

Original Research

A retrospective study evaluating outcomes of the Allied Health Rural Generalist Training Positions in the Queensland public health system

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Abstract

Introduction: The purpose of the study was to evaluate the workforce outcomes and costs associated with implementing Rural Generalist Training Positions (RGTPs) in public health services in Queensland, Australia.

Methods: A retrospective analysis was conducted between January 2019 and October 2021. Rural and organisational retention of employees was calculated as the median time to event, either transfer to a non-rural or remote Queensland Health service or permanent separation from the organisation, respectively, and the mean difference using a two-sample *t*-test with equal variance, with statistical significance set at 0.05. Descriptive analysis was performed to evaluate education and promotion outcomes. Retention and promotion of employees in RGTPs ('trainees') were compared with a group of allied health professionals in standard base-grade rural or remote clinical positions. A cost analysis calculated the additional cost of implementing an RGTP compared to a standard early-career allied health position from the perspective of the employing health service.

Results: Forty-five allied health professionals employed in an RGTP ('trainees') and 53 non-trainees were eligible for analysis. Participants' professions were nutrition and dietetics, occupational therapy, pharmacy, physiotherapy, podiatry, speech pathology and social work. Compared to non-trainees, trainees were retained significantly longer in their original rural or remote location prior to relocation (mean difference 153 days, 95%CI 55–252 days,

$p=0.003$); in any Modified Monash (MM) Model category 4–7 (MM 4 to MM 7) location until moving to an MM 1 to MM 3 location (mean difference 172 days, 95%CI 62–277 days, $p=0.003$) and in any MM 2 to MM 7 location until moving to an MM 1 location (mean difference 139 days, 95%CI 11–266 days, $p=0.035$). The trainee group had a total of 51 enrolments across two approved postgraduate rural generalist education courses, including six participants who undertook both courses. There were 22 (43.1%) course completions, 16 (31.4%) withdrawals, and 13 (25.5%) were continuing studies at the conclusion of data collection. More trainees were promoted above base grade Health Practitioner Level 3 (39%) than employees in the non-trainee group (29%). The total average annual cost for a health service to implement an early-career allied health position as an RGTP was between \$10,730 and \$15,718, which was fully covered by organisation funding grants of a minimum \$25,000 per annum.

Conclusion: RGTPs showed favourable outcomes for retention, education and promotion of early-career allied health professionals in rural and remote public health services compared to similar employees in standard positions. Implementation costs for a rural or remote work unit were manageable. The RGTPs provide good value for the health services through focusing training and development investment on early-career allied health professionals who are retained for longer in rural or remote communities.

Keywords

allied health, Australia, retention, rural generalist, training, workforce.

Introduction

Sustaining a multidisciplinary allied health workforce of adequate size and skills is a longstanding issue for rural and remote health services¹, and workforce distribution in Australia remains skewed towards metropolitan areas². Rural and remote areas, classified as Modified Monash (MM) Model categories MM 4 to MM 7, are home to 13% of the Australian population³, but only 8% of clinical pharmacists, 7% of podiatrists, 6% of occupational therapists, 6% of physiotherapists and 4% of psychologists practice in these locations⁴. Relative shortages of allied health professionals contribute to service access barriers experienced by rural and

remote consumers^{5–7}, and may impede the use of team-based multidisciplinary care⁸ and chronic disease and disability^{9,10} funding programs in these areas.

Recruitment and retention challenges for allied health professionals in rural and remote areas include limited access to professional support, supervision, relevant professional development and training^{5,6,11–13}, a perceived risk of deskilling, and limited opportunities for promotion or career progression^{5,11,12,14–16}. Turnover in rural allied health positions produces relocation and advertising costs and productivity losses for the service¹⁴, recruitment and orientation burden for managers and additional work and caseload stress for the team covering

vacancy periods^{5,6,12,17}. Workforce strategies that enable longer rural retention and provide practitioners with a supportive career pathway from graduate level to a rewarding rural career have been identified as critical for building workforce sustainability^{1,14,16,18,19}.

Rural Generalist Training Positions (RGTPs) for allied health professions were first developed and trialled in Queensland Health in 2014²⁰ as a new strategy to improve recruitment, retention and workforce capacity, with a specific focus on the early career stage (first 5 years of practice). The concepts of rural generalism and a rural generalist pathway, as they relate to allied health professions, were developed as part of this work (refer to **Supplementary text 1** for further information). In the past decade six Australian states and territories have implemented RGTPs²¹, the Australian Government funded a 5-year implementation in the private and non-government sectors²², a two-level program of postgraduate education was developed by James Cook University (JCU)²³ and an accreditation council²⁴ was formed to ensure the quality of rural generalist courses for specific allied health professions.

Evaluation findings for allied health RGTPs are currently limited to a few trials of limited size in public health services and a recent evaluation of implementation in the private and non-government sectors²². Eleven supernumerary training positions implemented in Queensland Health between 2014 and 2016 acted as a catalyst for service improvement²⁰, and 73% of the 22 position holders in the trial remained working in regional, rural or remote Queensland Health services 6 months after separation from their temporary training role²⁵. South Australian public health services implemented 15 rural generalist trainees between 2019 and 2022, finding positive outcomes for employee tenure and a positive return on investment for the organisation²⁶. A trial of three temporary, 2-year physiotherapy RGTPs in New South Wales found improved attraction to the previously chronically vacant roles that resulted in a 151% improvement in physiotherapy service activity during the pilot²⁷. Northern Territory RGTPs in 2017 to 2019 produced positive service development outcomes in host teams, and three of four trainees remained in regional or rural areas after separating from their temporary training position²⁸. A 5-year implementation of The Allied Health Rural Generalist Education and Training Scheme (TAHRGETS) included 62 trainees in private and non-government settings and found benefits for trainees' reported competence and confidence in rural practice, and enhanced capacity of employing teams²². A multijurisdiction evaluation of JCU education courses showed that as an integrated component of the RGTPs, supported by development-focused employment conditions and a local supervisor, the postgraduate courses improved participants' capabilities and potentially provided a recruitment and retention incentive for the service^{23,29}.

This article reports on the largest evaluation of RGTPs in the public sector to date and adds to the emerging body of literature on allied health early-career rural generalist workforce development. The purpose of this research was to evaluate the workforce outcomes and costs of RGTPs in an Australian public health service context.

Methods

Study design

This study, conducted as part of a broader evaluation, used a retrospective analysis to evaluate workforce outcomes including retention, education completion and promotion of RGTP position holders (trainees) versus a group of employees in regular base-grade rural roles (non-trainees). A cost analysis calculated the

marginal cost of implementing a base-grade allied health position as an RGTP from a Queensland Hospital and Health Service (HHS) perspective.

Intervention

The intervention evaluated in this study was RGTPs implemented in Queensland Health, a state health service of northern Australia, between January 2019 and October 2021. HHSs, independent statutory bodies responsible for delivering public health services in their region³⁰ for Queensland Health, created RGTPs in locations classified as Category A (rural) or Category B (remote) in Queensland Health employment policy³¹. These locations broadly corresponded to Modified Monash Model³² categories MM 4 to MM 7. RGTPs could be used for any of seven professions from January 2019: medical radiation (radiography), nutrition and dietetics, occupational therapy, pharmacy, physiotherapy, podiatry and speech pathology. Psychology and social work were included in the RGTP program from January 2021³³. HHSs were independently responsible for determining the number, profession and base location of the implemented RGTPs.

Training positions were converted from established Health Practitioner Level 3 (HP3) roles³⁴. HP3 is the entry-level classification for degree-trained allied health professionals in Queensland Health. Although not strictly confined to early-career practitioners, in rural and remote areas HP3 positions are generally occupied by less experienced staff. The total duration of the RGTP was 2–4 years, depending on the trainees' professional experience at commencement. Mandatory position requirements for an RGTP in Queensland Health were unchanged between 2019 and 2021, and included³⁴:

- a minimum 0.1 full-time equivalent protected work-time allocation (3.8 hours per week) for professional supervision consistent with organisational policy³⁵, plus study and work-based training and development activities
- allocation of a profession-specific supervisor, which for graduates was co-located with the trainee for at least 50% of work hours
- participation in a work-based service improvement project
- enrolment in the JCU Rural Generalist Program (RGP)³⁶ and/or Graduate Diploma of Rural Generalist Practice (GDRGP)³⁷ courses (refer to **Supplementary text 1** for further information).

Funding for RGTP salary and on-costs was drawn from the HHS workforce budget. An annual funding agreement with the Queensland Department of Health (QDOH) provided \$25,000 for rural and \$30,000 for remote health services to support the costs of implementing an agreed HP3 position as an RGTP³³. Given the absence of published research on costs of allied health RGTPs prior to the launch of the RGTP strategy in 2019, these sums were selected conservatively to ensure health services would bear limited financial risk. Health services reported quarterly, through a bespoke online reporting system, to the QDOH against the mandatory position requirements³³.

Participants

Workforce data for employees commencing in an 'eligible position' between 1 January 2019 and 31 May 2021 were included in the analysis. For trainees, an eligible position was an RGTP and for the non-trainee group it was a HP3 position in a Category A or B location, and a profession represented in the RGTP group. To limit the inclusion of short-term backfill or locum appointments in the non-trainee group, employees in casual positions were excluded, along with those who separated from the position less than

12 weeks after commencement. The cost analysis also included data reported by supervisors, who were generally senior practitioners in the HHS responsible for providing professional supervision and work-based training for a trainee.

Data sources

Data were sourced from the Queensland Health payroll system and RGTP online reporting system, and de-identified by the QDOH. Payroll data were extracted for all members of the trainee and non-trainee groups for each fortnightly pay run. The dataset was truncated at 31 October 2021 to allow for data analysis to be completed in 2022 (refer to Supplementary text 1 for further information). Demographic information captured at commencement in an eligible position included age group and profession. Fortnightly payroll data included pay point, MM category and any changes to employment location from the previous pay run. Operational data reported by HHSs to the QDOH via the bespoke online reporting system was compiled into program records for the period January 2019 to October 2021, and included trainee and supervisor self-reported weekly supervision and training time, and trainee course enrolment and completions.

Data analysis

Four retention outcomes were analysed for trainee versus non-trainee groups, reflecting continuous time in:

- the base location of the eligible position before relocating to a Queensland Health position in any other location
- any MM 4 to MM 7 location (medium rural towns to very remote communities) until relocating to a Queensland Health position in an MM 1 to MM 3 location
- any MM 2 to MM 7 location (regional centres to very remote communities) until relocating to a Queensland Health position in an MM 1 location
- Queensland Health positions before separating from the organisation.

The median time to leaving and interquartile range (IQR) were calculated for each outcome in trainee and non-trainee groups. The mean difference was calculated using the two-sample *t*-test with equal variance and presented as days and 95% confidence intervals (CIs). Statistical significance was set at 0.05. Data analyses were undertaken using Stata v16 (StataCorp; <https://www.stata.com> [https://www.stata.com]) and Microsoft Excel.

Education outcomes for trainees were assessed by descriptive analysis of enrolments, completions and withdrawals from postgraduate courses. Promotion for trainees and non-trainee group participants was indicated by a transfer to a pay point above HP3 at any point from commencement in an eligible position to either separation from Queensland Health or the data truncation date.

The cost analysis used HHS quarterly reporting to QDOH to calculate the average marginal cost to health services of implementing a regular HP3 position as an RGTP, being a sum of:

- tuition fees for postgraduate courses
- the trainee's work time allocated to study, training and project activities
- the supervisor's work time allocated to providing supervision and training in excess of the minimum Queensland Health requirement of 1 hour per week for early-career supervisees³⁵.

Trainee and supervisor time were considered opportunity costs, represented by salary and on-costs allocated by the HHS to RGTP development activities rather than clinical or operational duties. This was the notional cost of a replacement worker for the foregone work time, although in practice the service impact may have been operationally managed in other ways. For both trainees and supervisors, the reported weekly work times for RGTP activities were summed and averaged, and converted to costs by multiplying by an average hourly wage rate. The rates used were the midpoint increments of the HP3 wage scale for trainees and the HP4 wage scale for supervisors at 31 May 2021³⁸. On-costs were added at 21% of salary, which was appropriate for the organisation and position type. This covered other usual position costs such as leave loading and superannuation. Weekly costs were multiplied by 52 weeks to produce the average cost per annum.

Fees for the RGP³⁶ in 2019 to 2021 were \$800 per module, with 12 modules required to complete the course. The annual fee provided by the university for the GDRGP³⁷ in 2021 was \$26,100 for eight subjects, an average subject cost of \$3263. Each trainee's reported number of completed units (modules or subjects) was divided by the number of years, or part thereof, that they were enrolled in the relevant course, to produce an average number of units completed per year. This was averaged for the entire trainee group for both the RGP and GDRGP. The average tuition fees were calculated as the product of the average number of completed units per year and the cost per unit.

Ethics approval

Ethical approval was granted by the Darling Downs Hospital and Health Service Human Research Ethics Committee (HREC/2020/QTDD/70116) and Griffith University Human Research Ethics Committee (2021/142).

Results

The dataset included 45 RGTP employees in the trainee group and 53 employees who met the criteria for inclusion in the non-trainee group. Demographic information for these employees is summarised in Table 1. Supervision data from 49 supervisors was included in the cost analysis.

Table 1: Demographic information for Rural Generalist Training Positions trainees and non-trainees in public health services in Queensland, Australia

Characteristic		Trainee group (N=45) n (%)	Non-trainee group (N=53) n (%)
Age group (years)	20–24	21 (46.7)	22 (41.5)
	25–29	16 (35.6)	14 (26.4)
	30–39	6 (13.3)	11 (20.8)
	40–49	0 (0.0)	4 (7.5)
	≥50	2 (4.4)	2 (3.8)

Profession	Physiotherapy	16 (35.6)	12 (22.6)
	Occupational therapy	8 (17.8)	11 (20.8)
	Dietetics and nutrition	8 (17.8)	7 (13.2)
	Speech pathology	4 (8.9)	8 (15.1)
	Podiatry	4 (8.9)	2 (3.8)
	Social work	3 (6.7)	4 (7.5)
	Pharmacy	2 (4.4)	9 (17.0)
	Psychology [†]	0 (0.0)	
	Medical radiation (radiography) [†]	0 (0.0)	
Modified Monash (MM) category of base location at commencement in an eligible position	MM 4	15 (33.3)	35 (66.0)
	MM 5	9 (20.0)	0 (0.0)
	MM 6	10 (22.2)	11 (20.8)
	MM 7	11 (24.4)	7 (13.2)
Position classification at commencement in an eligible position	Graduate (<2 years professional experience)	24 (53.3)	35 (66.0)
	Beyond graduate (≥2 years professional experience)	21 (46.7)	18 (34.0)

[†] Positions in professions not represented in the trainee group were excluded from the non-trainee group.

MM, Modified Monash (Model) category.

Rural Generalist Training Position implementation

Physiotherapy, podiatry, and nutrition and dietetics had greater representation in the trainee group than the non-trainee group, particularly physiotherapy at more than one third of all trainees (35.6%). Pharmacy and social work had limited RGTP implementation. Pharmacy had the greatest difference in representation between the trainee (4.4%) and non-trainee group (17.0%). No psychology or radiography RGTPs were implemented by HHSs, although the number of regular HP3 roles in these professions was not captured so was not available for comparison.

One third (33.3%) of RGTPs were in medium-sized rural towns (MM 4), with the remainder relatively evenly spread among remoteness categories. Rurality of the non-trainee group was skewed towards MM 4 locations (66.0%), with no non-trainee positions recruited to in the study period in small rural towns (MM 5) and fewer in remote areas. The age of most trainees (82.2%) was less than 30 years; non-trainees were slightly older on average, with only 67.9% in this age range. Trainees were slightly more experienced at commencement: graduates, those within their first 2 years of practice, represented 53.3% of trainees and 66.0% of the non-trainee group.

Retention

The median retention in eligible position locations was 358 days (IQR 365 days) compared to 223 days (IQR 168 days) for the non-trainees. Trainees stayed significantly longer in their eligible position location prior to moving to another location, compared to the non-trainee group (mean difference 153 days, 95%CI 55–252 days, $p=0.003$). The median retention in MM 4 to MM 7 locations until relocating to a Queensland Health position in an MM 1 to MM 3 location was 372 days (IQR 405 days) compared to 237 days (IQR 139 days) for the non-trainees. Trainees were retained in MM 4 to MM 7 locations until relocating significantly longer than the non-trainee group (mean difference 172 days, 95%CI 62–277 days, $p=0.003$). The median retention in MM 2 to MM 7 locations until relocating to a Queensland Health position in an MM 1 location was 343 days (IQR 223 days) compared to 245 days (IQR 128 days) for the non-trainees. Trainees were retained in MM 2 to MM 7 locations for significantly longer than the non-trainee group (mean difference 139 days, 95%CI 11–266 days, $p=0.035$). The median time employed in any Queensland Health position until separation from the organisation was 343 days (IQR 226 days) compared to 296 days (IQR 321 days) for the non-trainee group. There was no statistically significant difference between trainees and non-trainees in overall organisational retention time (mean difference 33 days, 95%CI –168–234 days, $p=0.745$). Results are shown in Table 2.

Table 2: Retention for Rural Generalist Training Positions trainees and non-trainees

Outcome	Retention duration (days)			
	Trainees (N=45) Median (IQR)	Non- trainees (N=53) Median (IQR)	Mean difference (95%CI)	<i>p</i> - value
Retained in eligible position location before relocating to a Queensland Health position in any other location	358 (365)	223 (168)	153 (55–252)	0.003
Retained in MM 4 to MM 7 locations before relocating to a Queensland Health position in a MM 1 to MM 3 location	372 (405)	237 (139)	172 (62–277)	0.003
Retained in MM 2 to MM 7 locations before relocating to a Queensland Health position in a MM 1 location	343 (223)	245 (128)	139 (11–266)	0.035
Retained in Queensland Health employment before separation from the organisation	343 (226)	296 (321)	33 (–168–234)	0.745
Retained to data truncation date	635 (617)	595 (405)	29 (–172–234)	0.760

CI, confidence interval. IQR, interquartile range. MM, Modified Monash (Model) category.

Education and promotion

Education outcomes of the trainees are shown in Table 3. Graduates with less than 2 years of professional experience commenced their training pathway in the JCU RGP before progressing to enrolment in the GDRGP, but more experienced

trainees could commence directly in the GDRGP. A total of 27 of 45 trainees (60%) enrolled in the JCU RGP. Fifteen trainees (56%) completed the RGP and a further three (11%) were continuing studies at the conclusion of the data collection period. Twenty-four trainees enrolled in the GDRGP course, including six who had completed the RGP, with 17 (71%) either completing (7) or

continuing (10). One trainee completed both courses. With respect to all enrolments in both courses, there were 22 (43.1%) course completions, 16 (31.4%) withdrawals, and 13 (25.5%) were continuing studies at the end of the data collection period. Withdrawals represent the failed completion of the training pathway through transfer or separation from the RGTP. The mean duration to complete the RGP was 13.3 months, and GDRGP was 25.7 months. For the GDRGP this was approximately consistent

with a student studying part-time at half study load³⁷. RGP completion time varied from 284 to 690 days and GDRGP from 281 to 1040 days.

Promotion to a HP4 position was greater for trainees (39%) than the non-trainee group (29%). This included employees transferred temporarily or permanently to a higher-level position. For trainees, promotion could occur prior to completion of their training, as the QDOH funding rules allowed trainees to retain their training place and funding support if seconded or substantively appointed to a HP4 role in an eligible rural or remote location.

Table 3: Enrolments, completions and withdrawals for Rural Generalist Program and Graduate Diploma of Rural Generalist Practice

Course	Enrolment status at end of study	Trainees n (%)	Days taken for course completion (if relevant) mean, range
Rural Generalist Program (N=27)	Completed	15 (55.6)	406, 284–690
	Continuing	3 (11.1)	
	Withdrawn prior to completion	9 (33.3)	
Graduate Diploma Rural Generalist Practice (N=24)	Completed [†]	7 (29.2)	782, 281–1040
	Continuing	10 (41.7)	
	Withdrawn prior to completion	7 (29.2)	

[†] Total credit points required for Graduate Diploma of Rural Generalist Practice (GDRGP) was 24. Trainees transitioning to GDRGP following completion of the Rural Generalist Program were granted 6 credit points.

Costs

Trainees' average accrued time for development activities including supervision was 3.24 hours per week, which was less than the 3.8 hours per week prescribed in the RGTP program guidelines. In the cost analysis, 1 hour per week of supervision was discounted as this was consistent with the 'universal presumption' of supervision time for all Queensland Health early-career allied health professionals and not specific to RGTPs³⁸. Average salary and on-costs for the remaining 2.24 hours development time was \$5930. Tuition fees averaged \$4800 for the RGP and \$9788 for the GDRGP per year. The median time allocation by supervisors was 0.97 hours per week per trainee, which was consistent with organisational requirements³⁸. Consequently, no additional supervision costs were incurred by the health service for RGTPs compared to regular early-career allied health roles. Table 4 shows the total annual additional cost incurred by HHS implementing a HP3 position as

an RGTP, prior to considering QDOH funding grants. The cost was \$13,224 for all trainees, with a lower average cost of \$10,730 for trainees enrolled in the RGP and higher cost for those studying the GDRGP at \$15,718. The average additional cost of \$13,224 equates to 17.9% of the annual graduate (HP3 increment 1) wage rate of \$73,994 at May 2021³⁸. QDOH funding grants of a minimum \$25,000 per annum exceeded the average additional costs of an RGTP incurred by HHSs.

A costing was also completed using an assumption that health services met the 3.8 hours per week development time allocation prescribed in the RGTP program guidelines³⁴. This increased the annual salary and on-costs investment to \$7413, and total additional position costs to \$12,213 for trainees undertaking the RGP, \$17,200 for the GDRGP and an average cost for both courses of \$14,706. Even if meeting the prescribed work-time allocation, the QDOH grants more than covered the RGTP implementation costs for HHSs.

Table 4: Marginal cost per annum of implementing a Health Practitioner Level 3 position in Queensland Health as a Rural Generalist Training Position

Position	Work hours allocated to RGTP activities [†] median/range per week (per annum)	Cost of work time for RGTP activities [†] mean salary and on-costs per annum	Mean tuition fees per annum by course		Total additional cost per annum for RGTP
			RGP	GDRGP	
Trainee	Median: 3.24 (168.48) Range: 0.35–13.50 (18.20–702.00)	\$5930	\$4800	\$9788	RGP: \$10,730 GDRGP: \$15,718 Mean (both courses): \$13,224
Supervisor	Median: 0.97 (50.44) Range: 0.01–3.12 (0.52–162.24)	\$0.00			

[†] Work time reported by trainees for study, work-based training, supervision and project activities related to RGTP requirements, and supervisors for supervision and other support activities.

[†] One hour per week per trainee for supervision was not included in the calculation of trainee or supervisor costs, as this is a requirement for all Queensland Health early-career allied health practitioners³⁵.

GDRGP, Graduate Diploma Rural Generalist Practice. RGP, Rural Generalist Program. RGTP, Rural Generalist Training Position.

Discussion

This research analysed outcomes of allied health RGTPs in Queensland Health services between 2019 and 2021. The retention analysis demonstrated that allied health professionals in an RGTP were retained significantly longer compared to those in regular early-career positions in their original employment location and any Queensland Health rural or remote (MM 4 to MM 7)

employment location prior to relocating. All trainees undertook formal education in rural generalist practice, with 69% of enrolments resulting in completed or continuing coursework by the conclusion of the study. Promotion to higher roles was slightly greater for trainees (39%) compared to non-trainees (29%). Work time allocated for training and supervision plus university tuition fees produced a total annual additional cost of implementing a HP3 position as an RGTP for employing health services of between

\$10,730 and \$15,718, with an average of \$13,224. These costs to the health service were fully covered by the QDOH grants of between \$25,000 and \$30,000 per trainee per annum, with health services able to use residual grant funds to support team capacity building. The evaluation findings may assist funders and other stakeholders to tailor their resourcing strategy.

The allied health RGTP is unique to Australia and no comparable programs in other countries were known to the research team. The only previous study of RGTP retention outcomes that compared trainees to a non-training group was conducted in South Australia²⁶. Direct comparison of retention outcomes was not possible due to differing calculation methods. However, the relative differences between training and non-training groups in each study are similar, with our results showing the average retention in an RGTP prior to relocating was 69% greater than in a regular early-career rural or remote role, and the South Australian study finding an 82% greater average length of organisational tenure for trainees²⁶.

This study found a higher promotion rate for trainees compared to the non-trainee group, which may indicate a benefit in capabilities provided by the training opportunities, but could also relate to longer retention in rural work units providing more opportunities for advancement. The South Australian RGTP evaluation noted that all seven employees who completed the training pathway progressed to a higher level position²⁶. As career progression has been shown to influence rural career decisions of allied health professionals^{11,12,14,39} these outcomes may indicate an important benefit of the RGTP for participants.

Withdrawal from postgraduate training in this study at 31.4% compares favourably with the South Australian RGTP trial that had 46.6% withdrawal²⁶, the TAHRGETS implementation in private and non-government settings with 40.0% withdrawals²², and the Queensland Health medical rural generalist pathway that reported 36.3% withdrawal of the 237 participating doctors between 2008 and 2015⁴⁰. A multi-jurisdictional evaluation of the JCU rural generalist postgraduate courses found withdrawals to be only 23.1%²³. However, in that study 47.7% of students in the RGP and 92.0% in the GDRGP were continuing studies at the conclusion of data collection period²³, indicating the follow-up duration may have been inadequate to fully examine outcomes. Research has previously shown that course withdrawal for rural generalist trainees was influenced by access to development time and prioritisation of training, motivation and incentives for completion, alignment of course content to trainees' work roles, and consistent workplace support and supervision^{23,41}. In our study, average trainee development time was 34 minutes per week less than the target set for workplaces in the RGTP program guidelines³⁴, although supervision met the organisational expectation of 1 hour per week³⁵. Protecting development time in busy clinical environments has been consistently identified as a challenge for RGTPs^{23,27,41}, and more broadly for rural clinicians^{42,43}. The substantial range in average development time accrued by our trainees of 0.35 to 13.5 hours per week indicated variation in the strategies used, and potentially the support for and capacity to provide protected development time across workplaces.

Costs of RGTPs have been examined in one other study²⁶. The average implementation cost of an RGTP for a Local Health Network in the South Australian public health system was \$28,032 for the 18.6 months average participation period through to completion or separation, or \$18,085 per annum. This is \$4861 greater than the average annual cost found in our study. The South Australian study had greater average trainee

development time costs as a larger proportion of trainees occupied 'mid-career level' (Allied Health Professional 2) positions²⁶ at a higher wage rate⁴⁴, compared to the Queensland Health trainees.

The strength of our analysis lies in the relatively large number and broader composition of trainee and non-trainee groups, compared to other RGTP evaluations in public health systems. Our study included three times more participants²⁶ and more allied health professions than earlier public sector evaluations^{20,26-28}. It covered the majority of non-urban regions of Queensland and implementation sites spanned large rural centres through to very remote communities. Examining costs and retention impacts from the perspective of a local health service should provide valuable operational information for rural and remote healthcare providers.

The retrospective observational design of this study is a limitation as it cannot attribute causation of outcomes to the intervention. Trainees seek and secure employment in RGTPs, which may indicate underlying differences in career objectives or rural generalist capabilities compared to other rural employees. Profiles of the trainee and non-trainee groups indicated moderate variation in age, profession mix, remoteness and experience at commencement, which are variables shown to affect retention^{5,14,17}. Other known rural tenure influences such as rural origin, work unit support, interpersonal relationships and personal factors^{6,15,17} were not examined and may have varied between participant groups. Some potential health service benefits were not considered in the costing analysis including the impact of trainees' skill development and service improvement projects on productivity and recruitment efficiencies, as has been shown in other trials^{26,27}. The sample size did not allow analysis of associations between variables such as retention and trainee characteristics, course completions or development time. The study used documentation and data collected for payroll and RGTP program implementation purposes. The accuracy of the data sources was not explicitly tested in the research methodology and reporting errors are possible. The majority of the data collection period corresponded with the health system response to the COVID-19 pandemic. Staffing redeployment and shortages were common in Queensland Health between mid-2020 and late 2021, and workforce impacts across the health system have been widely reported⁴⁵. This potentially confounded retention and training outcomes in this study.

Trainees were retained in their rural or remote work unit for 22 weeks longer than non-trainees prior to transferring to another Queensland Health service location. Irrespective of whether there is a causal influence of RGTP participation on retention time, the findings show that the additional investment in rural generalist training correctly targeted practitioners that could utilise their learnings in practice for a longer period. Lower turnover can convey benefits to the organisation through reduced vacancy management, recruitment and onboarding burden for the health service¹⁴ and improved continuity of care for consumers⁴⁶. Retention gains of nearly half a year are likely to be considered operationally impactful by rural and remote services. Average retention durations in MM 4 to MM 7 locations, MM 2 to MM 7 locations and in Queensland Health were found to be similar, particularly for the trainee group. This indicates that resignation was a primary driver of attrition from regional, rural and remote Queensland Health positions, rather than relocation to metropolitan jobs within the organisation. Post-separation employment location for the 10 trainees and 17 non-trainees who

left the organisation were not available to the research team but may have included further time in rural or remote locations working in other agencies and sectors.

RGTP implementation in this study was skewed towards more remote service locations, potentially reflecting a known rurality gradient of recruitment challenges for allied health professionals¹⁴. The South Australian trial had approximately equal proportions of physiotherapy, podiatry, occupational therapy and speech pathology trainees⁴¹. In our study, vacancy trends, recruitment outcomes and operational structures responsible for QDOH grant fund-holding in HHSs may have influenced the over-representation of physiotherapy and limited implementation of RGTPs in pharmacy, radiography, and mental health discipline areas. Psychology and social work were only included in the program in January 2021, which contributed to limited RGTP numbers in these professions. Larger trials that allow analysis of profession-specific factors influencing RGTP implementation decisions and trainee outcomes could inform improvements to the RGTP strategy, and contribute to the limited existing evidence of variation in rural recruitment and retention between allied health professions^{5,14}.

Health service costs to redesign a regular early-career clinical role into an RGTP in Queensland Health were 17.9% of the graduate wage rate. Other organisations examining the introduction of RGTPs would need to consider costs in the context of their business and workforce models. Supervisor and manager time may require costing in other agencies and sectors, particularly in fee-for-service settings. For a system-level RGTP funding strategy, centralised coordination is required for policy, program and financial management, health service engagement and support, and evaluation. These costs are not reported in this article as they could not be reliably differentiated in the staffing data from other allied health workforce strategies managed by the QDOH. The South Australian trial of 15 RGTPs estimated central management functions to cost \$143,498 over 3 years or \$47,833 per annum²⁶.

RGTPs are a rapidly emerging strategy for improving rural and remote allied health workforce outcomes and service sustainability in Australia. Evaluated trials have occurred mostly in state health services and have been limited in size and duration, compared to the more established and better funded Rural Generalist Training strategies in medicine^{47,48}. With no current national funding measures for allied health rural generalism, cross-agency and

cross-sectoral collaboration is required to generate opportunities for larger studies, facilitate agreement on common evaluation metrics for workforce, education and service development outcomes, apply findings to refine the RGTP implementation model and improve sharing of successful implementation approaches. Longitudinal tracking of former trainees across employers and jurisdictions would enable longer and more comprehensive evaluation of rural and remote retention and career progression. However, the currently limited national data collection for self-regulated allied health professions in Australia⁴⁹ is a barrier for this research.

Conclusion

This study provides the largest evaluation of RGTP workforce and education outcomes to date, with encouraging indications of the value of this strategy for the health sector. RGTPs showed encouraging impacts on retention, education and promotion of early-career allied health professionals. These benefits were secured at a manageable cost to rural work units that was fully covered by the organisation funding grants. The RGTPs provide good value for health services through targeting training and development resourcing to early-career allied health professionals who are retained longer in rural or remote communities.

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Conflicts of interest

Four authors were employees of the funding body for the implementation and evaluation of the RGTPs. They were not involved in the data analysis.

AI disclosure statement

All authors confirm that no AI or AI-assisted technologies were used for this research or preparation of the manuscript.

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