An Exploratory Study of Extended Health Care Practitioner Roles in Medication Supply and Management in a Rural Community

Final report

20 February 2011

The project was funded by the 2009 Pharmacy College Trust Grant of The Pharmacists Board of Queensland

PROJECT TEAM

Dr Laetitia Hattingh (Chief Investigator)
School of Pharmacy, Griffith University
Gold Coast, Qld
Ph: 07 5552 7097 Email: l.hattingh@griffith.edu.au

Dr Lynne Emmerton (Co-investigator)
School of Pharmacy, The University of Queensland
Brisbane, Qld
Ph: 07 3346 1981 Email: l.emmerton@pharmacy.uq.edu.au

Amy Tan (PhD Candidate)
School of Pharmacy, The University of Queensland
Brisbane, Qld
Email: amy.tan@uqconnect.edu.auf

Victoria Jarvis (Research Officer)
School of Pharmacy, The University of Queensland
Brisbane, Qld
Email: v.jarvis@uq.edu.au

This report forms part of a thesis to fulfil requirements of a Doctor of Philosophy degree. Prior to reproduction of any parts, permission is to be sought from all authors.

Table of Contents

ACKNOWLEDGEMENTS 4

GLOSSARY OF TERMS 5

EXECUTIVE SUMMARY 12

INTRODUCTION 16

1.0 LITERATURE REVIEW 18

1.1 Health Care Issues in Rural Areas 19

1.2 Factors Contributing to Lack of Health Care Providers in Rural Areas 19

1.2.1 Ageing Population and Disease Burden 20

1.2.2 Health Workforce Characteristics 20

1.2.3 Personal Lifestyle and Workplace Concerns 20

1.2.4 Limited Remuneration and Financial Incentives 21

1.3 The Health Care Environment in Rural Areas 22

1.3.1 Development of New Roles or Scopes of Practice 22

1.3.2 Boundaries 25

1.4 Medication Supply and Management in Rural Areas of Australia 26

1.4.1 The Regulatory Framework 27

1.4.2 Authorisations Specific to Rural and Isolated Areas 28

1.4.3 Current Initiatives in Rural Areas 29

1.4.4 Current Medication-Related Issues in Rural Areas 31

1.5 The Research Problem 34

2.0 METHOD 36

2.1 Research Design 36

2.2 Aim, Objectives, Hypotheses and Expected Outcomes 36

2.3 Ethical Approval and Considerations 37

2.4 Stage 1: Identification of the Study Community 37

2.5 Stage 2: Stakeholder Interviews 39

2.6 Stage 3: Data Collection in the Study Community 40

2.7 Data Analysis 41

3.0 RESULTS 42

3.1 The Selected Study Community 42

3.2 Stakeholder Interviews 44

3.2.1 Major Issues and Barriers 44

3.2.2 Existing Facilitators for Medication Supply and Management 49

3.2.3 Potential Facilitators for Medication Supply and Management 51
3.2.4 Considerations for Rural Intervention Models 54
3.2.5 Summary Stakeholders' Comments 57
3.3 Interviews in the Study Community (Health Care Providers) 57
3.3.1 Extended Roles 58
3.3.2 Major Issues and Barriers 61
3.3.3 Existing Facilitators for Medication Supply and Management 76
3.3.4 Potential Facilitators for Medication Supply and Management 80
3.3.5 Summary of Health Care Providers' Comments 86
3.4 Interviews in the Study Community (Consumers) 87
3.4.1 Major Issues and Barriers 87
3.4.2 Medical Attention 88
3.4.3 Medication Supply and Management 89
4.0 DISCUSSION 90
4.1 Study design 90
4.2 Study community 90
4.3 Sampling 91
4.4 Key findings 93
4.5 Recommendations 99
5.0 CONCLUSION AND KEY IMPLICATIONS OF THE FINDINGS 116
6.0 STRATEGIES FOR ONGOING EVALUATION AND IMPROVEMENT 118
7.0 REFERENCES 120
8.0 APPENDICES 126
Appendix 1: Introductory letter 126
Appendix 2: Information sheet 127
Appendix 3: Consent form 129
Appendix 4: Phone script used to contact health care providers 130
Appendix 5: Interview guide for stakeholders 131
Appendix 6: Interview guide for health professionals 133
Appendix 7: Interview guide for consumers 135
Appendix 8: Health professional demographics 136

ACKNOWLEDGEMENTS

We acknowledge and are grateful for financial support for this project by the Pharmacists Board of Queensland Pharmacy College Trust.

We are grateful for the consultancy services of Dr Robert Eley, Centre for Rural and Remote Area Health, University of Southern Queensland, and support throughout the research.

We gratefully acknowledge the input of all stakeholders representing organisations involved in policy, regulatory/legislative and ethical/professional aspects of health care delivery, as listed below:

- Australian Health Workforce Institute
- Australian Pharmacy Council
- Medication Services Queensland
- Pharmaceutical Defence Limited
- Pharmaceutical Society of Australia
- Pharmacy Board of Australia
- Queensland Health Drugs and Poisons Unit
- The Pharmacy Guild of Australia
- Darling Downs – West Moreton Health Service District

We also extend our thanks to all the participating health care providers and consumers in the study community for their insightful opinions and experiences to formulate recommendations in this project.

GLOSSARY OF TERMS

Clinical pharmacy service
A process that involves reviewing the medication management of patients to promote therapy that is safe and appropriate and to minimise the risk of an adverse drug event.[1] This is commonly undertaken by a clinical pharmacist in a hospital setting, however, accreditation is required for a pharmacist to provide certain medication management services, such as Home Medicines Review (HMR) and Residential Medication Management Review (RMMR) in the community.

Community Aged Care Package (CACP) Program
Programs funded by the Australian Government to provide for the complex care needs of older people. CACPs provide a low level of community care to assist frail older Australians to remain living in their own homes. The types of services that may be provided include personal care, social support, transport to appointments, home help, meal preparation and gardening.[2]

Discharge Medication Record (DMR)
A document containing patient's discharge medication record. Generally it contains the patient's current, new and ceased medications as well as the directions for use of the medications.

Dispense/dispensing
Refers to a pharmacist receiving a prescription, assessing it against patient needs and safety, and accurately labelling and supply the medicine.[3] This standard for this activity is outlined in the *Professional Practice Standards* prepared by the Pharmaceutical Society of Australia.[4]

Dose administration aids
Dose administration aids are devices that assist patients with their medication management by dividing their medicines according to the dose schedule as prescribed by the patient's doctor (e.g. blister packs, bubble packs, dosette boxes, Webster Paks®).[3,5]

Drug Therapy Protocol (DTP)
A document certified by the chief executive and governed by the DTP committee (Environmental Health branch Queensland Health). It contains a list of drugs that have been approved for use by endorsed/authorised health practitioners and states the circumstances (conditions and restrictions) under which the drugs can be used. The implementation of DTP requires a Health Management Protocol (HMP), and the use of Primary Clinical Care Manual (PCCM) fulfils this criterion.[6,7]

Enterprise-wise Medication Liaison System (eLMS)
A web-based software developed to produce discharge medication record (DMR) for the patient, to enhance the process of medication reconciliation and to facilitate exchange of medication information with the patient's elected community health practitioners (e.g. general practitioners (GPs), community pharmacists).[8]

Enrolled Nurse (EN)
A person who has completed an approved 18-month diploma and is registered and licensed to practise nursing in Australia. An EN practises with the support and professional supervision of an RN or midwife.[9] A medication-endorsed EN (EEN) is able to administer S2, S3, S4 and S8 medications under the delegation and supervision of a Registered Nurse, midwife or medical practitioner. A non-medication-endorsed EN may check medications as long as no calculations or metric conversions are required in the checking. The EN may not administer medications, initiate any medications or help patients take dispensed medication.[10]

Health Management Protocol (HMP)
A clinical protocol that supports and details the clinical use of the drug for the patient condition by endorsed/authorised health practitioners. The content of HMP's contained in the Primary Clinical Care Manual (PCCM) is governed by the editorial review committee of Queensland Health and the Royal Flying Doctor Service (Queensland Section).

Health practitioner/health professional
An individual has a recognised specialty and registration and practises in any of the following professions: Aboriginal and Torres Strait Islander health practice, Chinese medicine, chiropractic, dental, medical, medical radiation practice, nursing and midwifery, occupational therapy, optometry, osteopathy, pharmacy, physiotherapy, podiatry and psychology.[11]

Health care service
Includes services provided by registered health practitioners, as well as hospital services, mental health services, pharmaceutical services, ambulance services, community health services, health education services, welfare services related to the former listed services, pathology services and services provided by dieticians, masseurs, naturopaths, social workers, speech pathologists and audiologists.[11]

Health care provider/health service provider
A person who provides a health care service.[11]

Home and Community Care (HACC) Program
A joint Australian, State and Territory Government initiative that provides community care services to frail aged and younger people with disabilities and their carers. The program provides services such as domestic assistance and personal care, as well as professional allied health care and nursing services.[2]

Home Medicines Review (HMR)
A medication review service designed to assist individuals living at home to maximise the benefits of their medicine regimen and prevent medication related problems. The service includes referral from a general practitioner (GP) for a clinical assessment by an accredited pharmacist.[12]

Indigenous Health Worker (IHW) (similar term: Aboriginal Health Worker, Torres Strait Islander Health Worker)
A person who holds a Diploma of Health Science Aboriginal and Torres Strait Islander Primary Health Care (Generalist) or certified equivalent qualification *and* has successfully completed the North Queensland Rural Health Training Unit Isolated Practice *Health (Drugs and Poisons) Regulation 1996* Course or a certified equivalent course of training for the accreditation of Registered Nurses for practice in an isolated practice area.[6] An IHW may administer S8 and supply or administer S2, S3 and S4 medications under the conditions of the DTP.[6,7]

iPharmacy®
A dispensing and inventory management software which is linked statewide in Queensland Health facilities.[8]

Isolated practice area
Means either:

a) a place that is within the area of local government mentioned in Appendix 5 of the Queensland *Health (Drugs and Poisons) Regulation 1996* and is remote from pharmaceutical services,
b) a clinic conducted by the Royal Flying Doctor Service (Qld section) in an area isolated from medical, pharmaceutical and hospital services, or
c) a plane operated by the Royal Flying Doctor Service (Qld section).[6]

Isolated Practice Area Paramedic (IPAP)
An ambulance officer who has successfully completed the training course Graduate Certificate of Rural and Remote Paramedic Practice, from James Cook University, that includes the Isolated Practice Area Paramedic course developed by the Northern Area Health Service Workforce Directorate; and is classified by the Queensland Ambulance Service as a paramedic 3, 3(ECP) or 4. An IPAP is authorised to initiate, supply and administer S2, S3, S4 and S8 medications for the purpose of paramedic practice in isolated practice areas under the conditions of the DTP.[6,7]

Management (of medications)
A term used in this report refers to the intervention to promote safe and effective use of (prescription and non-prescription) medications to help patients achieve the targeted outcome from the medication therapy. This includes medication counselling on medication supply to patients, dose optimisation, minimisation of adverse drug reactions, therapy recommendations, therapeutic levels monitoring, monitoring for drug-drug/drug-disease interactions and monitoring of adherence or compliance.

Medical practitioner/medical officer
A person who is registered under the *Health Practitioner Regulation National Law Act 2009* in the medical profession. Medication roles include ordering/prescribing, supply and administration of medications required for the medical management of patients.[1,6]

Medicare Benefits Schedule (MBS)
A listing of the Medicare services subsidised by the Australian Government. This scheme is managed by the Department of Health and Ageing and is administered by Medicare Australia.[3]

Medication
A therapeutic drug or poison, including prescription medicines and non-prescription medicines (over-the-counter products, complementary health care products). Medications are categorised by the *Standard for the Uniform Scheduling of Drugs and Poisons* in one or more of the schedules below:

a) Schedule 2 (S2) medicine (Pharmacy Medicine),
b) Schedule 3 (S3) medicine (Pharmacist Only Medicine),
c) Schedule 4 (S4) medicine (Prescription Medicine), and
d) Schedule 8 (S8) medicine (Controlled Drug).[1]

Medication reconciliation
The standardised process of obtaining a complete and accurate medication history, and in the context of the plan for patient care, comparing it to admission, transfer or discharge medication orders.[13]

Midwife
Either 1) a Registered Nurse with a midwifery endorsement or 2) a midwife only (who has completed a three-year direct-entry midwifery program).[9] A midwife may supply or administer certain approved S4 and S8 medications under the conditions of the DTP.[6,7]

Non-pharmacist sites
Rural/satellite Queensland Health hospitals, primary health care centres or outpatient clinics that do not employ a pharmacist on-site. These facilities may or may not be serviced by an outreach/visiting pharmacist.[8]

Nurse Practitioner (NP)
A Registered Nurse who has completed an accredited Master of Clinical Nursing degree for Nurse Practitioners and has a Nurse Practitioner endorsement under the *Health Practitioner Regulation National Law* on their license.[9] An NP may prescribe, supply and administer certain approved S4 and S8 medicines under the conditions of the DTP.[6,7]

Outpost
A facility licensed to the Royal Flying Doctor Service of Australia whereby a medicine/medical chest is kept at a place (outpost) approved by a doctor authorised in writing by the Service to approve the keeping of the medicine chest. Outposts are usually located in extremely remote or isolated areas of Australia.[6,14,15]

Pharmaceutical Benefits Schedule (PBS)
A list of medicines and the conditions for which they can be prescribed. These medicines are subsidised by the Australian Government.[3]

Pharmacist
A person who has completed a four-year degree in an approved Pharmacy course and is registered under the *Health Practitioner Regulation National Law*. A practising pharmacist provides pharmacy services such as supply, compounding and dispensing of medications, as well as advice and counselling on the effective and safe use of medicines.[3]

Pharmacy store
The storage area for medications in non-pharmacist sites.

Pharmacy support staff (include: dispensary technician, dispensary assistant, pharmacy assistant, pharmacy technician)
A person delegated and working under the supervision of a pharmacist. A pharmacy assistant is authorised to sell general and S2 medicines at a pharmacy; and dispense S3, S4 and S8 medicines under a pharmacist's direction and personal supervision.[6] Pharmacy 'assistants' are generally exposed to customer service, retail, dispensing, administration and business management; and requires a minimum qualification of Certificate II in Community Pharmacy (12-month course). In contrast dispensary assistants or technicians undertake a more specific role in dispensing of Prescription Medicines (assisting the pharmacist in selection, processing and labelling Prescription Medicines), stock control and preparation of dose administration aids, and requires completion of a minimum dispensary course of six months.[16]

Primary Clinical Care Manual (PCCM)
A document which provides clear and concise clinical care guidelines and Health Management Protocols (HMP) in accordance with the Queensland *Health (Drugs and Poisons) Regulation 1996*, especially for Registered Nurses, endorsed Registered Nurses, IHWs, midwives, paramedics and NPs who work in rural hospitals and isolated practice areas.[7]

Primary health care
A consumer's first point of contact with the health care system, generally for 'out-of-hospital' care services provided, for example, by GPs, pharmacists and community health care nurses/workers.[17]

Quality use of medicines (QUM)
The selection of wise management options, the choice of suitable medicines if a medicine is considered necessary, and the safe and effective use of medicines.[5,17]

Registered Nurse (RN)
A person who has completed an approved three-year degree course at a university and is registered and licensed to practise nursing in Australia.[9] An RN may administer S2 and S3 medicines without a doctor's instruction and administer S4 and S8 medicines under the instructions of medical practitioner or nurse practitioner. An RN working in rural hospitals or isolated practice areas may supply S2, S3, S4 and S8 medicines under the instructions of medical practitioner or NP.[6,7] With further relevant training, qualification and experience, an RN can advance into a prescribing role (as an NP), clinical role (as clinical nurse), rural role (as Rural and Isolated Practice-endorsed Nurse) or managerial role (as Director of Nursing, Nurse Unit Manager or team leader of a group of nursing staff in the community or aged care setting).

Residential Medication Management Review (RMMR)
A service provided to a permanent resident of an Australian Government-funded aged care home who is not eligible for a Home Medicines Review (HMR).[18]

RHealth
A member-based general practice support organisation delivering health services in rural and remote communities across Southern and South West Queensland.[19]

Rural
Locations with moderate to significant restrictions on accessibility of some goods, services and opportunities for social interaction, with Pharmacy Access/Remoteness Index of Australia (PhARIA) categories 4-6.[20] For the purpose of this study, the term 'rural' is used to describe disadvantaged areas with some deficiencies of health care services. The term 'rural' and 'isolated practice area' is applied to endorsements of practitioners according to the Queensland *Health (Drugs and Poisons) Regulation 1996*.

Rural and Isolated Practice-endorsed Nurse (RIPRN, or RIN in the Primary Clinical Care Manual)
An RN whose registration is endorsed under the *Health Practitioner Regulation National Law* as being qualified to supply and administer certain approved S4 and S8 medications for practising nursing in a rural and isolated practice area under the conditions of the DTP.[6,7]

Rural hospital (similar term: satellite hospital)
A public sector hospital at a place stated in Appendix 8A of the Queensland *Health (Drugs and Poisons) Regulation 1996*.[6]

Section 100 (s100) supply
The bulk delivery of PBS medicines, without dispensing and labelling, to a remote or isolated Aboriginal Health Service (which provides primary health care services to ATSI people), free of charge, according to the Section 100 of the *National Health Act (1953)*.[3]

Standing order
A protocol for the administration of medicines by an authorised person in situations where a prompt response is required to improve a patient's condition and where a medicine is part of this procedure. A standing order is not a 'when required' (PRN) prescription for an individual. Generally, health care providers in rural areas develop protocols describing the authorisation, use and routine monitoring of the standing order in accordance with State/Territory legislations and policy.[5] The *Primary Clinical Care Manual* (PCCM) provides standing orders for relevant authorised health care providers in rural areas of Queensland.

Supply of medications (by non-pharmacists in rural areas)
To give or provide a person one or more treatment doses of medications without the requirement to comply with the quality standards for dispensing outlined in the Queensland *Health (Drugs and Poisons) Regulation 1996* and Pharmaceutical Society of Australia (PSA) *Professional Practice Standards.*

Unlicensed health care worker
Include Assistants In Nursing (AIN), Personal Carers (PC) and IHWs. With the exception of IHWs, AIN (hospital setting) and PC (aged care and community setting) roles include carrying out non-complex personal care tasks. They may have a care-worker qualification but are not professionally regulated. They may assist with some nursing activities, including medication administration, with the support and under the supervision of an RN or midwife.[9]

EXECUTIVE SUMMARY

Background

Australia has a recognised shortage of qualified health professionals, particularly in rural and regional areas. Research has shown that rural patients indeed have poorer health status compared to metropolitan communities, with rates of mortality and morbidity constantly higher in rural regions.

A number of 'novel' and 'extended' roles have been developed for existing health care professionals. Some of these roles have application to rural areas, such as additional functions in terms of provision of medicines. In Queensland in particular, the *Health (Drugs and Poisons) Regulation* 1996 (the *Regulation*), which provides the regulatory framework for the handling of medicines, has been amended to include a range of endorsements, including Indigenous Health Workers (IHW) and Rural and Isolated Practice-endorsed Nurses (RIPRN). Another development is the amendment of the *Regulation* to allow for a range of health professionals, namely optometrists, physicians' assistants and nurse practitioners, to prescribe medicines. Whether such developments have addressed the needs of rural communities remains unknown.

Inherently, rural communities will suffer from limited access to health care services, and the services of the existing health care providers may be stretched to, or beyond, the scope of their recognised practice in order to meet the needs of the community. Little is known about the extent and nature of these 'extended' practices, the perceived need for (or obligation on) health professionals to adopt these roles, and the ethical, professional and legal considerations if/when they extend their services into non-traditional territories.

This research specifically focussed on the involvement of various health care providers in patients' *medication management* in a defined community or region. In doing so, it aimed to identify medication-related issues of a community and the potential roles for pharmacists to enhance safe, effective and efficient access to medicines in a rural setting.

Method

Ethical approval was obtained from Human Research Ethics Committees of Griffith University, The University of Queensland, University of Southern Queensland and Queensland Health.

Stage 1: Identification of the Study Community

This research stage required geographical mapping of health services in the defined study region in Queensland, to assist in the identification of a suitable rural community in which to focus the data collection. The identified community was to be geographically discreet, rural yet accessible to the researchers, without a full complement of health professionals (to explore the application of role extension by endorsed health care practitioners), at least PhARIA 3, with a maximum population of 5000 in the district.

Stage 2: Stakeholder Interviews

Key informants were identified and approached by the researchers to participate in semi-structured interviews (approximately 30 minutes in duration) to assist in defining the topics for investigation in the study community. Proposed stakeholders represented organisations involved in policy, regulatory/legislative and ethical/professional aspects of health care delivery.

Interview topics were informed by the literature review, and covered actual practices and procedures, current and future scopes of practice, responsibilities, competencies, guidelines and protocols, ethical boundaries, and instigation of legislative and practice change. The interviews were recorded, transcribed thematically and reported without identifying the interviewees.

Stage 3: Data Collection in the Selected Community

The health care providers of the target community who were involved in medication processes were identified from the generated list during the health services mapping exercise. They were invited to participate in one-on-one semi-structured interviews (approximately 30 minutes in duration). Topics included inter-professional relationships, scopes of practice, training, skills and knowledge, training needs, referral and support networks, self-reported description of their workload, views about health workforce shortage and needs in that area, as well as experiences in either being expected to practise, or actually practising, *at* or *beyond* the perceived limits of their expertise, and influences on these practices.

Consumers in the selected community were recruited through various businesses, with permission of the manager. They were issued an information sheet to explain the study and asked to provide consent for interview. Consumer interviews focussed on their experiences with access to medicines in that community, including their utilisation of the available mechanisms for managing their medicines, and recall of situations requiring emergency supply.

Data from all interviews were analysed thematically for commonalities and differences in responses, and reported anonymously.

Results

The Selected Study Community

The community selected for the study comprised four towns in the Darling Downs. The average population across the four towns was 1500, with rurality indices of PhARIA 4-6. These towns were serviced by at least one hospital, one medical practice (with limited services of each in one town), and one pharmacy each, and were located approximately 300-400km from the state capital city (Brisbane, Queensland).

Summary of Stakeholders' Comments

The 12 stakeholders interviewed identified a number of key issues, including:

- Limited health services in rural areas increasing workload and decreasing quality of care,
- The necessity of overlapping and up-skilling roles of health care providers, including potential challenges and limitations, and
- Funding and remuneration problems.

Stakeholders also discussed potential interventions, including:

- Increased scope for non-medical prescribing (e.g. for nurses and pharmacists),
- Increased scope of practice for pharmacists, e.g. through pharmacist-continued therapy,
- Improved access to pharmacist services through outreach, sessional and/or remote support, and
- Enhancing the role of pharmacy support staff in medication supply.

Summary of Health Care Providers' Comments

From 49 health care provider interviews, the dominant themes (in no order of significance) were:

- Capacity overload across all levels of health care providers, regulated and unregulated,
- Limited health care services, along with lack of funding for *extended* health services,
- Challenges in ensuring continuity of health care services, including medication processes,
- Ineffective information transfer and patient care planning within and beyond this community,
- Challenges in effective communication and bridging between services and between health care providers,
- Lack of support systems for rural health practitioners, and
- Legislative and professional boundaries in relation to extended roles of regulated and unregulated health care providers.

These were all perceived as barriers to provision of quality health care to patients in a rural community. However, there were also some examples of 'good' practice and good coping mechanisms provided by the health care providers, given their lack of resources:

- Local health care providers offering after-hours and weekend support and services,
- Some coordination of services to prevent unnecessary duplication of services,
- Tele-/video-conferencing for professional guidance, specialist consultation and education,
- Role extension, evident with nursing staff, for example:
  - PCs assisting with medications,
  - Nursing staff equipped with basic allied health skills in aged care facilities,
- Utilisation of extended roles for RIPRNs,
- Community pharmacist providing medication checking services to aged care facilities, and
- A visiting clinical pharmacist reviewing medications for the local aged care facility.

Interventions proposed by these health care providers to improve health care services were:

- Standing orders for RNs,
- Protocols or standardised guidelines for PCs,
- Outreach pharmacist support, and
- Step-down protocols for patients transferring from secondary/tertiary facilities (metropolitan) to the local rural hospital before returning to their residence.

Summary of Consumers' Comments

Sixty-nine consumers offered their opinions, themed as:

- Medical issues: obtaining appointments, long waiting times, dissatisfaction with the local doctor, lack of permanency of doctors, limited choice, inadequate attention/assessment,
- Medication issues: obtaining repeat prescriptions, dissatisfaction with local pharmacy services, stock issues at the local pharmacy.

Discussion

This study was designed as a case study of a selected rural community, which allowed a 'snapshot' of the medication-related issues within the study community. While some existing medication-focussed initiatives are beneficial, they were deemed inadequate for the continuity of care needed in the identified rural study community. The research has also highlighted the role and value of a pharmacist in promoting QUM in rural communities. The recommendations from this research stage (listed below) will be refined and investigated for their potential application in the study community, where the focus will be *improvement* of medication services to, and within, the study community. However, designing models/interventions involves considerations such as

the available workforce, practicality of extended roles, acceptance and referral network from health care providers, availability of infrastructure and legislative boundaries.

Recommendations

Recommendation 1: Expand the workforce capacity for existing and potential non-medical prescribers.

Recommendation 2: Expand the pharmacist workforce capacity in rural areas to extend medication services beyond medication supply.

Recommendation 3: Review medication management services referral protocols to enable expansion of accredited pharmacist services.

Recommendation 4: Work with the nursing profession to clarify, and where possible, formally realign nursing roles with rural needs.

Recommendation 5: Explore medication support models in non-pharmacist sites, as there were concerns regarding the quality of medication supply role undertaken by non-pharmacists.

Recommendation 6: Define the roles of PCs in medications.

Recommendation 7: Establish a system to facilitate the continuity of repeat prescriptions for ongoing therapy.

Recommendation 8: Provide training and support focussing on specific medication or medical issues in rural areas (e.g. mental health, alcohol and illicit drug issues).

Recommendation 9: Explore the potential for technology in video-conferencing to be implemented to improve pharmacy services (e.g. tele-pharmacy).

Recommendation 10: Develop a single, effective health information communication network, such as electronic health record.

Recommendation 11: Explore alternative mechanisms in a rural community to support and supplement nurses undertaking medication supply in rural areas.

Recommendation 12: Ease medication supply tasks for nurses at non-pharmacist sites and standardise medication supply protocols in all non-pharmacist sites.

Recommendation 13: Improve compliance with APAC guidelines for ensuring medication continuity.

Recommendation 14: Trial both the ‘sessional’ and ‘outreach’ models to determine their appropriateness.

Recommendation 15: Establish an appropriate community liaison pharmacist framework in the study community to ensure medication continuity and promote QUM.

Recommendation 16: Amend the *Regulation* to recognise the roles of pharmacy support staff working under the supervision of pharmacists.

Recommendation 17: Explore the provisions in the *Regulation* to also cover potential extended roles for pharmacy support staff into pharmacy ‘store’ management and medication supply in rural hospitals, and re-define the level of supervision required to undertake this role.

Recommendation 18: Explore potential extended roles for pharmacy support staff in dispensing processes and sale of non-prescription medications in single-pharmacist towns, and re-define the level of supervision required to undertake this role.

INTRODUCTION

In rural communities, the pharmacist, and other health care practitioners, may be located some distance from the people who may require health services. This means that the skills of the available practitioners can be 'stretched' *to*, or *beyond*, their scope of practice and comfort zone, a concept that this report refers to as 'role extension' or 'role overlap'.

Medication management is a complex process that often involves a range of health care providers. Rural areas pose specific medication management challenges that require careful planning in order to achieve quality use of medicines (QUM). This report explores the issues surrounding health care practitioners when 'extending' their roles to meet the medication-related needs of a rural community in the Darling Downs – West Moreton Health Service District. The focus is on the prescribing, dispensing and supply of medications in a rural area, considering that:

- Roles for pharmacists are constantly developing, and the pharmacist's expertise in medication management is established in literature spanning several decades.
- Rural pharmacists face particular problems beyond merely supplying medicines to the community; they are recognised as integral members of the health care team. Potential issues affecting rural pharmacists include lack of peer support, facing pressure to supply medicines without prescription due to unavailability of a general practitioner (GP) or other prescriber, and need for skills in other health disciplines such as dietetics, physiotherapy and mental health. Conversely, in the absence of a pharmacist, other health care practitioners may, through necessity, adopt medication management roles. This study explores such role overlap, and the ethical, legal and professional boundaries on their respective roles, specifically relating to the supply and management of medications.

A rural setting for this project allows focus on the pharmacist and other local health care providers involved in medication processes. While each rural community will have unique characteristics determined by the location of available health services and patient demographics, the inter-professional relationships and situations described in this research are likely to be common and applicable to other localities.

This research provides insight into:

- The perceived scope of practice for community pharmacists in rural areas
- The potential for the pharmacist to adopt extended roles in medication management (in the absence of other health care practitioners)
- How the pharmacist and other health care providers view their current scopes of practice and legal boundaries with regard to medication management, and their suggestions for improved access to medicines in the rural community.

This research identifies specific medication-related issues and explores potential roles for pharmacists and other health care providers to enhance safe, effective and efficient access to medicines in a rural setting. Additionally, information from this case-study community will help develop legal, ethical and professional limits for policy makers and practitioners.

1.0 LITERATURE REVIEW

The literature search strategy was designed to identify research papers relating to the key areas of the study: health care providers' role(s), medication supply and management, and health care provision models with a particular focus in rural settings.

The searches were limited to English language articles that focussed on health care settings in Australia and internationally. Preference was given to papers published between 2000 and 2010, for recency. The literature review was expanded to include a comprehensive search of the unpublished ('grey') literature, such as government reports and conference proceedings. Databases searched were EBSCOhost, Ovid, Rural and Remote Health, Informit, ProQuest, Pubmed/Medline, The Cochrane Library, *Medical Journal of Australia* (eMJA), National Rural Health Conference, CSIRO Publishing, Google Scholar and Australian Government and professional body websites (e.g. Department of Health and Ageing, Medicare, The Pharmacy Guild of Australia). Topics reviewed included:

1. Current and predicted health workforce issues in Australia to enable identification of geographical and professional areas of need
2. Emerging roles for health care providers
3. Inter-professional relationships and scopes of practice
4. Legal, professional and ethical boundaries of health practitioners' roles
5. Guidelines, models and checklists for the design, implementation and evaluation of extended roles for health care practitioners.

The search terms and concepts used to locate information for the review are presented in Table 1.

Table 1: Literature Search Strategy

Concept	Sub-concepts	Examples of Search Terms (Keywords)
Roles of health care providers	a) Role extension/overlap b) Novel roles c) Up-skill	roles, extended, extension, overlap, overlapping, novel, model, up-skill, cross-skill, skill-mix
Medication	a) Prescribing b) Supply c) Management d) Administration	Pharmacist, pharmacy, prescribe, prescriber, medication, medicine, supply, manage, management, administration, administer, legislation, regulation
Rural setting	a) Workforce b) Model c) Rural	workforce, model, shared-care, multi-disciplinary, intervention, rural, remote, isolated, issues, barriers, Australia

Wakerman (2004)[21] discussed variations in definitions of 'rural', 'remote' and 'isolated' as well as different classification systems for rurality. For the purpose of this study, the term 'rural' was applied consistently to refer to locations with moderate to significant restrictions on accessibility of some goods, services and opportunities for social interaction, leading to the potential of being disadvantaged in terms of health care. While the Pharmacy Access/Remoteness Index of Australia (PhARIA) category system was used when identifying towns in the study community,[20] the terms 'rural' and 'isolated practice area' are used when describing endorsements of practitioners in accordance to the Queensland *Health (Drugs and Poisons) Regulation 1996*.[6]

1.1 Health Care Issues in Rural Areas

The Australian health care system benefits from a wide range of providers and services and a progressive view towards collaboration between providers. Health occupations commonly represented are medical doctors, dentists, nurses, pharmacists, allied health workers, complementary therapists and Indigenous Health Workers (IHW),[11,22] whereas health services include hospital services, mental health services, ambulance services, pharmaceutical services, community health services, medical and dental services, allied health services, health education services and health-related welfare services.[11,22]

Numerous health workforce studies in Australia have identified a shortage of qualified health practitioners as the demand for health care services increases.[22-27] This is particularly problematic in rural areas in terms of availability and accessibility, a reflection of many health practitioners favouring major cities.[22,23,25] In 2005, although there was an increase in the number of health care providers over a decade, the health workforce, particularly medical practitioners and dentists, was, per head of population in rural areas, less than half of the health workforce of major cities.[22] Shortages were also reported in specialised and key allied health areas, including clinical and community pharmacy, occupational therapy, physiotherapy, specialist nursing, speech pathology, podiatry and diagnostic/laboratory services.[25,27] This trend, however, was not significant amongst workers in the nursing services, where nurses-to-population ratios have been reported to be somewhat consistent across all regions.[22,27] However, it should be noted that demand for nursing services is considerably greater than for other health care providers across all regions.[24] It should also be noted that access to nursing services may involve longer travelling times to larger population centres, impeding rural residents' access to these services.[25]

Research has shown that rural patients indeed have poorer health status compared to those in metropolitan communities, with rates of mortality and morbidity, health risk factors and occupational risks (e.g. mining, farming, forestry) consistently higher in rural regions.[22,25,26] This has been related to lack of accessibility to the most appropriate health care services, including less availability of general practitioner (GP) and pharmacy services, fewer preventive health care activities (e.g. cervical screening, breast cancer screening, immunisation, smoking cessation), fewer aged care facilities and less access to elective surgery (e.g. bypass surgery and knee or hip replacement) in rural areas.[22,26]

This unequal distribution of health services may potentially impact on the quality of life of rural Australians, as stated by the Human Rights Commissioner at a Rural Ageing Seminar[28]:

"A lack of health services impacts greatly on the health of older rural Australians. This is especially so where the aged and those with chronic diseases are over-represented, for example in many country towns. The health needs of these people may be difficult to meet because they often are unable to travel great distances to seek the care that they need."

1.2 Factors Contributing to Lack of Health Care Providers in Rural Areas

The major problem in terms of health services in rural areas is simply described as consumers' *demands* exceeding health workforce *supply*. Established trends relating to this problem that directly or indirectly impact on rural health workforce shortages include:

1.2.1 Ageing Population and Disease Burden

The constant increasing demand for health workforce services has been reported. This is due to the ageing population,[22,25] which correlates with increased prevalence of chronic diseases. There are also growing consumer expectations of health services and increased health awareness which increases demand for better health care, including more access to, and improved quality of, health care services.[22,23,25] In addition, shortages are also significant in areas of special need such as mental health, aged care and disability.[24,25] Thus, the health workforce is stretched to meet these growing demands, with the shortages of health workforce more critical in rural areas due to the aforementioned misdistribution of services.[22,23,25] The ageing population and chronic disease burden is generally associated with medication therapy. Patients in rural communities where health care services are lacking may be challenged in terms of medication supply and management. Numerous initiatives[24,25,29-32] have been introduced in metropolitan and rural communities to improve rural health care delivery, however, these initiatives mainly focussed on resolving medical needs or special group needs (e.g. those of Indigenous populations). There is minimal focus on quality medication supply and management to the general population of rural communities.

1.2.2 Health Workforce Characteristics

Reports have shown that the health care workforce is dominated by workforce ageing and feminisation, which may in turn affect ability and willingness to work longer hours to provide optimum access and delivery of health care services.[22,23,25] This is particularly relevant to rural areas, where timely access to health care services is already a concern. As older workers retire, there is a projected decline in number of health care service workers, which places pressure on the remaining health workforce.[24,25]

Another concern is the difficulty in recruitment of newly qualified health practitioners who previously concentrated their education and training in the major centres to rural areas. This includes students from rural areas, who are more likely to practise in these areas compared to their metropolitan counterparts.[25]

A majority of health care staff, particularly doctors, are overseas trained. They are encouraged to work in rural areas where there are workforce shortages. While this increases the number of doctors, this growth has not kept pace with the increasing health care demands and population growth. There are also concerns in terms of overseas-trained practitioners' provision of health care suitability for the Australian population, and the lack of support for these health practitioners.[25,31]

The difficulty in recruiting *and* retaining health care providers into rural communities may precipitate poor continuity of health care in rural communities, including continuous medication supply and management. Some initiatives and legislation changes have been implemented to improve medication supply processes in rural areas,[3,6] however, research and interventions into continuity of medication management are still lacking.

1.2.3 Personal Lifestyle and Workplace Concerns

Lack of staff in the rural setting has led to health care providers working unsatisfactorily long hours to cope with pressures to be available and to perform a wider range of services.[24,25,29,31] A

health care provider usually needs to deviate from a desirable work/life balance to face a heavier load of after-hours care and large distance travelling in order to provide health services to a rural area.[25,29] This is undesirable, as most health care providers have a desire to work sensible and regular hours to balance work with family and lifestyle demands.[23] Rural and remote areas do not offer the convenience of city living, with education, employment, career development, community social opportunities and child care services for relevant family members more restricted.[25,31] Thus, the geographical, social and professional isolation heavily discourages family-bound health care providers to offer health care services in the rural community.[21,25]

Studies have shown that a majority of the health care providers servicing rural areas are originally from these communities. They tend to be accustomed to, or familiar with, the lifestyle and living environment in rural areas, and therefore do not find these to be major barriers to work in these communities.[25,33] However, the limited health care workforce and professional or technological support in rural areas may challenge these health care providers from providing the optimal level of health care. The limitations include:

- Costs, training and staff availability issues are often faced in order to operate a new technology or equipment or run a new service.[25,29]
- Technological infrastructure, including high-speed Internet access and diagnostic equipment, is often unavailable for the health care team in the rural community.[25,34,35]
- Limited health networks, locum services and allied health workers exist for referrals in the rural areas.[24,25,29]

While geographical isolation is inevitable, distant/remote professional and technological support are available for rural health care providers to enhance clinical support, education/training opportunities and communication between health care providers.[8,25,29,35-37] A national broadband network has also been proposed to enhance electronic communication and information transfer in rural areas, under the management of the Australian Government's Department of Broadband, Communications and the Digital Economy.[38] However, there is limited systematic research to explore the overall effectiveness and limitations of such support systems from the users' (i.e. local health care providers') perspectives. Further, studies that do explore such concepts lack details of interventions to resolve the limitations and improve the support system.

1.2.4 Limited Remuneration and Financial Incentives

Provision of health care services in rural areas may be labour intensive, with most health care providers challenged by reduced access to facilities, social isolation and (perceived) compromised lifestyle opportunities. This will likely create pressures from salary-related cost and financial incentives.[23,25,29,31] Additionally, remuneration levels for individual professionals/practitioners generally do not compensate for their provision of more challenging health care services. Rural areas also generally offer fewer opportunities to advance to more financially-rewarding senior positions, due to lack of health care facilities offering these opportunities and lack of a 'critical mass' in the immediate community who require such specialties.[25]

Literature review has confirmed that there are challenges to the delivery of optimal health care in rural areas beyond merely the supply of qualified health care professionals. The complexity of issues in rural communities highlights a need for effective interventions to expand and support the rural workforce, using methods appropriate to the communities of interest.

1.3 The Health Care Environment in Rural Areas

The previous section established that rural areas are commonly under-serviced in terms of health care. The following section provides an insight into the current health care environment, in terms of legal roles and health care policies in place in rural areas.

1.3.1 Development of New Roles or Scopes of Practice

If it is accepted that rural health is generally underserviced, it follows that health care providers in rural areas are often required to provide services beyond their scope of practice in order to optimise consumers' access to required health care services and products. This may involve role overlap between health practitioners and role extension for existing health care providers beyond their traditional boundaries.[39] To this end, rural health has been described as[21]:

"… an emerging discipline with distinct sociological, historical and practice characteristics … overlapping and changing roles of team members ... and practitioners requiring public health, emergency and extended clinical skills."

Role Extension and/or Substitution

Duckett 2005[25] has reported a list of current and potential task substitution by various health care providers in Australia, particularly aiming at optimising workforce reducing shortages of skill sets in rural areas. Some of the examples are included in Table 2 below:

Table 2: Areas of potential and existing task substitution

Task	Traditional health care provider	Substitute health care provider
Anaesthesia	Anaesthetist	Nurse anaesthetist
Clerking of new hospital patients	Hospital medical officer	Nurse
Closure of wound	Surgeon	Nurse
Foot care	Podiatrist	Foot care assistant
Foot surgery	Orthopaedic surgeon	Podiatric surgeon
Maternity care	Obstetrician	Midwife or GP
Patient management	Medical practitioner	Nurse practitioner
Mobility assistance	Physiotherapist	Physiotherapy assistant
Plain X-rays	Medical imaging technologist	X-ray assistant
Reporting X-rays	Radiologist	Medical imaging technologist
Reporting pathology	Pathologist	Scientist

In Australian rural health care centres, the roles of nurses, midwives and IHWs have been extended to enable the provision of a range of medical and allied health services.[25,26,40] These may be at least partial substitutes for pharmacy, radiology, pathology, dental, social work and medical services – services that may be unavailable in rural communities. While the majority of health workforce reforms have focussed on medical care, little has been established in relation to medication management and other pharmacy services (i.e. extension of pharmacist roles into medical care). While some novel extended pharmacist models, particularly in medication review services, have been recommended and/or trialled, there are few data on their implementation and practicality in rural areas.

Up-skilling

Up-skilling or providing career pathways for existing health workers not only maintains the health workforce capacity, but should also increase the retention of existing health workers and reduce the need for extensive training, as some of these workers may have basic training in medicines and health care.[8,24,30,41] For example, specialisation in medications in IHWs in Australia was developed to fill the shortages of medication support systems in rural communities. The key roles for these workers include pharmacy store management and medication supply in areas where pharmacist support is absent.[30] While these roles are beneficial to enhance medication supply processes in rural areas of Australia, particularly in Indigenous populations, concerns were reported about the impact of such extended roles in promoting QUM due to the lack of involvement of a medication expert.[3,30]

The enhanced role of paramedics has also been considered in rural areas to improve health services to patients who may otherwise have difficulty receiving medical attention due to the geographical distances and lack of health services in the area. Qualified paramedic practitioners would be able to undertake tasks involving minor surgery, endoscopy procedures, anaesthetics, diagnostic tests (e.g. x-rays and pathology), medications supply and administration, preventive health and patient education.[25,42] Paramedic practitioner roles have been established in the United States of America (USA) and the United Kingdom (UK). The development of extended roles for paramedics in Australia is ongoing, with paramedics in rural areas providing community health services, promoting disease prevention and substituting medical practitioners or nurses in hospital emergency departments, on top of undertaking pre-hospital emergency roles in various states and territories, as described by Blacker (2009).[43] In Queensland, endorsements for specific medications has been authorised for Isolated Practice Area Paramedics (IPAP).[6]

In community and aged care settings, Assistants In Nursing (AINs) and Personal Carers (PCs) have been observed to undertake enhanced roles, including involvement with medication administration. This represents up-skilling from their traditional role, based on domiciliary care.[24,44] In Tasmania, legislation changes in 2009 allowed personal care workers employed in aged care facilities to *administer* medications, provided they have completed a Certificate IV in Aged Care.[44] Existing Queensland Health policies do not allow such roles to undertake medication administration, but rather *assist* patients in medication administration.[6,45] However, the extent of "assisting" in medications may vary between states, between facilities or communities, and between public and private setting. AINs and PCs are unlicensed health workers and they are not bound by professional regulation which ensures quality medication processes, warranting standardisation of legislations and guidelines for medication processes for these workers across public and private settings.

Recently, the significance of multidisciplinary team-based approaches in the rural setting has been highlighted.[24,25,29] Multidisciplinary care enables mobility across health tasks and roles of health care providers, thereby providing health care services that should otherwise be provided by an *unavailable* health care provider.[24] In Australia, mental health services are usually provided by a team of nurses and allied health professionals, such as psychologists, social workers and occupational therapists, in consultation with a visiting psychiatrist or via tele-psychiatry.[46] These workers are usually up-skilled to provide the necessary mental health service, not just in the area of psychotherapy and mental health counselling, but also in the area of social work, psychology and occupational therapy to assist in the case management of each mental health patient. This expands the mental health services due to the availability of skill mix inputs by different health care providers and opportunities for labour exchange or substitution.[47] There is a potential for similar models in other health care services in rural areas, in which

workforce shortages are significant and there is a need to optimally utilise the existing workforce via up-skilling and skill mix pathways.

Up-skilling has allowed various health care providers to provide similar services, therefore enhancing health care services particularly in rural areas. However, there is a lack of systematic studies and protocols to support these up-skilled roles in providing quality health care services. There is also minimal exploration of potential duplication of services for patients due to over-lapping of roles of health care providers.

Novel Roles

The recognised limitations of the current health workforce in rural communities have led to the development of new types of roles to assist or complement existing health practitioners.[21,23-25,29,34,39] "Mid-level practitioners" such as clinical assistants, surgical assistants and allied health assistants can help to expand the health workforce and enhance health care delivery options. In addition, these roles when required, may involve extended tasks and/or substitution for health care providers who are unavailable in a rural setting,[29] as described above.

Novel roles that have been established internationally (and now nationally) are nurse practitioners (NPs), who are autonomous health practitioners, and physicians' assistants (PA), with "delegated" roles, both of which are aimed to serve smaller and rural communities.[25,31,39] NPs have been practising for some time in countries including the USA, UK and New Zealand. In all of these countries, the NP role includes prescribing medications, initiating diagnostic investigations and referring patients to relevant health care channels according to clinical protocols, while practising within their defined areas of expertise. Although trial models of NPs started as early as 1990s in Australia, very few NPs are commissioned to work in rural areas to date.[25] However, there is growing recognition of their expertise, with the allowance for NPs to claim Medicare benefits and prescribe under Pharmaceutical Benefits Scheme (PBS) as of 1 November 2010.[48]

PAs have been increasingly employed to provide services in rural communities in the USA under the supervision and guidance of a medical practitioner. Roles of a PA include conducting physical examinations, diagnosing and treating illnesses, prescribing medications, ordering pathology tests, counselling on preventive health care and assisting in surgeries. This model is currently being trialled in Australia,[25,31] and it may be some time before its viability and appropriateness in rural areas is determined.

Advanced practice nurses, such as Rural and Isolated Practice-endorsed Nurses (RIPRN), sexual and reproductive health endorsed nurses and immunisation nurses, have also been trained to compensate for lack of qualified physicians in a rural Queensland. Each of these roles has specific endorsement and authorisation in medications supply and administration as defined in the Queensland *Health (Drugs and Poisons) Regulation 1996*, which provides the regulatory framework for the handling of medicines in Queensland.[7,49] There are perceived benefits of these roles in rural communities; however, systematic studies and data are lacking for these roles. In addition, a rural generalist model is being considered in Australia to provide an overall health care service in areas where the full complement of health care providers is lacking; models of this concept have yet to be established or trialled.[25,31,39]

While some of these novel roles are designed to provide a narrower and more specialised service, other roles are designed to broaden the scopes of practice of existing health practitioners. Both of these strategies are intended to compensate for the skills shortages and

limited health care services that are of concern in rural areas. While it is unclear whether health care roles are becoming more defined or more blurred, or both, what has become apparent is that development of new roles or scopes of practice is not unlimited; boundaries do, and will continue to, exist as a result of the necessary professional registration, scopes of practice and potential legal liability of these new health care providers.

1.3.2 Boundaries

The above concepts of role extension and novel roles warrant study of the legal, professional and ethical *boundaries* of current roles of health care providers. These boundaries are seen as inhibitory to efforts to adapt and innovate in a complex and dynamic health care environment.[25] Indeed, the impact of legal, professional and ethical boundaries may be more prominent in rural than in metropolitan health services, due to the specific challenges of health care in more isolated settings.

Attitudes of Health Practitioners

Role protection[23,29,39] and/or monopoly of services[41] by health practitioners have been widely reported as major barriers to introduction of new roles or scopes of practice of other health practitioners. One of the examples commonly reported is medical practitioners being reluctant to support non-medical prescribers, such as NPs, to undertake diagnosis and prescribing roles, because these are traditionally specialty roles of medical practitioners.[25] Cultural barriers, workplace attitudes, and differences in priorities can also reinforce challenges faced by rural communities to recruit sufficient numbers of appropriately trained staff.[24,25] This imposes a major challenge in rural areas where there is a relatively smaller network of health care providers and the acceptance and support for the implementation of the new roles or models from these providers is crucial, and suggests that a successful trial requires considerable focus on communication and attitudes of the existing health care providers.

Legislation

In Australia, the provision of health care is designed, implemented, delivered and regulated by a myriad of public (Federal and State) and private bodies or organisations.[25,27] This results in inefficiencies in the provision of health care due to various layers of bureaucratic structures, conflicting workflow and various cost shifting issues. While legislation, policies and protocols have a significant role in ensuring the quality and safety of health care delivery, the limited role definitions in the existing health care system do not offer sufficient flexibility to accommodate health care reforms in response to changing health care delivery needs.[24,25,31] Consequently, novel or alternate models of health care delivery have not been embraced by many regulatory or professional representative bodies.[39]

While legislation aims to provide a balance between health care needs and the safety of health care services, changes to legislation involve a large amount of time and effort to be debated and approved within and between layers of bureaucracy. As a result, current legislation is often not up-to-date with practices and health care settings. At present, the medication management provisions in Queensland are in the form of *Regulations*, allowing a degree of ease in amending the legislation, as the passing of Amendments involves fewer layers of bureaucracy. This is not the case in some other jurisdictions, where the provisions are bound by both *Acts* and *Regulations*.

Accreditation and Training

As the implementation of extended and novel roles for rural health care providers is still in its infancy, additional protocols are required to help establish these roles. This includes the requirements for levels of certification and training, credentialing, registration and accreditation by regulatory authorities.[23,29,41] However, there are concerns relating to lack of qualified staff, costs and/or time pressures in training and supervising workers for these roles, which may be more significant in rural areas. While there is pressure to establish trainers for newly-designed models, there is lack of alignment between the tertiary education sector and current requirements of the health care system.[23-25,31,39] This fragmentation increases the complexity in health workforce arrangements and delivery, and may impede progress towards the targeted objectives. Training and accreditation imposes a major issue for health care providers in rural areas, particularly due to access to training modules and facilities. Training is required for rural health care providers each time there is a change in role, and lack of training facilities may limit the success of implementing new models or health care roles in rural areas.

Remuneration and Funding Models

The success of a health care model, to a large extent, depends on the level and nature of financial support. Currently, there is limited opportunity for other health practitioners to operate independently under Australia's Medicare Benefits Scheme (MBS). This discourages implementation of extended or novel roles,[25] and was an issue with the implementation of NPs until policy changes allowed NPs to claim for MBS items (subsidised services) as of 1 November 2010.[48] There are also issues with establishing remuneration for health care providers to provide extended services to compensate for practitioners who are absent in rural areas. This is a result of "organisational boundaries", with implications for pay and grading of health care staff from different training backgrounds who provide similar services.[23,24,29,41] While funding has been highlighted as a major concern when implementing novel roles or models of care, little economic analysis has been published to identify the financial support required in rural areas, and thus justify role extension of existing personnel or development of new health care models.

Risks/Liabilities Involved

Many practitioners perceive that role extension and task substitution will lead to diminished quality and safety outcomes due to the additional training requirements and deviation from traditional roles. This highlights the importance of establishing clinical protocols, standard operating procedures, authority and supervision requirements to provide guidance to health care providers performing tasks beyond their traditional scopes of practice.[29,39,41] It is also important to develop protection and risk-management processes against claims of negligence associated with the extended roles.[25,29,41]

1.4 Medication Supply and Management in Rural Areas of Australia

It is timely and appropriate to design and implement processes to optimise health care system efficiencies, given the reported health workforce limitations in certain of these areas. Rural areas provide an ideal platform to explore health care models and extended scopes of practice, as professional boundaries have been known to 'grey' or 'blur' in these areas. As the health care environment changes and professions evolve, boundaries may become even more blurred.

This was already highlighted in the *Australia's Health Workforce Productivity Commission Research Report 2005* through the following comment:

"...what is deemed best practice today may not be shown to be best practice tomorrow..."[25]

Current models relating to prescribing and supply of medications may be of particular benefit to rural communities that are faced with problems of access to health services and medication services. Despite the existence of some models, little has been reported about the extent and nature of the 'extended' practices involved, their methods for implementation and evaluation, the perceived need for (or obligation on) health professionals to adopt these roles, and the boundaries experienced (including ethical, professional, legal and financial considerations) if/when health care providers extend their services into non-traditional territories. A further complication is the uniqueness of each rural community; no ideal 'one size fits all' model can be determined. This highlights the need to explore a range of potential models alongside the existing health care system that may be deemed inadequate. Current models and initiatives reported in the literature, albeit with limited data, are critiqued below.

1.4.1 The Regulatory Framework

The increasing number of health practitioners with authority and endorsements to prescribe, supply and administer medicines requires careful monitoring, as the medicines pathway is complex, involving many steps with the potential for error throughout the process.[50] Traditionally, medications were mainly only prescribed by medical practitioners, dentists and veterinarians, and dispensed by pharmacists. Over recent decades, these roles have, to some extent, been extended to other providers in the health care system, in an attempt to enhance consumers' access to health services and products.

In response to changed (and changing) practices, the Queensland *Health (Drugs and Poisons) Regulation 1996* (the *Regulation*), as is the case with legislation in other jurisdictions, has been amended in favour of prescribing by a range of health practitioners other than medical practitioners, provided that these practitioners comply with specified competency and credentialing requirements. These non-medical prescribers include surgical podiatrists, optometrists, PAs (under the supervision of a medical officer) and NPs (under a Drug Therapy Protocol, DTP).[6] Optometrists authorised to prescribe under State or Territory legislation, as of 1 January 2008, can also apply for approval as PBS prescribers, with a limited list of medicines that can be prescribed.[51,52] Similar access to the PBS is available for midwives and NPs, as of 1 November 2010.[48,52] While most of these prescribers may only prescribe from a limited list of medications, it should be considered whether a patient potentially consulting multiple prescribers could complicate monitoring of the patient's medications.

Under the *Regulation*, registered nurses (RNs) are authorised to administer Schedules 2 and 3 medicines without a doctor's instructions (i.e. nurse-initiated) but requires a doctor's, PA's or NP's instructions to administer Schedules 4 and 8 medicines.[6,7] A medication-endorsed Enrolled Nurse (EEN) is able to administer Schedules 2, 3, 4 and 8 medicines under the delegation and supervision of an RN, midwife, dentist or medical practitioner. An EEN may not delegate any other person to administer medications or initiate or supply any medications. While all enrolled nurses (ENs) now graduate with medication endorsement, existing ENs without this endorsement may not administer medications, initiate any medications or help patients take dispensed medication.[10] As established earlier, unlicensed nursing staff including AINs and PCs may not administer medications; however, they are able to provide physical *assistance* in

medication administration.[6,45] A further layer of complexity is that the defined tasks of these nursing roles can differ between jurisdictions.

Legislations relating to the supply and administration of medications and the specified conditions for this supply and administration differ between States and Territories. The State and Territory legislations also include scopes of practice of health practitioners, identifying the level of supervision required to undertake a specific medication task. Often, the peculiarities of the State and Territory legislations and PBS provisions in terms of legal prescribing, supply and administration of medications cause confusion among health care providers who are trained in the legislation of their home State or Territory.

There have been recommendations to improve consistencies between the legislation; however, certain inconsistencies exist to address local needs.[3,53] This is in apparent contrast to recent nationalisation of the registration and legislations for health practitioners, which enhances the mobility of the health workforce nationwide.[11]

1.4.2 Authorisations Specific to Rural and Isolated Areas

Health care providers providing services in a specific rural setting may have extended roles compared to their metropolitan counterparts. In Australia, specific personnel are authorised to carry out medication-related tasks according to the rurality or remoteness of their area of practice.

Several of these extended roles involve additional functions in terms of the provision of medicines, with the aim of facilitating QUM in rural areas, with specific reference to the *access* to medicines. In Queensland, the *Regulation* now includes a range of endorsements, thereby enabling the supply and administration of medicines in rural areas through extended roles, with definitions of 'rural' and 'isolated practice area' also included (*refer to glossary of terms*). Examples[6,7,24,54,55] are:

- The health care provider in charge of an outpost of the Royal Flying Doctor Service is authorised to administer or supply Schedules 2, 3, 4 and 8 medicines from a medical chest under a doctor's or NP's oral or written instruction [sections 54(2), 157(2), 246]. While the medical chests are licensed to the Royal Flying Doctor Service, the staff high turnover in rural communities has led to difficulty in accountability of these chests and the contents of these chests.[14,15]
- IHWs in an Aboriginal or Torres Strait Islander community in an Isolated Practice Area are authorised to supply and administer Schedules 2, 3 and 4 and administer Schedule 8 medicines on an oral or written instruction of a doctor, NP or PA or under a DTP [sections 59A, 164A, 252B].
- RNs in Isolated Practice Areas and rural hospitals may supply Schedules 2, 3, 4 and 8 medicines on the instruction of a doctor, NP or PA. This supply function may only occur in instances where the facility does not employ a pharmacist or the pharmacist is absent from the facility at the time the medication(s) is/are supplied [sections 67(3), 175(2A), 263(3)].
- In addition to the authority granted to registered nurses, midwives are also authorised to supply or administer Schedules 4 and 8 medicines on a doctor's instruction, in a rural hospital or an isolated practice area under a drug therapy protocol [sections 62, 167(1), 255(2)].

- In addition to the authority granted to registered nurses, a RIPRN can supply and administer Schedules 4 and 8 medicines on an oral or written instruction of a doctor, NP or PA or under a DTP. A RIPRN can also initiate, supply without prescription and administer a single dose of a non-prescription (Schedules 2 or 3) medicine [sections 67(2), 175(2), 263(2)].
- An Isolated Practice Area Paramedic (IPAP) is authorised to obtain, possess, supply and administer Schedules 2, 3, 4 and 8 medicines on an oral or written instruction of a doctor, NP or PA or under a DTP [sections 66(4), 174(2A), 262(2)].

1.4.3 Current Initiatives in Rural Areas

Legislative

Existing provisions in the *Regulation* has already allowed for, to some extent, ease in access for prescription and medication supply. For example, verbal order from prescribers are allowed provided it is followed up with a written order within 24 hours [sections 81, 97, 192].[6,45] In addition, the *Regulation* also allows authorised premises to hold general poison license to sell Schedule 2 medicines, provided the premise is located at a place more than 25km by road from a pharmacy [sections 19, 231].[6,45]

Further to the endorsements and authorisations outlined above for specified groups of health care providers, recent legislative changes in the *Regulation* allowing faxing of prescriptions throughout the state. A prescriber may fax a prescription to a dispenser, provided a verbal order is given and details of the order are confirmed within 24 hours after transmitting the fax, and the actual prescription (hard copy or electronic) is sent to the dispenser within seven days [sections 81AA, 192AA].[6] This anticipated improved efficiency in the medication supply process in rural areas and this is now more consistent with provisions in other jurisdictions

A more recent change in legislation is the addition of definitions of 'supervision' and 'personal supervision' in the *Regulation.* Supervision can now be undertaken using any technology (e.g. video-conferencing) that allows reasonably contemporaneous and continuous communication between the persons involved [section 5A].[6] This is anticipated to ease workforce issues in rural areas, particularly with health care providers requiring 'supervision' or 'personal supervision' to undertake their daily tasks, including pharmacy assistants, PAs and ENs. However, an appropriate supervision framework utilising technology has yet been established.

Pharmacists, who are dispensers of medications, are allowed to supply three days' worth of S4 medications which are not prepacked liquids, creams, ointments or aerosols, without a prescription, under the *Regulation* [section 194]. This is provided an emergency exists and it is essential to ensure continuity of the patient's medication treatment.[6] The provision of emergency medications applies to both metropolitan and rural areas, and differs between State and Territory legislation. A number of other approved medication suppliers, under specific conditions, are listed in each State or Territory legislations.[6,56] Recently, the 5th Community Pharmacy Agreement[57] between the Department of Health and Ageing (DoHA) and The Pharmacy Guild of Australia (the Guild) has recommended for pharmacists to supply, in the absence of a prescription, a *one-month* or *single-pack* of medication, instead of three days' supply, provided the patient has been stabilised on the medication therapy. This is known as a "medication continuance protocol". While the protocol is still under development, this is anticipated to ease access to medications in rural areas where prescribers are unavailable or in short supply. This protocol will be subjected to changes in State and Territory legislation, and

may only include a limited number of medications, such as dyslipidaemia medications called 'statins' and oral contraceptives. The passing of this protocol will not only attract PBS subsidy, but also requires the various jurisdictional drugs and poisons legislation to be amended to allow pharmacists to dispense to patients without a prescription from an existing prescriber (i.e. to implement the protocol).

Training Support

Acknowledging the lack of medication support services in rural health care centres, several health care organisations have developed training modules to up-skill existing health care providers' knowledge on QUM, medication reconciliation and legislation surrounding medication supply. These include training IHWs and nurses who undertake medication-related tasks in hospitals, outpatient clinics or health care centres that do not employ pharmacists (non-pharmacist sites).[8,30,58] While such training is deemed essential for quality assurance, some of the barriers hindering the success of the programs include staffing issues, fundamental qualifications or literacy levels, lack of funding and the vast geographical distances which compromise face-to-face training opportunities and increases training costs.[8,30,59,60]

Technological Support

Recent communications technology has enabled rural health care providers to consult another health care provider remotely. It has been found that this technology has a role in enhancing medical services as well as reducing medication errors.[35,60] Studies of the effectiveness of tele-medicine in rural medical practice have been positive in allowing a health practitioner to receive assistance or guidance from a remote health practitioner through the telephone or Internet.[25,29] Tele-psychiatry has also been beneficial in linking patients and relevant health care providers to a remote psychiatrist.[46]

Video-conferencing has also developed in the field of pharmacy, enabling pharmacists in rural areas to interact with their peers or mentors in larger facilities, both professionally as well as socially. This facilitator not only resolves the geographical barrier and isolation, but also provides educational support needed by pharmacists in rural areas, where professional support is often lacking and pharmacists may feel isolated.[36,37,60] In addition, "tele-health" technology also allows patients, nurses and other health practitioners to consult with a remote pharmacist, and thereby enhancing pharmacist services at non-pharmacist sites.[8,37,61] While the use of tele-pharmacy and video-conferencing has been established in the USA, this concept is still under development in Australia. Some of the reported barriers include lack of technology infrastructure, lack of (or poor) Internet connectivity and costs.[36,37]

There has also been the development of statewide software such as Enterprise-wise Medication Liaison System (eLMS) and iPharmacy® to facilitate medication processes in public hospitals (i.e. Queensland Health facilities). eLMS is a web-based application that produces a discharge medication record (DMR) that contains medication information for patients discharged from public hospitals in Queensland. Some of the information on a DMR includes new, current and ceased medications as well as written directions on how to take the medications. The DMR is also provided to the patient's elected community health practitioners (e.g. GPs, community pharmacists) to enhance the process of medication reconciliation and to facilitate exchange of medication information between health practitioners.[8] On the other hand, iPharmacy® is a dispensing and inventory management software used in non-pharmacist sites to facilitate nursing staff in medication supply processes.[8]

Outreach Support

In addition to providing training to on-site health care providers and remote assistance, outreach services are available to complement lacking health services in some rural areas. The Royal Flying Doctor Service (RFDS) provides a range of health services which may otherwise be inaccessible in rural areas. These services include emergency health services, routine health checks, child health care, community health care clinics (e.g. dental, eye and ear clinics), tele-health consultations, pharmaceutical supplies and hospital transfers.[22,25,31] While this service resolve some of the medical and medication access problems, QUM issue is still lacking as there is no medication counselling or review services available.

On the other hand, some hospital-based pharmacists have been commissioned to visit non-pharmacist sites to provide educational and medication support.[40,58,62] While nursing staff and other health workers in these sites have found these sessions to be beneficial, many have cited lack of consistency in terms of the frequency of visits and the communities covered for this outreach support. This may be due to rural workforce shortages, funding issues for staff and/or logistics.[62] In addition, medication review and clinical services are still lacking in this model, and QUM issues remain.

While these initiatives each address specific deficiencies in rural health care, their impact on the 'global' picture within a rural community is unknown. Published research on their effectiveness is sparse. Most research explores specific interventions to improve health care provision in a rural setting, but with insufficient focus on medication management and pharmacist services in rural settings to draw conclusions about the viability of such services for further implementation. Rural areas pose specific medication management challenges, and it is well established that timely and quality access to medicine supply and management services remains a significant, and growing, problem in rural communities.

1.4.4 Current Medication-Related Issues in Rural Areas

Legislation

Although the *Regulation* is empowering in certain instances, some anomalies exist in that pharmacists, even in rural areas, may only supply non-prescription medicines with no other provisions to enable the supply of certain prescription medicines without a prescription, except for the emergency supply provisions. The recently-released Australian Pharmacy Council (APC) report entitled *Remote Rural Pharmacists Project* has identified that legislation inhibits pharmacists, the medication experts, by not allowing them to prescribe medicines for the management of chronic disease. The APC Report therefore recommended that remote pharmacists be authorised to prescribe by protocol.[3] Further, the report has also identified that current legislation concerning pharmacy premises and the allocation of PBS provider numbers inhibits pharmacists to dispense from remote clinics as pharmacy outstations, as community pharmacists can only currently dispense from a pharmacy or dispensary which is located at an approved premises. These outstations are currently serviced by doctors, IHWs and/or nursing staff. While access to medication supply is improved significantly through these endorsements of non-medical staff, QUM remains a concern.[3,27,49,61] This is because medication supply undertaken by a non-pharmacist does not need to conform to the quality standards of dispensing outlined in section 4A of the *Regulation*, which requires pharmacists to follow Quality Standards during dispensing and selling of medicines [section 4A]. The Standards that apply are the Pharmaceutical Society of Australia (PSA) *Professional Practice Standards*.[4]

Lack of Medication Support

Reports have suggested that there is a lack of pharmacy and pharmacist support in rural or isolated practice communities.[8,61,63] More than half of Queensland Health hospitals have no pharmacist on site, and around one-quarter of these non-pharmacist sites have limited outreach pharmacist support. There are many (more than 60) outpatient clinics or health care centres in Queensland that are serviced by sole nurses or health workers, who also undertake medication supply tasks in these facilities.[8] In these settings, the health care system is likely to rely on doctors, nurses and IHWs to supply medications and manage the pharmacy store in the absence of a pharmacist.[40,59,61] This may ease workforce issues in rural areas in terms of medication supply; however, the quality of medication supply and management remains a problem in these areas. Research has also highlighted that health care providers in rural Queensland who supply medicines or undertake medication management roles require support systems, particularly from pharmacists, given their specialised training in medicines management.[3,30,35,40,49,64]

Pharmacists in Rural Areas

Medication management is a complex process that involves a range of health care providers. Medication-related problems and errors may occur at any stage of this complex pathway; the Australian Council for Safety and Quality in Health Care has indeed identified that 2-3% of Australian hospital admissions are related to problems with medicines (approximately 140,000 annual admissions), originating either within the community or within the hospital, and costing about $380 million per year in the public hospital system alone.[65] Pharmacists have extensive knowledge of, and expertise in, medication management, and should play a major role throughout the medicines management pathway to ensure quality and safe medication practices.[27,34,35,60,66] In addition, pharmacists can collaborate with other health care providers in terms of disease management, preventive care and patient education in a rural setting, where health care services are limited.[34,67] The preceding review of the literature has identified that pharmacists are under-utilised in rural areas, despite the availability of incentives (e.g. the Guild's Rural Pharmacy Program) to expand pharmacy services in rural areas and 1400 graduates produced by 16 university programs nationwide each year.[57] The under-utilisation appears to be a compounded effect of inadequate pharmacist workforce capacity in these areas, absence of legislation allowing pharmacists to take on expanded medication management roles, lack of employment opportunities (particularly for new graduates) and shortfalls in the support systems[27,66] (including training and mentoring for sole pharmacists practising in rural areas) to encourage utilisation of pharmacists' skills in QUM.

Numerous studies[27,34,35,61,66] have explored the value of pharmacists and their expanding clinical roles, but there is minimal discussion on ideal pharmacist models in rural communities or minimal focus on rural areas at all. Some of the rural studies in Australia have recognised the value of pharmacists in rural areas, and based on existing health care delivery models, the delivery of pharmacist services in rural areas can be divided into three main concepts:

1) Remote pharmacist support through tele-/video-conferencing.[36] While tele- or video-conferencing has been widely established to support medical practices in rural areas, and specialist medical practitioners and other allied health care providers have provided visiting services to rural areas, similar initiatives could be extended to enhance pharmacists' services in these areas.

2) Outreach pharmacist support (a visiting pharmacist providing on-site support on an occasional basis).[62] This support is frequently provided by medical services to an under-serviced community, however, a similar concept could apply with pharmacists providing medication support to a community lacking pharmacy services.

3) Sessional pharmacist support (the local pharmacist providing shared-care between primary and secondary health care).[68] Medical practitioners and allied health care providers have sessional employment between their private practice and the state's public health care system.[3] Similar employment options should be available for local community pharmacists to provide clinical pharmacy services to non-pharmacist sites or rural hospitals that do not employ a hospital pharmacist.

The approaches discussed above have been utilised in some studies exploring pharmacists' roles, however, apart from the limited pilot studies, there have not been any reported established models for implementation in Australian rural communities hitherto, and these calls for pharmacist-mediated support are largely hypothetical.

Pharmacy Staff in Rural Areas

It is recognised that IHWs and nurses are registered practitioners, while pharmacy support staff, such as pharmacy assistants or technicians, are unregistered health workers and have minimal professional accountability; all liability indeed lies with the pharmacists. The role of pharmacy support staff is not specified in the *Regulation,* except for to sell Schedule 2 medicines [section 258] and to possess medicines in order to perform pharmaceutical imprest duties in a hospital [sections 58B, 163A, 252A]. The existing *Regulation* requires pharmacists to follow Quality Standards during dispensing and selling of medicines [section 4A]. The Standards that apply are the Pharmaceutical Society of Australia (PSA) *Professional Practice Standards* for dispensing (Standard 5) and the provision of non-prescription medicines and therapeutic devices (Standard 12). These standards allow pharmacy assistants/technicians to perform certain duties, including involvement in the provision of non-prescription medicines (Schedules 2 and 3 medicines), assembling/labelling medications, data entry and daily stock control, under the *direction and personal supervision* of a pharmacist. The pharmacist has to be present while the activity is undertaken, providing direction and instructions to the pharmacy assistant/technician to perform a task, verifying the accuracy of the dispensed medication by the pharmacy assistant/technician and counselling the patient.[4,6,69] This is a particular problem, given the shortage of pharmacists in rural and isolated practice areas.[3,30,33,70] A recent change in the *Regulation* allows 'supervision' via video-conferencing or similar technology.[6] However, it is uncertain how these new definitions would be applied to pharmacy assistants/technicians as there is limited reference to their role in the *Regulation*. These new provisions could provide a resolution to the supervision issue, but an appropriate framework between pharmacists and pharmacist assistants/technicians is yet to be established. Kinrade (2004) reported international practices involving the roles of pharmacy technicians, including formalised checking of dispensed medications by non-pharmacists in the UK and Canada, with potential establishment of minimum training standards, mandatory registration and ongoing professional development for pharmacy assistants.[70] In New Zealand, pharmacy technicians are actively involved in the entire dispensing process, providing limited patient counselling, under the authorisation of the supervising pharmacist.[70] While the development of pharmacy support staff models overseas is still ongoing and under exploration, similar models detailing enhanced roles for pharmacy support staff may be established in Australia to optimise the value of this role within rural or isolated practice areas to ensure appropriate management of dispensaries as well as provide medication support in areas lacking pharmacists.

There is little research reported on medication processes and surrounding issues in rural areas. The *Australia's Health Workforce Productivity Commission Research Report 2005*[25] and other studies have explored health workforce redesign and health care delivery in the larger picture (nationwide), with some coverage of rural issues. There is a need for research specifically exploring role redesign, particularly role extension, of medical and allied health care providers to address medication management concerns in rural communities. Specific to medications, key Australian studies to date focus on two main areas: 1) QUM in Indigenous populations[3,27,30,59] and 2) enhanced pharmacy services and pharmacist roles.[5,60,63,66,68,71] While the value of pharmacist in promoting QUM is established in literature, there is a gap in the literature with regards to medication management models to be implemented for all rural and remote areas.

1.5 The Research Problem

Australia has a considerable land mass classified as rural, and issues/challenges with the provision of rural health care. Data suggest that rural communities often do not have a full complement of health care providers, which leads to the arguments that 1) rural health consumers have compromised access to health care services and products such as medicines, and 2) health care providers' roles in rural communities are, out of necessity, extended or overlapping if they are attempting to address the needs of their community. While initiatives have been established to support role extension, little is reported about the effectiveness, challenges and boundaries of such roles. Specifically, in terms of medications (a key component of health services), rural consumers may face issues with supply and timely access, and rural health care providers may face pressures to prescribe and/or supply medicines beyond their current professional boundaries. Few studies have explored issues with medication management processes in rural communities, particularly from both the local health care providers' and consumers' perspective, as existing health care delivery models in such communities have mainly focussed on resolving medical needs.

In light of these issues, **there is a need for research in a rural community to investigate the medication management pathway, including the dynamics between existing health care practitioners and scope of their respective roles, and identify the community's needs regarding access to medication management services**.

One premise of this research is that, if there were indeed 'gaps' within the medication management pathway in the chosen study community, the existing health care practitioners would be practising *at*, or *beyond*, their recognised scopes of practice. This then requires study of the *legal, professional and ethical boundaries* of current roles and necessary competencies to undertake the extended roles. If it were found that there were demands on the existing health care practitioners to practise beyond their recognised (and legal) scope of practice, i.e. that QUM in this community were not being met, it was intended to use this community as a model to propose practical solutions with a focus on safe, efficient and effective medication management within the constraints of current health care legislations.

2.0 METHOD

2.1 Research Design

This study constitutes Phase 1 of a larger project, and as such, an exploratory approach was applied, generating largely qualitative data. Phase 2, informed by the findings from this study, will incorporate modelling of an intervention(s) relating to enhancement of medication management in the study community.

The current study involved, firstly, identification of a suitable community in which to focus this research, with mapping of the health services available to this community, and subsequently data collection through two series of interviews. In such exploratory research, inclusion and engagement are paramount. To this end, this research involved key informants *external to* the study community, and the health care partners (including consumers) *within* the study community. A full-time project officer (VJ) was employed to provide assistance to the PhD student (AT) throughout the data collection stages.

2.2 Aim, Objectives, Hypotheses and Expected Outcomes

Aim

This project explored the issues surrounding health care providers when 'extending' their roles to meet the medication-related needs of a rural community in Queensland.

Objectives

The specific objectives were to:

- Identify health care providers involved in medicine prescribing, supply and management mechanisms in the defined study area
- Identify the role extension undertaken in this community by health care providers with specific reference to medication supply and management
- Identify training and support structures in place and/or needed to assist health care providers to deliver QUM services
- Identify situations that could potentially lead to adverse medication outcomes due to an inadequate medication management support structure
- Explore the potential for community or hospital pharmacists' roles to be extended to provide outreach dispensing and medication management services
- Explore the potential role for a community liaison pharmacist
- Explore mechanisms for other pharmacy staff to support rural health care providers who are involved in the medication cycle.

Hypotheses

Based on review of the literature, it was hypothesised that:

- Current options for medication supply (i.e. through endorsements and authorities for nurses and allied health care practitioners) are deemed inadequate to meet the needs of the identified rural study community.

- There is a need for extended medication management roles for pharmacists in the identified rural study area.

Expected Outcomes

The outcomes of this research were expected to be:

- Increased knowledge of the roles and responsibilities of various health care providers involved in medication supply and management.
- Insight into the perceptions of health care providers involved in medicine supply regarding current and potential difficulties and how they are coping with these.
- Identification of legal and ethical issues relating to medicine prescribing and supply.
- Recommendations for future role development, education and support structures for health care providers involved in the medicines cycle.
- Defining a role for pharmacists in assisting with medication management services provided by health care providers in rural areas.
- Development of models for pharmacy support staff in rural areas.

2.3 Ethical Approval and Considerations

Ethical approval was granted (15 December 2009) in accordance with the Griffith University Human Research Ethics Committee policy, based on the following assurances:

- Stakeholders, health care providers and consumers participating in interviews would receive an information pack *(refer to Appendix 1 and Appendix 2)* informing them of the study risks (considered negligible), the need to sign a consent form *(refer to Appendix 3)* before being interviewed, and assurance of the confidentiality of their responses.
- For consumers, participation or withdrawal would not have repercussions for their health care in the community.
- Participants would not be identifiable in the reports generated from this research; this is important given the size of the study community.

Additional ethical approval was also granted by the University of Southern Queensland Human Research Ethics Committee (21 January 2010), The University of Queensland Human Research Ethics Committee (16 February 2010), and the Darling Downs – West Moreton (Toowoomba & Darling Downs) Health Service District Human Research Ethics Committee (25 May 2010).

2.4 Stage 1: Identification of the Study Community

This research stage identified a suitable rural community in Queensland in which to focus the data collection, to assist the geographical mapping of health services[11] in the defined study region. Health services operating in the study community, including roles and availability of the health care providers, were identified for reference in later stages of the study. The services of an experienced health services mapping consultant were secured for this research stage. The consultant was employed by the Centre for Rural and Remote Area Health, a joint research centre between The University of Queensland and the University of Southern Queensland.

Prior to completion of the mapping exercise, the defined criteria for the selected community were:

- A geographically discreet location, rural yet accessible to the researchers (e.g. Darling Downs – West Moreton Health Service District),
- Without a full complement of health care providers (to explore the application of role extension by endorsed health care practitioners), and
- At least PhARIA 3,[20] which corresponds to an "accessible location with some restrictions on accessibility of some goods, services and opportunities for social interaction", with a maximum population of 5000 in the town/community.

Once the target community was selected, services and service providers were identified to saturation by systematic Internet searches followed by telephone calls, although some hard-copy directories and databases were also used. The search of the Internet utilised the Google™ search engine and then expanded into an examination of State and regional directories for government and non-government organisations. The main sources of information are listed in Table 3. The mapping spanned Queensland Health (public), private and not-for-profit (e.g. Blue Care) services, and included providers who were either based in the target community or provided an outreach service to the target community. Once a potential provider was identified, the applicable organisation was contacted to determine whether the provider did indeed offer such services. A "snowballing" technique was also used whereby already-identified participants were asked if they could provide the name or names of other service providers in the community. Table 4 lists the service providers of specific interest.

As the use of existing health services directories has recognised limitations and inadequate coverage to portray the complexities of access to health services in rural areas, the health services map was further refined during community-based consultation in later stages of the study.

Table 3: Sources of information	
Shire Council Web site	http://www.wdrc.qld.gov.au/
Queensland Health HSD profiles	http://www.health.qld.gov.au/wwwprofiles/default.asp
Queensland Health QFinder	www.qfinder.qld.gov.au/
Commonwealth Respite & Carelink	www.commcarelink.health.gov.au
Web based community directory	
• **InfoXchange Service Seeker**	http://www.serviceseeker.com.au/
• **Across net**	www.acrossnet.net.au/
• **Australia Community Guides**	www.communityguide.com.au/
• **dLook**	http://www.dlook.com.au/
Care delivery sources	Anglicare, Blue Care, Ozcare, RSL Care, Tricare
	St. Luke's Nursing Service
	Queensland Bush Nursing Association
	Queensland Health Aged Care Services
	Community Health Services
Community Health Services	Lifeline Community Care
	Royal Flying Doctor Service
Counselling	Centacare
	Southwest Queensland Psychology Service
	South West Financial Counselling Service Inc.
Indigenous Health Services	Goondir Aboriginal & Torres Strait Islander Corporation

Table 4: Service providers		
Aboriginal health worker	Diabetes educationalist	Osteopath
Aboriginal mental health worker	Dietitian/nutritionists	Pharmacist
Alternative therapist	Exercise physiologist	Physiotherapist
Audiologist	General practitioners	Podiatrist
Child health nurse	Hospital services	Psychologist
Chiropodist	Medical specialists	Radiographer
Chiropractor	Mental health nurse	Registered nurse (specialist)
Community Health Nurse	Occupational therapist	Social worker
Counsellor	Optometrist	Speech pathologist
Dentist	Oral hygienist	Women's health nurse

2.5 Stage 2: Stakeholder Interviews

Key informants were identified and approached by the researchers to participate in semi-structured interviews (approximately 30 minutes in duration) to assist in defining the topics for investigation in the study community (in Stage 3). These stakeholders represented organisations involved in policy, regulatory/legislative and ethical/professional aspects of health care delivery that may impact on health care delivery in rural communities, and included:

- Australian Health Practitioner Regulation Agency (AHPRA)
- Australian Health Workforce Institute (AHWI)
- Australia Pharmacy Council (APC)
- Medication Services Queensland (MSQ), Queensland Health
- Pharmaceutical Defence Limited (PDL)
- Pharmaceutical Society of Australia (PSA)
- Queensland Health Drugs and Poisons (QHD&P) Unit
- The Pharmacy Guild of Australia (the Guild)
- Darling Downs – West Moreton Health Service District

To enhance engagement with the local health service district, key stakeholders practising in the district were approached in the early stages and their input and commitment sought by prioritising their involvement in stakeholder interviews. This early engagement assisted with the identification of the services and perceived issues within the study community.

An interview guide (*Appendix 5*) was used to assist the flow of the semi-structured interviews. Interview topics were informed by the literature review, and covered:

- Actual practices and procedures
- Current and future scopes of practice
- Responsibilities, competencies, guidelines and protocols
- Ethical boundaries
- Instigation of legislative and practice change.

Interviews were conducted collaboratively, between August and November 2010, by the project officer (VJ) and PhD candidate (AT), with the collaboration aiming to enhance the quality of the data collection process. The interviews were recorded, transcribed and

thematically analysed using 'qualitative approach' to provide a platform to build on theories and thus inform the design of interview guides for use in the community.

The stakeholder interviews were designed to provide insight into participants' opinions, if not experience, relating to medication issues in a rural setting, to establish focus of interview topics for health care providers in the study community. The engagement with stakeholders also allowed discussions on current initiatives that are effective or ineffective, as well as potential models to be explored. This is considered essential for further investigation in Phase 2 of the research. Some scenarios were derived during interviews for more in-depth discussion.

2.6 Stage 3: Data Collection in the Study Community

The Darling Downs – West Moreton Health Service District Executive Director of Rural Health and Aged Care and a colleague were consulted in relation to the appropriateness of the study community. They also assisted in developing a suitable approach to the research and in identifying potential interview participants.

The health care providers of the target community identified during the health services mapping were screened for their involvement in medication supply and/or medication management within the community (Table 5). This allowed the investigators to focus on the objectives of the study with the relevant groups of health care providers. The health care providers were contacted by telephone (*Appendix 4*) and/or email to enquire about their involvement in medication supply, medication management or both in the study community.

Table 5: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
• Prescribe medications • Obtain supply of medications • Supply or dispense medications to patients • Administer medications or assist with administration of medications • Provide medication information to health care providers (e.g. education) or patients (e.g. counselling) • Provide medication recommendations to health care providers or patients	• Manage other aspects of health apart from medications (i.e. do not deal with medications at all) • Only provide referral to relevant health care providers in relations to medications • Visiting health care providers who were absent during site visits by the researchers

Once their roles regarding medications were established and confirmed, the identified health care providers were advised of the objectives and scope of the research and potential benefits to their community. Interview appointments were subsequently arranged. Other potential health care providers were also identified during the telephone contact. These recommended health care providers were added to the generated health services list, if they were not identified in the previous mapping.

Interviews with the relevant health care providers and consumers in the defined community were completed by the project officer and PhD candidate, in a period of 4 weeks (mid-September to mid-October 2010), using a semi-structured interview guide (*refer to Appendix 6*) developed with reference to Stages 1 and 2. A significant feature of this approach was that the

researchers established a presence within the study community to optimise on-site data collection by engagement with the health care practitioners and consumers, for convenience of access to the interviewees, and to enhance understanding of some of the logistical issues that impact on health care service provision. Additional potential health care providers were identified during site visits, some of whom were approached for an interview. The identified health care providers were added to the generated health services list if they were not identified in the previous mapping.

Interview topics focused on medicines management and included the health care practitioners':

- Inter-professional relationships
- Scopes of practice
- Training, skills and knowledge
- Training needs
- Referral and support networks
- Self-reported description of their workload
- Views about health workforce shortage and needs in that area
- Experiences in either being expected to practise, or actually practising, *at* or *beyond* the perceived limits of their expertise, and influences on these practices.

Perspectives were also sought from consumers who were prescribed regular medication(s) or knew of someone locally (e.g. a family member) who was prescribed regular medication(s). Consumers in the selected community were recruited through businesses in the towns or in the premises of health care services, with permission of the manager. They were issued an information sheet (*Appendix 2*) that explained the study and asked to provide consent to be interviewed (for an approximately five minutes). Consumer interviews (*Appendix 7*) were focused on the consumers' experiences with access to medicines in that community, including their utilisation of the available mechanisms for managing their medicines, and recall of situations requiring emergency supply.

Data were collected until saturation was reached, i.e. no new concepts or key themes were further identified from health care providers and consumers.

2.7 Data Analysis

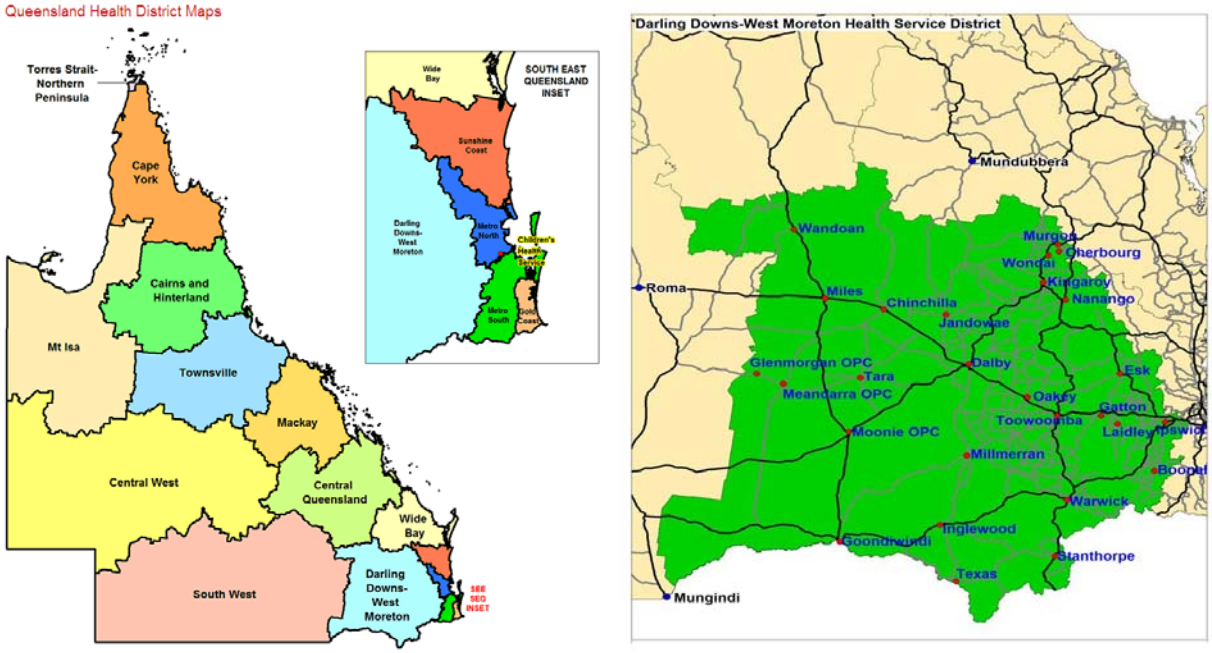
Data analysis was simultaneous with data collection, which enabled the testing of emerging concepts, themes and categories against subsequently-collected data, and allowed for adjustments to be made to interview topics. Data from all interviews were manually transcribed and analysed thematically for commonalities and differences in responses, to enhance the understanding of the findings and facilitate interpretation of the complexity of issues reported. With the data collected from multiple sources (stakeholders, local health care providers and consumers), a triangulation approach was used to interpret, analyse and validate data through cross verification from the sources, further enhancing the credibility of the qualitative analysis and providing a more detailed and balanced picture of the data collected. The involvement of four researchers (two involved in collecting the data and two project directors) added robustness to the interpretation of the themes. All data were reported anonymously.

3.0 RESULTS

3.1 The Selected Study Community

The community selected for the study comprised four towns in the Darling Downs – West Moreton Health Service District, Queensland (Figure 1).[10] The towns cannot be named, in compliance with ethical approval for the study, in which anonymity of the interviewees was assured and the naming of the towns would complicate participant confidentiality issues. The average population across the four towns, at the time of identification of the sites, was 1500,[10] with a rurality index between PhARIA categories 4 and 6.[20] In addition, these towns were equipped with at least one hospital (classified as a 'rural hospital'[6]), one medical practice and one pharmacy each, and were located approximately 300-400km from the state's capital (Brisbane, Queensland), which has a full complement of medical, other health care providers and community services.[10]

Figure 1: Map of Darling Downs - West Moreton Health Service District[10]

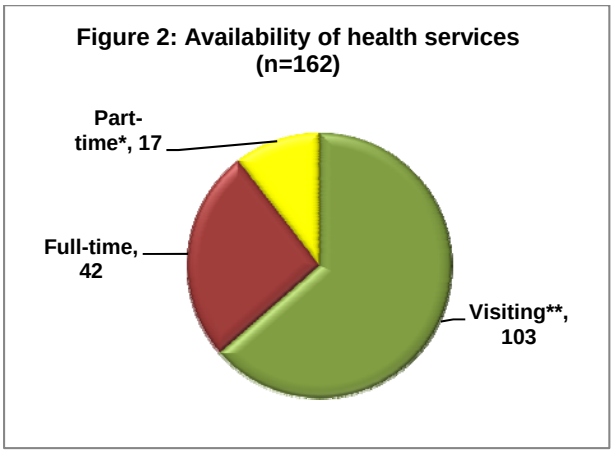


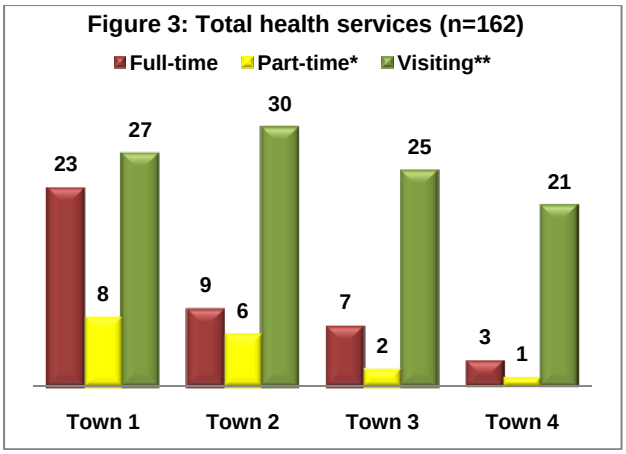
The initial desk-based search methods identified 144 health care services (including part-time and visiting services) between the four towns. Confirmation through the community-based data collection process increased this number to 162 services (Table 6, Figures 2 and 3).

Table 6: Health services in the four towns (n=162)				
Health Services	**Town 1**	**Town 2**	**Town 3**	**Town 4**
Primary health services				
Hospital	**1**	**1**	**1**	**1 (Outpatients only)**
Ambulance service	**1**	**1**	**1**	**0**
Medical practice	**1**	**1**	**1**	**1****
Community pharmacy	**2**	**1**	**1**	**1**
Dental	**1**	**1****	**1****	**0**
Community health services (roles undertaken by nursing staff)				
Aged care	**2**	**2**	**1**	**0**
Alcohol & drug	**1, 1****	**2****	**3****	**2****
Child health	**1**	**1***	**1***	**1***
Community health	**1**	**1**	**1***	**1**
Domiciliary nursing	**1**	**1***	**0**	**0**
Men's health	**0**	**1***	**0**	**0**
Women's health	**1****	**1****	**1****	**1****
Youth health	**1***	**1***	**1****	**1****
Specialists				
Diabetic physician	**1****	**0**	**0**	**0**
Gynaecologist	**1****	**1****	**0**	**0**
Orthodontist	**1****	**0**	**0**	**0**
Surgeon	**1****	**1****	**0**	**0**
Allied health				
Audiology	**3****	**0**	**0**	**0**
Chiropractic	**1***	**1***	**0**	**0**
Exercise physiology	**1****	**1****	**0**	**1****
Mental health	**2**	**2****	**2****	**2****
Nutrition/dietetics	**3****	**3****	**2****	**2****
Occupational therapy	**1*, 2****	**2****	**2****	**2****
Optometry	**1**	**1****	**1****	**2****
Physiotherapy	**1, 2****	**1*, 2****	**2****	**1****
Podiatry	**3****	**3****	**2****	**1****
Psychology	**1*, 2****	**4****	**2****	**1****
Social work	**1****	**1****	**1****	**1****
Speech pathology	**2****	**3****	**2****	**1****
Other health services				
Community nutritionist	**1**	**1****	**1****	**1****
Diabetic resource	**1***	**0**	**0**	**0**
Disability support	**1**	**0**	**0**	**0**
Healthy lifestyles officer	**1**	**1****	**1****	**1****
Multi service (e.g. welfare, health education, disability, domestic care)	**3, 1*, 1****	**2**	**2, 1****	**0**
Remedial massage	**2*, 1****	**0**	**0**	**0**
Transport service	**1**	**0**	**0**	**0**
Total health services	**58**	**45**	**34**	**25**

**Part-time*
***Visiting*
Note:

1. *There is currently no permanent medical practitioner practising in Town 4. This town is serviced on a part-time basis by locum medical practitioners deployed from major hospitals in Brisbane, Qld.*
2. *The Queensland Health facility in Town 4 is an Outpatient clinic, providing health care services only from Monday to Friday.*
3. *Some of the roles were shared-care. For example, a nurse may hold multiple part-time nursing roles in the town. Another example is that a health care provider may be based in one of the towns, providing outreach/visiting services to the other towns.*





3.2 Stakeholder Interviews

Twelve stakeholders were approached for face-to-face interviews to explore their opinions and experiences relating to key topics listed in *section 3.6*. The participants and their representative organisations were:

- A representative from AHPRA
- A representative from the AHWI
- A representative from the APC
- Two representatives from (MSQ), Queensland Health, one from a non-pharmacy background
- A representative from PDL
- A representative from the PSA
- A representative from the QHD&P Unit
- A representative from the Guild
- Two hospital pharmacists practising in the Darling Downs – West Moreton Health Service District, one with managerial experience and the other with sole pharmacist experience
- A hospital pharmacy assistant from the Darling Downs – West Moreton Health Service District

3.2.1 Major Issues and Barriers

Limited Staff and Health Services

Lack of comprehensive health services, mainly due to limited health care providers and frequent turn-over of health care staff in a rural setting, was a key issue raised by most stakeholders:

"There should be equity in service. There're so many services in the city but the large bulk of population at risk is out there in the bush because they get less service. There's capacity to improve the imbalance." (S7)

"(The rural area) is not necessarily where people want to live and work, therefore the full array of professional groups might want to be in an urbanised populated metro setting. It's not possible or affordable in rural settings." (S6)

"… we're all in an ageing population, we're using every people that we've got and who we can get back into health care …" (S4)

"… if you don't get your scholarship holders, you don't get anybody, because nobody wants to come out here." (S11)

One stakeholder commented that the challenging conditions and isolation from mentors of a rural area may affect the selection of health care staff, where practice experience may be essential prior to be employed in a rural setting:

"… also in rural positions they don't want a very young graduate or a new graduate (to) come out and take that position because there's no support mechanisms out there." (S7)

The lack of health care providers, in terms of capacity and permanency, may impede on continuous therapy and patient care in the primary health care sector. This not only burdens the current primary health care workforce, but also causes patients to utilise secondary care as a first option, which then burdens the secondary health care system:

"… it's just impossible, not only for us (to communicate information between health professionals), but for the patients themselves … in the past, a couple of patients expressed their frustration having to tell the new GP every time their whole picture … progress in patient care is really difficult … retention of staff is very difficult." (S10)

"(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." (S4)

While Stakeholder S5 pointed out that around three-quarters of the (public) hospitals in rural Queensland do not employ a pharmacist, some stakeholders commented that rural facilities that do employ pharmacists do not utilise a pharmacist's expertise appropriately, as they are expected to fulfil basic dispensing tasks, which could be performed by support staff. However, these tasks need to be performed by pharmacists in the absence of pharmacy support staff:

"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 now for the patient. So that's their first and prior concern. To a lot of hospitals, 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 …" (S4)

"… it's a very difficult to get (medication review services) or to deliver that if you're the sole pharmacist." (S3)

The majority of stakeholders expressed their concern about the lack of clinical pharmacy services in rural areas and the potential for higher rates of medication-related errors or events. Stakeholder S5 added that medication reconciliation is an issue, particularly in facilities lacking pharmacists or under-utilising pharmacists clinically, and provided an example where medication reconciliation process was not undertaken:

"This lady came in, she's confused and that was a tramadol interaction that she had ... It was identified and they ceased the tramadol. She became normal and coherent. The pharmacist has gone up and spoke to her because she likes her tramadol. We highlighted the need for her to have a DMR and to be counselled because her adherence is not the best. The doctor writes script and sent her home (without DMR). So she went to a pharmacy ... she took the discharge script and all her scripts from what she's always been using and they dispensed everything – the tramadol and everything. It wasn't until the pharmacy phoned us up because there was an order (error) for Iscover® and they wanted us to do another script, and I said Iscover® was ceased ... then we worked out that she's been dispensed some tramadol again. I said, "That's why she came into hospital." But if the patient had gone to another pharmacy, the pharmacist might not call to check with the hospital pharmacy." (S5)

Involvement of pharmacists in health care programs, which may enhance health services in a rural setting, is also lacking. One stakeholder (S5) provided an example of the federally-funded 'Transition Care Program', which identifies patients' needs when transiting from a hospital to a non-hospital environment, and pointed out the absence of a pharmacist involvement in such programs.

Overlapping Roles and Up-skilling

While some of the stakeholders acknowledged the skills of other health care providers in the field of medications, concerns were raised about overlapping roles and up-skilling, particularly relating to nursing staff undertaking pharmacy-based functions in non-pharmacist sites. The requisite training, depth of knowledge on pharmacotherapy, increased workload, priority processes and deviation from true core role(s) were some of the key issues raised:

"Nurses are being deployed from their real tasks, (which is) caring for patients, to do (medication supply)." (S7)

"... there was a lot of gaps out there with the rural and remote nurses in terms of training and knowledge… There's nothing there for the nurses on how to run the (pharmacy store) - a lack of resources and training for them." (S9)

"(Nurses are) actually out there to undertake a lot of other areas … and they've got more than enough roles of their own to do. And this is something that they have to take on because they're the only qualified persons (to supply medicines), but they have to undertake extra training to be medication endorsed and all of these things, whereas they would very much welcome a pharmacist being part of their team because there's just so much benefit. There's been many studies to show there are benefits when a pharmacist is involved in these teams, better therapeutic (recommendations), better clinical outcomes … (The nurses') ability to see the big picture is limited to their depths of knowledge, and not having any depredation of their depths of knowledge, but why are we getting a nurse to be all things …" (S12)

Stakeholder S12 also commented on the limitations of the s100 scheme, which involves the bulk delivery of PBS medicines, without dispensing and labelling, to a remote or isolated Aboriginal Health Service. The stakeholder added about the inappropriate role structures involved, requiring of pharmacists to do stock control instead of provide patient care services while up-skilling IHWs to undertake medication supply roles:

"… the pharmacy, not the pharmacist, provides the stock to the Section 100 clinics, then you have an Aboriginal health worker who unpacks it, puts it away and then supplies it via smaller

containers to a patient based on (the order that) is sent to them by the doctor or the nurse. So the true person with the expertise in providing medication and providing counselling is not interfacing with the patient. (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. They don't have patient contact, 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." (S12)

Limited Incentives/Remuneration

Many stakeholders commented that lack of funding or monetary incentives contribute to the lack of comprehensive services in rural areas. Funding concerns were raised in relation to the key areas listed below (in no particular order):

- Logistical costs of improving technology and infrastructure support, such as video-conferencing and electronic prescribing. (S4, S5)

- MBS, in relation to remunerating health practitioners involved in case-conferencing. (S6)

- PBS, in relation to lack of after-hours remuneration (e.g. additional dispensing fee) for pharmacists. (S1)

- Providing outreach services and site-visit training to health care providers in rural communities. (S9)

- Remuneration for pharmacists providing clinical pharmacy services, either on-site or from a remote site:

  "… there's not a very good remuneration package for other (novel) models of pharmacy services. … the compensation models are really all about supply of (medicines), it's not about compensating for the time of the pharmacist to do the work. … There's plenty of (pharmacists) out there doing it. But they're doing it more out of goodwill and because they're good pharmacists, (and) the barrier is the provision of payment for the service provided." (S12)

- Inappropriate allocation of funding and resources:

  "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." (S12)

Professional and Personal Support

Working in rural areas imposes social challenges such as "lack of collegial support and interaction" (S5). Lack of professional support for sole practitioners or health care providers was raised by several stakeholders, with concerns including:

- Continuity of quality health care processes. For example, if a nurse who is trained to perform certain medication supply functions takes leave, other nurses may not be trained sufficiently to undertake the role. (S5)

- Transferring a health care provider (from a larger town or metropolitan area) to cover an absence in a rural town, either on a temporary or permanent basis, as a sole practitioner. (S6)

- Deploying potentially incompetent overseas-trained health personnel to "an area of need", which is usually a rural town, as a sole practitioner with limited support. (S6, S8)

- Expectations of new "graduates who are bonded" to practise in rural communities when they "don't have the coping mechanism or support structure or life skills to be able to manage the more difficult situations in the rural environment" as sole practitioners. (S7, S10)

- Timely communication of information between health care providers who may be overloaded with health care demands of patients:

  "What I mean is between primary care to secondary care and then back again - there can be issues with communication of information, whether it be timely access to the information from the GP, because we know they're hard-pressed, (or) completeness of information … A lot of times, the patients have specialists, and the information isn't easy to streamline into … if they come into (rural town), we can't follow up completely or fully, which really impedes on our care for the patient, because we don't have a holistic view of the patient … sometimes there's difficulty in transmitting information back to the primary carer …" (S10)

Apart from that, several stakeholders stated that it can be challenging and de-motivating for health care staff to provide quality care in an unsupportive environment, at work or within the rural community, due to cultural differences and/or different work protocols. This was reportedly an issue in rural communities where professional support is already lacking:

"... If you have good relationships, a lot of things are easy. If you can't get along with your GP, and you're only one doctor and one community pharmacist in that town, it's going to be very hard for your patients." (S4)

Legislative Environment

While legislation, standards and protocols aim to enforce quality health care practice, several stakeholders commented on the complicated regulatory framework and interventions in place:

"Queensland Health has so many protocols. Like I said, I don't have an ideal model or protocol, but you've got your different categories of nurses, what they can do and can't do. Different protocols here and there, Federally … It becomes messy. One doesn't know what the other is doing. It's confusing. One group will be going down the path, they don't know what they're doing, whereas others have been there, done that." (S7)

"… dealing with the State Health protocols versus the Federal Health protocols, and the doctors not being able to cope, and they're writing scripts for PBS versus State Health. … the doctors

have no idea which way they're going. It's just so diverse, the different programs that are available." (S12)

Current legislation mainly supports traditional roles of health care providers, and therefore do not provide the flexibility needed in a rural environment where health care providers are unable to meet the necessary criteria or legislative requirements:

"I think there're a lot of community pharmacists in the country who would like to do that (i.e. provide off-site pharmacy services), but then they'll be constrained by the requirement to be in the pharmacy while the pharmacy is open. We lock people into the pharmacy." (S8)

"… you want to have a pharmacist who's got the flexibility to move between communities and locations and provide pharmacy services …" (S12)

"… in the Poisons (Regulations), technically only the pharmacists are allowed to order medications from their bulk suppliers (when the role has been undertaken by many non-pharmacists in many facilities) …" (S11)

Nonetheless, one stakeholder (S9) stated that while health care providers who undertook non-traditional roles are bound by legal responsibilities, they also have professional and ethical responsibilities to provide quality and continuous patient care:

"… there's still gap with the drug regulations and what happens with practice as well … I think they work around what they've got in mind is patient safety, what's best for the patient. It may not meet the Regulation, but they know it's patient's safety." (S9)

Quite often the roles of health care providers are 'stretched' to meet health care demands and there is a perceived tension between following legislative boundaries of the extended roles and providing patient care.

3.2.2 Existing Facilitators for Medication Supply and Management

Legislation and Policy

Stakeholder S2 commented that the (Queensland) legislation is reviewed periodically to accommodate the "stretching" of roles of health care providers working in rural communities. The *Regulation* is updated to promote quality and continuous provision of health care to rural communities where health care services are scarce. Some of the examples given are:

- Allowing rural IPAPs and nurses to supply medications in non-pharmacist sites,
- Exploring the role of NPs and PAs to prescribe in situations where availability of a doctor may be lacking, and
- Allowing certain licensed businesses to supply Schedule 2 medicines in towns isolated from pharmacy services.

Stakeholder S4 stated that, following the Public Hospital Pharmaceutical Reforms, changes in PBS requirements allows hospital doctors to prescribe PBS medications for discharge and out-patients, to be dispensed either by a hospital pharmacy or community pharmacy. The latter is encouraged by many, as "this allows the patients to gain adequate counselling by a pharmacist, and the nurses (in non-pharmacist sites) don't get tied down with dispensing." (S4)

Training and Support

Queensland Health's corporate directorate responsible for QUM, MSQ, has been actively involved in providing training and clinical support to health care providers in rural communities. Some of these activities were identified by stakeholders S4 and S9, whereas other stakeholders supported the concept but couldn't report the level of practical implementation, acknowledging funding and workforce issues:

- Informal assessment modules and credentialing processes to equip nurses with pharmacotherapy knowledge and knowledge to provide basic pharmacy services such as medication reconciliation.

- A resource package for nurses on "how to run a pharmacy" to reduce the need to rely on verbal handover. This package includes information on legislative requirements and guides relevant to medication supply.

- Clinical educators (senior pharmacists) to train junior pharmacists via site visits and video-conferencing; a "buddy-system" and education support to young pharmacists who are sole pharmacists with the aim of equipping them mainly in management and clinical skills.

- Pharmacists travelling to rural areas to provide academic detailing to nurses, doctors and pharmacists in the community and at the hospital.

Software Development

Stakeholders S4, S9 and S10 explored on the software packages developed for use in Queensland Health facilities statewide to facilitate transfer of medication-related information to health care providers within a facility, between facilities and in the general community. These aim to enhance communication between health care providers particularly in rural areas, where geographical distances and rurality may hinder access to a patient's medical information. The softwares include:

- eLMS, which is a web-based software program developed to produce a DMR and to enhance the process of medication reconciliation.
- The Enterprise Discharge Summary (EDS) is another application developed to facilitate transfer of patients' medical information from Queensland Health facilities to community health professionals. The EDS contains various medical information about the patient, including inpatient history, discharge history as well as DMR (i.e. eLMS feeds into EDS).
- iPharmacy®, which is dispensing and inventory management software linked statewide. This electronic bridging allows larger hospitals to access and monitor ordering processes conducted by satellite (smaller) hospitals.

Stakeholder S10 commented on the benefits of EDS in transmitting information electronically and improving communication and information relay between health care providers in rural areas. Stakeholders S4 and S9 commented on the need for nursing staff in non-pharmacist sites to be familiar with medication ordering and supply, and with the dispensing software. They added that gaps have been identified in terms of generating a quality DMR, although assessment modules have been developed for this purpose. Both stakeholders expressed difficulties such as infrequent on-site training and high turnover of staff in these sites, resulting in poor circulation of expertise and succession training amongst nursing staff themselves.

3.2.3 Potential Facilitators for Medication Supply and Management

Non-medical Prescribers

Some stakeholders put forth arguments for non-medical prescribers to provide greater flexibility and access in a rural setting. They stated that health care providers who have the appropriate training may be able to perform some limited prescribing according to the national prescribing competency standards and supply of the medications. This would subsequently free up doctors and GP resources to focus on more serious medical conditions. Some of the examples given were:

- 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. (S1)

- Nurse 'walk-in, walk-out' clinics:

  "It is a safety issue, but we're talking about laxatives, B12 supplements, calcium supplements, Panadol® … Why should some of those basic things be constrained to within high cost professional regulation?" (S6)

Use of Pharmacy Support Staff in Non-pharmacist Sites

Several stakeholders suggested the benefits in employing a pharmacy support staff, such as a pharmacy assistant or technician, in non-pharmacist sites, under the supervision of another health care provider e.g. a registered nurse or director of nursing, to provide more effective basic pharmacy services:

"(Technicians) can undertake supply function. … imprest stock, do orders, they would check expiry dates, tidy the shelves …" (S8)

"… nursing staff don't do labelling as well as pharmacy assistants, who have exposure to that area … 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 …" (S10)

"… as a pharmacist assistant, you would know more about the medications, how much you've got, how much you use … make sure stock is available, if (the pharmacy) hasn't got the stock, I often ring the (community) pharmacy … I know there's a lot of smaller places in this district (that) have RNs, and it's not a full-time thing (to manage a pharmacy), (but) it takes (nursing) staff out of their own scope." (S11)

Stakeholders S10 and S11 also added some of the clinical roles that a pharmacy assistant or technician can undertake in the future, as they believed pharmacy assistants/technicians have more exposure to these areas:

- Basic patient counselling with regular items such as antibiotics and analgesics.

- Checking patients' medication charts and writing generic names (to enhance familiarity amongst medical staff).
- Checking patients' medication charts for dose and unit availability and duplication of medications.
- Checking patients' medication and admission history.

Stakeholder S10 commented that having a pharmacy staff member in a medical facility to undertake medication supply and management roles would ease the burden of managing the pharmacy store from the nurses:

"… we have that support role in there. 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 (dangerous drugs); taking those things away from nursing staff so that they can focus on their aspects of care … so you're taking away distractions from them." (S10)

Improving Pharmacist Services

While other health care providers have reportedly been able to undertake and be competent in medication supply functions, improving pharmacists' medication management services in rural areas will be the next key target to enhance QUM in rural communities:

"We don't own that job (i.e. medication management). We're not legislated to say that we're the only person that can provide that activity. … All we've got is evidence that we do it very well because of the way we're trained, because of our focus and perspective that we take. We've got ... published literature that we do it very well … Other professionals are actually recognising now that pharmacists do have a major role to play … we do key things like admission history and reconciliation on admission, we do review, and we do reconciliation and 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." (S4)

"... we give medical practitioners that sense, that voice in their head that double checks and that actually helps optimise patient's therapy. … the value we bring, one of the things is medication education - I can't stress enough how much pharmacists bring that to the table and just talk about pharmacology and adverse events … to help other health professionals, to educate nurses …" (S10)

Stakeholder S12 stated that a model should be formulated to support pharmacists to medication management services to rural and isolated areas. This would not only improve QUM in those communities, it would also be a significant support system to rural doctors:

"Rural doctors are usually fly-in, fly-out physicians, and they want to maximise the amount of time with the patient, and a pharmacist can provide therapeutic options for the doctor; the doctors walk in with a defined set of list to work from … that should be a model we all should be embracing." (S12)

While a majority of the stakeholders acknowledged the limitations to supplying pharmacist services to rural areas, some of them have suggested ways to improve this situation, given that the provision of limited pharmacy services are better than no pharmacy service at all.

Pharmacist-Continued Therapy

Stakeholders S1 and S3 commented that pharmacists can have a role in chronic disease medication management to ensure continuous therapy and ease access issues in rural communities. This has been clarified as not being initial therapy, but rather, the pharmacist initiating a new prescription for a continuing therapy where the patient's condition is stable and/or the patient is unable to see a doctor for a prescription renewal. Pharmacists may also have additional roles in systemised screening programs such as blood pressure monitoring, diabetes monitoring and cholesterol monitoring.

"… if you (as the pharmacist) have someone that's on very stable chronic therapy, and you have the definitions of which one, they're able to do that, you can supply a month's supply." (S3)

Tele-pharmacy

Acknowledging logistical and funding issues, some stakeholders commented that tele-pharmacy is a good stepping stone to improving access to pharmacists and clinical pharmacy services in rural areas. Stakeholder S4 raised some benefits with the use of tele-pharmacy to access an off-site or remote pharmacist:

- To provide pharmacist consultation to a patient if the doctor or nurse deemed the patient's medication profile is complicated.
- To answer enquiries from medical staff about a certain medication.
- To assist nurses in inventory management.
- To enhance clinical pharmacy activities via case-conferencing.
- To provide support to sole pharmacists working in a rural community.
- To link pharmacists and other health care providers to education sessions in larger medical facilities.

Pharmacist Outreach Services

Hospital-based pharmacists from larger hospitals could undertake a role in providing district outreach support to nearby satellite hospitals lacking pharmacist services. An outreach pharmacist role may include on-site training and education to medical and nursing staff, as well as helping to manage the pharmacy store by doing inventory management, imprest reviews and stock control:

"… only some places have that, where a pharmacist visits quarterly, half-yearly or once every year, the pharmacist can provide in-service training and join in clinical ward rounds." (S4)

"When I was working in (a rural town) and had to do fly-ins, the hospital staff are always happy to see you. … that was more like going to the smaller hospitals and doing inventory management and medication replenishment. The nursing staff always ask you a thousand questions. They all try to follow their protocol, if they have a question … I helped them out because they just didn't have a pharmacist at all." (S12)

Stakeholders admitted barriers such as remuneration and staffing problems to these initiatives; however, they stressed the significant value of the physical presence of a pharmacist (or other health care providers) 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 and what actually happens, knowing how the hospital physically looks like, and the staff …" (S9)

Sessional Pharmacist Services/After-hours Services

Several stakeholders also raised a potential shared-care model of an on-site community pharmacist providing part-time or casual pharmacy services to non-pharmacist sites (hospital) in the same rural community. This is a value-added service to the community in supporting doctors in terms of therapeutic recommendations and assisting the nurses in terms of medication supply and management:

"I know community pharmacists are busy as well … but they can do things like facilitating discharge, dispensing discharge medications and checking. With that comes the checking of regular medications, adjuvant medications, (and) how to optimally counsel the patient. Although nursing staff may know the basic stuff of counselling points … pharmacists have got more experience with medication counselling." (S10)

Reiterating funding and staffing issues, Stakeholder S12 added that this model of care may increase the workload on the local pharmacist and therefore the need to consider rational compensation models:

"… 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. In small towns where I've worked, you can make that work, in that the town's people become aware that you're not available within a period of time, because you're at the hospital. It's actually quite hard work on the pharmacist. …" (S12)

3.2.4 Considerations for Rural Intervention Models

While funding and monetary returns to support skilled labour and technology/infrastructure improvements have become a universal key factor to envisage the success of a model or program, stakeholders have brought up several other factors, outlined below.

Workforce

Stakeholder S8 proposed that the key to enhancing health care workforce in rural areas is to train personnel from the rural communities. This is because these people understand and are used to the living conditions in rural areas, and are more likely to return to those communities to practise:

"I think people really need to get out there. A lot of people don't go to rural because they're isolated … they're going to be socially isolated and professionally isolated, and I think that's a big thing that you need to address. And that's a particular concern with people who have always grown up in a urban environment. … (with) students (coming) from rural and remote area, it's different for them, they know all these things. They don't see it as such a barrier. In some ways, if you want people to work in rural areas, you draw them from rural areas." (S8)

Roles and Functions

In rural communities where health care resources may be scarce, stakeholders stated that it is important to allocate these resources to the appropriate roles and functions.

"I don't think it's wrong to have overlapping roles, as long as there's somebody to do the function is qualified to do the function that is required … If they've got the appropriate training, qualifications and ability to do it … you need to make sure that you are (1) legally able to, and (2) you're supported and you know the boundaries what you can or can't do." (S7)

Most stakeholders commented on the need for a suitable framework and competency standards with the increased complexity of roles of health care providers, such as overlapping of roles, advancing roles into specialties and deviation from traditional roles. This would therefore ease access problems to the health care service in which the competency applies. Stakeholder S6 proposed the benefits of a national prescribing competency that allows a broad range of practitioners, including podiatrists, optometrists, midwives, NPs and PAs, to prescribe within their scope of practice against the national competency.

"Competency is important. If someone does the same thing, they need to follow the same exact criteria and protocol." (S1)

Interestingly, Stakeholder S1 highlighted that it is important for intervention models or protocols to be applied across the profession, rather than requiring the personnel in certain areas only to acquire certain accreditation, which may be a hindrance to the provision of the overall implementation of the service. This is to ensure that the services arising from the intervention are available to all communities:

"In rural areas, they're looking at services that every pharmacy can do, every pharmacist can do…" (S1)

Stakeholder S1 also indicated that university training should equip graduating pharmacy students with knowledge of the intervention model or protocol to avoid additional training requirements once qualified and registrable as health practitioners.

Professional and Infrastructure Support

Stakeholder S12 pointed out that it is important to have an understanding of the local health care community prior to implementing an intervention model or protocol, in order to gain support from the health care providers practising within the community. This stakeholder commented that "you can unbalance a team that actually was working". Therefore, there is potential for resistance with the proposed model or protocol:

"Many pharmacists who have served for years in rural towns may be resistant to changes and addition of scopes of practice because they're "happy with what I'm doing"." (S8)

"It's also how you prepare the staff on the ground to receive that service that they haven't had for a long time (such as introducing a pharmacist to a non-pharmacist site) … and being aware of what the value-add a pharmacist brings." (S4)

Apart from gaining support from the targeted group of health care providers within the intervention model, stakeholders also recommended that it is important that these health care providers have professional support in order for them to perform the role effectively.

"… if we were to set up and improve the medication system, we want people referring into it. So that means, (we have) all that wide range of health care professionals, and realistically only the nurses and medical practitioners ... look for help from it. … we have to get buy-in from the other health care practitioners. And buy-in means they want to use the service, they see the value. … The key to many of these services is that who refers to them … (and) who would refer to it if they knew about it. In many cases, very few people know about it, and of those, many of them are challenged by the concept, they don't see the value in it." (S3)

Inexperienced and young health care providers are often discouraged from working in a rural town due to the pressures of being sole practitioners in rural communities. Stakeholder S11 commented that it is crucial for support to be made available to inexperienced health care providers:

"They definitely need to give more support to first-years out … more mentoring roles … because it gives them a tremendous wealth of knowledge …" (S11)

Some of the infrastructure support recommended by stakeholders includes implementation of a national broadband system to improve the availability of clinical resources as well as tele- and video-conferencing to enhance remote clinical diagnoses. While these technological aspirations are desirable, stakeholders reiterated barriers such as the needed funding to cover staffing and the vast geographical distance between each rural community:

"I think it's a step in the right direction, but it's such a leap from where they are now to where they think they're going, there are a lot of steps in between that has to be resolved." (S7)

Regulatory Aspects and Indemnity

Stakeholder S2 stated that "the boundaries are there to try and make sure that the supply of medicine is done in the safest way and appropriate way". While it is essential that a health care provider practises within the legislative boundaries, the stakeholder stressed that certain allowances are available within the legislation to provide flexibility to health care providers working in rural communities.

Stakeholder S3 stated the need to ensure that professional indemnity insurance is available for the designed role and function, as most of the insurance coverage usually applies to traditional roles.

By comparison, Stakeholder S10 believed that it is important to educate medical staff in legislative requirements, particularly in relation to medication prescribing and supply. This would promote appropriate medication supply and therefore improve the health care providers' confidence in their practice.

Patient Care

Acknowledging the key factors involved in health care models and processes, some stakeholders mentioned the importance of understanding patients' needs in a rural setting where the lack of health care resources is well established:

"From a patient's point of view, if I need this service today, who can provide that service today? I don't care which health profession the personnel is from … the idea being you use the most conveniently-located health professional to provide that service to the patient, and only refer the patient to the specialty profession if the patient needed the value-add service (e.g. HMR by pharmacist)." (S4)

"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." (S6)

3.2.5 Summary Stakeholders' Comments

The interviews with stakeholders identified a number of key issues, including:

- Limited health services in rural areas increasing workload and decreasing quality of care,
- The necessity of overlapping and up-skilling roles of health care providers, including potential challenges and limitations, and
- Funding and remuneration problems.

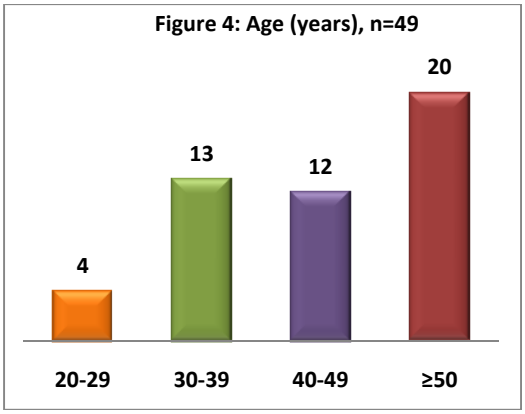
Stakeholders also discussed potential interventions, including:

- Increased scope for non-medical prescribing (e.g. for nurses and pharmacists),
- Increased scope of practice for pharmacists, e.g. through pharmacist-continued therapy,
- Improved access to pharmacist services through outreach, sessional and/or remote support, and
- Enhancing the role of pharmacy support staff in medication supply.

However, designing models and interventions involves numerous considerations such as availability of workforce, practicality of extended roles, acceptance and referral network from health care providers, availability of infrastructure as well as legislative boundaries.

3.3 Interviews in the Study Community (Health Care Providers)

Forty-three individual interviews and three joint interviews (two health care providers in each interview) were conducted in the four towns of the study community. A total of 49 health care providers (13 males, 36 females) participated in the face-to-face interviews. The participants all had a role in medication supply, medication management or both. Their age, work experience in their role and roles/work settings at the time of the study are depicted in Figures 4, 5 and 6, while more demographic details are provided in *Appendix 8*.



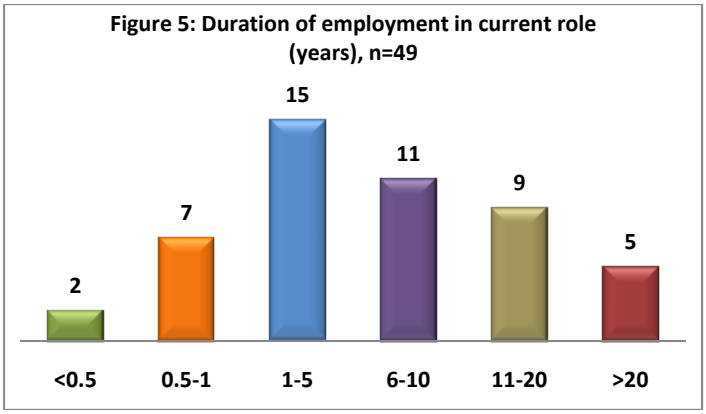
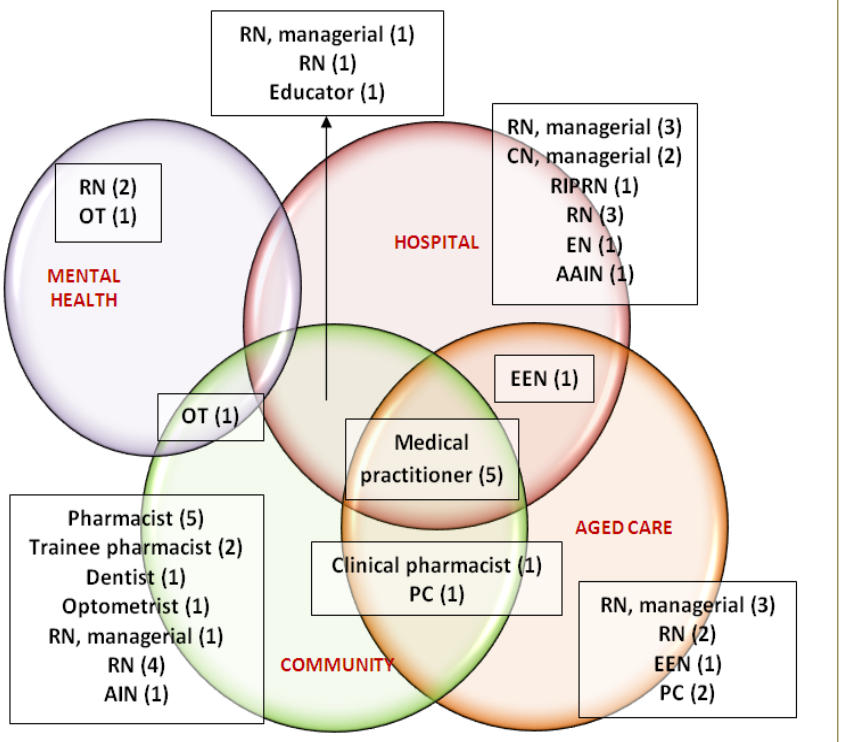


Figure 6: Current role and health sectors, n=49



Abbreviations (*refer to glossary of terms for nursing roles definitions)*:
AIN: assistant in nursing
AAIN: advanced assistant in nursing
CN: clinical nurse
EN: enrolled nurse, EEN: (medication) endorsed enrolled nurse
OT: occupational therapist
PC: personal carer
RN: registered nurse
RIPRN: Rural and Isolated Practice-endorsed Nurse

'Managerial' role refers to the Director of Nursing (DON), Nurse Unit Manager (NUM) or Team Leader (TL)/manager of a group of nursing staff in the community or aged care setting, or any health care provider acting in that capacity.

3.3.1 Extended Roles

With the exception of one of the four towns serviced at the time on a part-time basis by locum medical practitioners from Brisbane hospitals, other medical practitioners in the study community serviced all three sectors, namely hospital, community (general practice) and aged care. These medical practitioners are contracted by Queensland Health to service their respective hospitals in the study community while being allowed to remain in private practice. While this role is not formally seen as an *'extended role'*, it highlights the lack of medical practitioners in the study community and that the medical practitioners servicing this study

community were expected to extend their expertise to cover numerous medical fields including medical emergencies, general practice and aged care – a generalist approach:

"It's a uniquely Queensland-type position that we have where you are retained by the hospital and have the rights to do private practice. And as a private practitioner, we see patients out in the community and we are called in to do rounds at the aged care facilities in our capacity as GP's. But as Queensland Health doctors, we look after the acute patients, the acute admissions and the on-call rotation." (HP30, medical practitioner)

Nurses' extended roles with medications were very apparent in this study. While none of the participants held an NP role, the opinion from a RIPRN and nursing staff working with a RIPRN were sought about the extended RIPRN role. These interviewees were of the majority view that RIPRNs respected the medical practitioners' authority and would still seek confirmation with the medical practitioners in addition to utilising the medication-initiation guidelines within the Primary Clinical Care Manual[1] (PCCM), as their DTP. Some CNs and RNs from the hospitals and aged care facilities also had 'stand-by' orders to initiate a single dose of a limited number of non-prescription medications on emergency. These medications included aspirin/codeine, paracetamol/codeine, salbutamol, terbutaline, anginine, constipation drugs and antacids. This list is individualised by the local practising doctors and varies between facilities.

There were no pharmacists employed in any of the rural/satellite hospitals visited; therefore, nursing staff (RNs) undertook the role of managing the pharmacy store and supplying discharged medications or emergency supply when the local community pharmacy is close. Most nursing staff provided basic counselling when supplying medications, although most of the patients were directed to the local community pharmacy to obtain their bulk medications and appropriate advice from the pharmacist.

Several health care providers mentioned Home Medicines Review[2] (HMR) services provided by visiting accredited pharmacists; however, the regularity of this service was questionable due to the high turnover of health care providers. An visiting accredited pharmacist provided Residential Medication Management Review[3] (RMMR) services to patients in three of the four towns, which was highly valued by the majority of the local health care providers:

"(His/her) service is brilliant. The other people (from another hospital) used to do it, but they did it by phone and we used to have to fax them the medication sheet. These people come to the site. They talk to the residents, they talk to the family, they read the medication chart, they go back through the progress notes and make sure that there's no adverse effects, are (the patients) actually on the drug for the right reasons... do blood levels support doses? Very thorough. I would like them to be doing (outreach services) as a roving pharmacist" (HP25, hospital RN in managerial position)

[1] Primary Clinical Care Manual (PCCM) is a document which provides clear and concise clinical care guidelines and Health Management Protocols (HMP) in accordance with the Queensland *Health (Drugs and Poisons) Regulation 1996*, especially for Registered Nurses, endorsed Registered Nurses, IHWs, midwives, paramedics and NPs who work in rural hospitals and isolated practice areas.

[2] Home Medicines Review (HMR) is a medication review service designed to assist individuals living at home to maximise the benefits of their medicine regimen and prevent medication related problems. The service includes referral from a general practitioner (GP) for a clinical assessment by an accredited pharmacist.

[3] Residential Medication Management Review (RMMR) is a service provided to a permanent resident of an Australian Government funded aged care home who is not eligible for a Home Medicines Review (HMR).

"(The previous contracted pharmacists) did the RMMRs over the phone. The doctors didn't like that, they wanted the pharmacist to come out and look around and find all the pathology themselves." (HP15, community pharmacist)

AINs and PCs in the community and aged care facilities were reported to undertake extensive roles relating to medications in addition to domiciliary care. This included checking blister packs supplied from the pharmacy, assisting in medication administration (including oral medications, eye drops, inhalers and topical preparations), medication or clinical monitoring as well as providing basic medication education to patients. However, administration of injections, Schedule 8 medicines and wound dressings were usually undertaken by EENs or RNs. Some of the PCs' roles extended into actual administration of medicines, which falls outside their scope of practice, but the majority of the PCs had undertaken annual medication competency assessment within their facilities to maintain patients' safety.

Interestingly, two mental health workers with occupational therapy training, HP13 and HP19, described the mental health workforce in the district, which often recruited health care staff with occupational therapy, psychology, social work and nursing training. These staff practised a general case management approach, which requires a skill-mix of an OT, a psychologist and a social worker. This cross-skilling allows optimisation of workforce in a rural community with limited health care providers. It also eases case takeover in the absence of any mental health workers. HP13 added that this is different as compared to the metropolitan areas, where the OT mainly provides only OT recommendations in a multidisciplinary or acute team. Additionally, the mental health workers undertake a significant role relating to patients' medications, with the exception of the medication administration role, which is specific to mental health nurses. The role relating to medications included organising tele-conferences with the psychiatrist, organising prescriptions for patients, liaising between the psychiatrist, local medical practitioner and patients, monitoring patients' conditions, ensuring patients' adherence, prompting doctors about inappropriate medication use and recommending dose administration aids. They had also up-skilled themselves to educate patients on medications, including appropriate therapy and potential side effects. HP13 also provided an example of his/her role in assisting mental health patients with medication supply:

"We've got a client who's on lamotrigine[4] at the moment ... it's for bipolar ... She wasn't able to afford it privately because it's a pretty high-cost drug. It's something she was started by a psychiatrist up in (name deleted) and (name deleted) has their own pharmacy, so it was dispensed through the hospital pharmacy ... We don't have a hospital pharmacy as part of the hospital, but at the same time we weren't going to suddenly say to the lady "You're either stopping your lamotrigine today or you're paying, I think it was about AUD$200 a month or something". ... I contacted the Med Super in (nearby town's hospital), who approved it after he/she read my assessment, in consultation with the psychiatrist ... they have a pharmacy and they will dispense it for us ... We had emails back and forth regarding how are we going to dispense it? How are we going to post it? How are we going to check it off? Who's going to hold the script?" (HP13, mental health OT)

Participant HP22, a prescribing optometrist, commented on the benefits of having therapeutic prescribing rights and accreditation for the prescribing endorsement, particularly when patients have difficulties accessing a doctor or eye specialist in rural communities. This included

[4] Lamotrigine is on the hospital formulary as an anti-epileptic but not for bipolar disorder on both the formulary and the PBS, hence the reference to cost in the quote as the patient will need to pay if it's not supplied by State hospital and the need for special authorisation from the Medical Superintendent to supply the medication for that indication.

removing some responsibility (i.e. managing eye conditions) from rural doctors who are burdened by workload, organising repeat prescriptions previously initiated by a GP or an ophthalmologist as well as initiating eye medications.

"(The patients) have been waiting up there (for a doctor) for six hours and they can't be seen, so they come down and see me. After telling the doctors this is what I did, all of a sudden for the next month we had processions of people coming down (to see me) with eye problems. ... if I can't prescribe something and it's difficult to get access to the medication of the doctors who prescribe, I usually call one of the eye specialists and they write a script for me. ... We've just recently been able to start doing glaucoma medications. It's been really good because I have heaps of glaucoma patients and every single time they come back for review I say to them "your glaucoma is stable, I can prescribe this drop. You can keep going to see your eye specialist or you can come and see me"." (HP22, optometrist)

The prescribing optometrist (HP22) and dentist (HP38) believed that there is room to improve public awareness of what non-medical practitioners can prescribe. This may increase access for the patients and also reduce medical burden from the medical practitioners in rural communities.

3.3.2 Major Issues and Barriers

Workload

Most of the participants commented on challenging and excessive workload issues, with little or no opportunities for relief for on-call, after-hours work or leave. HP25, a RN in managerial position, added that rural health care providers, particularly medical practitioners and nursing staff, have to be a "jack of all trades" in order to provide the health care needed by patients. Further, local medical practitioners HP3 and HP34 stated that they had to cope with any medical situation as a result of the rural practice, and this makes the position for health care providers less attractive:

"If you work in urban general practice, you're never really out of your comfort zone. In provincial practice, I used to do obstetrics and fairly high level paediatric work, and it was a bit challenging. … We've got to take what comes through the door, no matter what it is. We've got to deal with it for at least a few hours. … And there's a broad range of medical emergencies, obstetric issues, trauma, road trauma, these are all things that come into emergency department at a major city hospital, and we have to deal with them all without any specific training for it - just relying on our experience." (HP34, medical practitioner)

"One of the real challenges out here is the spasmodic nature of absolutely everything. If you're on a cardiac ward in the Wesley Hospital (Brisbane), you deal with the same drugs, the same scenarios, day in and day out, whereas out here, you deal with everything that walks through the door, and it's such a broad range that you don't deal with the same drugs, you don't deal with the same scenarios, day in and day out." (HP32, hospital RN)

In a similar vein, hospital nursing staff, depending on the size and location of the facility, had to *"do everything"* from patient care, undertaking multiple health care roles, discharge, managing the facility, and paperwork, to managing the pharmacy store and coordinating pathology or blood tests. HP24, a hospital RN in managerial role, added that he/she had to undertake operational tasks due to tight budget of a small rural hospital. HP6, an RN working in both the

community and hospital sector, had become a multi-skilled nurse over time, undertaking tasks such as x-rays, chemotherapy administration and medication-related functions. It was reportedly common among nursing staff at the hospital to undertake multiple part-time roles within the hospital and outpatient clinics, rather than each nursing staff member undertaking a specialised role in the hospital, to ease workload when the hospital was short-staffed. While multi-skilling has become necessary in rural communities, the participant was concerned that the younger or relief nurses were unable to cope with the job demands.

From the aged care point of view, nursing staff in managerial positions are challenged by the amount of paperwork involved, in addition to clinical work, supervision, organising fundraising and community activities, facilitating education, and human resource work:

"I would have had to have gone to a doctor's appointment with one of our CACPs[5] patients. ... sort out scripts (ring the surgery) ... sort out blister pack with new drugs ... check blister packs ... organise my staff ... trying to update our food according to preferences ... first week of every month, I have to do monthly reports to my bosses and council, all the statistics for wound management, infection rates, falls, complaints, all that gets done the first week of every month ... meetings and audits ..." (HP27, aged care RN in managerial position)

This leads to increased clinical work amongst other nursing staff. EENs and ENs interviewed, commented on needing to assist RNs with clinical tasks (e.g. wound care, clinical monitoring) and EENs assisting RNs with medication administration. HP9, an EEN working in both the aged care and hospital sector, stated that multi-skilling and multi-tasking increase the potential for errors, including medication errors, particularly when the person with higher authority or skills is unavailable to supervise or assist.

At the bottom of the nursing hierarchy, medication-endorsed PCs are challenged with the expectations to assist with medication administration in a timely and safe manner as well as manage domiciliary needs of patients, often at the same time. HP43 mentioned it is even more challenging if the facility is short staffed, which is not uncommon in rural areas:

"RNs need help with their paperwork, so that's where the EENs step up and help … and then that's why the PCs have got to (help with) the meds, to take the pressure off. … I still love my job but it's a lot more stressful, especially with medications, because it's something you don't muck around with … more support would be good." (HP43, PC)

Similarly, community pharmacists HP4 and HP10 commented that they are laden with paperwork and the workload at the pharmacy does not allow much opportunity to interact with patients for integrated care or for any comprehensive form of medication review. With the excessive long hours managing pharmacy businesses, community pharmacists HP23 and HP26 added concerns about coping with newly introduced continuing professional development (CPD) requirements by the Pharmacy Board of Australia under national registration. It is also for this reason that trainee pharmacists were not sought, because "it entails more work" (HP26).

[5] Community Aged Care Package (CACP) Program is funded by the Australian Government to provide a low level of community care to assist frail older Australians to remain living in their own homes. The types of services that may be provided include personal care, social support, transport to appointments, home help, meal preparation and gardening.

Limited Health care Services and Health care Providers

Most of the participants commented that the increased workload burden is due to the limited health care services and providers in the rural areas:

"Here, in the country, you have to really be on the ball more, whereas in the cities, they've got everything there, everything's at their beck and call. Here, you've really got to do a lot of your own stuff because we just don't have the facilities or the services." (HP27, aged care RN in managerial position)

"One of our limitations, is that all of our nurses work across the whole (hospital) service. We don't have a dedicated emergency department or dedicated outpatients' clinic that's there all day. ... We don't have staff to do that." (HP14, hospital RN in managerial position)

In the hospital setting, a hospital RN in a managerial position (HP14) stated that because most rural hospitals only function and supply medications based on acute clinical presentation, there is a lack of resources to manage and provide other health care services. This includes clinical pharmacy services, which most health care providers perceived as long-term medication management, drug-drug interactions and drug-medical condition interactions. HP45, a visiting educator in the hospital and community sector, pointed out the lack of other clinical pharmacy services relating to management of inpatient therapy, including therapeutic drug monitoring and dose recommendations. Examples of such activity include optimisation of antibiotic doses, dose adjustments based on creatinine clearance and monitoring of anticoagulants such as heparin and enoxaparin.

Generally, the medication stock in these sites is limited to reduce risk of expiration, and therefore, there have been instances where a certain medication on order is not readily available. However, this is not perceived as a major issue by the hospital staff due to the presence of a community pharmacy in town, and indeed, alleviates nursing staff of the responsibility to supply medications frequently or in large quantities.

"From a supply point of view, it can get quite difficult because you have a run of something and all of a sudden you could be very depleted in stock. If you can't get it out here urgently enough, you can find yourself totally out of stock of something. So that's always a challenge in itself. That part of it can get quite daunting, even just trying to keep all your stock on the shelf and not run out of anything. We sometimes barter with the local (or nearby town) pharmacy and vice versa." (HP32, hospital RN)

"We're not a pharmacy for people to come and get their scripts filled. We're a hospital and it's based on the clinical presentation of those people that come in that we supply medications. The community has grown to accept that. ... In a community such as this, when there is a pharmacy in town, the Queensland Health priority is that we supply only to the acute presentation." (HP14, hospital RN in managerial position)

"The general principle is anyone who's discharged during the week is given a prescription (to be dispensed) at the local pharmacy. Anyone who's seen and discharged late on a Friday or Saturday, we might be able to get them started on a medication to last them until the Monday when they can go and get their prescriptions filled. So we don't keep stock specifically to be dispensing and filling prescriptions." (HP30, medical practitioner)

Participant HP2, another hospital RN in managerial position, also added that due to limited nursing staff in various specialised positions, it is difficult to replace absent staff because there is no succession training available in rural areas.

"You can't really ask someone to step up into that role without some sort of experience." (HP2)

In the community setting, on the other hand, numerous participants raised concerns about the undersupply of medical practitioners and health care services in the study community, particularly in relation to local population growth from the mining industry. They were aware that patients had to endure long waiting times and travel considerable distances into town or to another town to consult a doctor or obtain a certain health care service. Most of the health care providers added the increased pressure to provide primary health care services at the secondary care level (hospital) due to the capacity overload or unavailability at the primary care level (medical centre, pharmacy):

"What's tended to happen, especially when there's been a lot of pressure (for patients to get into the medical centre), if they can't get in here, they tend to go over to the hospital and try to be seen there. What would happen is the duty nurse would call the on-call doctor and if need be, a telephone order would be given. But obviously the nurses can't give out prescriptions." (HP30, medical practitioner)

"There may not be a pharmacy in town, and so people will then use the hospital as their pharmacy, which is a huge workload on the nurses. ... the hospital then provides a lot more of the chronic disease medications rather than just on the acute presentation." (HP14, hospital RN in managerial position)

Another medical practitioner, HP3, commented that there was a lack of specialist support in rural communities, resulting in long delays in referrals. During the wait, patients may have to continue their potentially inappropriate medications, or may have to change medications. Consequently, the patients may lose interest or become non-compliant, the list of medications sent to specialist when sending referral request might be outdated, or the specialist may no longer service the area.

Community pharmacist HP23 commented that without a permanent doctor in one of the towns (i.e. at that point, the doctor visited from another town several days per week), the pharmacy business was under threat due to infrequent prescription numbers and decreased trading. In addition, some of the patients in rural communities opted for the convenience of medication supply via online pharmacies, which can be *"a threat to (pharmacy) business and to safe patient care"*.

"They're, presumably, working on an absolute shoe string and the rest of us (pharmacies) look like rip-offs." (HP23)

Participant HP34 stated that while pharmacists are prepared to provide weekend support and perhaps after-hours support, the opening hours of pharmacies in rural areas are still limited:

"(The pharmacist) often will be closed for the rest of the weekend, and we're often seeing patients in the private system where we'd like to be able to prescribe and have medications dispensed, and we haven't got access to a (community) pharmacist at those times … We send private patients over to the hospital to see if they've got medications over there. So that's often

an inconvenience for both the doctors and the patients, and to some extent the nursing staff at the hospital. They have to become dispensers over there." (HP34, medical practitioner)

The shortage of pharmacists in the community was also highlighted. Three of the four towns studied were serviced by sole community pharmacists. These pharmacists commented that the workload does not allow them to leave the pharmacy to undertake extended roles outside the pharmacy, such as medication reviews. Some participants raised concerns with 'poly-pharmacy' (multiple medications), particularly among elderly patients, which stresses the importance of pharmacists' roles in medication review and patient education. Further, participant HP21, a trainee pharmacist, was concerned that young graduates are not given the opportunity to work in rural areas, as most job positions available are as a sole pharmacist. It is acknowledged that experience is needed and beneficial in order to provide services as a sole pharmacist, but this hinders the staffing of areas in need of the pharmacy service.

Other major services that are limited in the community included pathology and blood tests, ambulance services and transfers for patients to and/or from larger health care facilities (in the metropolitan area):

"We have a Clopine®[6] (coordinator) ... she/he had some unrealistic expectations of what you could do in the country with getting bloods down to the city and getting them back so that they could get the results to send the Clopine® out. She/he was thinking we could have them done on the morning and be ready by noon that day, but that's unfortunately not the case. It takes at least 24 hours turn around to get the blood results back. So we changed it to the day before. Another problem, especially if we're on a show holiday where no one works ... I've got to organise something else for the bloods to be picked up from the hospital or my client can pick the results up or they've got to have enough Clopine® to last them." (HP37, mental health RN)

"Not so much the lack of support, just delay in getting services some times and access to services like secondary and tertiary facilities. The biggest thing we find for our clients is actually getting to Toowoomba and Brisbane (QLD). We don't have transport. Our Greyhound bus leaves 4.30am every morning so that's not really appropriate. We have a train that leaves at 4.00am in the morning. We have a rural bus, I think they travel once a fortnight or once a month. So really, if (the patients) don't have family, it makes it very difficult for them to get to where they're going." (HP39.1, community RN in managerial position)

Participants also cited lack of health care staff to provide provision of domiciliary services after hours or on weekends and limited access to Aged Care Assessment Team (ACAT), which assesses a patient's care needs prior to providing government-funded home and community health services to a patient.

Continuous Health Care

Some health care providers cited issues with ensuring supply of medication to patients in rural areas, as patients are challenged by difficulties scheduling appointments to visit the medical centre to obtain repeat prescriptions. Barriers included large travelling distance, patients' working schedule, long waiting list for an appointment and long waiting times at the medical centre. This is particularly a concern for patients with mobility issues:

[6] Clopine® (generic: clozapine) is a regulated restricted drugs which can only be prescribed by a psychiatric specialist, based on provisions on the *Regulation*. It is for treatment of resistant schizophrenia and requires appropriate monitoring including full blood count each week for the first 18 weeks on initiation and then each month.

"There will be a few people who feel they cannot get an appointment to get a repeat prescription. There are some as well who are probably not as mobile or who cannot come in as frequently as they would like to, to get repeat prescriptions." (HP30, medical practitioner)

The workload burden and shortage of health care resources further challenges current health care providers to provide continuity in health care in the study community. For example, a number of the participants reported difficulties in following up on the doctors' orders and prescriptions, changes on medication charts and blister packs, as well as DMRs, in a timely manner. In contrast, the medical practitioner HP30 felt additional burden on top of medical-related tasks, with multiple requests for such items, particularly repeat prescriptions, leading to inefficiencies in ensuring continuing medication processes, ineffective communication amongst health care providers as well as duplication of repeat prescriptions:

"The trouble, though, comes sometimes mainly because we get lists (i.e. repeat prescription reminders) sent in from the pharmacist, aged care facilities, community nurses, requesting repeat prescriptions for patents out in the community or at the aged care facilities and you're getting these lists coming in from different directions and they're not always in sync with each other. ... it becomes difficult to keep track of prescriptions that have gone out ... I end up going through (the multiple lists requiring repeat prescriptions for multiple medications and multiple authority scripts) and finding a lot of the duplications myself. ... It's very time-consuming." (HP30, medical practitioner)

The participant (HP30) also explained difficulties in keeping up-to-date with patients' medication records, particularly if the patients have visited more than one practice in other towns, attended a specialist consultation in the metropolitan area, or are not regular patients at the local medical practice services. This is common in rural areas, because the availability of existing medical practitioners is limited and patients may seek for medical attention in another medical facility in another town.

The high turnover of health care providers, particularly medical practitioners who are waiting for job opportunities in metropolitan areas or who are just needing to complete the rural component required for professional assessment purposes, further complicates the problem. Concerns include poor knowledge of patients' medical history, poor follow-up with patients' conditions, frequent medication changes and the potential of *"things getting overlooked"* (HP11). These challenges hinder the progress of health care provided to patients, and the older patients are amongst the groups of concern. HP21 believed that continuous medical care is an issue with patients who have preferences with medical practitioners, while HP23 commented that while this is an unfortunate situation in rural areas, the patients had become accustomed to it:

"You get a large proportion people that want to see those (main) doctors. So if they're not available, they'll come over (to the pharmacy) and go, "oh they're not available" and you go "go and see another doctor then." (Patients say) "Oh no, I'm not going to see another doctor. (Hesitation from patients) happens with all new doctors out here. ... I have heard people say, "I'm not going back to him"." (HP21, trainee pharmacist)

Some participants commented that the pharmacist medication review services were, in general, being limited to one per consumer per year, according to the Medicare requirements. This restriction could result in insufficient case load and income for an accredited pharmacist who wants to focus on providing medication review services in the community. The medical practitioner HP3 admitted that it is difficult to provide a comprehensive overall medication review

service, as patients who are taking a large number of regular medications had to make multiple appointments to the medical centre to review the progress of the different medications. He/she also added that there is the potential of frequent changes to medications to these patients within one year. This medical practitioner, along with other medical practitioners and nursing staff, recognised the value of a pharmacist in medication reviews.

A number of participants also raised concerns with following up the progress of patients who were transferred from larger facilities in the metropolitan area to their home in rural areas. They perceived that patients are often sent home without information, medications, support and care plans, due to poor discharge planning by health practitioners in larger facilities who may be unaware of the rurality of the location and health services available for the patient:

"We have a difficulty if people go to Brisbane or Toowoomba (and) we don't get a discharge summary for the (patients) because that goes to the doctor. None of the hospitals send a routine discharge to (the patients') hospital of origin. It should just automatically go into their medical record, but it doesn't. ... We had a lady who went down to Brisbane ... who had spinal injury and she was put on gabapentin[7]. She then came back, presented at the (local) hospital with a piece of paper and said, "I want my gabapentin". ... One, we don't stock gabapentin, two, we don't dispense (a repeat script). Then we contacted the (nearest large hospital) and they said, "We have a pharmacist, we can dispense, but we're not paying for it." I contacted the (next larger hospital), because it's very expensive and they went, "No, no, no." It was prescribed at a hospital in Brisbane; it should be provided by them. Meanwhile, 400-odd kilometres away, I've got a lady out here with no gabapentin. ... (the gabapentin eventually got sent here) ... That lady could have been without gabapentin for a couple of days, except we have a wonderful (community) pharmacist." (HP25, hospital RN in managerial position)

"We ring (the hospital in Brisbane) and ask "how are (the patients) going, where are they going? When do you think they'll be home? Can you give us a ring when they're coming home?" ... because if we don't keep our fingers on them, they don't always tell us. So people get discharged to the community with no services. We've had a fellow come back, he'd had a total knee replacement. No follow-up to us. We've got all the equipment to loan them, do a home assessment before (the patient) gets here, have the gear in there." (HP25)

"For one, discharging people on a Friday afternoon into a rural area really isn't appropriate. A palliative care client was sent home on a Friday with no analgesia to get her through the weekend. She was sent home with enough for that day and that was it. I was trying to run around, and then the pharmacy didn't have them all. I do understand that Queensland Health facilities are strapped as far as beds go and that they want to get people in and out as fast as they can. The biggest thing is making the (larger facilities) aware of where we actually are. We are a town not close by, our pharmacies here, for safety reasons, don't keep large stocks of narcotics on the shelf, there is that delay in sorting out medications ..." (HP39.1, community RN in managerial position)

In addition, the majority of the participants, including local medical practitioners, discussed the difficulties for medical practitioners to prescribe medications that were initiated by medical practitioners in larger facilities without clear indications, discharge plans, information on starter packs and/or information on the patient's medical conditions. The larger facilities were perceived

[7] Gabapentin is on the hospital formulary for neuropathic pain but not for that indication on the PBS, hence the reference to cost in the quote as the patient will need to pay if it's not supplied by State hospital.

to not follow the continuity of care guidelines, because they may also have workforce issues, causing a domino effect in the relevant rural towns.

"A lot of specialists don't have time, either. I've seen a couple of post total hips and total knees (replacements) and (after their last analgesic at the facility, the patients were sent home with no scripts. It's Friday and the (local) doctors are booked out or they don't know the patient so they won't write a script ... you can't blame (the local doctors) ... (the discharge planning) wasn't a focus either in the acute setting." (HP39.2, community RN)

"Sometimes the DMRs are pretty vague. Sometimes the patients don't have the DMR ... Sometimes (the patient) brings a little brown packet that has five tablets in it, with no name on it. So it's a bit hard to look at a white tablet and see what it is. (The patients) get five days' worth from a lot of the hospitals. Sometimes the labels are not very clear. Maybe that's not happening so much now, but sometimes you have trouble to work out what they are though." (HP35, medical practitioner)

Participant HP19, a mental health worker, commented on the challenges in providing continuity of health care to school students from remote properties who live in a hostel through the week, and particularly those with medical and mental health concerns. This is due to inefficiencies in the health care system, such as long waiting times, lack of bulk-billing services and conveying their parents' health care information/card. Consequently, these youths were not able to receive the required medical attention and medications in a timely manner.

Professional and Infrastructure Support

Some participants have noted cultural differences, language barriers, as well as training and work protocol differences between health care providers in their town. This may be a hindrance to ensuring effective professional interaction and support between health care providers, as well as continuity of therapy of the patients. HP23 cited an example particularly relating to language barriers:

"Our normal GP doesn't speak English very well, so I try not to ring him up. And so I just send little notes across (to the medical centre) when he's here and he fixes it up, it's no real drama. ... Everyday people come and say, "You know, I don't know what's wrong with me, but I hope this (medication) fixes me because I can't understand what the doctor's saying". It's really poor." (HP23, community pharmacist)

Some participants also identified insufficient support from fellow health care providers within the rural community, partly due to the high turnover of health care providers in the rural area hindering the establishment of networks and interaction with other health care providers. Participant HP5.1 (RN) provided an example of the RIPRN role not being facilitated by medical practitioners who wanted to maintain authority and did not have confidence in the skill set of RIPRN nurses. HP11, an RN in managerial position, admitted that it took time to develop good rapport with the local medical practitioners in order to gain respect and trust from them with the nurses' skills and scope of practice. HP20.1, a clinical nurse at the local hospital, on the other hand, felt uncomfortable utilising post-graduate advanced practice rural and isolated practice endorsement because of his/her own lack of experience and the few RIPRNs available to provide professional support.

Interestingly, HP15, a community pharmacist, commented that certain senior medical practitioners were not supportive of the HMR program. However, junior doctors were more involved in HMRs, as they valued the role of pharmacist in assisting with medication review:

"It takes the doctors a long time to realise the pharmacist isn't scrutinising their prescribing habits and it always comes across as that ... especially a country doctor who's worried the pharmacist might know a little bit more than them drug wise, and sometimes they're uneasy about that. I've had a few bad experiences with HMRs." (HP15, community pharmacist)

Acknowledging the absence of a pharmacist in the hospital, most of the hospitals' nursing staff had consulted either the local community pharmacist or a remote (Queensland Health) hospital pharmacist for medication-related information, although the frequency of this consultation remained dubious. They believed the local community pharmacists may not be aware of Queensland Health medicine policies or were not knowledgeable of medicines used in hospitals, although the nursing staff provided positive feedback about the local community pharmacists' support through medication supply and patents' medication history. Additionally, most of the participants understood that the local community pharmacist, being a sole practitioner, has a heavy workload and did not want to place an extra burden on him/her.

The majority of participants commented on the lack of effective communication and support between health care providers in the community. One of the common examples provided by participants involved lack of communication surrounding hospital admissions and discharges, and medication changes when the patients were transferred between local hospitals, tertiary hospitals in the metropolitan area, and/or the community/aged care facility:

"I sat in (the doctor's) office with the pharmacist ... because all our drug charts were different, we had that many discrepancies between what was on his computer, what was on our charts (at the nursing home) and what the pharmacy had. They are supposed to be all the same. We sat there and sorted them out and I couldn't believe the discrepancies we had." (HP27, aged care RN in a managerial position)

Most of the participants also commented on the limitations with programs developed to communicate information and support health care providers. For example, a DMR is a document designed to enhance communication of patient's medication history between the hospital and the community. Feedback includes additional workload, the lack of consistency in producing discharge summaries, inaccuracy of information and delays (of some weeks) in relaying the document. On balance, however, participants believed it is a useful tool that can be further improved to achieve the target outcome of effective communication between health care providers:

"Usually they're quite good, especially if a pharmacist has done them. Out here, when the nurses do them, they tend to not be very thorough and it doesn't have a lot of explanation about what things are being started and stopped and why… some things might get missed… we're relying on information that's printed out for us but isn't necessarily correct." (HP12, community pharmacist)

"With what's on the discharge medication summary and with what (the patients) are taking, there's often discrepancies ... (this often occurs with patients who have spent substantial amount of time at larger facilities in metropolitan area with numerous changes to medications during that time and also with patients who have had multiple discharges from tertiary and local hospitals) ... a lot can happen in a few weeks" (HP39.1, community RN)

"That discharge summaries or that list of medications, it's a fantastic idea. It is an extra bit of paperwork, though, for the health professionals in the hospital. With the workload as it is, it's going to be very hard for (staff) to keep on top of that. ... We've had a fair few from the bigger hospitals but I think they have the advantage that they have the more junior doctors who tend to do more of the clerical stuff." (HP30, medical practitioner)

"I've never had one that's accurately done by a nurse. I mean, no disrespect to the nurses but it's just not their specialty." (HP15, community pharmacist)

HP45, an educator in the study community, added that medical practitioners do not necessarily use the eLMS and EDS applications at the hospital because they are seeing their own patients at the hospital and have the patients' medical and medication record at the local medical centre. This, however, may affect access to patients' medical and medication history by other health care providers within the study community and tertiary facilities in the metropolitan area:

"Most of (the doctors) don't want to use the electronic discharge summary system that Queensland Health has because it doesn't talk directly well to their computer systems ... They don't have access to all the Queensland Health computer data from their (medical centres). ... In these towns, patients go to hospitals, they're also (the doctors') patients (at the medical centre) and so (the doctors) just take the medication history on their computer systems from the GP surgery. For their discharge summaries, (the doctors) think, "Oh well, it's my patient." It's a different attitude with GPs that work at the hospitals compared to having a separate hospital doctor and GP. It's just another computer system they've got to use. If they're already using their Medical Director® at the medical centre, they prefer just to use one system. They quite often just change the things on their Medical Director® rather than doing another electronic discharge summary." (HP45, educator)

HP20.2, a hospital RN, commented that despite the availability of tools to facilitate medication reconciliation, there are still medication reconciliation issues in the community due to the poor utilisation of such tools:

"Not a lot of the doctors are really up with (the EDS) at the moment. And usually the EDS is done after discharge ... the patient has gone home and it might be done the next morning and it will be filed in their chart but the patient isn't actually given a copy of the EDS." (HP20.2)

Participants also provided negative feedback on iPharmacy®, which is the dispensing software developed for use in Queensland Health hospitals. Many nursing staff admitted lack of familiarity with the software due to the infrequent use and lack of succession training; further, iPharmacy® technical support is only available during working hours. Despite a reference manual available for iPharmacy®, they believed that it is not a convenient tool, and experienced difficulties navigating through the software to generate a label for the supply of medication. A number of nursing staff undertaking medication supply resorted to handwriting labels, as they had other priorities such as acute patient care.

"If it was something that we could use every day, I think it would be used a lot. But you might go several weeks without having a patient being supplied a script (and needing to supply the medications from the hospital). By the time you get back to using iPharmacy®, it's like, "What was the password?" let alone trying to negotiate your way through the dispensing process on it. I think as good as it is, probably its main downfall out here is you just can't use it consistently enough to make it viable." (HP32, hospital RN)

Roles and Function

The interviews also sought the opinions of participants about issues relating to the extended roles of health care providers in medication supply and management.

As medication supply and management is not the core role of nurses, some participants cited the value of pharmacists in this area. At the local hospitals, it is a task that the nursing staff have to undertake due to lack of hospital pharmacists; a "pharmacy portfolio" was developed for the nurse in charge of medication processes, including ordering, distributing and issuing, in the facility. They also commented on the up-skilling and self training required in order to equip themselves with medication and knowledge prior to undertaking the medication supply role. Some of the issues faced were workload, time consumption and potential medication errors:

"If it's the weekend ... if (the doctor) orders something for a patient to go home on, I have to go to the pharmacy, which is not a huge problem, but on a busy day it can be a problem. We have to do the charging, we have to collect the money, we have to give the receipt, we have to make sure that box is written out correctly, we get them checked by another RN just to make sure ... that takes time, because you're not familiar with it. Sometimes you can do none (medication supply) but on some weekends, you could do four or five. That doesn't sound very many, but if you got four or five outpatients that you've had to fully assess, you've also got a busy ward, it does impact on your time. ... we do a bit of discharge summary, we educate the patient, we make sure they've got the right medications. I think that's just loading the nurses with another job in rural and remote areas." (HP33, hospital CN in managerial position)

"It's not complicated business, but it's time consuming and you've got to be pedantic about checking that the items on the order form have arrived. Then they've got to deal with the iPharmacy® and ensure that those items have been loaded onto the program … You might get different lots of the same medications but they might be from different suppliers (i.e. different trade names)." (HP2, hospital RN in managerial position)

"I love doing (the pharmacy portfolio), because it's independent and special … But the only problem I had, I did it all on my own time and I was drained (ordering takes time) … all my returns, that used to take ages … it's very hard to find time to (manage) the pharmacy … I just felt that I was concentrating on pharmacy and my patients were being neglected." (HP42, RIPRN)

HP3, among many other participants, added that while nurses may be coping with the medication supply role, it is "not ideal" and a pharmacist would add value in a clinical capacity:

"Every patient, before they are discharged, the dispensing is done by a pharmacist, so they look through everything and they will give you phone calls to adjust everything. There's no room for error really." (HP3, medical practitioner)

"It would be good to have a pharmacist up there to be cross checking the medications, strength, dose, any interactions at all..." (HP21, trainee pharmacist)

"Without a pharmacist here, (the trouble) is working out new regimes, new protocols for drugs, new directions on usage with them..." (HP32, hospital RN)

"We've had nurses that are very good at doing it (i.e. medication role) and then we've had other nurses that can cause a few dramas." (HP12, community pharmacist)

"I trust the doctor at getting it right. ... that's a downfall that we don't know the interactions. If someone comes in and they want an antibiotic, as long as they're not allergic to it and we can get an order for it, then we can send them home. We won't even know necessarily what other medications they're on." (HP20.1, hospital CN in managerial role)

There were also concerns with the role of nurses to *supply* medications in the absence of a pharmacist. However, a lot of the nursing staff felt that it is an obligation to play a role *beyond* medication supply, including patient counselling.

"It says very clearly that nurses are not to dispense ... where do you draw the line between supply and dispense? The minute you write your name, you're the person choosing the drug, you're explaining it to the person (patient), you're writing the directions on it ... I have very strong feelings about that, that's definitely not a nurse's role." (HP25, hospital RN in managerial position)

On the other hand, participant HP14, an RN in managerial position, stated that there is no role for NPs in rural hospitals, due to the narrow scope of practice and expertise of an NP. This is due to budgetary constraints and demands for generalists, particularly with medical practitioners and nursing staff, who are expected to manage a myriad of medical situations in the rural areas where health care staff and support is limited.

In the aged care setting, some participants have expressed concerns with PCs' extended role in assisting with medication administration, due to the need for comprehensive training and up-skilling:

"With my registered nurse's hat on at the moment, I don't feel that PCs should be able to (take up medication responsibilities) unless they do a Cert IV to bring them up to standard of an endorsed enrolled nurse. Even endorsed enrolled nurses can't do everything in their scope ... I just don't think that PCs have the knowledge base to be able to allow them to take that on board themselves with regard to PRN medication in particular, even endorsed enrolled nurses have to phone back to a registered nurse to do that." (HP39.1, community RN)

"I think at times that's unfair. There's a huge responsibility on the carers. The carers do 18 months for a Cert III. Then they also are expected to take on this medication responsibility in aged care ... We're not funded the same as the government facilities at the hospital where they have a registered nurse and an EEN. We might have, in our facilities, one registered nurse with 60 residents, so the reliance is that you train your PCs to (assist with) the medications. However, they then take on that responsibility without knowing all of the consequences. They do have training, but that responsibility for medications is huge." (HP18, aged care RN)

"I think it should be an EEN's job to do medication … (the PCs) are all about looking after the residents not medications." (HP43, PC)

Regulatory Aspects

The majority of participants pointed out the various protocols in place to ensure quality provision of health care services, although the overall effectiveness of these models or protocols were unknown:

"There are so many different models of care in the rural hospital. There're so many different combinations of the way things are done. It's a very diverse system that Queensland Health has set up … the reason that there're so many different models is there're so many different sets of circumstances, different staffing levels, medical staffing levels, nursing staffing levels, pharmacy staffing levels, that there's no perfect arrangement for all situations." (HP34, medical practitioner)

There were numerous discussions regarding PCs' roles in relation to (assisting) medication administration to patients. In aged care facilities, PCs in aged care facilities (HP8, HP43, HP44) described their medication roles as checking patients' medications, and assisting with prescription medications packed into dose administration aids by pharmacists by removing medications from the packaging and placing it into a cup, on a spoon or the patient's hand for the patient to self-administer. They also assisted with crushing or mixing of medications for the patients to take, but did not feed, or administer, medications to the patients. The medicines included topical products and inhalers, as well as co-signing with an RN for applications of patches. However, PCs' role in assisting with non-prescription or patient's own medications varied between patients and between facilities. In some instances, PCs assisted with removing non-prescription medications from the original packaging, provided orders were written in the patient's medication charts and the original packaging was labelled by the pharmacist. In other instances, all medications, including 'as needed' and non-prescription medications, were packed into dose administration aids to enable the PCs to assist in medication administration.

Participant HP39.1, a community RN, commented that PCs' "assistant" roles in the community are limited only to medications that are packed into dose administration aids by the pharmacist. This rule serves as a legal protection for the PCs. Another community RN (HP28) mentioned that authority is required for PCs' assistance beyond 'packed' medications:

"We have a lot of unregulated care workers (in the community). Being PCs, with the Drugs and Poisons Regs, they're not actually allowed to (assist with) medications unless they're in a blister pack. So unless that's all organised ...they can't even take a Panadol® out of a box. ... if it's not packed in a Webster-Pak®, the PCs cannot touch (or crush or administer) it regardless of what schedule (the medicine) is. If it's in that client's home, and that client asks (for the medication), if it's not in the Webster Pak®, the PCs can't do it. ... You've got to be very careful with the different funding. PCs are not allowed to assist DVA clients with medication in any way, shape or form, even if (that medication) is in a Webster-Pak®; that's part of the Veterans' guidelines." (HP39.1, community RN in managerial position)

"If it's an unregulated worker being able to help with medication, both the family and the GP need to authorise that before (the worker can help with medication). So long as the client agrees to be assisted with the medication and the GP also authorises that and signed the form, then we can give them full assistance, whatever they require. And the PC has competencies in whatever they're doing. They're not going to have that (medication) knowledge. It's just a physical assistance. There's no further expectation that they will be able to pick up (another medication role)." (HP28, community RN)

Participant HP28 also raised issues with handling and storage of controlled drugs (S8 medicines) in the community when a patient requires domiciliary assistance, whether it is the patient's responsibility or the PC's responsibility. While it is acknowledged that PCs are unregulated workers, some participants expressed the need for guidelines and standard accreditation/training for PCs, as their roles, particularly with medications, varied between facilities or between communities.

Other concerns included:

- Legal issues with nurses not able to "repack" medications from their original packaging. This was perceived by participants HP5.1 (a hospital RN) and HP35 (a medical practitioner) as irrational, as nursing staff have to supply a full box of medications while it is the intention of the medical practitioner or nursing staff to supply limited amount of medication as emergency supply. This is an issue in rural hospitals where medication stock is limited, and the reliance of patients on the hospital to supply medications in turn burdens the nursing staff.

- Lack of guidelines with Medicare requirements with referrals from GP to allied health care providers:

  "There's a Government Medicare scheme now for people with chronic diseases, (whereby) they can actually get their dental treatment subsidised ... It was being phased out and blocked in the Senate. It's had a big cost blow out, and everyone goes - it's because all the dentists are rorting it ... they've investigated it and there were two instances of (rorting) in Australia." (HP38, dentist)

- Lack of standardised guidelines with cytotoxic handling in an aged care facility, and this was a particular concern for PCs who have the closest point of contact with patients:

  "I find there's not a lot of information in aged care facilities for the staff. What happens is often the resident will want their medication in their hand, and some medications actually absorb into the hand, if they've got a sweaty hand ... their hands aren't washed all the time afterwards ... if the staff are pregnant, they're not supposed to be near cytotoxics ... if there's cytotoxics and they come out in the urine or the skin, what are (the staff) to do? ... Toilets are supposed to be flushed twice or three times ... But that information isn't compiled sufficiently, (and) simply enough for aged care. I find that in a lot of nursing homes ... they'll have a (cytotoxic) policy, but there's a breakdown in that (staff are) not being made aware of it ... I know in some facilities where I've been, the pharmacist will come up and do education ... If there could be that information, that would relate to aged care, the pharmacists would be an ideal resource for that sort of thing." (HP18, aged care RN)

- Some of the nursing staff were concerned with the recognition of Queensland-based endorsements, including RIPRN and EEN roles, with the current national registration as well as the constant changes with nursing roles and credentialing processes have rendered qualifications from certain institutions unrecognised:

  "There was some talk that (RIPRN) wouldn't be a recognised endorsement. There was a big debate over it. I think it got up. I think immunisation and those things didn't, and that's a bit sad. People worked really hard for those qualifications. Because they don't have a university attached to them, they're not given the recognition. I did my ICU certificate in Sydney years ago. I practised it for many years. But because it's not a Grad Dip, it's not recognised in Queensland. When I did it, I went to New South Wales to do it because Queensland didn't offer anything post-grad other than midwifery." (HP25, hospital RN in managerial position)

- Accredited pharmacist HP46 commented about HMR referrals which are required to be channelled through community pharmacies under the *5th Community Pharmacy Agreement*.

This may deter the flexibility of a remote or outreach pharmacist to provide medication review service in rural communities, where pharmacy review services are scarce. The participant added that HMR referral protocols should simulate RMMR referral protocols, as medical practitioners and aged care facilities are able to contract their own RMMR pharmacist.

Monetary Concerns

A majority of the participants related to budget restrictions ultimately affecting workload and lack of services in rural communities. Relevant topics include lack of:

- Funding for qualified health care providers. Common examples provided were:
  a) Hospital setting: No budget allocation for the nurse portfolio for pharmacy-related functions, to maintain the pharmacy store, or to support a part-time/outreach pharmacy (pharmacist or pharmacy assistant) staff. This leads to additional workload on nurses undertaking medication ordering and supply functions as well as inventory management at the hospital, with no financial compensation.
  b) Aged care setting: Lack of funding to employ sufficient number of RNs, resulting in a larger workload burden for the current RNs and other nursing staff such as EENs, ENs and PCs on the lower workplace hierarchy.

- Budget allocation for preceptors and mentoring.

"It's out of our FTE (full-time equivalent) and in our FTE budget, there's no allocation for preceptoring, there's no budget allocation for mentoring. There's no budget allocation for portfolio work, for example when you're talking about pharmacy. There is no portfolio time for those people to do that work. They do it in their work time or they do it for the love of it out of work time." (HP25, hospital RN in managerial position)

- Funding of un-established health care services, such as Men's Health.

"We do Men's Health as a screening clinic. A lot of other places do Men's Health as in education. We do full screens ... we weigh (the patients), height, bloods. They do a full consult with the doctor, and we've pick up undiagnosed diabetes and hypertension so far. We haven't got any bowel cancers or any prostate cancers yet, but that's what we're looking for." (HP25)

- Funding for education or training via tele-conferencing.

"The tele-conferences I was involved in were part of RHealth[8] … the Division of General Practice. We used to have our regular tele-conference meetings and discuss topics … There's a mental health part of it, and diabetic part of it … That's stopped. I'm pretty sure they said something about funding." (HP12, community pharmacist)

Participant HP43, a PC, stated that medication-endorsed PCs should be remunerated for the extra workload and risks involved in handling medication-related tasks such as checking of blister packs, administering packed and unpacked medications, and crushing and mixing of medications.

[8] RHealth is a member-based general practice support organisation delivering health services in rural and remote communities across Southern and South West Queensland.

Interestingly, HP37, a mental health RN, and HP25, a hospital RN in managerial position, acknowledged that there is some degree of duplication of services in rural communities, such as various funds for different organisations to provide similar services. An example provided by HP37 was mental health services provided by Queensland Health and other smaller non-government organisations in the community; these organisations received different "buckets of funding". The participant recommended that overall funding should be allocated to established organisations, rather than split between every relevant organisation, to optimise health care services in rural communities.

Another example provided by H25 was different health care providers offering the same service:

"We have RAHT (Rural Allied Health Team) OTs and we have Queensland Health OTs ... they travel the same distance, they go to the same towns, so they incur the same expenses. They have rules that this one can't see this patients and that one can't see those patients. I just think it's a dreadful waste of money. So Government, State and Federal are duplicating services." (HP25)

3.3.3 Existing Facilitators for Medication Supply and Management

Health Care Demands

Most rural community pharmacies offered after-hours and weekend services and emergency supplies to the local hospital to ensure continuity of supply of therapy. On the other hand, some medical centres were observed to be open on the weekends for emergency cases, only to find increases in routine health care demands from the community. In addition, the medical centres in the study community have offered a fast-tracked repeat prescription service for patients needing repeat prescriptions without having to endure the long queue at the medical centre. HP30, a medical practitioner, explained about the process and the benefits of reducing work pressures at the medical centre:

"If all they (the patients) needed was just a repeat prescription for something simple (e.g. antihypertensives) that they are routinely on, we offer the facility of (allowing the patients) to leave details of that prescription and we'll try to get it through to them within forty-eight hours. So a lot of people took that up. ... if it's an authority script, generally, I have asked (the patients) to come in. ... when we do repeat prescriptions we make sure that the patient has been seen at least once in the recent past before we just issue a repeat prescription. And there're certain medications that we won't issue a repeat prescription unless and until that patient is reviewed clinically." (HP30, medical practitioner)

Coordination and Communication

Most of the participants stated that frequent local community meetings with health care providers (local and visiting) are useful in order to increase awareness of the availability of the relevant health care services as well as to address any issues that arose between health care providers. However, attendance at these meetings and effectiveness of the procedures varied, and this may deter effective communication amongst all health care providers within that community:

"… there's always little teething problems and it doesn't seem to sort itself out, so that's one of the biggest problems without a doubt." (HP12, community pharmacist)

While there are some challenges relating to organising government-funded and non-government funded services, participants reported that health care providers in the study community had coordinated defined roles to minimise duplication of services and inappropriate allocation of health care resources, as well as concurrently optimising patient care. Participant HP1, a mental health RN, provided an example of Queensland Health Mental Health service that focused on moderate-to-severe cases, whereas non-government RHealth focused on uncomplicated or mild cases, providing basic non-medication-related mental health services in the community.

Another example was provided by HP41, a community RN, in that the Queensland Health Alcohol, Tobacco and Other Drugs Service (ATODS) provides medical and medication information, assessment, counselling, treatment and referral relating to the misuse and abuse of alcohol and drugs for patients. The coordinating non-government service, Alcohol and Drug Foundation Queensland (ADFQ), does not have a *"medical background of any description"* and offers counselling, health promotion and behavioural support.

A third example related to domestic or domiciliary care, in that the Queensland Health home care services requires a pension card prior to providing the services, whereas the non-government Blue Care organisation provided home care services *"for anybody if they don't have a pension card"* (HP39.1, community RN), which improves accessibility to domiciliary health care services. Additionally, it was common for health care providers to monitor the services in which the patient was enrolled, to avoid duplication of health services, particularly domiciliary services with different funding sources (e.g. HACC[9] and CACP):

"There seems to be a need for all the services we have … and the pre-requisites are different." (HP28, community RN)

Other communication-focused facilitators include remote access of patients' medical records to ease transfer of medical information, prescription orders and progress notes between the medical centre and aged care facility (HP11, an aged care RN in managerial position) and discharge care coordination meetings (involving medical practitioners, nurses and allied health care providers) to discuss about patients' domiciliary needs, social support and transition care from the hospital to their residents (HP30, medical practitioner). One medical practitioner explained the coordination of the patient transfer process:

"Those meetings tend generally to be about domiciliary needs of the elderly and the more frail people out in the community with very little social support, hence the involvement of Blue Care and HACC. We generally try not to go into details about an individual's medical conditions, at least not at that sitting. If it's all we feel that an individual needs their medication or their medical problem reviewed, the consensus at that meeting would be that we should get them to see the doctor ... It's all about trying to maintain confidentiality." (HP30, medical practitioner)

Communicating patient information in the community remains a challenge, particularly in this study community. This is because the various providers must balance the need to disclose patient information to coordinate health care services with privacy and confidentiality requirements.

[9] Home and Community Care (HACC) Program is a joint Australian, State and Territory Government initiative that provides community care services to frail aged and younger people with disabilities and their carers. The program provides services such as domestic assistance and personal care, as well as professional allied health care and nursing services.

Peer Support, Consultation and Training

While the medical practitioners in rural communities are required to be multi-skilled, there may be support available via a video facilitator tool – tele-medicine – to connect to a remote specialist or medical practitioner for guidance (HP3, medical practitioner). Further, mental health workers commented on the benefits of video-conferencing, which enabled patients to consult specialists without having to travel the vast distances. Some participants also added the benefits of being connected remotely via video-conferencing to attend or provide continuing education sessions or to consult their senior health care providers or mentors in the metropolitan area.

At the time of the study, a visiting educator provided medication education and support to pharmacist and medical practitioners in the community, as well as health care staff (nursing staff) at the local hospital. In contrast, the visiting accredited pharmacist, in addition to providing medication management services, provided medication education to staff in aged care facilities. Most of the participants were appreciative of the visiting services provided by district educators, although they would prefer more frequent education sessions. Education sessions may involve training in prescribing and medication use, and management of specific medical conditions or emergencies. While isolation and large distances were perceived as a challenge to undertaking continuing professional development activities in the metropolitan areas, lack of funding was reported as a barrier to support visiting educators. On the other hand, insufficient caseload within the local community does not warrant the increased frequency of services by the visiting accredited pharmacist.

With the demand for medication management roles in aged care facilities, some interviewees had undertaken annual medication modules and assessments to ensure safe undertaking of medication-related tasks. Participant HP11, an RN in a managerial position, added that staff members at his/her aged care facility were also equipped with basic occupational therapy, speech therapy and physiotherapy skills via informal training by visiting health care providers, aiming to provide a more comprehensive health care service to elderly patients.

Extended Roles

Despite concerns relating to the RIPRN role reported earlier, such as confidence in skillset and role protection amongst some medical practitioners, other medical practitioners and nursing staff valued the extension of nursing roles to include pre-diagnosis and medication-initiation responsibility, thus reducing medical practitioners' workload. They also added that the PCCM is a valuable reference for rural practice.

"I certainly encourage the nursing staff at the hospital, from a very selfish point of view, to take responsibility for assessing patients and making judgements. They're always told that if they want to bounce things off us, they should do so … some of the nurses are really good … saves them ringing me at two o'clock in the morning." (HP34, medical practitioner)

"Out here it is very supported. It reduces a doctor's workload exponentially. If you have someone come through with glaring symptoms now, you can actually administer the antibodies, or you can cannulate, or you can suture ... it is very supported from both (hospital) management and the doctors." (HP32, hospital RN)

"You need to support the doctor, because in case you've got an emergency, you want the doctors to be rested and not sleep-deprived because of things that really the nurses have the

scope to follow, and they have the clinical protection if they follow the Primary Clinical Care Manual." (HP14, hospital RN in managerial role)

While nursing staff at the hospital were undertaking a medication supply role in the absence of a pharmacist, HP45, a visiting educator, commented that nurses are encouraged to undertake extended roles beyond medication supply to compensate for the lack of clinical pharmacy services in non-pharmacist sites. HP45 added that training support and facilitator tools from Queensland Health are available for these nurses to undertake the extended roles that include medication reconciliation and dosing adjustments based on patients' creatinine levels. However, the acceptance and effectiveness of these roles vary between health care providers:

"The next best thing is to get the nurses to do it (in the absence of a pharmacist), and that's where it becomes variable ... When I visited a site, the nurse would take a medication history on admission. But then, quite often I would say, "So from that medication history, would you do a reconciliation to see whether what (the patient has) actually been on before they came into the hospital is what they're charted whilst they're in the hospital?" Some nurses were doing that already, and some nurses have not seen that as their role. Then onto discharge and helping plan for discharge and ensuring the continuity of care once (the patients) actually get discharged from the hospital, so that the patient understands what changes to the medications have also happened." (HP45, educator)

"Queensland Health had these creatinine clearance calculators which also did Clexane® dosing and gentamicin dosing. ... We were doing some education in that regard, went around showing the nurses and doctors how to actually work out (the patients') creatinine clearance and then from there talking about dosage of Clexane® and gentamicin ... The tool was quite handy but the thing is, the GPs don't have access to these calculators ... they don't have access to all the Queensland Health computer data from their (medical centres) ... quite often, the nurses are happy to do those sort of roles although the nurses find it quite difficult ... The gentamicin calculator, they could actually put in all the patient's information like the creatinine clearance and what the drug level has been, and print off the next level and what the next dose should be, to show the doctors. They liked that they could help with the doctor's prescribing of the next dose and checked the doctor's prescribing dose. There are some nurses who are standing up to do these roles, but there's a lot who we're trying to encourage, (and who) probably either don't feel comfortable or the doctors don't necessarily want them to be doing that role." (HP45, educator)

Most of the local community pharmacists were actively involved in taking patients' medication history as part of the dispensing process, providing drug information (such as potential interactions and dosing advice) to other health care providers and medication supply to the hospital when there were stock shortages. In addition, they offered extended pharmacy services including weight loss program, National Diabetes Services Scheme (NDSS), dose administration aids and 'Know your numbers'. HP26 commented that extended pharmacy services were limited due to time pressures and workload, and that dispensing becomes the prime focus of pharmacy service in rural areas:

"There's only so far a single pharmacist can stretch yourself ... By the time you check off your dispensing techs and do what you've got to do, there's simply not enough time to go into everything." (HP26, community pharmacist)

Some local community pharmacists had extended their pharmacy services for aged care facilities to a clinical level, without remuneration. Some of the roles described by participants

HP12 (community pharmacist) and HP21 (trainee pharmacist) include checking medication charts against medication histories, and verification of pharmacy records and medications packed in dose administration aids. This enables identification of medication-related errors including dosing errors, medication changes and drug-drug interactions.

"We don't get paid for that hour going up there (to the nursing homes), so it comes back from the pack that we do. That covers it. It's more just to weed out those problems that are happening ... just going through and making sure all our Webster-Paks® match the actual charts. Some changes were getting missed so that came in." (HP21, trainee pharmacist)

Local community pharmacists also saw themselves in an educative role in the community by providing talks to health care staff and patients:

"I took on a lot more training roles of the assistants out here, so we do a monthly training on different topics, say 'cough, cold, flu' ... I've done some talks up at the hospital. They have a weekly cardiac seminar ... one of the weeks is medication ... I do a little talk about people's drugs and medications and what they're all about." (HP21, trainee pharmacist)

Up-skilling PCs in aged care facilities to assist with medication administration has become necessary due to budget restrictions and workload pressures of other nursing staff. Participants HP27 and HP40, aged care RNs in managerial position, proposed that PCs do a better job with medication management as compared to nursing staff, mainly due to their familiarity with patients' medications and regular monitoring of adverse effects of medications:

"… just through experience, I've seen that medication management by PCs has been far safer and far more accurate than nursing." (HP40)

"They (the PCs) are doing the medications every day. They actually will look at a pack and know just by looking at it that there's a different tablet in there. I can look on it "oh yes, that's right, the doctor had ordered a different strength or whatever", but at least they know that there's different colours (and different tablets and number of tablets) ... I actually don't mind and I assess them on a regular basis and reassess them ... They're interested in what (medications) we're giving the residents, they are frightened about giving drugs, but I say to them it is good to be frightened because you're more cautious. I think it is a good responsibility; I don't give to anybody, I do watch them and I pick and choose who is to be medication-competent." (HP27)

3.3.4 Potential Facilitators for Medication Supply and Management

Extended Nursing Roles

While PCCM is regarded as a useful tool, the protocols are only limited to authorised IHWs, IPAPs, RIPRNs, NPs and other advanced-certified nurses. Some of the nursing staff in the study community would value standard standing orders for registered nurses to reduce reliance on, and workload of, local medical practitioners. Participants HP18 (aged care RN) and HP42 (RIPRN) stated that while nurse-initiated protocols are available, they differ between facilities, and the protocols are usually individualised by the local medical practitioners.

Some of the registered nurses interviewed expressed their interests in undertaking an NP course to improve medication processes in rural areas. Mental health RNs, HP1 and HP37, commented on the value of the certification, particularly in making day-to-day therapy

recommendations, ordering blood tests and supplying repeat prescriptions and medical certificates. They believed that this role eased patients' therapy, particularly in rural towns, given the various barriers reported earlier, but also added that the role should be limited to their area of expertise.

Some participants reported the value of AINs and PCs in assisting medication administration and concurred with the potential of extending PCs to undertake medication-related tasks. Although annual medication competencies are in place within each facility, there is a need for guidelines and qualifications to ensure safe medication practice:

"We're trying to get most of our assistants in nursing through a course in health care to give us a minimum standard of care - but they are unregulated, they don't have to register (with a professional board). We've put them through competencies ... I need to know that if they have theoretical understanding of what they're doing. Otherwise you can't guarantee that minimum standard." (HP25, hospital RN in managerial role)

Improving Pharmacists' Services

Some of the pharmacists interviewed shared their experiences as a 'sessional pharmacist' providing part-time services to non-pharmacist sites in other rural towns. Participant HP26, who used to service a rural community pharmacy, mentioned his/her involvement in the 'sessional pharmacist' model, but was disappointed that the model had not been established further for statewide or nationwide implementation:

"... it was my responsibility to order all the medications needed, to dispense anything for outpatients and check the ward stock. ... the very fundamental things of a hospital pharmacy ... that was where I had the most input, where the nursing staff ring up and check things out, pharmaceutically. And I thought it was brilliant ... They've carried on (the system) for a while, and then it felt flat ..." (HP26, community pharmacist)

Participant HP46 also cited his/her experiences as a 'sessional' pharmacist:

"… it was one doctor, one-pharmacist town, the doctor would be up at the hospital until 10 o'clock in the morning. I wasn't doing any dispensing and there'd be a nurse (at the hospital) dispensing … We ended up piloting sessional hospital pharmacy where my dispensary was closed until 10 o'clock. I worked at the hospital. Did the hospital dispensing, also provided clinical services … That was then available for every pharmacist in Queensland to do that. It was created and we ran that like that for ages, but no one else ever picked it up. It was 40 years ago … the hospital paid me … we worked through the Minister of Health and the local hospital board wanted it too … they wanted it on the basis of cost cutting, as it was very poor stock management (at the hospital). So I got in there on budgetary rationale, but then I actually turned it into a clinical rationale." (HP46, accredited pharmacist)

In addition, HP46 had also established a 'sessional' nursing home service in New South Wales, which required a legislative change:

"I was going up (to the nursing home) when the doctors visited, did their rounds and I was doing the dispensing, and I was also doing clinical work and talking to doctors. That actually led to the big research RMMR. Then I was working in the (name deleted) Division of General Practice. I went out there, got some funding from a drug company … I went into nursing homes, I went into

the community health and did education, reviewed people, did talks … had sit-down sessions with the doctors ..." (HP46)

Most participants agreed with the support model from an outreach or visiting pharmacist, providing district support, inventory audit services and medication education for health care staff in non-pharmacist sites. While currently, pharmacists located at larger hospitals are able to provide remote support through the telephone, the value of a visiting pharmacist is perceived to be greater.

"It would be a really good role to have, and a very valuable role. I quite often think why aren't they (the pharmacists) doing it now? ... Even from working, knowing what happens in my own hospital here that doesn't have a pharmacist, visiting all the little other towns (that also lack a hospital pharmacist), it really makes me just wish that there was some sort of role there for a pharmacist." (HP45, educator)

"In another town, we had a permanent pharmacist who was able to get staff to do outreach visits. So they were a great support to the staff and to audit the pharmacy ... They'll do a drug count and check the drug book and audit to ensure the correct use and supply ... Then they had a lot of problems staffing the pharmacy, so they didn't have staff to go on outreach. Hopefully, if they do come, they do education as well for the staff, you know, different drugs are always coming online and different storage or different administration." (HP14, hospital RN in managerial position)

HP46, an accredited pharmacist, spoke of his/her experiences as an outreach clinical pharmacist in NSW:

"I was operating as a regional clinical pharmacist for a regional hospital group … (the health care staff) realised they had a hospital pharmacist at the main base, but there was no-one getting around to all the little hospitals … So they put me on a stipend and I was going around all the little hospitals, talking to doctors, talking to nurses, doing education, exactly like RMMRs long before RMMRs came." (HP46, accredited pharmacist)

The majority of hospital staff perceived that there is not sufficient workload and funding in a rural hospital to justify the employment of a pharmacist. They acknowledged the value of a pharmacist in checking medication charts and providing patient education, but cited current budget and health care models supporting acute patient care as some of the barriers. On the other hand, the majority supported the intermittent outreach services provided by a visiting pharmacist, but acknowledged staffing and workload issues in larger facilities in order to provide this service:

"I think we do need to have a pharmacist come in, provide support, review what we're doing and audit what we're doing. I think twice a year would be great, if more, it would be excellent, but not permanent ... Quite a big limitation, they needed to keep the pharmacy (at the larger hospital) staffed and if they don't have any extra there, they can't release pharmacists to do the outreach." (HP14, hospital RN in managerial role)

HP30, a medical practitioner, agreed with other participants that the current health care setting in rural hospitals may not be appropriate to implement a sessional pharmacist model, although he/she believed in the value of a sessional pharmacist in an aged care facility:

"(A hospital pharmacist) would be ideal. The thing is, in the hospital we have such high turnover of patients that (the pharmacist) have to be there on a day-to-day basis to be able to catch up with everybody. There is a facility for pharmacy-led medication reviews for the long-term patients in the aged care facilities. But in the acute wards, there would be a lot of people falling through the crack." (HP30, medical practitioner)

Several community pharmacists and medical practitioners recognised the value of the 'pharmacist-continued therapy' model recommended by the Commonwealth's Fifth Community Pharmacy Agreement. However, participant HP30, a medical practitioner, stated that clear guidelines have to be established in order to ensure quality and safe provision of the service:

"What would be helpful in the future and I see it's being suggested now, is to have some sort of mechanism for continuing supply. People come in with their, "Oh, I thought I had a repeat and it's my blood pressure tablet and there's no doctor in town, what am I going to do?" ... What would be really helpful is if that could be made into some sort of process whereby you could give them their one month supply, pending a visit to the (doctor's)." (HP23, pharmacist)

Other recommendations included improvement in medication review services (HP36, medical practitioner) and implementation of disease management clinics run by pharmacists (HP21, trainee pharmacist). These services would enable the local medical practitioners to concentrate on medical situations requiring immediate attention, with the pharmacists as support personnel to manage concerns regarding poly-pharmacy patients and those with stable chronic conditions.

Extending the Role for Pharmacy Support Staff

Some participants agreed with the concept of pharmacy assistants or technicians undertaking a supply role in non-pharmacist sites under the supervision of a doctor or indirect supervision by a remote pharmacist:

"... the routine dispensing for outpatients could still be done by a (pharmacy) tech. And the topping up of the ward cupboard could still be done by a pharmacy tech." (HP26, community pharmacist)

"I think pharmacy technicians would probably be in better position than some of the nurses to be doing (supply) … there's also need to have something put in place so that they could reference things if they need to be referenced … whether that involves talking to the doctor or ringing a pharmacist for advice … as an outposting, have someone doing (medication supply) and for anything that needs to be referred, they could call a pharmacist that's based in (a larger hospital)." (HP12, community pharmacist)

However, HP14, a hospital RN in managerial role, commented that the model has to be designed to be applicable to rural hospital, citing current budget and health care models supporting acute patient care as some of the barriers:

"Our workload doesn't support having someone sitting here just in case someone needs the pharmacy. It's 24 hours a day at our emergency demand ... Our work demand is too erratic over a 24 hour period to support having a technician sitting on here on a just in case basis ... I don't know that our service could support having a person just for that role (i.e. medication supply) unless they were doing another role as well. If they were a dietician, they could share that, part-time dietician, part-time (pharmacy) technician. I would not be able to justify having a full-time person sitting here just in case." (HP14)

Training

Most of the participants with a pharmacy background had experienced a degree of hardship as sole practitioners. Participant HP26 (community pharmacist) recommended that pharmacy organisations should extend mentoring and management courses to help young pharmacists cope as sole practitioners, to facilitate the provision of quality pharmacy services in rural areas. Participant HP10, a trainee pharmacist, suggested that a rotational schedule to hospitals and rural facilities should be included in the pharmacist internship program to enhance an interns' experience.

Interestingly, HP15, a community pharmacist, acknowledged the necessity of nursing staff undertaking medication supply roles in non-pharmacist sites. He/she recommended a minimum qualification for nursing staff undertaking medication supply roles:

"Dispensing medications, you should have a trained dispenser. If you're going to get a nurse, they should at least have to go on a pharmacy training course or a (Pharmacy) Guild training course to dispense. But they don't."

HP26 also added that most health care providers, particularly medical practitioners, should be trained based on Australian legislations, medical conditions, medical protocols and health care processes before starting to practise in rural areas. This would aim to improve coping mechanisms in rural communities where peer support is minimal, and to enhance workflow with all the health care providers in the community.

Some of the participants highlighted alcohol and drug concerns amongst residents in the community. Participant HP41, an RN practising in the community, commented that training the local medical practitioners in alcohol, tobacco and drug management would be useful. Up-skilling local medical practitioners in this area would not only ease access to alcohol and drug management services but would enhance medication supply and management to alcohol and drug patients, and therefore optimising their treatment. While supplying medications, such as methadone and buprenorphine, for opioid replacement is traditionally a pharmacist's role in metropolitan areas, nursing staff in non-pharmacist sites have to undertake this role in the absence of a pharmacist. HP41 believed that it is important to provide education and support, as well as organising training for nurses undertaking a role in the opioid replacement program or other alcohol and drugs-related program.

HP37, a mental health RN, commented that it is important that medical practitioners are trained and are aware of the requirements of clozapine (e.g. Clopine®) prescribing to ease management of patients on that medication in the rural community:

"No knowledge of Clopine® at all. They don't realise that they've got to be in hospital for six weeks to be monitored ECGs, have bloods done ... every 28 days, there's a protocol to have a full blood count done, check if there's no cardiac enzymes. There's a big protocol about it. It's a book that talks all about Clopine® and what you can and can't do ... I had to do an education session to a GP about Clopine®." (HP37)

Facilitating Tools or Protocols

Participant HP39.1 (community RN) recommended that a "step-down" protocol should be adopted, which can involve a patient being transferred from larger facilities in the metropolitan areas to the patient's local hospital, before being discharged to return home. This would then

enable the local health care providers to determine the patient's coping mechanism and needs, and carry out medication reconciliation.

"I had a phone call from the (name deleted) mental health unit in Brisbane, trying to get a lady back home to here and they were concerned about having everything in place as far as modifications to the home, and I said to her, "why don't you contact the (local) hospital and see if she can step down from (name deleted) (in Brisbane) to (local hospital) before she goes home?" You can step down from a tertiary centre back to your primary centre before you go home and everything can be hopefully put in place before she goes home (from the local hospital). It's just that communication between services and health professionals." (HP39.1, community RN)

"We've had a fellow come back, he'd had total knee replacement. No follow up to us. We've got all of the equipment to loan, do a home assessment before (the patient) get here, have the gear in there ... When someone goes in (to larger facilities) for surgery, they only need surgery, we've got the backup. There's no reason that on Day 3, when the surgeon says, "look, I'm happy with you", (the patient) can't come back here and do their last couple of days' recuperation. That'd free up acute beds. I have great trouble getting that to happen ... Very sadly, people in acute settings (in larger hospitals) for some unknown reason, don't recognise or acknowledge the expertise of us sitting in the bush." (HP25, hospital RN in managerial position)

HP20.1, a CN in managerial role, added that starter packs (seven days' supply) should be implemented uniformly particularly for patients transferring from other facilities to the local hospital:

"If people are transferring back here, it is good that they come back with a seven-day supply, because they often transfer back in the evening or on a weekend and we haven't got access to the tablets that they've ordered because it's not something we have. It would be good if that could be maintained with everyone and not just occasionally happening. It does happen most time ... they just assume that "oh they'll have that out there" and will just send them out. 'Cause they're going to a hospital ... it's often very daunting when they come back with a list of drugs and we don't have half of them ... and you have to go somewhere else to get what they need." (HP20.1)

Participants identified that the Queensland Health documentation and tools could be improved to achieve their aims. HP39.1 showed researchers the Ongoing Needs Identification document, which is a hard-copy HACC (Home and Community Care) tool. This document contains comprehensive details of the patient, including personal information, medications, referral tools and services currently accessed by the patient.

"There's current medications, what (the patient) is on, does this person generally look after his/her own prescribed medication, if they are reliable or extremely unreliable, is this person willing to take medication when prescribed, does this person cooperate with health services, is a blister pack used, is a review of medications recommended, how long has it been since the patient has last been to the doctor ... this is what helps us identify the priority of us providing the service to that client." (HP39.1)

Some participants expressed interests in similar community-wide systems or software, which can be developed electronically to enhance communication between health care providers and thus increase awareness amongst health care providers in the following areas:

- Health care services accessed or needed by patients,
- Referrals to other health care providers,
- Patient's medication history, and
- Monitoring patients' prescriptions and medical appointments.

3.3.5 Summary of Health Care Providers' Comments

Interviews with the majority of health care providers in the rural community identified a number of dominant themes (in no order of significance):

- Capacity overload across all levels of health care providers, regulated and unregulated,
- Limited health care services, along with lack of funding for *extended* health services,
- Challenges in ensuring continuity of health care services, including medication processes,
- Ineffective information transfer and patient care planning within and beyond this community,
- Challenges in effective communication and bridging between services and between health care providers,
- Lack of support systems for rural health practitioners, and
- Legislative and professional boundaries in relation to extended roles of regulated and unregulated health care providers.

These are all perceived as barriers to provision of quality health care to patients in a rural community. There is need for improvements in these areas in order to optimise health care workforce in such communities, given the limited health care resources within the community and lack of outreach or remote support. However, there were also some examples of 'good' practice and good coping mechanisms provided by the health care providers, given their lack of resources:

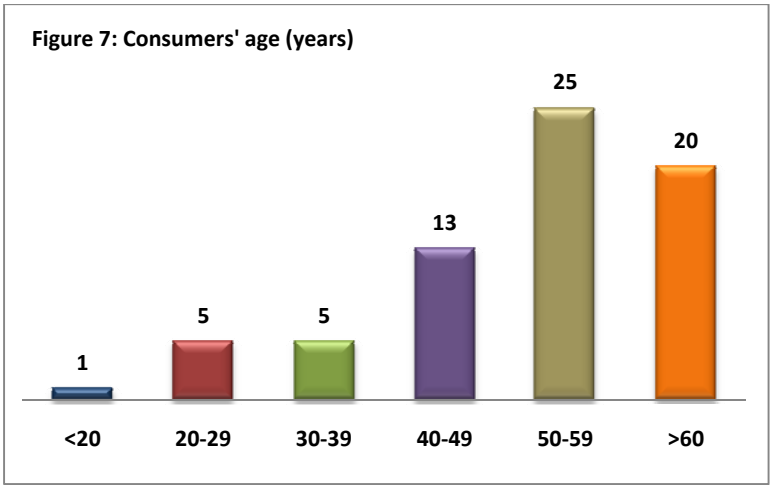
- Local health care providers offering after-hours and weekend support and services,
- Some coordination of services in the community to avoid unnecessary duplication of services,
- Tele-/video-conferencing for professional guidance, specialist consultation and education,
- Role extension, evident with nursing staff, for example:
  - PCs assisting with medications
  - Nursing staff in aged care facility equipped with basic allied health skills,
- Benefits of extended roles of RIPRN were recognised
- Local community pharmacist providing medication checking services to aged care facilities, and
- Visiting accredited pharmacist reviewing medications for the local aged care facility.

Further, health care providers proposed several interventions that may improve rural health care services, in addition to improvement in training and communicating patient's medical/medication information:

- Standing orders for RNs,
- Protocols or standardised guidelines for PCs,
- Outreach pharmacist support, and
- Step-down protocols for patients transferring from secondary/tertiary facilities (metropolitan) to the local rural hospital before returning to their residence.

3.4 Interviews in the Study Community (Consumers)

Sixty-nine consumers (14 males, 55 females) offered their opinions when asked about issues relating to medication prescribing, supply and advice within their community. Their ages ranged from under 20 to over 60 years of age (Figure 7). In order to explore medication-related issues and obtain maximum benefit from interviews, participants approached were consumers who were either taking regular medications, or had reasonable knowledge of someone (i.e. a relative or friend) who was taking regular medications. A number of participants provided a range of positive feedback regarding medical and pharmacy services in the study community, particularly with extended hours of medical centre and pharmacy services, community pharmacists providing informal on-call services, medical practitioners prioritising emergency cases and an increase in the number of medical practitioners in two of the four towns in the study community. However, some participants raised concerns with issues discussed below.

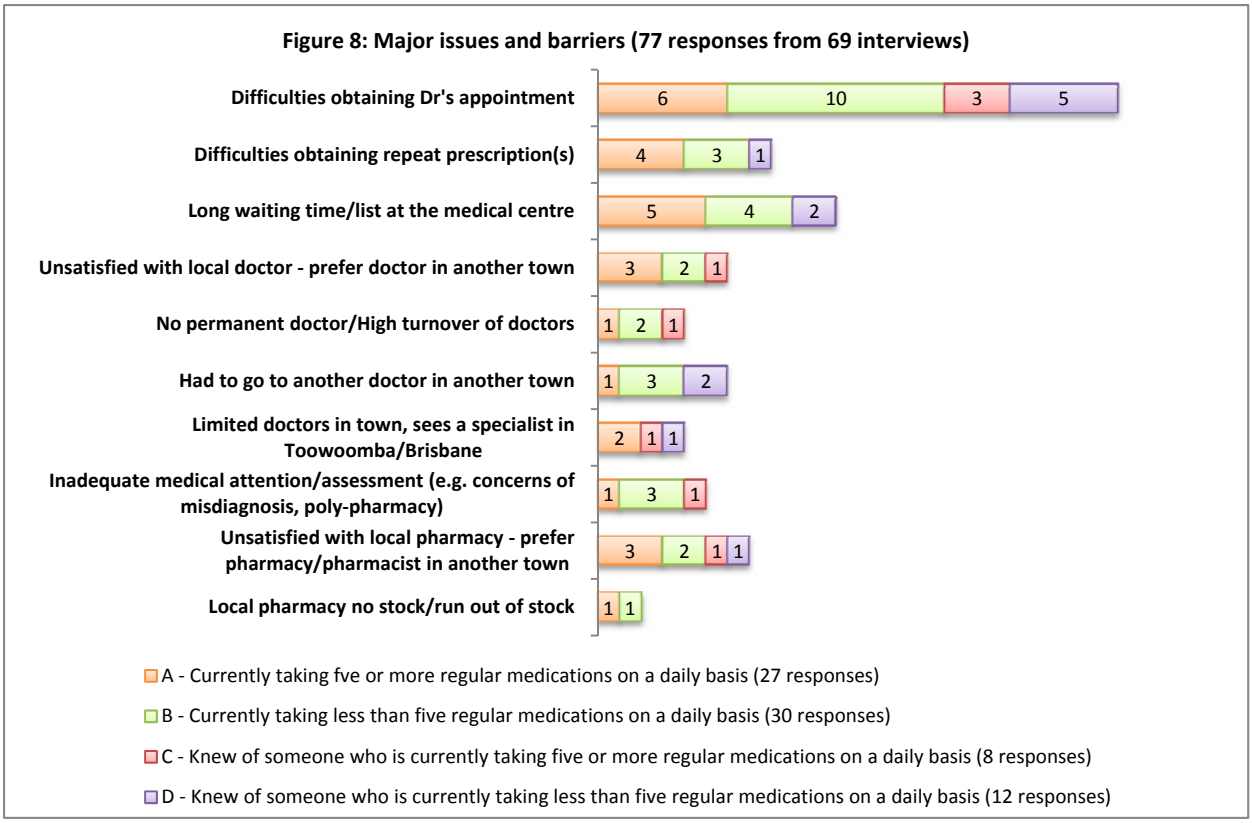


3.4.1 Major Issues and Barriers

For ease of data analysis and discussion, consumers' comments were divided into four main categories:

A. Currently taking five or more regular medications on a daily basis (n=25).
B. Currently taking less than five regular medications on a daily basis (n=23).
C. Knew of someone who is currently taking five or more regular medications on a daily basis (n=8).
D. Knew of someone who is currently taking less than five regular medications on a daily basis (n=13).

While it is not the aim of this study to quantify data, researchers resorted to using the interview guides as a 3-minute 'questionnaire' to prompt responds. Key themes (in no order of significance) are presented in Figure 8. Some consumers provided multiple responses, whereas others either provided positive responses or were uncomfortable revealing health care challenges in the study community. Further comments were reported in the next section.



3.4.2 Medical Attention

A long queue for a doctor's appointment, ranging from a few days up to two weeks, was commonly reported by consumers, unless it was an emergency, where the consumers would seek for medical attention at the local hospital, to be tended by a nurse or the local medical practitioner. Even in an emergency, some consumers expressed concerns about long waiting times for ambulance services and medical attention from the local medical practitioner, who also had obligations at the local medical centre. These concerns may be intensified by the consumers' anxiety during the emergency. Other consumers were dissatisfied with the long waiting times causing difficulties in terms of work schedules and arranging travel from out-of-town. Consumer C7 commented that patients *"need to work with the (doctor's schedule) rather than coming in within a preferred time"*.

Most of the consumers were aware of the limited number of doctors in the rural area, time pressures as well as the doctors' workload, having to juggle between acute care for patients at the hospital, primary care for patients presenting to the medical centre and ongoing care for patients residing in the local aged care facility. Another consumer (C21) was concerned with the limited health services in town, despite the town's growing population, which contributes to the long waiting times; this may decrease the quality of health care being delivered.

One consumer (C40) acknowledged the lack of medical services in a rural community but commented that patients are *"never left without care"*. A number of consumers acknowledged the role of nurses in medical pre-assessment, and therefore reducing waiting times for patients to seek medical attention, although one consumer preferred to seek medical attention from a medical practitioner and not a nurse.

Some of the consumers who were concerned with the quality of medical care and assessment by local medical practitioners opted to seek medical care from another town, due to limited medical practitioners in the existing towns, or travel to the metropolitan area to see their specialist for regular appointments, due to the nature of their more complex medical condition. One consumer (C15) commented on the high turnover of doctors in the study community, which may lead to poor knowledge of patients' medical history, and highlighted his/her preference to see a regular medical practitioner.

3.4.3 Medication Supply and Management

Difficulty in obtaining an appointment with a medical practitioner might consequently lead to difficulty in obtaining repeat prescription(s), with some consumers specifically mentioned the challenges in obtaining repeat prescription(s).

A number of the consumers commented about stock running out at the local pharmacy, however, the stock usually arrived the next day or the day after. This was particularly problematic with medicines that require the maintenance of the cold-chain, such as vaccines as the pharmacies do not want to carry large numbers of stock. Most of these consumers noted that the hospital would be the first port of call for medication supply should the pharmacy be closed or the pharmacist not be available. Nonetheless, most of them were aware that it is their responsibility as patients to plan ahead and be proactive in obtaining repeat prescriptions and medications.

A small number of consumers opted to place medication orders and rely on delivery from mail order pharmacies based in metropolitan areas, due to their perceived lower prices. A few other consumers opted to obtain medication supplies from another pharmacy, based on personal preference, but had to travel to another town due to limited number of pharmacies in the study community (two pharmacies in one of the towns, one pharmacy each in three other towns).

When asked about their first port of call in obtaining information about medications, the majority of the consumers directed their enquiries to their doctor or the local pharmacist. Of the 33 consumers who were taking, or knew someone who was taking, five or more regular medications, only five recognised pharmacist medication review services when descriptions of the HMR service were provided, and four had experience with the service. Most of them stated that their medications were reviewed by the local medical practitioners or their specialists in the metropolitan area. Two consumers were concerned about poly-pharmacy issues among patients that were not detected by the local GP, and information about drug interactions was not readily being offered at the local pharmacy.

The majority of the consumers considered themselves relatively well serviced in health care compared to their more remote counterparts. While some consumers exhibited dissatisfaction with existing health care in the towns, the majority tolerated and managed with the limited health care available in the community, acknowledging the disadvantages of living in rural areas. In contrast, some consumers who were more concerned with their health care opted to travel to another town or the metropolitan area to seek for perceived better health care services. On the other hand, some consumers reportedly had a degree of reliance on the local hospital (secondary care) to provide medical attention and medications when the primary care (general practice and pharmacy) services were unavailable.

4.0 DISCUSSION

4.1 Study design

This study was designed as a case study of a selected rural community, which allowed a 'snapshot' of the medication-related issues within the study community. While there are obvious limitations when attempting to generalise the findings to other rural communities in Queensland and interstate, many of the identified issues concur with the published literature. The researchers acknowledge that some of the identified issues, such as potential misdiagnosis, medication errors, long waiting times at medical centres and discrepancies with patients' medication records, may not be specific to other rural communities. However, this study was not designed to draw comparisons between different types of health care settings such as isolated communities, remote communities and/or metropolitan communities, but rather to identify gaps in the existing system, with particular emphasis on medication supply and management in the selected rural setting. The qualitative study methodology, and interviews with health care providers at the 'coal face', added richness and breadth to the data to allow an in-depth understanding of the issues in the study community.

4.2 Study community

The study community was selected for convenience and accessibility, while at the same time meeting our criteria for 'rurality' for research purposes. The health services illustrated in Table 5 may seem comprehensive; however, the majority of these services were not *readily* available, as shown by the high percentage of part-time and visiting health care providers. It was determined that certain services were provided on a weekly or monthly basis, depending on the patient demand.

With reference to the availability of health care services:

- Three out of the four towns were serviced by sole community pharmacists.
- None of the hospitals employed a hospital pharmacist.
- Medical practitioners operated in both a private (medical centre) and public service (hospital) capacity, prioritised by emergency patient demand.
- Nursing staff roles overlapped between outpatient clinics and emergency departments, prioritised by emergency patient demand.
- In all of the towns, there were limited allied health, specialist and non-primary care services, with the majority of these services being part time and/or visiting services. Further refinement of the list of services during the community-based consultation identified a number of health care providers providing district support or part-time services in multiple sites.

The issues identified above were those of a rural community with moderate remoteness and somewhat restricted access to health care providers. Review of the literature has identified that *remote, isolated* communities in far-west and northern Queensland (e.g. Indigenous communities, mining sites and remote islands) may benefit from established services including the Royal Flying Doctor Service, Indigenous Health Services and the 'Section 100' (s100) scheme for Indigenous populations. Our study has shown that while the health services in the study community were not as limited as those in isolated communities, health services in the

rural community were still not as accessible as those in regional/metropolitan communities. Additionally, such communities differ in their complexity, needs and capacity to implement initiatives to optimise health resources.

While the health care system in the four towns were fairly similar, there were some specific differences between the towns in the study community (e.g. one had two pharmacies and one had no permanent doctor) which makes the data gathered more 'generalisable' and added richness to the data. This unique blend allowed the researchers to explore consistencies and differences in issues in each town.

The high turnover of health care providers and services in the study community limited the currency of some data. Further, the data represent those services available during a defined data collection period, and no attempt was made to measure seasonal trends and reduced and locum services at certain times of the year, e.g. Easter and Christmas.

4.3 Sampling

The researchers were able to recruit stakeholders from a wide range of organisations with relevance to pharmacy, regulation and health services. The responses from the stakeholders were considered insightful in discussing and highlighting issues in rural communities from an *outsider's* point of view, which provided a solid foundation for the subsequent interviews with health care providers in the community of interest. Some stakeholders were able to provide examples of medication issues based on work experience. In addition, stakeholders were able to provide important recommendations in terms of designing or improving health care models, which will be useful for Phase 2 of the project. Most of the stakeholders had a pharmacy background, and were specifically recruited in order to gain information about potential medication issues in rural areas and to explore potential models with increased involvement of a pharmacist and/or pharmacy staff.

The sample size for the health care providers who participated in the study is considered small, and hence may not necessarily be representative of all rural communities. However, data were obtained from nearly all of the providers involved in a range of medication supply and management services, and all health care provider groups were represented amongst the participants. The interviews were conducted in a comfortable environment and with individuals rather than groups of participants, thereby encouraging candid responses. The study was designed to identify gaps in the existing system (with particular emphasis on medication supply and management) rather than to criticise individual health care providers who acted outside their scopes of practice. With the assurance of anonymity, participants were encouraged to provide honest responses and provide examples of real practice, rather than 'professionally acceptable' responses. This highlights the importance of the site visits by the researchers in establishing trust and respect with the local health care providers compared to remote data collection (e.g. mailing of questionnaires, telephone interview).

Health care providers with a range of demographic characteristics (e.g. age, roles, health sector, duration of employment) provided the breadth and depth of information needed for the research. In addition, the demographic data suggest a large number of female and older health care providers, which correlates with feminisation and ageing of the health workforce, and this may have contributed in part to workforce issues in the study community. The recruited health care providers were asked to indicate their length of employment in their current position, rather than total career experience, so this variable does not necessarily correlate with the participants'

age. Some participants were able to compare their current role with their experience in similar roles overseas, interstate, in a metropolitan area or in another rural town. This added richness to the data collected.

The low number of medical practitioners who participated reflects the size of the rural towns in this study. The researchers were unable to interview all of the medical practitioners, due to time restrictions and the workload of the medical practitioners, but this did not appear to compromise the data. The researchers were unable to recruit specialist medical practitioners as these health practitioners provided visiting services that were not available during the data collection period. The final list of the health care providers in this community includes a significant number of nursing staff in a range of roles in hospital, community, aged care and mental health sectors.

Nursing staff were the most hierarchical group of health care providers; represented groups were RIPRNs, RNs, EENs, ENs, PCs and AINs, with some complexity in terms of staffing, remuneration and task responsibilities. Nurses in managerial roles appeared to have had vast experience, including experience with medication services. There is evidently a large demand for nursing services, presumably with the purpose of reducing the burden of medical practitioners. There were no NPs, surgical podiatrists, IPAPs, PAs or IHWs practising in the study community, although some of the nursing staff had expressed interests in the NP role and were able to provide opinions regarding that role.

The community pharmacists represented a mix of sole community pharmacists (n=3) and community pharmacists with a trainee pharmacist (n=2), and they provided a range of responses relating to medication issues, support systems, existing functions and potential roles in a community lacking hospital/clinical pharmacy services.

Allied health care providers were not largely represented in this study (two OTs and one prescribing optometrist were interviewed), as their role(s) in the study community did not involve medication supply or management.

The main limitations of the health care providers' interviews are that:

- The study was conducted within a small community. A small number of participants appeared reluctant to reveal inter-professional relationships and/or issues that may relate to other health care providers.
- Despite the assurance of anonymity, participants may have provided answers that could be classified as 'professionally acceptable' for fear of judgement of their practice or service by the researchers.
- All of the aged care facilities involved were managed by the same organisation, limiting the potential to explore differences in work protocols.

Consumers who participated in the study represented a wide range of age groups, which added breadth to the data. Consumers who were on regular medications, or who knew someone who was on regular medications, were recruited in order to explore medication-related issues from different consumer perspectives. The exploration of issues was limited due to the short interview time frame (five minutes). Therefore, the quantity of data presented may not reflect the relatively large sample size. Additionally, the interviews with health consumers in the rural community were generally less insightful than those with the health care providers. Some consumers were able to provide both positive and negative responses, however, there was a high possibility of consumers providing responses that they thought would be acceptable. Several reasons are postulated. Firstly, the interviews were unannounced, which may have compromised the

consumers' recall of specific scenarios and anecdotes, despite an explanation about the study and prompts by the researchers. Secondly, there was some indication that consumers were reluctant to comment critically or provide specific scenarios/examples on the state of their current health services for fear of reprisal, particularly if they had developed a relationship with the health care provider. Thirdly, it could be possible that the consumers could not appreciate services or new models of care with which they had no experience, and had developed coping mechanisms to manage their longer-term medications in the current environment. No comparisons were made between the four groups of consumers due to the inconsistent sample sizes.

4.4 Key findings

This study focused on issues impacting on medication management and processes and gaps within the health care system. While the researchers acknowledge that there may be other issues that apply to specific groups of the population (e.g. Indigenous), health issues (e.g. drug and alcohol problems) and non-medication related health care services, these issues fall outside the scope of the study and are not reported in detailed.

All of the stakeholders, health care providers and consumers identified that health care providers and services were limited in rural areas, which, in turn, increases workload on the existing workforce in rural areas. Ageing of the existing workforce compounds this issue. In the end, the health care providers and consumers have to cope with the limited services in such areas. This finding is aligned with current literature and signifies the importance of optimising and restructuring existing health care providers in the community to increase access to health care services and resolve workload and workforce issues.[24,25,33,39,61,72,73] Another issue raised unanimously was the reliance of the patients on their local hospitals, utilising them as a primary community care facility for perceived emergency medical attention and medication supply due to the overloaded primary care service in the community. Potential model(s) should be explored to optimise primary care services, to reduce the burden on these potentially under-serviced rural hospitals.

The interviews with the stakeholders served to provide an overview of the issues, at least from an administrative and policy perspective, before commencing the data collection in the community. The key issues reflected those in the Australian literature, such as inadequate pharmacist services, lack of funding and legislative issues constraining role extension of health care providers in rural areas. In addition, stakeholders from each organisation were able to provide opinions on existing systems and initiatives specific to their area of expertise:

- Representatives from professional organisations (AHPRA, APC, PSA and the Guild) elaborated on current pharmacy-related issues in general and those specific to rural communities, challenges faced by pharmacy interns, as well as potential future practice models for pharmacists in general and in rural areas.
- Representatives from QHD&P Unit and PDL provided details about current legislations, recent legislative changes and indemnity issues.
- Representatives from MSQ, Queensland Health, provided insights into current initiatives, including training support and software development, in rural hospitals.
- Health care providers practising in the Darling Downs – West Moreton Health Service District provided opinions on current rural issues with medication supply and management.

This is considered valuable, as there were no hospital pharmacists or hospital pharmacy assistants employed within the study community.
- The representative from AHWI provided details about current workforce issues in general and potential workforce reform.

A number of the stakeholders drew upon personal rural experience during their interviews. This was particularly valuable in identifying issues potentially relevant to our study community, including:

- Increasing role overlap and extension in rural areas.
- Barriers to continuous care and information relay between secondary/tertiary hospitals and primary health care providers.
- Pharmacists' role predominantly in medication supply, with minimal involvement in clinical practice and medication management.
- Lack of support for sole health care providers.
- Funding issues for health care providers and services in rural areas.

The interviews with health care providers identified further complexities in some of the issues raised by stakeholders, as well as localised issues potentially unrecognised by the stakeholders. In addition, interviews with health care providers allowed researchers to explore gaps and benefits of existing and potential initiatives discussed with the stakeholders. Further, it appeared that there has been a lack of active feedback between the local health care providers and policy makers, which signifies the importance of this study.

As expected, more deficiencies and issues in the study community were identified by local health care providers than the consumers. This was due to their experiences with managing competing interests, extended hours of service, miscommunication or lack of communication relating to patient transfers, and poor opportunities for up-skilling and continuing education in an environment that demanded multi-skilling, which added considerable depth to this research.

Workforce Issues

The stakeholders and the health care providers mentioned numerous workforce shortage issues and high turnover of health care providers that result in limited, or lack of, services. This highlights the necessity to expand workforce into rural areas and/or extend the roles of existing health care providers to improve access to health care services in rural areas.

While key stakeholders and major professional/regulatory organisations are exploring workforce expansion, local health care providers mentioned the need for better regulation and strict criteria regarding the recruitment of inexperienced and/or overseas-trained health care providers in rural areas, due to their unfamiliarity with the local health care system and/or potential language/cultural barriers. In addition, stakeholders and local health care providers commented on the reluctance of the existing workforce to embrace new health care policies or roles if the existing system is perceived to be effective.

Further health care modelling is warranted to ensure that adequate training and mentoring pathways are available for new recruits into rural communities, and re-education of existing health care providers exists to enable them to adapt to the relevant new initiatives. Role extension for *individual* health care providers is not perceived as ideal, as succession training

problems have been identified, so the approach should be aimed at one or more groups of health care providers.

However, local health care providers added that the extension of roles and scope of practice has led to increased workload in an already overloaded rural health care system. This was evident with medical practitioners undertaking multiple prescribing roles in acute, general and aged care, nursing staff undertaking multiple patient care and medication supply roles, and PCs undertaking medication administration roles. There were also concerns regarding the quality of services associated with the extended role(s), as these are not the true core roles of the relevant health care provider(s) and are not incorporated in basic training. An example is the extension of RNs' roles to the supply of medications at non-pharmacist sites. It has been stressed that this extended role is merely a medication "supply" function, and some support is available in the form of training packages and a facilitating dispensing tool (iPharmacy®).[8] However, a number of the stakeholders and health care providers identified gaps and issues relating to loss of quality in medication supply and management, a function traditionally undertaken by pharmacists, as well as unfamiliarity of the nurses with medication processes due to lack of succession training. This highlights the need to *expand the workforce in its traditional capacity*, i.e. pharmacists in this instance.

While it is acknowledged that workforce issues may, or will, remain a challenge in rural areas, an alternative, or supplementary, option is to explore the *potential for health care reform* to increase the scope of practice across the relevant health profession. This therefore standardises the training and credentialing requirements to undertake the extended role.

Continuous Care

Stakeholders highlighted key barriers to the provision of continuous health care in rural areas, including the lack of services and difficulties in transmitting information between secondary/tertiary facilities in metropolitan areas and primary care facilities in rural areas. In contrast, the local health care providers commented that health care providers in these secondary/tertiary facilities were unfamiliar with the required skill set and status of health care services in rural areas, resulting in poor continuity of health care for rural patients. The health care providers commented that the metropolitan facilities appeared to discharge patients directly back to their rural homes without adequate medical and medication information, sufficient medication supplies and/or without enquiring for assistance from the local health care providers. This was particularly problematic over weekends or after hours when the local health care providers were either unavailable or do not have adequate information about a patient to care for the patient's medical or medication needs. This was further complicated by the limited number of health care providers available in rural areas.

The transfer of a patient's medication history between facilities seemed to be a challenge. The stakeholders suggested that the use of eLMS (which generates a DMR) and EDS in Queensland Health hospitals should facilitate the relay of medical and medication information to primary carers. However, the local health care providers commented on limitations of the system(s), including time pressures and lack of trained staff to undertake the task, subsequently resulting in poor utilisation of these tools in the study community.

Cases reported by health care providers have been presented in the *Results* section, along with challenges in ensuring continuity care for patients in rural areas. From a medication supply and management point of view, it appeared that guiding principles for medication management to promote QUM, as presented by the Australian DoHA[5] and Australian Pharmaceutical Advisory

Council (APAC), were not effectively implemented in the study community. Further initiatives need to be explored to ensure optimal and continual health care services are available, despite the rurality of the community under study.

Pharmacist Services

While the stakeholders commented on the benefits of pharmacists' services and the potential of increasing pharmacists' scope of practice, they also highlighted the shortage of pharmacists and associated services in rural areas. Hospital staff, in particular, acknowledged the lack of clinical pharmacy services, but appeared to have adapted to a non-pharmacist system. In the absence of clinical pharmacy services, and with consideration of salary budgets, nursing staff had undertaken to supply and manage medications.

While the theoretical benefits of pharmacists in the clinical setting have been identified in the literature,[57,60,63,67] the study also explored the possibility of health care providers not *recognising* the potential value of pharmacists in medication management due to their lack of experience with, and insight into, pharmacists' roles. This is evidenced by nurses in the local hospitals 'supplying' medications, and pharmacists, when visiting the hospitals, being expected to dispense medications and audit ordering/supply of medications, rather than providing clinical pharmacy services. Both stakeholder and health care providers provided examples where medication reconciliation did not take place, and medication reconciliation tools (i.e. eLMS and DMR) were not utilised, potentially leading to medication misadventures (e.g. the cases involving tramadol provided by S5 and digoxin provided by HP20.2). This is a problem in facilities where pharmacists are under-utilised, or are lacking, and highlights the significant role of a pharmacist beyond dispensing medications. Nonetheless, local health care providers acknowledged and valued the role of pharmacists in providing medication education, even in the absence of hospital pharmacists being employed in these sites.

Another interesting situation discussed by both stakeholders and health care providers is the lack of a pharmacist's involvement in the Transition Care Program, or a similar process in the community. This is a process whereby a patient's domiciliary needs are identified when transitioning from the hospital to the patient's residence. While stakeholders believed that pharmacists have a role in medication management in this process, current arrangements in rural communities only include domiciliary services provided by nursing staff and allied health care providers including physiotherapists, occupational therapists and speech pathologists. The majority of metropolitan hospital patients' medications were reviewed by pharmacists on-site. The incorporation of pharmacist medication review services in this process in rural sites may impart significant benefits. Further exploration is needed for this role to be extended to a visiting pharmacist providing outreach services or a local pharmacist providing sessional services in non-pharmacist sites.

Current initiatives,[40,59,74] including role extension of nurses and IHWs, have evidently improved access to medication supplies in rural areas. This study has established the value of community pharmacists in assisting to achieve continuous medication supply and QUM in the community, which support findings from the literature review.[3,30]

Support

The stakeholders and local health care providers alike commented on the lack of professional and infrastructure support for health care providers in rural areas, of which the majority are sole health care practitioners or providers. While the local health care providers recognised the

benefits of current visiting educator and distant/remote training sessions via video-conferencing, they identified that the frequency and availability of these educative opportunities varied, and that more support is required particularly for sole and/or new health care providers in the community. The majority of stakeholders and local health care providers mentioned funding, logistical costs and remuneration issues as the major barriers to improving support mechanisms.

One of the key areas in need of support, as identified in this study, relates to medication processes in non-pharmacist sites. While the hospital staff recognised the availability of distant/remote pharmacist support from larger Queensland Health metropolitan hospitals and the availability of local support from the *community* pharmacist, they did not want to impose extra responsibility on health care providers (i.e. pharmacists) who are technically not contracted or employed by the local hospital. The majority of "support" reported was limited to medication *supply* (technical/logistic support) rather than medication *management* (clinical support). While a visiting educator and accredited pharmacist provided outreach clinical support and education to three of the four towns, it appeared that this was inadequate to promote quality medication management in the study community.

Although reports[57,60,63,67,68] have shown potential benefit for increased scope of practice for pharmacists, there are minimal studies on the effective overall implementation of such practice in rural areas, where pharmacists are lacking in terms of number and support. This leads to another issue, which is the need to assist and provide support for pharmacists practising in rural hospitals or communities in terms of mentoring and training, particularly when a rural pharmacist is practising solely, a new policy/protocol is implemented or an inexperienced pharmacist has opted to work in a rural facility.

Findings from both the literature review and this study suggested that current support initiatives are inadequate, and there is a need to improve medication support to health care providers in rural areas.

Funding

Stakeholders and health care providers in this study cited financial issues with logistics, costs and remuneration for health care providers, which should be addressed in order to improve health care services in rural areas. Interestingly, a stakeholder questioned the priorities in allocation of funding to improve extended roles such as training for IHWs and nurses to undertake medication supply function, when the funding could be applied to remunerate pharmacists to undertake medication supply *and* management functions in rural areas. Some of the local health care providers raised issues with potentially inappropriate use of funding for duplicated services, i.e. different organisations ultimately providing similar services, when the funding could be applied to health care services that are in need of improvement.

While funding remains one of the key barriers to improving health care systems in rural areas, the existing allocation of funding should be reviewed to explore the potential for re-allocation of funding for new health care initiatives. For example, funding for discharged patients' medications has recently been re-allocated from the State and Territory hospital funding to Federal funding under PBS Hospital Reform arrangements.[75-77] However, this arrangement is not implemented in all public hospitals nationwide. This could potentially lead to inconsistent cost-shifting of funding (from medication supply) to improve clinical and other health care services, as well as implementing APAC guidelines that aim to promote QUM.

Regulatory aspects

A major regulatory issue raised by stakeholders and health care providers was the numerous protocols or policies by both Federal and State/Territory organisations. While the stakeholders commented on the flexibility and inflexibility of the existing legislations, the local health care providers acknowledged the overall purpose of the legislation, namely to provide safe patient care. The local health care providers indicated that they aim to work within the regulatory guidelines without compromising patient care, although the various restrictions may be impractical in certain instances. The health care providers also suggested some areas lacking clear guidelines, including formalised protocols for unregulated workers (e.g. PCs). There appeared to be significant inconsistencies in terms of a PC's role, and given the role extension and up-skilling of PCs (reported in the Results section), the current 'unregulated' status of PCs should be reviewed.

Specific to medications, existing Queensland legislation does not allow nurses undertaking medication supply roles in non-pharmacist sites to repack medications. This is problematic in the supply of a limited quantity of medication and where quality standards for dispensing are not in place. To complicate issues further, existing legislation does not allow pharmacy *assistants/technicians* to manage stock ordering/control, and their tasks are limited to working under the supervision of a pharmacist. The legislation therefore restricts the potential for role extension, such as medication supply, by pharmacy assistants/technicians in non-pharmacist sites.

A review of the current *Regulation*[6] and the data from the study suggests challenges experienced by various health care providers to comply with the provisions in the legislation, particularly with extended scope of practice into non-traditional roles (e.g. nurses undertaking medication supply, PCs undertaking medication administration). The current provisions in the *Regulation* is perceived as prohibitive in patient care and data indicated a need for future amendments in the legislation to cater for specific rural needs.

While each State/Territory legislations provides provisions to address local needs, the recent nationalisation of health practitioners' registration, potential health care reform and legislative issues presented in this report warrant the need to review State/Territory drugs and poisons legislation to achieve national harmonisation. Currently, the provisions in Queensland regarding the handling of medications (prescribing, dispensing and supply) are in the form of delegated legislation, namely the Queensland *Health (Drugs and Poisons) Regulation 1996*. This allows the legislation to be reviewed and amended at regular intervals to update to current health care needs, as it does not need to be passed through Parliament, only requiring Ministerial approval. In contrast, medication-related provisions in some other jurisdictions, however, are in the form of primary legislation (Act of Parliament), which imposes a challenge for amendments, and hence a challenge to legalise a nationwide role extension or health care protocol.

Potential Facilitators

Stakeholders proposed several potential models or interventions that may be of benefit in rural areas:

- Non-medical prescribing (e.g. for nurses and pharmacists).
- Pharmacy support staff undertaking a supply function in non-pharmacist sites.
- Outreach pharmacist model.

- Sessional pharmacist model.
- Remote pharmacist model/tele-pharmacy.

When these were proposed to the health care providers, the majority were keen for an outreach pharmacist model to provide medication support, as the employment of part-time or full-time pharmacy staff was not considered feasible in terms of financial and workforce capacity. Health care providers, particularly hospital staff, could not provide further comments regarding other potential pharmacist models with which they had no experience. While none of the health care providers specifically commented on non-medical prescribers, some made comments regarding the 1) implementation of standing orders for RNs, and 2) potential for pharmacist-continued therapy to ease the workload of medical practitioners in rural areas. Other proposed interventions by health care providers include:

- Protocols or standardised guidelines for PCs, due to the significant up-skilling of PCs in the aged care facilities.
- Step-down protocols for patients transferring from secondary/tertiary facilities (metropolitan) to the local rural hospital before returning to their residence.

In contrast, health consumers in the rural community were more concerned about, and their comments were limited to, isolation and rurality of the community and access to health care services. While they were aware of the limited services and under-servicing of the community, they were also aware of the workload on existing health care providers. One of the key issues explored was that the majority of consumers were not aware of pharmacist medication management services and relied on the local medical practitioner to manage their medications. Interviews with stakeholders and health care providers identified the shortage of pharmacists in rural areas and the importance of a pharmacist in medication reviews, but recognised that the local sole pharmacists did not have the capacity to undertake additional roles. With poly-pharmacy concerns among the consumers and health care providers, it is crucial to explore a medication management model and improve pharmacist services in such rural communities.

Some of the issues explored in the study community were those recognised by the key organisations/stakeholders, and it can be anticipated that any initiatives to be trialled in Phase 2 of this project should seek endorsement by these organisations, in addition to further consultation with the study community. It should be noted, however, that this was a qualitative study exploring a wide range of issues, rather than quantifying the extent of specific issues. With the limited interview time that was available, not all topics in the interview guide were explored in every interview. Some issues might not have been identified or recognised by certain parties or entities, but it does not imply that the issues are insignificant. Additional issues identified during the data collection were aimed at improving awareness of issues in the study community, particularly among key stakeholders and policy makers. Future initiatives or interventions by stakeholders and policy makers are anticipated to resolve the issues reported.

4.5 Recommendations

This is a seminal project that has explored issues and opinions from various perspectives and attempted to draw together the key findings, in anticipation of developing recommendations for the community of interest and working towards an intervention research stage. The study hypotheses were confirmed by our data; these were that:

- Current options for medication supply are inadequate to meet the needs of the rural study community, and
- There is a need for extended medication management roles for pharmacists in the rural study community.

A number of recommendations were proposed in response to the study objectives. These recommendations take into consideration existing medicines policies, the established or potential framework imposed by regulatory and professional organisations, and the needs of local health care providers and consumers.

Objective 1: Identify health care providers involved in medicine prescribing, supply and management mechanisms in the defined study area.

The study has identified several *prescribers* in the study community, including medical practitioners, dentists and a prescribing optometrist. Nurses who have rural and isolated practice endorsements (i.e. RIPRN) are endorsed to initiate medications according to the PCCM as their DTP. While the medical practitioners coped with prescribing responsibilities in the hospital, community and aged care facilities, the majority of health care providers supported the use of non-medical prescribers, such as optometrists, RIPRNs and NPs, to reduce the burden on medical practitioners in the study community. While no NPs were employed within the study community at the time of the research, the extended nursing role was perceived as valuable in medical areas where specialist skills are lacking (e.g. mental health).

Community pharmacists undertook medication *supply* roles in the community, and several local community pharmacists undertook medication education roles in the community and hospital. In this study community, their dispensing role was emphasised and medication management mechanisms had not been well established. A major contributing factor, according to the participants, was the limited pharmacist workforce, restricting community pharmacists, as sole practitioners, from providing services other than basic pharmacy services (dispensing and some enhanced pharmacy services). This highlights the need to expand the pharmacist workforce capacity, as highlighted by the Pharmacy Guild's *Strategic Direction for Community Pharmacy*,[57] that practice change and current/future pharmacist model demands will require at least two pharmacists in each premises. Existing initiatives are in place to expand pharmacist workforce capacity, including incentives from Rural Pharmacy Programs to expand pharmacy services in rural areas and the production of 1400 graduates by (now over) 16 university programs nationwide.[57] The gap appeared to be recruiting rural workforce versus the existing employment opportunities in rural areas, with the key examples being:

- None of the hospitals in the study community employing a pharmacist, and
- Lack of trainee placements and mentoring for trainee pharmacists (interns) in rural communities.

The study established the role of a visiting accredited pharmacist in the study community, which was perceived as valuable in medication *management*, particularly in the aged care facilities. However, the HMR service was identified neither as a recurring nor a commended service in the study. Currently, HMR referral is initiated through the GP and community pharmacy, to be conducted to the accredited pharmacist, whereas RMMR referral is initiated through direct contracts with the accredited pharmacist.[12,18] The existing referral protocol for HMRs restricts case load and income for visiting pharmacists who would want to focus on medication review services. Given the base Medicare limitation of one HMR/RMMR per consumer per year, HMR

referral restrictions and lack of pharmacist workforce in the local community, the local medical practitioners undertook significant responsibility in medication management in the hospital, community and aged care sectors. However, medical practitioners reported challenges in providing quality medication management due to workload and time pressures and largely supported medication reviews by pharmacists. There is potential to review and further expand HMR referral protocols to include hospitals, rather than their current restriction to GPs. This has been trialled in South Australia, enabling post-discharge HMRs for 'high' risk patients, facilitated by hospital-based liaison pharmacists.[78] In addition, aligning HMR with RMMR protocols could attract more accredited pharmacists to provide the HMR service.

Nursing staff appeared to be the most hierarchical group, and undertook a variety of responsibilities:

- RNs were responsible for management of the facility, on top of patient care, medication administration (e.g. injections, patches) and medication supply.
- EENs mainly assisted RNs in paperwork, clinical tasks (e.g. wound care) and medication administration.
- ENs assisted RNs with clinical tasks, and were responsible for domiciliary tasks and medication monitoring (i.e. observing the patient's clinical condition).
- PCs (in aged care facilities) appeared to have a number of roles, including assisting in medication administration, particularly with medications in dose administration aids, topical medications, and inhalers, medication monitoring (i.e. observing the patient's clinical condition), and domiciliary tasks.
- AINs mainly assisted nursing staff (in hospitals) in terms of domiciliary tasks, and did not deal with medications at all.

Recommendation 1: Expand the workforce capacity for existing and potential non-medical prescribers. This should improve access to medical services and medications in rural communities, as well as ease workload burden of the existing medication practitioners in rural areas.

Recommendation 2: Expand the pharmacist workforce capacity in rural areas to extend medication services beyond medication supply. While workforce in terms of pharmacy graduates and incentives are made available, the key remaining issue is lack of employment opportunities, and to some extent, rural recruitment and retention. Alternatively, re-engineering practice to better involve pharmacy support staff could improve the capacity for pharmacists to explore medication management services (see *Objective 7*).

Recommendation 3: Review medication management services referral protocols to enable expansion of accredited pharmacist services. This is necessary to ensure sufficient case load and income for clinical pharmacists to extend their services into rural areas, as visiting medication consultants.

Objective 2: Identify the role extension undertaken in this community by health care providers, with specific reference to medication supply and management.

This study identified:

1. *Potential duplication* of services, although local health care providers have reportedly defined and coordinated their roles for some of the services. Some duplication was also

noted for privately- and government-funded *allied* health services; this was not explored further, as the roles were not directly related to medication management.

2. *Multiple roles and mixed skills* undertaken by a number of the health care providers in this community, in an attempt to resolve shortcomings in the workforce. These were:

    - Medical practitioners providing generalist medical care to the community (general practice), hospital (acute) and the local aged care facility. This was due to the limited workforce capacity of medical practitioners in the study community.

    - Nursing staff holding multiple part-time roles in both community and hospital sectors. Multi-skilling was common among nursing staff at the hospital, to ease workload when the hospital was short-staffed. Following from Objective 1, while the different nursing roles are defined by the delegation process, training requirements and remuneration for each level of nursing staff, it appeared that the roles were blurred, and mixed skills, including medication administration, were identified particularly in the aged care setting, necessitated by workforce issues in the rural areas. The Queensland Nursing Council developed a scope of practice and framework for nursing staff in 2005;[9] however, with the recent national registration (overseen by AHPRA) introduced in 2010, such a framework is yet to be established by the Nursing and Midwifery Board of Australia.

3. *Extension into non-traditional roles* of health care providers, requiring up-skilling:

    - RNs undertook a medication *supply* role in hospitals for discharged patients and patients needing emergency medication supply. The current *Regulation*[6] outlines the requirement that "dispensing" complies with quality standards outlined in the PSA's *Professional Practice Standards*;[4] this does not apply to non-pharmacists undertaking medication *supply* [section 4A]. Nurses 'supplying' medications recognised that they were performing the pharmacists' role without the equivalent training. Nursing staff reported 1) the predicament between the need to 'supply' and the professional obligation to 'dispense', 2) challenges with complying with legislation due to lack of succession training in medication processes, and 3) challenges in balancing the acute patient care workload with the medication supply role. Most health care providers acknowledged the necessity of the role to improve access to medications, but were concerned with the lack of *quality* dispensing and a clinical pharmacy component. The majority of health care providers believed that up-skilling and training was required to undertake the role, and the potential to enhance the medication supply role to include a clinical component such as medication reconciliation, necessitated by the lack of pharmacist workforce.

    - A number of PCs in aged care facilities were up-skilled (through medication competency and assessment modules) to *assist* with medication administration, although some roles appeared, through necessity, to extend further into actual medication *administration.* Further, the boundaries were blurred in terms of 'assisting' with medications that were not packed into dose administration aids. The study identified ambiguity in terms of protocols for PCs between aged care facilities and organisations providing domiciliary services in the community (e.g. Blue Care). While the management staff supported the up-skilling into medication administration, some of the nursing staff, including PCs themselves, were not supportive of the extended role due to additional workload and the need for quality assurance. Current legislation does

not include the scope of practice for PCs in medication administration; however, various informal medication competencies and protocols were in place for these unregulated workers. Further review of the undertaking of extended PC roles is needed to explore the need for increase scope of practice, and hence, the need for formalised protocols, training and framework within the nursing hierarchy.

- Mental health workers up-skilling their roles into the field of psychology, social work and OT to provide generalist health care when managing cases. This extension was necessitated by the limited number of allied health care providers and mental health workers in rural areas. Similar models could be explored for other health care services to improve patients' access to rural health care services.

4. *New extended roles* have also been discussed in the report:

- The RIPRN role is well supported by the majority of health care providers to reduce the workload of medical practitioners in rural areas, although two out of five medical practitioners interviewed were uncomfortable with the extended role of nurses into medication initiation and non-medical prescribing.

- The NP role was perceived as being too specific for rural hospitals demanding generalists. This was evident given the multiple roles undertaken by medical practitioners and nursing staff in this study. However, the role of NPs was reportedly valued in health care areas such as mental health, and may be particularly useful in contributing to prescribing and medication supply.

- The role of the pharmacist in undertaking a potential "medication continuance protocol" was considered beneficial in easing access issues in rural communities for patients requiring continuous therapy. Not many health care providers were able to provide insightful comments regarding this role, as it has not yet been established. Clear guidelines are required, because it involves the extension of the pharmacists' role to initiate a new prescription for a continuing therapy for the duration of one month.

The abovementioned overlapping and extended roles and services are seen as essential, and a consequence of practice, in rural areas, and highlighted the limitations of traditional health care providers and services. Importantly, the majority of the health care providers preferred their *traditional* roles and role extension within their traditional scope of practice, mainly due to their core training and numerous barriers identified in the literature. Nevertheless, the majority of health care providers acknowledged workforce issues in rural areas. They accepted the necessity to undertake extended roles (and training) and potential increase in workload to ensure optimal health care services are available for patients in rural areas.

No specific recommendations were made relating to duplication and multiple roles; however, the researchers acknowledge the following needs:

- 'Streamlining' current health care services to address inefficiencies arising from duplication of services (not limited to medications) prior to introducing new roles or protocols to *complement* the existing health care system. *Supplementary* roles or health care protocols should avoid overlap in the existing health care system, which could potentially result in wastage of health care resources.

- Expansion of health workforce capacity to address workload issues with existing health care providers adopting multiple roles. Currently, increasing the scope of practice of health care providers appeared to cope with health care demands in rural areas, however, it has also led to increase in workload, highlighting workforce capacity issues. Minimising duplications could potentially optimise health care resources in rural areas, and hence, improve health workforce capacity to some extent.

Recommendation 4: Work with the nursing profession to clarify, and where possible, formally realign nursing roles with rural needs. Interviews with nurses identified role extension and overlap necessitated by their rural practice setting. While those undertaking each role appeared to be aware of their scope of practice and limitations, and had established these through negotiation with colleagues, this study recommends formalisation of such role extension. At present, all ENs now graduate with medication endorsement (as EENs). However, there were concerns with national registration not recognising state-level endorsements (e.g. RIPRNs) or certifications from certain institutions. Formalisation of nursing roles is timely with the national registration for health professionals.

Recommendation 5: Explore medication support models in non-pharmacist sites, as there were concerns regarding the quality of medication supply role undertaken by non-pharmacists. Nursing staff raised preferences for a visiting hospital pharmacist providing district support in terms of auditing inventory management and medication supply processes as well as providing medication education. Further models are explored in Objectives 5 and 7.

Recommendation 6: Define the roles of PCs in medications. There were concerns with lack of appropriate medication endorsements and framework for PCs in the study community. In Tasmania, PCs' role include medication administration.[44] The definition of medication assistance requires state-by-state exploration, with view to the involvement of PCs in medication administration. With the up-skilling of PCs to adopt medication roles, it is important to implement uniform PC protocols across all organisations and nationally to ensure a minimum practice standard aiming to reduce the potential for adverse medication outcomes in patients.

Recommendation 7: Establish a system to facilitate the continuity of repeat prescriptions for ongoing therapy. This would be particularly valuable in rural areas, where access to prescribers is limited and the potential role of NPs and pharmacists in initiating prescriptions for continuing therapy is supported. This would require amendment to the *Regulation*, as pharmacists can currently only 'initiate' three days of continuing therapy without a prescription under the "emergency supply" provision. This would also require some amendment to the PBS.

Objective 3: Identify training and support structures in place and/or needed to assist health care providers to deliver QUM services.

Current educational initiatives in place were largely appreciated by local health care providers. These include:

- A training and resource package for hospital nursing staff undertaking medication supply.
- Medication education sessions (by local and visiting pharmacists) to health care staff in a relevant hospital, community or aged care facility.

Further training and support, specific to medications, was recommended by health care providers in the following areas:

- Management courses and rural mentoring to help young/new pharmacists cope as sole practitioners, providing quality pharmacy services in rural areas.
- Training in medication-related provisions, particularly for overseas-trained health care providers.
- Training relating to specific medical issues (e.g. alcohol and illicit drugs) or medications (e.g. psychotropics, opioid replacement therapy) for health care providers, particularly medical practitioners, nursing staff and pharmacists, to optimise medication therapy for their patients.

With the limited number of pharmacists in the study community, the study identified that existing medication support that they provided was restricted to education and training. Existing health care providers acknowledged the local community pharmacists' skills in providing medication information, but did not want to impose extra obligation or responsibility due to the perceived workload of the local community pharmacists. They were aware of the availability of hospital-based pharmacists by telephone for enquiries about medications commonly used in hospital and medication-related regulatory aspects, but there were no communication channels established for this contact. Visiting educators and accredited pharmacists may be able to provide occasional or periodic medication education and support, but it appeared that the community was in need of a more established medication support mechanism.

Technological advances in video-conferencing were well received by health care providers, particularly in obtaining guidance from a remote practitioner (e.g. tele-medicine), improving access to specialist or consultant (e.g. tele-psychiatry) and distant continuing education sessions for health care providers. While tele- or video-conferencing has been widely established to support medical practices in rural areas, and specialist medical practitioners and other allied health care providers have provided visiting services to rural areas, similar initiatives could be extended to enhance pharmacists' services in these areas. With national broadband in discussion to facilitate connectivity,[38] these types of applications could be further explored to include medication support such as tele-pharmacy. This could span:

- Patient/health care provider consultation with a remote pharmacist.
- Preceptoring/mentoring for pharmacists.
- Supervision of pharmacy support staff by a remote pharmacist.

Queensland Health software applications, such as eLMS and DMRs, were designed to improve communication and record keeping relating to patient transition; however, these applications were utilised poorly in the study community and did not adequately facilitate communication between health care providers, further contributing to the poor continuity of health care and medication supply for patients, particularly for patients transferring between metropolitan and rural health services. In addition, dispensing software iPharmacy® was not well received by nursing staff undertaking medication supply due to the perceived challenges in navigating the software. While health care providers acknowledged the potential benefits of these tools, more effective universal communication networking should be explored.

Recommendation 8: Provide training and support focussing on specific medication or medical issues in rural areas (e.g. mental health, alcohol and illicit drug issues). This would re-educate existing health care providers on the issues, along with the regulatory aspects required when providing health care relating to these issues. While workforce capacity to provide such training and support could remain an issue in rural areas, the lack of training and support could be addressed by establishing hotlines/mentoring for the relevant health care staff in rural areas.

Recommendation 9: Explore the potential for technology in video-conferencing to be implemented to improve pharmacy services (e.g. tele-pharmacy). This should assist in resolving pharmacist workforce capacity issues in rural areas. There is potential to utilise the technology to provide patient consultations and medication education/support for health care providers in rural areas, without having to recruit pharmacists into these areas. The current *Regulation* also recognises the value of technology (e.g. video-conferencing) in supervising delegated health care staff, which could be utilised for remote pharmacists to supervise and delegate pharmacy support staff in non-pharmacist sites.

Recommendation 10: Develop a single, effective health information communication network, such as electronic health record. Queensland Health applications were only utilised in Queensland public hospitals, and did not appear to be systemised with existing health record applications in the community. The research identified the need to address the issue with multiple software applications. Given the generalist model reported by numerous participants in this study, a communication network linking to applications utilised in the community (i.e. medical centre, aged care facility, pharmacy) is ideal. A national electronic health record for individuals has been mooted for some time; if in place, this would further improve patient information transfer, not only between hospitals and community, but also interstate.[38]

Objective 4: Identify situations that could potentially lead to adverse medication outcomes due to an inadequate medication management support structure.

It is acknowledged that non-pharmacists undertaking medication roles in rural areas prioritised patient care and safety. However, health care providers identified concerns and challenges in coping with legislation requirements and standards for quality medication processes, and the lack of medication support and involvement of pharmacists to implement QUM in the community. Situations that could potentially lead to adverse medication outcomes, identified by this study, are discussed below (in no order of significance).

Due to workforce issues, nurses undertook medication *supply* in non-pharmacist sites to improve access to medications. This was raised as an issue because quality standards for dispensing are not in place, as they are for pharmacists' *dispensing*. Hospital nurses voiced challenges relating to supply of medications without appropriate counselling and generating labels for dispensed medications with iPharmacy® and resorted to handwritten labels, while coping with challenges to comply with legislation requirements. Quality dispensing, which is traditionally undertaken by a pharmacist as outlined by the PSA's *Professional Practice Standards*[4], includes verifying the patient's medication history, identifying potential adverse drug reactions, precautions or contraindications, verifying the appropriateness of drug therapy and use of legible and unambiguous labels with adequate dosing instructions. This standard is not required by the *Regulation* when medication *supply* is undertaken by nurses, due to their level of training and expertise with medications. This could potentially lead to adverse medication outcomes for patients and highlights the need for pharmacist or pharmacy support staff involvement in medication processes in non-pharmacist sites.

For discharged patients and emergency supplies, nurses are not legally allowed to repack sufficient medication to last the patients until the next working day when they can visit the local pharmacy or medical practitioner. Instead, they supply an original pack. This results in potential delay for patients in seeking the necessary medical attention from a medical practitioner or medication supply from a pharmacy, where medication intervention could occur. Another issue is the incongruence with pharmacists' emergency supply regulation (three days' supply) which is aimed at harm minimisation through reduction in supply. It appeared that some hospital nursing staff were able to provide minimal amounts of medications as 'starter packs' for discharged patients from inpatient supplies; however, the issue with emergency supplies to outpatients remains.

Relating to medication supply, nursing staff had to also undertake the supply of opioid replacement therapy by nursing staff in non-pharmacist sites. While no adverse outcomes were reported in this study, the dosing of methadone (an opioid replacement therapy) is somewhat complicated, as it is generally prescribed in 'mg' and dispensed in 'mL'. In addition, the management of opioid replacement therapy requires a systematic procedure for both the induction and management phases. Opioid replacement therapy management issues, particularly for methadone, include side effects, overdosing, intoxicated presentations, incorrect dosing, co-morbidity, polydrug use, withdrawal, stabilisation, missed doses and reintroduction, as well as cessation of therapy.[79] Dosing and managing opioid replacement therapy requires experience and training, and health care staff in this study were lacking adequate support. Dosing errors and inadequate drug management services in rural communities could lead to adverse medication outcomes for patients undertaking opioid replacement therapy.

The study also identified inefficient communication transfer of patients' medication histories, including the lack of implementation of medication reconciliation processes, traditionally undertaken by pharmacists, and under-utilisation of medication reconciliation tools such as eLMS, DMR and EDS to transfer information from the hospital to primary carers. Ideally, medication reconciliation (DMR) is carried out by pharmacists (at the hospital pharmacy), or by medical practitioners or nurses in non-pharmacist sites, from patients' admission until discharge.[13] Case examples provided by both a stakeholder and a health care provider (the tramadol example provided by S5 and digoxin example provided by HP20.2) suggest that this process is not always implemented. Contributing factors include time and workload pressures of existing medical practitioners and nursing staff, lack of training for nursing staff in medication reconciliation, as well as lack of pharmacists to implement medication reconciliation processes. The resulting discrepancies in patients' medical and medication records in the hospital and community could result in inaccurate patient medication histories and adverse medication outcomes.

A number of patients returned home (to their rural residence) from larger facilities (in the metropolitan area) with nil-to-minimal medication information or medication supply, deviating from the aim of APAC medication continuance guidelines.[5] Prior to introduction of PBS in Queensland Health hospitals, patients were supplied with seven-day starter packs by the hospital upon discharge, although the frequency of this practice was ambiguous. With the recent PBS hospital reforms, discharge patients were being issued PBS prescriptions on discharge to be dispensed either by the hospital pharmacy or community pharmacy, enabling the patients to obtain full packs of medication (one-month supply) for ongoing treatment. However, gaps remained for patients discharged after-hours or on the weekends, where pharmacy services were scarce or certain medications were not available in rural area stock, and patients could ultimately end up with no medications at all with which to go home. This is particularly

problematic for patients requiring pain management therapy, psychotropic therapy or other acute medication therapy.

The study also reported poly-pharmacy concerns among health care providers and consumers. This was inflated by the lack of adequate medication review services in the community, which could lead to adverse medication outcomes for patients:

- Existing medical practitioners were unable to provide comprehensive medication review services for patients due to time pressures and workload at the medical centre.
- Existing pharmacists were unable to extend their pharmacy services into medication management due to limited pharmacist workforce capacity.
- Services provided by the visiting accredited pharmacist were valuable, but the frequency and availability of such services were dictated by case loads.

All the above situations that could potentially lead to adverse medication outcomes highlighted the importance of expanding medication management and reconciliation services in rural communities, ideally undertaken by pharmacists (see Recommendations 2 and 3 and Objective 6). Other recommendations include:

Recommendation 11: Explore alternative mechanisms in a rural community to support and supplement nurses undertaking medication supply in rural areas (see Recommendation 9, Objectives 5 and 7).

Recommendation 12: Ease medication supply tasks for nurses at non-pharmacist sites and standardise medication supply protocols in all non-pharmacist sites. The study identified increased workload and challenges with medication supply by nurses and variable medication supply practices between non-pharmacist sites. Some patients were supplied full packs (as discharged medications or for emergency supply), whereas some patients were supplied sufficient amount of medications to last them until the next doctor's appointment (to obtain repeat prescriptions) or when the pharmacy opened to dispense their repeat prescriptions. In addition, 'hospital ward stock' was restricted to inpatients, due to the need for medication chart records. Allowing nurses to supply limited medications via the 'hospital ward stock' to outpatients (who were identified needing the medications) would not only reduce risks through smaller quantities, but also relieve nurses of 'dispensing' duties. This should annihilate the need to dispense full packs of medications and the need to be familiar with dispensing tools (i.e. iPharmacy®), although a simpler recording tool would need to be developed for accountability purposes. In addition, a pharmacy staff could be introduced at the local hospital to assist with ordering and stock control (see Objective 5 and 7).

Recommendation 13: Improve compliance with APAC guidelines for ensuring medication continuity. The study identified poor utilisation of medication reconciliation and communication applications and challenges for discharged patients returning home without 'starter' packs. This issue could be addressed by resolving communication transfer problems (see Recommendation 10) and/or implementing discharge protocols for all patients returning to their rural residence to ensure that medications are supplied from the hospital, medication reconciliation is undertaken and documented, and sufficient medication information is provided to the patient.

Objective 5: Explore the potential for community or hospital pharmacists' roles to be extended to provide outreach dispensing services.

Findings from the study highlighted the lack of pharmacists and the need to improve medication services in the study community. Interviewees in this research identified the potential for part-time ('sessional') or casual ('outreach') pharmacist services, in the absence of a hospital pharmacist in the entire study community, and given that there could be insufficient workload to warrant a full-time clinical service.

A 'sessional' model involves a community pharmacist undertaking a shared-care role, dividing working hours between hospital and community sector. Major roles include inventory management and dispensing medications to inpatients and outpatients. Currently, medical practitioners and allied health care providers have sessional employment between their private practice and the state's public health care system, to resolve workforce issues.[3] Similar employment options should be available for local community pharmacists to provide clinical pharmacy services to non-pharmacist sites or rural hospitals that do not employ a hospital pharmacist.

With the current workload of local pharmacists, being sole practitioners, the effectiveness of this model could be enhanced with ideally two pharmacists per pharmacy/town. However, key issues remain with cost recovery (salary) and viability of the pharmacy business. Two of the pharmacists in one study town comprised one pharmacist and one trainee pharmacist, where the pharmacist continued the functionality of the pharmacy while the trainee pharmacist provided clinical/medication support to the local aged care facility. A similar model could be designed for the trainee pharmacist to provide clinical/medication support to the local hospital. However, review and amendment of the *Regulation* would be required if the role of trainee pharmacist were extended to medication *supply* at the local hospital, as the existing legislation states that medication dispensing requires "direction and personal supervision of a pharmacist" [sections 64(3), 171(2), 257(2)].

An outreach model, on the other hand, involves a pharmacist visiting from district hospital to provide on-site support to non-pharmacist sites in the district. The role may include on-site training and education to health care staff, as well as assisting in inventory management, imprest reviews and stock control. In this study, the visiting accredited pharmacist provided medication support in terms of clinical services and education to local aged care facilities. There is potential to contract this role to provide similar medication support to local hospitals and health care services in the community. Alternatively, the visiting educator could be contracted for the outreach role to provide audits and technical support to local hospitals, including inventory management and stock control. These strategies could minimise the potential for service duplication.

Literature review and these data indicated that outreach pharmacist services had been informally undertaken. This model had not been established further due to lack of remuneration for the outreach pharmacists. This model could be developed further, with the potential of replacing current medication supply models (e.g. IHW and nurses) to improve QUM in rural areas.

The majority of hospital nursing staff supported outreach support from hospital-based pharmacists, which averts the need to 'employ' a pharmacist by the local hospital. A 'sessional' pharmacist could be valuable in terms of providing further medication support due to the pharmacist's availability in the community; however, the current limited pharmacist workforce

capacity in the study community restricts the implementation of this model. Further advantages and disadvantages of the two models are proposed below:

	Sessional (local community pharmacist)	Outreach (visiting pharmacist from district hospital)
Pros	• More frequent services • Potential to expand clinical pharmacy services in non-pharmacist sites • Relief for nurses of 'pharmacy' duties • Add-on medication reconciliation service as a liaison pharmacist • Established communication networks with local health care providers, which could ease workflow	• Funded by district hospital, hence avoiding budgetary concerns with employment of pharmacist by local hospital • Hospital-based pharmacists could have more experience with hospital guidelines and medication protocols • Does not increase workload pressures for local (sole) pharmacists • Potential for visiting accredited pharmacist or educator to extend medication support to the local hospital
Cons	• Unfamiliarity with hospital guidelines and medication protocols • No sales and dispensing of Schedules 2, 3, 4 and 8 medicines when the pharmacist is absent • Increased workload on top of current business demands and CPD requirements	• Less frequent service • Role may be restricted to inventory management, rather than clinical pharmacy, with the limited timeframe available at the local hospital • Difficult to implement if the district hospital also has limited pharmacist workforce capacity

While these potential pharmacist models may improve medication support and processes in the study community, key issues remain with pharmacist workforce and funding.

Recommendation 14: Trial both the 'sessional' and 'outreach' models to determine their appropriateness. It is acknowledged that different rural communities impose different complexities and workforce issues, and both models could be as effective to be implemented in rural communities.

Objective 6: Explore the potential role for a community liaison pharmacist.

One specific medication role currently undertaken by *multiple* health care providers (e.g. aged care nursing staff, community nursing staff, community pharmacists) was ensuring continuity of medication supply. However, the study identified ineffectiveness and/or inefficiencies in the existing patient information transfer system, within the study community and with health care services outside the study community. This is compounded by the limited pharmacist workforce capacity, under-utilisation of existing pharmacists' skills, under-utilisation of medication reconciliation tools (e.g. eLMS and EDS) in the hospital sector and/or lack of medication reconciliation tools in the community. The following issues were cited:

- Discrepancies in patients' medication records.
- Difficulties in following up on doctors' orders/prescriptions and changes in medication charts.
- Duplication of prescriptions following requests from multiple health care providers.

- Difficulties in following up with patients returning from secondary/tertiary facilities (metropolitan area) without DMR or sufficient medication information to warrant continual prescribing by the local medical practitioners.
- Inadequate communication between secondary/tertiary facilities with primary carers in rural areas to ensure availability of medication supply for patients for ongoing treatment initiated in the secondary/tertiary facility.

The health care providers appeared frustrated with the inefficiencies in the existing system, making it challenging to provide continuous health care and medication support to patients. There is potential for a medication liaison model to be implemented to improve such inefficiencies. The community liaison pharmacist model is anticipated to reduce duplication and workload of other health care providers, allowing them to focus on their aspects of health care provision, and at the same time allowing the implementation of QUM and continuity of care principles as outlined in the APAC guidelines.[5]

The PSA *Professional Practice Standards*[4] outline the scope of a liaison pharmacist, incorporating medication review and reconciliation, particularly targeting patients who are transferring between health care settings and health care providers. This is a model to be ideally undertaken by a community pharmacist, given that the medication record at the local pharmacy should be the most current/accurate. This is provided the patient utilises a single pharmacy, which is not an issue in a rural community serviced mainly by single pharmacies. This report has identified two community pharmacists extending their services to check medication charts in the local aged care facility, to minimise discrepancies in medication records as well as ensure the correct medications are dispensed to the patients. This could be further extended to hospital records. The role could also involve:

- Communicating with pharmacists in secondary/tertiary facilities in the metropolitan area about medications that the patient will be continuing on discharge, to ensure ongoing supply for the patient.
- Updating key health care providers in the community, including medical practitioners and relevant nursing staff, with the most current medication history for use in medication management decisions.
- Identifying patients at risk of medication misadventure.
- Collaborating with other health care providers in identifying patient's individual medication needs.
- Formulating a medication action plan in collaboration with the patient and the relevant health care providers.
- Providing health and medication information to patients and other health care providers to promote QUM in the community.

Some of the local community pharmacists had undertaken this role to some extent, particularly providing medication education and checking medication records for discrepancies. However, the findings demonstrated the need for further improvement of medication management services and medication continuance in the community. The role is also anticipated to minimise, if not resolve, difficulties for health care providers to follow up on doctors' orders and prescriptions, medication changes on medication charts and DMRs, as highlighted by health care providers. This will allow the other health care providers to focus on their aspects of health care provision. Key issues relating to implementation of this model include pharmacist workforce capacity and remuneration for the role.

Recommendation 15: Establish an appropriate community liaison pharmacist framework in the study community to ensure medication continuity and promote QUM. Considerations should include workforce capacity, availability and utilisation of facilitating communication tools (see Recommendation 10), and remuneration. This is anticipated to resolve gaps in medication management and reconciliation processes in the community.

Objective 7: Explore mechanisms for other pharmacy staff to support rural health care providers who are involved in the medication cycle.

Currently, the *Regulation*[6] has no provisions or endorsements for pharmacy support staff (e.g. pharmacy assistants or dispensary assistants/technicians) apart from:

- Authorisation to sell Schedule 2 medicines in a pharmacy [section 258], and
- Pharmaceutical imprest duties in a hospital under the supervision of a pharmacist [sections 58B, 163A, 252A].

However, pharmacy support staff undertake a variety of other tasks in the pharmacy under the direction and personal supervision of a pharmacist, which requires a pharmacist to be present on the premises while the tasks are performed.[70,80] The roles of pharmacy assistants have been well established in terms of community pharmacy and non-prescription medicines (Schedules 2 and 3 medicines). The roles of pharmacy technicians have been well established in terms of daily stock control and dispensing tasks in supplying medications, as they generally have undertaken training in legislation relating to medication ordering, dispensing and supply, as well as medication stock management.[16,70,81]

The literature review[8,40] and findings from the study have identified the potential for endorsing pharmacy support staff (e.g. pharmacy assistants/technicians) in the medication cycle, and hence, facilitating their role in medication support, particularly in rural areas where the pharmacist workforce is limited. Key areas of role extension for pharmacy support staff identified are: 1) hospital and 2) community, as outlined below.

Hospital

Pharmacy technicians generally have undertaken training in medication stock management and legislation relating to medication processes.[70] When pharmacist workforce capacity is limited, pharmacy support staff are considered appropriate personnel to undertake independent operation or technical tasks such as daily stock control and medication supply in non-pharmacist sites, without the expectation to respond to clinical needs in the health care setting. This would relief nurses of their medication supply role to focus on patient care.

The data reported here suggest that pressures on nursing staff in non-pharmacist sites do not permit a consistent nurse 'pharmacy portfolio' (on short-staffed days). Further, succession training for medication processes is not in place, potentially impacting effective medication stock/cost control and quality supply of medications. This supports the use of pharmacy support staff to undertake medication roles, but the role extension would be limited in the absence of a supervising pharmacist.

While pharmacy support staff traditionally operate under the delegation of a pharmacist, the delegation model for pharmacy support staff could be redefined to include a medical practitioner, director of nursing or registered nurse, a concept established by one of the stakeholders. Alternatively, supervision could be undertaken with a remote pharmacist via

video-conferencing, a concept that has been explored overseas. This is aligned with recent changes in the *Regulation*, which acknowledged the role of technology (e.g. video-conferencing) in 'supervision' and 'personal supervision' of health practitioners [section 5A].

The key issue with the employment of pharmacy technicians in non-pharmacist sites remains budgetary restrictions (rural hospitals prioritising nursing staff for acute patient care) and the availability of the personnel to perform medication tasks during non-working hours. Further role modelling and employment pathways for a pharmacy support staff undertaking medication supply in non-pharmacist sites is warranted.

Community

Currently, the 'dispensary area' of a pharmacy (for Schedules 2, 3, 4 and 8 medicines) is only permitted to function in the presence of a pharmacist. This restricts sole community pharmacists in rural areas from providing medication support outside the pharmacy. This will in turn restrict potential role extension of providing 'sessional' services to a non-pharmacist site (local hospital). Existing legislation allows authorised premises to sell Schedule 2 medicines in areas isolated from pharmacy services [sections 19, 231].[6] The role of rural pharmacy support staff could be extended to allow sales of Schedule 2 medicines in pharmacy located in rural communities in the absence of a pharmacist, with appropriate training and endorsement to align with the requirements of minimum practice standards for endorsed health practitioners.

In addition, overseas models have explored the value of pharmacy assistants in undertaking the entire dispensing process (receiving the patient's prescription and dispensing the medication) for the pharmacist to verify the dispensed medication and consult with the patient at the end. Some models extended into formalised checking of dispensed medications by pharmacy support staff.[70] This suggests potential for extending the role of pharmacy support staff in rural communities to receive prescriptions from patients and dispense medications in the absence of a pharmacist, and subsequently the pharmacist could verify the accuracy of the dispensed medications and consult the patients. This is anticipated to ease workload pressures of existing pharmacists in rural areas to provide more clinical medication services outside the pharmacy such as medication reconciliation and medication management reviews.

Recommendation 16: Amend the *Regulation* to recognise the roles of pharmacy support staff working under the supervision of pharmacists, as study findings and literature review have reported that pharmacy support staff undertake various medication roles. Regulatory endorsements for pharmacy support staff would also allow development of medication-related models or extended roles for these staff in rural areas, where pharmacists are lacking (see Recommendation 17 and 18).

Recommendation 17: Explore the provisions in the *Regulation* that refer to hospital pharmaceutical assistants performing imprest duties to also cover potential extended roles for pharmacy support staff into pharmacy 'store' management and medication supply in rural hospitals, and re-define the level of supervision required to undertake this role. This should provide some level of pharmacy support to non-pharmacist sites in rural areas lacking pharmacists and concurrently relieving nurses of medication supply role to focus on patient care. Additional training and competency assessment would be required.

Recommendation 18: Explore potential extended roles for pharmacy support staff in dispensing processes and sale of non-prescription medications in single-pharmacist towns, and re-define the level of supervision required to undertake this role. This would enable the pharmacist to provide extended medication services outside the pharmacy (e.g. local hospital, aged care facility). Additional training and competency assessment would be required.

Some key questions remain unaddressed by the above recommendations:

- The source of funding (Federal or State) for new or enhanced health care provider roles remains ambiguous. While this study did not directly explore economic issues, financial constraint was an underlying theme amongst interviewees when discussing solutions and their ideals. Currently, Queensland Health funds only apply to public hospitals in rural areas. This is not desirable, particularly when a large number of patients relied on the public hospital system (secondary/tertiary facilites) due to inadequate primary care services.

- Medication issues and potential models may not be extrapolated to other communities, due to differences in legislation between States or Territories. While it is recognised that such inconsistencies allow these jurisdictions to implement provisions that address local needs (e.g. Queensland Health endorsements for IHWs), there is a need to focus on their *impact* on rural health care providers and medication processes and the potential benefits of nationalisation of medication-related provisions.

5.0 CONCLUSION AND KEY IMPLICATIONS OF THE FINDINGS

This project explored a range of health care and medication-related issues in rural communities, with the focus on formal role extension or informal 'stretching' of roles of health care providers to meet the medication-related needs of a rural community in Queensland. It is unique because the project explored medication issues qualitatively from a variety of perspectives: issues reported in the literature, perceived issues among stakeholders, actual issues from various health care providers in the study community and consumers' issues/needs. Through field work, the researchers gained valuable insight into:

- Extended roles and responsibilities of health care providers involved in medication processes in the study community.
- The perceptions of health care providers regarding challenges in medication processes in rural communities, including legal and ethical issues relating to medication prescribing, supply and administration, and how they were coping with these challenges.

It was found that while some existing medication initiatives, including endorsements, training, education and intermittent outreach and/or remote support, were beneficial, they were deemed inadequate to meet the optimal continuity needed in this rural study community.

The research also highlighted the role of a pharmacist in promoting QUM, and the need to enhance medication roles for pharmacists servicing rural communities. Potential roles were identified for pharmacists in assisting with medication management services provided by health care providers in rural areas. Further, role development or optimisation of existing models to ensure quality medication processes in rural communities was proposed.

A series of 18 recommendations were generated, which will be refined and investigated for their potential application in the study community (Phase 2), and are available for other researchers and policy makers to explore.

6.0 STRATEGIES FOR ONGOING EVALUATION AND IMPROVEMENT

This a preliminary exploration study that forms part of a larger, ongoing research of role extension of health care providers in medication processes in a rural community. Ongoing investigation of the model(s) will again involve stakeholders, health care providers and consumers within the selected community. The key focus of the next research stage (Phase 2) will be improvement of medication services to, and within, the selected study community.

Issues and recommendations explored in this study will form part of the considerations in designing potential model(s) in Phase 2. These considerations include:

- Existing models overseas (e.g. extended roles for pharmacists and pharmacy assistants)
- Individual endorsement versus role extension across the whole profession
- Distant/remote support *versus* outreach/visiting support, *versus* role extension locally
- Consistency and sustainability of the model(s) (e.g. training, funding, workforce)
- Legal issues
- Professional guidelines and protocols
- State *versus* Federal funding or protocols
- Streamlining to reduce complexity of implementing the model (i.e. integration within the pre-existing health care/support system(s) in the community)
- Pre-existing cultural and personality differences (re-education of local health care providers in the extended roles)
- Outcome measurements and short-term valid evaluation (e.g. process indicators, monitoring of roles)

Researchers may seek partnership with relevant health care organisations, such as the National Prescribing Service (NPS), MSQ, QHD&P Unit, PSA, the Guild, Australian Nursing & Midwifery Council (ANMC) and/or rural entities. This allows integration of recommendations from this study with established potential models or protocols, therefore reducing possible duplication of interventions, while ensuring the potential model(s) is rationalised within the existing health care system, legally and professionally.

7.0 REFERENCES

[1] Queensland Health. Medication management - administration, handling, storage and supply of medication (Toowoomba and Darling Downs Health Service District). Brisbane; 2008.

[2] Department of Health and Ageing. Help staying at home [Online]. 2009 [cited 2011 February 15]; Available from: http://www.agedcareaustralia.gov.au/internet/agedcare/publishing.nsf/Content/help+staying+at+home.

[3] Australian Pharmacy Council. Remote rural pharmacists project [Online]. 2009 [cited 2009 July 12]; Available from: http://www.pharmacycouncil.org.au/PDF/Rural%20Remote%20Final%20Report%20June%2009.pdf.

[4] Pharmaceutical Society of Australia. Professional practice standards. 4th ed. Deakin; 2010.

[5] Department of Health and Ageing. Guiding principles for medication management in the community; 2006 [cited 2011 February 16]; Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/nmp-guide-medmgt-jul06-contents~nmp-guide-medmgt-jul06-contents-intro.

[6] Queensland Health (Drugs and Poisons) Regulation 1996.

[7] Queensland Health and the Royal Flying Doctor Service (Queensland Section). Primary Clinical Care Manual. 6th ed. Cairns; 2009.

[8] Arkinstall R, Lum E, Reid C, Maclean C. Supporting rural nurses in safe and appropriate medication management. Association of Queensland Nurse Leaders Conference; 2007.

[9] Queensland Nursing Council. Scope of practice - framework for nurses and midwives. Brisbane; 2008.

[10] Queensland Health. Location Profiles - Darling Downs - West Moreton Health Service District [Online]. 2010 [updated 2010 November 3; cited 2011 January 18]; Available from: http://www.health.qld.gov.au/workforus/profiles/Region_Toowoomba.asp.

[11] Health Practitioner Regulation National Law Act 2009.

[12] Medicare Australia. Home Medicines Review [Online]. 2010 [cited 2011 March 10]; Available from: http://www.medicareaustralia.gov.au/provider/pbs/fourth-agreement/hmr.jsp.

[13] Burridge N. SHPA standards of practice for the provision of medication reconciliation. Journal of Pharmacy Practice and Research. 2007;37(3):231-233.

[14] Roberts, A (aka Robbo). RFDS Medical Chest [Online]. 2009 [cited 2011 February 18]; Available from: http://bitethedust.com.au/bitingthedust/2009/09/16/rfds-medical-chest/.

[15] Royal Flying Doctor Service. Medical chests [Online]. 2011 [cited 2011 February 18]; Available from: http://www.flyingdoctor.org.au/Health-Services/Remote-Services/Medical-Chests/.

[16] The Pharmacy Guild of Australia. Pharmacy assistant training [Online]. [cited 2011 February 14]; Available from: http://www.guild.org.au/tas/content.asp?ID=2734.

[17] Pharmaceutical Society of Australia. National competency standards framework for pharmacists in Australia. Deakin; 2010.

[18] Medicare Australia. Residential Medication Management Review (RMMR) [Online]. 2010 [cited 2011 March 10]; Available from: http://www.medicareaustralia.gov.au/provider/pbs/fourth-agreement/rmmr.jsp.

[19] RHealth. What is RHealth? [Online]. [cited 2011 February 11]; Available from: http://www.rhealth.com.au/.

[20] GISCA. Pharmacy ARIA - PhARIA [Online]. The University of Adelaide; 2010 [cited 2010 November 15]; Available from: http://gisca.adelaide.edu.au/projects/pharia.html.
[21] Wakerman J. Defining remote health. Australian Journal of Rural Health. 2004;12:210-214.
[22] Australian Institute of Health and Welfare. Australia's health 2008. Cat. no. AUS 99. Canberra; 2008.
[23] Brooks PM, Lapsley HM, Butt DB. Medical workforce issues in Australia: "tomorrow's doctors - too few, too far". Medical Journal of Australia. 2003;179:206-208.
[24] Kilpatrick SI, Johns SS, Millar P, Le Q, Routlet G. Skill shortages in health: innovative solutions using vocational education and training. Rural and Remote Health. 2007;7:623-636.
[25] Productivity Commission. Australia's Health Workforce. Research report: Canberra; 2005.
[26] The Australian Institute of Health and Welfare. Health in rural and remote Australia. AIHW Cat. No. PHE 6. Canberra; 1998.
[27] Davidson P, Abbott P, Davison J, DiGiacomo M. Improving medication uptake in Aboriginal and Torres Strait Islander People. Heart, Lung and Circulation. 2010;19:372-377.
[28] Sidoti C. The human rights of older Australians in the bush [Online]. 1999 [cited 2009 July 12]; Available from: http://www.hreoc.gov.au/about/media/speeches/human_rights/hr_older_aus_bush.html.
[29] Pashen D, Murray R, Chater B, Sheedy V, White C, Eriksson L, De La Rue S, Du Rietz M. The expanding role of the rural generalist in Australia - A systematic review. Brisbane: Australian College of Rural and Remote Medicine; 2007.
[30] Craig M. Development of career pathways for Indigenous people, to provide medication support services in remote Health Service settings. Alice Springs: Centre for Remote Health; 2009.
[31] Australian Government Department of Health and Ageing. Report on the audit of health workforce in rural and regional Australia, April 2008. Canberra; 2008.
[32] Birks M, Mills J, Francis K, Coyle M, Davis J, Jones J. Models of health service delivery in remote or isolated areas of Queensland: a multiple case study. Australian Journal of Advanced Nursing. 2010;28(1):25-34.
[33] Harding A, Whitehead P, Aslani P, Chen T. Factors affecting the recruitment and retention of pharmacists to practice sites in rural and remote areas of New South Wales: A qualitative study. Australian Journal of Rural Health. 2006;14:214-218.
[34] Andrus M, Clark DB. Provision of pharmacotherapy services in a rural nurse practitioner clinic. American Journal of Health-System Pharmacy. 2007;64:297-297.
[35] Casey M, Moscovice IS, Davidson G. Pharmacist staffing, technology use and implementation of medication safety practices in rural hospitals. The Journal of Rural Health. 2006;22(4):321-330.
[36] Kairuz T, Volk H. Development and evaluation of a Rural Pharmacy Practice-and-Research Network to facilitate the provision of pharmacy services - Final report: Rural Pharmacy Workforce Program; 2009.
[37] Kimber M. Telepharmacy-enabling technology to provide quality pharmacy services in rural and remote communities. Journal of Pharmacy Practice and Research. [Thesis]. 2006;36(2):128-133.
[38] National Health and Hospitals Reform Commission. A healthier future for all Australians. Barton: Commonwealth of Australia; 2009.
[39] Brooks PM, Robinson L, Ellis N. Options for expanding the health workforce. Australian Health Review. 2008;32(1):156-160.

[40] Fiore S, Souzani S, D'Amore R, Behan K, Cutts C, La Caze A. Support needs of supply nurses in rural and remote Queensland. Australian Journal of Rural Health. 2005;13:10-13.
[41] Mullan F, Frehywot S. Non-physician clinicians in 47 sub-Saharan African countries. Lancet. 2007;370:2158-2163.
[42] Reeve C, Pashen D, Mumme H, De La Rue, S, Cheffins T. Expanding the role of paramedics in norther Queensland: An evaluation of population health training. Australian Journal of Rural Health. 2008;16:370-375.
[43] Blacker N, Pearson L, Walker T. Redesigning paramedic models of care to meet rural and remote community needs. In: Gregory Gordon, editor. 10th Nationl Rural Health Conference; 2009; Cairns.
[44] Keep RNs in aged care. Australian Nursing Journal. 2010;17(7):6.
[45] Queensland Health. Personal care guidelines and procedures. Queensland Health home care services. Brisbane; 2004.
[46] Chur-Hansen A, Todd E, Koopowitz L. Description and evaluation of an up-skilling workshop for rural and remote mental health practitioners in South Australia. Australasian Psychiatry. 2004;12(3):273-277.
[47] Schoo A, Boyce RA, Ridoutt L, Santos T. Workload capacity measures for estimating allied health staffing requirements. Australian Health Review. 2008;32(3):548-558.
[48] Medicare Australia. Nurse practitioners and midwives [Online]. 2010 [cited 2011 January 20]; Available from: http://www.medicareaustralia.gov.au/provider/other-healthcare/nurse-midwives.jsp.
[49] Hegney D, Plank A, Watson J, Raith L, McKeon C. Patient education and consumer medicine information: a study of provision by Queensland rural and remote are Registered Nurses. Journal of Clinical Nursing. 2004;14:855-862.
[50] Stowasser D, Allinson YM, O'Leary KM. Understanding the medicines management pathway. Journal of Pharmacy Practice and Research. 2004;34:293-296.
[51] Medicare Australia. Optometrist PBS prescribing [Online]. 2010 [cited 2011 January 20]; Available from: http://www.medicareaustralia.gov.au/provider/pbs/supplier/optometrist.jsp.
[52] National Health Act 1953 - Prescribing of pharmaceutical benefits. Sect. 88.
[53] Health Consumers Queensland. Health Consumers Queensland Response to the Australian Government's Department of Health and Ageing: Medicare Locals: Proposed boundaries. Brisbane; 2010.
[54] Timmings R. Rural and isolated practice registered nurse (RIPRN) - Emergency nurses of the Queensand 'bush'. Australasian Emergency Nursing Journal. 2006;9:29-34.
[55] Queensland Health. The Health (Drugs and Poisons) Regulation 1996 - What nurses need to know. Brisbane; 2008.
[56] Department of Health and Ageing. Supplying medicines - what pharmacists need to know [Online]. 2011 [cited 2011 January 20]; Available from: http://www.pbs.gov.au/info/healthpro/explanatory-notes/section1/Section_1_3_Explanatory_Notes.
[57] The Pharmacy Guild of Australia. The roadmap - The strategic direction for community pharmacy. Barton; 2010.
[58] McRae M, Taylor SJ, Swain K, Sheldrake C. Evaluation of a pharmacist-led, medicines education program for Aboriginal Health Workers. Rural and Remote Health. 2008;8:946-963.
[59] Kelaher M, Dunt D, Taylor-Thomsn D, Harrison N, O'Donoghue L, Barnes T, Anderson I. Improving access to medicines among clients of remote area Aboriginal and Torres Strait Islander Health Services. Australian and New Zealand Journal of Public Health. 2006;30(2):177-183.

[60] Crockett J, Taylor S. Rural pharmacist perceptions of a project assessing their role in the management of depression. The Australian Journal of Rural Health. 2009;17:236-243.
[61] Sunderland V, Burrows SD, Joyce AW. A comparative evaluation of phamacy services in single and no pharmacy towns. Australia and New Zealand Health Policy. 2006;3:8-17.
[62] Schwartz A. Developing a sustainable pharmacy support network to address geographical issues associated with quality use of medicines (2002-2005): Pharmaceutical Society of Australia (NSW Branch) Ltd; 2004.
[63] Wibowo Y, Berbatis C, Joyce A, Sunderland VB. Analysis of enhanced pharmacy services in rural community pharmacies in Western Australia. Rural and Remote Health. 2010;10:1400-1408.
[64] Coombes I, Heel ACY, Stowasser DA, Reid CM, Henderson A, Mitchell C. Identification of medication errors by nurses during a simulated ward, medication safety orientation program. Journal of Pharmacy Practice and Research. 2005;35:190-194.
[65] Safety & Quality Council. Second national report on patient safety - improving medication safety. Canberra: Australian Council for Safety and Quality in Health Care; 2002.
[66] Easton K, Morgan T, Williamson M. Medication safety in the community: A review of the literature. Sydney: National Prescribing Service; June 2009.
[67] Dooley M, Allen KM, Doecke CJ, Galbraith KJ, Taylor GR, Bright J, Carey, DL. A prospective multicentre study of pharmacist initiated changes to drug therapy and patient management in acute care government funded hospitals. British Journal of Clinical Pharmacology. 2003;57(4):513-521.
[68] Bonner CJ C, B. Medication compliance problems in general practice: detection and intervention by pharmacists and doctors. The Australian Journal of Rural Health. 2002;10:33-38.
[69] Queensland Health. Interpreting specific references in the *Health (Drugs and Poisons) Regulation 1996* pertaining to the supervision of a person: Drugs and Poisons, Policy and Regulation, Queensland Health; 2008.
[70] Kinrade W. Workforce and career options for phamacy assistants - Final report: Pharmacy Guild of Australia; 2004.
[71] Nissen L, Tett S. Rural community pharmacists integrating care for people with complex health needs. Brisbane: The Pharmacy Guild of Australia; 2005.
[72] Segal L, Bolton T. Issues facing the future health care workforce: the importance of demand modelling. Australia and New Zealand Health Policy. 2009;6(12):1-8.
[73] Moore T, Sutton K, Maybery D. Rural mental health workforce difficulties: a management perspective. Rural and Remote Health. 2010;10:1519-1528.
[74] Thornberry F, Emerson L. Ensuring access to pharmacy services in rural Australia. 7th National RURAL HEALTH Conference; 2003.
[75] Gallego G. Untangling hospital medicine funding. Hospital & healthcare. 2006:14-15.
[76] Department of Health and Ageing. Patient charges [Online]. Commonwealth of Australia; 2011 [cited 2011 March 24]; Available from: http://www.pbs.gov.au/info/healthpro/explanatory-notes/section1/Section_1_4_Explanatory_Notes.
[77] Brown L, Payne A, Nepal B, Gong C, Cooper G. Modelling options for the public funding of hospital medicines in Australia. Bruce: National Centre for Social and Economic Modelling, University of Canberra; 2010.
[78] Angley M, Ponniah A, Bong J, Padhye V, Shakib S, Spurling L. Implementing and evaluating a parallel post-discharge Home Medicines Review (HMR) model: The Pharmacy Guild of Australia.
[79] Department of Health and Ageing. Clincal guidelines and procedures for the use of methadone in the maintenance treatment of opioid dependence. Canberra: Commonwealth of Australia; 2003.

[80] Pharmaceutical Society of Australia. The role of non-pharmacist dispensary assistants/technicians; 2003.
[81] Leversha A, Ahlgren KL, Gray MJ. Ward pharmacy technicians assist clinical pharmacists with admissions. The Australian Journal of Hospital Pharmacy. 2001;31(2):130-132.

8.0 APPENDICES

Appendix 1: Introductory letter

School of Pharmacy
Gold Coast Campus
GRIFFITH UNIVERSITY QLD 4222
Telephone (07) 5552 7097
Facsimile (07) 5552 8804
l.hattingh@griffith.edu.au
www.griffith.edu.au

School of Pharmacy
The University of Queensland
Brisbane QLD 4072 Australia
Telephone (07) 3346 1900
Facsimile (07) 3346 1702
l.emmerton@pharmacy.uq.edu.au
www.uq.edu.au

(Date to be inserted)

Dear (stakeholder/health care practitioner to be inserted)

Medication management is a complex process which involves a range of health care professionals. Rural and remote areas pose specific medication management challenges that require careful planning in order to achieve quality use of medicines. We are therefore conducting research with a focus on the supply, prescribing and dispensing of medicines in a rural area to assist us in identifying problem areas, in order to ultimately trial alternative models of medication management.

Part of our research will involve interviews with (stakeholders/health care practitioners). As a (stakeholder/health care practitioner) involved in medication management, we are seeking your participation in this research through a face-to-face interview, estimated to be approximately 30 minutes. The interview will be with Victoria Jarvis and Amy Tan, who is undertaking this research study in meeting the requirements of a Doctor of Philosophy. The interview will mainly focus on current practices and issues that impact of patients' medication management.

Your participation is completely voluntary, and any time you can take to assist us with our research will be greatly appreciated. We will contact you in the near future to discuss the interview in more detail.

If you have any questions about our research please contact us and we will provide you with further information.

Thank you for your time.

Yours sincerely,

Dr Laetitia Hattingh
School of Pharmacy
Griffith University

Dr Lynne Emmerton
School of Pharmacy
The University of Queensland

Appendix 2: Information sheet

TITLE OF PROJECT

An exploratory study of extended health care practitioner roles in medication management in a rural community.

INFORMATION SHEET

Chief Investigators Dr Laetitia Hattingh School of Pharmacy Griffith University Telephone: (07) 5552 7097 Email: l.hattingh@griffith.edu.au Dr Lynne Emmerton School of Pharmacy The University of Queensland Telephone: (07) 3346 1900 Email: l.emmerton@pharmacy.uq.edu.au	Student Investigator Amy Tan School of Pharmacy The University of Queensland Doctor of Philosophy student Telephone: (07) 3346 1900 Email: amy.tan@uqconnect.edu.au

The purpose of the study is to explore the issues surrounding health care practitioners when 'extending' their roles to meet the medication-related needs of a rural community in the Darling Downs – West Moreton Health Services District. Information from this case-study community will help develop legal, ethical and professional limits for policy makers and practitioners in other communities.

The research specifically aims to determine:

- Who is involved in medicine prescribing and supply services in the defined (rural) study area, including medical and non-medical prescribers and roles undertaken by nurses and allied health care practitioners.
- What training and support structures are in place to assist health care practitioners to deliver medication services.
- When situations arise that could potentially lead to adverse medication outcomes due to an inadequate medication management support structure in the rural community.
- How the role of community and hospital pharmacists and pharmacy support staff could be extended to better support rural and remote health professionals and improve access to medicines.

Please note that the investigators are not interested in any specific illegal activities which may require mandatory reporting but rather issues in general where boundary issues can cause difficulties.

Your participation in the study

Thank you for indicating your willingness to participate in an interview. The purpose of the interview is to gather information about current practices and issues that impact of patients' medication management. It is estimated that an interview will take approximately 30 minutes, and we will organise the interview at a time that is convenient to you.

To assist us with accurately representing your views and experiences, we seek your permission to record the interview. Recordings will be erased following the transcribing thereof. The information obtained during your interview will only be available and accessible to the research team and all information will be de-identified in reports and publications. We will provide you with a summary of the findings once the research is completed.

Please contact us if you have any questions about the research and we will be happy to provide you with more detail.

Griffith University conducts research in accordance with the *National Statement on Ethical Conduct in Human Research*. If you have any concerns or complaints concerning the manner in which the research study is conducted, you can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on (07) 3735 5585 (or research-ethics@griffith.edu.au) or the Darling Downs – West Moreton Health Services District Human Research Ethics Committee Coordinator at (07) 4616 5916 (or Jennifer_Beatty@health.qlod.gov.au).

Thank you for your assistance with this research project.

Yours sincerely

Dr Laetitia Hattingh
School of Pharmacy
Griffith University

Dr Lynne Emmerton
School of Pharmacy
The University of Queensland

(Date)

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at www.gu.edu.au/ua/aa/vc/pp or telephone (07) 3735 5585.

Appendix 3: Consent form

An exploratory study of extended health care practitioner roles in medication management in a rural community.

CONSENT FORM

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include a face-to-face interview that will be recorded;
- I have had any questions answered to my satisfaction;
- I understand the risks involved;
- I understand that there will be no direct benefit to me from my participation in this research (this may need to be modified for some projects);
- I understand that my participation in this research is voluntary;
- I understand that if I have any additional questions I can contact the research team;
- I understand that I am free to withdraw at any time, without comment or penalty;
- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 5585 (or research-ethics@griffith.edu.au) or the Darling Downs – West Moreton Health Services District Human Research Ethics Committee Coordinator at (07) 4616 5916 (or Jennifer_Beatty@health.qlod.gov.au) if I have any concerns about the ethical conduct of the project; and
- I agree to participate in the project.

Name	
Signature	
Date	

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes. However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan at www.gu.edu.au/ua/aa/vc/pp or telephone (07) 3735 5585.

Appendix 4: Phone script used to contact health care providers

Good morning/afternoon. My name is Victoria Jarvis. I am a Project Officer based at The University of Queensland, managing a study of the extended roles of health care practitioners in a rural community.

As part of the study, we need to interview a range of health care practitioners who have experiences in practice in health care in a rural area. The rural area chosen for the study will focus on a number of towns, including yours (*name town*). The particular focus of the study is medication supply and management, so I'm wondering if your role involves either of these?

If answer is 'yes' – Fantastic. Can you describe your role?

If description is relevant - As a health practitioner in the town would you be available for a face-to-face interview? The interview should take approximately 30 minutes and will be conducted by myself and Amy Tan, a PhD candidate, in the next few of weeks at a time and location suitable to you.

If answer is 'no' – Just to clarify, by 'medication management' we mean providing information or recommendations for medications to your customers/ clients. Do you do this?

If answer is 'yes' – see above.

If answer is still 'no' – Thank you for your time.

More information if needed:

The chief investigators are Dr Laetitia Hattingh from the School of Pharmacy at Griffith University and Dr Lynne Emmerton from the School of Pharmacy at The University of Queensland. The project has been funded by the Pharmacists Board of Queensland, and approved by both institutional Human Research Ethics Committees and Queensland Health.

Also:

- Inter-professional relationships
- Scopes of practice
- Training, skills and knowledge
- Referral and support networks
- Workload
- Views on health workforce – shortage and needs in area
- Experiences in either being expected to practice, or actually practicing, at or beyond the perceived limits of their expertise, and influences on these practices.

Can I just check that I have your contact details right?
Your name is _____ (or can I have your name please?)
Best contact details:
Phone:
Email:

Can I leave my contacts for you as well? Please contact me if you have any questions or second thoughts about this in the meantime.

Thank you for your time. I'll see you on _____ at _____. Bye.

Appendix 5: Interview guide for stakeholders

Thank you for taking the time to see me today.

Just a brief introduction, I am Amy Tan, a PhD student for this project. The chief investigators for this project are my supervisors. And you may have spoken to Victoria, she's the project officer.

(We emailed the Information Sheet and Consent Form for you to read, but here is another copy … read … sign)

I'll just give you a brief rundown on the project to start. The key question is how the roles of healthcare practitioners are *challenged* in a rural community – and by 'challenged', we mean the *overlap* between their roles, and how these roles might be *stretched* to the limits of, or beyond, their accepted scopes of practice. To focus the project, we're looking at two aspects of rural health care: medication *supply* and medication *management*.

I have a series of questions to help guide the interview. There are no wrong answers to these questions, so please feel free to share your point of view and experience. Just as a reminder, everything that you say will remain confidential and your name will not appear in any reports or publications resulting from this work. If you don't mind, we'd like to record this, so we can focus on the discussion. *(start recorder)*

1. I'd like to start with a broad question: **what do you think are the major issues in rural health care** at the moment? Prompts:
    - Staffing:
        - Healthcare practitioner numbers (including locums)
        - Salaries
        - Career prospects
        - Referral networks
        - Attitudes to working in rural settings
        - Expectations and pressures on rural practitioners
    - Technology (and tech support)
    - Government support
    - Societal changes (population changes impacting on health care)
    - Focusing on medication services in general (medication *supply* and *management*), **what do you think is happening at the moment** in rural communities? Prompts:
        - Who is prescribing medicines?
        - Who is supplying medicines and pharmaceuticals?
        - When a patient is in urgent need of medicines after hours, what do they do?
        - Who helps patients manage their medications?
        - What are the current challenges faced by these health care practitioners (relating to medications)?

2. So far, we have identified that health care practitioners' **roles in rural areas are not as well defined as their metropolitan counterparts**. This might be due to the pressure of having to provide a number of health care services that may not be within their expertise or scope of practice.
   - What is your opinion on this? (explore **overlap, extension, fuzzy boundaries**)
   - What do you think are the challenges involved?
   - How will this affect patient care, medication supply and medication management?

3. Now that we have discussed what you think is currently happening out there, let's move on to **what you think should happen** in a rural community. Prompts:
   - In your opinion, what *might* work in a rural setting? *(This may be where the stakeholder talks about current initiatives.)*
   - If a doctor is not available, who should be the next port of call to *prescribe* medicines?
   - If the pharmacy is closed, who do you think should be the next port of call to *supply* medicines and pharmacy supplies?
   - Pharmacists do more than just supply medicines. Services we're considering include counseling, medication reviews (e.g. HMRs), dealing with drug interactions, and managing chronic diseases. Who do you think can provide these types of services if a pharmacist is not available in a rural town?
   - What is your opinion on the role of community pharmacist in towns where the hospital does not have a pharmacist?
   - If a novel model is suggested:
     - What medication-related tasks would you expect for this model?
     - What would be needed to ensure this model works successfully?
   - For any of the mentioned initiatives/roles:
     - What potential challenges might there be in this initiative?
     - What accreditation and training would be needed?
     - What are the legal implications?
     - What are the ethical implications? (pay-for-service, risk/liability)

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 medicines?

Thank you again for your time. Before we finish off, do you have any other comments that you'd like to make, either about the research topic or about this interview?

Appendix 6: Interview guide for health professionals

Town: 1 / 2 / 3 / 4 **Date/Time:**

A. Health care service details

1. Operating hours:
2. Services provided:
3. Other health professionals involved:

B. Interviewee Details

1. Gender ☐ Male ☐ Female
2. Age ☐ 20 – 29 ☐ 30 – 39 ☐ 40 – 49 ☐ >50
3. Are you: ☐ Local ☐ From another town:_____ ☐ From the city: _____
4. Are you working here: ☐ Full-time ☐ Part-time, explain:

C. Exploration of roles

1. Job position(s):
2. How long have you been associated with this service?
3. Approximately how long have you worked in your profession?
4. What are your approximate working hours/week?
   - Are these your regular working hours?
   - How do you feel about your current workload?
5. Describe your daily tasks as a_____ (job position)
   - Have there been times in this job when you had to do a task that falls outside your job description?
6. Is there anyone else with the same job position (in this town)?
   - Are there any other health professionals doing similar tasks as you?
7. If worked in urban areas before: how different it is compared to rural setting?

8. Medications:
    - Describe your role in relation to patients' medications
    - What support (e.g. resources, training, mentoring, IT, etc.) do you receive?
    - Difficulty? Challenges? Possible room for error?
    - How do you cope?
    - Can you recall a situation when a patient has needed a doctor, but the doctor was unavailable?
    - Can you recall a situation when a patient needed medications but the pharmacist was unavailable?

9. Relating to medicines supply and management, which other health professionals do you:
    - Ask for assistance from?
    - Work closely with?
    - Often have to refer patients to?
    - What happens if that person is unavailable?

10. If non-pharmacists were to supply/manage patients' medications in this town, which other health professional do you think will be suitable?
    - How do you feel about that?

11. Can you recall any other examples where improvements have been needed in terms of medication supply and safety in rural setting?
    - How did you manage?
    - Is there any 'internal' process/protocol in place?
    - Are/were you involved in any rural initiatives/intervention conducted by other people?

12. What role do you see for a community pharmacist in towns where there is no hospital pharmacist?

13. How do you feel about your role in patient care in this town? Do you feel you should have more roles?

14. Before we finish off, do you have any comments regarding the interview or the research project?

15. Thank you again for your time. Before we finish off, do you have any other comments that you'd like to make, either about the research topic or about this interview?

Appendix 7: Interview guide for consumers

Date/Time:	Age: <20	20-29	30-39	40-49	50-59	>60	Gender: F/M

1) Are you on any regular medications? If not, does anyone else in your household take prescription medicines?

2) a) Where do you (your friend/family) obtain your (their) medications?

   b) How often do you (your friend/family) obtain your (their) medications?

3) a) Have you (your friend/family) faced any difficulties in obtaining your (their) medications?

   b) Have you (they) needed help with managing your (their) medications?

   c) If on 5 or more regular medications, has anyone reviewed your (their) medications?

4) There's only a limited number of health care practitioner (e.g. doctors, nurses, pharmacists) in town:
   a) Can you think of a time when you (or someone else) needed a doctor, but the doctor was unavailable? What happened?
   b) Can you think of a time when you (or someone else) needed medications, but the pharmacist was closed? What happened?
   c) How do you feel about that?

Appendix 8: Health professional demographics

Label	Gender	Age (years)	Job type	Locality*	Position/current role and health sector	Duration of employment in current role** (years)
HP1	F	40-49	Full time	Metropolitan area	RN (mental health)	6-10
HP2	F	≥50	Full time	Local	RN (managerial^; hospital)	>20
HP3	M	30-39	Full time	Overseas	Medical practitioner (aged care, community, hospital)	0.5-1
HP4	M	40-49	Full time	Metropolitan area	Pharmacist (community)	6-10
HP5.1	F	30-39	Part time	Nearby town	RN (hospital)	1-5
HP5.2	F	≥50	Casual	Local	EN (hospital)	11-20
HP6	F	≥50	Part time	Local	RN (community; hospital)	>20
HP7	F	≥50	Casual	Metropolitan area	RN (aged care)	<0.5
HP8	F	≥50	Full time	Local	PC (aged care)	11-20
HP9	F	40-49	Part time	Local	EEN (aged care, hospital)	6-10
HP10	M	30-39	Full time	Overseas	Trainee pharmacist (community)	0.5-1
HP11	F	≥50	Full time	Local	RN (managerial; aged care)	1-5
HP12	M	30-39	Full time	Local	Pharmacist (community)	6-10
HP13	F	20-29	Part time	Local	OT (mental health)	6-10
HP14	F	40-49	Full time	Another rural town	RN (managerial; hospital)	0.5-1
HP15	M	40-49	Part time	Local	Pharmacist (community)	6-10
HP16	F	≥50	Part time	Local	AIN (community)	11-20
HP17	F	≥50	Part time	Another rural town	EEN (aged care)	1-5
HP18	F	≥50	Full time	Metropolitan area	RN (aged care)	<0.5
HP19	F	40-49	Part time	Local	OT (mental health, outreach)	1-5
HP20.1	F	20-29	Part time	Local	CN (managerial; hospital)	11-20
HP20.2	F	30-39	Full time	Local	RN (hospital)	0.5-1
HP21	F	20-29	Full time	Local	Trainee pharmacist (community)	0.5-1
HP22	M	30-39	Visiting	Local	Optometrist (community)	1-5
HP23	F	≥50	Full time	Local	Pharmacist (community)	>20
HP24	F	≥50	Full time	Local	RN (managerial; community, hospital)	>20
HP25	F	≥50	Full time	Metropolitan area	RN (managerial; hospital)	1-5
HP26	F	≥50	Full time	Local	Pharmacist (community)	11-20
HP27	F	40-49	Full time	Metropolitan area	RN (managerial; aged care)	0.5-1
HP28	F	40-49	Part time	Metropolitan area	RN (community)	1-5
HP29	F	40-49	Part time	Local	RN (community)	11-20
HP30	M	30-39	Full time	Metropolitan area	Medical practitioner (aged care, community, hospital)	1-5
HP31	F	30-39	Part time	Local	AAIN (hospital)	11-20

HP32	M	40-49	Full time	Local	RN (hospital)	6-10
HP33	F	≥50	Full time	Metropolitan area	CN (managerial; hospital)	1-5
HP34	M	≥50	Full time	Local	Medical practitioner (aged care, community, hospital)	11-20
HP35	M	≥50	Full time	Local	Medical practitioner (aged care, community, hospital)	>20
HP36	M	30-39	Full time	Metropolitan area	Medical practitioner (aged care, community, hospital)	0.5-1
HP37	M	40-49	Full time	Local	RN (mental health)	6-10
HP38	F	30-39	Full time	Local	Dentist (community)	11-20
HP39.1	F	40-49	Full time	Nearby town	RN (managerial; community)	1-5
HP39.2	F	30-39	Part time	Metropolitan area	RN (community)	1-5
HP40	F	≥50	Full time	Nearby town	RN (managerial; aged care)	1-5
HP41	F	30-39	Full time	Local	RN (community)	1-5
HP42	F	≥50	Part time	Nearby town	RIPRN (hospital)	6-10
HP43	F	20-29	Full time	Metropolitan area	PC (aged care)	1-5
HP44	F	≥50	Part time	Local	PC (aged care, community)	6-10
HP45	F	30-39	Visiting	Nearby town	Educator (community, hospital)	1-5
HP46	M	≥50	Visiting	Metropolitan area	Accredited pharmacist (aged care, community)	6-10

**'Locality' is refers to the location the individual resided in, tracking back 5 years ago; 'metropolitan area' refers to locations with PhARIA category 1.*
***Duration of employment in current role excludes duration or work experience in previous employment(s) in similar role(s).*
^'Managerial' position refers to Director of Nursing (DON), Nurse Unit Manager (NUM) or Team Leader (TL)/manager of a group of nursing staff in the community or aged care setting.
Abbreviations: AIN: assistant in nursing, AAIN: advanced assistant in nursing, CN: clinical nurse, EN: enrolled nurse, EEN: (medication) endorsed enrolled nurse, OT: occupational therapist, PC: personal carer, RN: registered nurse, RIPRN: Rural and Isolated Practice Endorsed Nurse.