2021 and observed working in Australia in 2022. Internship location was defined as being metropolitan or rural, along with other key rural exposures of whether they are of rural origin (childhood) and whether at least 1 year of clinical training at medical school was in a rural location.

Primary outcome measure Current work location was collected from the Australian Health Practitioner Regulation Agency (AHPRA) in 2022, classified as either rural or metropolitan and measured in association with their internship location.

Results From 1930 eligible graduates, 21.5% took up a rural internship, which was associated with rural origin (OR 1.5, 95% CI 1.2 to 2.0) and medical school rural immersions of either 1 year (OR 2.8, 95% CI 2.1 to 3.7) or 2 years (OR 5.8, 95% CI 4.4 to 7.7). Completing a rural internship was associated with currently working rural (47% vs 14%, OR 4.6, 95% CI 3.5 to 5.9), which weakened the observed (adjusted) effect of rural origin (OR 1.5, 95% CI 1.2 to 2.0) or medical school rural immersions (1 year: OR 1.4, 95% CI 1.0 to 1.9; 2 years: OR 1.7, 95% CI 1.2 to 2.3). All combinations of the key rural exposures that included rural internship had the highest proportions currently working rurally (range 32–69%) compared with the combinations with a metropolitan internship (range 12–22%).

Conclusions Internship location appears to be a critical factor in shaping medical workforce distribution decisions. This evidence supports the need for strengthened and expanded rural training pathways after medical school. In particular, clearer pathways into specialty programmes via rural internships are likely to support increased numbers choosing (with confidence) to preference rural internship first and subsequently more working in rural areas long term.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The cohort study used linked administrative datasets to evaluate all eligible graduates working within Queensland.
⇒ All study results are adjusted for known key rural exposures and participant characteristics from premedicine to nearing completion of specialty training.
⇒ This study was limited to graduates of one medical school that undertook internship in that state's public health system. However, key rural exposures and participant characteristics were reflective of all Australian medical graduates.
⇒ Only administrative data were used, thus limiting available measures.
⇒ Relying on Australian Health Practitioner Regulation Agency data for workforce outcomes may produce some inaccuracies and does not reflect short-term rural rotations or rural outreach.

INTRODUCTION

Geographical maldistribution of doctors across metropolitan and rural communities exists worldwide. Insufficient medical graduates are choosing a rural career to address current and future workforce gaps.[1 2] For example, in Australia, approximately 29% of its population are in rural locations compared with around 22% of its medical workforce.[3] The underlying factors include a scarcity of medical schools considering the production of rural doctors as central to their mission, inadequate selection of students with a rural background and/or rural interest, incompatibility of many popular medical subspecialisations with rural practice, limited healthcare infrastructure and resources in some rural areas and most doctors wanting to work nearby to where they completed postgraduate training—often in well-resourced areas within major cities.[4 5] Rural deficits with respect to healthcare access, particularly for doctors, is common globally.[6]

Most countries include an internship immediately after graduation from medical school, as part of the medical training pathway to general registration, either before entry

to specialty college (eg, Australia, UK) or embedded upfront within residency programmes (eg, USA, Canada). Medical internship is a key transition point in medical training, from student to independent doctor.[7] Interns are closely supervised by senior doctors and supported through regular education sessions and capability assessments; in this period, they are both finding their feet in the workplace and 'sightseeing' as they determine which specialty and setting they best fit with.[8] A large proportion are not yet clear of their preferred key career decisions.[9] Given that evidence suggests graduates' choice of internship hospital is associated with their longer term career and/or social interests[10] and that rurally based internships have been demonstrated to be positive and professionally satisfying experiences,[11 12] encouraging more graduates to choose a rural internship could play a role in sustaining their interest and producing more rural doctors. However, evidence supporting this is currently scarce.

There is a growing body of evidence, largely from medical school graduate tracking studies of who is observed to be working rurally, which has consistently demonstrated the importance of selecting those of rural background/rural interest and supporting extended placements in rural communities as part of their training.[13 14] Evidence from primary care residency programmes and some other specialties across both the USA[15–17] and Australia[18 19] also suggests that increased rural training exposure during their graduate medical education (or vocational training) period is also significantly associated with subsequent rural practice, often in the same or neighbouring location.

In contrast, evidence of the contribution of preferencing and take-up of rural internships, in addition to rural background/rural interest and rural training exposure, is less clear. Outside of one Victorian study[20] and a recent Queensland-wide study,[21] there has been little published on internship preferences and acceptances, or longer term work locations associated with rural internships. This study aims to evaluate the importance of rural internships to observed medical workforce distribution outcomes. This is observed up to 8 years post-medical school, for a cohort from a large medical school in Queensland, Australia.

The context of medical training and internship allocation in Australia

In Australia, medical students complete their degree at 1 of 20 universities over 4–6 years, with many programmes being graduate entry, requiring a prerequisite 3-year degree.[22] Medical school training is based at the university, in hospitals and in other clinical settings such as general practices and community-based health services. All graduates then complete a compulsory internship year, no longer connected to universities and undertaken with provisional registration, which changes to general registration at successful completion of their internship. Most then undertake a minimum 1 year of clinical service as junior doctors (also termed 'prevocational trainees'), mostly in hospitals, before entry into vocational training which is overseen by specialist colleges. Graduating with a fellowship of a specialty college usually occurs within 6–10 years after medical school.

In 2021, Australia published its 10-year National Medical Workforce Strategy, with a key focus on addressing the ongoing geographical maldistribution.[23]Moreover, a significant long-term national policy of Australia has been its Rural Health Multidisciplinary Training (RHMT) programme. The RHMT aims to improve the recruitment and retention of doctors to the rural workforce through several key initiatives that are embedded in universities, including Rural Clinical Schools (RCSs, from 2000) and Regional Training Hubs (RTHs, from late 2017).[24] RCSs and RTHs build partnerships with medical schools, hospitals and other health services to support increased education, clearer pathways and clinical training capacity in rural areas for doctors, thus strengthening rural career interest and guidance. However, responsibility for the provision of internships is predominantly with each jurisdiction's health department.

Queensland has fewer intern positions on offer compared with the total number of medical graduates (eg, in 2021, there were 784 intern positions and 858 graduates of Queensland medical schools, the latter consisting of 738 domestic and 120 international students), although Queensland-trained domestic students are guaranteed an internship. Notably, Queensland Health (ie, Queensland's main public health provider) has expanded its rural internship positions over the last decade, based in 12 metropolitan and 8 rural hospitals, to near-parity with its population distribution. Historically, there has been a strong competition for internships in large metropolitan hospitals; in contrast, under-preferencing of some rural hospitals is anecdotally reported. An application process is conducted through an online portal assessing applicants' merit, comparing their preferences with available positions and allocating a position if eligible.[25]

METHODS

This retrospective cohort study design used three data sources. First, Queensland Health (QH) provided internship preferences and acceptances data for all graduates of The University of Queensland (UQ) who were interns in 2014–2021. Second, these were matched to UQ's administrative dataset of key characteristics including childhood origin (ie, rural or not), rural clinical training participation, being rural bonded, gender and age at graduation. Third, graduates were matched using their Australian Health Practitioner Regulation Agency (AHPRA) registration number to identify their practice location in 2022, as well as in 2020 and 2018 for the same cohort.

Patient and public involvement

This study focused on locational outcomes of graduating medical students; it did not involve patients or the

general public in the design, conduct or reporting of this research.

Study measures and definitions

This study uses a few key measures, linked to individuals via unique identifiers from both UQ and AHPRA. Internship location data were geocoded using the 2019 Modified Monash Model (MMM) national classification as either rural (MMM 2–7 communities) or metropolitan (MMM-1). The MMM classification is defined by the Commonwealth Government and widely applied to health policy, distinguishing locations based on their population size and remoteness but using an evidence-based approach specific to general practitioners.[26] Using QH's full list of internship location preferences (up to n=20), calculated study measures included whether they accepted their first preference, if offered; whether their first preference was metropolitan or rural; and the preference number of the accepted offer. Only group A applicants (Queensland-based graduates, domestic enrolments) were included in this study, thus excluding UQ's graduating international students who stayed working in Queensland (these are group C applicants; group B applicants were interstate graduates, thus already excluded). Demographic, training and enrolment data from UQ included if they were classified as being of rural origin (based on Australia's current definition of residency in a 'rural' area (MM 2–7) for at least 10 years cumulatively or any 5 years consecutively up to aged 18, verified by admissions team on enrolment); if they enrolled in a rural-bonded place, which means they have an obligation to work for up to 3 years in eligible rural locations, but with 18 years to complete; if they had spent one or two clinical training years as a medical student with UQ in a rural setting; gender and age at graduation, which was simplified to whether they were at least 28 or not. Their postgraduation year (PGY) was calculated as the difference between the final observed work location year (ie, 2022) and their graduation year, which was categorised as PGY 2 to 3, PGY 4 to 5 and PGY 6 to 8.

Key outcomes and comparison groups

Work location was collated from AHPRA as town/suburb and postcode, then geocoded under the MMM national classification as rural or metropolitan. Rural internship location was used as both a primary outcome and independent variable. Current (June 2022) work location was the other primary outcome measure, while 2018 and 2020 locations contributed to intermediate outcomes (eg, work location at PGY 2 to 3 or PGY 4 to 5), depending on their internship year. Modelling of their current work location excluded 2021 interns, to ensure a minimum gap of 1 year.

Statistical analysis

Associations between participant characteristics and the two primary outcomes of internship location and current work location were assessed using Fisher's exact test. Absolute counts were observed against eight rural exposure groups, defined by all possible combinations of the three key rural immersion timepoints of their childhood, university and internship. Multivariable logistic regression models were applied to each primary outcome of internship location and work location (in 2022). Second, in turn, models limited the included participants to those choosing a rural or metropolitan internship and whether they stayed rural or had subsequently moved to a rural location. All analyses used Stata SE V.18.0 for Windows (Stata Corp, College Station, Texas, USA) and 95% CIs are reported.

RESULTS

There were 1930 graduates who met the study's inclusion criteria. Working rurally, either in their internship year or currently, was significantly associated with being of rural origin, rural bonded or participating in 1–2 years rural clinical training; in contrast, gender and age were not associated with work location at either timepoint (table 1). Approximately 22% took up a rural internship, which was associated with currently working rural (47% vs 14%), although it is also notable that a slight majority of those currently rural completed their internship in a metropolitan setting (n=206 vs n=193); similarly, 15% had first preferenced a rural internship, which was associated with currently working rural (57% vs 14%).

Multivariable logistic regression modelling of those completing a rural internship confirms two significant factors of rural origin (OR 1.5, 95% CI 1.2 to 2.0) and medical school rural clinical training of either 1 year (OR 2.8, 95% CI 2.1 to 3.7) or 2 years (OR 5.8, 95% CI 4.4 to 7.7). Being rural bonded, along with gender and age, was not a significant factor.

Table 2 shows, in crude terms, the proportion of each rural exposure group observed currently working rurally. The lowest proportions were associated with rural origin alone (12%), 1–2 rural clinical years alone (16%) or none of the three rural exposures (13%). In contrast, rural internship appeared to be the strongest factor, either alone (32%) or up to 69% working rurally when combined with the other two factors. All four rural exposure groups that included rural internship had higher proportions currently working rurally (range 32% to 69%) than the other four groups with a metropolitan internship (range 12% to 22%).

The crude association between internship location and current work location at each of PGYs 2 to 3, 4 to 5 and 6 to 8 is summarised in figure 1. Rural interns could either stay rural or move to a metropolitan location and vice versa for metropolitan interns. At PGY 2 to 3, most were observed in the same location type, with around 72% staying in rural locations and 95% staying in metropolitan. At PGY 4 to 5 and PGY 6 to 8, this drops to about 49% and 42%, respectively, still working in rural areas. Around 12% had changed from metropolitan internship to rural work at either PGY 4 to 5 or PGY 6 to 8.

Table 1 Study participant characteristics and crude associations with rural internship uptake

	Level	Participants (n, %) Total N=1930	Rural internship N=415 (21.5%)	Rural internship uptake, adjusted model (OR, 95% CI)
Rural origin	No	1488 (77%)	276 (19%)	Ref
	Yes	442 (23%)	139 (31%)	1.5 (1.2 to 2.0)
Rural bonded	No	1435 (74%)	285 (20%)	Ref
	Yes	495 (26%)	130 (26%)	1.2 (0.9 to 1.5)
Rural clinical training (university)	0 years	1328 (69%)	176 (13%)	Ref
	1 year	306 (16%)	92 (30%)	2.8 (2.1 to 3.7)
	2 years	296 (15%)	147 (50%)	5.8 (4.4 to 7.7)
Gender	Female	786 (41%)	179 (23%)	Ref
	Male	1144 (59%)	236 (21%)	0.9 (0.7 to 1.2)
Graduation age	<28 years	1502 (78%)	326 (22%)	Ref
	28+ years	428 (22%)	89 (21%)	0.9 (0.7 to 1.2)
Rural internship	No	1515 (78%)	N/A	N/A
	Yes	415 (22%)	N/A	N/A
Rural intern first preference	No	1643 (85%)	131 (8%)	
	Yes	287 (15%)	284 (99%)	

Table 3 confirms all three key exposures of 1–2 rural clinical training years, rural origin and rural internship were associated with subsequently working rural. However, after adjustment for confounding the effect of rural internship remained strong (OR 4.6, 95% CI 3.5 to 5.9), while the effect of 2-year rural training (OR 1.7), 1-year rural training (OR 1.4) and rural origin (OR 1.6) remained significant but of a lower OR. Other factors of being rural bonded, gender and age were non-significant. The second model revealed increased odds of rural work where they had both completed the rural internship and preferenced it first, compared with a lower rural preference.

Table 4 identifies that lower preferencing of an accepted rural internship was strongly associated with decreased odds of subsequently working in a rural location. Rural origin was associated with increased odds of staying rural, similarly for those rural bonded. Rural clinical training was not associated with staying rural after accounting for other confounding factors, nor where gender and age. Changing from metropolitan internship to subsequent rural work was significantly associated with those completing rural clinical training in medical school, but not for other factors including those of rural origin or those rural bonded.

DISCUSSION

This study provides new evidence of the strong association between completing medical internship in a rural location and subsequent rural practice across the first 3–8 years after medical school. Our modelling found that undertaking a rural internship had a stronger association than other rural exposure factors including rural childhood origin, 1–2 years rural clinical training in medical school or being rural bonded as part of their medical school admission. Notably, no combination of factors that included a metropolitan internship saw over 22% working

Table 2 Work location outcome of key rural exposures (childhood, medical school, internship)

Exposure group	Rural origin	1–2 years rural clinical training	Rural internship	Current rural work % (95% CI)
Type 1 (n=210)	**Yes**	No	No	12% (8% to 17%)
Type 2 (n=942)	No	No	No	13% (10% to 15%)
Type 3 (n=270)	No	**Yes**	No	16% (11% to 20%)
Type 4 (n=93)	**Yes**	**Yes**	No	22% (13% to 30%)
Type 5 (n=133)	No	No	**Yes**	32% (24% to 40%)
Type 6 (n=143)	No	**Yes**	**Yes**	42% (34% to 50%)
Type 7 (n=43)	**Yes**	No	**Yes**	56% (41% to 71%)
Type 8 (n=96)	**Yes**	**Yes**	**Yes**	69% (59% to 78%)

Source: UQ graduate outcomes in 2022, merged with QH internship data 2014–2020 (ie, 2013–2019 medical school graduates).

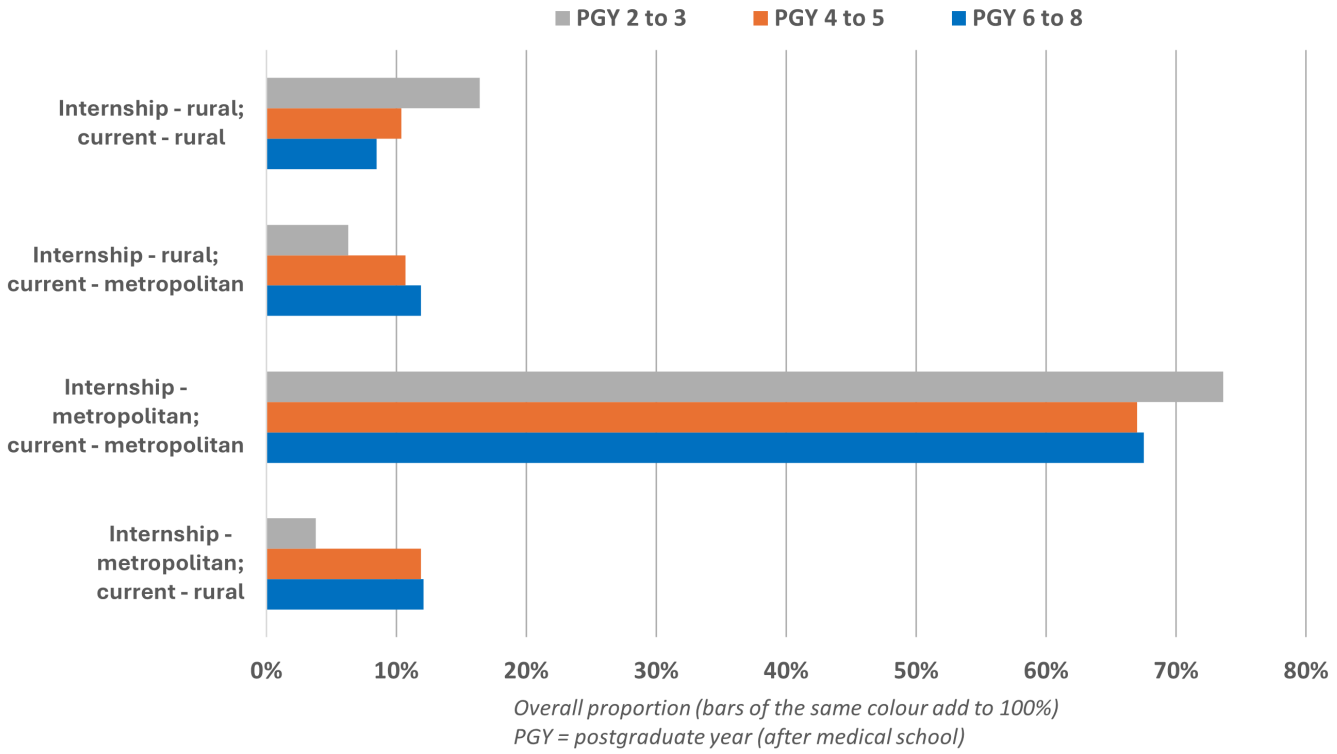

Figure 1 Aggregate of current work location by career stage, relative to internship location. PGY, postgraduation year.

Table 3 Multivariable logistic model of factors associated with rural work outcomes, adjusting for key rural exposures

		Rural work 2022 N=399 (20.7%)	Rural work 2022, adjusted model 1 OR, 95% CI	Rural work 2022, adjusted model 2 OR, 95% CI
Rural internship	No	206 (14%)	Ref	n/a
	Yes	193 (47%)	4.6 (3.5 to 5.9), p<0.001	n/a
Intern location and preference*	Both metropolitan	206 (14%)	n/a	Ref
	Metropolitan preference & rural intern	29 (22%)	n/a	1.8 (1.1 to 2.7), p=0.012
	Both rural	164 (58%)	n/a	7.3 (5.3 to 9.8), p<0.001
Rural clinical training	0 years	211 (16%)	Ref	Ref
	1 year	78 (25%)	1.4 (1.0 to 1.9), p=0.04	1.3 (0.9 to 1.8)
	2 years	110 (37%)	1.7 (1.2 to 2.3), p=0.002	1.3 (0.9 to 1.8)
Rural origin	No	263 (18%)	Ref	Ref
	Yes	136 (31%)	1.5 (1.2 to 2.0), p=0.002	1.5 (1.2 to 2.0), p=0.003
Rural bonded	No	272 (19%)	Ref	Ref
	Yes	127 (26%)	1.1 (0.9 to 1.5)	1.1 (0.9 to 1.5)
Gender	Female	155 (20%)	Ref	Ref
	Male	244 (21%)	1.2 (0.9 to 1.5)	1.2 (0.9 to 1.5)
Graduation age	<28 years	300 (20%)	Ref	Ref
	28+ years	99 (23%)	1.1 (0.9 to 1.5)	1.1 (0.8 to 1.5)

*There were no observations of rural preference and metropolitan internship.

Table 4 Multivariable logistic model of factors associated with rural work outcomes, stratified by internship location

		After rural internship		After metropolitan internship	
		Rural work 2022 n=193 (47%)	Rural work 2022, adjusted model (OR, 95% CI)	Rural work 2022 n=206 (14%)	Rural work 2022, adjusted model (OR, 95% CI)
Rural clinical training	0 years	67 (38%)	Ref	144 (12%)	Ref
	1–2 years	126 (53%)	1.1 (0.7 to 1.7)	62 (17%)	1.4 (1.0 to 2.0)
Accepted intern preference	1st preference	156 (57%)	Ref	199 (14%)	Ref
	2nd to 5th	21 (44%)	0.6 (0.3 to 1.1)	6 (11%)	0.8 (0.3 to 1.8)
	6th or more	16 (17%)	0.2 (0.1 to 0.3)	1 (2%)	0.1 (0.0 to 1.1)
Rural origin	No	103 (37%)	Ref	160 (13%)	Ref
	Yes	90 (65%)	2.4 (1.5 to 3.9)	46 (15%)	1.2 (0.8 to 1.7)
Rural bonded	No	112 (39%)	Ref	160 (14%)	Ref
	Yes	81 (62%)	1.9 (1.2 to 3.1)	46 (13%)	0.8 (0.6 to 1.2)
Gender	Female	74 (41%)	Ref	81 (13%)	Ref
	Male	119 (50%)	1.5 (0.9 to 2.3)	125 (14%)	1.1 (0.8 to 1.4)
Graduation age	<28 years	139 (43%)	Ref	161 (14%)	Ref
	28+ years	54 (61%)	1.4 (0.8 to 2.4)	45 (13%)	1.0 (0.7 to 1.4)

rurally; in contrast, all combinations that included a rural internship saw at least 32% working rurally and which increased to 69% when all three rural connection points of childhood origin, rural clinical training in medical school and rural internship were present.

In Australia, the number of rural medical internships has grown sharply, rising from very few 20 years ago to the current near-parity level.[25 27] However, limited published evidence suggests that many of these additional rural internships are not being sufficiently filled by either those ranked highest in the selection process or those with a high preference or strong rural career interests at that time.[20] Instead, they are being too often filled by the lower priority applicants, particularly international students completing their medical degree in Australia and then choosing to remain, which is often via rural internships. As this study demonstrates, when graduates have preferenced and accepted rural internships, the subsequent association between completing a rural internship and future work in a rural location is strong, seemingly more so than either rural childhood or rural clinical training in medical school. This does not mean that the latter factors are less 'important' in the pathway, but mirrors other evidence of significant mediation in such modelling, suggesting that the early training years after medical school most strongly shapes the workforce distribution.[13] Thus, solving the chronic workforce distribution issue could be partly addressed through increasing the number of new domestic graduates who actively preference completing a rural medical internship.

The focus of this study was mostly about work location outcomes after rural internship, demonstrating strong association with rural practice. However, it remains that only about 1 in 7 (15%) first preferenced a rural internship and 22% then accepted a rural internship, both being well short of Queensland's allocation of 30% of intern places in rural areas. Across the literature and anecdotally, many reasons are noted why some new graduates choose not to do their internship in a rural setting, even if they have a strong long-term interest in living or working in rural areas. A key factor is that many remain uncertain if going rural may hinder some part of their training pathway.[28] Entry into most specialty colleges is highly competitive and thus most potential applicants are going to seek training pathways that are at the very least not going to impede their chances.

With smaller training cohorts and often a broader range of cases, rural internships have been demonstrated to provide positive and professionally satisfying, but this factor may not be enough justification for many junior doctors.[11 12] It is often pushed aside by the pulling power of the big hospital and the perception of these offering more 'opportunities', such as for research, networking and other boosts for their curriculum vitae (CV).[20 29 30] This 'metro bias' is likely to apply strongly to those who are more uncertain of their preferred career and thus are seeking a larger range of opportunities and experiences. It may also apply to those with a clear specialty target, such that a tunnel vision approach to improving their networking, experiences, reputation, references and other CV-boosts in that specialty, often perceived to be more common in larger metropolitan hospitals, may be most important to their location decision-making.

Junior doctors who choose a rural training pathway to their specialty can face many other potential challenges, although the direct impact of these is not well understood. In particular, rural hospitals are generally characterised by a number of factors that perceivably could reduce their attractiveness as training pathways to specialty entry: (1) increased turnover of senior staff (fragility), thus limiting local leadership; (2) less culture of supporting career development, accepting that non-retention of the junior

doctor is likely and thus not worth investing in; (3) only having partial (or missing) training pathways for many specialties, but limited local resources to change this; (4) increased proportion of senior staff trained outside of the Australian system, thus a lack of local knowledge and/or career support; (5) concern, particularly with chronic rural workforce shortages, whether they will consistently get quality supervision, teaching and clinical exposures.[11 31]

Despite small growth of specialty training opportunities outside of large metropolitan settings in recent years, it remains a very small proportion of medical training. Moreover, most specialty colleges do not actively value rural internships or other rural clinical training experiences in their admission processes.[32] In combination, it is unsurprising that many junior doctors perceive that a rural internship may isolate themselves from the training networks and perhaps reduce their chances of later breaking back into those networks. If specialty colleges consider addressing workforce maldistribution as a key priority, then stronger pathways into specialty programmes via rural internships of those with a strong interest in rural work long-term seems an obvious goal. As demonstrated here and from many other studies, the 'consequences' of missing rural training periods after medical school on the long-term workforce distribution outcomes are clear and somewhat dire.

A strength of this study is the large number of observations, using three linked administrative datasets thus having very few missing data from all graduating cohorts. However, a key limitation of this study is that it did not investigate the contribution of their preferred or actual specialty choice on the observed patterns. In Australia and globally, undertaking general practice specialty training in a rural location is commonly available; moreover, entry into general practice is often perceived to be less competitive, while a higher proportion of doctors working in rural areas are general practitioners (GPs) compared with that in metropolitan areas. This likely gives more confidence to those who are considering or open to the idea of working as a GP, that completing a rural internship is a good option for them. However, evidence from a separate study across different career points found that rural training time in the years following medical school were significantly associated with rural practice, irrespective of whether they chose general practice or another specialty.[13] In addition, this study's data come from a single university programme and only focused on one state employer (QH), although it is known that very few go interstate at this career point. Up to PGY 8, we also know that very few will have completed all training, thus current work location may not reflect their eventual longer term choice. Relying on AHPRA data for workforce outcomes may produce some inaccuracies and does not reflect short-term rural rotations or rural outreach.[33]

One point of caution is that Queensland offers a relatively large number of rural internship positions, in parity with population distribution. Some jurisdictions, such as South Australia and Western Australia, only offer a small proportion of rural internships and thus the career pathways of junior doctors in those states will likely be shaped differently.

CONCLUSION

This study demonstrates that the medical internship location is a critical factor in shaping workforce distribution decisions. Rural internship was the most consistent factor associated with subsequent rural practice, even after accounting for other key factors including childhood origin, being rural bonded or medical school rural-based clinical training. This evidence supports the need for strengthened and expanded rural training pathways after medical school, given its strong association with longer term decisions to work rurally. The availability of rural pathways should be aligned with supporting sufficient rural careers, with evidence encouraging stakeholders involved in postgraduation training to be more cognisant of the impact of training location(s) on workforce distribution outcomes.

Contributors MRM: Conceptualisation, methodology, investigation, formal analysis, writing—review and editing, supervision, project administration. JF: Supported methodology and investigation, writing—review and editing. PM: Supported methodology and investigation, writing—review and editing. All authors reviewed and approved the manuscript before submission for publication. MRM is the guarantor for this work.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Utilisation of QH data for this project was approved by the Townsville Hospital and Health Service Human Research Ethics Committee (HREC) (Reference: HREC/QTHS/77113) as part of a separate statewide study, while usage and linkage of all three datasets was approved by UQ's HREC (project: 2021/HE001740).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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