**Pharmacy Workforce Profile in Rural New South Wales: Demographics, Preceptorship and Scope of Practice**

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**Abstract**

**Introduction**

As is the case for other health professions, limitations in the size of the pharmacy workforce in rural and remote locations disadvantages the population in those communities in terms of access to health care. While the role of pharmacists continues to evolve, expectations and demands to provide student and intern preceptorship and broaden their scope of practice challenge the rural pharmacy workforce. This project aimed to profile the rural pharmacy workforce in the Tamworth and Taree regions of New South Wales, explore pharmacists’ capacity to provide student and intern supervision, and provide an extended range of services.

**Methods**

A survey was administered to practicing pharmacists, including owners and managers. Data collected included professional role, age, gender, location, hours worked, student and intern supervision experience, the range of services provided, and perceived limitations to extended scope of practice. The survey was completed either online or face-to-face over a nine week period in 2019.

**Results**

A total of 50 pharmacists responded, 28 from the coastal Taree region and 22 from the inland Tamworth region. Most respondents were female (62%) and less than 40 years old (60%), similar to the national workforce profile. Sixty-seven percent reported working 36 hours or more per week and there was no difference in the mean hours between male and female respondents. Student supervision was associated with more accessible locations. Direct student supervision was performed by 54% of respondents, with 64% of the sites indicating they provide student placements. Professional services were similar among respondents, 74% indicating staffing issues limited extension of their scope of practice.

**Conclusions**

This project identified a stable core of rural pharmacists, the vast majority of who were not planning to retire soon. Many felt staffing shortages limited their capacity to extend service provision, which may influence job satisfaction. Under-utilisation of student placement and intern supervision capacity was also evident, which may negatively impact future workforce recruitment and retention. Further small-scale studies are recommended to gain insight into local, meso- and micro-scale facets of pharmacy practice.

**Keywords**

Rural health; Health workforce; Pharmacy education; Community pharmacy services

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**Introduction**

The size of the Australian rural pharmacy workforce declines relative to the population size as distance from major cities increases. The Australian Institute of Health and Welfare have reported 95.4 full-time equivalent (FTE) pharmacists per 100,000 population in the major cities, compared to 75.2 and 72.3 FTE in inner and outer regional centres respectively, and 56.3 FTE in remote locations[1]. In 2018/19, the Australian Health Practitioners Regulation Agency (AHPRA) reported 31,955 registered pharmacists in Australia, 2.7% more than the previous reporting period and 4.3% of nationally registered health practitioners[2]. About 77% of pharmacists practice in major cities[3], while 6.7% serve outer regional communities, and 1.2% work in remote or very remote locations[4]. As for the medical workforce[5], the impact of this maldistribution is that health care access is limited for rural and remote Australians.

Inadequacy of the rural pharmacy workforce is not unique to Australia. A systematic review found global pharmacy workforce to be increasingly composed of females who were working a diminishing number of hours[6,7,8]. Lower workforce participation rates parallel a decrease in the full-time equivalent pharmacists and a consequent shortage of qualified pharmacists.

The role of pharmacists continues to evolve in Australia[9,10],as well as in other developed countries[11]. Changes have been towards more patient-centred practice models, such as medication management and review[11,12]. While broadening of the scope of practice of pharmacists is a positive development, it presents challenges for the regional, rural and remote practitioners when there is a workforce undersupply. Expectations that pharmacists perform a wider range of duties places demands on the practitioners in terms of time and availability. It also creates the need for accredited and continuing professional development (CPD), which can be difficult to access outside metropolitan areas because of costs of registration and travel, as well as time way from family and the community that the pharmacists serve. This is exacerbated in small communities where the local pharmacist is a sole practitioner[13,14,15].

Pharmacists are also expected to contribute to clinical preceptorship of pharmacy students and new graduates[16]. In 2019 there were 7,200 domestic undergraduate, 1,688 international undergraduate, and 2,154 graduate entry pharmacy students enrolled at Australian universities, with a graduate employment rate of approximately 95%[17]. Following completion of their degree, all pharmacy interns are required to have 1,824 hours of supervised practice[18], with onsite supervision by a registered pharmacist. New graduates prefer to do their internship close to the university from which they graduated,6 most, therefore, remaining in the major cities. However, in the interest of building future rural health workforce, it is desirable for part of the education and training of pharmacists to take place in non-metropolitan locations, in the hope that at least some stay and pursue a rural career.

Under successive Community Pharmacy Agreements, the Australian Government has funded Rural Pharmacy Workforce Programs, including the Rural Pharmacy Liaison Officer (RPLO) Program[19]. The RPLOs are pharmacists employed in a clinical-academic capacity to support pharmacy students on placements outside major cities. Embedded in University Departments of Rural Health (UDRHs), funded under the Rural Health Multidisciplinary Training (RHMT) Program[20], RPLOs also support local rural pharmacists to access CPD. The University of Newcastle (UON) employs two part-time RPLOs, one in Tamworth, in the New England and Northwest region of New South Wales, and another in Taree, in the Lower Mid-North Coast region. To better inform support for rural students and pharmacists, there was a perceived need to survey the rural pharmacists in those regions.

**Methods**

Clearance was obtained from the UON Human Research Ethics Committee (UONHREC QA189, 5 July 2019). The questionnaire included demographic questions, plus questions about employment and scope of practice and about willingness to act as preceptors to students and interns. Respondents indicated professional services offered from a list of 21 options that included blood pressure monitoring, opioid substitution, healthy weight management programs and vaccinations, with space to add ‘others’, if necessary. The list of survey questions is shown in Table 1 and services specifically listed in the survey are shown in Table 3, together with results.

The target population included practicing staff pharmacists, managing pharmacists and pharmacy owners. Volunteer sampling was performed over a 9 week period from August to October, 2019. Email invitations with a link to the online Survey Monkey™ questionnaire were sent to pharmacists listed in the data base held by the UDRH. Data was also collected face-to-face by the RPLOs during site visits, entering responses into the online questionnaire using an iPad. All data were downloaded into a Microsoft Excel™ spreadsheet and exported into Statistical Package for Social Sciences (SPSS) (IBM Australia, St Leonards, Sydney) for analysis.

**Results**

A total of 50 pharmacists provided data, being some 46% of those invited to participate and about 25% of the registered pharmacy workforce in the combined regions[21]. Demographic variables are shown in Table 2 for the 28 respondents from the Taree region and 22 from the Tamworth region. Only one respondent was a hospital pharmacist, the rest being employed in community pharmacy, including one intern. The majority (62%) were female. Almost half indicated that they were employed as community pharmacists and 22 (44%) were pharmacy owners or owner-managers.

Distribution of age was similar to the 2018/19 AHPRA workforce age profile[2] (p=0.151, Chi2), as in Figure 1, with the largest proportion in the 25 to 34 age category, the next largest category being 35 to 44 years. The smallest age category was less than 25 years (n=2) and only one respondent was older than 70 years. Nine respondents (18%) thought they may retire in the next 5 years, with a further five (10%) unsure.

Location data was categorised using both Pharmacy Accessibility and Remoteness Index of Australia (PhARIA)[22] and Modified Monash Model (MMM)[23]. The former has since been replaced by the later for determination of rural pharmacy support[22]. Nine respondents chose not to provide their address, so it was not possible to determine their location. Of the 16 different locations, eight fell into the superseded PhARIA 1 (High Accessible) (n=30 respondents), two were PhARIA 2 (n=4) or 3 (n=5) (Accessible, Group A and Group B respectively), one PhARIA 4 (Moderately Accessible) (n=1) and one PhARIA 5 (Remote) (n=1)[22]. In the MMM classification, no locations fell into the two lowest, most accessible, or two highest, most remote, categoriesand ten locations were classified as MMM 3 (n=35 respondents) and six as MMM 5 (n=6)[23].

Respondents estimated their average hours worked each week. With two missing, responses were negatively skewed, a quarter of respondents working 30 or less hours per week. With a mean of 35.4 hours and median of 40.0 hours, 67% of the respondents worked 36 or more hours per week. The results are shown in Figure 2, with separate distributions for males and females. Though almost twice as many female as male respondents worked less than 20 hours per week, there was no difference in the means (p=0.797, Kruskal-Wallis). The average weekly hours reported by owner-manager pharmacists was 33.9 hours, compared to 37.5 hours for other community pharmacists (p=0.222, Kruskal-Wallis Test). Some 48% of respondents perceived a need to increase the number of pharmacists where they worked, but only 4% wanted to increase pharmacists’ hours. Of the 22 owner-managers, eight (36%) said they would employ overseas trained pharmacists and two were ‘unsure’, while 12 (55%) did not respond.

While 27 respondents (54%) indicated that their role included supervision of students on placement, 64% indicated that the site where they work provided placement opportunities. Of the 23 respondents that did not perform student supervision, five said they would be interested in doing so and that there was potential for student placements where they worked. Providing student placements was associated with more accessible locations (p=0.024, Fisher’s Exact Test), although four of the six respondents in MMM5 locations regarded their workplace as a potential student placement site. The same association was not found for intern supervision (p=0.333, Fisher’s Exact Test), however. Excluding the intern, 23 of the respondents (47%) indicated that they had a role in intern supervision (n=12) or would be interested in such a role (n=11). Meanwhile, 26 respondents (53%) indicated that their workplace either currently (n=22) or could potentially (n=4) supervise interns.

Types of services provided are shown in Table 3. Six service types were provided by 80% or more of the respondents, either by the pharmacist or another trained staff member, or by an external provider. If no response was given, it was assumed the service was not offered and for two service types, Chronic Obstructive Pulmonary Disease (COPD) screening and International Normalised Ratio (INR) monitoring, more than 80% did not respond. Asked whether, given adequate staffing, they would broaden the range of services or scope of practice, only three respondents (6%) said ‘No’, 74% ‘Yes’ and 20% were ‘Unsure’. Also asked what activities, if any, were limited by ‘staffing issues’, the most common responses were ‘limitations on providing professional services’ (58%) and in ‘extending scope of practice’ (56%). Limiting ‘capacity to take annual leave’ was indicated by 52%, while the least common was limiting ‘supervision of students and interns’ (24%). ‘Attending CPD events’ and ‘attracting locums’ were both flagged by 30%.

Six respondents (14%) gave open-ended comments, most about staffing and recruitment, such as:

*‘When pharmacist in charge, I am a sole pharmacist on duty and struggle to find enough hours to complete necessary tasks. Would love to have another pharmacist on duty to enhance clinical role.’* (Respondent #4, MMM3)

*‘It is difficult in rural areas to balance cost with adequate staffing, particularly due to decreased income in recent years (codeine rescheduling, accelerated price disclosure) … .’* (Respondent #37, MMM5)

One respondent expressed a desire to do more:

*‘I enjoy being a pharmacist and want to learn and offer more knowledge and services to consumers, time permitting.’* (Respondent #7, Location unknown)

**Discussion**

The regions in this project are different and diverse, encompassing both inland and coastal regional, rural and remote communities. They are broadly reflective of other parts of non-metropolitan Australia, and the demography of the pharmacy workforce bears similarities to the national 2018/19 AHPRA workforce data[2]. Over 60% of the survey respondents were in the prime working years of 25 and 45. Previous studies had suggested an aged rural pharmacy workforce in similar regions. Data collected in 2005 in Northern NSW showed an average age for pharmacists of 51 years[24] and a follow-up study in that region 3 years later showed a mean age of 58 years[25]. Another survey of rural and remote pharmacists found a mean 55.8 years[26], which the authors suggested reflected that rural and remote pharmacists are generally older than the national average.

The results suggest a stable core of practising, mostly female (> 60%) pharmacists, with less than 20% considering retirement within five years. The average hours worked per week and distributions of hours worked by males and females were similar to previous studies[27, pp.12-13] and, in this study, the mean hours worked by females was no different to males. This seems contrary to the perception that feminisation of the pharmacist workforce leads to a decrease in workforce participation rates[6]. While a greater proportion of females worked less than 20 hours per week, a higher proportion of males worked between 20 and 34 hours per week, less than full-time equivalent.

As one respondent commented, attracting young pharmacists to rural areas is difficult, as is well represented in the literature[28,29,30].Nearly half the respondents considered that they needed more pharmacists. Efforts to build the rural pharmacy workforce are ongoing. The number of pharmacy schools in Australia has more than doubled in the last 15 years, with some established in regional locations[26,31], and graduate numbers are at unprecedented levels. Increased student and intern numbers promises long-term benefits, with the hope that a ‘trickle-down effect’ will lead to more graduates entering rural practice in the future. However, passive trickle-down theory, with overflow of practitioners into rural practice, has been questioned[32] and largely refuted as an effective solution to the rural medical workforce shortage[33,34]. Rather, there is a need for affirmative action. Students and early career practitioners must experience rural practice and lifestyle, the challenge being to get them into regional, rural and remote areas for part of their education and training.

There was evidence in this project of some under-utilisation of rural student placements and internship opportunities. Pharmacists willing to provide student and intern preceptorship exceeded the number with an active preceptor role. There is a need for further investigation and if similar under-utilisation occurs in other regional, rural and remote regions, it may be argued that more work is required to increase student and intern exposure to rural practice. While predictors of rural practice include rural origin and attending a rural university[28], compared to rural curriculum alone, a positive placement experience is strongly associated with rural practice intentions[29,31,35]. Taylor et al.[29] reported that recent graduates who had a rural placement said it impacted on their decision to enter rural practice. The RPLOs are well placed to support the rural career pipeline, from student placements through internship and into early-career and ongoing professional practice.

One of the motivators for rural practice is the potential for expanded scope of practice[30] and job satisfaction is associated with the ‘use of advanced skills’[26]. Though opposed by some in the medical profession[36], and often poorly understood[37], provision of an extended range of primary health care services by pharmacists may be beneficial in rural communities[36,38], which is similarly true for other health professionals, such as nurse practitioners[39]. More could be done in roles such as COPD screening, and INR and cholesterol monitoring. Given the comparatively high prevalence of cardio-vascular disease risk factors in rural communities[30,41], pharmacist-led interventions in managing hypertension and hyperlipidaemia could improve pharmacological treament[42]. In this project almost three-quarters of respondents indicated that staffing issues limited extending their scope of practice. Increasing expectations and demands in a climate of workforce undersupply, can lead to career frustration and decrease job satisfaction, so addressing workforce under supply in parallel with pharmacist role development is essential.

This was a small scale study intended primarily for internal quality assurance purposes. Reliability of responses may be affected by self-reporting, recall bias and perceptions of social desirability[43]. Role differentiation could have been further explored, such as sole practitioners versus those working at multi-pharmacist sites. These are opportunities for future research, as is greater exploration of the association between role development and job satisfaction and more targeted support of student and intern rural experiences.

**Conclusions**

Over the past 10 to 15 years changes have been debated and implemented in both pharmacy education and practice. There is a need to monitor such changes, how they are implemented and the outcomes produced. Large scale, national, profession-wide data collection is essential to provide a macro-perspective, while projects such as that reported in this article give insight at the meso-scale, community level and the micro-level of individual practitioners[39]. There is a need for further localised studies of the regional, rural and remote pharmacy workforce (as well as other health professions) to better understand local variation in work patterns and the needs of practitioners and to inform support and future development.

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| **Table 1:** List of the survey questions and possible responses. | |
| **Questions** | **Possible Responses** |
| Current professional role (predominantly) | Community pharmacist/ Hospital Pharmacist/  Accredited Pharmacist/ Non-practising owner/  Owner Manager/ Managing Pharmacist/ Other (free text) |
| Gender | Female/ Male/ Not specified |
| Your age group | Five year categories from < 25 years to > 70 years |
| Do you see yourself retiring from the profession in the next 5 years? | Yes/ No/ Unsure |
| Current employment status | Full-time/ Part-time/ Casual/ Intern or provisional pharmacist/ Other (free text) |
| Average hours worked as the pharmacist on duty per week | Numerical whole number |
| Does your place of employment supervise pharmacy students during their placement period? | Yes/ No/ No, but I would be interested |
| Do you supervise pharmacy students during their placement periods? | Yes/ No/ No, but I would be interested  (+ optional comment) |
| Does your place of employment supervise intern/provisional pharmacist(s) during their placement period? | Yes/ No/ No, but I would be interested  (+ optional free text comment) |
| Do you personally supervise intern/provisionalpharmacist(s)? | Yes, annually/ Yes, but not currently/  No/ No, but I would be interested  (+ optional free text comment) |
| **Number of Pharmacists employed within your workplace (including yourself)?** | Full-time = (whole number)  Part-time = (whole number) |
| Do you feel current pharmacist staffing levels are adequate at your place of employment? | Yes/  No, I would like to see an increase in pharmacist numbers/  No, I would like to see an increase in current pharmacist hours/ Other (free text) |
| Scope of practice – Please select from the list below professional services offered in your place of employment (see Table 3) | Range of categorical options + other, either:   * Delivered by Pharmacists/ trained pharmacy staff, or * Delivered by external providers |
| Do you have any additional qualifications or accreditations relevant to your Pharmacy Practice? | Accredited Pharmacist/ Accredited Pharmacist Immuniser/ Diabetes Educator/ Other (free text) |
| Have staffing issues limited your ability to … | Increase the professional services offered/ Increase your scope of practice (eg. Medchecks, HMRs/ RMMRs, vaccinations, etc.)/ Supervise pharmacy students or interns/ Attend CPD events/ Take annual leave/ Attract locums/ Other (free text) |
| If your place of employment had (or currently has) adequate pharmacist hours would you consider broadening the professional services/scope of practice offered? | Yes/ No/ Unsure |
| **Would you consider employing an overseas trained pharmacist if there was adequate funding and/or incentive program on offer to assist with this?** | Yes/ No/ Unsure  (+ optional free text comment) |
| Any additional comments | (Free text) |

**\*** Bolded questions were only asked of owners/managers.

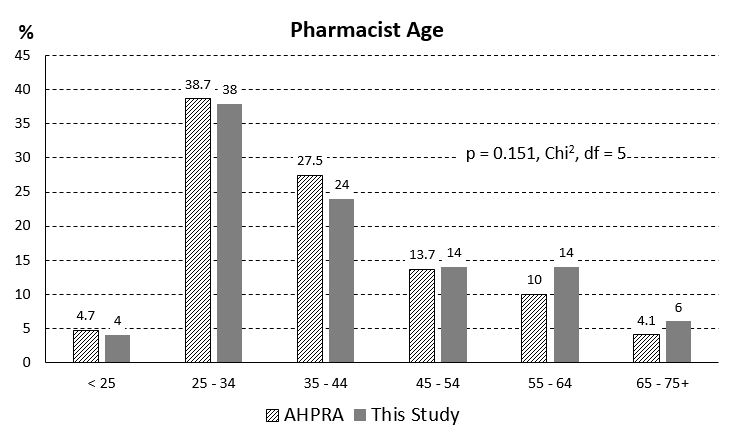
**Table 2:** Respondents demographic variables (n = 50).

|  |  |  |
| --- | --- | --- |
| **Variable** | **n** | **%** |
| **Professional Roles** | | |
| Accredited Pharmacist | 2 | 4 |
| Community Pharmacist | 24 | 48 |
| Hospital Pharmacist | 1 | 2 |
| Managing Pharmacist | 4 | 8 |
| Owner | 1 | 2 |
| Owner Manager | 17 | 34 |
| Intern Pharmacist | 1 | 2 |
| **Cohort (data collection hub)** | | |
| Coastal (Taree) | 28 | 56 |
| Inland (Tamworth) | 22 | 44 |
| **Gender** | | |
| Female | 31 | 62 |
| Male | 19 | 38 |

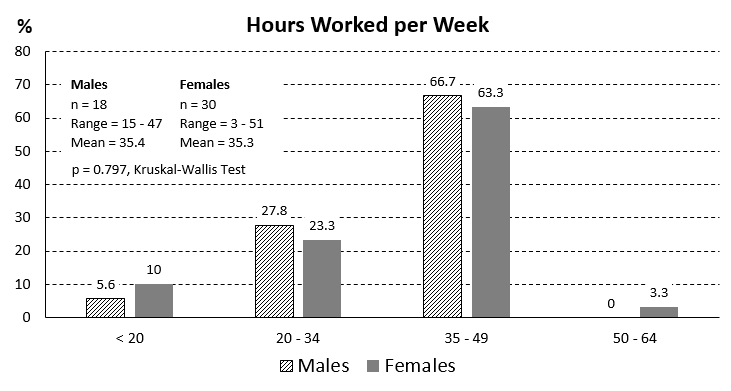
**Table 3:** Responses to the question of what services were provided from the list below, either by staff within or external to the pharmacy. If neither, no response was recorded.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Professional**  **Service Offered** | **Delivered by Pharmacist or Pharmacy Staff** | **Delivered by**  **External Providers** | | **Did Not Respond** |
| Opioid substitution program | 18 (36%) | | 3 (6%) | 29 (58%) |
| Diabetes educator clinics | 18 (36%) | | 4 (8%) | 28 (56%) |
| Sleep apnoea | 12 (24%) | | 3 (6%) | 35 (70%) |
| Needle syringe program | 28 (56%) | | 3 (6%) | 19 (38%) |
| Staged supply | 39 (78%) | | 1 (2%) | 10 (20%) |
| Smoking cessation advice and support | 21 (42%) | | 2 (4%) | 27 (54%) |
| Weight loss programs | 33 (66%) | | 1 (2%) | 16 (32%) |
| Immunisation | 41 (82%) | | 0 | 9 (18%) |
| Meds Checks / Diabetes Checks | 46 (92%) | | 0 | 4 (8%) |
| Dose Administration Aids | 26 (52%) | | 3 (6%) | 21 (42%) |
| COPD screening | 3 (6%) | | 2 (4%) | 45 (90%) |
| Compounding | 31 (62%) | | 5 (10%) | 14 (28%) |
| Clinical interventions | 47 (94%) | | 0 | 3 (6%) |
| INR monitoring | 1 (2%) | | 6 (12%) | 43 (86%) |
| HMR/RMMR | 22 (44%) | | 20 (40%) | 8 (16%) |
| Blood cholesterol monitoring | 15 (30%) | | 3 (6%) | 32 (64%) |
| Blood glucose monitoring | 33 (66%) | | 1 (2%) | 16 (32%) |
| Blood pressure monitoring | 47 (94%) | | 0 | 3 (6%) |

Abbreviations: COPD = Chronic Obstructive Pulmonary Disease; INR = International Normalised Ratio; HMR = Home Medicines Review; RMMR = Residential Medication Management Review.



**Figure 1:** Comparison of the age of pharmacist categories between this project and 2018/19 Australian Health Practitioner Regulation Agency (AHPRA) data for registered pharmacists.



**Figure 2:** Self-reported average weekly hours of work, male versus female respondents.