Abstract

Background
Rural settings challenge healthcare providers to provide optimal medication services in a timely and quality manner. Extending the roles of rural healthcare providers is often necessary to improve access to medication services; however, there appears to be a lack of pharmacy-based involvement and support within the medication system.

Objectives
This paper explores medication supply and management issues in rural settings, based on the governance perspectives of key informants on regulatory aspects, policy and professional practice. Specific objectives were to:

• Identify the key issues and existing facilitators, and
• Explore the potential role of pharmacy to improve medication supply and management services.

Methods
Semi-structured interviews were conducted with representatives within regulatory or professional organisations. The participants were key informants who held leadership, managerial and/or leadership roles within their respective organisations, and were recruited to provide insights from a governance perspective prior to data collection in the community. An interview guide, informed by the literature, assisted the flow of the interviews, exploring topics such as key issues, existing initiatives and potential pharmacy-based facilitators in relation to medication supply and management in rural settings.

Results
Issues identified that hindered the provision of optimal medication supply and management services in the rural areas centred on workforce, inter-professional communication, role structures and funding opportunities. Legislative and electronic developments and support mechanisms aim to facilitate medication processes in rural areas. Potential initiatives to further enhance medication services and processes could explore extended roles for pharmacists and pharmacy support staff, as well as alternative service delivery models to enhance pharmacy workforce capacity.

Conclusions
The study provided an overview of key issues with medication supply and management and highlighted the potential for increased pharmacy involvement to improve and support medication services in rural areas. The governance views of these key informants could be used to inform policy and practice related to rural medication services.
INTRODUCTION

Medication management is a complex process that involves a range of healthcare providers and tasks: prescribing, recording of the medication order or prescription (data entry), review of the medication order or prescription, issue of the medication, provision of medication information, distribution and storage, administration of medication, monitoring for the patient’s response, and transfer of verified information between healthcare providers.¹

In Australia, the management of medication services is complicated by the division of responsibilities, funding and regulatory aspects of healthcare delivery between the Commonwealth (national) Government and State/Territory Governments. For example, the Commonwealth Government oversees registration, credentialing and scopes of practice of a range of healthcare practitioners through the National Registration and Accreditation Scheme (as of July 2010) and the subsidy of pharmaceuticals under the national Pharmaceuticals Benefits Scheme (PBS).²,³ By comparison, regulatory aspects relevant to the handling of medications (also referred to as drugs and poisons) by healthcare practitioners and providers falls under the jurisdiction of States and Territories, and can differ between jurisdictions.²,³

Rural settings impose further complexity in the medication management cycle. Australia is one of the few developed countries with vast areas comprising small and highly-dispersed communities, resulting in low population densities and long distances between communities.⁴,⁵ Access to the full complement of medical, other health professional and community services is at least 80km or an hour away by road.⁵ In Queensland, almost 98% of the state is classified as “outer regional”, “remote” or “very remote”, where approximately 22% of people live, in comparison to the corresponding Australian average of 13%.⁴ The geographical, social and professional isolations have been identified to compromise rural health workforce and the viability of healthcare services, which in turn challenges existing rural healthcare providers to provide optimal healthcare, including medication services, in a timely and quality manner.²,³,⁶,⁷ As such, rural healthcare often requires extended clinical skills and overlapping or changing roles of healthcare providers to cope with healthcare demands.⁵,⁷ For example, in Queensland, registered nurses, midwives, paramedics and Indigenous health workers, often practise with endorsed roles in medication initiation, supply and administration to improve access to medications in rural areas.³,⁷,⁸ Some of these extended roles are outside the traditional scopes of practice of these healthcare providers, and support structures, ideally pharmacy-based, are required for these providers to assist them in medication management processes, and thus promote “Quality Use of Medicines” (QUM) in the community.²,³,⁷,⁹,¹⁰
A Pharmacy Workforce Planning Study reported that the majority of pharmacists are concentrated in major cities and inner regional areas, with less than 10% of the workforce distributed across outer regional, remote and very remote areas. Other data showed that the number of community pharmacists per 100,000 population in rural and remote areas ranges between 25 and 60, compared to 70 in major cities, whereas hospital pharmacists per 100,000 population ranges between 4 and 8, compared to 13 in major cities. Pharmacy services in rural areas are often provided by one or few community pharmacists with either one or no hospital pharmacist employed at the local hospital, and nurses are relied upon to undertake pharmacy-based medication roles at non-pharmacist hospitals. Due to the limited pharmacy workforce in rural areas, the majority of rural pharmacists are required to be mainly engaged with dispensing roles. This, in turn, impedes their capacity to provide additional pharmacy services, despite developments in enhanced pharmacy services (e.g. weight loss, asthma, diabetes, smoking cessation), pharmacist-mediated medication review services and increased roles to minimise medication-related errors such as medication information liaison and multi-disciplinary integrative services. Studies to apply these developments in rural areas are lacking, and there is potential for research into alternative service delivery models to expand pharmacy workforce to improve QUM and provide medication support in rural areas, where there is increased reliance on medication therapy and often no healthcare services offering alternative or adjunct therapy.

This paper reports the first of two phases of data collection that explores medication supply and management issues in rural settings, based on the governance perspectives of key informants on regulatory aspects, policy and professional practice. Specific objectives were to:

- Identify the key issues and existing facilitators, and
- Explore the potential role(s) of pharmacy (pharmacists and pharmacy support staff) to improve medication supply and management services.

**METHODS**

Ethical approval was granted by the Griffith University Human Research Ethics Committee, the University of Southern Queensland Human Research Ethics Committee, the University of Queensland Behavioural & Social Sciences Ethical Review Committee, and the Darling Downs-West Moreton (Toowoomba & Darling Downs) Health Service District Human Research Ethics Committee. The multiple approvals were required for access to interviewees beyond the immediate regions of the researchers. Following a review of the literature, the data collection stage relevant to this paper involved semi-structured interviews with key informants with roles and expertise in medication services governance.
Information reported elsewhere presents the full scope of the project, which also included subsequent identification of a rural community of interest and data collection with rural healthcare providers and consumers within that study community to further contextualise the data from the key informant research stage presented here.\textsuperscript{14}

This exploratory research phase involved purposive sampling\textsuperscript{15} to elucidate a range of perspectives and experiences from representatives within organisations involved in policy, regulatory and/or professional aspects of healthcare that may impact on medication services delivery in rural communities. Twelve key informants, who held leadership, managerial and/or administrative roles in their respective organisations, were contacted to participate in individual semi-structured interviews:

- A representative from the Australian Health Practitioner Regulation Agency (AHPRA),
- A representative from the Australian Health Workforce Institute (AHWI),
- A representative from the Australia Pharmacy Council (APC),
- Two representatives from Medication Services Queensland (MSQ), Queensland Health, of which one was from a non-pharmacy background,
- A representative from Pharmaceutical Defence Limited (PDL),
- A representative from the Pharmaceutical Society Australia (PSA),
- A representative from the Pharmacy Guild of Australia (the Guild),
- A representative from the Queensland Health Drugs and Poisons (QHD&P) Unit,
- Two hospital pharmacists, one with managerial experience in a multiple-pharmacist regional hospital, and the other with experience as a sole pharmacist in a rural hospital, and
- A sole hospital pharmacy assistant, with practice experience under the supervision of a registered nurse in a non-pharmacist rural hospital.

The limited geographical focus of the data collection was necessitated by the scope of the subsequent research stage and accessibility of the key informants. The involvement of Queensland-based key informants from various organisations was considered valuable in contextualising the findings from a range of governance perspectives relevant to legislative, practice and role development specific to Queensland. Key informants from pharmacy-based organisations (APC, PDL, PSA, and the Guild) were specifically recruited to gain information about medication-related policies and issues, with particular focus on rural settings, and to explore potential solutions involving pharmacists and/or pharmacy staff in both hospital and community settings. The administrative perspective of the hospital pharmacists and pharmacy assistant was considered valuable in discussions relating to hospitals with multiple pharmacists, hospitals with a single pharmacist and hospitals functioning without a pharmacist (common in rural areas). Key informants from AHPRA, AHWI and QHD&P...
were recruited to provide an overview of workforce and regulatory issues. Representatives from MSQ, Queensland Health’s corporate directorate responsible for QUM, provided insights into medication-related initiatives, policies and issues in public hospital settings, focusing on rural hospitals which were predominantly serviced by Queensland Health. Two of the key informants (de-identified) had nursing practice experience and were able to also provide opinions from nursing perspectives.

The purpose and nature of the study was explained to the participants prior to their interviews, and again at the start of the interview. While the participants were approached as representatives from their respective organisations, participants who held multiple roles, either in practice and/or representatively, and either at the time of the interview or in previous positions, were allowed to provide opinions from both governance and practice perspectives. Representatives who declined to participate in the study, mainly due to work responsibilities, provided the name of another representative within that organisation. All participants provided consent to their participation and recording of the interviews.

An interview guide (Table 1) was developed, informed by the literature, to assist the flow of the interviews. Interviews started with a brief discussion of major issues in the provision of medication services in rural settings, specifically focusing on medication supply and management. This was followed by a discussion of a range of topics, with a degree of flexibility to allow key informants to expand on topics according to their area of expertise, as per semi-structured interview methods.\textsuperscript{15,16} Topics of interest included:

- Current medication roles, including extended roles, of rural healthcare providers.
- Current and potential facilitators relevant to medication supply and management, and associated challenges.

As the parent study focused on rural settings in Queensland, interviews with key informants referred to the medication-related authorities and roles in the Queensland Health (Drugs and Poisons) Regulation 1996,\textsuperscript{8} although participants could reference provisions in other States or Territories as comparison. Interviews also referred to Commonwealth Government policies such as the provisions in the PBS and the objectives of the National Medicines Policy,\textsuperscript{2} namely, (1) timely access to affordable medications, (2) responsible and quality delivery of medication services with best practice regulatory systems in place, and (3) QUM.

Interviews were conducted between August and November 2010, for approximately 45-60 minutes each, jointly by two of the researchers (AT, VJ) to enhance the quality of the data collection process.
The interviews were conducted face-to-face (with the exception of one telephone interview as the informant was not in Brisbane at the time of interview), and recorded, with signed consent from each participant.

Upon reaching theme saturation, the interviews were transcribed verbatim. Qualitative techniques were applied for data analysis to identify themes, general trends, major issues, differences and unique individual responses. These were manually identified from the transcripts, to ensure accuracy of interpretation and contextualisation of the participants’ comments to prevent misinterpretation of data that is possible with electronic-based analysis. The dominant themes from the data analysis are reported below and were also used to strengthen identified issues, or build on issues otherwise unidentified, in the literature to formulate interview topics for subsequent data collection in the study rural community.

**RESULTS**

To maintain confidentiality in reporting the findings, the key informants are coded as K1 through to K12, without affiliation with their organisation or sector. Some key informants revealed relevant rural practice experience, as reported below.

**Major Issues in Provision of Medication Supply and Management Services in Rural Settings**

**Rural healthcare environment:** The workforce shortage was perceived to impede the continuity of therapy and patient care in the primary healthcare sector. This not only burdens the primary healthcare workforce, but also results in patients utilising secondary-care services as a first port of call:

“[There is a] very limited pool of people ... The queue to see the GP is long and passers-by and other people cannot get into the GP, so they turn up at the hospital, and the hospital is functioning like a GP clinic on some days.” (K4)

Working in rural areas imposes social challenges such as lack of collegial support, interaction and communication. Lack of professional support for sole practitioners or recent graduates in terms of clinical and therapeutic decisions was raised by several participants. Timely communication of medication information can also be lacking between healthcare providers who may be overloaded with patients’ healthcare demands.

**Role extension:** While participant K5 pointed out that about three-quarters of the public hospitals in rural Queensland did not employ a pharmacist, and registered nurses on site were up-skilled to
undertake pharmacy-based functions in these non-pharmacist hospitals. While some of the participants acknowledged the skills of other healthcare providers in the field of medications, concerns were raised about overlapping roles and up-skilling, particularly relating to nursing staff undertaking pharmacy-based functions without professional support from a pharmacist. The requisite training, level of pharmacotherapy knowledge required, increased workload, patient prioritisation and deviation from true core role(s) were some of the key issues raised.

Numerous participants commented that inappropriate allocation of funding for role extension to provide pharmacy services, instead of supporting outreach pharmacists to provide such services, contributed to the incomprehensive medication services in rural areas:

“Right now, we’re spending an awful lot of time developing training programs, to train Indigenous health workers and nurses to actually undertake a role that (pharmacists) are actually trained for ... the only reason (pharmacists) are not doing it is because there’s no remuneration package to allow pharmacists to perform that role.” (K12)

Under-utilisation of pharmacists: Some participants commented that rural hospitals that did employ pharmacists did not utilise a pharmacist’s expertise appropriately, as they are expected to fulfil basic dispensing tasks. The majority of participants expressed their concern about the shortage of clinical pharmacy services (e.g. medication reconciliation, medication review services and therapeutic recommendations), and the potential for higher rates of medication-related events as a result. This was particularly an issue in facilities without pharmacists or where pharmacists are being burdened with dispensing tasks:

“If you take it back to basics, the first thing the hospital wants a pharmacist to do is supply. That’s the legal requirement, that’s what we need for the patient. ... the clinical pharmacy is the nice bit that we can drop if we’re short of funding there’s no one we can recruit, et cetera ...” (K4)

Pharmacists were also under-utilised in healthcare programs, which may enhance health services in a rural setting. Participant K5 cited the example of the federally-funded ‘Transition Care Program’, which identifies patients’ needs in transition from a hospital to a non-hospital environment, and pointed out the potential of pharmacist involvement to facilitate medication information transfer and to provide post-discharge medication reviews. It is, however, currently restricted by workforce issues and lack of remuneration.

Participant K12 also commented on the limitations of the PBS Section 100 scheme in Australia, which involves the bulk delivery of PBS medications, with no dispensing or labelling, to a remote or
isolated Aboriginal Health Services. The participant reflected on the inappropriate role structures involved:

“Pharmacists] really have a house-keeping role – they turn up, they drop off the drugs, they remove the old drugs, do appliance clean-up at the clinic’s room and leave again. Then you have an [Indigenous] health worker who unpacks it, puts it away and then supplies it to a patient based on [the order that] is sent to them by the doctor or the nurse. So the true person [i.e. the pharmacist] with the expertise in providing medication and providing counselling is not interfacing with the patient, no interaction like what would normally happen in a community pharmacy. That’s just really disjointed and a poor use of the ability of a pharmacist.” (K12)

Existing Facilitators for Medication Supply and Management

Table 1 provides a summary of identified existing facilitators.

Regulatory aspects: Participant K2 explained that extending the roles of rural healthcare providers aims to promote continuity of therapy in rural communities where healthcare services are scarce. This was supported by a number of participants:

“Patients don’t care if their care is delivered by a nurse practitioner, a senior registrar, a physician assistant or general practitioner. What the patient wants is quality care in a timely manner, delivered in a caring manner. [But] there’s a balance between increasing access and ... unsafe practice.” (K6)

However, participants K7 and K12 pointed out the divergence between Federal and State/Territory protocols, contributing to confusion and inefficiency in legislative compliance. Several participants also commented that current legislation does not allow the flexibility needed in a rural environment. Quite often the roles of healthcare providers are ‘stretched’ to meet healthcare demands, and there is a perceived tension between following legislative boundaries and providing patient care:

“There’re a lot of pharmacists in the country who would like to [provide off-site pharmacy services], but they’re constrained by the requirement to be in the pharmacy while the pharmacy is open. We lock people into the pharmacy.” (K8)

Support: Queensland Health’s corporate directorate responsible for QUM, MSQ, has been actively involved in providing training and clinical support to healthcare providers in rural communities, particularly sole practitioners or those undertaking non-traditional medication roles. The concepts
were supported by participants, but they acknowledged that funding shortages and workforce issues were hindering the ideal implementation and uptake of these support mechanisms.

**Electronic development:** Participants K4, K9 and K10 also commented on the benefits of software packages developed for state-wide use in Queensland Health public hospital facilities to facilitate medication processes such as ordering or issuing of drugs (iPharmacy®) and transfer of medication-related information to healthcare providers within a facility, between facilities and in the general community (eLMS). As these support systems are generally utilised by pharmacists rather than nurses, training and assessment modules have been developed to familiarise nursing staff in non-pharmacist hospitals with medication supply and reconciliation processes as well as the use of the software. The participants expressed difficulties such as infrequent on-site training and high turnover of staff in these sites, resulting in poor sharing of expertise and succession training amongst nursing staff.

**Potential Facilitators for Medication Supply and Management**

Key informants believed that some healthcare providers have demonstrated competency in practice when undertaking extended roles in rural communities, for example, nurses adopting medication supply roles to enhance consumers’ access to medications. However, pharmacy support to achieve quality medication services, including medication management, in rural areas was perceived as the next target to support the provision of healthcare and to enhance QUM in rural communities.

**Non-medical prescribers:** Some participants proposed arguments for increased use of non-medical prescribers, including pharmacists, to provide greater workforce capacity in a rural setting. This should free up medical doctors somewhat to focus on more complex medical conditions. Some of the examples of roles for pharmacists in ‘prescribing’ were:

- Participant K1 suggested the potential of pharmacist-initiated therapy according to a “rural schedule” or protocol for medications with immediate need, such as for urinary tract infection or “cold and flu” with antibiotics, and eye drops for eye infection. Despite this, the participant believed that training, competency measures and defined protocols were needed for implementation, as this role requires more specialised skills compared to supplying a pharmacist-only product in a pharmacy.

- Participants K1 and K3 commented that pharmacists could have a role in chronic disease medication management to ensure continuity of therapy and to ease access issues in rural communities. This was clarified as not initiating therapy, but rather the pharmacist writing a
prescription for a continuing therapy in cases where the patient’s condition is stable and/or the
patient is unable to see a doctor for a new prescription, a form of 'supplementary prescribing'.

**Alternative delivery models by pharmacists:** Participant K12 stated that a model should be
formulated to support pharmacists to provide medication services to rural and isolated areas. This
would improve QUM in those communities, and provide a significant support system to rural
healthcare providers. While a majority of the participants acknowledged the limitations to providing
pharmacists’ services full-time to rural areas, some of them have suggested alternative ways to
improve the situation:

“Other professionals are actually recognising now that pharmacists do have a major role to play ...
[pharmacists] do key things like admission history and reconciliation on admission, ... review, ...
reconciliation on discharge, counselling and communicate all the information; all that will reduce
readmission rates. ... [The doctors] want the service but we can’t get people out there, so we’re
looking at other options as [there are many] hospitals that are not serviced by a pharmacist on-site.”
(K4)

**Video technology:** Acknowledging logistical and funding issues, some participants commented that
tele-pharmacy, utilising video technology, is a good compromise for physical services, improving
access to pharmacists and clinical pharmacy services in rural areas. Participant K4 listed the benefits
with the use of video technology to provide access to an off-site or remote pharmacist: assistance with
patient consultation, medication consultation via case-conferencing, assistance with inventory
management, support for rural pharmacists and medication education to rural healthcare providers.

**Pharmacist outreach services:** Hospital-based pharmacists from larger hospitals could undertake a role
in providing district outreach support to nearby non-pharmacist hospitals. Apart from auditing
inventory management and medication supply practices, an outreach pharmacist’s role may also
include providing on-site training and education to medical and nursing staff, covering topics from
medication-related provisions to pharmacotherapeutics:

“When I was working in [a rural town] and had to do fly-ins, the hospital staff [were] always happy
to see you ... The nursing staff always [asked] you a thousand questions. I helped them out because
they just didn’t have a pharmacist at all.” (K12)

Participants identified barriers, such as remuneration and staffing problems to these initiatives.
However, the initiatives were considered important, and the participants perceived significant value
from a pharmacist being physically present in a rural facility, compared to remote-services models:
“[This] would enhance the face-to-face pharmacy service ... until you actually go out to one of those places ... you don't have an understanding of what [isolation] is actually like and what actually happens, knowing how the hospital physically looks, and the staff ...” (K9)

Sessional pharmacist services: Several participants also identified a potential shared-employment model with an on-site community pharmacist providing part-time or casual pharmacy services to non-pharmacist hospitals in the same rural community. This is a value-added service to the community in supporting doctors in terms of therapeutic recommendations, assisting the nurses in terms of medication supply and management processes, and providing medication consultation to patients.

Reiterating current funding and staffing issues, participant K12 added that this model may increase the workload on the local community pharmacist, particularly in single-pharmacist rural towns, and rational compensation models were required:

“... you leave your pharmacy, race down to the hospital to do two hours of running around like a maniac, and then you race back to your pharmacy where you’ve left your staff keeping everything at bay. They could do basic things, but while you’re not there, they can’t do S3’s, S4’s and S8’s. It’s actually quite hard work on the pharmacist ...” (K12)

Extended roles for pharmacy support staff: Rural pharmacists practising as sole practitioners are often burdened with dispensing tasks, impeding them from undertaking additional medication management roles such as medication reviews. Several participants highlighted the benefits of expanding the roles of pharmacy support staff, thereby releasing pharmacists to focus on more advanced roles.

Pharmacy support staff, such as a pharmacy assistants or technicians, could potentially support medication supply processes in non-pharmacist sites, under the supervision of another healthcare professional, e.g. a registered nurse or director of nursing, to provide more effective basic pharmacy services:

“I think [pharmacy assistants’] knowledge of [legislation requirements] is probably more than the nursing staff have been trained to do. It’s not because the nursing staff is incompetent, it’s because they haven’t been exposed to that area ... [a pharmacy assistant] knows the ordering processes ... the only thing is, we lose the pharmacist function of looking at therapeutic appropriateness of the prescription ... but with nurses, we’re not going to get that either ...” (K10)
Participants K10 and K11 also mentioned some of the potentially more clinically-focused roles that a pharmacy assistant or technician could undertake in the future, such as medication reconciliation or checking patients’ medication charts for dose and dosage form availability and potential duplication of medications.

Participant K10 commented that having a pharmacy staff member in a medical facility would ease the burden on nursing staff in managing the pharmacy store:

“It definitely takes pressure off nursing staff when it comes to supply, because they don’t have to deal with supply processes and what to do when a brand is short, there’s another brand; … worrying about the Controlled Drugs. [The nurses] can focus on their aspects of care.” (K10)

DISCUSSION

The interviews with key informants identified a range of issues relating to the workforce, professional support and communication, role structures and funding opportunities, which hindered the provision of optimal medication supply and management services in rural areas. Existing legislative and electronic developments and support mechanisms aim to promote continuity of therapy, provide medication training and support to rural healthcare providers and facilitate medication processes in rural areas. Pharmacists and pharmacy support staff could potentially play a major role in medication processes, and hence, expanding pharmacy-mediated services in rural areas should be the next key target to support provision of healthcare and to enhance QUM in rural communities. Potential facilitators highlighted by the key informants included:

- Increased scope for pharmacists in medication initiation (a ‘rural schedule’) or supplementary prescribing.
- Alternative pharmacist-mediated service delivery models via use of video technology (tele-pharmacy), outreach services or sessional employment, and
- Enhancing the role of pharmacy support staff in the medication supply process.

The strength of our study lies in the exploratory approach that included a range of representatives, adding breadth and depth to the limited published data on this topic. A number of the key informants who provided their perspectives from their governance viewpoint also drew upon personal rural practice experience during their interviews, which added richness to the data presented and was valuable in contextualising the issues and identifying potential solutions.
Key Issues

Workforce shortages, lack of professional support and communication or interaction between rural healthcare providers were the dominant issues raised by the majority of the key informants, consistent with several Australian healthcare workforce studies.\textsuperscript{3,7,10,12} The interviews conducted further explored perceptions of the impact of these reported challenges on rural healthcare providers providing medication services. A significant concern that could contribute to poor medication management in rural communities was the lack of pharmacy services in addition to basic dispensing services, pharmacist consultation services and pharmacist-mediated support, worsened by the perceived pharmacy workforce shortage.\textsuperscript{3,6,13} Key informants also reported the under-utilisation of rural pharmacists’ expertise resulting from the need to prioritise dispensing (medication supply) tasks. The need for enhanced pharmacist roles and improved pharmacy services in rural areas was highlighted by the majority of the participants as a measure to optimise QUM in rural areas.

Role or Practice Development

The participants, on the whole, supported role extension of rural healthcare providers in medication initiation, supply and administration to improve access to medications.\textsuperscript{8,17-19} This role extension is in line with the proposed ‘generalist’ career pathway to ensure access to healthcare in all rural communities.\textsuperscript{7} However, similar developments specific to pharmacists’ roles are lacking. On the other hand, challenges have been cited, aligned with published reports, that rural healthcare providers with extended medication roles were unable to provide optimal medication services due to lack of familiarity and knowledge to perform such roles.\textsuperscript{1,20-22} Pharmacy-based electronic facilitators, such as iPharmacy\textsuperscript{®} and eLMS, developed to enhance medication processes, were also reportedly under-utilised. Key informants commented that training packages were inadequate to support these healthcare providers. There is a need for continuous pharmacy-based medication support amidst limited professional peer support, although research into methods to provide such support is lacking.

Extending prescribing roles to include non-medical prescribers has been long debated in Australia as a measure to improve continuity of care and medication therapy, particularly in rural areas challenged by workforce shortages.\textsuperscript{7,23} Suggestions by key informants for pharmacist-mediated medication initiation or supplementary prescribing would require legislative amendments, training and endorsements and development of a defined framework.\textsuperscript{23} The support for a pharmacist prescribing model is also in line with the APC report \textit{Remote Rural Pharmacists Project}, recommending that remote pharmacists be authorised to prescribe by protocol.\textsuperscript{3} The 5\textsuperscript{th} \textit{Community Pharmacy Agreement} between the Department of Health and Ageing and the Pharmacy Guild of Australia included a recommended model for pharmacists to be able to supply, in the absence of a prescription, a one-
month or single-pack of medication, instead of the current short period of three days’ supply (based on the Queensland’s Health Drugs and Poisons Regulation). \textsuperscript{8,24} This “medication continuance protocol” is under development, and would require jurisdictional drugs and poisons legislation to be amended. It is anticipated to ease access to medications in rural areas where prescribers are unavailable or patients are in short supply, and also increase pharmacists’ involvement particularly in management of chronic medication therapy. With the establishment of models for pharmacists’ prescribing internationally, developments in this field in Australia are being explored.\textsuperscript{3,23-25}

The key informants proposed a range of other roles for pharmacists, including a greater focus on clinical pharmacy services, provision of medication information and support to healthcare providers, and expansion of medication review services in primary health care. While the key informants commented on the potential advantages of increasing pharmacists’ scope of practice and the ideal provision of medication support by pharmacists to rural healthcare providers, they also highlighted the well-reported shortage of pharmacists and associated services in rural areas.\textsuperscript{3,9,10,13,26} Other studies have explored enhanced roles for pharmacists, however, formal establishment of such roles in rural areas is lacking due to remuneration issues and limited pharmacy workforce capacity.\textsuperscript{3,6,13,27-29}

**Capacity-building Initiatives**

One approach to address workforce issues in rural areas is to effectively ‘expand’ the workforce via alternative service delivery models, namely through the utilisation of video-technology (tele-pharmacy) to address the rural geographical barrier, provision of outreach support by visiting pharmacists and provision of shared-care via sessional employment of the local pharmacist. These approaches were viewed as appropriate by the majority of the key informants, particularly for non-pharmacist hospitals, thereby improving access to medication consultations and promoting QUM. Some of the key informants were able to share their experiences with similar delivery models. All three delivery models have been suggested or identified in a range of studies, although application models in rural areas have not been explored.\textsuperscript{6,9,10,20,26,28,30-33} With the lack of professional support in rural areas, these models were also deemed suitable for providing medication information and clinical support to rural healthcare providers, including sole rural pharmacists.\textsuperscript{13,18,20} However, barriers to the development of these models were cited, including lack of legislative support to provide services outside pharmacy, existing pharmacy practice models that tend to prioritise dispensing, workforce issues to support those delivery models, as well as lack of career or remuneration pathways. Further research into developing these models of delivery is warranted.

The key informants also supported expanded roles for pharmacy support staff (pharmacy assistants or technicians) to provide enhanced support in terms of medication supply and at the patient-care level,
given their training in medications. 26,34-37 This would also enable pharmacists to focus on medication-related patient care in both hospital and community settings. This is in line with career pathway developments for pharmacy support staff in New Zealand, Canada, the United Kingdom and the United States of America. 37 Such initiatives would require further exploration of formalised training, remuneration models, legislation amendment and supervision requirements. 36,37

**Limitations**

Limitations of our study included lack of input of representatives from Indigenous-based organisations. While the Indigenous community is acknowledged to form a significant population in rural Australia, Indigenous issues require separate investigation due to specific Indigenous policy and practice in Australia. 3,18,38

We also acknowledge potential bias from pharmacy-based key informants. However, key informants were able to report on both positive and negative aspects of rural pharmacy practice and healthcare issues. Another limitation is that the key informants were Queensland-based, and hence, some of the responses may not apply to other Australian jurisdictions to the same extent as there are jurisdictional differences. It should be noted, however, that the concept of facilitators discussed in this paper should be applicable to general rural settings, at least for exploratory purposes.

The limited geographical focus reported is due to the scope of the study exploring medication supply and management issues within a specific rural study community in Queensland. While the purposive sample is statistically non-representative of all policymakers and practitioners in Queensland, the participants represented the majority of relevant organisations and groups with interest in medication services provision in rural Queensland. 15 The range of responses generated was considered valuable in providing an exploratory overview, from a governance perspective, of medication-related issues in rural areas, which can then inform data collection in the specific community.

**CONCLUSION**

Optimising healthcare in rural Australia imposes challenges that are different from those in metropolitan areas. Research into roles, practices and legislative developments based on metropolitan areas are often unsuitable to be applied to rural areas. This study presented the insights of key informants with policy development, regulatory or administrative experiences relevant to rural healthcare, particularly medication supply and management services. Practice experiences shared by several key informants further strengthened the quality of the findings.
The interviews identified a range of issues and challenges relating to medication supply and management processes in rural areas, with the focus on role or practice development and legislative development relevant to medication supply and management. It was found that while some existing medication initiatives, including endorsements involving medication roles and additional training education, were perceived to be beneficial, our data highlighted the role for pharmacy to optimise medication management and support medication services in rural areas.

The purpose of this exploratory project approach was to inform policy and role development for Queensland, and potentially for other regions with similar recognised limitations in medication services in rural areas. The outcomes from this study also informed interview topics for exploratory research with healthcare providers and consumers in a specific study community.

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TABLES AND FIGURES

Table 1: Interview guide
Table 2: Existing facilitators for medication supply and management
Table 1: Interview guide

<table>
<thead>
<tr>
<th>1) What do you think are the major issues in rural health care and provision of medication services?</th>
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<tr>
<td>Prompts: Workforce, support (between healthcare providers, government, technology), societal changes (population)</td>
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<th>2) Which rural healthcare providers are involved in provision of medication supply and management services?</th>
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<td>Prompts: Who can prescribe or initiate medication? Who can supply medication? Who helps patients manage their medication?</td>
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<td>When a patient is in need of prescription(s) and/or medication(s) after hours, what do they do?</td>
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<td>Are there any healthcare providers undertaking extended medication roles? What do you think are the challenges involved?</td>
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<th>3) What potential models might improve access to medications in rural areas?</th>
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<td>What potential models might improve medication management in rural areas?</td>
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<td>Prompts: Roles/scope of practice, service delivery models, challenges (support, training, legal implications)</td>
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<th>4) (If answering from a theoretical perspective) Can you tell us about your experience in terms of rural initiatives and pilot projects, particularly relating to quality supply and use of medications?</th>
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<td>Theme</td>
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<td>Regulatory aspects</td>
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<td>Public Hospital</td>
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