

Continuity of service and longer term retention of doctors training as general practitioners in the Remote Vocational Training Scheme

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The known: Turnover of general practitioners in more remote and First Nations health services is generally high (reasonable retention is estimated as two years). The Remote Vocational Training Scheme (RVTS) aims to address this, but the program's service continuity and longer term retention outcomes have not previously been analysed.

The new: RVTS participants provided a mean of 1.6 years' service in the same practice before the program, and a mean of 3.6 years' additional service at the same practice during the program (5.2 years in total); 49% were still in the same community two years after completing the program.

The implications: Service continuity outcomes can be improved — above expected levels — in challenging settings by using place-based retention-focused programs like the RVTS.

Poor continuity of care and high turnover of health care staff are common characteristics of more remote and First Nations health services, which is very costly both financially and in terms of the quality of care in these high need communities.^{1,2} Turnover rates for general practice fellows and trainees are higher in smaller rural and remote communities than in other contexts. Fewer than 50% of general practice fellows and trainees in such smaller communities are retained after three years,^{3,4} and one study of health service managers in this context concluded that retaining doctors for two years was reasonable.¹ International medical graduates (IMGs) are a major source of workforce for Aboriginal Medical Services (AMS) and for rural and remote communities.^{5,6} However, they are generally older, more of them have dependants, and many of them are mandated to practise rurally, and all of these factors may decrease their satisfaction and willingness to continue working in these locations,^{7,8} and contribute to them relocating at a higher rate than Australian medical graduates.^{3,4}

Australia's National Medical Workforce Strategy 2021–2031 aims for more general practitioners who are distributed to meet the needs of communities;⁹ however, place-based “grow-your-own” retention-focused strategies, which can efficiently address the distribution and continuity of primary care services in this context, are uncommon.^{10–13} Notably, there is also scant high quality evidence on the impact of interventions for achieving more remote continuity of service and longer term retention outcomes specific to the general practice workforce.^{14,15}

Australia's Remote Vocational Training Scheme (RVTS) is a place-based retention-focused workforce program. For 24 years, it has provided remote supervision and support for doctors to remain working either in MMM4–7 (Modified Monash Model) practices in its Remote Stream or in rural (MMM2–7) AMS in its AMS Stream. Enrolment is typically for three to four years, until all program requirements are completed, which mostly mirrors

Abstract

Objective: To explore continuity of service and longer term retention outcomes of participants of the Remote Vocational Training Scheme (RVTS).

Design, setting, participants: Retrospective cohort study of all doctors who participated in the RVTS from 2000 to 2023, many of whom are international medical graduates and are expected to work in the same community for three to four years in remote (Modified Monash Model [MMM] categories 4–7) or rural Aboriginal Medical Services (AMS) streams while undertaking training towards general practice fellowship.

Main outcome measures: Continuity of service was measured in the pre-program period (period working in same practice before commencing) and during-program period (period completing the RVTS program in same practice as worked in before commencing the program). Retention was measured firstly within two years, and secondly beyond two years (up to 20 post-completion years) based on: working in the same community (relevant to both streams); working in the same region (Remote Stream only); working in any MMM4–7 community (Remote Stream only); or working anywhere rurally (both streams).

Results: From 506 enrolled participants, 373 (73.7%) were international medical graduates. The approximate mean service continuity in the same practice was 1.6 years (standard deviation [SD], 2.2 years) for the pre-program period and 3.6 years (SD, 1.4 years) for the during-program period (mean total, 5.2 years). Two years after completion, 21 out of 43 Remote Stream doctors (49%) and four out of five AMS Stream doctors (80%) remained in the same community. Over the long term, retention in the same community stabilised to 44 out of 242 Remote Stream doctors (18.2%) and seven out of 27 AMS Stream doctors (26%); 72 Remote Stream doctors (29.8%) remained in the same region, 70 Remote Stream doctors (28.9%) were in an MMM4–7 community, and 11 AMS Stream doctors (41%) were in a rural (MMM2–7) community.

Conclusion: Strong service continuity outcomes have been achieved by the RVTS, which supports mostly international medical graduates in locations typified by the highest workforce turnover. This suggests that continuity of service could be improved for remote and First Nations communities through place-based retention-focused programs like the RVTS.

completion of general practice fellowship.^{16,17} The AMS Stream only began in 2013, contributing 20% of the RVTS cohort since it commenced. Uniquely, the RVTS program targets continuous service in these communities. Owing to the locations it targets, it engages a high proportion of IMGs (about 80%),¹⁸ which is a group that requires nuanced support and career advice.^{19,20} Community support and integration are known to be key factors that influence retention for this group.²¹ Doctors participating in the RVTS work in challenging contexts, with higher and more complex caseloads, coupled with reduced resources and infrastructure.^{22–24} IMGs working in AMS may also face increased cultural barriers.²⁵ Moreover, many are completing

their ten-year moratorium requirements while enrolled in the RVTS, which may be an additional source of concern during their training.²⁶

To our knowledge, there have only been small early studies of RVTS graduate outcomes to date, and these have not explored overall service continuity or considered the moratorium period in their analyses.^{27,28} In this study, we aimed to explore continuity of service and longer term retention of doctors participating in the RVTS.

Methods

This exploratory, descriptive cohort study used retrospective administrative data for doctors who participated in the RVTS from 2000 to 2023. These data included demographic variables (sex, age at enrolment, country of medical training, year first registered in Australia), location during the RVTS (community or town and postcode, coastal or non-coastal), stream (Remote Stream or AMS Stream), year of commencing, outcome status (active, withdrawn, or completed program requirements) and fellowship details. Qualitative data about reasons for withdrawing were coded and validated by the RVTS.

Participant location during the RVTS was geocoded using the 2019 Modified Monash Model national classification, validated online via the Health Workforce Locator tool.²⁹ Current work location was sourced by matching each participant's Australian Health Practitioner Regulation Agency (AHPRA) registration number in November 2023, as supplied by the RVTS, then similarly geocoding to the 2019 Modified Monash Model classification.

Continuity of service

Continuity of service in the same practice was recorded for both the pre-program and during-program periods. Pre-program service continuity was estimated based on a random (11% [58/506]) sample of applicant curricula vitae (those of 40 Remote Stream participants and 18 AMS Stream participants). During-program service continuity was measured as whole years from RVTS commencement through to 2023, or year of completing or withdrawing from the program. For example, commencing in 2015 and completing in 2018 was counted as four years' continuity. Respective months of service were not available for more granular analysis, but the RVTS program broadly operates on whole calendar years.

Longer term retention

Longer term (post-program) retention was defined by comparing each participant's current AHPRA work location with their location during the program to determine whether they were: working in the same community, measured as within 10 km of the RVTS location and assumed to approximate the same practice (relevant to both streams); working in the same rural region, based on federal electoral boundaries, which largely align with hospital and health service regions (Remote Stream only); working in any MMM4–7 community (Remote Stream only); or working anywhere rurally, defined as any MMM2–7 community (both streams). Longer term retention outcomes were analysed for all commencing participants except those still active. Participants who completed the program were grouped into cohorts by number of years since completion, to increase counts for estimating proportions: less than two years since completion (completion year of 2022 or 2023), two to three years

since completion (completion year of 2020 or 2021), and so forth up to 20 years post-program. An aggregation of all cohorts other than the most recent graduates (defined as two or more years since completion) was used to estimate the mean longer term retention, providing a more conservative estimate (not inflated by the higher rates of those who might stay in the initial two years).

Statistical analyses

Where appropriate, longer term results were adjusted for being rurally mandated (or not), which was estimated for IMGs using a combination of their work time in Australia before enrolment, their time within the program location and remoteness of the program location (accommodating scaling or less moratorium years if working more remotely), in line with moratorium policy.³⁰ If the time served was less than the re-scaled target (less than ten years) at program completion, these doctors were deemed to have rural moratorium that was still outstanding.

Multivariable logistic regression models explored longer term retention firstly in the same community, then in the same region, any MMM4–7 community and any MMM2–7 community for the Remote Stream participants, excluding those still active. Tested variables were limited to available administrative data and included training location characteristics (remote [MMM6–7 community] or coastal community [< 50 km from the coast]), and participant characteristics (sex, country of training, fellowship program [college], clinical years in Australia at commencement, moratorium or age at completion, and career point at November 2023).

All analyses were completed using Stata/SE 15.1 for Windows (StataCorp) and a *P* value of less than 0.05 was considered to indicate statistical significance.

Ethics approval and reporting

This study was approved by the University of Queensland Human Research Ethics Committee (2023/HE001926, 24 October 2023). The study reporting follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.³¹

Results

A total of 506 participants commenced the RVTS program, of whom the majority were IMGs (373, 73.7%) and men (329, 65.0%); 435 (86.0%) enrolled in the Remote Stream and 71 (14.0%) enrolled in the AMS Stream. At program commencement, IMGs had worked in Australia for a median of 5 years (interquartile range [IQR], 3–8 years) and had worked clinically for a median of 14 years (IQR, 10–19 years), and an estimated 292 (78.3%) were yet to complete their rural moratorium. Australian and New Zealand medical graduates had worked clinically for a median of 6 years (IQR, 4–11 years) at program commencement. There were no statistically significant differences between participant characteristics per stream type (comparing sex, country of training, clinical years working and time working in Australia).

Overall, 425 Remote Stream participants (97.9%) worked in MMM4–7 communities during the program; this included 141 in remote areas (32.5%, MMM6–7), 218 in small rural communities (50.2%, MMM5) and only 66 in medium rural communities (15.2%, MMM4). As of November 2023, 101 were still active (of whom 87 [86%] were in the Remote Stream), 317 had completed the program requirements (of whom 281 [88.6%] were in the

Remote Stream) and 88 had withdrawn from the program (of whom 67 [76%] were in the Remote Stream). The overall program completion rate was 78.3% (317 of the 405 participants who were not still active). Withdrawal was related to inadequate progress (48 participants) or leaving the practice (40 participants), and the rate of withdrawal was significantly higher for the AMS Stream than for the Remote Stream (21/57 [37%] *v* 67/348 [19%]; $P = 0.005$). AHPRA registration numbers were not known for 13/506 participants (2.6%), for whom only historical state-based registration data were available, so they were excluded from the retention outcome analysis.

Continuity of service

The estimated mean time employed in the same practice before commencing the program for all participants (those who were still active, had completed or had withdrawn) was 1.6 years (standard deviation [SD], 2.2 years). The mean service continuity during the program, excluding those still active, was 3.6 years (SD, 1.4 years) — or 3.8 years for those who completed the program, and 2.3 years for those who withdrew — giving an approximate total mean of 5.2 years of service continuity in the same practice up to program completion or withdrawal.

Longer term retention of Remote Stream participants

Within the first two years of program completion, 21 Remote Stream participants (49%) remained in the same community, 25 (58%) remained in the same region and 27 (63%) were in an MMM4–7 community (Box 1). After this period, retention rates stabilised: 44 (18.2%) remained in the same community, 72 (29.8%) remained in the same region, 70 (28.9%) were in an MMM4–7 community, and nearly half (112, 46.3%) were in a rural community. When IMGs in the Remote Stream were stratified by whether they were estimated to have an any outstanding rural moratorium or not at the time of completing the RVTS program (about 103 [35%] *v* 188 [65%] respectively), we found that they were similarly likely to be working in the same community (noting that counts are small) regardless of whether they had completed the program within the previous two years (12/20 [60%] *v* 6/19 [32%]; $P = 0.11$) or two or more years ago (5/54 [9%] *v* 21/114 [18%]; $P = 0.17$).

Multivariable analysis (Box 2) identified that recently completing the program (within three years) was strongly associated with retention in the same community (odds ratio [OR], 3.99; 95% CI, 1.60–9.92). No factors were associated with significantly reduced odds of working in the same community; notably, neither being an IMG nor having an outstanding moratorium at program completion were found to reduce the likelihood of working in the same community.

Other multivariable analyses (Box 3) identified that being an IMG was significantly associated with reduced retention on all other

measures (eg, retained in any MMM4–7 community: OR, 0.28; 95% CI, 0.13–0.60). Recently completing (within three years) was associated with remaining in the same region and with being in an MMM4–7 community, but not with being in an MMM2–7 community. Training in a remote location was associated with poorer retention in the same region. Older graduates were more often retained in any rural (MMM2–7) or smaller rural (MMM4–7) communities. Fewer men were retained, but this difference was not significant for any retention outcome.

Longer term retention of AMS Stream participants

Although participant numbers for the AMS Stream were small, these doctors commonly remained in the same community (4, 80%) or any rural community (5, 100%) within two years of program completion (Box 4). However, as seen in the Remote Stream, there were notable decreases in retention rates after this period: after two to seven years, seven (26%) remained in the same community and 11 (41%) were in any rural (MMM2–7) community.

Discussion

Our findings show strong continuity of service and retention outcomes in remote communities and rural AMS for participants of the RVTS over a 24-year timeframe. The program draws on doctors already working in these settings, where they remain while they train towards their general practice fellowship, to give a mean of about 5.2 years of continuous service at program completion. This estimate is conservative as it includes those who completed the RVTS program and those who withdrew. The program also has a latent retention impact; once doctors are no longer actively supported by the RVTS, about one in two remain working in the same community for another two years. This represents a substantial period of continuous service in communities with high needs and challenging work settings with limited resources.

Not unexpectedly, longer term retention in same community and region diminished thereafter. However, on a positive note, one in three Remote Stream participants stayed in the same community or a similar MMM4–7 community, suggesting that the program contributes to the national agenda for a distributed generalist workforce.⁹ The proportion completing their fellowship and working in the same or similar community was similar to that seen in another national study of recently registered GPs, which explored rural retention up to five years after completing general practice fellowship, although this was not specific to the remote and First Nations context for a majority IMG cohort — all factors which normally contribute to increased turnover.³²

The continuity of service (5.2 years) and longer term retention (one in two remaining in the same practice within two more

1 Post-program retention rates for Remote Stream participants, by number of years since completion*

	< 2 years [†] (n = 43)	2–3 years (n = 40)	4–5 years (n = 43)	6–7 years (n = 47)	8–10 years (n = 46)	11–14 years (n = 41)	15–20 years (n = 25)	2–20 years (n = 242)
Same community	21 (49%)	9 (23%)	8 (19%)	5 (11%)	11 (24%)	7 (17%)	4 (16%)	44 (18.2%)
Same region	25 (58%)	15 (38%)	12 (28%)	12 (26%)	12 (26%)	15 (37%)	6 (24%)	72 (29.8%)
Any MMM4–7 community [‡]	27 (63%)	12 (30%)	12 (28%)	11 (23%)	15 (33%)	14 (34%)	6 (24%)	70 (28.9%)
Any rural (MMM2–7) community [‡]	30 (70%)	17 (43%)	14 (33%)	18 (38%)	23 (50%)	27 (66%)	13 (52%)	112 (46.3%)

* Data are number (percentage) of participants. † Estimate based on whole years; includes 1–23 months since completion of the Remote Vocational Training Scheme program. ‡ Based on Modified Monash Model (MMM) classification. ◆

2 Multivariable logistic model of factors associated with longer term retention of RVTS participants in the same community (Remote Stream)

	Same community, unadjusted model, n/N (%)	Same community, adjusted model, odds ratio (95% CI)
International medical graduate		
No	21/94 (22%)	Ref
Yes	52/235 (22%)	0.54 (0.22–1.29)
Sex		
Women	24/97 (25%)	Ref
Men	49/232 (21%)	1.00 (0.54–1.84)
Remote training location (MMM6–7)*		
No	56/220 (25%)	Ref
Yes	17/109 (16%)	0.56 (0.28–1.12)
Coastal training location		
No	50/231 (22%)	Ref
Yes	23/98 (23%)	1.09 (0.59–1.99)
Program fellowship		
RACGP only	50/210 (24%)	Ref
ACRRM	12/53 (23%)	1.11 (0.45–2.70)
Neither†	11/66 (17%)	0.61 (0.26–1.40)
Outstanding moratorium at program completion		
No	53/247 (21%)	Ref
Yes	20/81 (25%)	1.07 (0.43–2.67)
Age at program completion		
≤ 35 years	14/56 (25%)	Ref
36–40 years	14/95 (15%)	0.54 (0.22–1.33)
41–45 years	17/70 (24%)	0.99 (0.39–2.48)
≥ 46 years	26/85 (31%)	1.55 (0.60–3.99)
Missing‡	2/23 (9%)	0.37 (0.07–2.05)
Years in Australia at program commencement		
≤ 3 years	25/99 (25%)	Ref
4–6 years	22/126 (17%)	0.66 (0.32–1.40)
≥ 7 years	25/102 (25%)	0.74 (0.31–1.78)
Post-program career point‡		
11–20 years	11/69 (16%)	Ref
6–10 years	18/104 (17%)	1.55 (0.62–3.91)
3–5 years	12/67 (18%)	1.45 (0.55–3.86)
< 3 years	32/87 (37%)	3.99 (1.60–9.92)

ACRRM = Australian College of Rural and Remote Medicine; RACGP = Royal Australian College of General Practitioners; Ref = reference category in multivariable model; RVTS = Remote Vocational Training Scheme. * Based on Modified Monash Model (MMM) classification. † Mostly participants who had withdrawn from RVTS the program. ‡ Measured at November 2023 (up to 20 years after completion of the RVTS program); estimate based on whole years but, for example, the < 3 years group includes one to 35 months since completion of the program. ◆

programs like the RVTS could play a role in reducing the direct and indirect costs of remote health workforce turnover, estimated at up to \$32 million per year in the Northern Territory alone;² they can also offer general practice registrars the opportunity to settle into relationship-based care, where they can see improvements in health outcomes.³⁴

Achieving these retention outcomes is more remarkable given that IMGs are generally observed to have 1.5–2.0 times increased odds of turnover than rural-based Australian graduates.^{3,4} Following participation in the Remote Stream, this cohort was less likely than Australian graduates to remain longer term in any rural location other than in their training community, suggesting that when they do choose to leave the community where they trained, they may relocate to metropolitan settings. This may be because this group faces significant challenges — including mandatory rural work periods, cultural differences, and more challenging pathways into and completing specialty training — resulting in generally poorer professional or life satisfaction when compared with Australian graduates.^{7,35–37} Moreover, maintaining practice in these locations once the RVTS support ceases is likely to be challenging because of higher unpredictability of workload, limited amenities, and nuanced professional practice challenges.^{38,39} The RVTS' remote supervision model and educational content are also tailored for busy and culturally isolated doctors, but beyond program participation, doctors may miss this level of support.¹⁷ Another component of the RVTS' support model is the inclusion of the doctor's family in workshops out of the community twice a year, which promotes bonding and belonging (factors important for IMGs) but is hard to sustain after the program finishes.^{17,21,40} Importantly, the RVTS' support and training model could be applied to support the productivity, safety and quality of a distributed general practice workforce for better service continuity.^{6,9,17,36}

Australia's moratorium policy generally has a reputation of being associated with dissatisfied IMGs,⁷ who anecdotally wish to leave rural practice at the first opportunity. Contrary to this, our study showed that whether on moratoriums or not, these doctors were similarly likely to be working in the same community after completing the RVTS program. However, broader rural work outcomes were lower for these groups in our study, suggesting that many who do not stay

years) that we report from the RVTS are also far better than the observed 50% retention rate and the two-year expected retention benchmark for doctors in smaller (MMM4–7) communities seen elsewhere.^{1,4,32} In addition, RVTS outcomes are achieved in mostly non-coastal regions, which are normally associated with poorer retention.³³ This suggests that place-based retention-focused

in the same community might eventually move to metropolitan areas rather than other rural communities. Regardless of post-program outcomes, our research suggests that pairing regulatory policies with quality support tailored to place through the RVTS can, at minimum, provide a mean of about 5.2 years of continuity, which is substantial in this work setting.¹⁷

3 Multivariable logistic model of factors associated with other longer term retention outcomes for RVTS participants (Remote Stream)

	Same region, adjusted model, odds ratio (95% CI)	Any MMM4–7 community, adjusted model, odds ratio (95% CI)	Any rural MMM2–7 community, adjusted model, odds ratio (95% CI)
International medical graduate			
No	Ref	Ref	Ref
Yes	0.38 (0.18–0.82)	0.28 (0.13–0.60)	0.25 (0.12–0.54)
Sex			
Women	Ref	Ref	Ref
Men	0.68 (0.40–1.17)	0.72 (0.42–1.23)	0.60 (0.35–1.03)
Remote training location (MMM6–7)*			
No	Ref	Ref	Ref
Yes	0.43 (0.23–0.79)	1.43 (0.81–2.53)	1.06 (0.60–1.87)
Coastal training location			
No	Ref	Ref	Ref
Yes	1.05 (0.61–1.80)	1.10 (0.65–1.87)	1.33 (0.79–2.26)
Program fellowship			
RACGP only	Ref	Ref	Ref
ACRRM	1.09 (0.50–2.37)	1.34 (0.64–2.83)	1.41 (0.66–3.01)
Neither [†]	0.79 (0.38–1.65)	1.52 (0.77–3.01)	1.61 (0.81–3.21)
Outstanding moratorium at program completion			
No	Ref	Ref	Ref
Yes	0.86 (0.38–1.92)	2.05 (0.93–4.54)	1.38 (0.64–2.99)
Age at program completion			
≤ 35 years	Ref	Ref	Ref
36–40 years	0.76 (0.34–1.69)	1.06 (0.48–2.35)	0.98 (0.46–2.09)
41–45 years	1.67 (0.72–3.88)	1.85 (0.80–4.28)	1.72 (0.75–3.96)
≥ 46 years	1.66 (0.70–3.94)	2.88 (1.21–6.88)	2.55 (1.07–6.09)
Missing [†]	0.65 (0.18–2.36)	0.65 (0.19–2.25)	1.29 (0.38–4.39)
Years in Australia at program commencement			
≤ 3 years	Ref	Ref	Ref
4–6 years	0.45 (0.23–0.89)	1.30 (0.68–2.49)	0.68 (0.36–1.30)
≥ 7 years	0.53 (0.24–1.15)	1.39 (0.65–2.98)	0.81 (0.37–1.77)
Post-program career point [‡]			
11–20 years	Ref	Ref	Ref
6–10 years	1.41 (0.64–3.09)	1.61 (0.74–3.50)	1.03 (0.49–2.14)
3–5 years	1.41 (0.61–3.23)	1.43 (0.62–3.28)	0.62 (0.28–1.38)
< 3 years	2.80 (1.26–6.21)	3.49 (1.55–7.85)	1.54 (0.70–3.38)

ACRRM = Australian College of Rural and Remote Medicine; RACGP = Royal Australian College of General Practitioners; Ref = reference category in multivariable model; RVTS = Remote Vocational Training Scheme. * Based on Modified Monash Model (MMM) classification. † Mostly participants who had withdrawn from the RVTS program. ‡ Measured at November 2023 (up to 20 years after completion of the RVTS program); estimate based on whole years but, for example, the < 3 years group includes one to 35 months since completion of the program. ♦

The findings also build evidence to the value of grow-your-own place-based retention workforce strategies, which are considered useful models for achieving longer term workforce capacity in communities that most need services.³⁴ In the case of the RVTS, the grow-your-own approach largely draws on IMGs who are commonly already in more remote areas and First Nations communities through regulatory policies;

distribution levers like these policies are critical for programs like the RVTS to be sufficiently subscribed.³⁴ Other research about grow-your-own approaches for Australian graduates working in the same regions as their origin (from high school) and medical school training has led to results that are similar to those from the RVTS — 28% of participants worked in the same region and 48% in any rural region (not specifically

4 Post-program retention rates for AMS Stream participants, by number of years since completion*

	<2 years [†] (n = 5)	2-3 years (n = 6)	4-5 years (n = 14)	6-7 years (n = 7)	2-7 years (n = 27)
Same community	4 (80%)	3 (50%)	1 (7%)	3 (43%)	7 (26%)
Any rural (MMM2-7) community [‡]	5 (100%)	4 (67%)	2 (14%)	5 (71%)	11 (41%)

AMS = Aboriginal Medical Service. * Data are number (percentage) of participants.
[†] Estimate based on whole years; includes 1-23 months since completion of the Remote Vocational Training Scheme program. [‡] Based on Modified Monash Model (MMM) classification. ◆

more remote areas), but these outcomes were only achieved if graduates were of rural origin and had completed more than one year of their medical school training rurally.¹³ Our study of the RVTS expands on this, specifically with respect to drawing from and supporting general practice workforce for retention in more remote places.

A limitation of our study is that post-program retention observations were limited to a single cross-section (November 2023), so movements between measured time points were not known. This meant that more accurate estimates of continuity of service, turnover and survival could not be determined. Also, despite drawing on 24 years of observations, each graduating cohort year included a maximum of 32 doctors, thus comparisons between cohort years (eg, those in Box 1 and Box 4) should be interpreted with caution. Moreover, there is likely to be variation in the characteristics and experiences between cohorts that would have influenced our results. The use of administrative data is a strength of this study, as we had close to 100% complete data; however, our research was restricted to available data items, which meant that factors like the moratoriums for IMGs could only be estimated and that no data on rural bonding arrangements for Australian graduates were available.

In conclusion, the continuity of service and retention outcomes of the RVTS provide a useful backdrop for reconsidering the role of place-based retention-focused approaches to promote access to quality services in communities with relatively high needs. Our findings suggest that with careful selection and program design in specific places, and supervision and support for resilience and retention in challenging contexts, continuity of service and longer term retention outcomes can be achieved well above benchmark standards. This can reduce costs and improve quality of services for remote and First Nations communities. Our findings can be used to inform wider considerations of the value of retention-focused workforce programs within Australian and overseas medical workforce policy.

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Data sharing: The de-identified data we analysed are not publicly available, but we will seek to provide data through requests to the corresponding author which will be considered on a case-by-case basis.

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